Christchurch Southern Motorway
Objectives

• Provide strategic motorway link between SH1 in the south to the CBD and Port of Lyttelton.
• Separate through traffic from local commuter traffic.
• Provide for cyclists/pedestrians.
• Connectivity between communities.
The Basics

- NZTA RoNS Project – Stage 1 of 3.
- 10.5 km total length.
- 4 Lane Motorway:
  - 3.0km Duplication (Brougham St to Curletts Rd).
  - 5.0km Greenfields (Curletts Rd to Springs Rd).
- 2 lane State Highway:
  - 2.5km – Halswell Junction Road Upgrade (Interim Link until completion of Stage 2 & 3)
Christchurch RoNS
The Contract Works

- Design & Construct Contract.
- 3 Year Contract Period.
- Contract Start Date: 22$^{nd}$ February 2010.
- Physical Works Value $105,000,000
- Total Project Cost $140,000,000
Opus’s Role

• Scheme Assessment (2001).
• Tendering and Procurement (2009).
• Principal’s Advisor (2009-present).
• Engineer/Engineer’s Representative (2009-present).
NZTA Procurement Method

• NZTA has various procurement methods including:
  – Traditional Measure and Value (M&V)
  – Design and Construct (D&C).
  – Early Contractor Involvement (ECI).
  – Alliances, and more…. 

• The chosen method of procurement for the Christchurch Southern Motorway was Design and Construct (D&C).
What does D&C Mean for the Principal’s Advisor

• D&C delivery requires us to change our thinking.

• Part of our role as Principal’s Advisor includes:
  – Development of the Specimen Design (SD)
  – Preparation of the Principal’s Requirements (PR’s)
  – Review design for compliance with PR’s. This doesn’t mean:
    “We would have done it like this…”
    “This is how it is normally done…”
    “NZTA won’t allow this…”
    “NZTA won’t accept that…”
What does D&C Mean for the Contractor’s Designer

• The designer has a client who is commercially & technically astute.
• Is carrying a share of the risk.
• Design for minimum compliance with PR’s.
• Look for opportunities to maximize returns.
• How can the PR’s be interpreted?
D&C Challenges

Some of the challenges experienced by the Principal’s Advisor included:

– Preparation of the SD and PR’s.
– Assessment of the design against the PR’s – not a peer review!
– Assessment of innovative designs – not the way “we” might have designed it.
– Ensuring robustness in the design.
Preparation of Specimen Design

• The Specimen Design is developed to
  – Confirm technical viability of the project.
  – Define the designation and land purchase.
  – Obtain consents.

• The SD is not a detail design - sufficient to confirm designation, and allow consents to be obtained.

• Consents need to be as wide as possible to allow for alternative designs and construction techniques etc.
Preparation of Principal’s Requirements

- The Principal’s Requirements (PR’s) are developed around the Specimen Design.

- It is very important that the PR’s are correct and detail all the clients expectations and requirements.

- Time spent on the development of the PR’s will reduce the risk of variations through the contract.
**Assessment of the Design**

- Assessment of the design by the Principal’s Advisor (Opus) was undertaken to confirm:
  - Compliance with the PR’s – not a peer review of the design.
  - Compliance with the risk profile.
  - That the design complies with consent conditions.
  - That there were no situations where minimums on minimums cause concern.

- The Contractor’s Peer Reviewer’s Comments where unknown to the Principal’s Advisor.

- Construction hard on the heals of Design – therefore timeframes were short.
Assessment of Innovation

- The Principal’s Advisor has to review the innovative aspects of the design in terms of their compliance with the PR’s and the outcome of the design only.

- The Principal’s Advisor could not discount a design because it did not follow the “normal” design practice.

- A shift in thinking was required by the Principal’s Advisor when undertaking the review.

- Innovation should not be confused with cost-cutting.
Ensuring Robustness

- “Must Haves” to be included in PR’s – ie: no piers in central median.
- Heavy Duty Asphalt pavements:
  - A case (whole of life) for the use of structural pavements in highly traffic sections of the motorway was approved by NZTA.
  - Additional structural pavement depth included in the contractors design to reduce the risk of reflective cracking.
- Replacement of rounded aggregates in existing pavements.
- Increased intersection approach lengths of AC surfacing.
- Future proof ducting for interchange signalisation or ramp metering.
duplication
upgrade