SCIRT Rebuilding Infrastructure

LEARNING LEGACY

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.

Central City Delivery Management Plan

Story: Central City Infrastructure Rebuild

Theme: Programme Management

A document outlining how the rebuild of wastewater, water supply, storm water and roading infrastructure was to be managed and coordinated with other programmes of work in the central city.

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

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Central City Delivery Management Plan

Review:

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A	Approved	Richard Topham	Ian Campbell	24/10/2013
B	Approved	Richard Topham	Ian Campbell	05/03/2014

Authorisation:

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CONTENTS

1 ACRONYMS, ABBREVIATIONS AND DEFINITIONS

Term	Definition
AA	Alliance Agreement
GM	General Manager
CCC	Christchurch City Council
CCDU	Central City Development Unit
CERA	Canterbury Earthquake Recovery Authority
CTOC	Christchurch Transport Operations Centre
DMP	Design Management Plan
EMP	Environmental Management Plan
IST	Integrated Services Team
ITP	Inspection and Test Plan
KPI	Key Performance Indicator
KRA	Key Result Area
NZTA	New Zealand Transport Agency
OLG	Operational Leadership Group
PMP	Programme Management Plan
QMP	Quality Management Plan
SCIRT	Stronger Christchurch Infrastructure Rebuild Team
SDI	Spatial Data Infrastructure
TIM	Transport Impact Minimisation Group
TLG	Tactical Leadership Group
TTM	Temporary Traffic Management
USC	Utility Service Coordinator
UMP	Utility Management Plan

2 INTRODUCTION

2.1 PURPOSE OF THIS PLAN

The purpose of this *Central City Delivery Management Plan* is to describe how SCIRT intends to manage the specific risks associated with undertaking the construction of the Christchurch horizontal infrastructure rebuild works within the central city area (bounded and inclusive of the '4 Avenues'). Such works shall include the construction of the 3 waters (water, wastewater and stormwater) roadway, bridges and associated facilities required to complete the rebuild works.

2.2 PROGRAMME DETAILS

The full scope of the SCIRT rebuild programme is detailed in the *Programme Management Plan*.

3 OBJECTIVES

This plan has been produced to supplement the *Construction Management Plan* and other relevant Management Plans for specific issues within the central city.

The main objective of this plan is to facilitate completion of all construction activities on time and on budget within the central city area, in a manner that facilitates the wider rebuild and recovery process, and in particular, the Central City Plan.

Many of the various non-SCIRT work programmes will be delivered alongside the SCIRT programme. Together, they will have a significant impact on both traffic flow and the business community within the central city area.

The main issues identified specific to the central city area and addressed in this plan include:

- Alignment of the various work programmes
- Road space conflict identification and management
- Maintaining minimum levels of service for traffic flow
- Communication & Stakeholder engagement
- Minimising the impact to businesses
- Parking strategy
- Construction site and footprint management

This document will therefore enable a consistent approach for these issues to be adopted by the delivery teams working within the central city area.

4 PROGRAMME ALIGNMENT

4.1 INTERACTION WITH ANCHOR PROJECTS

Anchor Projects will be implemented by both the CCC and CCDU between 2013 and 2018. These include the following:

- Avon River Precinct
- Convention Centre
- Stadium
- Metro Sports Facility
- Bus Interchange
- The Square
- Justice & Emergency Precinct
- Health Precinct
- Residential Demonstration
- Innovation Precinct
- Retail Precinct
- Accessible City Plan
- Earthquake Memorial
- Central Library
- Performing Arts Precinct
- Cricket Oval

SCIRT has prioritised the horizontal infrastructure repair/rebuild around these works where necessary to ensure underground and surface infrastructure supports the timing of these developments. Because of this, the infrastructure has been designed ahead of the anchor projects and as such SCIRT meet with the CCC and CCDU weekly to keep ahead of progress and Anchor project design development.

As the Anchor Project proposals develop, workshops will be held between the SCIRT Design/Delivery teams and the Anchor Project teams to confirm that our construction plans meet Anchor project requirements. Any requirements outside of SCIRT scope are identified and passed to the Horizontal Infrastructure Management Team (HIMT) for agreement between the Client Organisations and to allow instruction to be given to SCIRT for progression. The IST Central City Programme Manager (Richard Topham) is responsible for this liaison.

4.2 INTERACTION WITH OTHER PROGRAMMES

In addition to the Anchor Projects, various other programmes of work are being delivered within the central city. These include:

- Demolition Work
- CCDU/CCC Accessible City Plan
- Private Developments
- CCC other Programmes
- Utilities work
- Events

Because of this, where a conflict with other work programmes exists, there is very little flexibility to change the SCIRT schedule without incurring delay and hence additional cost to the rebuild programme. As such, SCIRT will continually liaise with the various programme holders to minimise risk and ensure the SCIRT programme is well understood.

