La Pregunta es Sellar o no Sellar?

Seal/No Seal GROUP

Historia del Grupo SNS y sus Esfuerzos

Cuales son los temas

Actividades y Organizacion del Grupo SNS

Esfuerzo del Estudio de TTI (Texas Transportation Institute)

Desarrollo de nuevos metodos para ensayar; Limpio, Seco y Listo

Reportes y Documentos

Tecnicas Apropiadas para la instalacion correcta de sellos de juntas

Temas de Deterioro prematuro de Juntas y Esfuerzos en proceso

Uso de cordón de respaldo correctos

Oportunidades para el futuro

Preguntas y Respuestas

Grupo SNS

Mision

- El Grupo **Seal/No Seal (SNS)** fue formado para responder a la pregunta que la industria realiza hace muchos años sobre el valor de sellar juntas en pavimentos de Concreto. Su mision es de establecer miembros que tomaran en forma responsable el estudiar y determinar la efectividad a largo plazo de sellantes en pavimentos de concreto.

Actividades Tipicas

- Dessarrollar Miembros y Los Fondos Necesarios para Avanzar los Estudios
- Desenvolver y promover secciones de ensayo
- Preparar Tech Briefs y Updates periodicos sobre informaciones relevantes
- Promover y Conducir Estudios de Sellos

Empresas Miembros

ATLANTIC CONCRETE CUTTING INC.	BARNSCO	CMI CONSTRUCTION MATERIALS, INC.
COSTELLO INDUSTRIES, INC. - Where Safety Works -	CRAFCO INC	CRAFCO TEXAS, INC.
DIAMOND CORING CONCRETE CUTTING CONTRACTORS	DIAMOND PRODUCTS	DIAMOND SURFACE INC.
DOW CORNING	D.S. BROWN	FAHRNER
HILTI	HUFF SEALING CORP.	Husqvarna
INTERNATIONAL GROOVING & GRINDING ASSOCIATION	INTERSTATE IMPROVEMENT	ISC Interstate Sealant & Concrete, Inc.
K2	LoJac	PENHALL COMPANY
PRO DIAMOND BLADES & BITS NORTON 1(800) 854-3281	QUALITY SAW & SEAL	
SIMPLEX CONSTRUCTION SUPPLIES, INC	Smalley & Company	
SWANK	W. R. MEADOWS SEALTIGHT	

SEMINARIO INTERNACIONAL DE PAVIMENTOS DE HORMIGÓN

ICPA

Como se Organiza el Grupo SNS

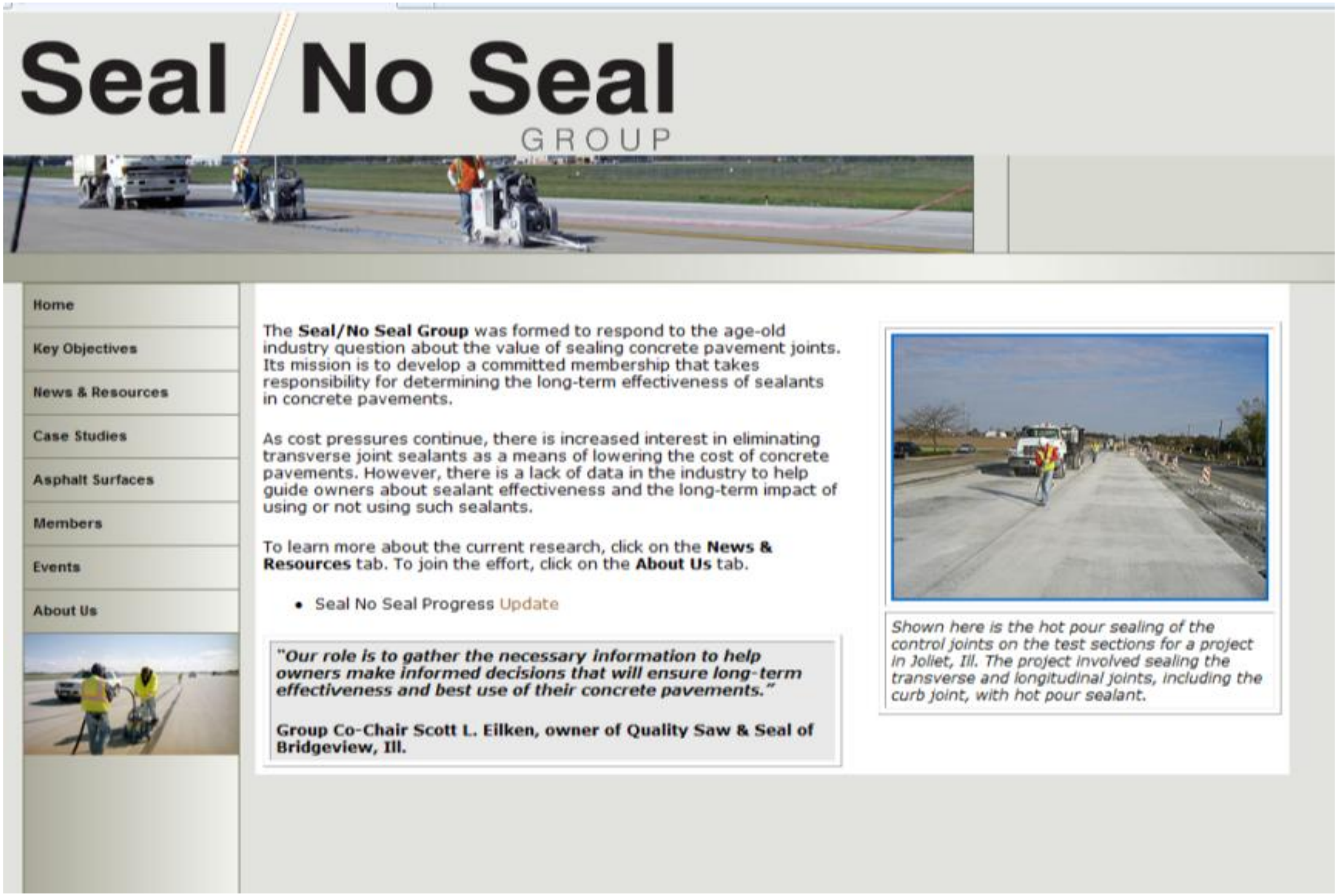
Gerencia

- Scott Eilken
- Charles Grady
- John Roberts
- Matt Ross

Comite Tecnico

- Mike Darter
- Dan Zollinger
- Katie Hall
- Wouter Gulden
- Imad Al Qadi
- Robert Rodden
- Larry Scofield

WEB www.sealnoseal.org



CUALES SON LOS TEMAS

- Resultados en Conflicto Sobre la Efectividad y Performance del los Sellos
- El problema del Deterioro prematuro de Juntas esta tornandose mas relevante –Cual es la Causa?
- Inspeccion y Construccion Apropiado
- Desarrollar Mejores Procedimientos de Ensayos
- Definindo cuando sellar
- Foco es Costo de la Construcción Inicial y no en el Valor al Largo Plazo del Sello.

Sellos Son Efectivos?

FHWA Sealant Effectiveness Study

CONCRETE PAVEMENT
CPTP
TECHNOLOGY PROGRAM

TechBrief

The Concrete Pavement Technology Program (CPTP) is an integrated, national effort to improve the long-term performance and cost-effectiveness of concrete pavements. Managed by the Federal Highway Administration through partnerships with State highway agencies, industry, and academia, CPTP's primary goals are to reduce congestion, improve safety, lower costs, improve performance, and foster innovation. The program was designed to produce user-friendly software, procedures, methods, guidelines, and other tools for use in materials selection, mixture proportioning, and the design, construction, and rehabilitation of concrete pavements.

www.fhwa.dot.gov/pavement/concrete

U.S. Department of Transportation
Federal Highway Administration

Performance of Sealed and Unsealed Concrete Pavement Joints

This TechBrief presents the results of a nationwide study of the effects of transverse joint sealing on performance of jointed plain concrete pavement (JPCP). This study was conducted to assess whether JPCP designs with unsealed transverse joints performed differently from JPCP designs with sealed transverse joints. Distress and deflection data were collected from 117 test sections at 26 experimental joint sealing projects located in 11 states. Performance of the pavement test sections with unsealed joints was compared with the performance of pavement test sections with one or more types of sealed joints.

