I-515 Henderson Asphalt Rubber Overlay

Darin Tedford, P.E.
Principal Bituminous Engineer
Nevada DOT Materials Division

Asphalt Rubber Overlay

- Added to Contract 3322 as a test section.
- Also known as: Asphalt Rubber – Asphalt Concrete Friction Course (AR-ACFC) from Arizona DOT
- Placed on 6 miles of I-515 (US93/95) from the southern end of Henderson….


W Sunset Rd
m Springs Rd
Marks St
N Stephanie St
N Gibson Rd
Las Vegas Expy
Boulder Hwy
Pabco Rd
Carver Park
Titanium Metals
Victory Village
564
Center St
Pueblo Pl
Emden St
N Racetrack Rd
146
146
Paseo Verde Pkwy
582
582
95
93
Skyline Rd
Greenway Rd
College Dr
Colt Dr
Roan Rd
515
Trenier Dr
95
93
Calvert St
San Gabriel Ave
S Boulder Hwy
Nevada Hwy
2.5 miles

Asphalt Rubber Overlay

- Added to Contract 3322 as a test section.
- Also known as: Asphalt Rubber – Asphalt Concrete Friction Course (AR-ACFC) from Arizona DOT
- Placed on 6 miles of I-515 (US 93/95) from the southern end of Henderson to just south of the new interchange with the Beltway (I-215).


W Sunset Rd
m Springs Rd
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N Gibson Rd
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Boulder Hwy
Pabco Rd
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Calvert St
San Gabriel Ave
S Boulder Hwy
Nevada Hwy
2.5 miles


Henderson
W Basic Rd
Las Vegas Expy
Viewmont Dr
Opal Dr
Palecrest St
E Van Wagenen St
E Fairway Rd
Cresta Way
Ridgeway Rd
W Pacific Ave
Blackridge Rd
E Kimberly Dr
E Rancho Dr
95
93
582
Mona Ln
Newport Dr
Newport Dr
S Racetrack Rd
S Magic Way
Richard Bunker Ave
Sausalito Dr
S Boulder Hwy
Equestrian Dr
Albino Dr
Colt Dr
Appaloosa Rd
Pinto Rd
Roan Rd
Thoroughbred Rd
Foothills Dr
Turf Dr
E Horizon Dr
Summit Dr
Skyline Rd
Greenway Rd
Heather Dr
College Dr
Arrowhead Trail
515
Vidaire Ave
E Horizon Ridge Pkwy
Calvert St
Mission Dr
Mission Dr
Mission Dr
San Bruno Ave
Trenier Dr
Patti Ann Woods Dr
San Eduardo Ave
San Gabriel Ave
Santa Helena Ave
Dawson Ave
Foxhall Rd
1 miles


Henderson
W Basic Rd
Las Vegas Expy
Viewmont Dr
Opal Dr
Palecrest St
E Van Wagenen St
E Fairway Rd
Cresta Way
Ridgeway Rd
W Pacific Ave
Blackridge Rd
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S Boulder Hwy
San Eduardo Ave
San Gabriel Ave
Santa Helena Ave
Dawson Ave
Foxhall Rd
1 miles

Existing Roadway:

- Contract 2427
- 9.5 inches PCCP, 4 inches CTB, 6 inches base
- 2-3 lanes in each direction
- Constructed in 1992
- Uniform transverse tining
- Both shoulders constructed of PCCP
- Existing profile before overlay was greater than 7 inches per mile (0.2 blanking band)

Asphalt Rubber Specifics:

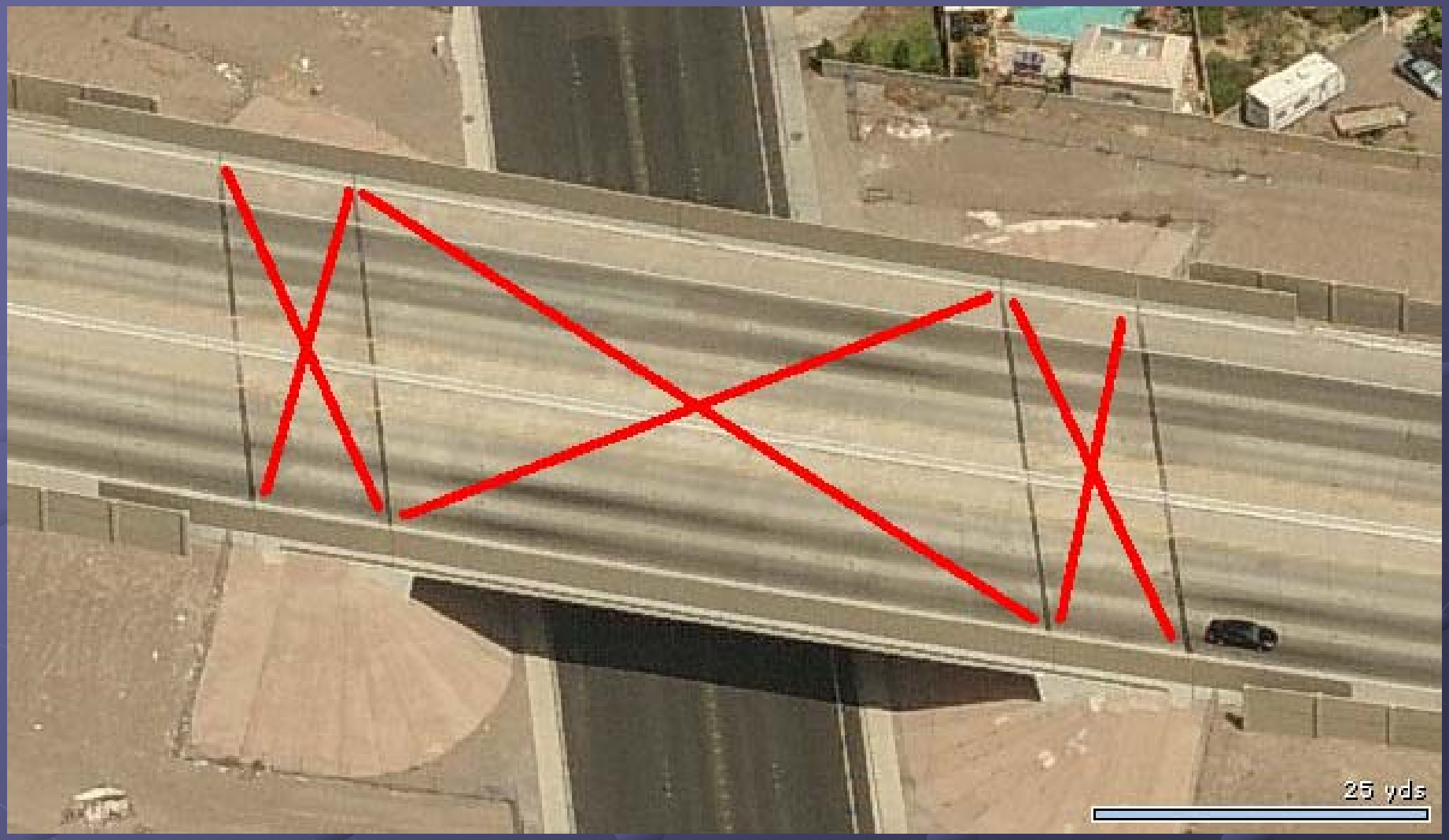
- Contract 3322: 6 miles of AR-ACFC, 11 miles of saw, seal and profile grind.
- Specifications adopted from Arizona DOT
- Existing PCCP left “AS IS”
- Asphalt, Rubber and Aggregates sampled in Las Vegas and sent to Arizona for mix design.
- Aggregate gradation: 3/8” (Type 2-AZ)

