

RESEARCH PROBLEM STATEMENT

DATE: 09/06/2019	PROJECT AREA: Pavements
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TITLE: Impact of Grinding on Pavement

PROBLEM STATEMENT:

Recently, there has been an increase of grinding on newly constructed pavement in order to achieve smoothness specifications. While grinding is currently allowed (410.09(b)(2) for asphalt and 501.05(m) for concrete) to correct surface tolerance deficiencies or to reduce the profile index, it appears to be developing into a time-saving measure to deliver projects rapidly. This raises several potential issues, including whether the life span of the pavement is reduced and quality is being sacrificed for speed of construction. In order to address this potential issues, this research will focus on three areas for both asphalt and concrete pavements. First, an analysis will be performed to determine if the grinding does in fact impact the life span of the pavement. Second, Sections 400 and 500 will be examined to determine if there is the possibility of rewording ARDOT's specifications, or creating a supplementary specification revolving around ensuring good construction practices to avoid the need for grinding. Finally, third, potential treatments to counter any potential decrease in life span will be explored.

OBJECTIVES:

There are three objectives to this research. First, two sets of both asphalt and concrete pavements will be compared: pavements without grinding and pavements with grinding. This will determine if grinding influences the life span of a pavement. Second, ARDOT specifications for asphalt (Section 400) and concrete (Section 500) will be examined to see if modifications or additions could be made that would reduce the possibility of grinding immediately after new construction. Finally, third, treatments for both asphalt and concrete pavements will be explored that neutralize the potentially negative effect of grinding on new pavement.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:

There are two primary forms of research implementation. First, existing specifications will be modified, or new supplementary specifications will be developed, in order to reduce the potential for grinding to occur on new build asphalt and concrete pavements. Second, a final report will be produced that discusses the impact of grinding on the life span of pavements and will include a comprehensive review of treatments designed to mitigate any potential negative influence of grinding on pavements.

Estimated Project Duration: 24 Months

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PHONE: (479) 575-6028 **REVIEWER:**

Standing Subcommittee
Ranking

Advisory Council
Ranking

Statement Combined with
Statement Number(s)

Title: Impact of Grinding on Pavement

- Increase of grinding on newly constructed pavement
 - Used to achieve smoothness specifications
- Current allowed in specifications
 - Has changed into “time-saving” measure to deliver smooth project rapidly



Grinding visually apparent on new asphalt pavements
(waterblastingtechnologies.com)

How does this influence the pavement quality?

Submitted by Andrew Braham and Cameron Murray

Does grinding impact the life span?

- Traditionally, grinding applied to restore friction to existing structurally sound pavement
- Recently has been used to achieve surface tolerance/reduce profile index immediately after construction
- If applied immediately after construction, questions raised:
 - Was there a deficiency in the construction?
 - Is a flaw being “hidden”?
 - Grinding removes material, does that compromise the pavement structure?



Traditional grinding
(dot.ca.gov)

Immediate grinding may impact quality of new pavement

Exploring grinding during construction: objectives

- Impact of grinding
 - Evaluate quality of pavement exposed to grinding
 - Determine if flaws existing in materials or construction
- ARDOT specifications
 - Review Sections 400 (asphalt) and 500 (concrete) to ensure grinding is not being abused
- Treating grinding
 - If negative impacts found, treatments to address grinding will be explored
 - Can the impacts be mitigated?

501

straightedge, shall be reduced by grinding until such deviations as indicated by retest do not exceed the above limits.

Grinding in Section 500 (arkansashighways.com)

Grinding research implementation

- Specifications
 - Modify existing, or create supplementary specifications to ensure grinding is being properly utilized
- Impact and treatment
 - Justify specifications by quantifying impact: quality of structure and materials
 - Recommendations for treatments to mitigate potential negative impacts of grinding



Grinding blades (worldhighways.com)