

E-Construction Successes

County Engineer Workshop
February 1, 2017

Kelly L. Crannell, P.E., Local Agency Construction Engineer - MDOT

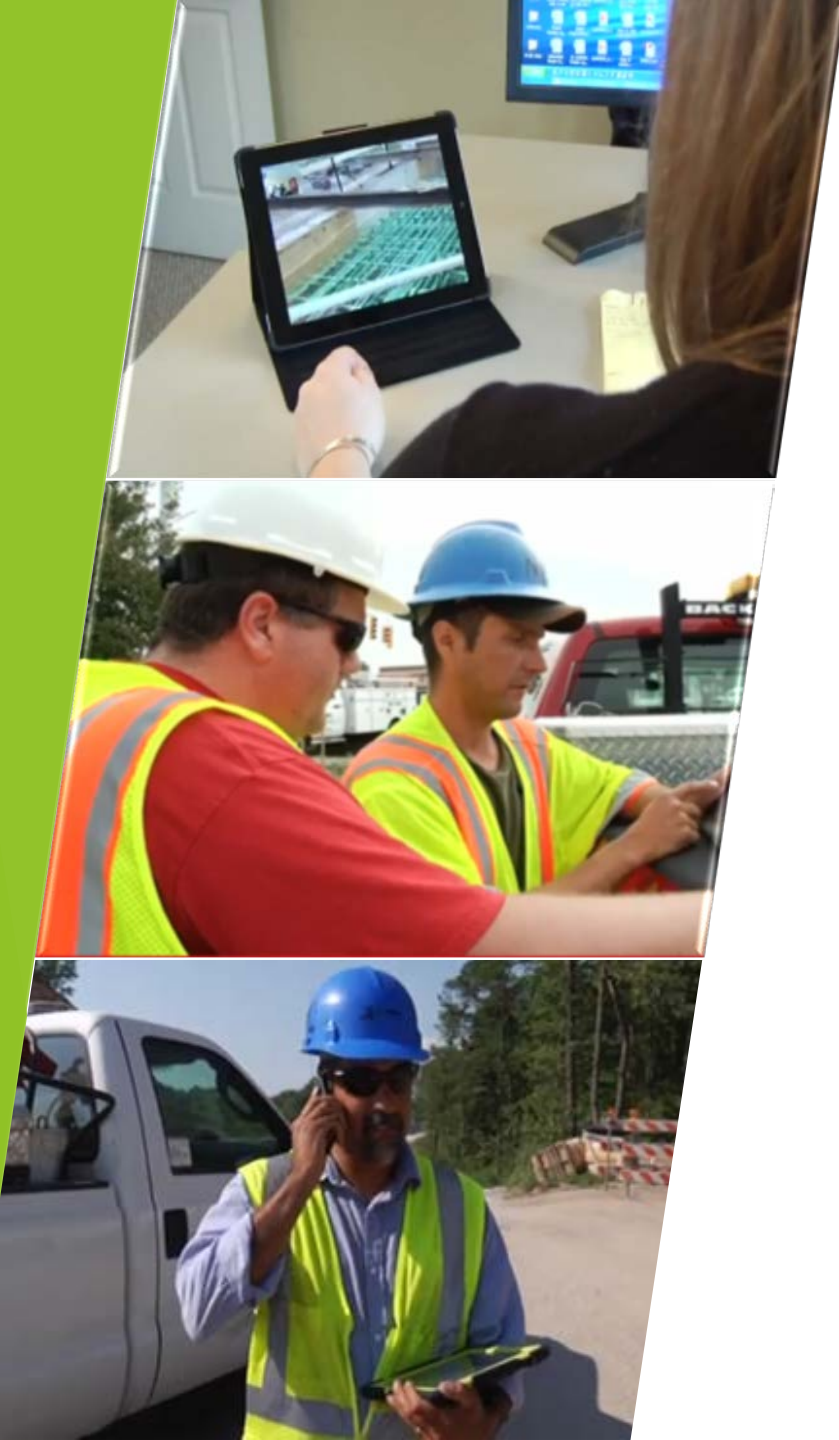
Sheryl Soderholm Siddall, P.E., Director of Engineering - Washtenaw County Road Commission

Wayne Harrall, P.E., Deputy Managing Director Engineering - Kent County Road Commission

Mike McInerney, ProjectWise Local Agency Support Analyst - MDOT

What is e-construction?

