Ten-Year Performance of Bonded Concrete Pavement Overlays on I-295 and I-85

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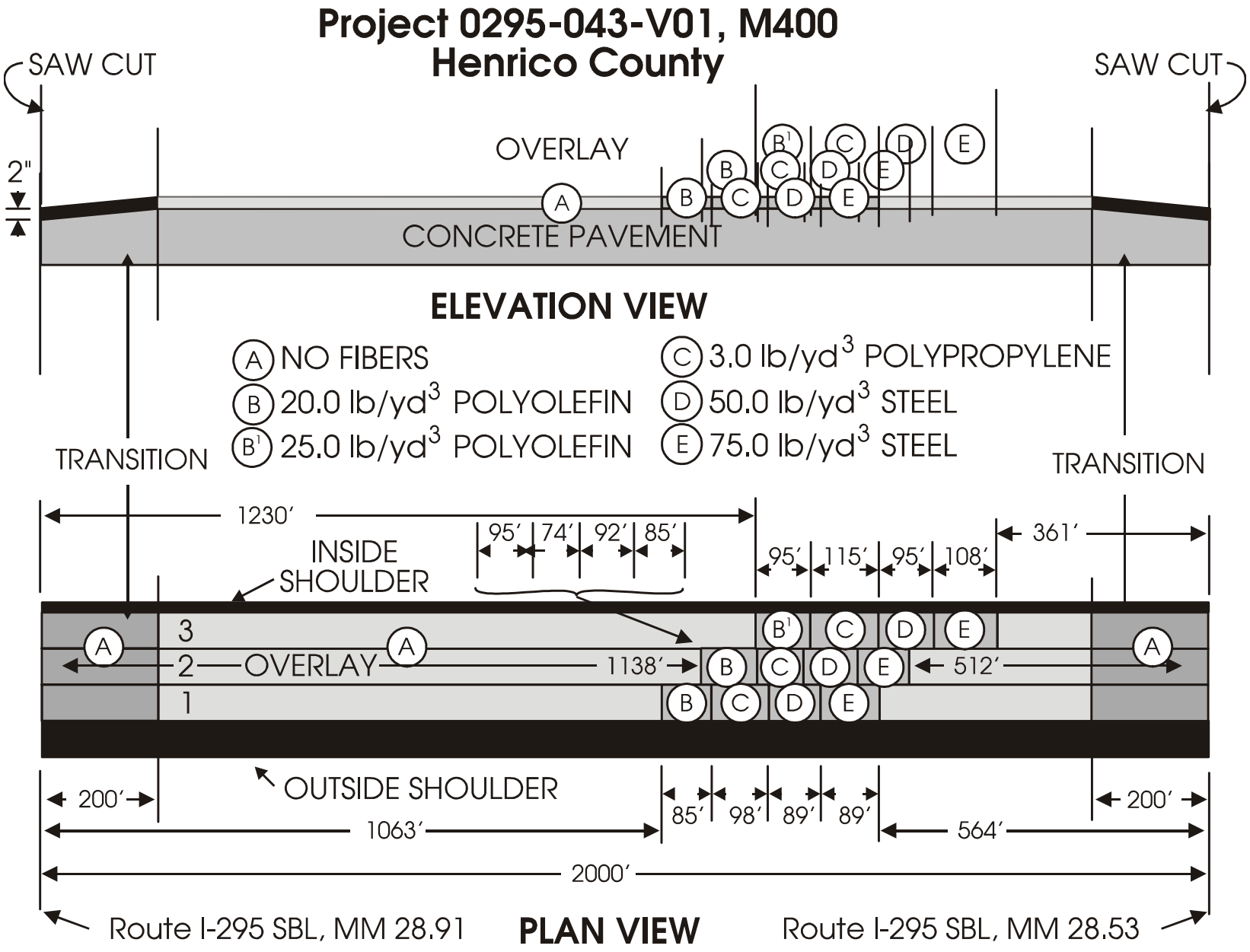
Overlays Placed in Summer 1995