SCIRT schedules have been developed and prioritised as follows:

1. Anchor Project alignment
2. Hydraulic dependencies (constructability) due to network changes
3. Productive and economic delivery of the work
4. Optimisation for traffic and business impact management

Due to the various conflicting priorities and the changing central city environment, there may be the need to optimise the schedule for traffic impact and business impact minimisation. SCIRT will liaise with CTOC and the business owners to facilitate this process. However, it is likely that conflicts will occur, and rescheduling of the SCIRT programme would result in additional cost or programme delays. In these instances, SCIRT will follow the conflict resolution process as outlined in the Transport Optimisation Management Plan appended to this document.

4.3 SCHEDULE UPDATES

Baseline and Progress Schedules are prepared and maintained by the Delivery Teams for all SCIRT projects in accordance with the Schedule Management Plan. For Central City projects, the progress schedule will be developed into a detailed street level schedule. This Street-level Schedule will be maintained and updated weekly and provided to the IST by 12pm Thursdays to for processing as per Figure 1.

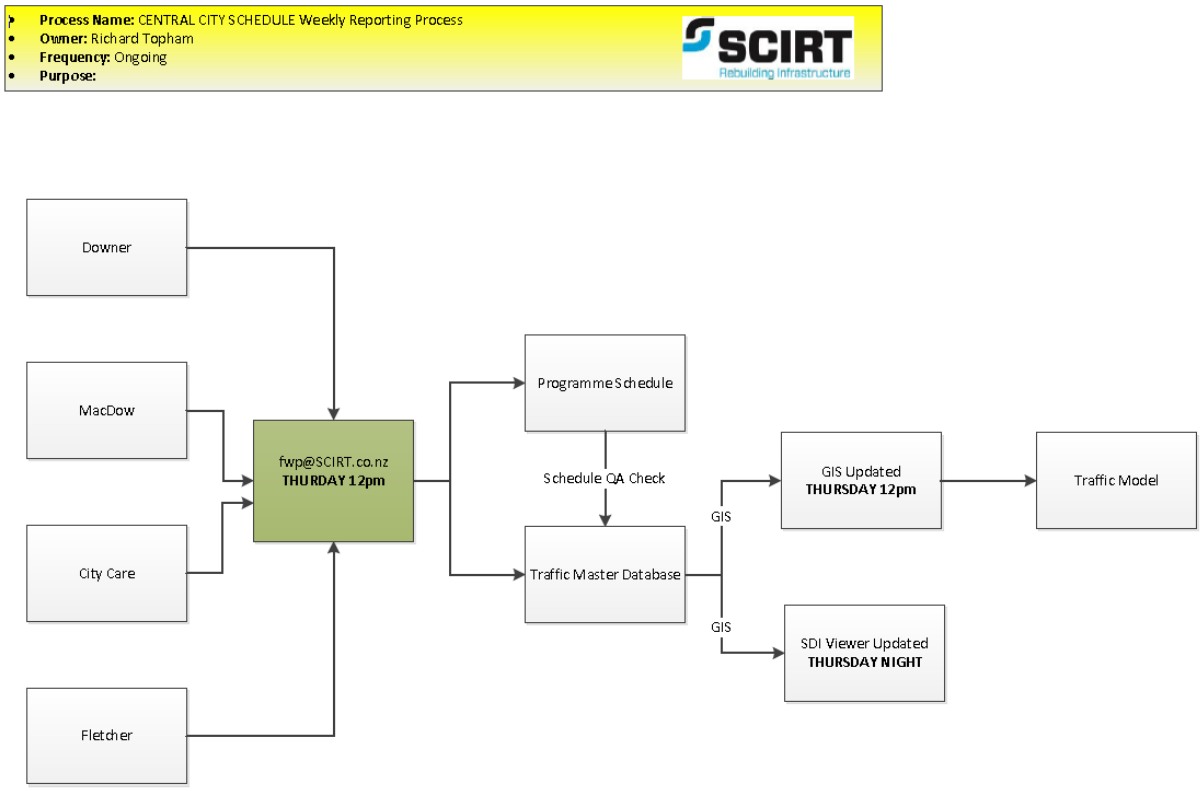


Figure 1: Schedule Update Process Chart

Delivery Teams will ensure that the street level schedule updates provided are consistent with project schedule reporting required by the *Schedule Management Plan*.

All street level schedule updates will include the proposed traffic impacts to assist with conflict assessment and address the overall impact on traffic flow. The traffic impact information provided must include:

- Primary impact (within the work site area)
- Secondary Impacts (on interconnecting roads)

Accuracy of this information must be:

- Greater than 3 months from submission date – Impacts Indicative only
- 3 months from submission date – Impacts confirmed
- 1 month from submission date – Impacts validated through production and submission of the TMP

This information will be uploaded into the SDI tool (as detailed in 5.1 below) to ensure current information is displayed and utilised by the various stakeholders, programme owners and CTOC to assess the transport impact.