BACKGROUND

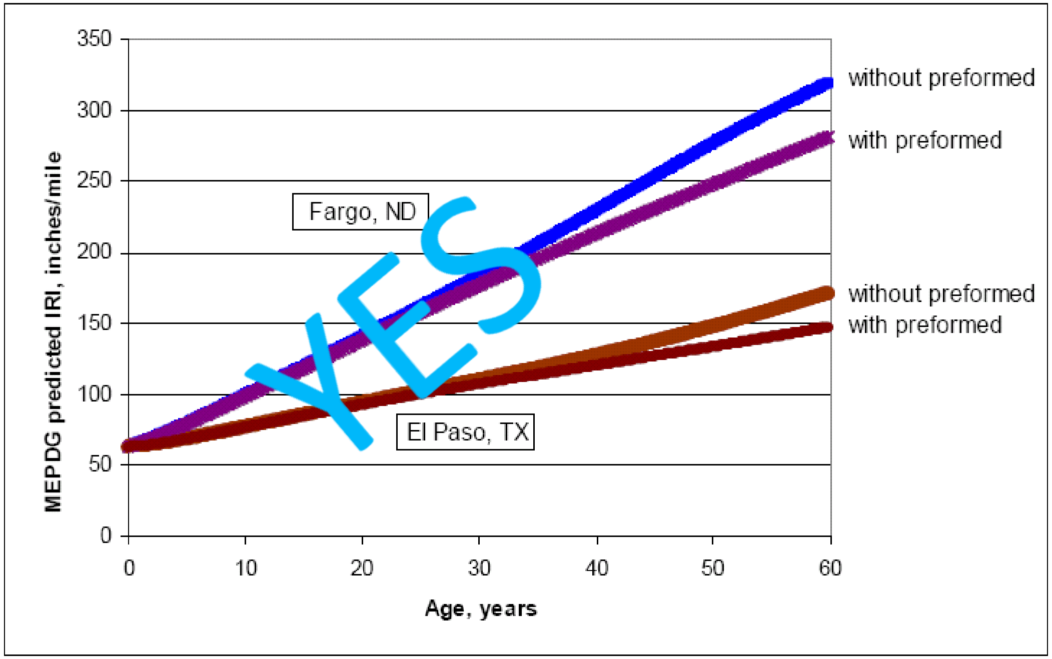
The sealing of transverse contraction joints in JPCP has been standard practice throughout much [illegible] ted States for many years. Its widespread use is due to the comm[illegible] belief th[illegible] aling joints improves concrete pavement performance in tw[illegible] ways: by red[illegible] ng water infiltration into the pavement structure, thereby r[illegible] ucing the occ[illegible] ence of moisture-related distresses such as pumping [illegible] nd fau[illegible] g, and by p[illegible] venting the infiltration of incompressibles (i.e., san[illegible] nd sm[illegible] tones[illegible] to the joints, thereby reducing the likelihood of [illegible] f pressure-[illegible] lated jo[illegible] distresses such as joint spalling and blowups.

[illegible] jointed concrete pavement (JCP) are typically created by m[illegible] ng an [illegible] w cut to force controlled cracking, followed by a second, w[illegible] saw cut to produce a reservoir for the joint sealant material. This traditional [illegible] proach of sawing and sealing transverse contraction joints is estimated to [illegible] ccount for between 2 and 7 percent of the initial construction cost of a JCP. Moreover, these sealed transverse joints require resealing one or more times over the service life of the pavement, leading to additional costs in terms of labor, materials, operations, and lane closures.

Recently, several State departments of transportation (DOTs) have been questioning conventional transverse joint sawing and sealing practices. These agencies contend that the benefits derived from sealing do not offset the costs associated with the placement and continued upkeep of the sealant over the life of the pavement. As a result, they have been experimenting with different sawing and sealing alternatives, for example:

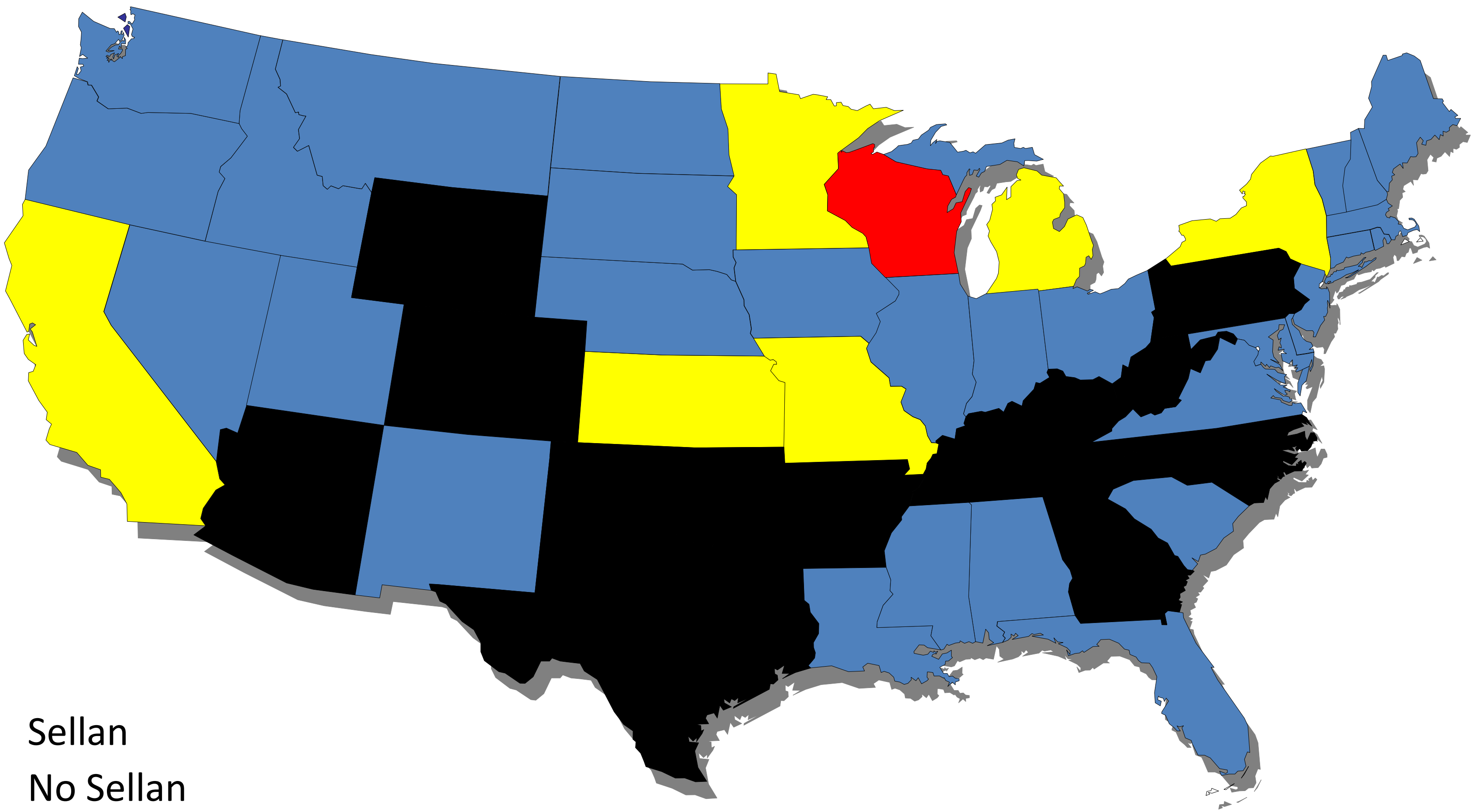
- Narrow unsealed joints, consisting of single saw cuts that are left unsealed.
- Narrow filled joints, consisting of single saw cuts that are filled with sealant that adheres to the sides and bottom of the saw cut.
- Narrow sealed joints, consisting of single saw cuts that contain a narrow backer rod and sealant material.

AASHTO New Design Guide



SEMINARIO INTERNACIONAL
DE PAVIMENTOS DE HORMIGÓN

Practicas en los Estados de E.E.U.U.