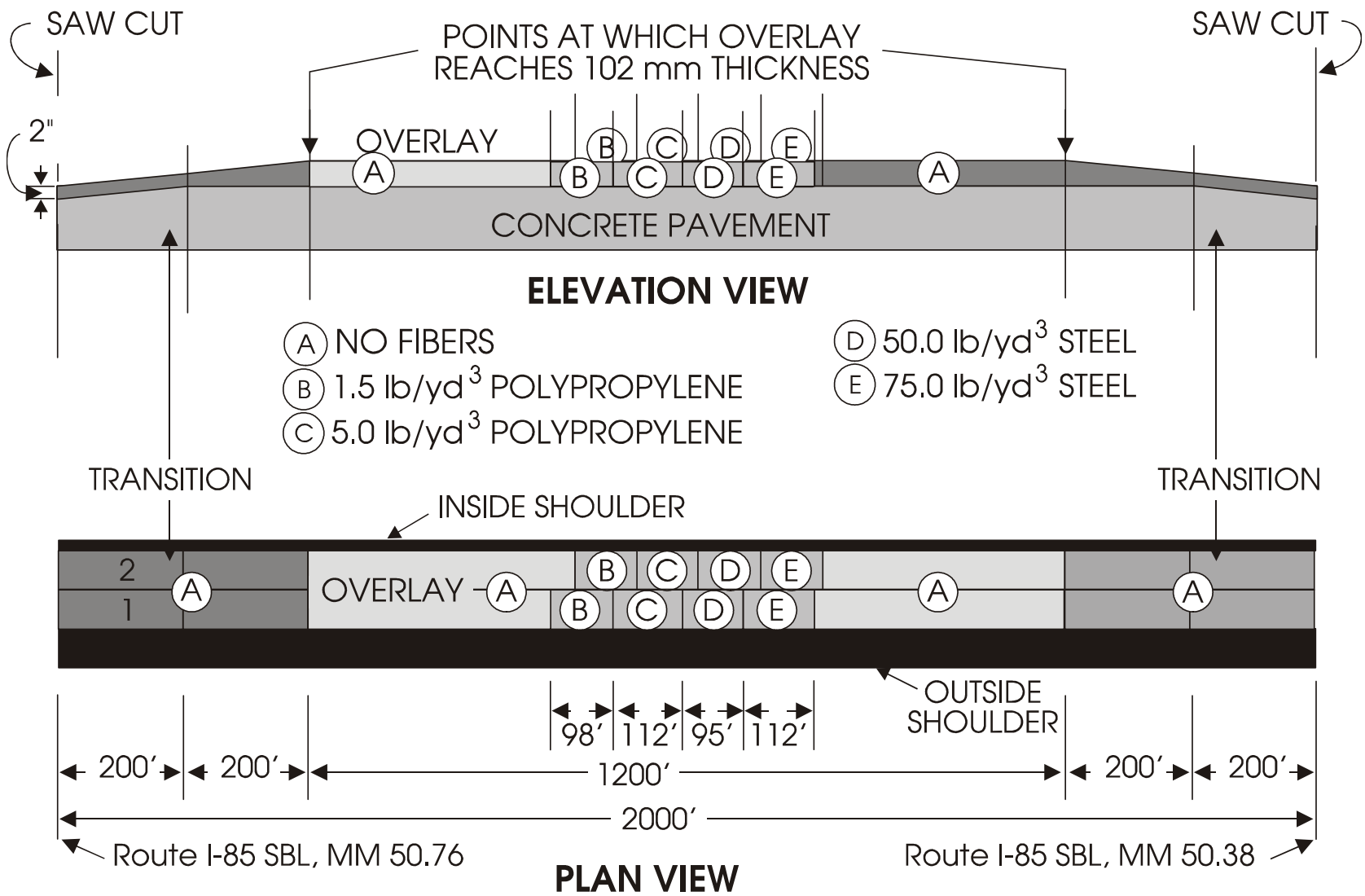
- I-295 overlay: 2-in thick and 3 lanes wide over a continuously reinforced concrete pavement
- I-85 overlay: 4-in thick and 2 lanes wide over a continuously reinforced concrete pavement

I-295 Overlay



I-85 Overlay

Project 0085-026-V02, M400
Dinwiddie County



Mixture Proportions, lb/yd3

Overlay	I-295	I-85
Cement	539	579
Flyash	126	136
Coarse Aggregate	1529	1744
Fine Aggregate	1255	1064
Water	280	300