5 ROAD SPACE & TRANSPORT MANAGEMENT

The Transport Optimisation Management Plan can be found in Appendix A.

As construction activity increases in the central city there will be two primary conflicts for road space:

- Road space - Competition between separate construction contractors/crews for the same space in the road reserve (e.g. SCIRT working to replace a wastewater pipe in the same location as a crane to rebuild a structure)
- Transport - Competition from geographically separate work fronts whose combined impact effects the operation of the road network. An example would be two work fronts which both consume a northbound lane on separate arterial routes through the central city.

To identify and mitigate these potential conflicts the following process has been designed.

5.1 SPATIAL DATA INFRASTRUCTURE (SDI) TOOL

The Spatial Data Infrastructure (SDI) tool which is also known as the Forward Works Spatial Collaboration (FWSC) tool, is a web based portal for the visual display of forward works information at a street by street level developed and operated by LINZ. The tool is designed to identify spatial and network clashes at least three months prior to the start of construction activity. The SCIRT delivery teams are required to:

- Provide central city schedule updates to the SDI tool on a weekly basis

- Submit central city schedules on a 'best foot forward' basis. Therefore the schedule should always reflect a delivery team's current construction method, sequence and timing, irrespective of whether TMP's are approved or programmes fixed.

This is to allow an integrated planning approach to be taken to identify conflicts or interactions between the various work programmes, assisted by the CCDU Construction Management Office (CMO).

An example of a screenshot from the SDI tool is shown below in Figure 3 detailing SCIRT work in construction on 12th September 2013. Proposed and completed work can also be shown at any point in time:

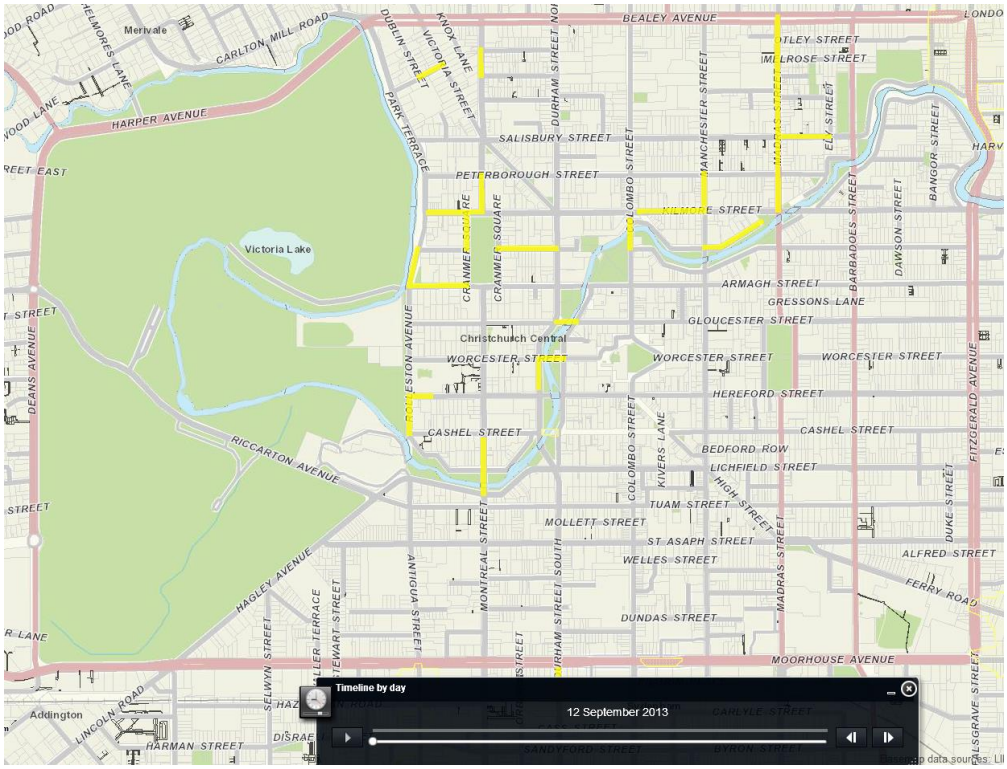


Figure 2 – Example of the SDI Output

It is intended that the programme managers, on identification of a conflict/interaction liaises with the other programme manager to ensure the interaction is possible, and an integrated approach is taken.

5.2 GIS Traffic Impact Analysis and traffic modelling

Based on the Primary and Secondary Traffic Impact data provided, a comprehensive GIS traffic impact and traffic modelling analysis is undertaken. This analysis will identify the times and locations where combined work activity no longer provides for a minimum level of service for the transport network. When such constraints are identified the delivery team(s) will be contacted to investigate opportunities for re-sequencing of work. If re-sequencing is possible the SDI will be updated by the delivery team with the new proposed sequence. If re-sequencing is not possible then CTOC will be alerted and additional mitigation employed to ease the overall impact on the transport network.

The request to re-sequence work will be issued directly by the SCIRT Transport Planning team following a request from the TIM Group (as outlined below and in Appendix A).

