

E-Tickets

What an E-Ticket is (Iowa)

Process of E-Tickets

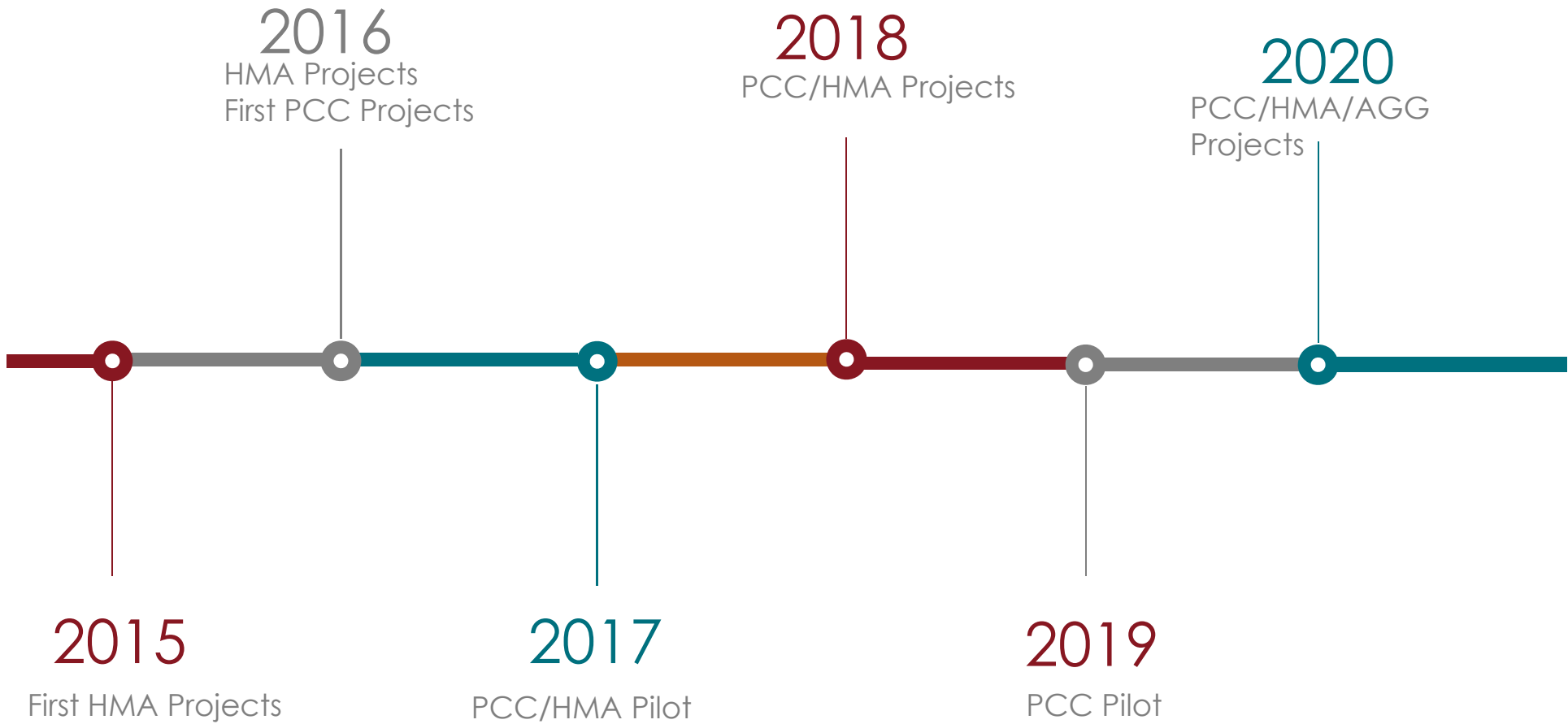
Project Documentation

Future of E-Tickets



 E-Tickets

E-ticket timeline



I-74 Quad Cities



I-74 E-Tickets

- Bridge replacement over the Mississippi River
- 322 Million dollar contract
- 101,000 CY of concrete
- A typical county bridge = 400 CY
- A six pier bridge = 2,417 CY
- 4-6 Concrete trucks per barge
- 9,006 Tickets to date