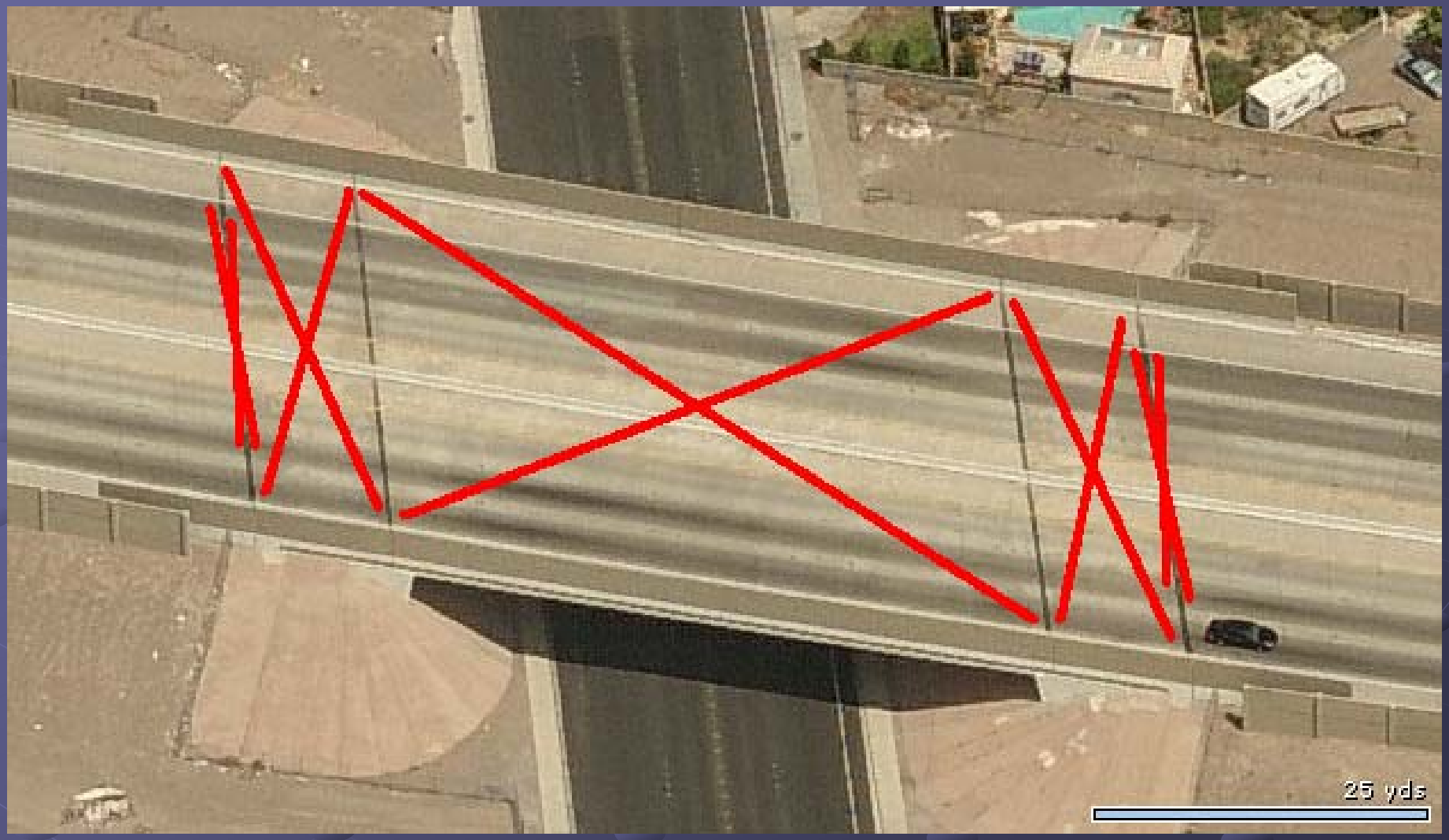
More Asphalt Rubber Specifics:

- Base Asphalt: PG 64-16 (M320 specs)
- Tire Rubber: 20% by wt of Asphalt
- Mix to be placed 1” thick
- Transitions ground into slabs adjacent to approach slabs…..