The traffic impact analysis will consider the potential conflict associated with detour routes or turn restrictions at intersections.

5.3 TRAFFIC MINIMUM LEVELS OF SERVICE

A minimum level of service (LOS) for the traffic network in the central city has been agreed between SCIRT, CCDU and CTOC. This has been agreed on the basis of providing sufficient number of traffic lanes to accommodate north-south and east-west traffic volumes with a specific focus on the peak AM and PM periods. This minimum LOS will be further developed to as new traffic count/volume data becomes available.

It is recognised that it may not always be possible to meet this minimum LOS for the central city in which case additional traveller demand messaging will be expected by the combined SCIRT communication teams to mitigate the additional delay and congestion which is likely to result.

5.4 CTOC INTERACTION AND PROCESSES

SCIRT will liaise on a weekly basis with CTOC in regard to the central city schedule of works and the resulting traffic impact analysis. CTOC will continue to have input on a project by project basis through the consenting process of traffic management plans and representation on the Traffic Impact Minimisation Group which is led by CTOC.

5.5 TRANSPORT IMPACT MINIMISATION GROUP (TIM)

The purpose of the TIM group is to review the SDI forward work programme and identify potential locations and times that the traffic network within the central city will be overly constrained. Identification of poor network performance will be undertaken by TIM with reference to the minimum network LOS framework identified above. The TIM group includes representatives from CTOC, ECan, CCC (events coordinator) in addition to construction programme representatives from CCDU and SCIRT and meets fortnightly for this review.

Details of the role of the TIM group are also included in Appendix A.

5.6 SCHEDULE OPTIMISATION & CONFLICT RESOLUTION

TIM will work with the programme owner to investigate the possibility for re-optimisation of their schedule when a network constraint is identified. For SCIRT activity (across all delivery teams) TIM will raise a request via the IST outlining where the network minimum LOS has not been met. If re-optimisation or re-sequencing of work is not possible (i.e it is not possible to mitigate network constraints or programme clashes) one of two processes will be followed.

CTOC may be willing to accept the constraints imposed on the traffic network by the work activity in which case they will mitigate the effects via increased messaging and possibly aggressive traffic management (changing the phasing of lights etc). If CTOC are not willing

to accept the additional network constraints and re-sequencing of work is not possible then the issue will be elevated to the appropriate governance level for resolution.

5.7 BRIDGE SEQUENCING AND HAULAGE ROUTES

There is a high priority for access and egress routes for heavy vehicles including high productivity motor vehicles (HPMVs) within the central city. There are two primary constraints for heavy vehicles inside the four avenues. The first relates to available routes during the bridge rebuild programme and the second relates to ensuring sufficient room for long vehicles to manoeuvre through traffic management sites which may leave limited space particularly at corners requiring additional turning space for trucks.

SCIRT will work with CTOC to identify appropriate access routes into and through the central city which account for the sequence and progress of SCIRT work activity – particularly in respect of bridge reconstruction work.

These bridges extend from the Antigua Street footbridge downstream to the Stanmore Road Bridge. Particular focus is given to the key arterial routes (and associated bridges) of Montreal Street, Durham Street, Madras Street, Barbadoes Street, Fitzgerald Avenue and Stanmore Road which, although outside the central city, acts as an important relief route for north-south central city routes.

6 COMMUNICATION

The Central City Programme Engagement Plan can be seen in Appendix B.

The purpose of this engagement plan is to outline the communication and community engagement that will support SCIRT's central city programme and keep the people of Christchurch informed about this work. Only 'outstanding' levels of communication will meet the needs of those affected by our works to minimise the overall impact on both transportation levels of service and businesses operating within the central city.

6.1 COMMUNICATION GOALS

Our communication goals outlined in the plan are:

- To provide accurate, timely and accessible information
- To give confidence that SCIRT's rebuild is coordinated and well considered
- To encourage key stakeholders, such as business leaders and elected representatives, to become advocates for SCIRT's work
- To manage expectations with business, residents, motorists and other stakeholders
- To build relationships between the residents/businesses in each quadrant and the relevant delivery team

6.2 DESIRED COMMUNICATION OUTCOMES

The desired outcomes from this are:

- To ensure stakeholders and community understand the work programme and what is involved with the rebuild of central city infrastructure. Particular focus will be given to the criticality of programme timeframes, effects of construction and traffic management on achieving the overall rebuild of the central city.
- To ensure stakeholders and the community are appropriately engaged around the programme and that communications are delivered in a way that meets their needs.
- To reassure those who have businesses and/or work in the central city that SCIRT will minimise the effects of the work as much as possible and will work with them to support continued business.
- To reassure residents that we will minimise the effects of the work as much as possible and keep them informed about upcoming work near their home.
- To provide an outstanding level of communication that maintains SCIRT's reputation as an organisation that holds the people of Christchurch at the heart of the rebuild.