Sellan
No Sellan
Considerando No Sellar
No Sabemos

SEMINARIO INTERNACIONAL
DE PAVIMENTOS DE HORMIGÓN

Definiendo La Vida Util del Sellante

Caltrans

MAINTENANCE TECHNICAL ADVISORY GUIDE (TAG)

State of California Department of Transporta
Office of Pavement Preservation
Division of Maintenance
1120 N Street, MS-5
Sacramento, CA 95814

October 2003

Table 2: Crack Sealer and Filler Specifications

Material	Specifications (CT/ AASHTO)	Application Type	Approx. Costs ($/kg)	Approx. Life (Years)
Asphalt Emulsion	CT section 94/ M140, M208	Filling	0.15-0.30	2-4
Asphalt Cements	CT section 94/ M20, M226	Filling	0.03-0.15	2-4
Fiber Modified Asphalt	No Specification	Filling	0.35-0.60	6-8
Polymer Modified Emulsion (PME)	CT section 94/ M140, M208	Filling (minor sealing)	0.80-1.20	3-5
Asphalt Rubber (AR)	CT SSP 37-400	Sealing	0.45-0.60	6-8
Specialty AR Low Modulus	CT SSP 37-400	Sealing	0.75-1.40	5-9
Silicone	CT SSP 41-200, SSP 51-740	Sealing	5.75-6.75	4-6

Definiendo la Vida Util del Sellante

LTPP Pavement Maintenance Materials: SHRP Joint Reseal Experiment, Final Report

PUBLICATION NO. FHWA-RD-99-142 SEPTEMBER 1999

232% to 348% Increase for Silicone

U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

LTPP

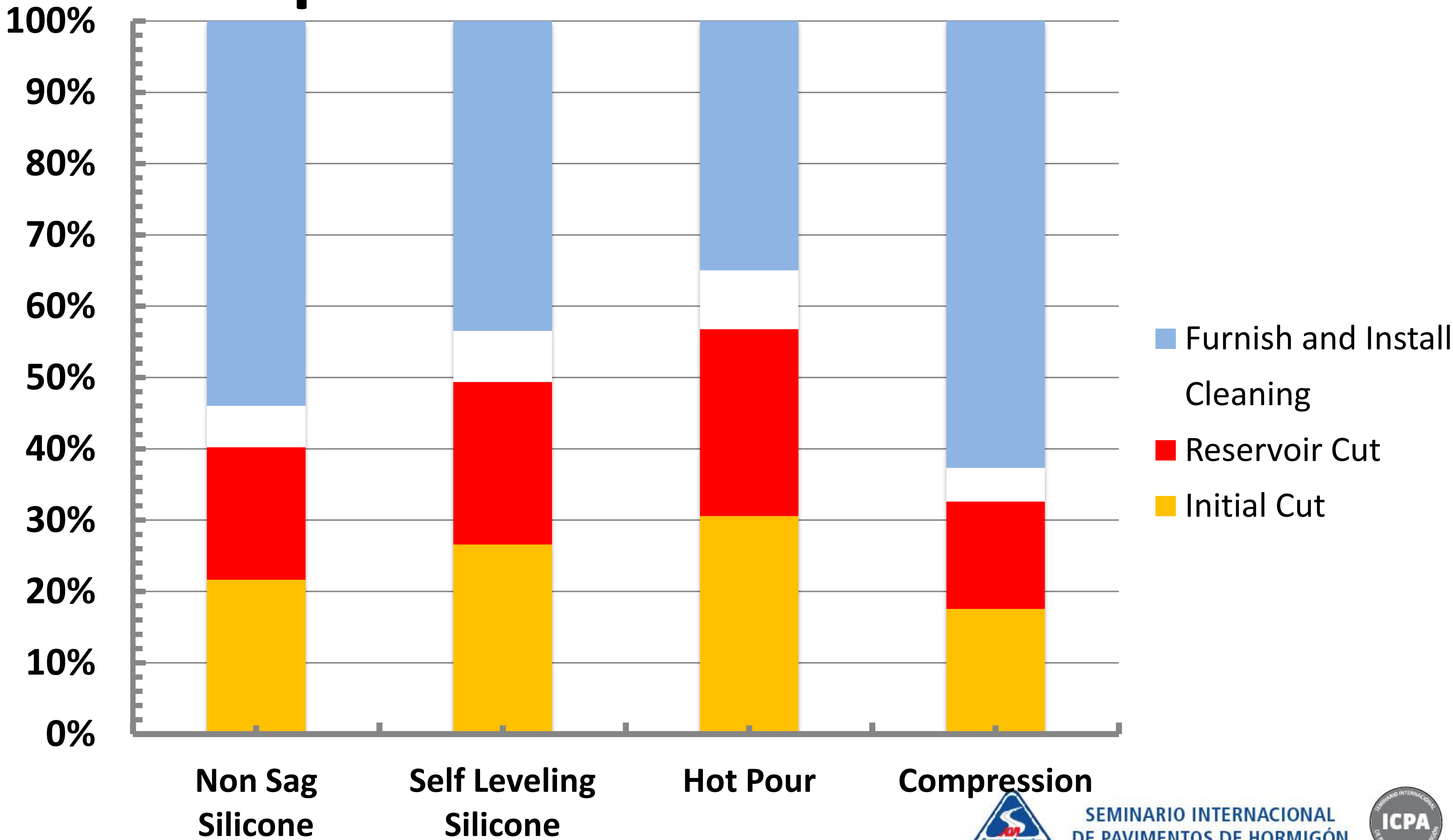
Sealant Material	Configuration	Time at Which 75% Effectiveness Level Was Reached, months*					
		Arizona	Colorado	Iowa	Kentucky	South Carolina	Average
Koch 9005	1	116	66	94	156	63	99
	2	112	66	91	191	90	110
	3			148	182	49	126
	4	105	61				83
Crafco RS 231	1	52	80	76	86	92	77
	2	135	69	118	108	138	114
	3			103	155	80	113
	4	83	72				78
Meadows Sof-Seal	1		34	40	39	55	42
	2		40	51	64	46	50
	3			57	161	31	83
	4		43				43
Koch 9030	1		31	50	60	41	46
	2		32	63	50	58	51
	3			59	143	15	72
	4		37				37
Meadows Hi-Spec	1	43					43
	2	94					94
	4	76					76
Crafco RS 221	1	65					65
	2	105					105
	4	117					117
Dow 888	1	198	145	130	186	178	167
Dow 888-SL	1	183	110	125	164	186	154
Mobay 960-SL	1	194	93	65	115	168	127
Mobay 960	1			143			143
Crafco 903-SL	1	194					194
Koch 9050	1		19		136		78
Dow 888 w/ primer	1			151			151
Dow 888-SL w/ primer	1			143			143
Koch 9005 w/ primer	1				173		173

* Times greater than 82 months are extrapolated to a maximum of 200 months.

Cuales Son Los Problemas

- Mientras los costos aumentan, hay un interes en eliminar el sello de juntas como un método para bajar el costo de pavimentos rígido. Hay una falta de datos en la industria, para ayudar a los dueños sobre la efectividad de sellantes y su impacto al largo plazo en sus pavimentos de usar o no usar dichos sellantes **Proyectos de subastas alternativas (Asfalto versus Concreto)**
    - **Preocupaciones de costo bajo inicial dado los Presupuestos locales**

