

# ALASKA HIGHWAY

MP 1235- 1252 Rehabilitation

Foamed Asphalt Stabilized Base  
Course (FASBC)

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# FOAMED ASPHALT IN NR DOT&PF



For Northern Region (NR) Rehab/Resurfacing projects, Crushed Asphalt Base Course (CABC) is typical.



The last time FASBC was done in NR was in 2005 (Parks Hwy 325- 351 Rehab)



The largest and northernmost foaming project in the U.S. at this point.




# WHY FOAMED ASPHALT ON THIS PROJECT?

Per Geotechnical Report & Design Study Report:

- Substandard Base & Subbase material with up to 12% of fines.
- Varying paving products encountered (Hot mix, chip seal, High float).
- Permafrost and ice rich material (sand) susceptible to seasonal frost.
- Distressed pavement, potholing, excessive patching, and settlement.

# FASBC WAS SELECTED RATHER THAN CABCTO IMPROVE



 Bind excess fines to improve freeze thaw performance of the base layer.



 The material properties of the base course layer.

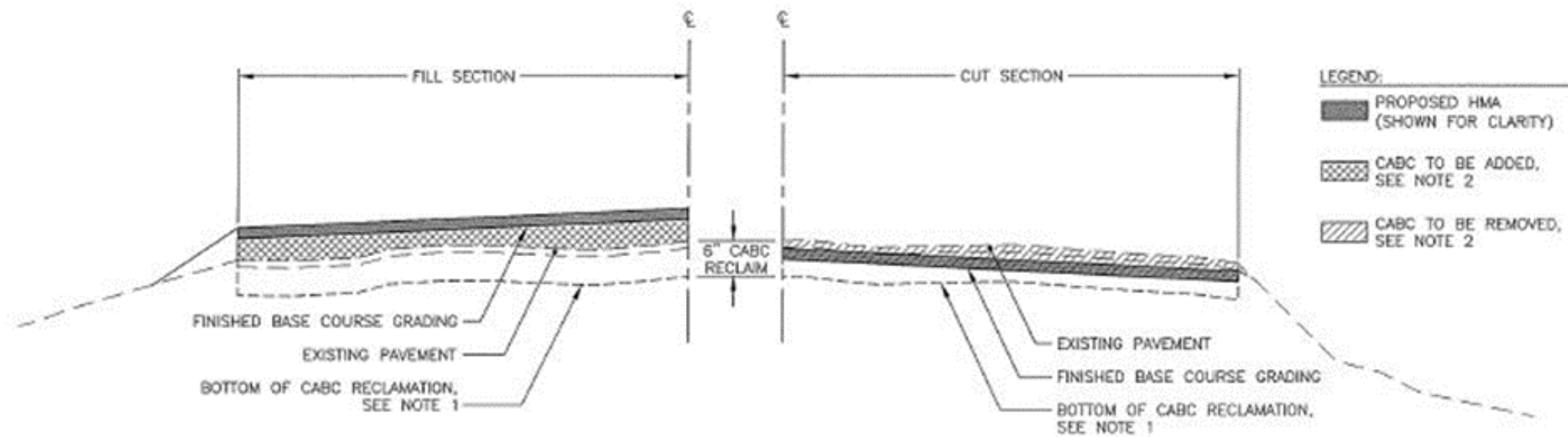
# THREE PROPOSED GRADATIONS & MIX DESIGNS

Due to varying paving products and thicknesses in the existing pavement and base, several mix designs were proposed.

	MD-1	MD-2	MD-3
Existing HMA Depth	1.58-in	2.33-in	--
Existing Base Depth	4.66-in	3.67-in	--
Imported Base (E-1)	--	--	100%
Mix Ratio ( <u>HMA:Base</u> )	25:75	39:61	--
Asphalt Cement 52-28	2.0%	1.5%	<b>2.0%</b>
Portland Cement	1.0%	1.0%	<b>1.0%</b>
Water to Foam Asphalt	3.5%	2.5%	<b>3.0%</b>
Half Life	12 sec	8 sec	<b>9 sec</b>
Expansion Ratio	12	12	<b>13</b>
Optimum Moisture	5.6%	5.3%	<b>4.2%</b>

- Foaming Oil Temperature: 329 F<sup>o</sup>
- This project utilized MD-3.