6.3 COMMUNICATION APPROACH

Communication will have two parallel approaches:

- At the operational level communication will be targeted at those affected by SCIRT works. It will also focus on each delivery team developing relationships with the local people that live or work in the quadrant that they are rebuilding. Each project with be supported by a Communication Control Plan (CCP).
- There will also be a city-wide approach. It will be targeted towards all people who visit, pass through or represent interests in the central city, as well as those that live or work there. City-wide communications will be guided by this document and will support the operational delivery of the programme. This approach will include key messaging agreed with the CCDU, CCC and CTOC, along with presentations to the private industry.

7 PARKING STRATEGY

7.1 CONTRACTOR ALTERNATIVE PARKING

To reduce the construction site footprint, the Delivery Teams will enforce parking restrictions on the number of contracting staffs vehicles able to be parked on site. The Delivery teams will work with the CCC and CCDU to identify, through the short term parking strategy, alternative sites for staff parking. The delivery teams will then assess the need to transport staff to the various worksites from the alternative parking areas.

7.2 PARKING FOR BUSINESSES

7.2.1 Identification of parking spaces affected

In areas where work has significant effect on commercial areas (such as Cashel Mall, New Regent Street and Victoria Street) or public facilities (such as the Hospital), the Delivery team will identify and record the parking spaces to be affected from the SCIRT works 3 months in advance, and reconfirm one month in advance of the construction start date.

This information will be provided to the CCC Parking team for a joint review between the delivery team and the CCDU/CCC for alternatives required to support businesses in light of other programmes of work being delivered at the same time.

7.2.2 Communication to Businesses

In all areas, the loss of parking and identified alternatives will be communicated to the affected businesses by the Delivery Team. This liaison will ensure the parking requirements of the business are known (i.e. cafe and office parking requirements will differ). If customers are required to be notified of these changes this can be included in the work notices, and posters can be displayed in the shop windows etc. The Delivery teams will be responsible for this operational communication.

7.2.3 Parking Signage

In addition, site signage will be used to direct traffic to these alternative parking areas and included in the site TMP.

Support is also available from the CCC in form of the Transitional Project Team (Felicity Morey). Where appropriate, the Delivery team, with the IST Communications team will liaise with the CCC for support with 'Way-finding', signage, and transitional opportunities to support the businesses as the work progresses.

7.2.4 Parking Within Traffic Management Sites

Typically, the temporary traffic management (TTM) required either side of the physical works will also take available parking spaces. In these instances, the STMS and Delivery Team Project Manager will provide access to these spaces through entry/exit points within the TTM site if safe to do so, supported with signage indicating the spaces are available for public use. The STMS will have the discretion to decide if site safety allows for this measure, and if necessary, amend the TMP during the work progression.

8 CONSTRUCTION SITE MANAGEMENT

8.1 BUSINESS IMPACT MANAGEMENT

When working in the Central City it is extremely important that the impact on the businesses is effectively managed.

Business impact management can be summarised in 4 parts outlined in this document:

- Providing minimum levels of service for transport routes (Refer to Section 5.0)
- Early communication of programme and work and impact (refer to Section 6.0), supported by:
    - Key messaging such as 'Open for Business' – Joint messaging with the CCDU/CCC
    - Generic citywide communication (SCIRT IST/CCC/CCDU)
    - Specific operational communication (SCIRT Delivery teams)
- Minimise the impact on parking (Refer to Section 7.0)
- And construction site management adjacent to the businesses affected outlined below

A key point of difference in the central city is the number and variety of stakeholders which includes present and absentee owners, operating businesses, developers and residents.

In comparison to working in a residential area where most of the residents leave for work for the day, in the central city the work occurs at the same time as the businesses are operating. The Delivery Teams therefore need to ensure that they are considerate of the business needs and requirements to minimise inconvenience and financial impact due to the work.

This significantly increases the level and amount of communication resource required for projects in the Central City. As such, the Delivery teams need to ensure adequate resource is available to support business owners.

8.2 CONSTRUCTION SITE FOOTPRINT & ACCESS

To reduce the impact as much as possible the site footprint needs to be kept to the minimum required for productive work delivery for the various work types. The Delivery team will ensure that this is regularly reviewed with site personnel and included in the site audit process.

Particular attention will be given to 'redundant' traffic management, i.e. TTM in place before mobilisation of resource or removal after demobilisation of resource. Attention should also

be given to road reinstatement being undertaken as soon as possible after completion of the trenching work (public perception is that this is also redundant TTM).

Additional site measures may also be required such as safe clean pedestrian access from the alternative parking areas to the business entrance along with additional signage to support the businesses affected.

8.3 "ONE PASS" APPROACH

The idea of "one pass" is to carry out all of the work (3 waters and roading) within a length of road in a continuous operation from installation of the temporary traffic management to the de-establishment from site. This provides benefits in terms of minimising the duration of rebuild works at any given location, minimise the impact for affected stakeholders and provide value benefits, particularly for TTM establishment costs.

