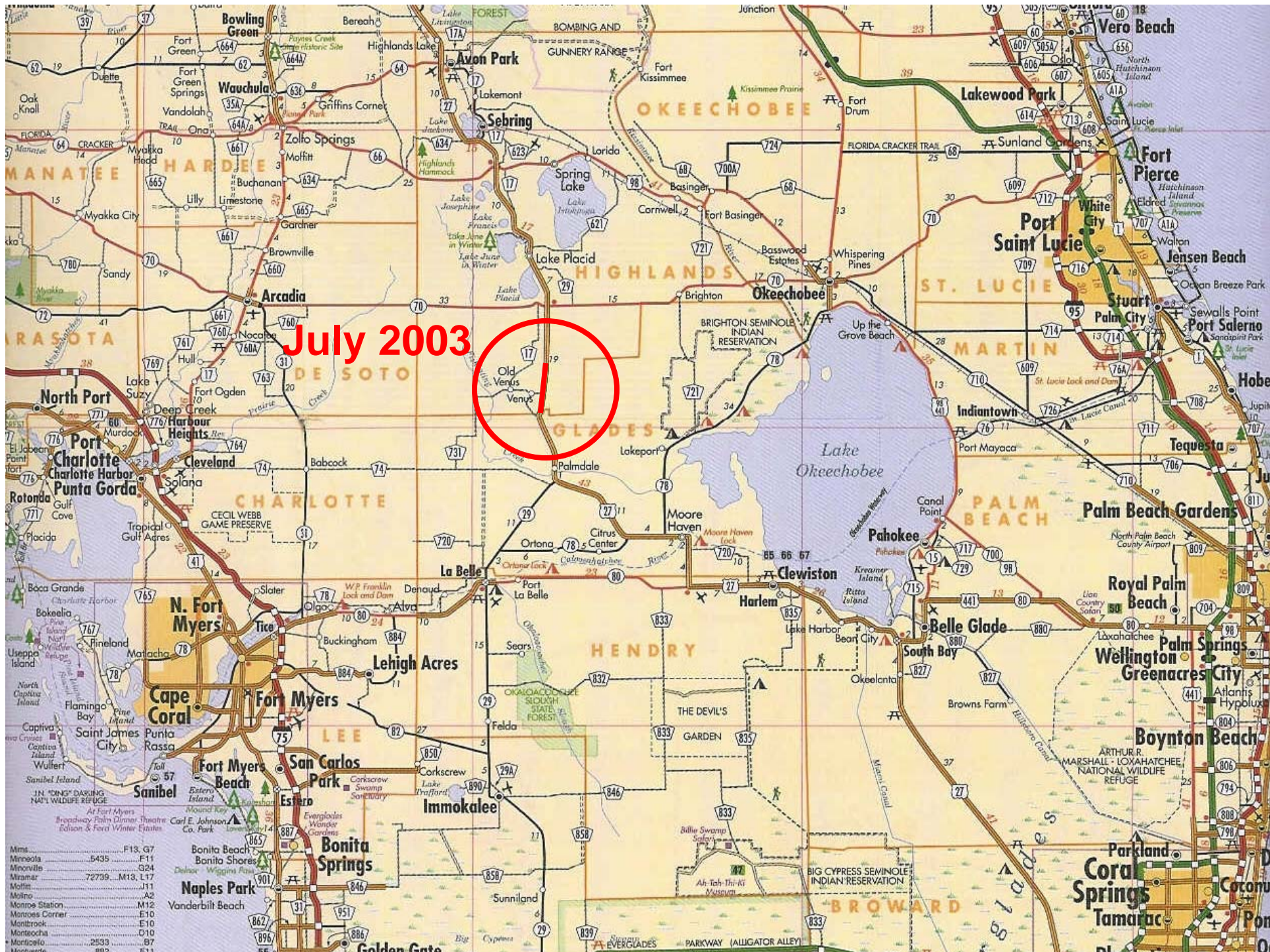




US-27 OGFC Test Sections

***2006 SE Pavement Management and
Design Conference***

Greg Sholar



July 2003

Purpose of Research

- **Evaluation/comparison:**
 - ◆ Conventional FC-5 (open-graded mix).
 - ◆ FC-5 with thick polymer modified tack membrane.
 - ◆ Novachip proprietary mix.
 - ◆ Limestone vs. Granite.

Construction Plan

- **Five test sections (1.3 miles long each):**
 - ◆ **FC-5 with FL limestone aggregate (Miami area).**
 - ◆ **FC-5 FL limestone with polymer membrane.**
 - ◆ **FC-5 with Nova Scotia granite aggregate.**
 - ◆ **FC-5 Nova Scotia granite with polymer membrane.**
 - ◆ **Novachip mix with Nova Scotia granite.**

Evaluation Parameters

- Long term durability (cracking, rutting and ride quality).
- Field permeability.
- Friction resistance.
- Noise.