Porcentaje Total del Costo de Cada Operación del Sello de Juntas



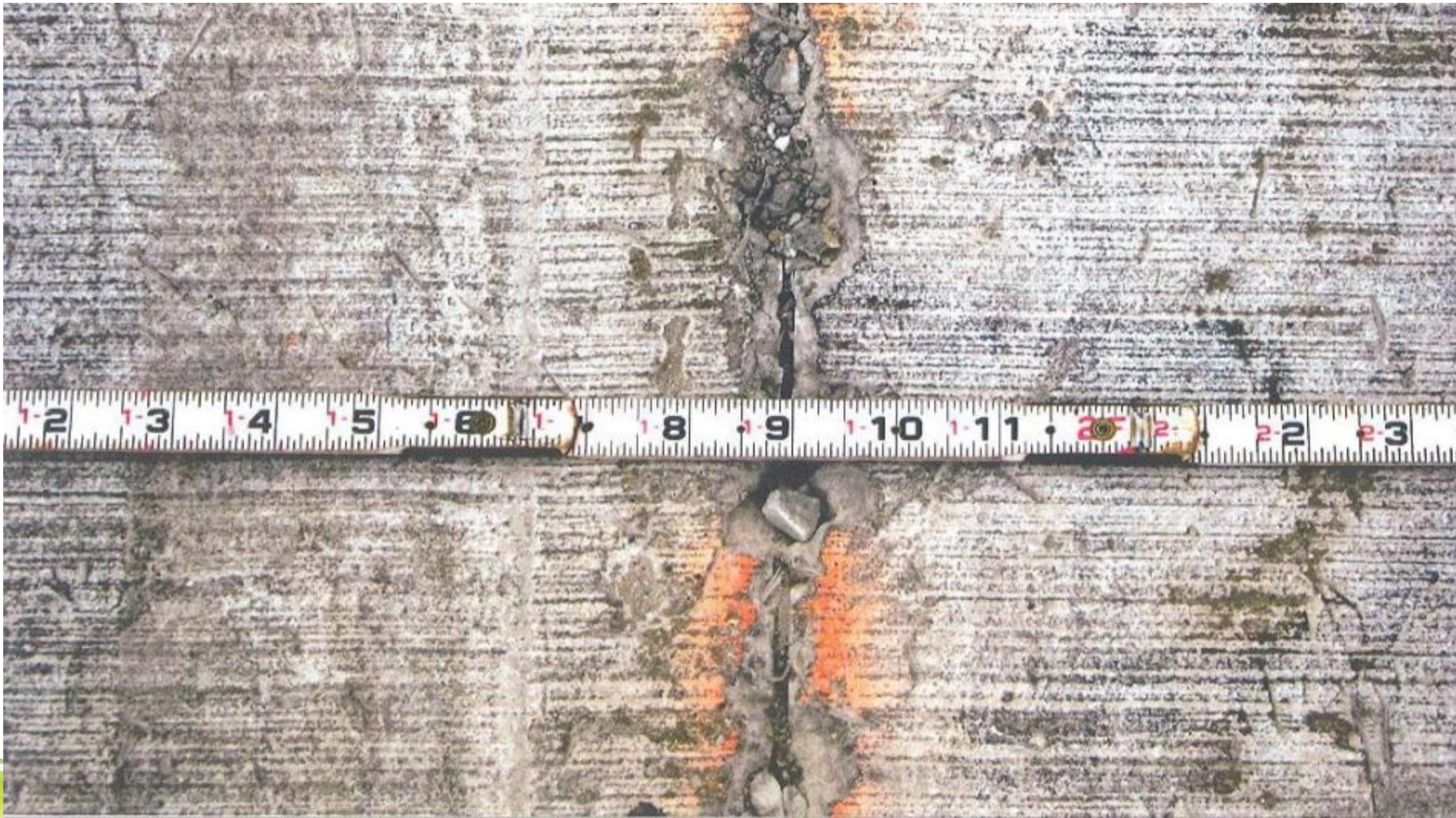
No Compresibles

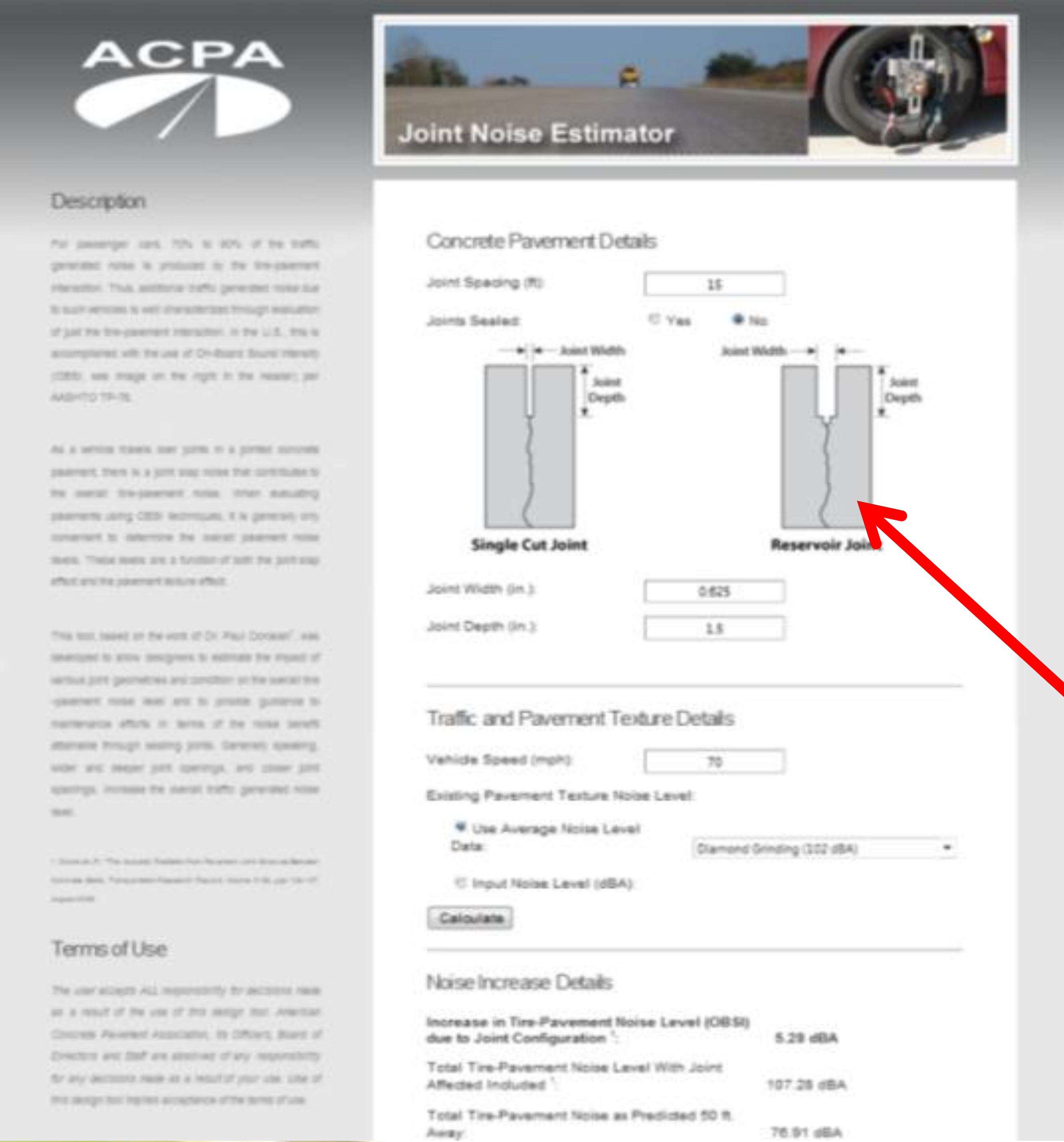
Crecimiento de Lozas
Movimiento de Soportes

Inspección mas Cercana

Aumenta el Mantenimiento

Ni siempre es dramatico





Sellantes Afectan Ruido

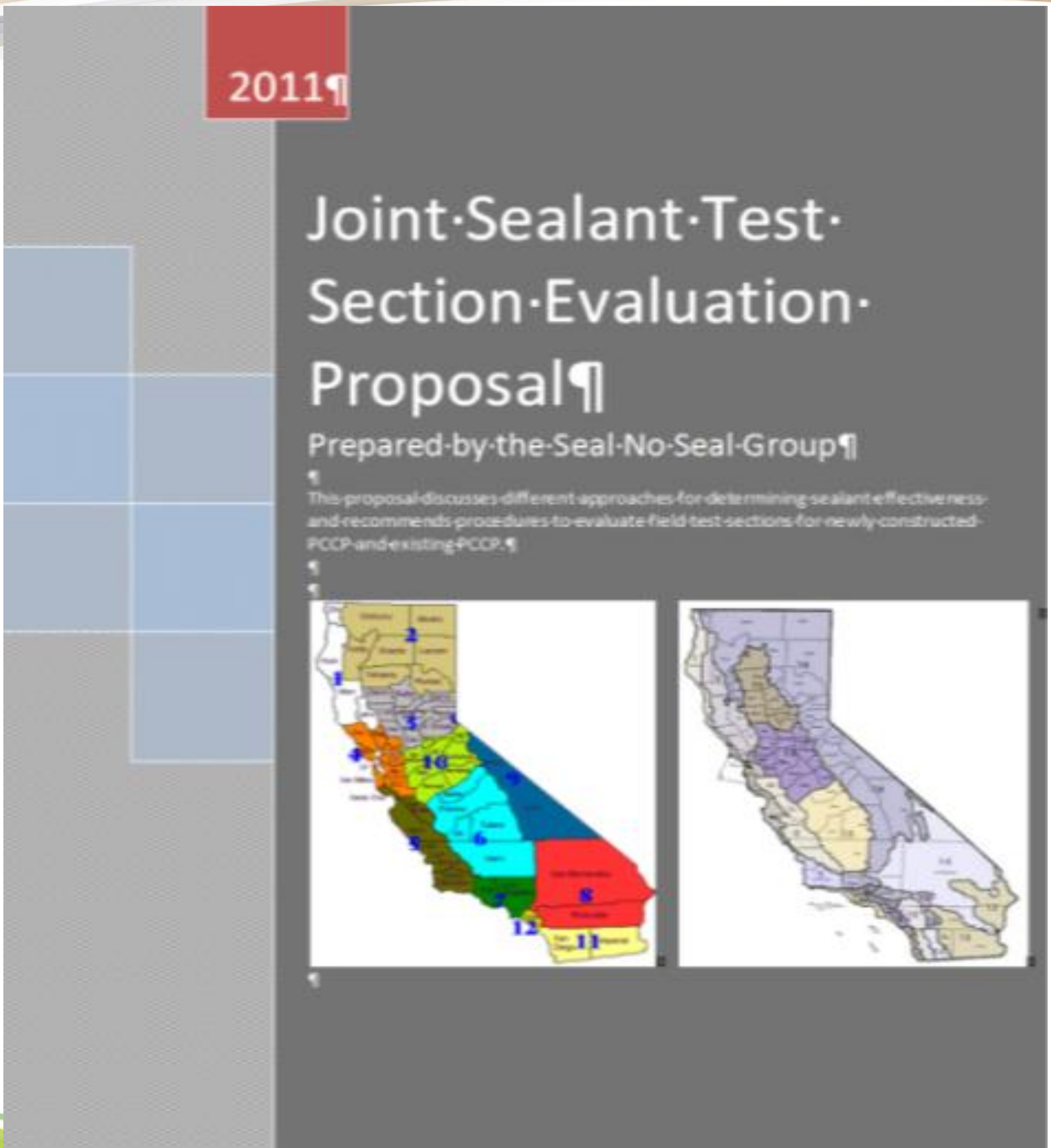
Sin Sello vs Juntas Selladas es +- 5 dBA