- ▶ paperless construction administration/ document management process using:
 - ▶ Electronic file cabinet
 - ▶ Electronic plans
 - ▶ Electronic/digitally encrypted signatures
- ▶ ProjectWise program used @ MDOT
- ▶ Mike McInerney MDOT ProjectWise Resource
MDOT-ProjectWiseLocalAgency@Michigan.gov





E-construction benefits

- ▶ Eliminates bulky paper files/file rooms
- ▶ Saves time
- ▶ Provides cost savings
- ▶ Allows flexibility
- ▶ Promotes transparency
- ▶ Promotes sustainability

Local Agencies e-construction Trained

as of January 2017



Steps to get on-board

- ▶ Contact MDOT for training & set-up
- ▶ Implement 12SP-104E-01
- ▶ Utilize digitally encrypted signature (currently Adobe, transition to Co-Sign)



MICHIGAN
DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION
FOR
CONSTRUCTION DOCUMENT MANAGEMENT

1 of 3

APPR-JIG:DBP:09-09-14
FHWA:APPR: 09-22-14

CFS:CF

a. Description. This work consists of providing all materials, labor, and equipment necessary to meet MDOT's construction document management (CDM) system process. Submit all project documentation for this contract in electronic format and place it in MDOT's CDM system, unless otherwise noted in this special provision. No paper documents, faxes, e-mails or other methods/media are permitted except as allowed by this special provision or specifically approved by the Engineer. The Contractor is responsible for keeping all information in the CDM system up to date throughout the execution of the contract.

b. Digitally Encrypted Electronic Signatures. All documents utilized on the project that require signature authorizations must be signed using a validated by MDOT digitally encrypted electronic signature. Submit digitally encrypted signatures using Form 5600, Contractor Statement of Digital Electronic Signature Validation, to the Engineer for validation. A database will retain the Contractor's unique public key embedded into all digital electronic signatures. If the approved validated signature file becomes unusable due to password or computer failures, loss of signature file, or other similar reason the Contractor is required to submit a new Form 5600 for the new digital signature.

Scanned signatures, retail point of sale scribble capture, cursive fonts or other non-conforming signatures are prohibited. All digitally encrypted signatures must meet the legal requirements of the Federal e-Sign Act of June 30, 2000 and use Public-Key Cryptography Standards (PKCS) #12 encryption. The signature must be embedded into documents digitally by the unique user signing the document and must not require the use of a third party website, pay service or other proprietary software to view or authenticate. Many different software/applications use standard PKCS #12 digitally encrypted electronic signatures.

All fillable forms must retain the ability to be fillable upon submission to the Engineer. Submitted documents are not to be locked (changes not permitted) when placing a digitally encrypted signature. Software tracks changes to documents and this information is captured as part of each individual document. Locked documents do not allow additional processing (information entry) by the Engineer and all locked documents will be returned to the Contractor for resubmission.

Additional digitally encrypted electronic signature information can be found at the following link:

<https://mdotwiki.state.mi.us/construction/index.php/E-Signature>

Failure to submit documents utilizing valid digitally encrypted signatures will result in the documents being rejected by the Engineer and returned to the Contractor. No payment will be made for any affected work items until all required documents are received with validated digitally encrypted signatures.

g. Document Format. The Engineer may reject documents that are deemed to be unsuitable. This includes documents submitted that are illegible, unreadable, locked, etc. The Contractor must re-submit the corrected documents via ProjectWise. Failure to address rejected documents may delay progress payments.

The Contractor must use the document naming conventions as described in the Department's Construction Manual under the heading "Construction Documentation Standard Naming Conventions for e-Construction". This section is maintained at the following website:

<https://mdotwiki.state.mi.us/construction/index.php/E-Construction>

h. Document Workflows. Electronic review/approval of documents will be accomplished through ProjectWise workflows and e-mail notifications. A workflow is an ordered group of milestones, or states, through which a document passes on its way to completion.

Documents placed in the ProjectWise Contractor In Box folders will initially have a state of "Pending." While in the Pending state the Contractor is able to modify or delete the document. Once the Contractor has finalized the document they must change the state from "Pending" to "Submitted." Once the document is in the "Submitted" state the Contractor will no longer be able to modify or delete the document.