FC-5 and Novachip Differences

■ FC-5

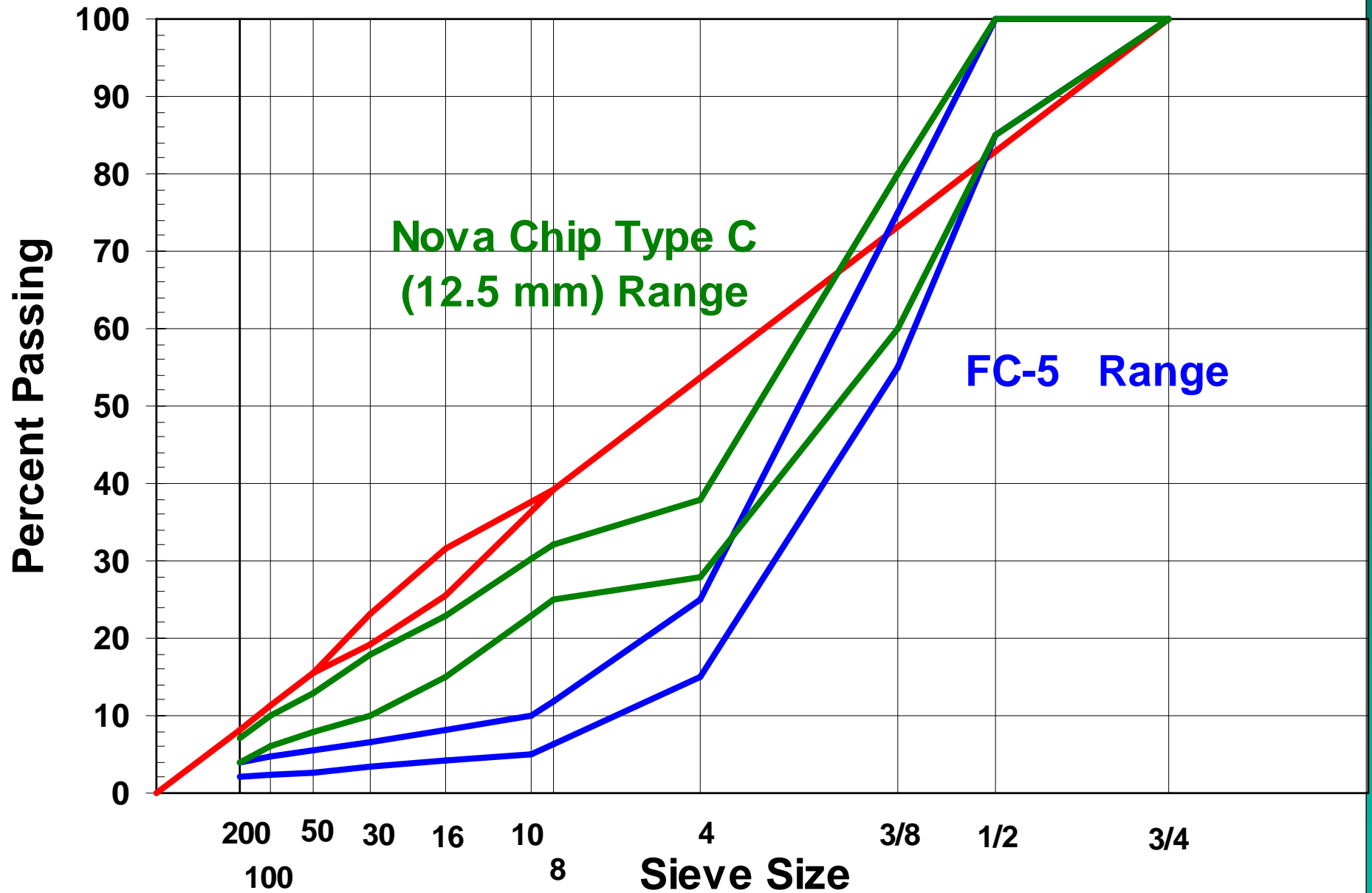
- ◆ Standard FDOT mix used on high speed facilities.
- ◆ Porous, open-graded mix for spray reduction.
- ◆ Standard ARB-12 binder for this project.
- ◆ Uses conventional tack coat.
- ◆ Placed $\frac{3}{4}$ " thick.
- ◆ Based on Georgia's OGFC mix.

FC-5 and Novachip Differences

■ Novachip

- ◆ Proprietary mix developed by Koch (now SEM).
- ◆ “Denser” open gradation.
- ◆ Comes in three sizes, depending on application.
- ◆ Used Type C gradation – coarsest.
- ◆ PG76-22 binder recommended.
- ◆ Uses thick polymer tack coat, i.e. membrane (Novabond).
- ◆ Special paver.
- ◆ Bottom line: premium mix.

Gradation Differences



Tack Coat vs. Polymer Membrane

■ Standard FDOT tack:

- ◆ Conventional rapid set emulsion.
- ◆ Applied at target rate of 0.045 gal/sy (diluted).

■ Polymer modified tack:

- ◆ Uses styrene-butadiene (SB) polymer.
- ◆ Emulsified after polymer addition.
- ◆ Generic specification for Novabond exists.
- ◆ Target rate of 0.20 gal/sy.