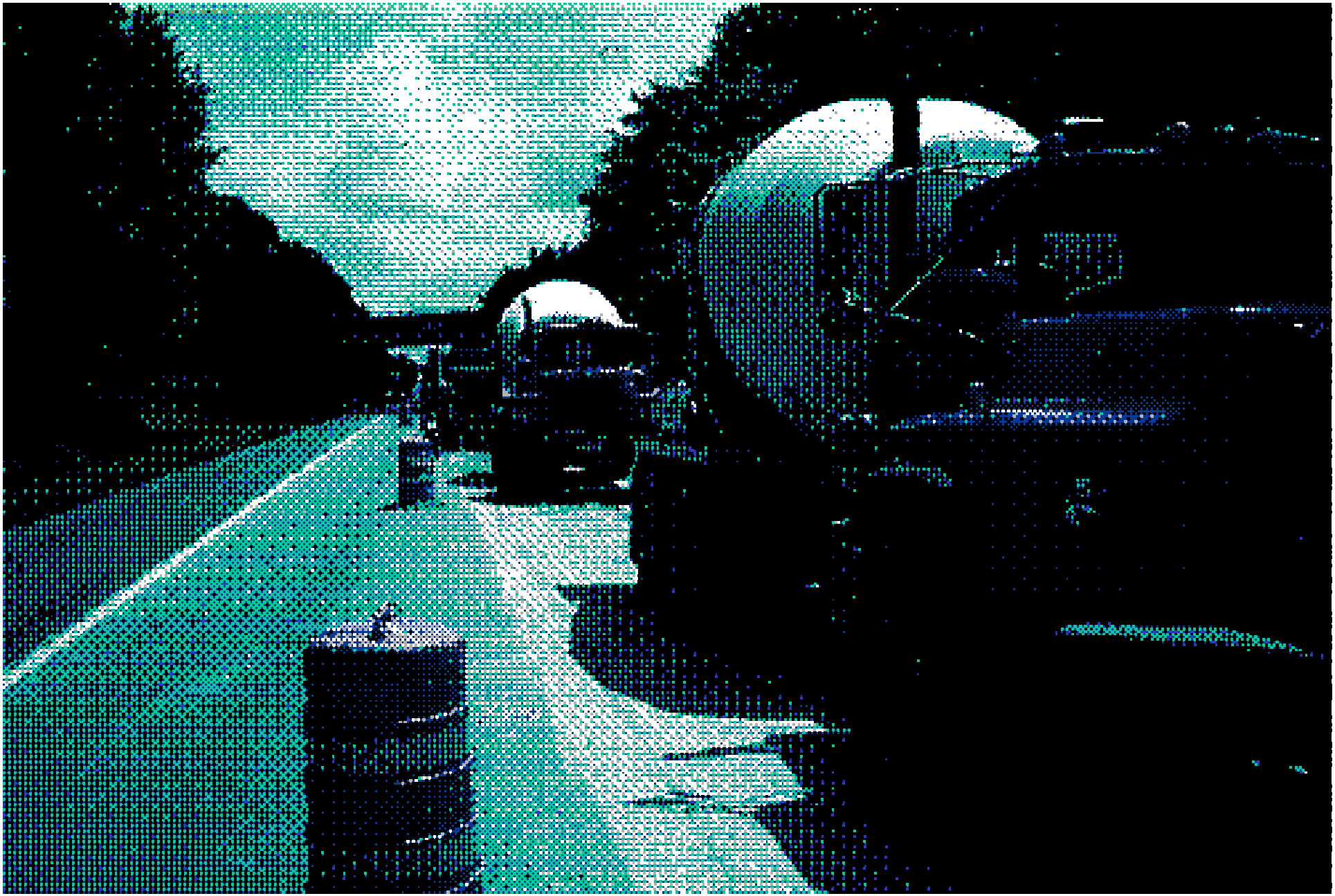
Plastic Properties

Overlay	I-295	I-85
Water/Cem. Materials	0.42	0.42
Slump, in	1.4 – 4.5	1.3 – 3.3
Air, %	4.5 – 6.4	4.2 – 7.5