Factores Medio Ambientales

“El Contratista general requiriere un contractar con una compañía medio ambiental con un minimo de experiencia de cinco (5) en obras documentada de limpiezas ambientales de tanques bajo la superficie o que son precalificados para remediar la contaminacion del suelo y el monitoreo de la proteccion de sus empleados designado para tratar “Desechos Peligrosos” por el D.O.T.

Actividades del Grupo SNS

- ❑ Trabajando con Caltrans en su Estrategia de Sello
- ❑ Conduciendo Estudio con TTI
- ❑ Conduciendo estudio de limpio, seco y listo
- ❑ Especificaciones de aplicacion para uso General
- ❑ Contacto con Agencias para determinar su Experiencia en Blow Ups and Abutment Encroachments
- ❑ Documentacion de la absorcion del cordón de respaldo
- ❑ Papel Tecnologico de Sellantes superficiales para Concreto (Silanes)


2011

Joint Sealant Test Section Evaluation Proposal

Prepared by the Seal No Seal Group

This proposal discusses different approaches for determining sealant effectiveness and recommends procedures to evaluate field test sections for newly constructed PCCP and existing PCCP.

California DOT (Caltrans)

Estudio Texas Transportation Institute

Plan de Estudio TTI

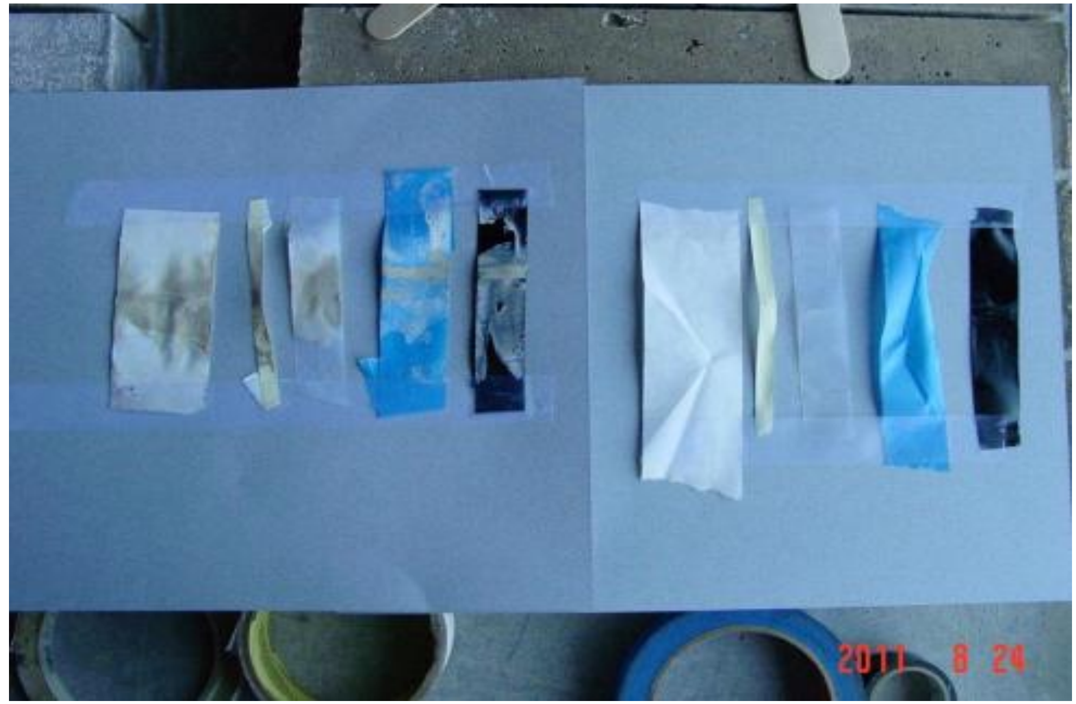
1. Medir el flujo a través de juntas
2. Prueba de infiltración
3. Radar de Penetración Terrestre

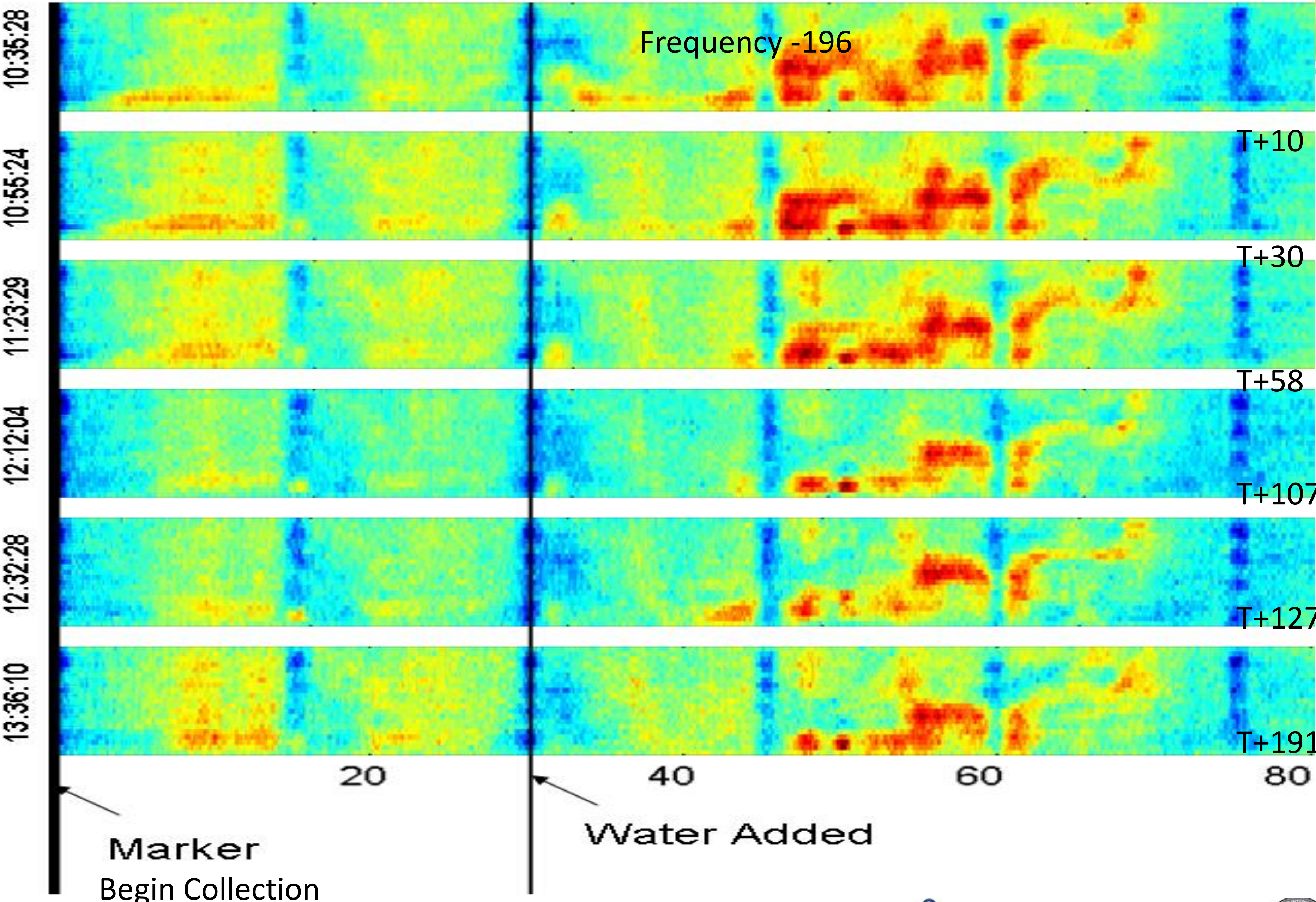
Equipo de Laboratorio para estudiar la abertura de las Juntas