The Contractor must complete the following actions:

12SP-104E-01
09-09-14

2 of 3

CFS:CF

c. Contractor Access to MDOT's Construction Document Management System (ProjectWise). The Contractor must use the Departments current CDM system (ProjectWise). ProjectWise access is available at no cost to all contractors, suppliers and other vendors associated with the project. ProjectWise access is granted in two ways, a web based access portal or full version of the software installed on a company's computer. User account setup, installation details, and access to ProjectWise may be requested by sending an e-mail request to: MDOT-ProjectWiseConst@michigan.gov

d. Contractor Authorized Requestors. The Contractor must designate two authorized requestors at the preconstruction meeting. The authorized requestors are:

1. The only individuals that can request the Engineer to provide or withdraw ProjectWise access for this contract.
2. Responsible to designate contract roles in ProjectWise (submitter or read only).
3. Responsible for promptly notifying the Engineer of any ProjectWise user access changes for this contract.

e. Training. Additional documentation and training for CDM system processes and details of scheduled classes and methods for requesting training are available at the following website:

<http://www.michigan.gov/mdotprojectwisetraining>

f. Technical Issue Resolution. Upon discovery of a ProjectWise access issue the Contractor must immediately notify the Engineer and submit a notice to the e-mail resource MDOT-ProjectWiseConst@michigan.gov.

FS:CF

- 12SP-104E-01
09-09-14
- 3 of 3
- Upload all documents into the corresponding Contractor In Box folder.
 - Change the state of the document.
 - Send an e-mail to the Engineer, or their approved representative, providing notification that there are new documents submitted.

Place all required documents in the appropriate ProjectWise folder as listed below.

1. Contract Modifications. This folder contains contract modifications added by the Engineer for signature by the Contractor.
2. Correspondence. This folder contains all Contractor submitted documents not specifically listed below.

3. Materials. This folder contains all documents pertaining to the certification and approval of contract materials as defined in section 105 of the Standard Specifications for Construction. Combining of multiple material certification documents into one large single electronic file may cause delays in material acceptance and progress payments.
4. Payrolls. This folder contains all documents related to prevailing wage. Certified payrolls are not to include full social security numbers. Submission of any documents with full social security numbers is not permitted and these documents will be rejected and may result in delayed progress payments.

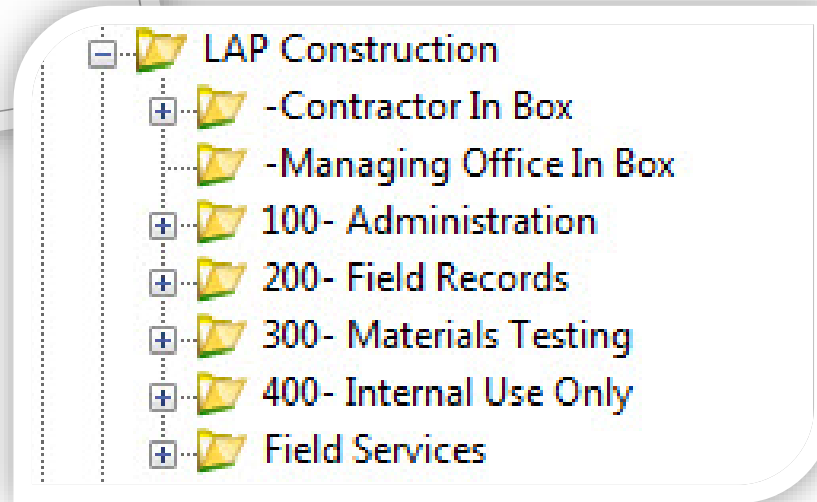
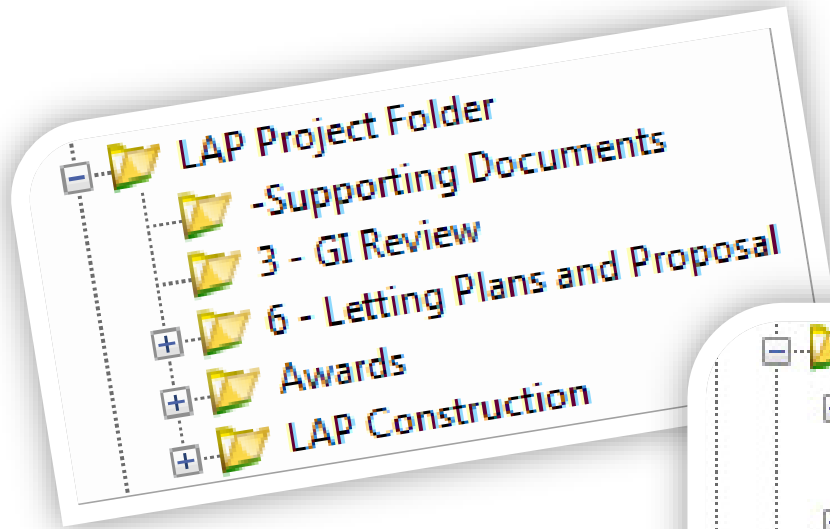
5. Shop Drawings. This folder contains shop drawings submitted by the Contractor.
6. Sub-Contractor In Box. This folder contains all documents submitted by subcontractors, suppliers, and any other companies associated with the Contractor or their subcontractors. The Contractor must review each document prior to submittal in ProjectWise.