5

E-Tickets



Partners

Iowa DOT

Hahn Ready Mix

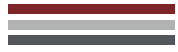
Command Alkon

infotech



2020 E-Ticketing (Iowa)

- Iowa DOT due to Covid-19 is working with the following vendors
 - Command Alkon - Connex (Concrete, Asphalt, Aggregate)
 - Sysdyne – iStrada (Concrete)
 - Earthwave – FleetWatcher (Asphalt)
 - BCMI – (Concrete)



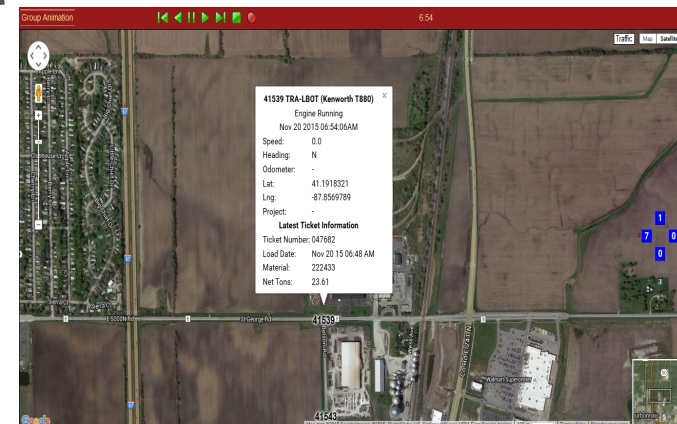
2020 E-Ticketing (Iowa)

- 64 Concrete projects
- 12 Asphalt projects
- 4 Aggregate projects

- This includes County and Cities

What is E-Ticketing (Iowa)

It's not
Truck Tracking
Tracking is a benefit but not what makes
an e-ticket



IT'S NOT A PDF TICKET

TICKET #327739 **DATE** Sep 15, 2017

PLANT N **TRUCK** 141 **DRIVER** Perez, Carlos **TICKETED:** 07:19:49
ORDER# 4 **PO#** 835 **JOB#** **TO JOB:** 16:11:14

CUSTOMER# STE1090 **PROJECT#** STE835 **PROJECT NAME** Des Moines- BO 103 Park Ave

SOLD TO: Sternquist Construction
DELIVER TO: BO 103 Park Ave Des Moines, IA

PRODUCT NO.	QTY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
DCSUDSA	10	cy	C-SUD 3 Agg, SA Air, 5 oz WR 1 oz Ret		
200	10	cy	Hauling Charge		

SUB TOTAL:
TAX:
TOTAL:

ORDERED: 12:00:00 DELIVERED: 10:00 SLUMP: 2.50

LOAD TIME: 07:21:14 MAX WATER ALLOWED: 0.00 WATER ADDED @ PLANT: 0.00 WATER ADDED @ JOBSITE: 0.00
W/C RATIO @ PLANT: 0.37 W/C RATIO @ JOBSITE: 0.37

	ACTUAL	MOISTURE	TARGET	UNIT
LIMESTONE	14360	0.6% (10.32 gl)	14266	LB
SAND	12480	3.3% (49.35 gl)	12596	LB
LS 3/8" CHIPS	3280	0.6% (2.36 gl)	3089	LB
CEMENT 1	3995		3970	LB
FLYASH	1975		1960	LB
RETARDER	120		119	OZ
POLYCHEM SA	90		90	OZ
KB1200	177		178	OZ
WATER	201		203	GL