25 yds


25 yds


25 yds


25 yds


25 yds


EXIT
56B

Results

- PCCP Slabs: Sealed and Protected
- PCCP Joints: Covered (Sealed?)
- Bridge Joints: Next time?
- Ride: Improved from C to B with no grinding*
- Cost vs. Saw/Seal/Grind - TBD
- Noise……..

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

505 Petaluma Boulevard South
Petaluma, California 94952
Tel: 707-766-7700
Fax: 707-766-7790
www.illingworthrodkin.com
illro@illingworthrodkin.com

MEMO

Date: January 23, 2008

To: A. Reed Gibby

From: Dana M. Lodico, P.E.

Subject: I-515 Pavement Overlay, OBSI Measurement

On Board Sound Intensity measurements were conducted on I-515 between the College Drive and West Horizon Drive Interchanges (Exits 57 and 59) on November 1, 2006 and January 21, 2008, prior to and after the placement of rubberized asphalt concrete (RQGFC). The pre-construction pavement was Uniformly Transverse Tined PCC pavement. The post-construction pavement was older The approximate section locations for the 2006 and 2008 measurements are indicated in Figure 1. Photographs of the pre and post construction pavements are shown in Figure 2.

Figure 1: OBSI Measurement Locations

...ce (RAC-O)
..., January 2008

...test vehicle and the
Aquatred 3 test tire
...vel lane at a test speed
...und and southbound
...sociated microphones
...ns that are very close
...cted using a dual-
...to be measured

...to the leading and trailing
...ad toward the tire. Leading
...d together during post-
...using a 5-second averaging
...0 acoustic calibrator set for
...ues were made for each test

...ns for both the 2006 pre-
...luding 3-test section in
...the resultant overall A-
...Pre-construction
...surements were
...producing higher OBSI
...orrection factor.

...ment and about 1 dBA greater
...sured in the Arizona Quiet

...ruction Pavements

...kely depending on
...BA. The
...outbound
...97.9 dBA, with
...8.8 to 12.5 dBA
...els of 10.7 dBA
...hown in Figure
...C pavement
...C pavement at

...AC pavements, 60 mph

...ols of the I-
...Arizona
...ns DOTs to
...ment was
...ise
...1.6, 97.4,

...amplifiers are
...-mm configuration and fitted with a
...measurement location. The probe was positioned 75mm from the
...range of OGAC and RAC