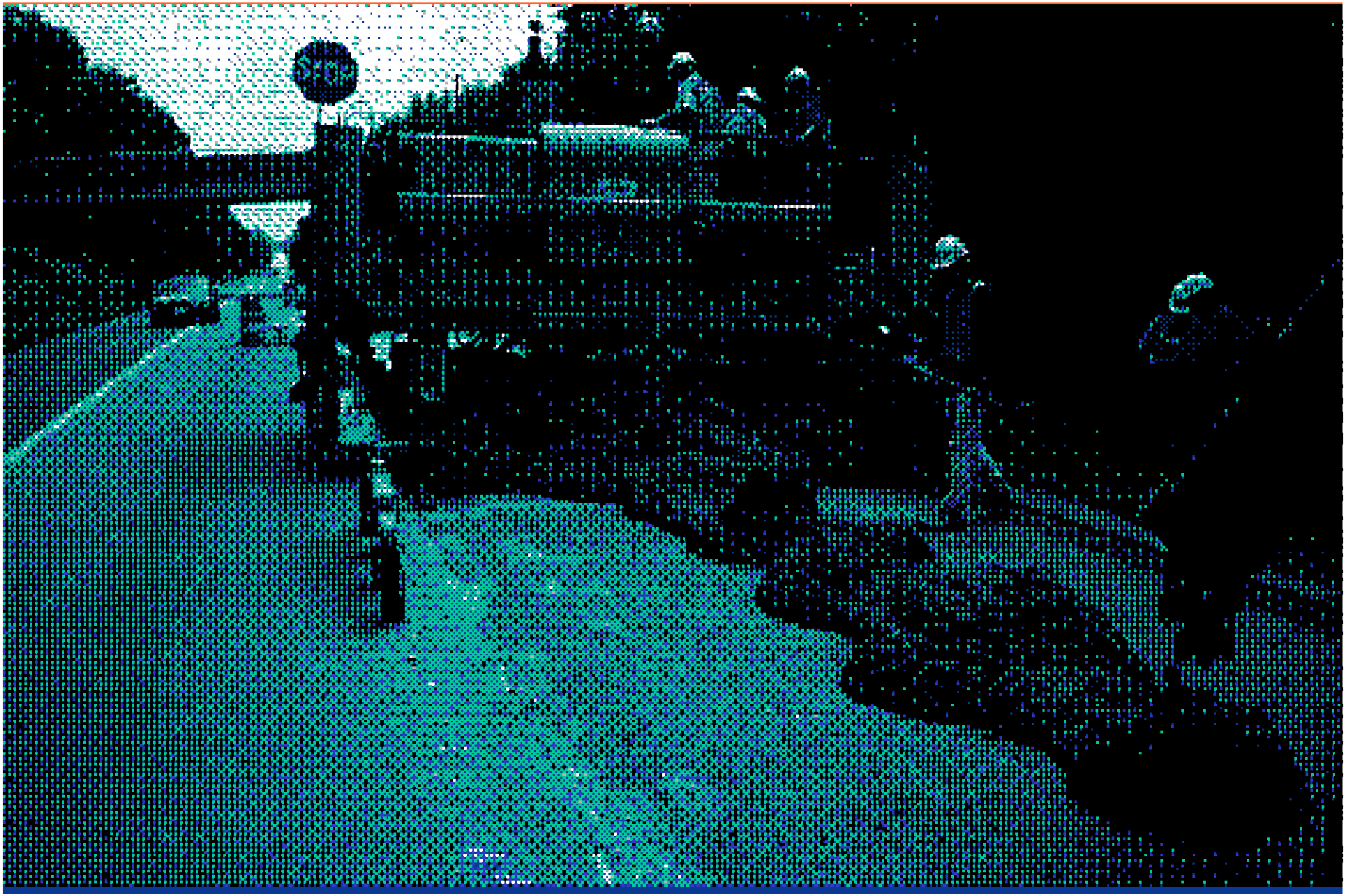
Shot Blasting I-295 Pavement

Wetting I-295 Pavement

Supplying I-85 Concrete

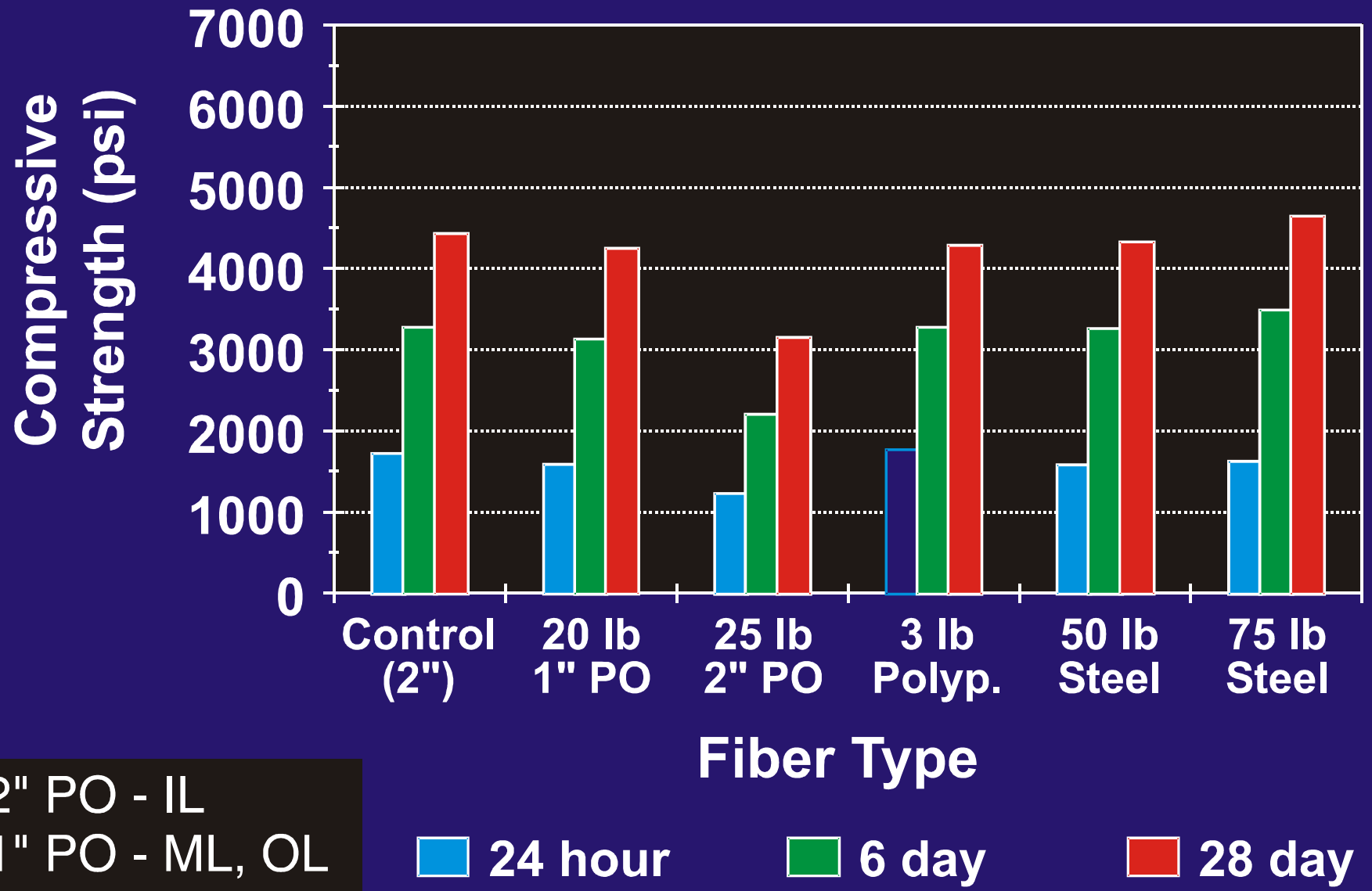


Paving I-85 Overlay



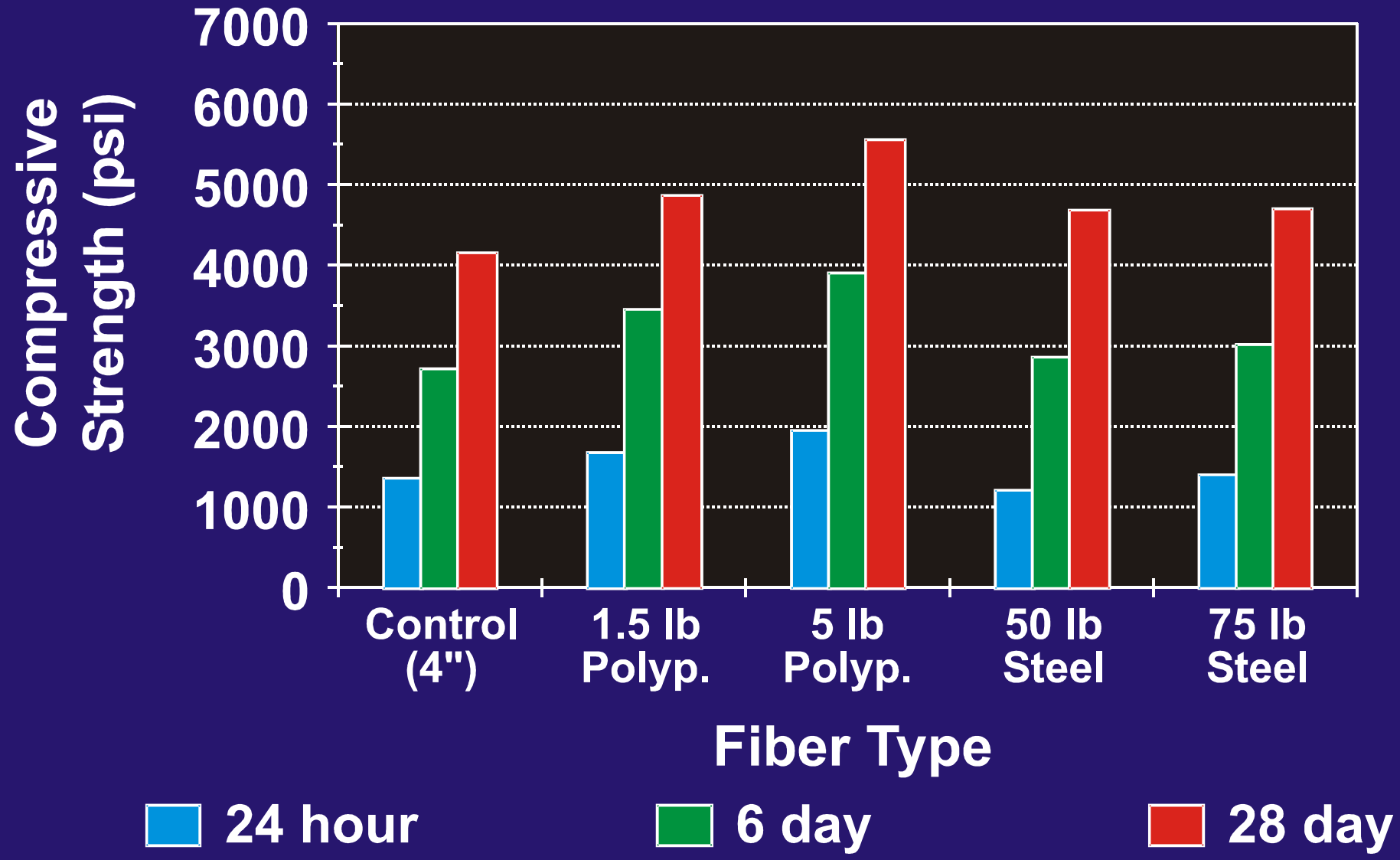
Tining I-295 Overlay Surface

I-295 COMPRESSIVE STRENGTH RESULTS



2" PO - IL
1" PO - ML, OL

I-85 COMPRESSIVE STRENGTH RESULTS



Evaluations in 1995, 1999, 2006

- Surface distress based on visual inspection (cracks, delaminations)
- Permeability to Chloride Ion, AASHTO T 277
- Bond Strength, VTM 92
- Pavement Stiffness, Falling Weight Deflectometer
- Skid Numbers

Surface Distress

Overlay	I-295	I-85
1995	Transverse reflective cracks	Transverse reflective cracks
1999	Transverse reflective cracks	Transverse reflective cracks
2006	Transverse reflective cracks	Transverse reflective cracks