Equipo para Estudiar Movimiento de Juntas en Campo

Campo Móvil Ubicaciones Losa

Ensayos de Contaminación



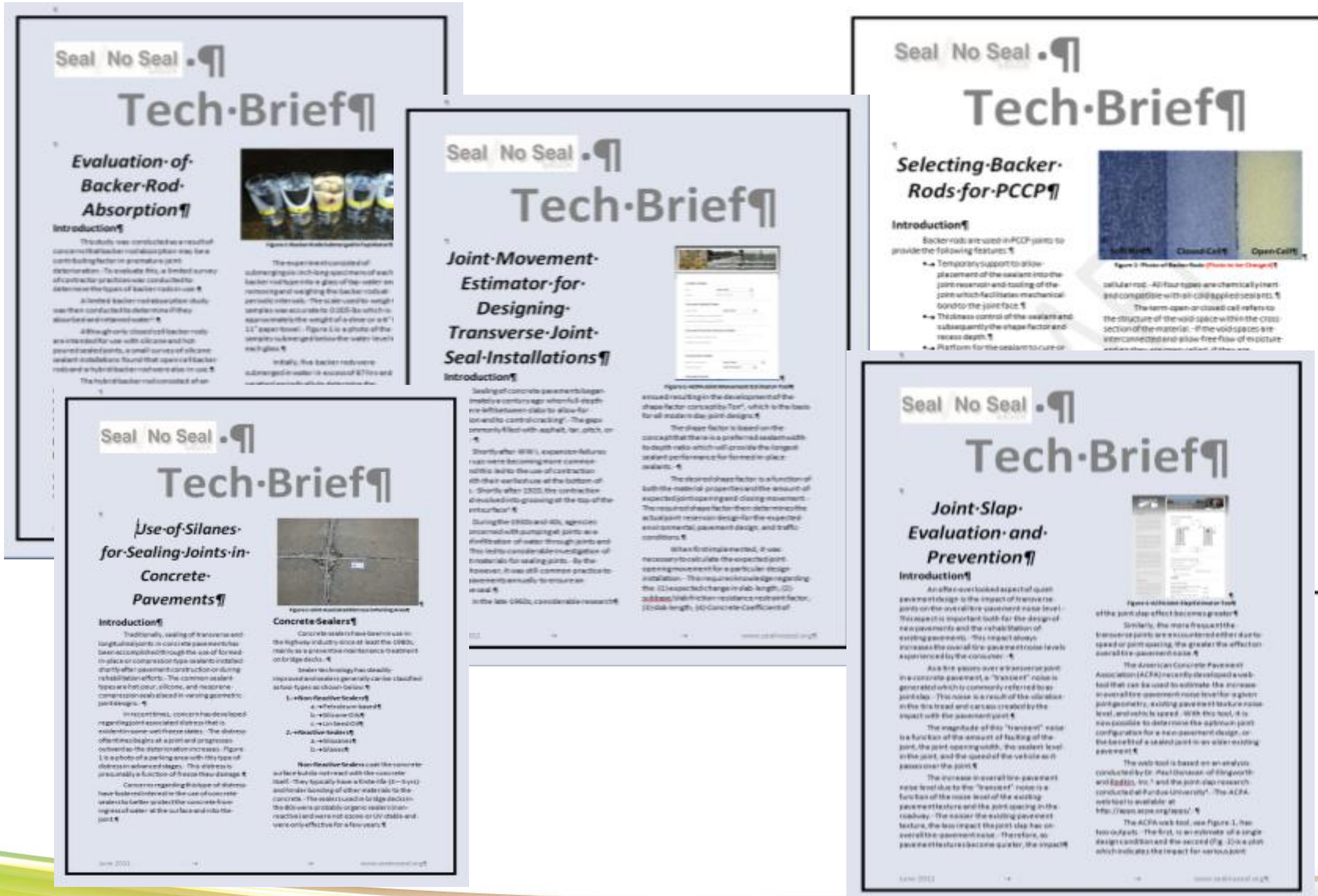


T – Tiempo en que el agua fue agregada

Reportes y Documentación

- Papeles Tecnológicos
- Reportes de Evaluaciones de Sellantes en Campo
- Reporte sobre el Deterioro Prematuro de Juntas
- Miscelaneo

Papeles Tecnológicos



Investigación en campo de los selladores

Joint Associated Revisión Distress

SEPTEMBER 2011

Interim Guide for Optimum
JOINT PERFORMANCE
of Concrete Pavements

IOWA STATE UNIVERSITY

National Concrete Pavement Technology Center

Deterioro Prematuro De Juntas

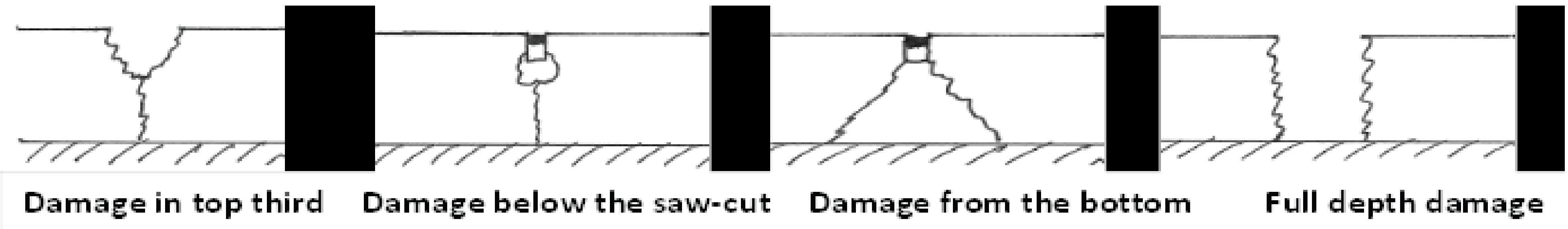
Deterioro Prematuro de Juntas

La superficie no siempre nos dice todo

La superficie no siempre nos dice todo (Continuación)

Si quieren saber a que se parece en el fondo

Tipos de Deterioro Prematuro de Juntas



Joint Deterioration in PCC Slabs on Grade

Dr. Peter Taylor PE (IL)
Associate Director

National Concrete Pavement Technology Center
Tech Center

Iowa State University
Institute for Transportation

SEMINARIO INTERNACIONAL DE PAVIMENTOS DE HORMIGÓN

ICPA

Deterioro prematuro de Juntas

Deterioro en adoquin hacia el Centro de la loza

Agua en el Pavimento

Mas el Sellante esta en excelente condición

Areas de Estacionamiento

13th street, Ames, IA

September, 2009

September, 2010

SEMINARIO INTERNACIONAL
DE PAVIMENTOS DE HORMIGÓN

Deterioro Debajo del Sello

Deterioro Debajo del Sello

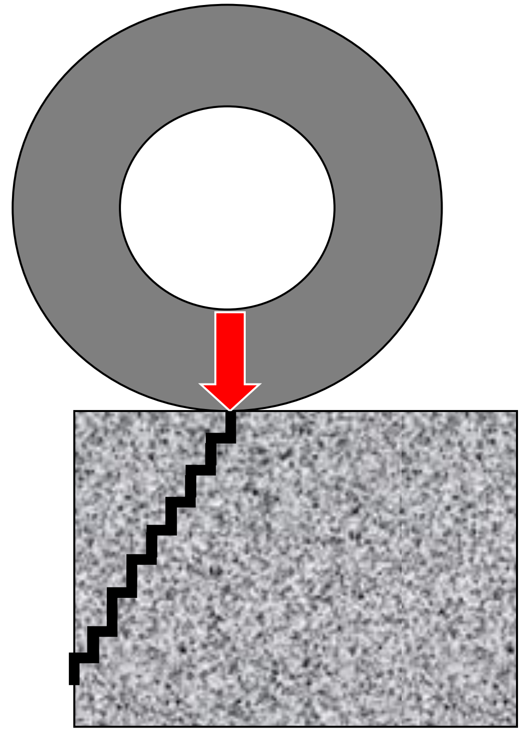
Deterioro del Mortero

Preguntas

- Aplicando Sal aumenta o disminuye el numero de ciclos de congelación descongelación?
- Cuales son las temperaturas en la loza?
- Cargas de construccion?
- Lo podemos reproducir en el laboratorio?
- Que podemos aprender en el campo?