Figure 2: Photographs of Pavement Surfaces

Uniformly Transverse Tined PCC (PCC)
Pre-Construction Pavement, November 2006

Rubberized Asphalt Concrete (RAC-O)
Post-Construction Pavement, January 2008

Figure 3: OBSI Equipment Installed on the Malibu Test Vehicle

Figure 1: OBSI Measurement Locations

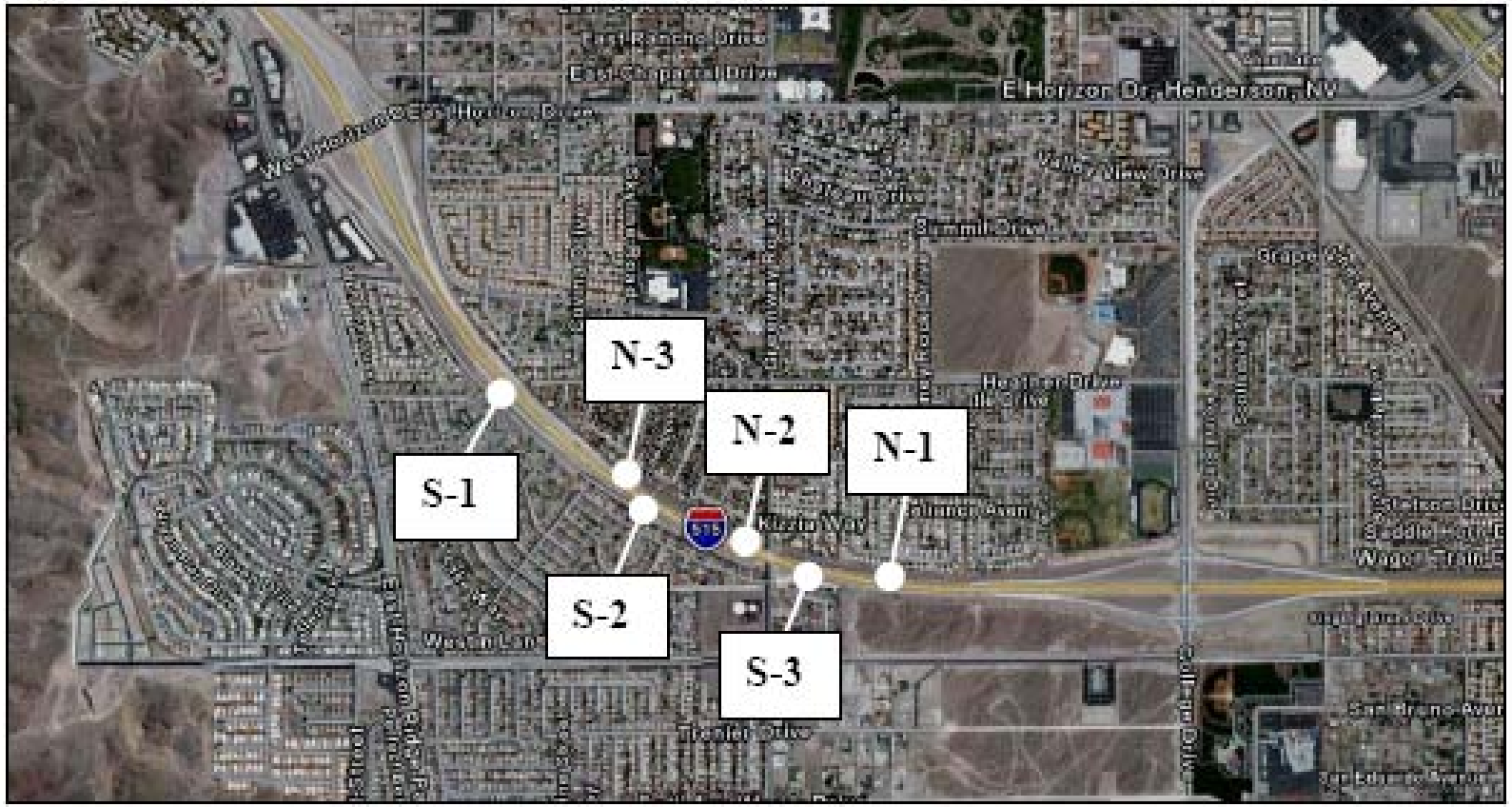
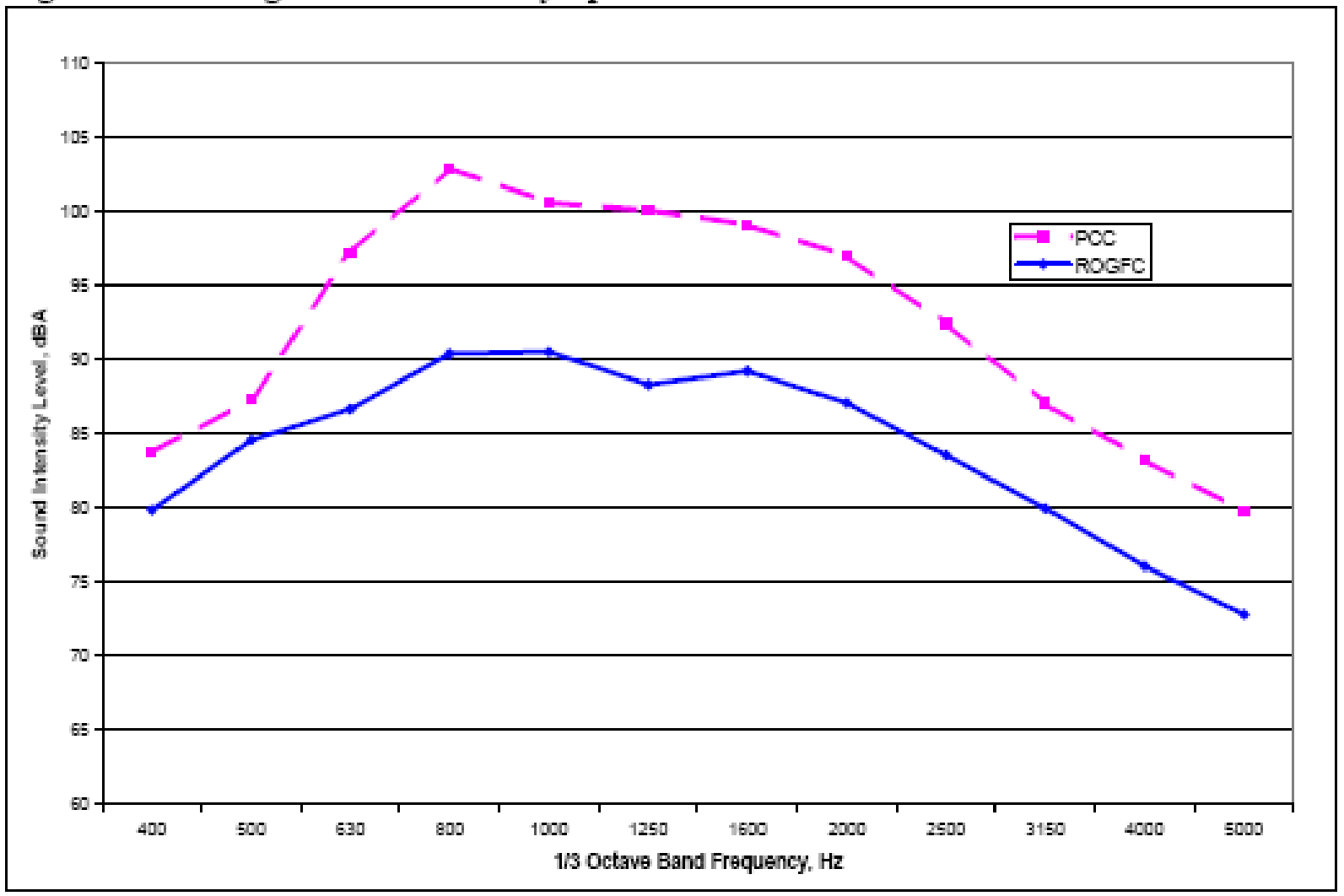