This detailed planning will occur at a street level as the programme progresses and the schedule updated accordingly. This will be especially important at intersections where a project boundary exists between separate Delivery Teams.

"One pass" may not be achievable or desirable in all circumstances dependent on the conflicting priorities, hydraulic dependencies, the vertical development or other related issues. However, SCIRT will actively identify and implement opportunities to use this approach.

8.4 ENVIRONMENTAL MANAGEMENT

8.4.1 Noise

The limits recommended in NZS 6803 Acoustics Construction Noise must be complied with in the central city. This includes both day-time and night-time limits. Consideration should be given to the proximity of receptors, the sensitivity of receptors (e.g. residential vs buildings that are only occupied during the day) and the nature of the work.

8.4.2 Dust

Dust management is important to minimise nuisance and health effects on businesses and people. Sites must ensure that dust is controlled so that it is not discharged beyond the site boundary. Dust control measures may be required dependent on the type and location of the work and consideration given to residents, businesses, pedestrians and road users.

Screening of sites may also be necessary particularly in busy pedestrian areas or adjacent to business premises.

Delivery teams Environmental Advisors will consider whether it would be efficient to have joint dust management measures during the programme of works and will actively review this issue as the work progresses.

8.4.3 Vibration

Ground vibration is inherent in most construction activities. Excessive vibration can result in damage to surrounding structures. Open trench drainage requires trench support and typically shields and other passive methods of trench support can be used to safeguard work crews. However sheet piling may be required for deep excavations or where space is limited.

Where sheet piling is required, Delivery teams will follow SCIRT protocols for risk assessment of vulnerable structures, select appropriate plant and methodology, consider carrying out pre and post work damage assessments and implement protective measures.

The appropriate controls will be based on the risk assessment, and must be implemented prior to construction.

A walkover and desktop study on GIS of the surrounding site is recommended to ensure any vulnerable buildings are included into the delivery teams risk management.

8.4.4 Temporary Works - Wastewater Flow Diversion

Temporary works to divert wastewater flow will be actively managed through a specific flow management process developed between the IST, CCC Operations and the Delivery Teams. This will ensure that all temporary diversion of flows are considered for:

- Continuity of service
- Impact on the system and any associated overflows
- Ongoing maintenance operations
- Effect on other delivery teams
- Risk of drawdown in sewers damaged through the EQ events (fines loss, voids and tomos).

The delivery teams will provide the CCC Ops team with a Permit to Work (PTW) for all temporary flow diversion at least 4 weeks prior to the temporary diversion taking place including a detailed sketch of:

- Location of the bung/Pump
- Expected duration
- Expected surcharged pipes and discharge points for diverted flows

A weekly review will then take place to analyse the effect on the network, initiate modelling where required, and identify active control measures needed to manage the risk.

The review will be undertaken by Tim Ure (CCC Ops Liaison) and Chris Mance (SCIRT Asset Owner Representative) with input from the Delivery teams. Recommendations will then be made and discussed with the delivery teams where necessary.

8.4.5 Dewatering

Coordination will be needed with the CCC Rebuild Central team and ECan to manage the effect of private developers discharging ground water into either the stormwater or wastewater system where SCIRT are required to undertake repairs downstream of the discharge point.

For SCIRT related dewatering, consideration must be given to the risk of impact of the dewatering on neighbouring properties when selecting the appropriate system, and the effects on other delivery teams programmes.

8.4.6 Working Adjacent to Trees

Requirements for working around trees are outlined in the SCIRT Tree Consent and the SCIRT *Tree Management Plan*. Care must be taken when working around trees to avoid any accidental damage by plant, and an Arborist may be required on site when working within the specified setback distances from trees.

8.5 LATERAL INVESTIGATION AND REPAIR

The general philosophy for lateral repair is as follows:

- Where the sewer is to be renewed, all laterals identified for renewal are replaced to boundary (except for vacant lots).
- Where the sewer is to be relined, lateral investigation will be required to decide whether the action for the lateral is to do nothing, to be relined or relaid.
- Where multiple laterals exist to a vacant lot (building demolished), then one lateral will be repaired and others abandoned. Where the vacant lot has multiple road boundaries, then one lateral will be repaired, with a capped stub on the other road/s.
- Where the laterals serve an Anchor Project site, then the Delivery team will liaise with the CCDU to determine requirements.
- Where the lot is under development, the delivery team is to liaise with Rebuild Central, through David Bain, the SCIRT Utilities Coordinator to identify the Developers specific requirements.

Both open cut and pipe bursting methods will be used. Where a private development is under construction the Delivery Team will liaise with the Developer to agree where the most suitable end point of the lateral is. It is proposed that the laterals are left short of any planned foundation works to avoid damage as the foundations are excavated or removed. The developer can then complete the lateral connection for the property.

