

Network Outcomes Contract Clarification Governance Group Clarification

Reference Number:	NOCC No. 30
Subject Title:	Single Coat versus Multi-Coat Chip Seal Strategy
Issue Date:	6 August 2018
Clarification Purpose	Clarification is provided to ensure the NOC is being interpreted consistently. The clarification does not remove or supersede the Network Outcomes Contract documentation.

SUBJECT

There is still concern about the extent of multi-coat sealing being undertaken across the state highway network. In spite of the rational processes outlined in most MMP's, we are still ending up with some programmes comprising almost exclusively multi-coat seals.

While the reasons for defaulting to a multi-coat treatment are understood (traffic stress, texture variation), mitigating the short term risks by defaulting to multi-coat solutions fails to fully consider the outcome consequences. There is an increasing trend towards texture loss becoming a predominant driver for resurfacing need and this is inhibiting the increase in life achieved from chip seals that is necessary to underpin our long-term renewal investment forecasts.

In reviewing seal designs, ensure the default starting position is a single coat seal, and if there is a departure to a multi-coat seal, the supporting justification is provided and sound.

DISCUSSION

There are many factors will that contribute to reducing seal life achieved, including premature failure, traffic growth, and increasing stress resulting from HCV growth. While there is currently no research evidence to determine the relative weighting of all potential factors, what is known is:

- The life achieved from multi-coat seals is less than the life achieved from single-coat seals,
- The achieved life of multi-coat seals is reducing over time,
- The proportion of multi-coat seals being applied is not reducing as quickly as expected given the tension that is being employed to achieve a reduction through the MMP process and the Principal's stated intention to promote the use of single-coat seals,
- The increasing quantity of sealing being carried out is being matched by an increasing destructive input (water cutting) to remove the resulting surplus binder,

and, we are at the same time, using more chip to fill the voids that would otherwise be available to take up this free binder. Ideally we can break that cycle.

- In situations where low application rate multi-coat seals are used we are seeing an increase in early life stripping and scabbing
- Multi-coat chip seals do not provide the same waterproofing characteristics as single coat seals

We are looking for a reduction in the quantity of multi-coat seals being applied across the state highway network and in order to be confident application is genuinely the best option, both technically and economically in whole of life terms, there will be an increase in tension applied to approvals. We recognise there are situations where multi-coat sealing is an appropriate strategy and we certainly do not intend implementing any strategy that would disfavour this.

There are some situations where a multi-coat seal is appropriate because of environmental (noise) and social (pedestrian) factors. It is not our intent to tension situations such as these. The primary focus of this memo is on texture and traffic stress considerations that are affecting treatment selection. It does, however, need to be recognised that, where multi-coat seals are proposed in noise sensitive areas there is still an element of additional noise created (the larger chip is essentially held on its AGD by the locking chip).

All of the approved MMP's contain surfacing strategies designed to minimise the use of multi-coat seals therefore any tension that the Agency might apply to the use of them is aligned with this intent. Appendix 6.4 of the NOC documents makes it clear that it is the Principal's intention to promote the use of single-coat seals wherever possible.

PROPOSITION

To achieve this intention, it is proposed that in reviewing the appropriateness of seal designs and treatment selection outcomes, the Agency adopt the following principles:

- 1. The default starting position for all sealing will be a single-coat seal treatment.**
2. Any proposals to use a multi-coat seal treatment will require a robust evidence based justification for the treatment proposed.
3. Citing "traffic stress" or "texture variation" will not be accepted as evidence based justification. The level of justification expected will include for example:
 - 3.1. Consideration of all viable options and discussion of the merits of each in the treatment selection outcomes.
 - 3.2. A whole of life economic comparison of options including assessment of any pre-treatment options that may be necessary to mitigate contributing factors such as texture variation. In most cases the Contractor's own economic assessment process required to justify chip seal resurfacing treatments as per section 2.5.4 of the NOC specification should suffice.
 - 3.3. The expected lives used in these analysis must be based on demonstrable performance of insitu chip seals. We are looking for demonstration of seal life expectation (not time to first maintenance need) and do not expect that this will be based on convenient extreme cases.
 - 3.4. We expect that mitigations to address the factors that are driving a preference to move to a multi-coat seal will be considered. For example, discrete texturing is a viable strategy to address texture variation.

4. It is understood that we may see an increase in chip loss as the proportion of single-coat sealing increases. However, chip loss can be mitigated by using active traffic control for 24 – 48 hours to ensure the traffic embeds the chips before opening up to increased traffic speeds. The extent of expected chip loss should be quantified and factored against the expected extent of texture loss that might be expected if a multi-coat solution is adopted.
5. A robust justification would include a risk assessment of the options consider, for example, the probability and consequences of some loss of chip compared to the probability and consequences of early loss of texture, bearing in mind the performance outcomes from both a safety and life cycle perspective.
6. In addition to the economic considerations, when proposing reduced seal life solutions, the treatment selection proposition should also consider;
 - 6.1. The impacts on both the base preservation quantities available under the contract,
 - 6.2. The medium term effects of any change in this investment level beyond the period of the contract in terms of any bow wave effect created by the shortened life expectation.

The objective should not be to implement short term solutions to minimise any perceived risks under the contract and push the consequences to an increased seal renewal need outside the period of the contract.

TEXTURE CORRECTION

Correcting existing texture to achieve texture uniformity is best practice as a pre-surfacing treatment that is well covered in the Chip Sealing in New Zealand textbook. While, in some cases, the treatment selection process may favour a multi-coat solution this could be avoided by implementing a texture correction strategy.

It is understood there may be a reluctance to consider texture correction because of where the cost of implementing this treatment may lie.

The intent of this memo is;

- Not to identify whether texture correction is a lump sum or measure and value item. Clearly correction of any minor texturing sealing as a pre-treatment could be seen as a pre reseal repair, however, some discussion may be necessary to determine where the extent of the pre reseal texture correction would switch over to being a part of the resurfacing strategy or treatment selection
- To ensure that the optimal whole of life solutions are put forward for consideration as part of the treatment selection and design approval process. The cost of any extensive texture correction necessary to achieve the best whole of life solution for the sealing treatment proposed should be identified as part of the resurfacing option (this should consider the expected life of the texturised seal). An arbitrary limit set on the area of texturing required to support the option is set at anything greater than 10% of the area of the seal.

SUMMARY

The Agency's intent has always been to promote the use of single coat seals wherever possible, this was clearly signalled in the Contract and associated schedules of quantities.

The Contractors MMP's contain strategies designed to minimise the use of multi-coat seals so the Agency's preference to promote the use of single coat seals is aligned with the intent of the surfacing strategies in the Contractors MMP.

The justification requirements referred to within this memo are in accordance with the Contractors MMP and are in no way an additional process or requirement.

Each NOC (Contractor and Agency) should:

- Review the total quantities of single coat and multi-coat seals delivered on the Network to date. Compare this with those specified in the Schedule of Quantities and assess if there is significant variation or skewing towards the use of multi-coat seals. If so, rethink the sealing strategies and discuss in the upcoming design reports whether this trend can be changed and what the impacts of this may be
- In reviewing seal designs, ensure the default starting position is a single coat seal, and if there is a departure to a multi-coat seal the supporting justification is provided and sound
- Ensure the MMP processes have been correctly followed in the treatment selection and seal design