The Engineer will review all documents added to these folders and move them to the appropriate document folder for further review, processing, or records storage.

Furnish paper bills of lading/delivery tickets to the Engineer on the jobsite. This exception to electronic document submittal is a requirement for any item of work or material that is paid based on weight or shipping volume. Scanning of other manifests, seed tickets, or delivery confirmations will be as directed by the Engineer.

1. **File/Document Retention.** The electronic files stored in ProjectWise are the official project documentation and will be retained per the current document retention schedule.
2. **Measurement and Payment.** The work included in this special provision will not be paid for separately and is considered to be included in other items of work.

Standard ProjectWise Template



MDOT Construction Wiki has index for filing

https://mdotwiki.state.mi.us/construction/index.php/Main_Page

E-construction is FHWA Every Day Counts Initiative



- ▶ Trunkline Projects - 100% e-construction
- ▶ Local Agency Projects - approximately 25% of yearly projects are e-construction
(FY '16 - approximately 64 Road Agencies had multiple projects, only 34 trained)

Additional Local Agency Updates

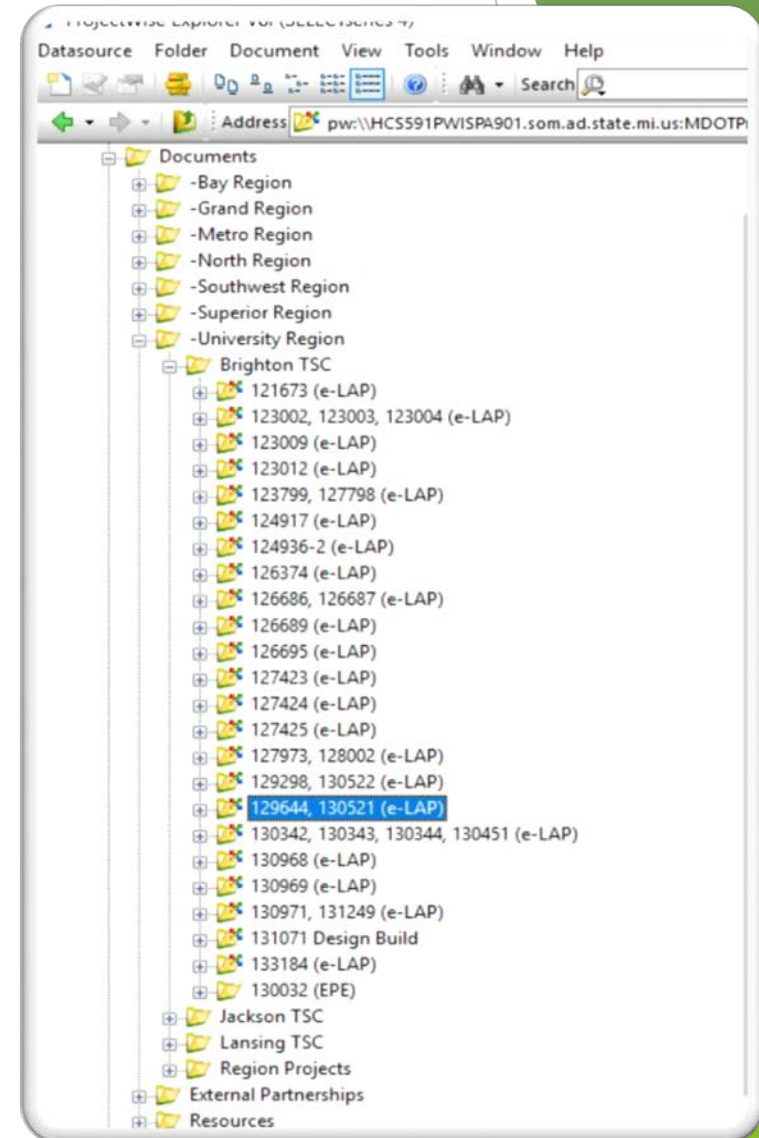
- ▶ GI submittals transitioning to electronic
- ▶ Adobe to Co-Sign transition for e-signatures
- ▶ LCP Tracker availability
- ▶ Project Close-out - continue to work with TSC Designated Representatives
- ▶ Specification Book Update - 2020 version, electronic and hardcopy being discussed