In all circumstances, Delivery teams only have approval to repair existing laterals. New laterals must be approved and instructed to SCIRT through HIMT

The process to agree laterals for the vertical development is shown in Figure 3 overleaf will be used:

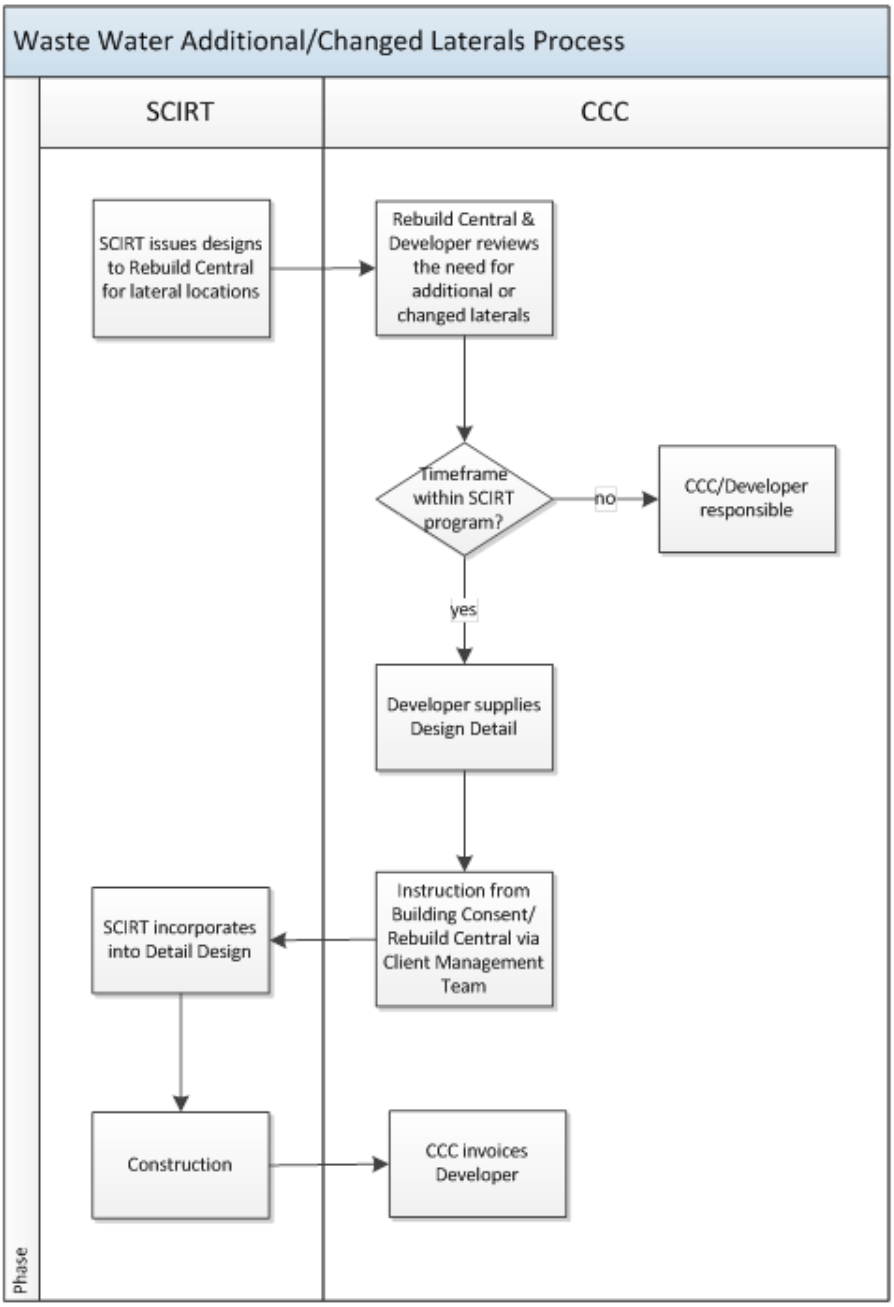


Figure 3 – Additional/Change in lateral connections

8.6 UTILITY COORDINATION

In accordance with the Alliance Agreement and Utilities Management Plan (UMP), 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. This is reflected in the *'SCIRT Central City Utilities Coordination and Shared Corridors Project Execution Plan'*, included in Appendix C.

SCIRT Design and Delivery teams must follow the SCIRT Design Guideline and Notice of Requirements for identification location and protection of utilities. The NZUAG Code of Practice, DOL Guideline and other utility specific regulations specify further requirements when working with utilities.

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
- Reducing costs via shared trenching wherever it is practical to do so.

8.7 SERVICE PROTECTION

Due to the number of utility services within the Central City the protection of services needs careful consideration and effort. It is likely that because of this, trench shields may not be used in all locations, hence requiring sheet piling between some services where a trench shield cannot fit.

Due to the narrow corridor available to install the wastewater, water mains (particularly AC) may have to be isolated in places to prevent them from being damaged. A greater level of planning is required to manage and support the services crossing and running parallel to the trench.