Application Process for BACFC





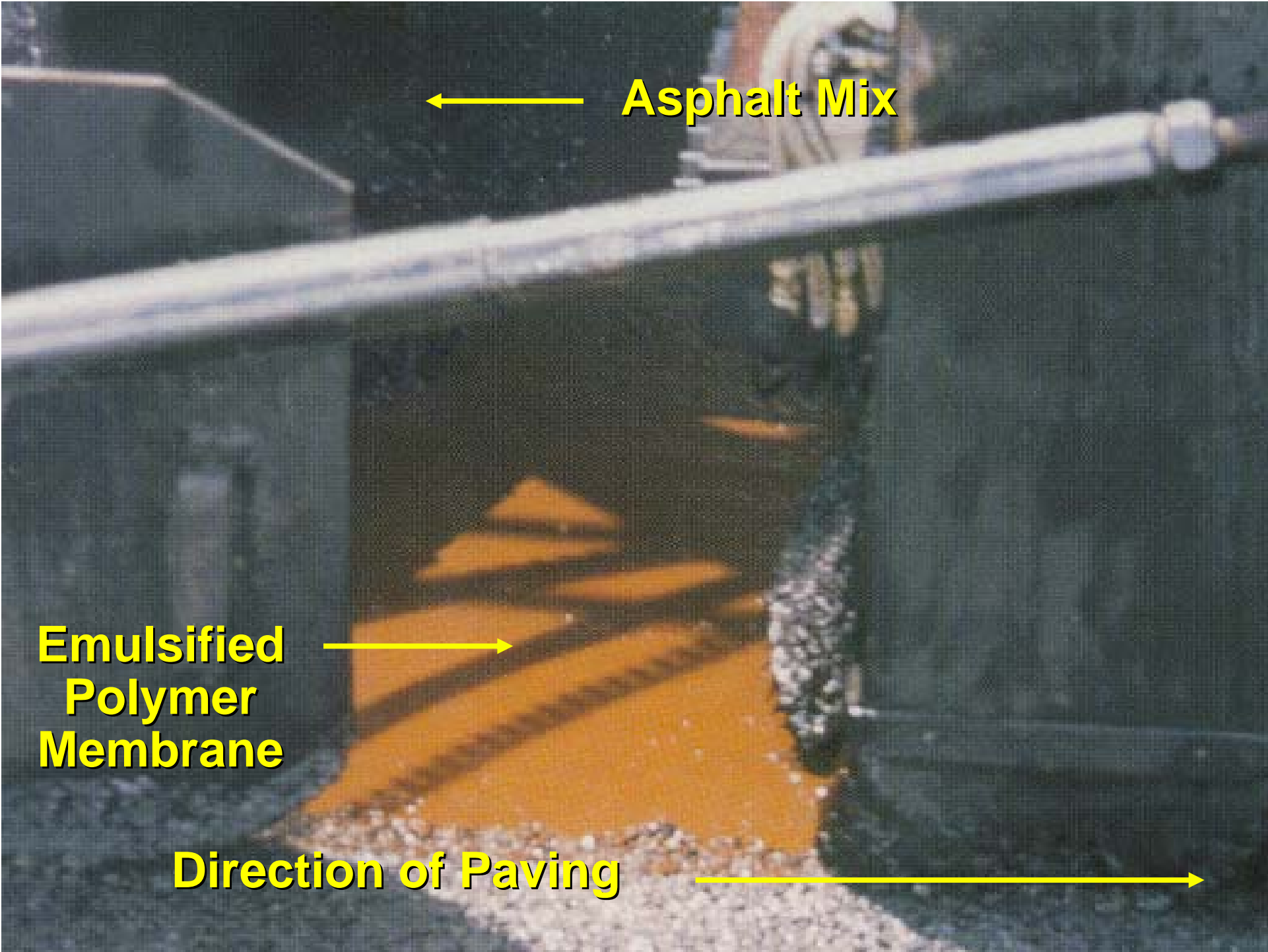
Asphalt Mix



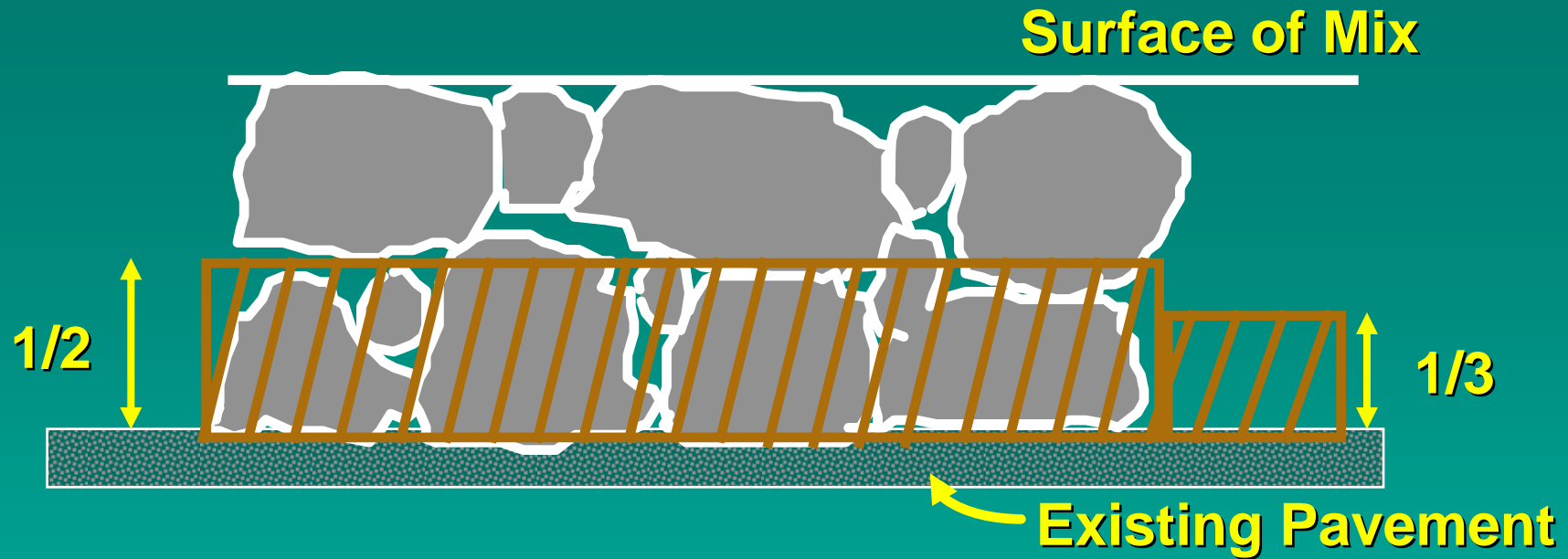
**Emulsified
Polymer
Membrane**



Direction of Paving



Polymer Membrane



- Wicks $1/2$ way up when hot.
- Final wick is $1/3$ after water vaporization.