Success Stories from Local Agencies

- ▶ Washtenaw County Road Commission
- ▶ Kent County Road Commission

Washtenaw County Road Commission

- ▶ First use in 2016
- ▶ Ran approximately 12 projects through ProjectWise last year
- ▶ Expect all MDOT let projects to use e-construction
- ▶ Faster communication and document approval with MDOT, WCRC and contractors



Washtenaw County Road Commission

First Steps:

- ▶ Contact MDOT for ProjectWise training for ALL staff
- ▶ Write Contract Modifications to add 12SP-104E-01 if not already included in projects
- ▶ Set up filing protocols amongst staff

Washtenaw County Road Commission

Equipment:

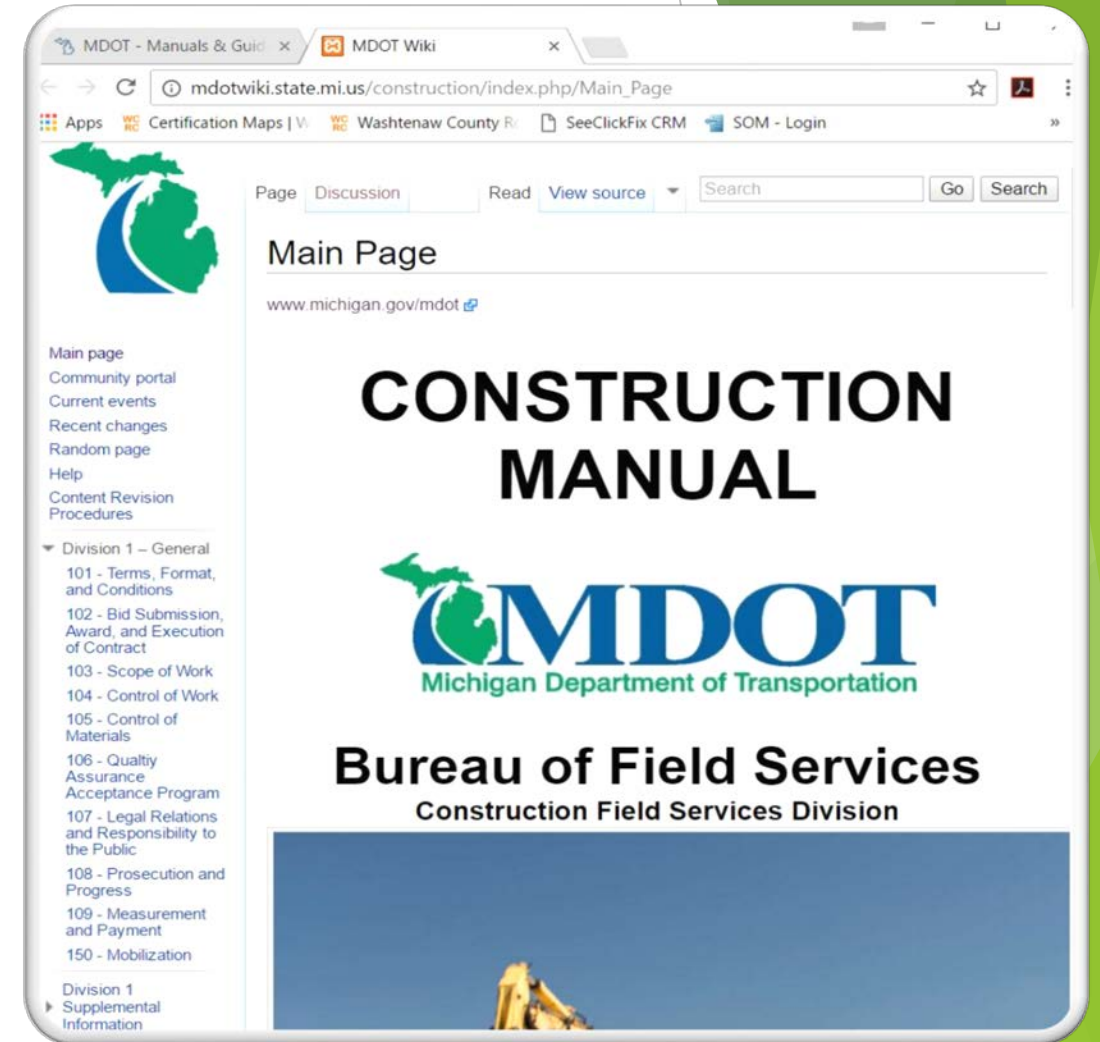
- ▶ Laptops or tablets
- ▶ Cell phones with hot spots