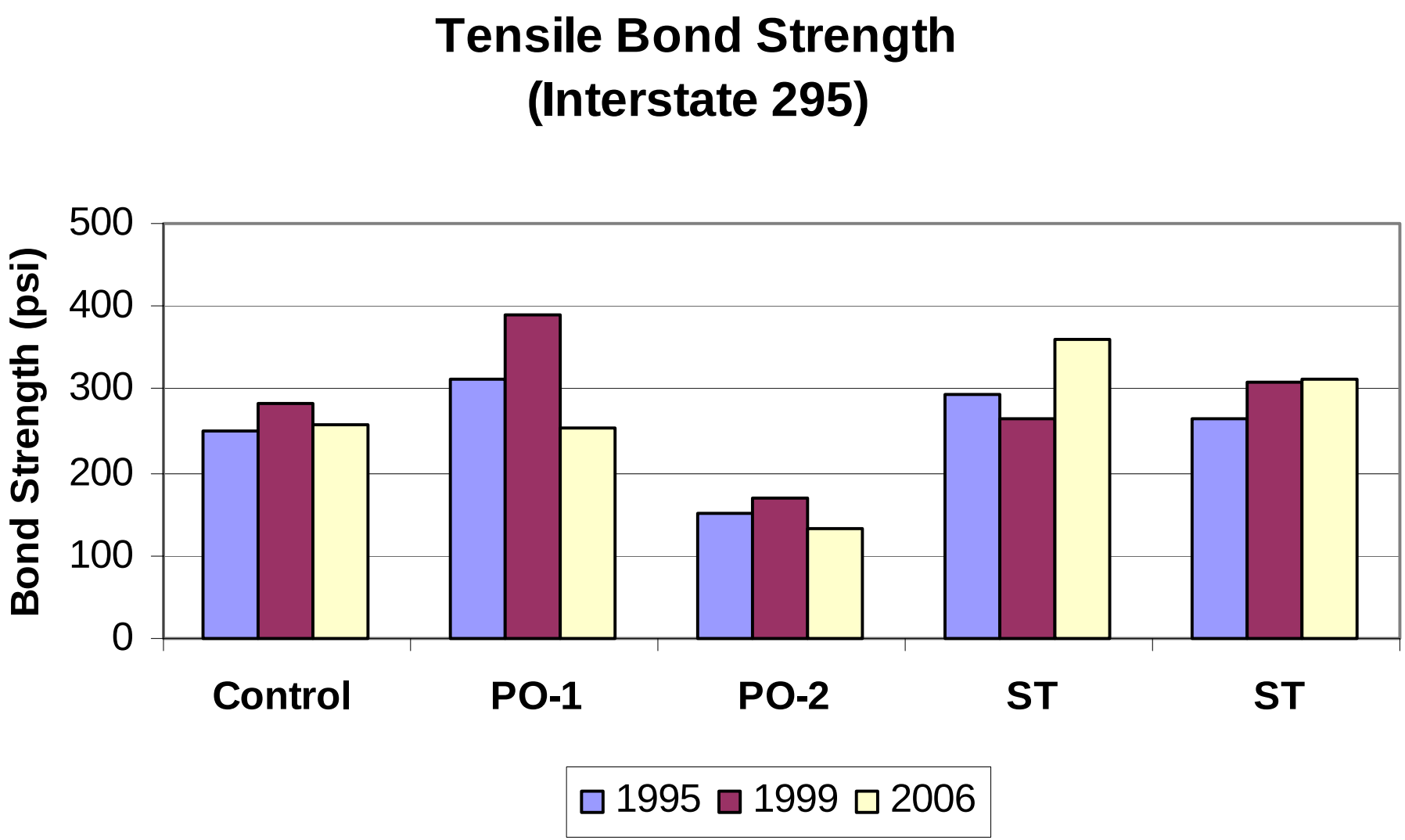
Permeability to Chloride Ion, AASHTO T 277

Overlay	I-295	I-85
1995	2051	4462
1999	398	396
2006	515	1037

I-295 Bond Strength, VTM 92

Year	Strength, psi	Overlay %	Bond %	Base %
1995	251	19	2	79
1999	284	40	2	58
2006	257	3	2	95

