SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

A MIDWEST CONTRACTOR'S EXPERIENCE WITH PRS I-90 TOLLWAY (JANE ADDAMS EXPRESSWAY)

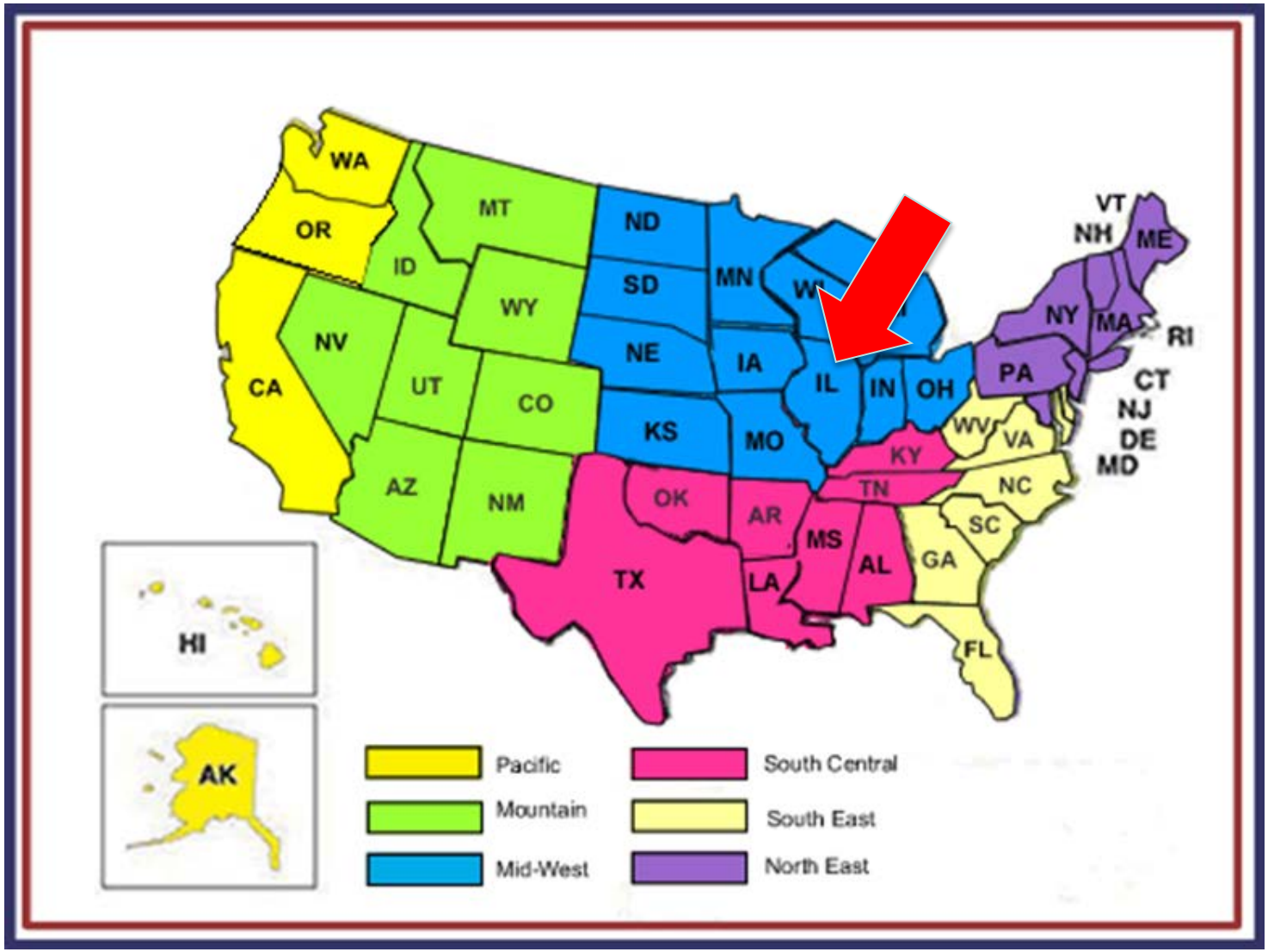
Jerry Reece,
Chief Operating Officer
Plote Construction Inc.