Pesos de Cargas

- Cargas tempranas pueden estar causando el deterioro prematuro?



Max Prokudin

Resumen de Cuestionario

- Estados que proporcionaron respuesta detallada:
- Iowa (transversal y longitudinal)
- 15 años - un deterioro mayor

- Minnesota (transversal, 2 casos)
- 13 años – un deterioro mayor

- Michigan (transversal y longitudinal, 4 casos)
- 6 años - Mancha

- Indiana (principalmente longitudinal, 3 casos)
- 9 años - poco de deterioro

Trabajo de la U de Purdue

- Los daños depende de la saturación
- Saturación depende del contenido de vacíos de aire en el hormigón así como el contenido de agua / cemento del hormigón
- Algunos sales evitan que se sequen
- Some salts prevent drying

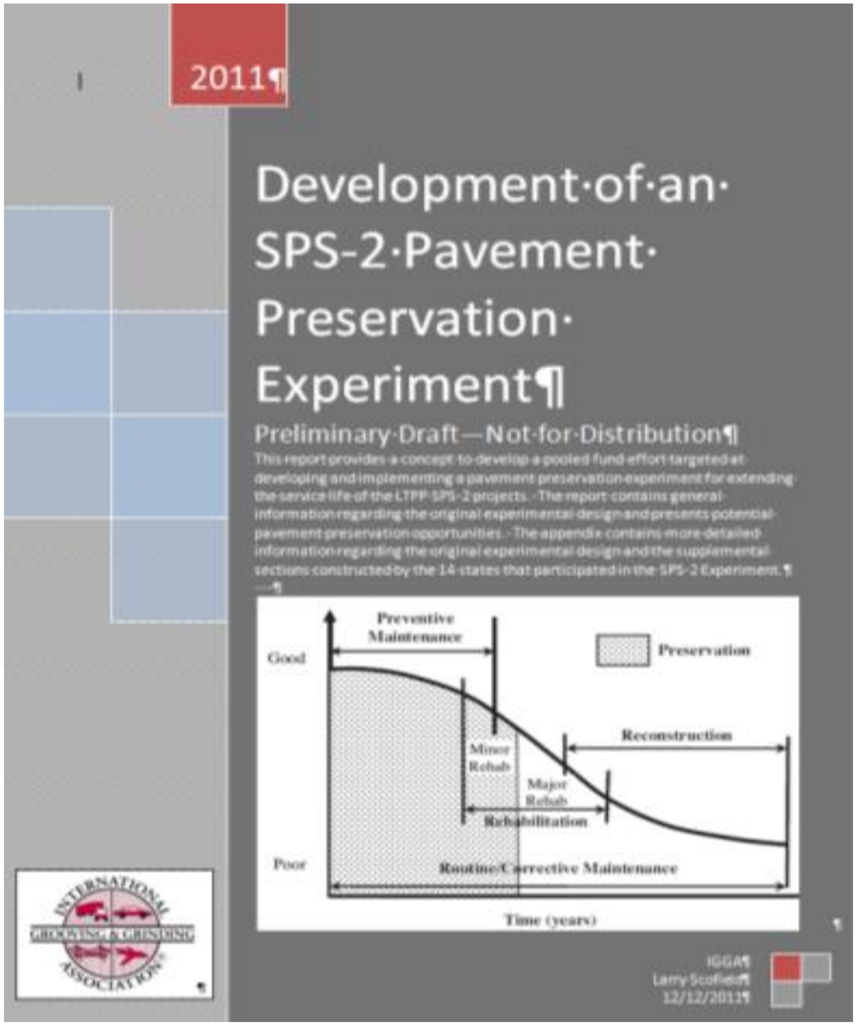
SEMINARIO INTERNACIONAL DE PAVIMENTOS DE HORMIGÓN

Jason Weiss

Qué consejo le damos ahora?

- ❑ Deje que el agua pueda salir
- ❑ Preste atención a los vacíos de aire y contenido de agua en la mezcla
- ❑ Trabajo de Aserrado
- ❑ Selle existente?

Sumario de Oportunidades


2011

Development of an SPS-2 Pavement Preservation Experiment

Preliminary Draft—Not for Distribution

This report provides a concept to develop a pooled fund effort targeted at developing and implementing a pavement preservation experiment for extending the service life of the LTPP SPS-2 projects. The report contains general information regarding the original experimental design and presents potential pavement preservation opportunities. The appendix contains more detailed information regarding the original experimental design and the supplemental sections constructed by the 14 states that participated in the SPS-2 Experiment.

IGGA
Larry Scofield
12/12/2011

- SPS-2 P2 Experiment
- National P2 Test Bed
- GPR Activities
- Field Verification of WJE and TTI Studies
- Petrographer's Perspective of Joint Associated Distress

Seal No Seal

Tech Brief

Selecting Backer Rods for PCCP

Introduction

Backer rods are used in PCCP joints to provide the following features:

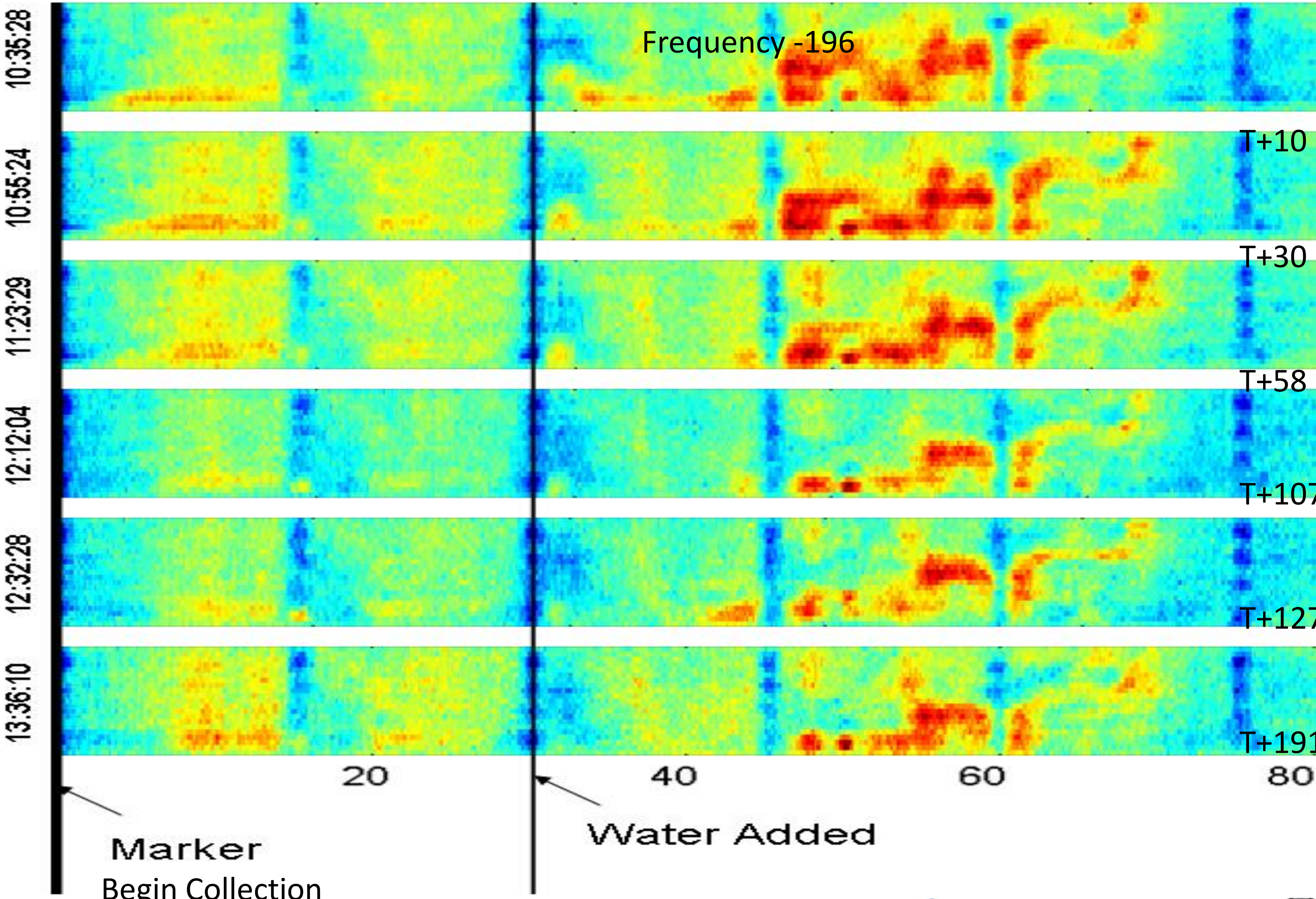
- Temporary support to allow placement of the sealant into the joint reservoir and tooling of the joint which facilitates mechanical bond to the joint face.
- Thickness control of the sealant and subsequently the shape factor and recess depth.
- Platform for the sealant to cure or cool until its final properties are attained in several hours to several weeks while preventing third-side adhesion.