Table 1: Overall A-Weighed Sound Intensity Levels

PCC Section No.	A-Weighted Level	ROGFC Section No.	A-Weighted Level
N-1	108.6 dBA	N-1	97.1 dBA
N-2	109.6 dBA	N-2	97.1 dBA
N-3	109.2 dBA	N-3	97.2 dBA
S-1	106.4 dBA	S-1	97.6 dBA
S-2	107.4 dBA	S-2	97.7 dBA
S-3	107.1 dBA	S-3	97.9 dBA
Average	*108.1 dBA*	*Average*	*97.4 dBA*

Reduction of 10.7 decibels!

Figure 4: Average Sound Intensity Spectra for Pre and Post Construction Pavements



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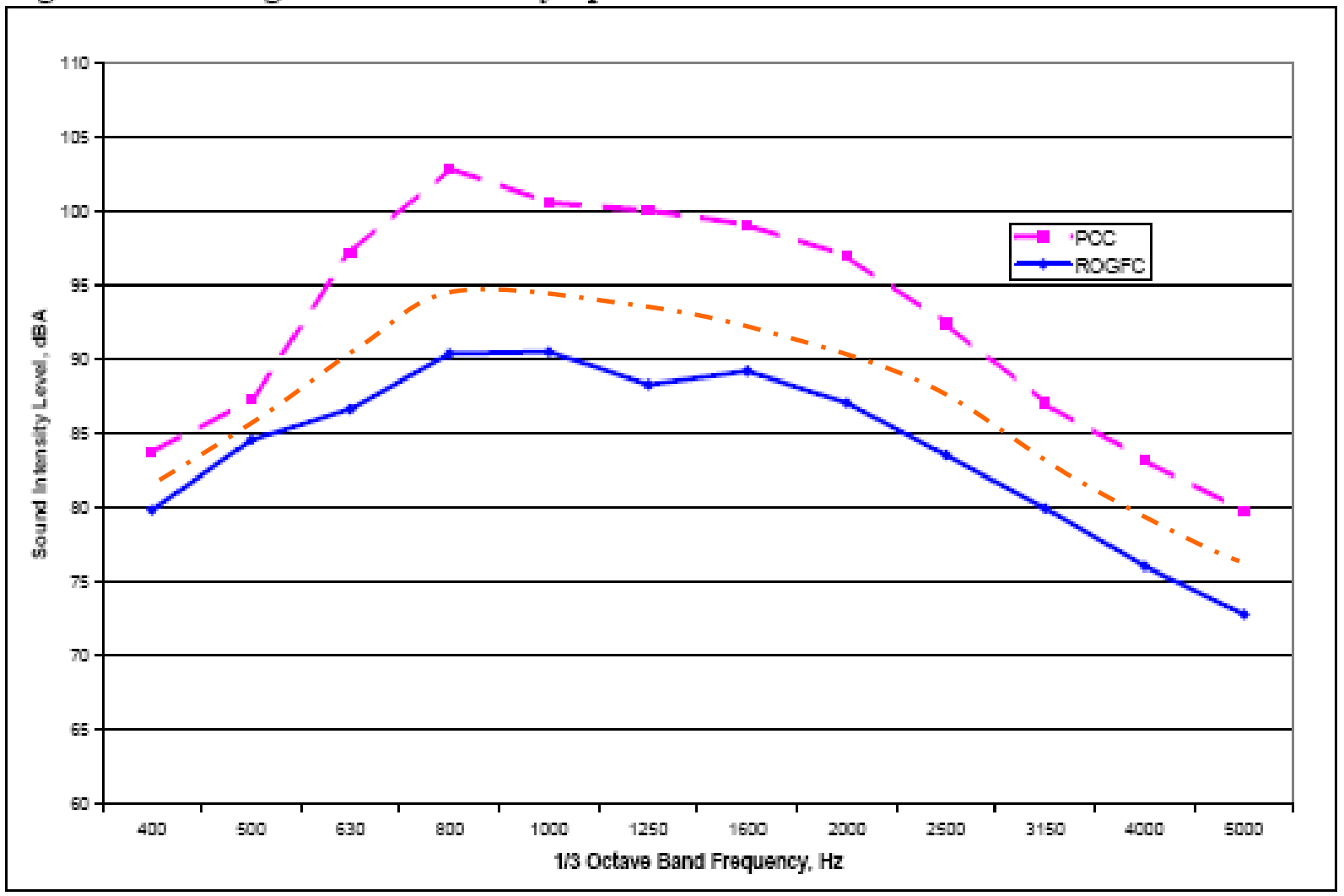