March 14, 2017

U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

WHERE ARE WE?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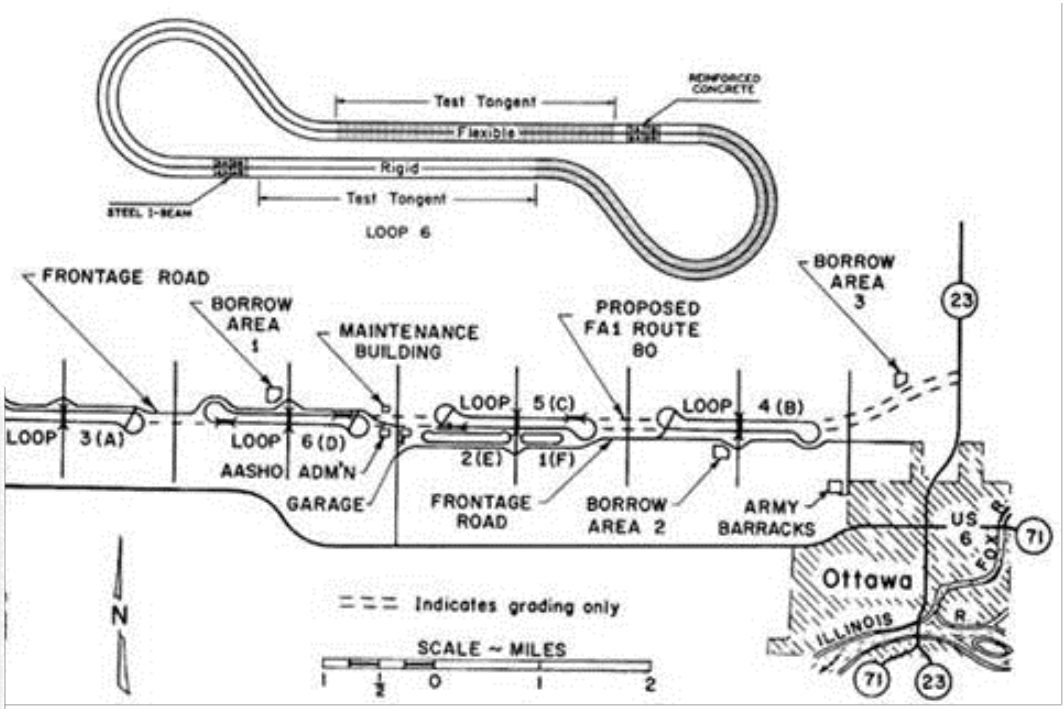
A FEW STATISTICS ABOUT ILLINOIS

- 2016 population estimated at 12.89 Million
- 25th largest state in land area
- Chicago's O'Hare airport is the 3rd busiest airport in America and 4th in the world
- 2,185 Interstate miles serve Illinois making us number #3 in the Country
- 15,969 miles of state highways
- 7,200 trucking establishments in Illinois
- 25% of US rail freight travels thru Chicago daily

WHAT IS ILLINOIS KNOWN FOR?
- IT ONLY TOOK 108 YEARS!