# FOAMED ASPHALT PROCESS



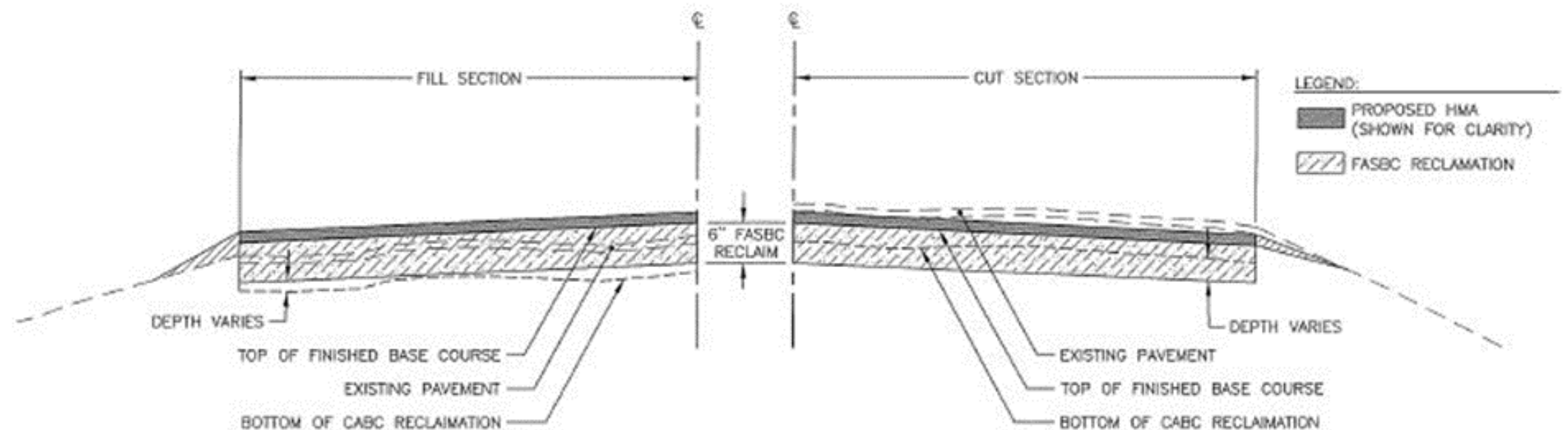
PHASE 1 - CRUSHED ASPHALT BASE COURSE DETAIL (PAY ITEM 308.0001.0000)

## Phase 1 - Steps

1. Reclaim 6" of existing pavement and base course.
2. Level adjust CABC grade to base course finish grade.
3. Use CABC material for shouldering the pavement.
4. Import ABCE-1 where CABC material is depleted.

## Phase 2 - Steps

1. Spread Cement on CABC grade & foam 6" of CABC
2. Grade FASBC to the base course finish grade.



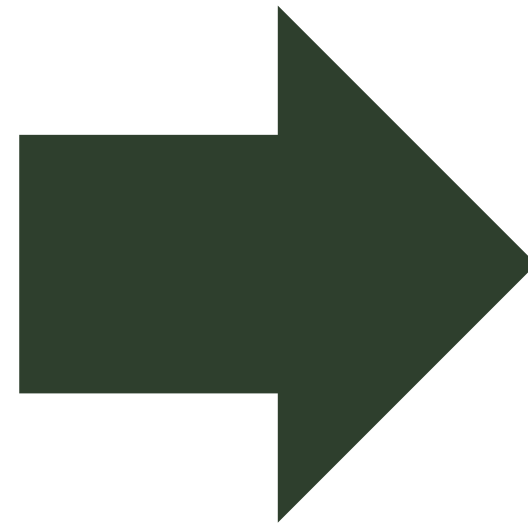
PHASE 2 - FOAMED ASPHALT STABILIZED BASE COURSE DETAIL (PAY ITEM 318.2000.0000)