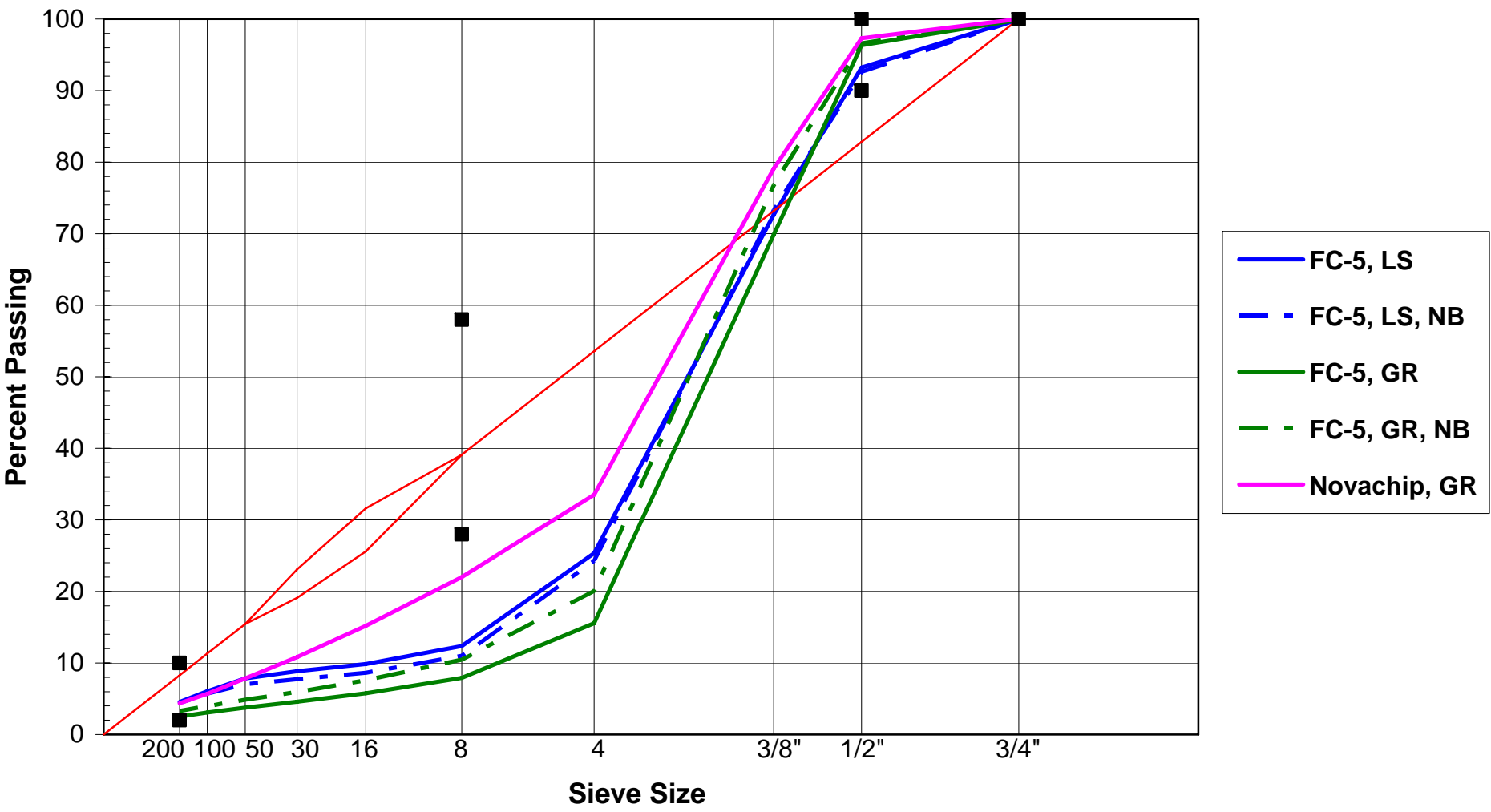
Benefits of Process

■ Benefits:

- ◆ No tracking.
- ◆ Sticky polymer membrane for adhesion.
- ◆ Much thicker than conventional tack.
- ◆ Complete coverage.

As-Built Data

US-27 As-built Gradations



Layer Thickness (inches)

FC-5 LS	FC-5 LS w/ P.M.	FC-5 GR	FC-5 GR W/ P.M.	Novachip
0.81	0.73	0.85	0.85	0.89

Asphalt Content

	FC-5 LS	FC-5 LS w/ P.M.	FC-5 GR	FC-5 GR W/ P.M.	Novachip
Design	6.4	6.4	6.0	6.0	5.0
As-built	6.0	6.2	5.5	5.8	4.5

Tack Rate

FC-5 LS	FC-5 LS w/ P.M.	FC-5 GR	FC-5 GR w/ P.M.	Novachip w/ P.M.
0.03	0.18	0.02	0.18	0.18



FC-5 Limestone



FC-5 Limestone



FC-5 Limestone w/ P.M.



FC-5 Limestone w/ P.M.



Transition: Limestone to Granite



FC-5 Granite



FC-5 Granite



FC-5 Granite w/ P.M.



FC-5 Granite w/ P.M.



FC-5 Granite w/ P.M.

A close-up photograph of a dark gray, textured surface, likely a road or driveway. The surface is composed of small, irregularly shaped aggregate particles, possibly granite, embedded in a dark matrix. The texture is rough and granular. The text "FC-5 Granite w/ P.M." is overlaid in the bottom right corner in a bold, yellow font with a black outline.

FC-5 Granite w/ P.M.