INSPECTION ON SITE

INSPECTOR: Ryan utter **ACCEPTED**

NOTES:
Sta 76+98 ft

AIR CONTENT: 8.90 SLUMP: 0.00 TEMPERATURE: 83.0 F WATER ADDED: 0.00 DISCHARGE TIME: 09:53:49
REVOLUTIONS: 30

Hahn Ready Mix Co.
CENTRAL DISPATCH - 3636 WEST RIVER DR. - DAVENPORT, IOWA 52802 - PHONE 563-322-1208

DELIVERY INSTRUCTIONS
CIVIL CONSTRUCTORS WEST BOUND I-80 UNDER DIVISION
ST BRIDGE

QUANTITY **CODE** **DESCRIPTION** **UNIT PRICE** **EXTENDED PRICE**

10.00	N-4	CONCRETE		
1.00	ea	PLANTOPEN		
1.00	ea	TRUCKTIME		
10.00	ea	DEL		

REASON FOR DELAY - PLEASE EXPLAIN:
10 GAL

IMPORTANT TERMS AND CONDITIONS
TRUCK WASH QUIET - Customer agrees to provide properly permitted area or receptacle to wash and remove any residual material from the delivery vehicle. Failure to do so may result in added fees. Excess pour time will be charged at \$125.00 per hour.
PROPERTY DAMAGE RELEASE - Customer agrees to maintain a suitable roadway to point of delivery and accepts all responsibility for truck damage and property damage between curb and point of delivery.
INSPECTED, APPROVED & RECEIVED BY: *R.W.*

BATCH DATA

Material	Design Qty	Adj. T	Required	Batched	S Var	S Moisture	Actual Mat	Tot. Mat
PORTLAND CEMENT	1309 lb	1437	1436	1440	0.37%	3.43%	57 gl	57
WATER	37.00 gl	27.11	271.06 gl	256.00 gl	-1.96%		256.00 gl	256.00
ADDITIONAL WATER	1.00 gl	25	248 gl	248 gl	0.28%		248 gl	248
ADDITIONAL WATER	1414 lb	1424	1423	1424	0.15%	0.78%	12 gl	12

Actual Mix Batches: 1
Design 8.37% Water/Cement 0.348 R Design 378.0 gl Actual 335.2 gl To Add: 34.8 gl
Water in Truck: 8.8 gl Adjust Water: 8.8 gl / Load

WEIGHMASTER SIGNATURE X.

What it is

- Real Time data of ticket information
- Ability to enter test data
- Keeping the **Data Digital**
- Ability to utilize data to **automate forms**
- **Safe way** to collect tickets





A Digital PCC Ticket Life



A Digital PCC Ticket Life

- 1. Digital Ticket is created at the plant with all the important batch information for that truck
 - Batch Weights
 - W/C Ratio
 - Project information

TICKET # 32098812 4:46 PM ACCEPTED

connex

Batch Data		Moisture	
Max Water/Add	Actual W/C	Max W/C	
33.1	0.376	0.42	
Material	Batched	Variance	
CONTINENTAL BUFFALO TYPE I/II	3410 LB	-0.58	
HOT WATER	0 GA	0	
TEMPER WATER	9 GA	0	
WATER	212 GA	0	
W.R.	37 OZ	-2.63	
GRACE DARAVAIR 1400			
RIVERSTONE	14200 LB	-0.36	
ALLIED 1" CONCRETE STONE			
RIVERSTONE	4600 LB	0.13	
ALLIED 3/8" CHIPS IA			

Reject Pending Cancel Save



A Digital PCC Ticket Life

- 2. Inspector opens an APP on any mobile device and sees all the ticket information when the ticket is created, even before the truck shows up on-site





A Digital PCC Ticket Life

- 3. Inspector takes all the necessary tests and adds the test data to the ticket on the mobile device
- 4. Inspector accepts the ticket

