



Roading New Zealand

**Presentation To
AAPA International Conference**

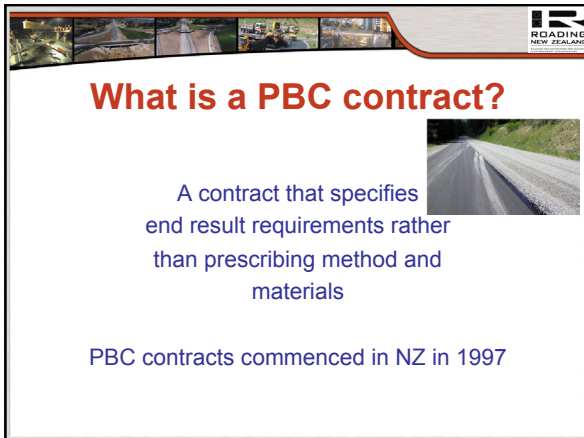
**Performance Based Reseal Contracts ----The
Results**

By
Chris Olsen
Chief Executive
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Overview

- About Performance Based Chipseal (PBC) Contracts
- Have PBC Contracts provided Value for Money?
- Reasons for the Results
- Conclusions



What is a PBC contract?

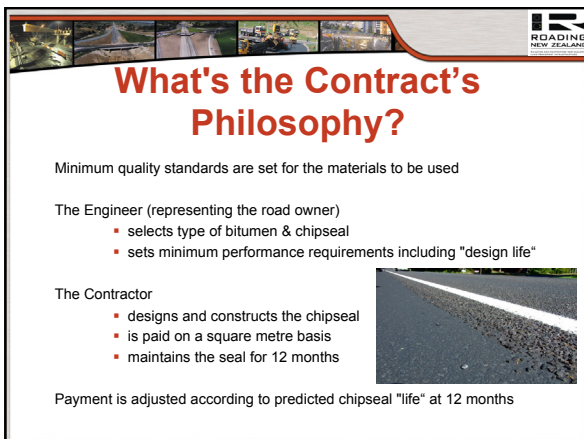
A contract that specifies
end result requirements rather
than prescribing method and
materials

PBC contracts commenced in NZ in 1997



Why have a PBC contract?

- Clearer definition of accountability and responsibilities
- More opportunity for the private sector to offer innovation
- Focussing of technical expertise to align with accountabilities and roles
- Client/Consulting expertise is focussed on asset management inputs and the contractor on technical design and construction issues
- More appropriate apportioning of risk with the contractor responsible for construction risk
- Increased opportunity to provide higher quality outcomes and more efficient delivery.



**What's the Contract's
Philosophy?**

Minimum quality standards are set for the materials to be used

The Engineer (representing the road owner)

- selects type of bitumen & chipseal
- sets minimum performance requirements including "design life"

The Contractor

- designs and constructs the chipseal
- is paid on a square metre basis
- maintains the seal for 12 months

Payment is adjusted according to predicted chipseal "life" at 12 months



**Principle Performance
Requirements**

Failure mechanisms

- Reduction of voids due to trafficking, plus embedment into the substrate leading to flushing
- Bitumen oxidation leading to cracking and/or chip loss
- Chip polishing leading to loss of skid resistance
- Repeated flexure leading to fatigue cracking

Principle Performance Requirements

Performance Requirement	Criteria	Measurement	When Measured / Assessed
Safety	Skid Resistance	Aggregate PSV	C
		Aggregate % Crushed	C
	Chip Take	Texture Depth Minimum	I
		Chip Retention Test	I
Environmental	Noise	Texture Depth Maximum	I
Waterproofness	Impermeable	Minimum Chip Size	I
Durability	Aggregate	Crushing Resistance	C
		Weathering Resistance	C
	Bitumen	Durability	C
		Flux Content	C
	Bitumen thickness	Texture Depth Minimum	I