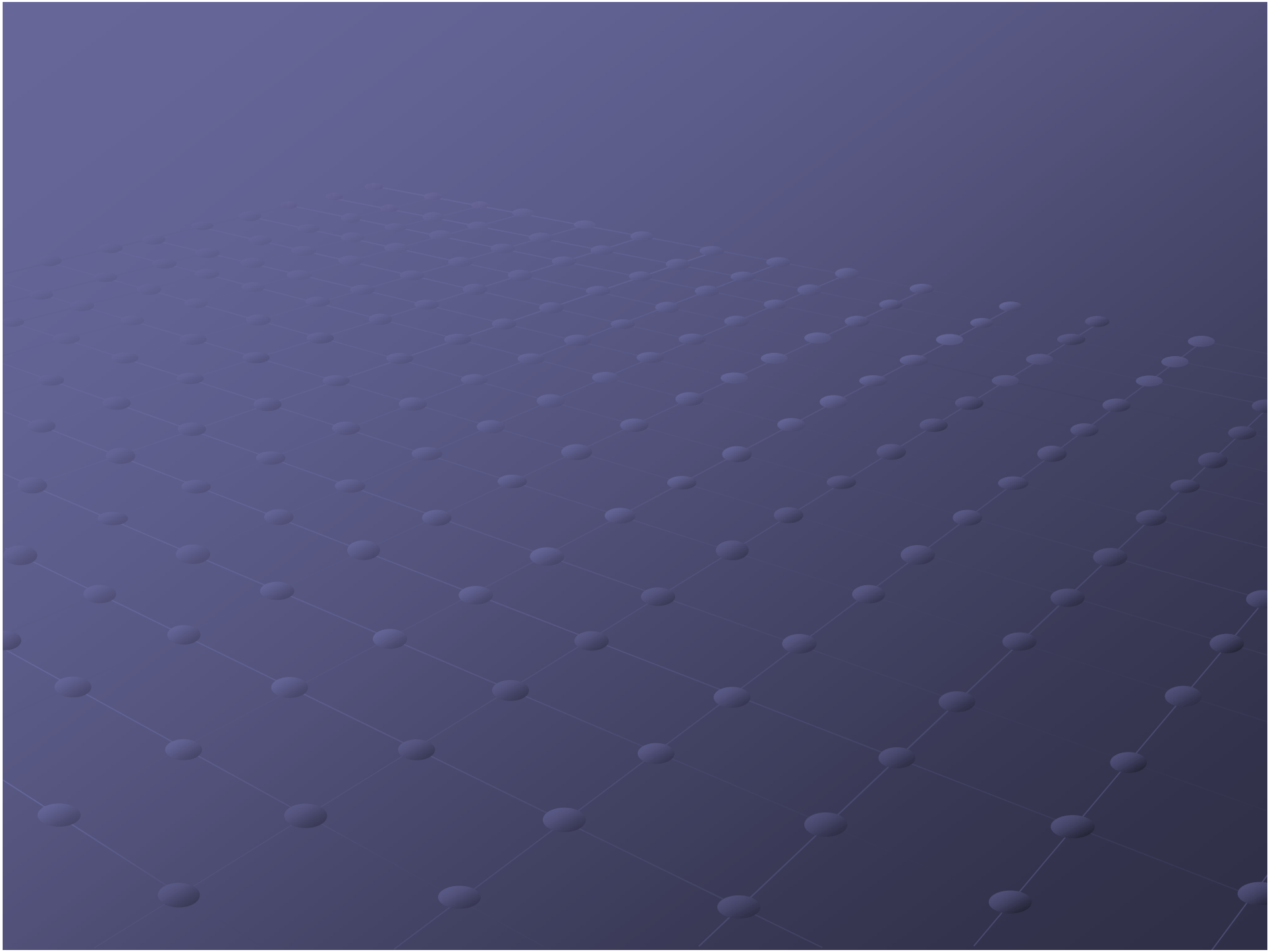

Future Plans:

- Monitor the project (Summers)
- Fine tune specifications and test methods
- Be ready for other opportunities

Special thanks …..

- Arizona DOT
- Rubber Pavements Association
- Las Vegas Paving and FNF
- NDOT District Testers
- NDOT Crew 922
- Wayne Kinzer, RE

Questions?

Thank you.

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