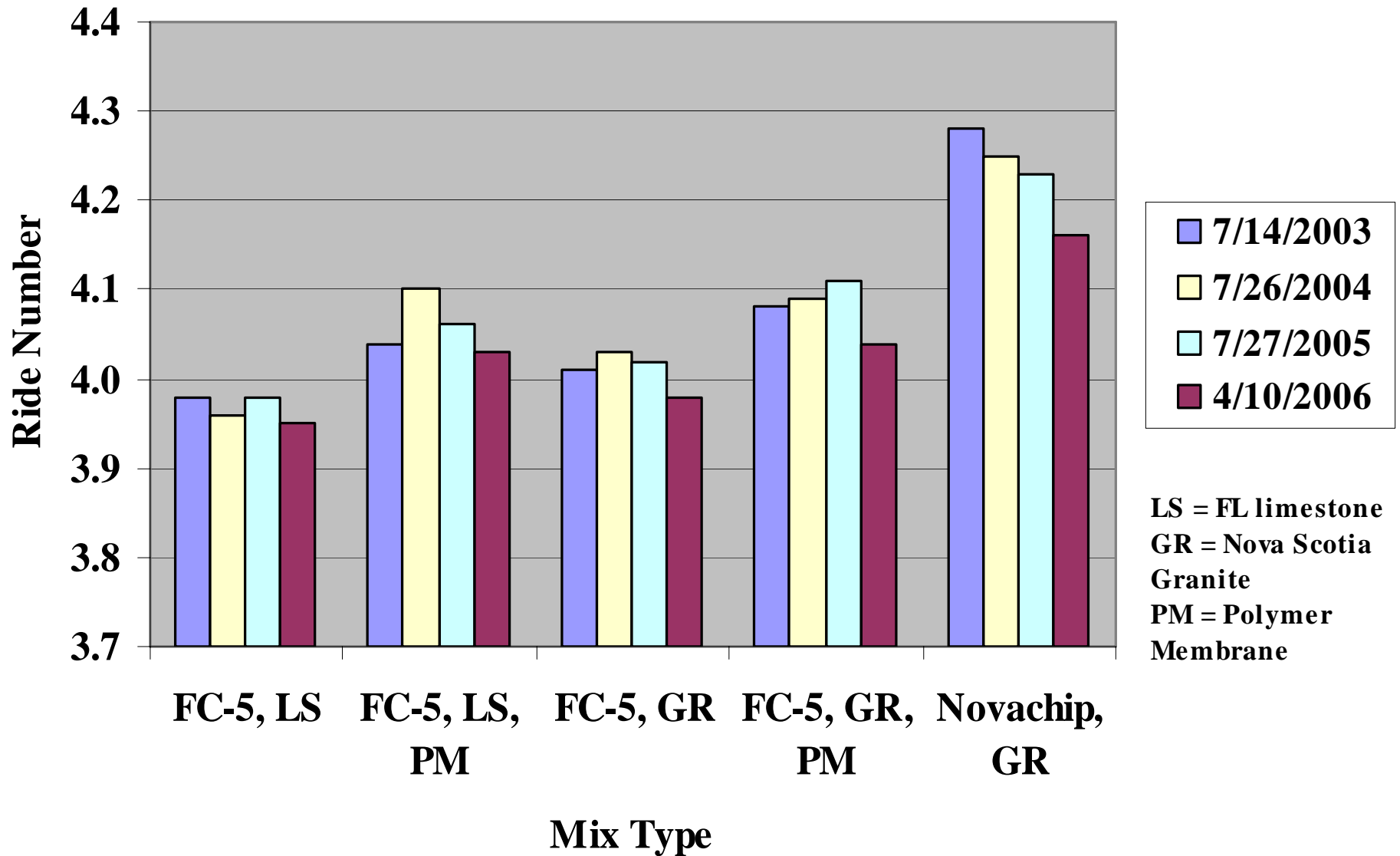
Novachip w/ P.M.



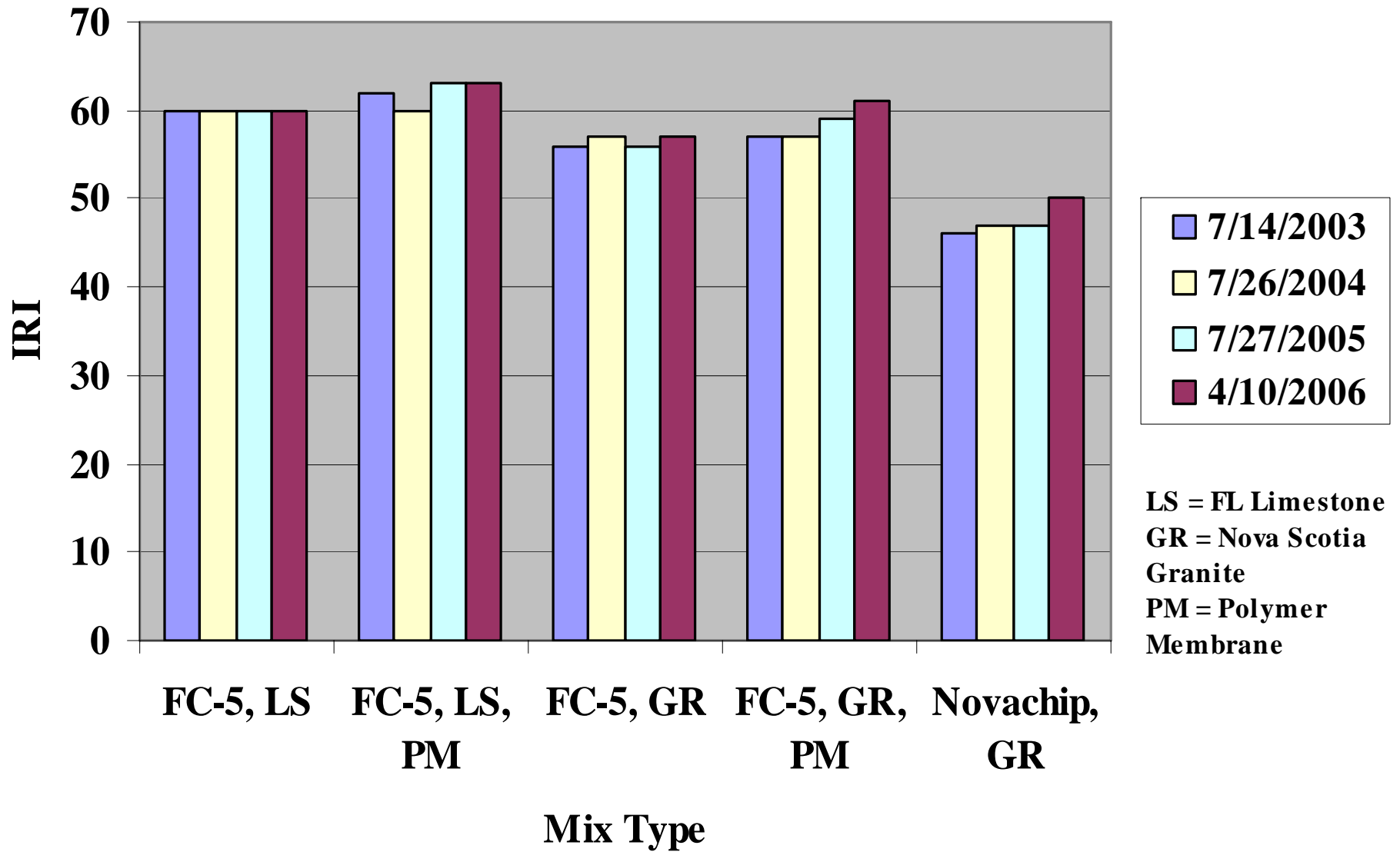
Novachip w/ P.M.