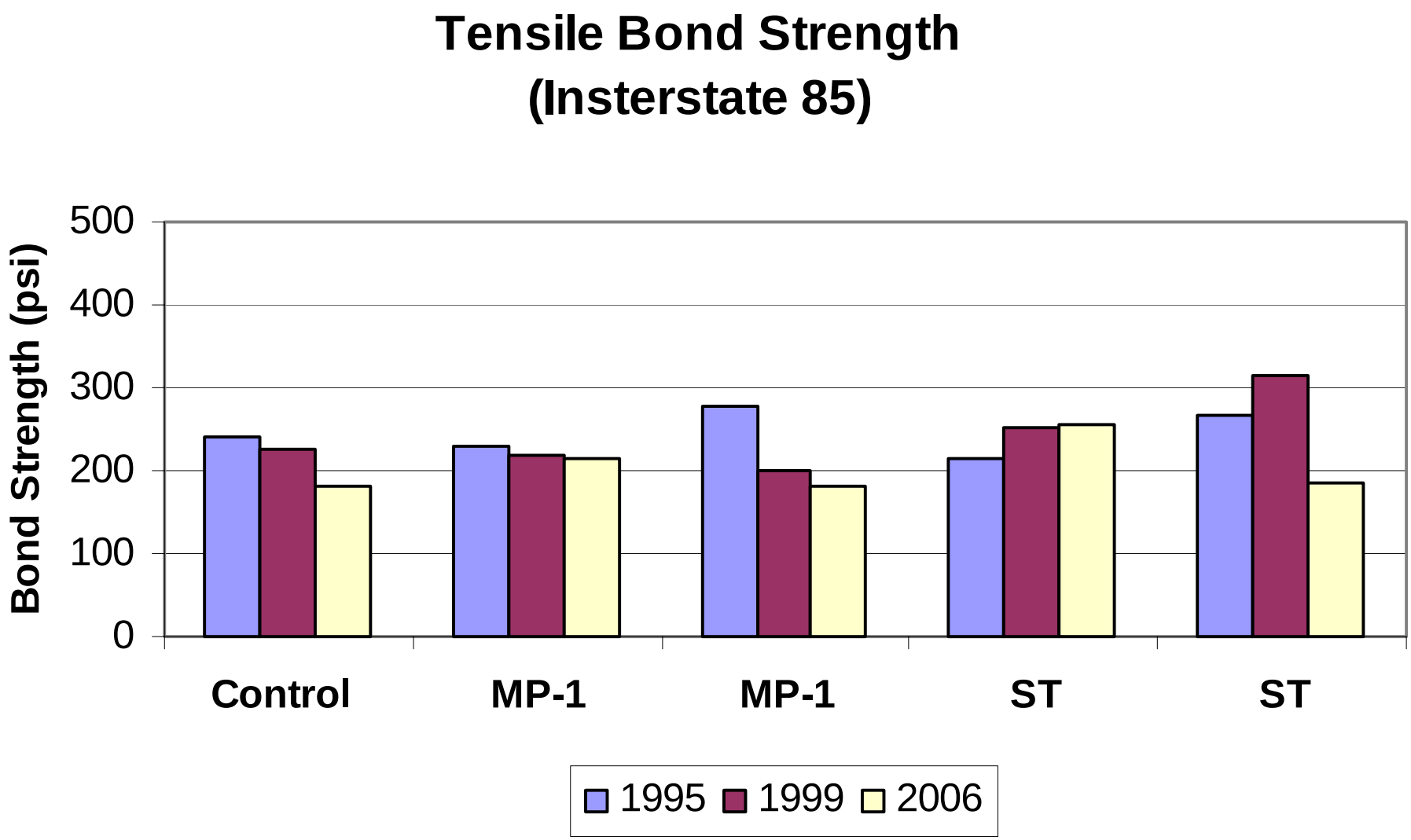
I-295 Bond Strength, psi



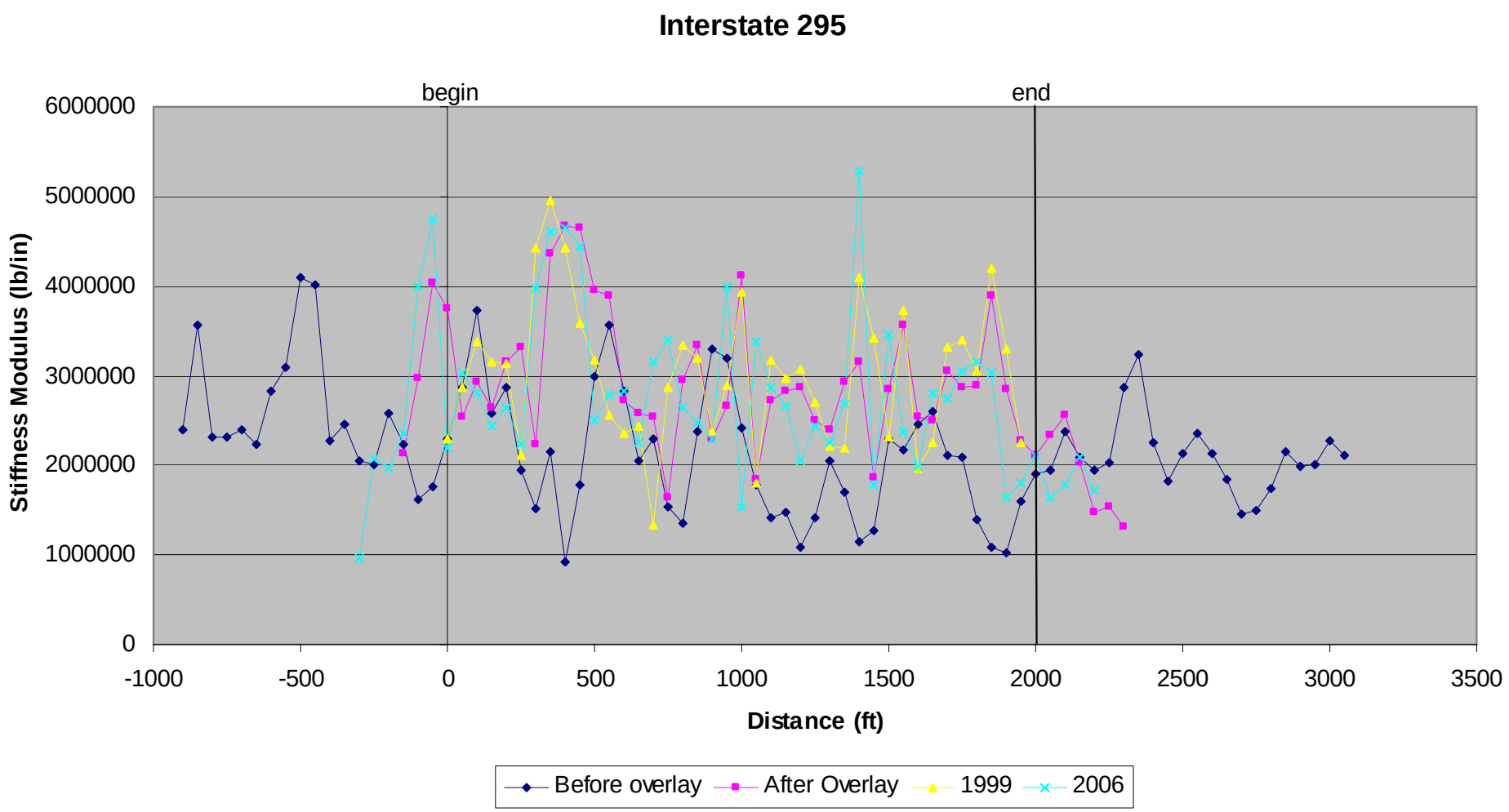
I-85 Bond Strength, VTM 92

Year	Strength, psi	Overlay %	Bond %	Base %
1995	239	0	0	100
01999	227	0	0	100
2006	182	0	0	100