OTTAWA, IL – WHERE IT STARTED



AASHO ROAD TEST

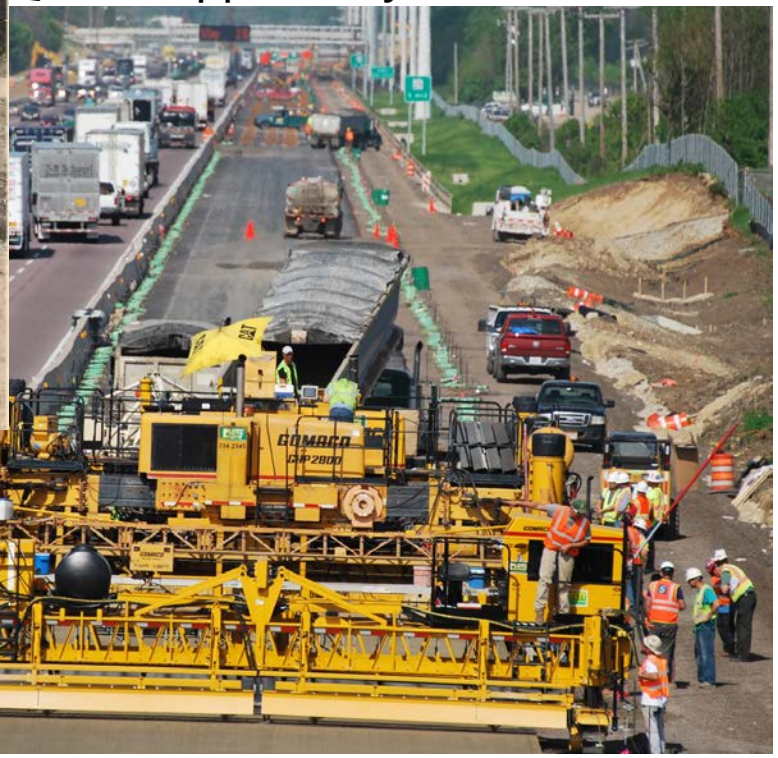
2016 CONTRACTOR OF THE YEAR

PLOTE – A FAMILY COMPANY THAT BUILT I-90 TWICE IN 50 YEARS

Jan Plote

1946 – The house came down so the Tollway could go in

2016 - Plote's 2nd Tollway Opportunity



SIDE NOTE – MODERN CONVENIENCE IN 1946

PRS SPECS
WE WERE THE FIRST

TOLLWAY PROJECTS HIGHLIGHTS

Project Length 12 Miles	PCC Pavement on 4” HMA 750,000 SY	No. of Interchanges 7	No. of Bridges/Box Culverts/Walls 11/3/44
Tons of Asphalt 400,000 TN	Tons of Recycled Products 1 Million TN	All Work Done In Traffic	No Serious Construction Accidents
	Zero Slabs Removed*	Avg. Pay Factor 101.4	

*Subsurface Settlement Caused Some Minor Rework

PROJECT CHALLENGES

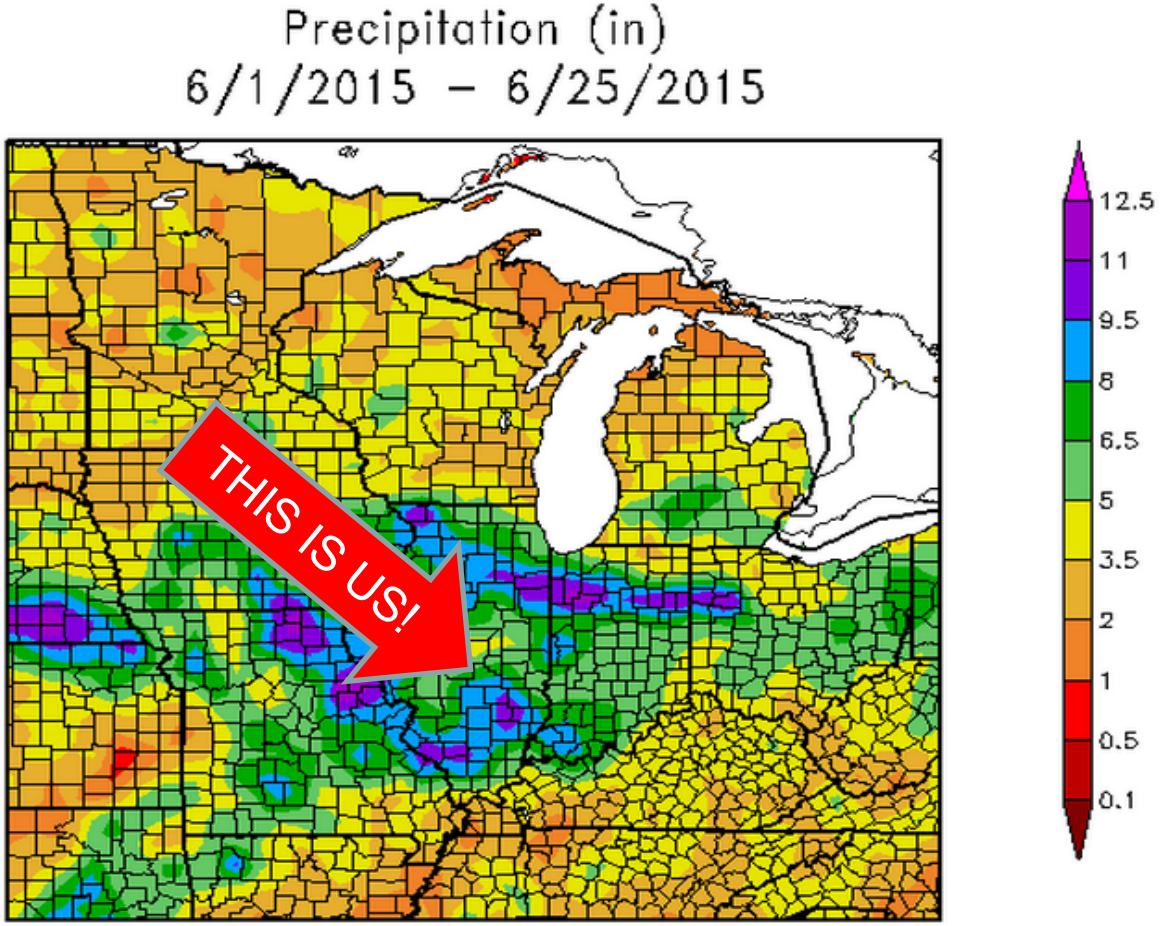
R-O-W Issues with High Pressure Gas Lines