# Foamed Asphalt

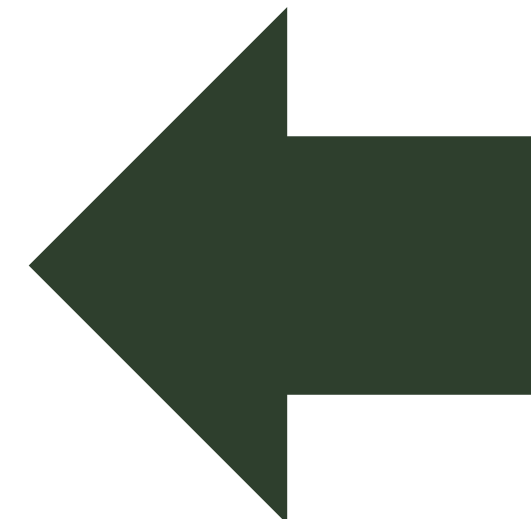
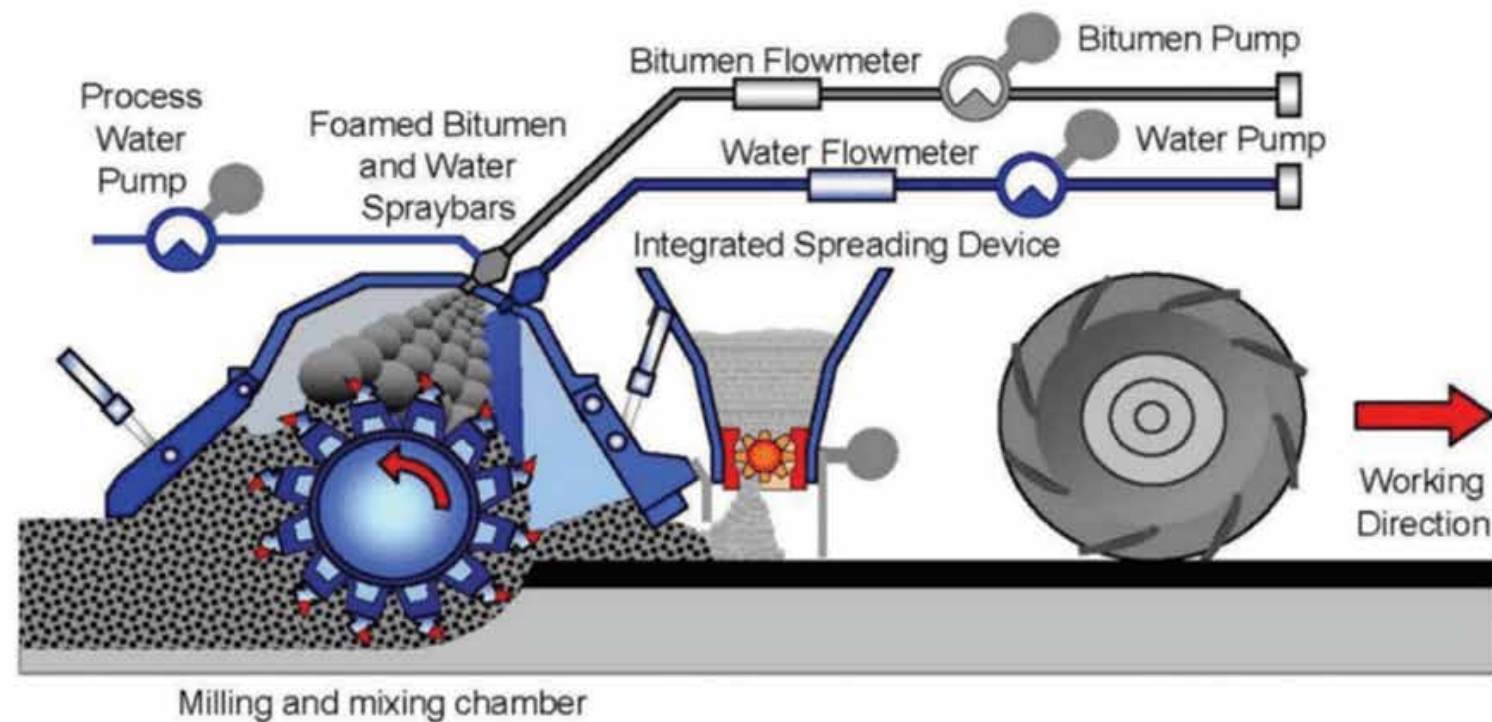
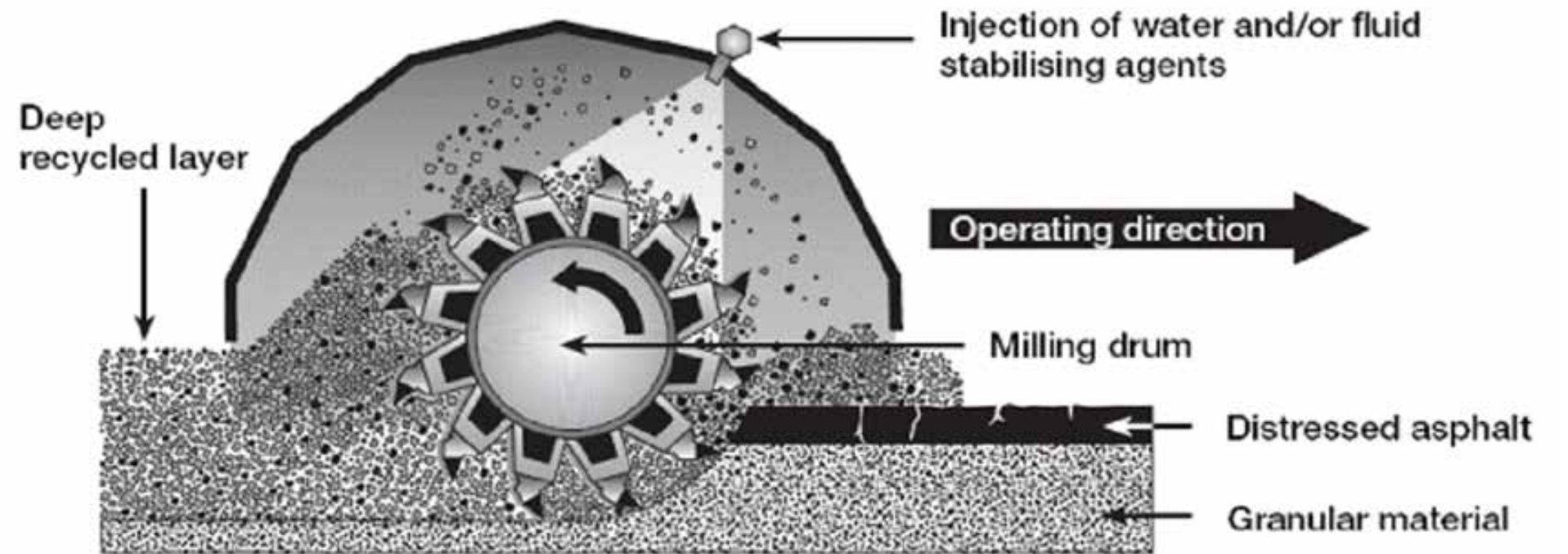
## Process