Washtenaw County Road Commission

Challenges:

- ▶ Changing “How We Do Business”
 - ▶ Using links instead of paper (MDOT Construction Manual, Standard Plans, Special Details)
 - ▶ Forms
 - ▶ Plans, proposals
 - ▶ Shop drawings



The image shows a screenshot of a web browser displaying the MDOT Wiki page for the Construction Manual. The browser's address bar shows the URL mdotwiki.state.mi.us/construction/index.php/Main_Page. The page features the MDOT logo (a green map of Michigan with a blue road) and the text "CONSTRUCTION MANUAL" in large, bold, black letters. Below this is the MDOT logo and the text "Michigan Department of Transportation". Further down, it says "Bureau of Field Services" and "Construction Field Services Division". On the left side, there is a navigation menu with links for "Main page", "Community portal", "Current events", "Recent changes", "Random page", "Help", "Content Revision Procedures", and a list of sections under "Division 1 - General" including "101 - Terms, Format, and Conditions", "102 - Bid Submission, Award, and Execution of Contract", "103 - Scope of Work", "104 - Control of Work", "105 - Control of Materials", "106 - Quality Assurance Acceptance Program", "107 - Legal Relations and Responsibility to the Public", "108 - Prosecution and Progress", "109 - Measurement and Payment", and "150 - Mobilization". At the bottom of the page, there is a blue banner with a yellow excavator.

Washtenaw County Road Commission

Challenges (cont'd):

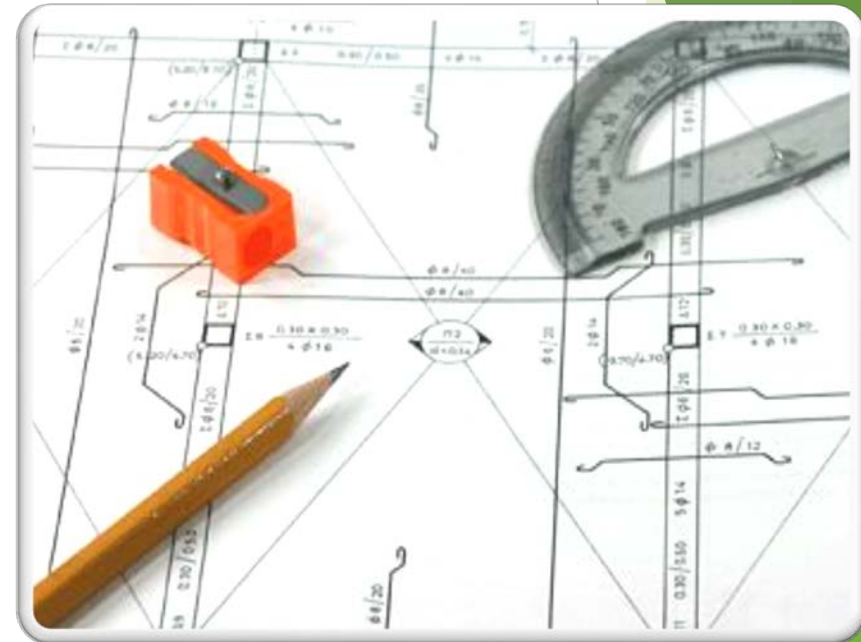
- ▶ FieldManager/FieldBook
 - ▶ If standalone version then need procedure for processing IDRs
- ▶ Not all Contractors familiar with ProjectWise and working with electronic documents
- ▶ Validating e-signatures