Performance Data

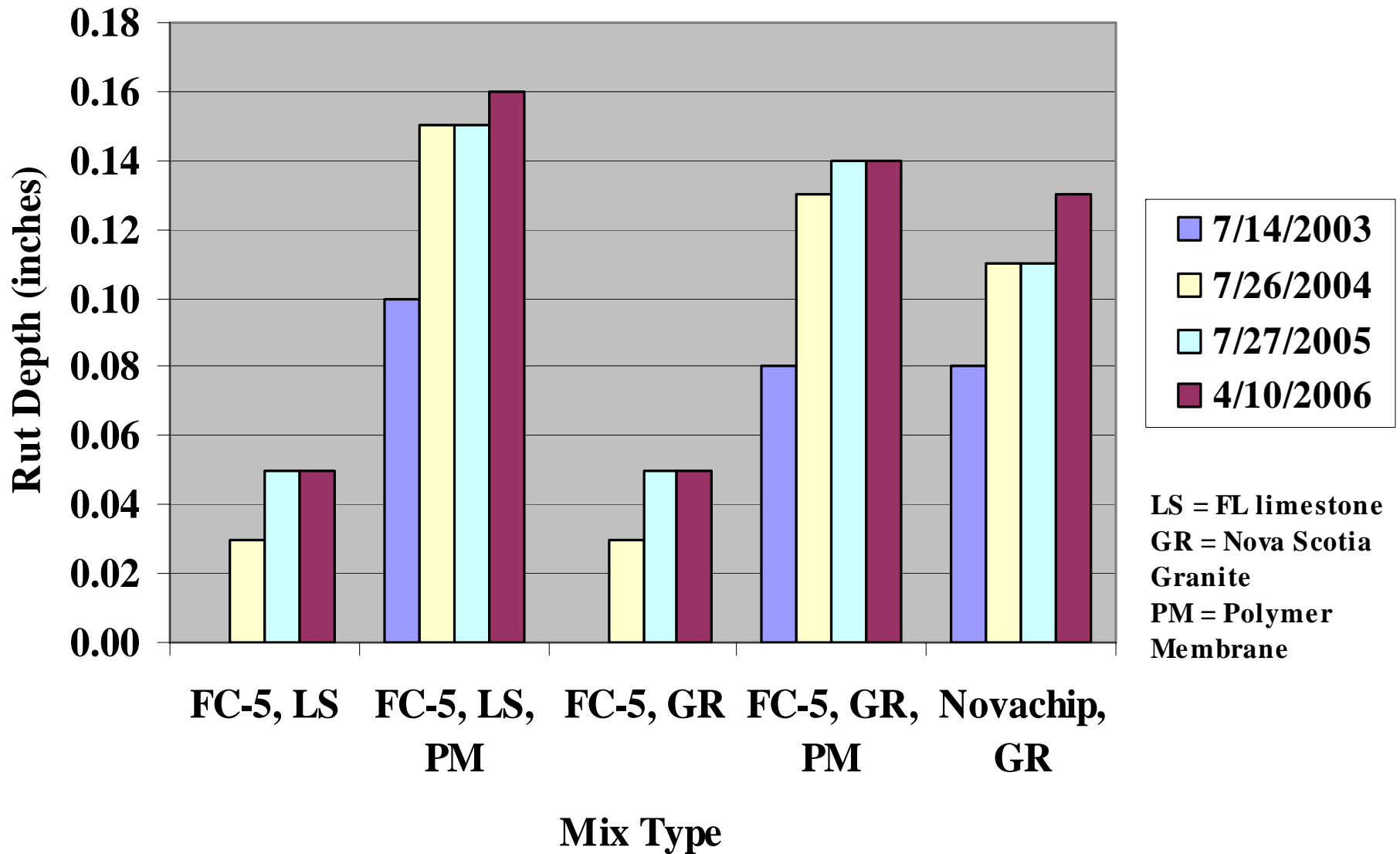
Ride Number Data, US-27, Highlands Co.



IRI Data, US-27, Highlands Co.