### Phase 1 - CABC

1. Reclamation
2. Water



The recycling process



### Phase 2 - FASBC

1. Asphalt Cement (2%) - 329 F
2. Portland Cement (1%)
3. Water (3%)

# Foamed Asphalt Basic Equipment



Oil Storage  
Tanker



Cement Distributor  
Truck



Cement Storage  
Tanker



Wirtgen Reclaimer- 600  
hp



2 Water  
Trucks



Sheepsfoot Roller



Motor  
Grader



Double Drum  
Roller



Pneumatic  
Roller



# Foamed Asphalt Operation

## Foaming Train & Procedure



1. Cement Distributor Truck – spreads the cement in front of train
2. Connected Train: Oil Tanker -> Wirtgen Reclaimer -> Water Truck
3. Vibratory Sheepsfoot roller – min. 60k lbs. (initial compaction)
4. Motor Grader with calibrated automatic cross slope control
5. Water truck – water for compaction during grading
6. Vibratory Steel Drum roller – min. 60k lbs. (secondary compaction & finishing)
7. Pneumatic Tire roller – min. 50k lbs. (secondary compaction & finishing)

# Foamed Asphalt Operation



Display in Reclaimer

2.0% Oil Targeted

3.0% Water Targeted

Hoses Connect to Reclaimer

Grey -> Oil Tanker

Blue -> Water Truck

Bucket -> Check Expansion & Half Life



# Foamed Asphalt Operation



Foaming Train after Cement spread



Foaming Train w/Sheepsfoot roller

# Foamed Asphalt Operation



Foaming Train w/Motor Grader  
after the second pass commences



Second Water  
Truck working  
with Motor Grader



# Foamed Asphalt Operation



Double Vibe Steel Drums – secondary compaction after Motor Grader



Pneumatic Tire Roller doing Finishing

# Foamed Asphalt Test



Foamed lump does not immediately disintegrate.