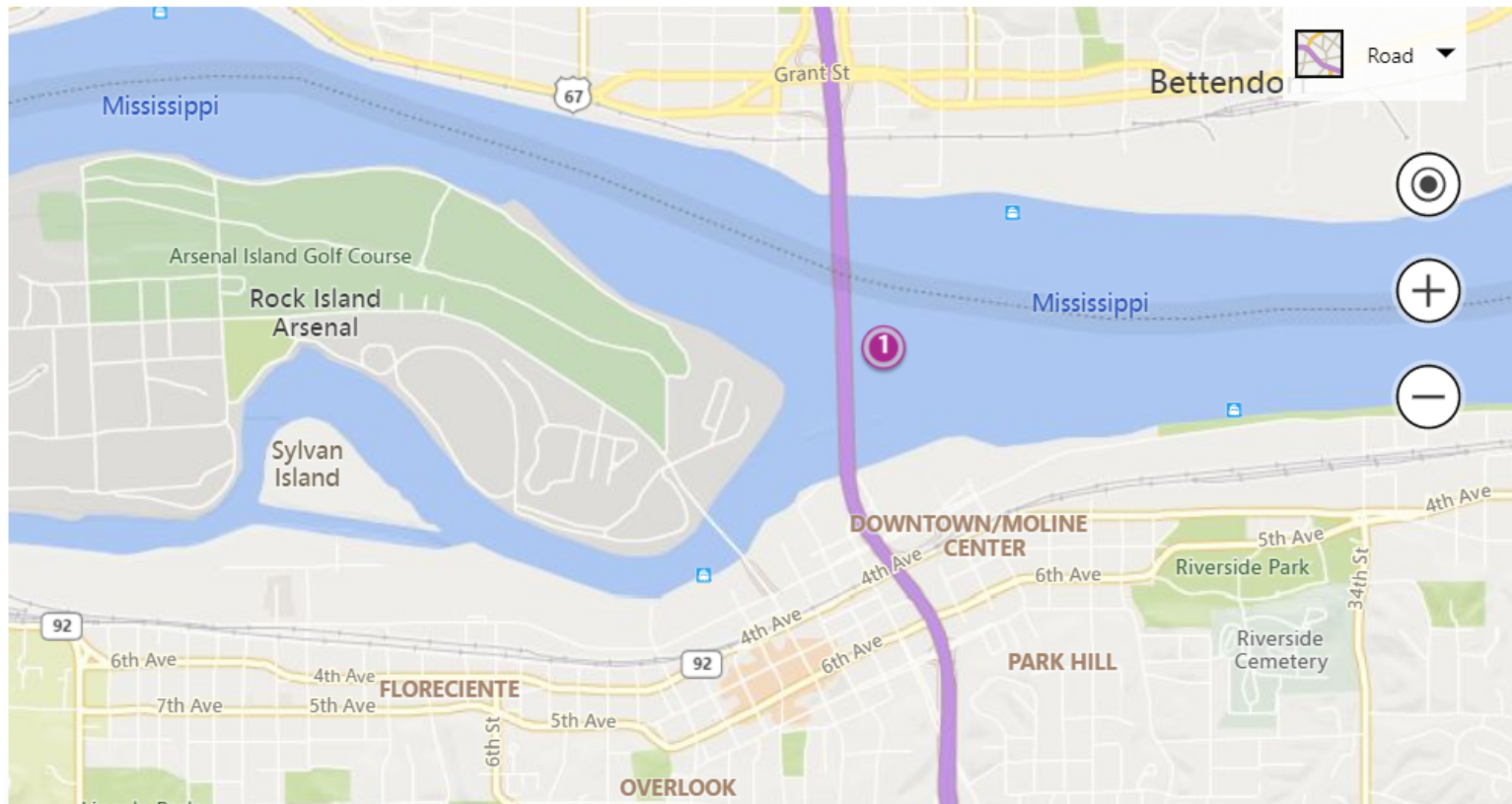
A Digital PCC Ticket Life

5. Inspector downloads the daily or project ticket information

6. All the Air and Slumps are tailed automatically and can be sorted by Mix, date, etc.

Geolocation of Accepted Ticket

Test Data Location



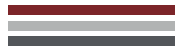
Geolocated Material



Project Documentation

- Replace old existing Forms?
 - E-114 (Beam Breaks)
 - E-115 (Air and Slump)
 - E-145 (Structure page)
 - Update plant report
 - Aggregate Summaries





Project Documentation

- Data exported and Auto Populated
- Water Added
- Sample Frequency
- # of test's required
- # of test's taken
- Yield
- Station location
- Evaporation Rate

Project Documentation

AutoSave Off | v4_01 PCC Master e-Ticketing.xlsx - Saving... | Wilkinson, Cedric

File Home Insert Draw Page Layout Formulas Data Review Design View Developer Help BLUEBEAM ProjectWise ACROBAT Power Pivot Design Search Share Comments

Function Library: Insert Function, AutoSum, Recently Used, Financial, Logical, Text, Date & Time, Lookup & Reference, Math & Trig, More Functions, Name Manager, Define Name, Use in Formula, Create from Selection, Trace Precedents, Trace Dependents, Remove Arrows, Formula Auditing, Show Formulas, Error Checking, Evaluate Formula, Watch Window, Calculation Options, Calculate Now, Calculate Sheet