8.8 DROP ZONES, DEMOLITION AND BUILDING PROTECTION

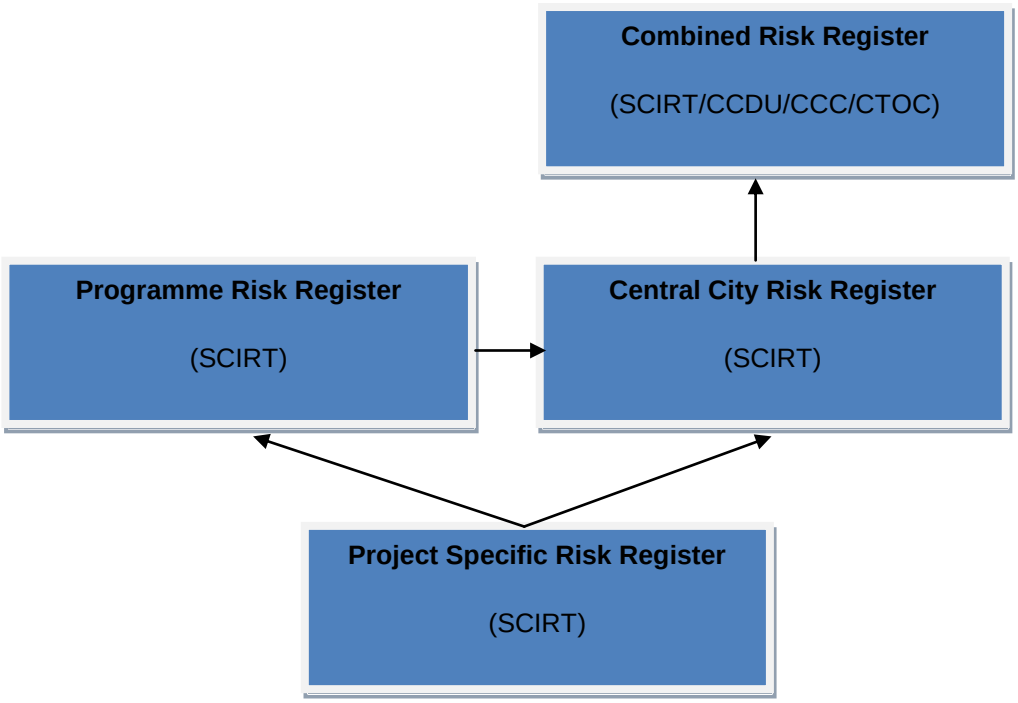
There are a number of buildings fenced off to protect drop zones (Section 45 Notices) encroaching on the proposed work location. In situations like this, the Delivery teams will liaise with the CCDU with regards to the constraints imposed. Up-to-date information about the S45 Notices can be found on the CERA website – http://cera.govt.nz/notices.

Where conflicts still exist, the Delivery Team will assess whether their programme can be adjusted to suit the removal of these obstructions. Where this affects the overall programme, or has a cost impact, then this will immediately be notified to the Clients.

9 RISK MANAGEMENT

The *Risk & Opportunities Management Plan* details how SCIRT manages risks associated with the rebuild works generally.

SCIRT will consider the risks associated with the Programme for the rebuild as a whole, this will be done using 3 levels of assessment as follows:



The Combined Risk Register will be jointly developed and discussed at the weekly CCC/CCDU/SCIRT planning meetings. The Delivery teams will actively engage with the Central City Programme Manager to review and manage these risks.

The Central City Risk Register will be developed from the Project Specific Risk Registers to summarise risks that are inherent across the projects within the central city and will be managed jointly by the Delivery teams in a coordinated and consistent manner.

Managing the Project-specific construction risks will be the responsibility of the respective Delivery Team assigned to that Project. The Delivery Team will address the project construction risks in the selection of their construction methodology.

10 MANAGEMENT PLAN CONTROL

10.1 AUTHORISATION

Initial authorisation is in accordance with the AA, Section 6.1.1. All plan revisions will be authorised by the GM.

10.2 DISTRIBUTION

The Plan is a controlled document and shall be distributed and revised in accordance with the SCIRT *Quality Management Plan*. Hard copies are Un-Controlled copies. The Controlled copies are maintained in "Project Centre" which is a secure website which supports various project management functions for the Programme including "configuration management" i.e. version control of documents.

11 ROLES AND RESPONSIBILITIES

The responsibility for meeting the key requirements of this plan are assigned primarily to the roles identified in the table below

Responsibility	**Role**
Plan preparation/revision	Central city Programme Manager
Plan Issue/Revision authorisation	Delivery Manager & General Manager
Plan Evaluation and Review	Quality Manager and General Manager

Appendix A – Transport Optimisation Management Plan

Appendix B – Central City Engagement Plan

Appendix C - SCIRT Central City Utilities Coordination and Shared Corridors Project Execution Plan