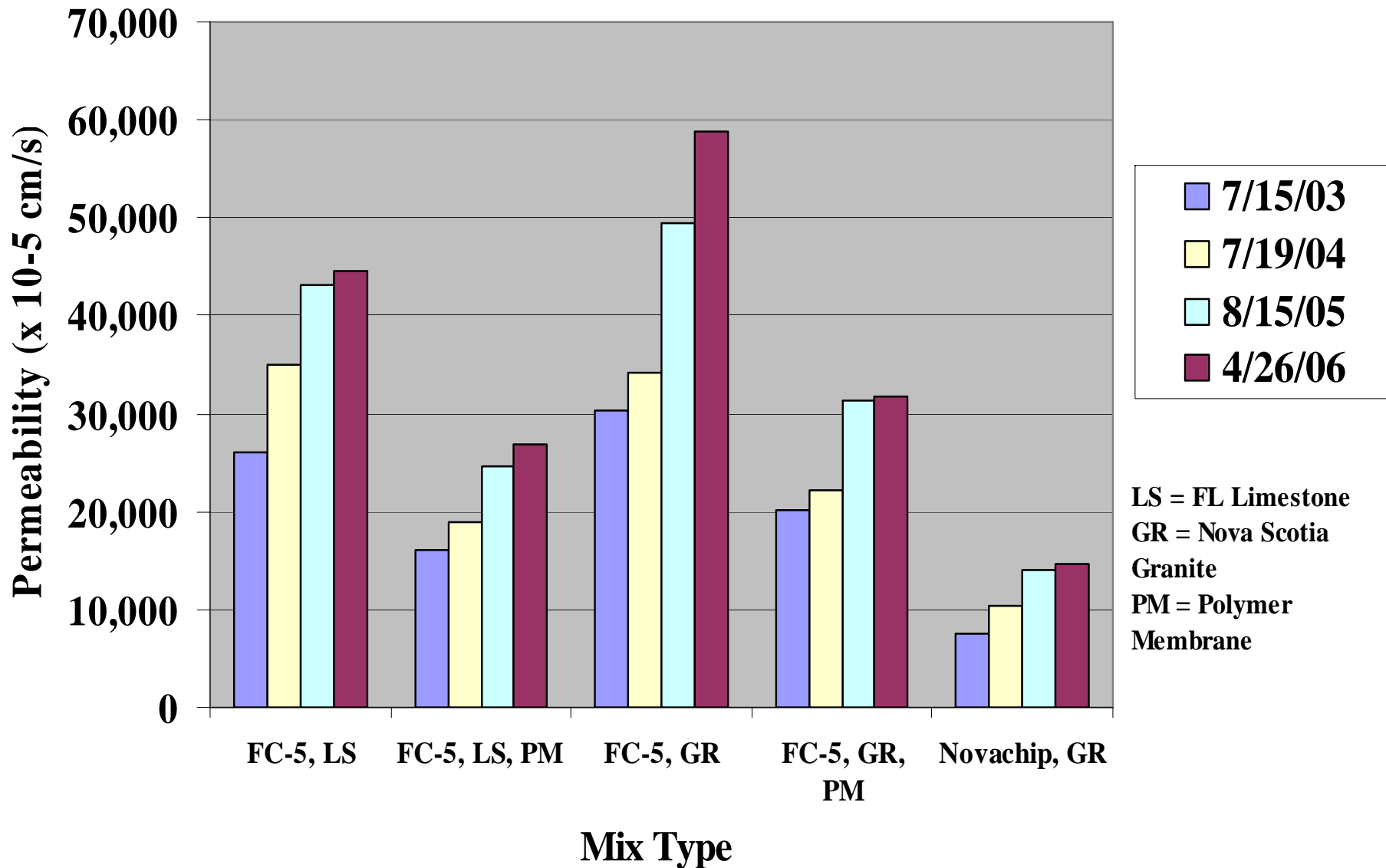
Rut Data, US-27, Highlands Co.