D13: =IFERROR(INDEX('Raw Data'!\$1:\$1048576,MATCH(@[Hide],'Raw Data'!\$A:\$A,0),MATCH("Ticket",'Raw Data'!\$1:\$1,0)), "")

Iowa DOT PCC Ticket Summary																							
Project		Total CY Estimated	680.00	Location	From	0	To	0	Air/Slump		Gradation												
Contract ID		Total CY Batched	479.00	Sample Freq.		100		Pick Below	1/700 yd3: 1/100 yd3 RM		S/T 1st day, then 1/day>500 yd3, If <500 yd3												
Contractor	HELM CIVIL	Total CY used	467.50	Air Required		5		PCC Pavement			Gradation Verification												
Supplier	Hahn Ready Mix	Yield	69%	Slump Required		5		Fixed			S/T 1st/day, S 1/day >500 yd3 & T 1/wk, If <500 yd3/day S 1/wk & T 2/wk												
IMPORT DAILY TICKETS		Total # of Air	21.00	Total Water Added (Gal)		199.00		Paving			(1) If less than 20 yd3/day, the engineer may waive air testing if inspection is not available and producer has exhibited consistency in p												
Version 4-1 PCC For Connex 2.0		Total # of Slump	21.00	Total Water Added (Lbs/CY)		3.55					(2) On large structural placements >350 yd3, the DME may adjust air and slump testing to 1/50 yd3 based on consistent results in the fir												
											(3) Sampling and testing rate if no other concrete supplied. Use structural or paving test results to cover non structural concrete items.												
											(4) Look in IM 535												
Date	Load #	Ticket #	Truck #	Location	Plant	Mix #	CY	Waste	Total CY	Loaded	Discharged	Pay Item	Air 1	Air 2	Slump 1	Slump 2	Water (Gal)	Passed ?	Rejected	Reject Reason	Void	Material Air Te	
10/1/2020	1	32101910	241	EB Pier 19 mud mat	RIVER PLANT	IOWA DOT C-4 WR C-15 S20	7		7	1:34 PM	2:40 PM		7.00		3.5		7	PASSED				65	
10/1/2020	2	32101914	115	EB Pier 19 mud mat	RIVER PLANT	IOWA DOT C-4 WR C-15 S20	7	5	14	2:05 PM	3:00 PM							7	PASSED				
10/6/2020	3	17020398	333	Mud Mat	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	9		23	1:57 PM		0040	8.50		4.75			5	PASSED				70
10/6/2020	4	17020399	333		MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	1		24	2:07 PM									NOT_ASSES				
10/6/2020	5	17020401	221	pads	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	8		32	2:52 PM								15	NOT_ASSES				
10/6/2020	6	17020402	333	Pier 19EB Mud Mat/Level	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	4		36	3:29 PM		0040						10	NOT_ASSES				
10/6/2020	7	17020403	333	pad	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	4		40	4:20 PM	4:48 PM	0040						5	NOT_ASSES				
10/9/2020	8	17020550	302	Pier 20 -East Mud mat/level pad	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	7		47	2:02 PM	2:49 PM	Incidental to	7.2		2.25	4.25		21	PASSED				86
10/9/2020	9	17020552	334		MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	7	1	54	2:38 PM	3:18 PM	Incidental to						20	NOT_ASSES				
10/13/2020	10	32102416	303	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	10		64	12:09 PM	12:43 PM	0040	8.2		7				PASSED				73
10/13/2020	11	32102423	103	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	10		74	12:40 PM	1:19 PM	0040							NOT_ASSES				
10/13/2020	12	32102428	210	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	10		84	1:03 PM	1:37 PM	0040	7.9		7				PASSED				70
10/13/2020	13	32102432	119	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	10		94	1:25 PM	1:53 PM	0040							NOT_ASSES				
10/13/2020	14	32102435	305	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	10		104	1:41 PM	2:12 PM	0040							NOT_ASSES				
10/13/2020	15	32102439	124		RIVER PLANT	HP MASS STRUCTURES	8		112														
10/13/2020	16	32102441	101	Pier 19 EB Footing	RIVER PLANT	HP MASS STRUCTURES	8	2	120	2:30 PM	3:00 PM	0040							NOT_ASSES				
10/15/2020	17	17020660	118	Collar/Rock Key	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	9		129	10:52 AM		Incidental to							PASSED				
10/15/2020	18	17020662	235	Collar/Rock Key	MOLINE PLANT	IOWA DOT C-4 WR C-15 S20	9		138	11:10 AM		Incidental to							NOT_ASSES				
10/16/2020	19	32102587	334	Mats/Level Pad	RIVER PLANT	IOWA DOT C-4 WR C-15 S20	10		148	12:07 PM	1:05 PM	Incidental to	7.2		2.75	5		25	NOT_ASSES				68
10/16/2020	20	32102592	210	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	10		158	1:01 PM	1:52 PM	0040	8		8				PASSED				68
10/16/2020	21	32102593	111	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	10		168	1:18 PM		0040							NOT_ASSES				
10/16/2020	22	32102598	117	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	10		178	1:53 PM	2:24 PM	0040							NOT_ASSES				
10/16/2020	23	32102600	235	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	10		188	2:10 PM		0040	8		8				PASSED				68
10/16/2020	24	32102601	421	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	10		198	2:29 PM		0040							NOT_ASSES				
10/16/2020	25	32102602	210	Pier 19 EB - Footings	RIVER PLANT	HP MASS STRUCTURES	9		207	2:40 PM	3:11 PM	0040							NOT_ASSES				
10/19/2020	26	32102620	123	Pier 19 Footing Collar	RIVER PLANT	IOWA DOT C-4 WR C-15 S20	9		216	12:09 PM	12:54 PM	0040	7.5		3.5			10	PASSED				63