Soft Rod | Closed Cell | Open Cell

USO DEL CORDON DE RESPALDO

SEMINARIO INTERNACIONAL DE PAVIMENTOS DE HORMIGÓN

GPR Imagen de Agua Debajo del pavimento

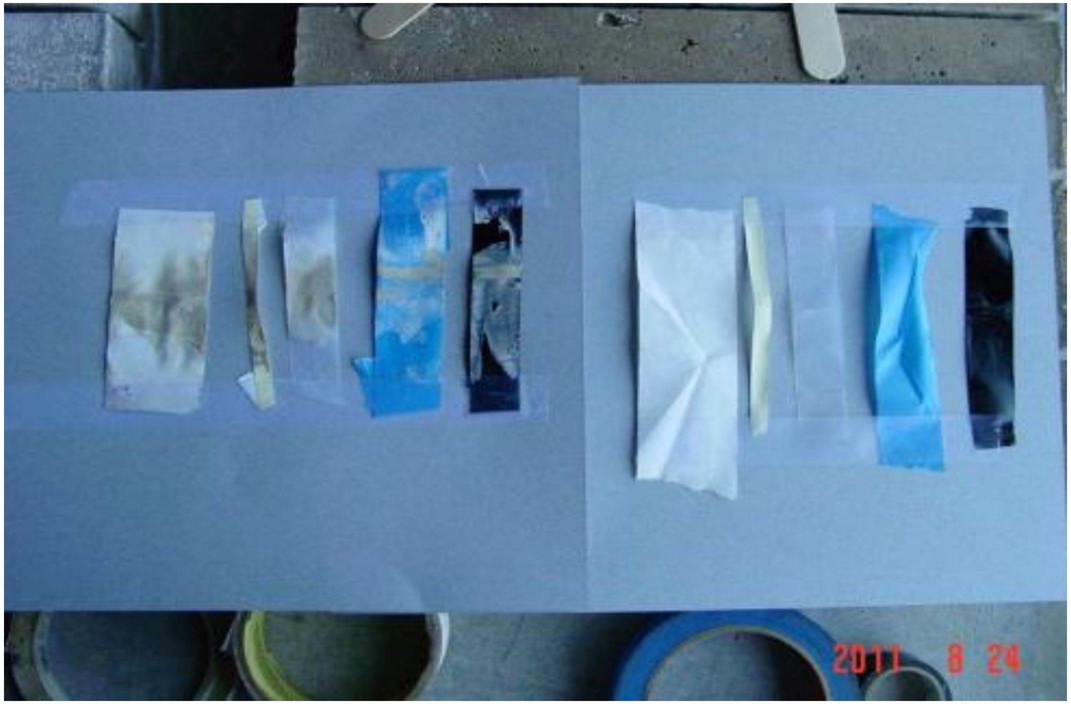


T – Tiempo en que el agua fue agregada

Estudio WJE (Limpio, seco y Listo)

- **Contaminación (Limpio & Listo)**
- Cinta Contaminada “prueba de limpieza”
- Adhesión de cinta de enlace resista la Prueba tracción
- Inspección de luz UV
- **Seco**
- la humedad del papel
- Medidor de Resistividad
- Medidor de Humedad Relativa
- Medidor de Humedad electromagnética

Ensayos de Contaminación



TEST METHOD: Tape Contamination Test (Cleanliness)

STANDARD REFERENCES: Section 5.4 and 6 of SSPC-SP 13/NACE No. 6

USAGE: Measure of the cleanliness of the prepared concrete joint prior to application of joint sealant.

EQUIPMENT / MATERIALS:

1. 3M Super 33+ or 3M Super 88 3/4-inch wide black electrical tape
2. Tongue depressor (3/4 in. wide)
3. Field scale and clamping device for direct tensile test. Scale should read between 0 and 30 lbs. or more, be accurate to 0.5 lbs., and have a peak hold.

PROCEDURE:

1. Cut a strip of black tape. The length of the strip should be at minimum two times the depth of the joint plus two (2) inches.
2. Wrap the tape around the depressor with the adhesive side of the tape facing away from the depressor.
3. Insert the tape and depressor into the joint, perpendicular to the surface of the concrete slab/pavement.
4. Firmly rub the tape against the surface of the joint with the tongue depressor. Rub both vertical surfaces and the bottom of the joint. Sufficient pressure should be applied so the level of contaminant removal is not affected by slight variations in pressure.
5. Attach the clamp and scale tightly onto both pieces of tape and tongue depressor and pull perpendicular to the joint. Record maximum load. For wider joints, it is acceptable to stack multiple depressors as a spacer as long as the depressors do not apply pressure to the vertical surface of the joint during the pullout test.
6. Examine the tape for contaminants. Grade level of contaminates per the visual standard.
7. Repeat the procedure at one additional location within 12 inches of the first test.
8. Report the contamination level of the two tests and determine if the level of contamination is below the predetermined acceptance threshold. (if applicable).

REPORT:

1. Sawcut width and preparation method
2. Time and date of the test
3. Test location
4. Length of sawcut joint represented by the test
5. Test result of the two tests by visual standard level (Trace, Light, Moderate, Heavy) and maximum pull out load.

TEST METHOD

EQUIPMENT

PROCEDURE

Step: 2, 4

3, 4

5

VISUAL STANDARD

TRACE

LIGHT

MODERATE

HEAVY

Ensayo de Limpieza con Cinta

TEST METHOD: Wipe Test (Cleanliness)

STANDARD REFERENCES: Section 5.4 and 6 of SSPC-SP 13/NACE No. 6; ASTM D 5295

USAGE: Measure of the cleanliness of the prepared concrete joint prior to application of joint sealant.

EQUIPMENT / MATERIALS:

1. Black 100% cotton cloth
2. Tongue depressor or other flat tool made of wood, metal, or stiff plastic. Length of the depressor should be sufficiently long to extend to the bottom of the cut joint with room to hold it above the surface of the concrete.

PROCEDURE:

1. Cut the cloth into 2-inch wide strips. The length of the cloth strips should be at minimum two times the depth of the joint plus two inches.
2. Place the cloth strip around the tongue depressor and insert into the joint, perpendicular to the surface of the concrete slab/pavement.
3. Firmly rub the entire width of the cloth against the surface of the joint with the tongue depressor over a 2 in. length of the joint. Rub both vertical surfaces and the bottom of the joint. Sufficient pressure should be applied so the level of contaminant removal is not affected by slight variations in pressure.
4. Remove the depressor and cloth. Use caution when handling the cloth to avoid dislodging contaminants by shaking the cloth.
5. Examine the cloth for contaminants. Grade contamination per the visual standard.
6. Repeat the procedure at one additional location within 12 inches of the first test.
7. Report the contamination level of the two tests and determine if the level of contamination is below the predetermined acceptance threshold (if applicable).

REPORT:

1. Sawcut width and preparation method
2. Time and date of the test
3. Test location
4. Length of sawcut joint represented by the test
5. Test results of the two tests by visual standard level (None, Light, Moderate, Heavy).

TEST METHOD (VISUAL)

EQUIPMENT

PROCEDURE

Step: 1

2, 3

4, 5

VISUAL STANDARD

None

LIGHT

MODERATE

HEAVY

Ensayo de Limpieza con Tela

Pre Moldeo y aserrado de las muestras

Prueba de humedad

Sonda de Humedad Relativa

Resistencia AC

Papel de Humedad

CONCLUSIONES

- Resultados en Conflicto Sobre la Efectividad y Performance del los Sellos
- El problema del Deterioro prematuro de Juntas esta tornandose mas relevante –Cual es la Causa?
- Inspeccion y Construccion Apropiado
- Desarrollar Mejores Procedimientos de Ensayos
- Definindo cuando sellar
- Foco es Costo de la Construcción Inicial y no en el Valor al Largo Plazo del Sello.

GRACIAS

PREGUNTAS?

Seal No Seal
GROUP