JAWA Waterline issues –Work stoppage May to October

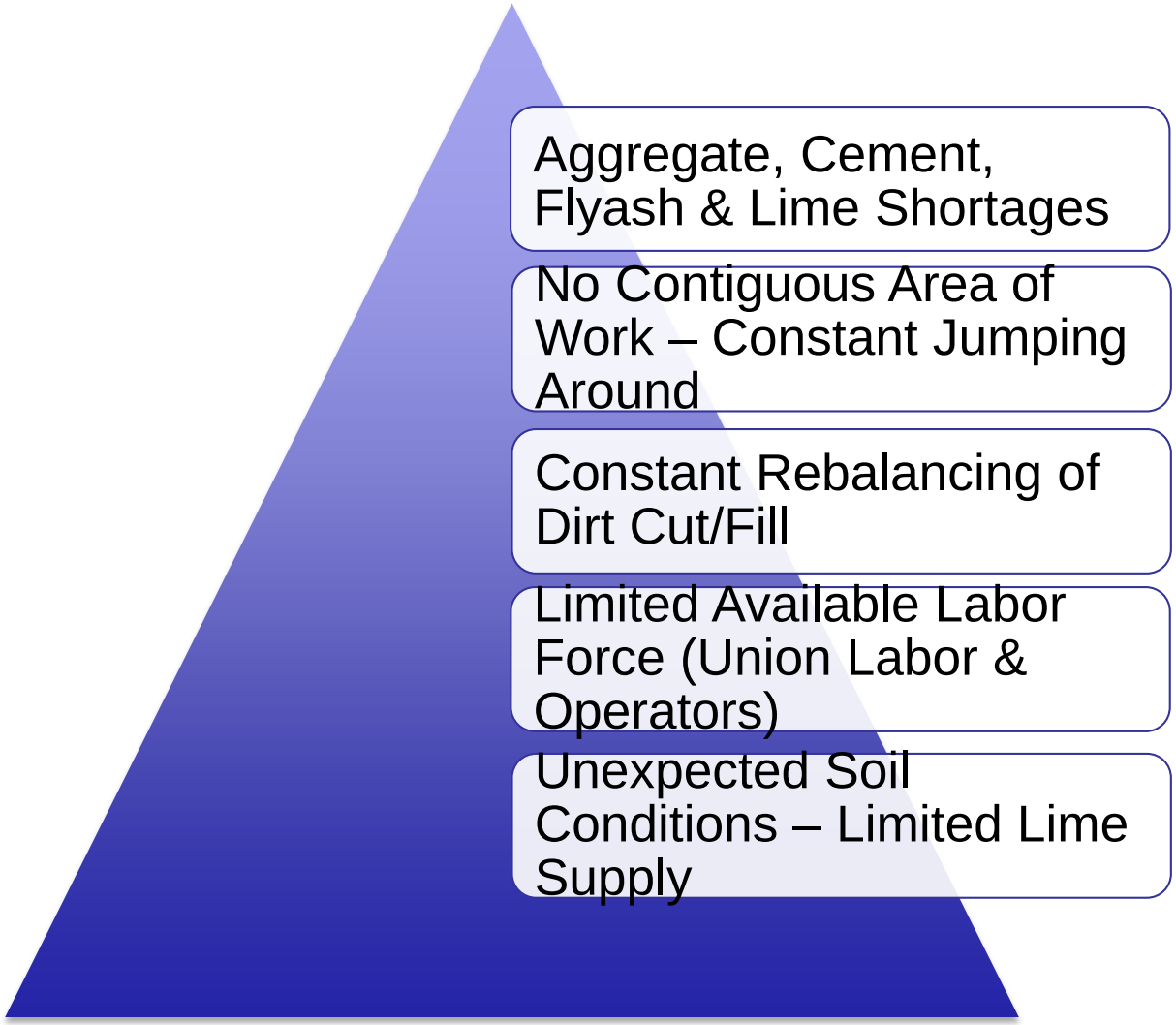
Wettest June in IL History – 11”