Ready | Display Settings | 85%

Desktop | 8:59 AM | 10/31/2020

What to do with the Data?

- Doc Express
 - Tickets are supporting documentation to the plant report

Pay Items

82-0741-207 - Davenport - IM-NHS-074-1(207)5--03-82 & (220) - PCC Pavement - Grade & Replace

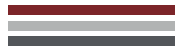
Hahn River Plant Report 1120 001-B 20200606 0190 STRUCT CONC (MISCELLANEOUS) PCC Structure – PCC Plant Report update

Iowa DOT

[2 comments](#) [1 supporting document](#)

Sep 11 2020 01:00 PM CDT commented
06052020_0190_Retianing_Wall_Footing_River
06052020_0190_Retianing_Wall_Footing_River
Iowa DOT - adrian simonson

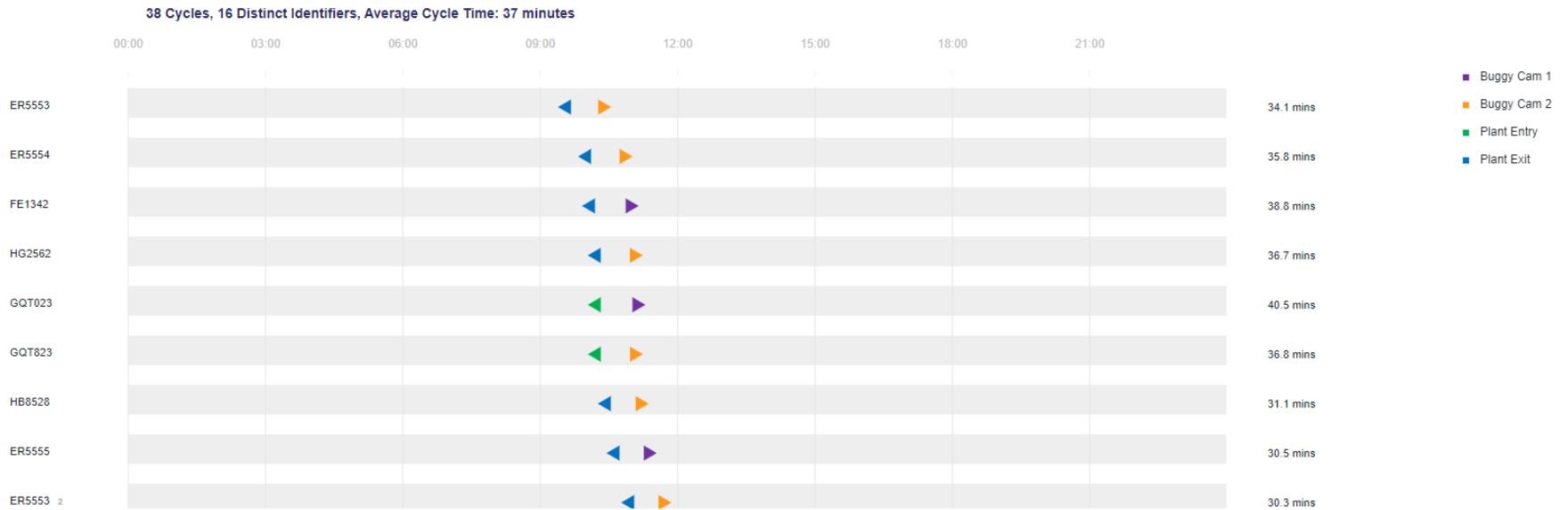
Sep 11 2020 12:59 PM CDT Submitted
Version 1 (current)
6/5 - 15 CY
Iowa DOT - adrian simonson Electronically Signed (Confirm)
Published from [Working / Hahn River Plant Report 1120 001-B 20200606](#)