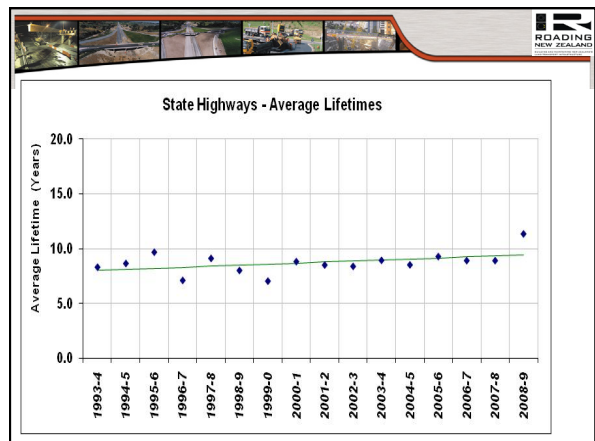
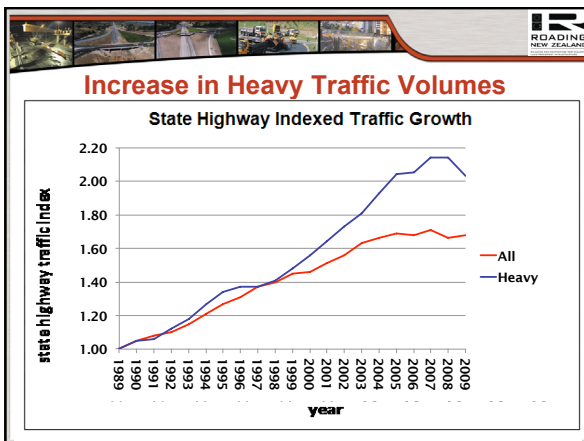
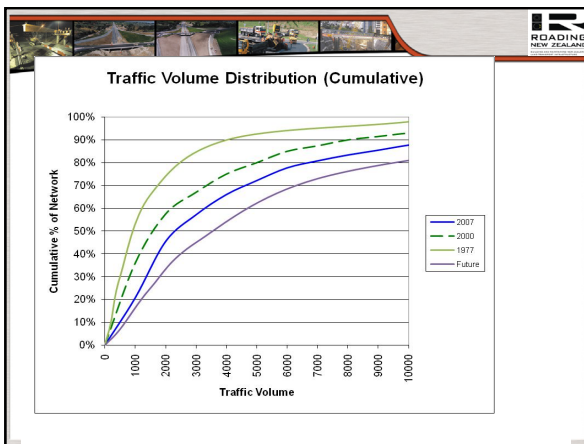
C = at the time of construction; I = 10-12 months after construction

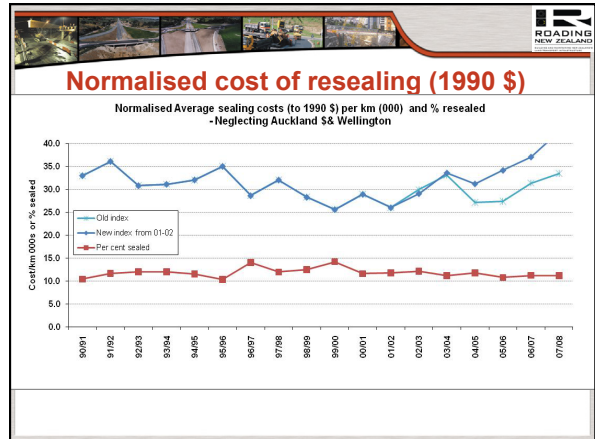
Have PBC Contracts Provided Value for Money?

Consider the the cost/km of chip sealing before and after PBC contracts taking into account

- change in traffic volumes
- change in heavy traffic
- change in chipseal lives

Source NZTA and Opus Central Laboratories





Reasons For Results

The contractor is accountable for chipseal performance

Competitive market at the tenderbox

These have lead to

- Pressure to reduce rework and to maximise payment
- The use of different seal designs
- The use of different binders
- Innovation

Conclusions

- Cost /km of reseals (1990 dollars) is the same today as it was in 1991
- Chipseals need to be much stronger today due to 75% increase in heavy traffic
- Innovation has increased
- Seals today last longer --- 9.2 years compared to 7.8 years in 1993
- PBC contracts were introduced in 1997 and are responsible for this
- Cost of the consultant carrying out design is eliminated
- Savings from not needing the consultant estimated at 10%
- Savings from innovation to handle the extra stress estimated at 10%

References

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Thank you

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