Asphalt residue sticks to your palm.

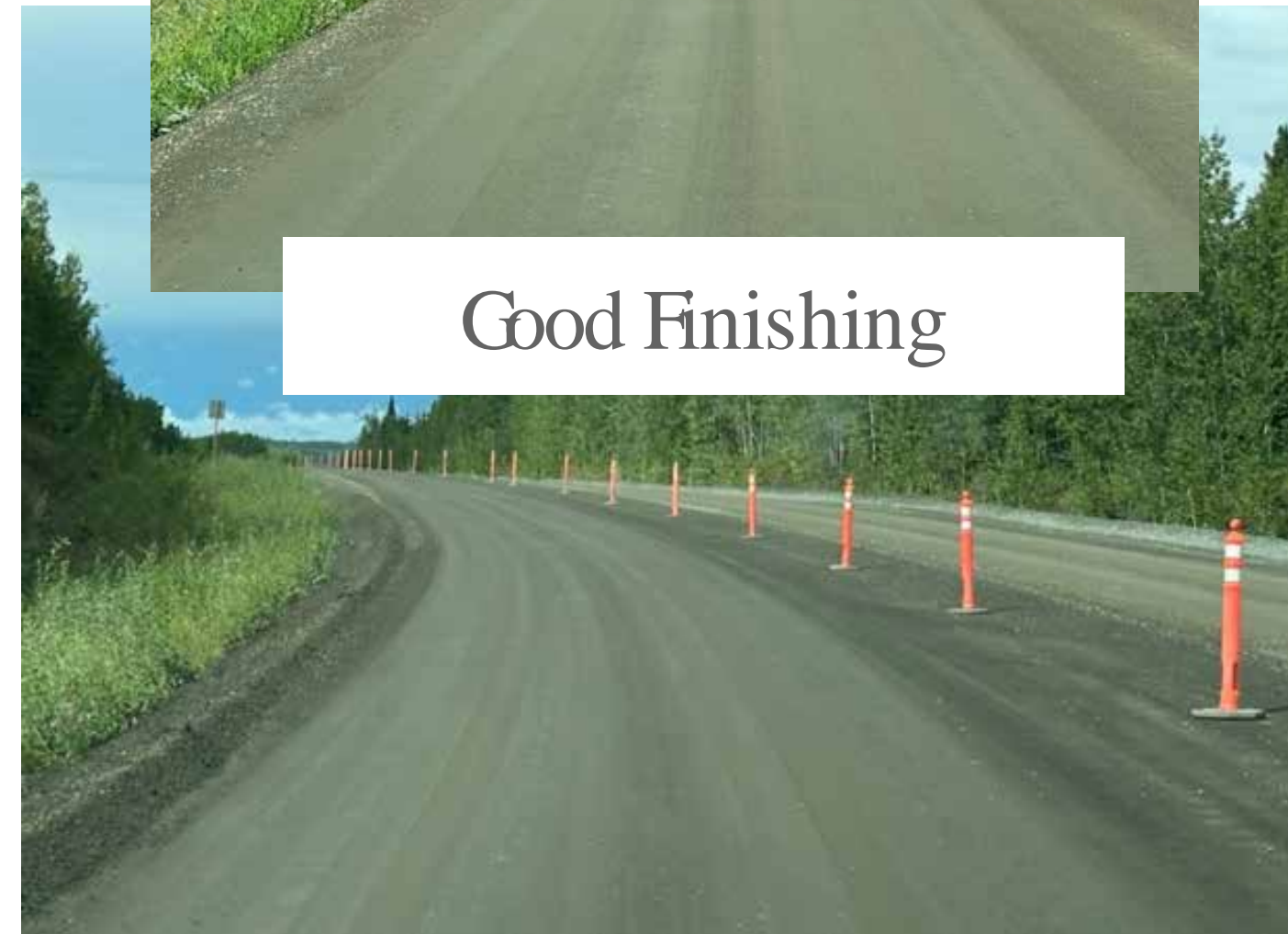
# Foamed Asphalt Finishing



Not- So- Good Finishing



Good Finishing





THANK YOU!  
QUESTIONS?