E-Ticket P.O.D. for HMA

- Alternative to GPS Tracking
- Camera at the plant and at job site
- Captures License plate and other unique characteristics of a truck
- New Pilot project at end of 2020
- Doing more Pilot projects in 2021

E-Ticket P.O.D. for HMA



At the Plant

Time: 09:41 CDT 




LP: ER5553




Type or click here

Update Tags

At the Job Site

Time: 10:15 CDT  x

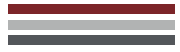
LP: ER5553



2020-09-17 15:15:08

IPC

Type or click here Update Tags



E-Ticket P.O.D. for HMA

- Advantage to Agency
 - Automatically accept tickets
 - Don't need ticket taker
 - Safety
 - Have proof of delivery from plant to job
 - Also captures videos so the actual dump can be witnessed



E-Ticket P.O.D. for HMA

- Advantage to Contractor/Supplier
 - Cycle Times
 - Delivery tracking.
 - End-to-end cycles tracking (between raw-materials yards to mobile plants to the job sites)
 - Safety monitoring.
- Live alerts for cycles duration and critical safety violations















E-Ticket P.O.D.

- Other Materials
 - Aggregate
 - PCC
 - What is coming into the plant?
 - Asphalt
 - Rock
 - Sand
 - Cement
 - Fly Ash
 - Etc.

E-Ticket HMA

- New for 2021
 - Running Total
 - Load Number
- All on the mobile app or website

 20972	PENDING
 10/12/2020 2:52 pm	
 Load #2	28.76/-- TN
 Not Assessed	
 021	
 ABD20-3027 -RAP#abc20-0...	14.27
 20971	PENDING
 10/12/2020 2:22 pm	
 Load #1	14.49/-- TN
 Not Assessed	
 021	
 ABD20-3027 -RAP#abc20-0...	14.49 TN

Iowa DOT Vision

Integration into
AASHTOWare Project



Iowa DOT Vision

Integration into
Doc Express

Doc Express[®]

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An e-Construction solution for documents

Route and store the construction docs you need. Know the status
from any device, at any time.

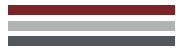
e-ticketing Hurdles

- Management of e-ticketing vendors
 - Inspectors using different software and workflow
- Standardizing data needed and exported
- Internet Connection
- Mobile Device Battery life



E-Ticket Future

- PCC
- HMA
- Aggregate
- Pilot Projects 2020 (Volunteers)
- DS – 2021-2022
- SS 2023, 2024
- Working on getting implemented with AASHTOWare Construction & Materials



Conclusion

- Ticket starts out with intelligent data
- Printed Ticket = Usability of data is lost
- PDF Ticket = Electronic
- E-ticket = Digital Data



THANK YOU FOR YOUR TIME AND ATTENTION
Questions?



Cedric Wilkinson
Eng. Tech Senior
Davenport RCE Office

Troy Schroeder
Const. Tech Senior
Davenport RCE Office