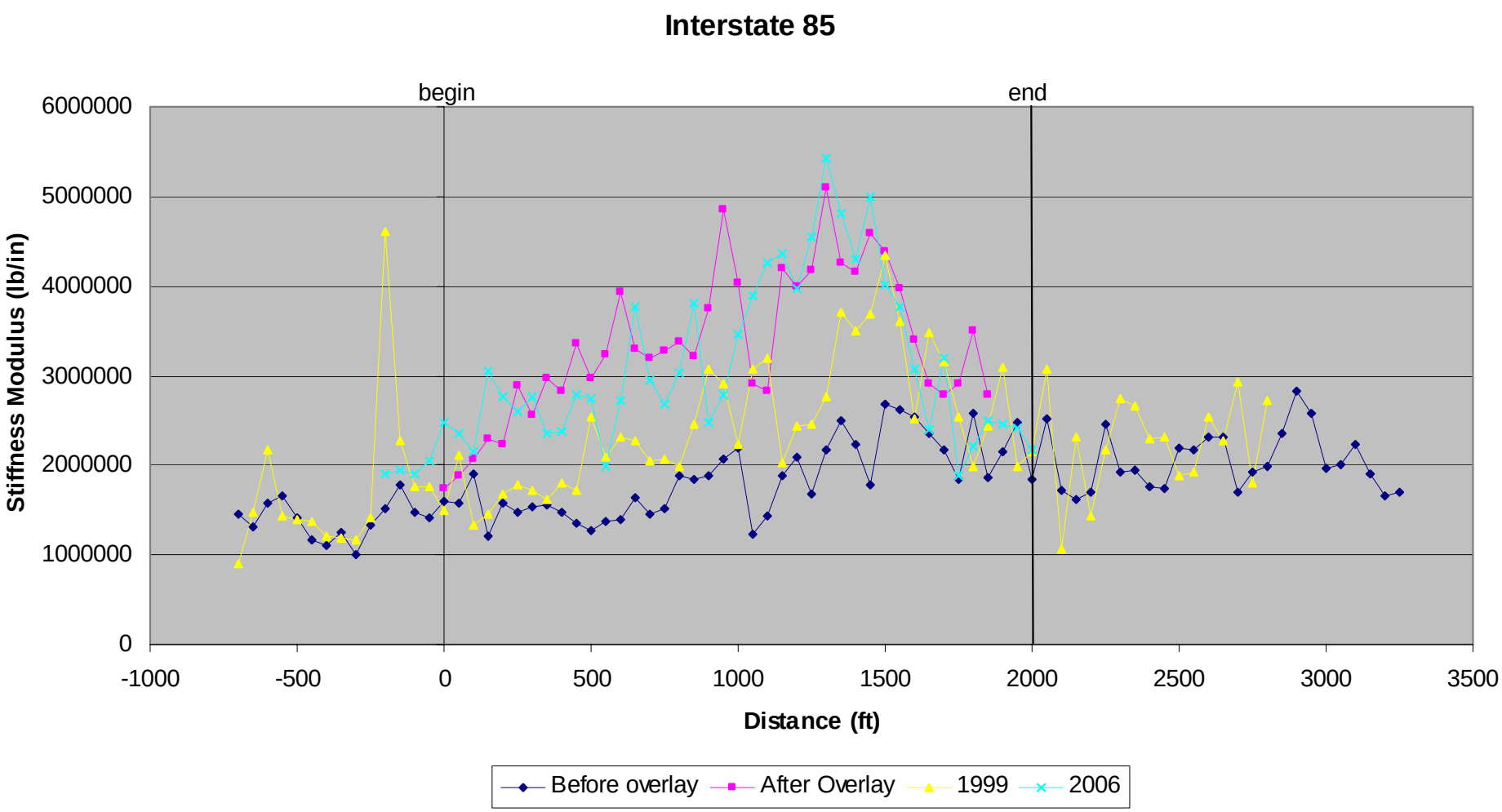
I-85 Bond Strength, psi



I-295 Pavement Stiffness, FWD



I-85 Pavement Stiffness, FWD



Skid Numbers

Overlay	I-295	I-85
1995	53	48
1999	47	34
2006	-	-

1995 Cost of Overlays, $/yd2

- I-295: $18.00
- I-85: $23.75

Conclusions

- Bonded hydraulic cement concrete overlays 2-in and 4-in thick have increased the pavement stiffness and cover depth over the reinforcement of two continuously reinforced concrete pavements.
- The overlays have performed well for more than 10 years and have extended the life of the pavements.

Overlays on I-295 and I-85

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Thank you.

Questions?

VTRC

Virginia Transportation
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