

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.

ECI team deliverables

Story: Early Constructor Involvement (ECI)

Theme: Programme Management

A document which outlines the roles, responsibilities and deliverables of people involved with the SCIRT ECI process.

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



This work is licensed under a [Creative Commons Attribution 3.0 New Zealand License](https://creativecommons.org/licenses/by/3.0/nz/).

The authors, and Stronger Christchurch Infrastructure Rebuild Team (SCIRT) have taken all reasonable care to ensure the accuracy of the information supplied in this legacy document. However, neither the authors nor SCIRT, warrant that the information contained in this legacy document will be complete or free of errors or inaccuracies. By using this legacy document you accept all liability arising from your use of it. Neither the authors nor SCIRT, will be liable for any loss or damage suffered by any person arising from the use of this legacy document, however caused.

ECI TEAM DELIVERABLES

1. Purposes of ECI

- Provide constructability advice to Designers
- Participate in project risk assessment and management
- Evaluate project methodology and schedule to inform project design, TOC development and programme forward planning

2. ECI Team

The ECI team will be nominated by the Delivery Managers and comprise an ECI Team Leader and other individuals provided by the Delivery Teams, selected for their expertise in accordance with project requirements. This team will be formed prior to and attend the project initiation workshop and disband upon project handover to the Delivery Team.

3. Roles and Responsibilities

Project Design Lead and team are responsible for:

- Design – investigation, concept and detailed design
- Convening project initiation, risk and constructability and optioneering workshops
- Preparing and maintaining the project risk register (during project design phases)
- Providing design phase schedule data to scheduling team
- Initiating resolution of project consenting and property issues
- Preparing project BOQ
- Provision of Project Design Report to TOC team

Project ECI Team is responsible for:

- Providing construction phase schedule data to scheduling team
- Assessing and investigating solutions to constructability issues (with Designers)
- Assessing and investigating treatment of construction risks (with Designers)
- Informing programme forward planning with respect to likely project resource, traffic management, communications, utilities, procurement and other requirements
- Provision of a draft construction schedule and methodology assessment (to be appended to the Design Report provided to the TOC team).

4. ECI Team Deliverables for Gate 2 (concept/design completion)

The effort and deliverables required of the ECI process will vary between projects. ECI requirements will be discussed between Design and ECI team leaders and agreed with the Design and Delivery Managers after the project initiation workshop and the ECI and ECI team leaders will then be responsible for ensuring these requirements are met efficiently and effectively.

First Deliverable for the ECI team is to provide an *estimated construction phase duration* for the project to the scheduling team. During the concept design phase the ECI team will then produce:

- *An outline methodology assessment*
- *An outline construction schedule*

The outline methodology assessment will consider key aspects of the physical delivery for that project typically including:

- Construction methods and sequence
- Plant and labour requirements
- Safety & Environmental hazards
- Access and traffic management
- Interface with other projects

The focus for the ECI Team during the concept design phase will be identifying and providing solutions to constructability issues and similarly identifying and investigating possible treatment for construction risks – both to inform the concept design option evaluation and selection process.

5. ECI Team Deliverables for Gate 3 (Detailed design completion)

For all projects the ECI Team will provide, for Delivery Manager approval and subsequent appending to the Detailed Design Report:

- *A Detailed Project Methodology Assessment Report*
- *A draft construction schedule*

The Detailed Methodology Assessment will consider all aspects of project physical delivery including:

- Construction methods and sequence
- Plant and labour requirements
- Project-specific health, safety and environmental issues/hazards
- Site Access and Traffic management requirements
- Procurement issues (particularly long-lead items)
- Services protection, relocation and other requirements
- Interface and opportunities for synergy with other projects (SCIRT and non-SCIRT)
- QA requirements and issues (incl. continuing Designer requirements and involvement)
- Communication requirements/opportunities
- Innovation and other value opportunities

It is anticipated that after an initial programme ‘learning curve’ many projects will be repetitive in nature and not require much ECI effort. In these cases the methodology assessment might simply confirm which established standard methodologies are appropriate. However, it is important that the ECI Team systematically considers each of the above aspects in turn to ensure there are no project-specific exceptions to the rule that require more in-depth assessment.

6. Relationship of ECI to TOC and Delivery Processes

The ECI process is expected to ensure, insofar as is possible, that:

- all issues that need to be considered in the TOC are identified in advance
- there are no surprises for the Delivery Team after the project has been allocated to them.

The ECI process is also expected to give Delivery Teams a head start with construction planning thereby reducing the time between design completion and the start of physical works and mitigating schedule risk associated with procurement, consenting and other pre-construction activities.

Important Note:

The TOC team is required to form their own view, for TOC estimating purposes, as to the optimum methodology and schedule for each project and so will not necessarily accept and price the methodology and schedule suggested by the ECI Team.

Consequently, the best measure of success for the ECI process will possibly be the alignment achieved between the methodology and schedule suggested by the ECI Team and the methodology and schedule adopted and priced by the TOC Team (and agreed with the Independent Estimator).

The only requirement of the ECI team during the TOC phase will be to *respond to any queries the TOC Team may have regarding the schedule and report appended to the Detailed Design Report.*