JUNE 2015 WEATHER

Green – 5-8”
Blue – 8-11”



MORE PROJECT CHALLENGES



So How Did Overcome all of these challenges?

PROJECT ACCELERATION

We completed 7 months of work in 4 months and accelerated all projects to meet a December completion of mainline pavement by:

- Working 14 seven day work weeks in a row
- Hiring other subs to assist with misc. work
- Shutting down other projects to free up resources
- Cross training our paving crews
- Reallocating aggregate supply locations
- Redesigning mixes to accommodate inconsistent cementitious material supply

WHAT IT TOOK TO GET THE JOB DONE

HOW DID WE ENHANCE OUR SUCCESS? 1 of 2

ONE	• Extensive QC Planning for Aggregates & Material Production
TWO	• Weekly Corridor-Wide Planning Meetings
THREE	• Heavy Use of GPS & Computer Aided Technology
FOUR	• Widen Pavement Track Lines with Asphalt to Enhance Smoothness
FIVE	• Extensive PRS Spec Training and Inertial Profiler Smoothness Testing

HOW DID WE ENHANCE OUR SUCCESS? 2 of 2

SIX	• GSI Device Use for Real Time Smoothness Reading of Plastic Concrete
SEVEN	• Used Central Mix Concrete Plant with Full Time QC Oversite
EIGHT	• Extremely Well Maintained Equipment
NINE	• Very Experienced Staff
TEN	• Cohesive Planning & Execution Strategy between PMs & Field

WE DID IT USING ALL THE LATEST GPS TECHNOLOGY

WE DID IT USING ALL THE LATEST TECH – STRINGLESS PAVING

CONCRETE

ASPHALT

STANDARD DEVIATION TABLE AIR QUALITY

Air Quality Pay Factor

The quality pay factor for air shall be determined by linear interpolation of the table below. If the standard deviation is beyond a value listed in the table, the maximum standard deviation value listed in the table shall be used.

Air, percent	SD 0.0 %	SD 0.5 %	SD 1.0 %
5.0	100.1	99.3	98.5
5.5	100.7	100.0	99.3
6.0	101.3	100.7	100.1
6.5	102	101.4	100.8
7.0	101.3	100.7	100.1
7.5	100.6	100.0	99.4
8.0	100	99.3	98.6
8.5	99.3	98.5	97.7
9.0	98.6	97.7	96.8

- Air Content is measured between 5.5-8% and is taken every 50 cubic yards

- You will receive 100% pay as long as you fall in-between 5.5-8% and are penalized if you go higher than 8% and anything lower 5% or higher than 9% is rejected.