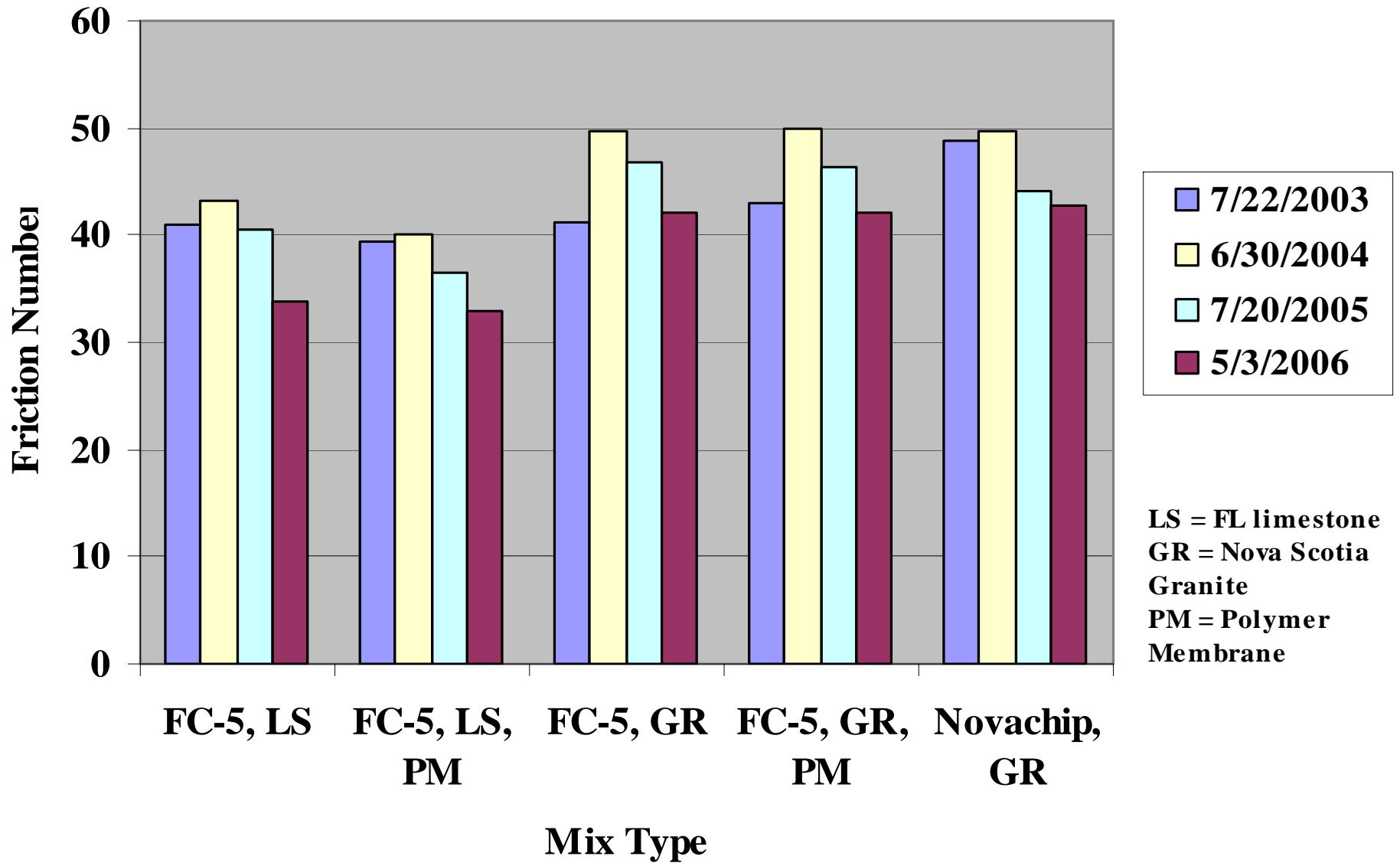
Field Permeability



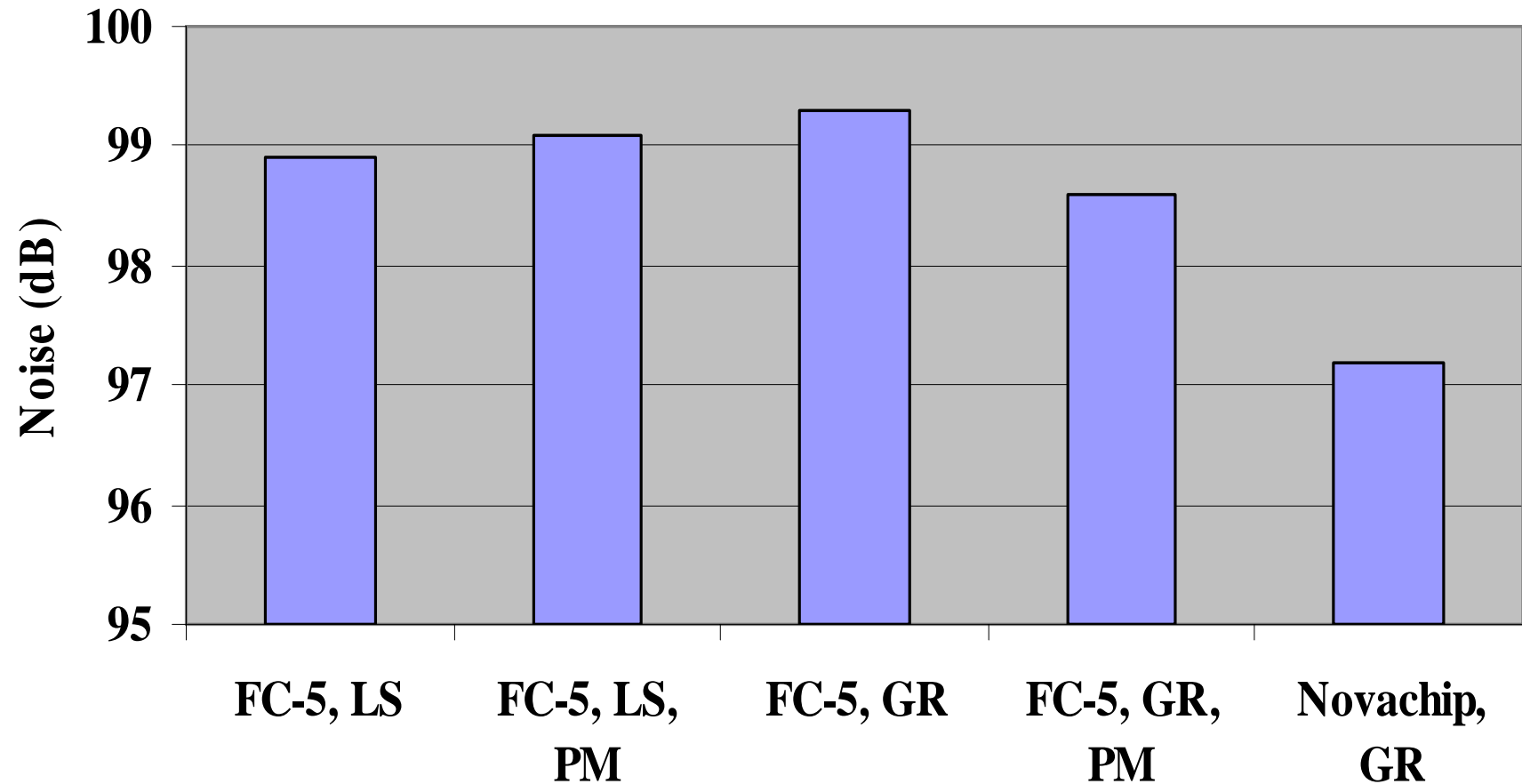
Field Permeability, US-27, Highlands Co.



Friction Data, US-27, Highlands Co.



Noise Data, US-27, Highlands Co. March 2004 by NCAT



LS = FL Limestone
GR = Nova Scotia Granite
PM = Polymer Membrane

Mix Type

Related Research

- **BACFC, I-75, Marion County (Ocala).**
- **Two-mile BACFC section vs. control.**
- **October 2005.**



Related Research

- Porous Friction Course.
- Coarser FC-5, 1 ¼ to 1 ½ inches thick.
- Conventional tack coat.
- Jacksonville, July 2005.



Conclusions

- Great test section...many variables examined.
- High truck traffic.
- Construction went well.
- Collecting a lot of data.
- All performing well so far.
- Main focus is long term durability.

Thank You!

Comments / Questions?