STANDARD DEVIATION TABLE
DOWEL DIAMETER

Dowel Diameter Quality Pay Factor

The quality pay factor for effective dowel bar diameter shall be determined by linear interpolation of the table below.

Dowel Diameter, in	QPF
1.35	98.0
1.40	98.8
1.45	99.4
1.50	100.0

- Dowel Diameter is measured between 1.35 inches and 1.50 inches
- We very rarely go below a 1.46 in.

STANDARD DEVIATION TABLE THICKNESS

Thickness Quality Pay Factor

The quality pay factor for thickness shall be determined by linear interpolation of the table below. If the standard deviation is beyond a value listed in the table, the maximum standard deviation value listed in the table shall be used.

Thickness, in	SD 0 in	SD 0.25 in	SD 0.5 in
12.50	96.8	95.0	90.0
12.75	99.0	97.8	95.4
13.00	100.5	100.0	98.3
13.25	101.1	100.8	100.1
13.50	101.3	101.2	100.8
13.75	101.3	101.3	101.3
14.00	101.4	101.4	101.4

- Thickness is measured from 12.5 inches to 14.0 inches
- There is no penalty for being thicker than 14 however anything less than 13 inches begins to get penalized

STANDARD DEVIATION TABLE SMOOTHNESS

Smoothness Quality Pay Factor

The quality pay factor for smoothness shall be determined by linear interpolation of the table below. If the standard deviation is beyond a value listed in the table, the maximum standard deviation value listed in the table shall be used.

Smoothness, in/mi	SD 0 in/mi	SD 10 in/mi	SD 20 in/mi
50	103.1	102.7	102.3
55	101.8	101.4	101.0
60	100.4	100.0	99.6
65	99.0	98.6	98.2
70	97.7	97.2	96.7
75	96.5	95.9	95.3
80	95.5	94.8	94.1

- Smoothness is measured from 50 in/mi to 80 in/mi.
- Anything 60 in/mi or greater is 100% pay up to 103.1%
- the smaller the number the greater the benefit

STANDARD DEVIATION TABLE STRENGTH

Strength Quality Pay Factor

The quality pay factor for strength shall be determined by linear interpolation of the table below. If the standard deviation is beyond a value listed in the table, the maximum standard deviation value listed in the table shall be used.

Strength, psi	SD 0 psi	SD 500 psi	SD 1,000 psi
4,000	91.4	90.6	89.8
4,250	93.1	92.3	91.5
4,500	94.8	94	93.2
4,750	96.4	95.7	94.9
5,000	98	97.3	96.6
5,250	99.3	98.7	98
5,500	100.6	100	99.4
5,750	101.4	100.9	100.3
6,000	102.2	101.7	101.2
6,250	102.6	102.2	101.7
6,500	103	102.6	102.2

- 5500 to 7500 will earn 100% and up to 102.6% depending on where you fall on the scale
- The target quality level (TQL) is 5500
- The maximum quality level (MQL) is 6500

PLOTE'S RESULTS – HOW DID WE DO?

PAY FACTOR	#4205*	#4206*	#4207*	#4232	#4233
Strength	99.8	99.8	96.4	100.9	101.3
Thickness	101.2	101	101	101.1	101
Dowel Diameter	99.9	100	100	100	100
Air	101.2	101.2	101.2	101.1	100.8
Smoothness	97.2	100.3	97.2	99.2	99.7
Calculated Pavement Quality Pay Factor	100.8	102.2	99.1	102.3	102.8
85% and 105% Limited Pavement Quality Pay Factor	100.8	102.2	99.1	102.3	102.8

*The Tollway decided to accelerate and mitigate the delays rather than extend completion dates for #4205, #4206 and #4207 and we were forced to work under adverse conditions. These jobs were divided into 2 lots: before 11/7/15 and after 11/7/15. After 11/7/15 eliminated the smoothness and strength pay factors. The above represents an average of the 2 lots.

WORKING THE PCC SPEC ON I-90

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