Washtenaw County Road Commission

Design:

- ▶ Use for all LAP submittals
- ▶ Easy to share documents
 - ▶ No zip files or FTP sites
- ▶ Move easily from design into construction



Washtenaw County Road Commission

Overall Success

- ▶ Fast!!
- ▶ Ability to track documents
- ▶ Accessible





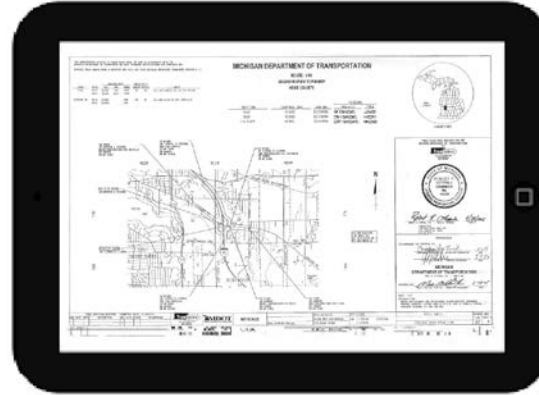
Kent County Road Commission - Partner with MDOT in I-96/ Cascade Road DDI



Kent County Road Commission E-construction project administration coordinating State, Consultant and Local Agency



NO.	SHEET
	456



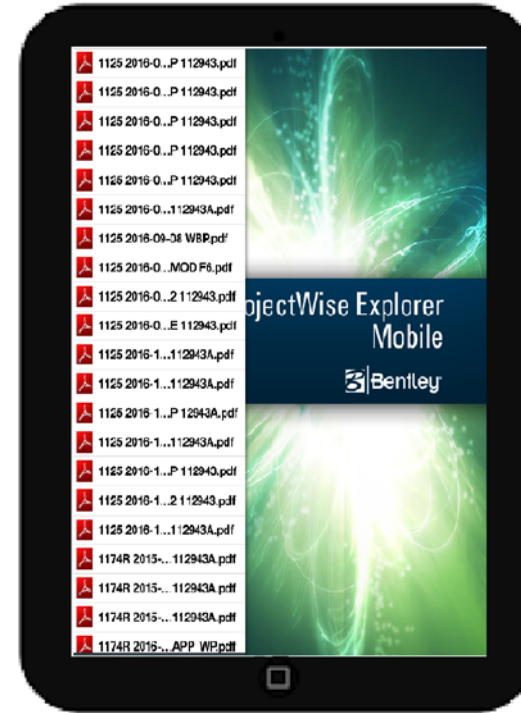
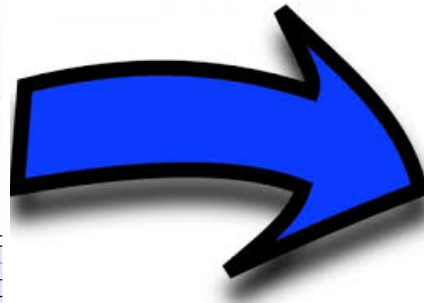
- ▶ KCRC portion \$810,500 of \$15.8 Million project
- ▶ 456 Sheet Plan set easily navigated on mobile device
- ▶ Complete access to MDOT form library with readily fillable forms
- ▶ Photo attachments aid in Material Acceptance Process
- ▶ Mobile Inspector allows for real time submittal of inspectors daily reports and forms from wireless device

Kent County Road Commission E-construction project administration

Michigan Department
of Transportation
1174R (08/12)

INSPECTOR'S REPORT OF CONCRETE PLACED - Roadway FILE 210
DISTRIBUTION: ORIGINAL - Construction Project Engineer Files COPY - CFS Page 1 of 2

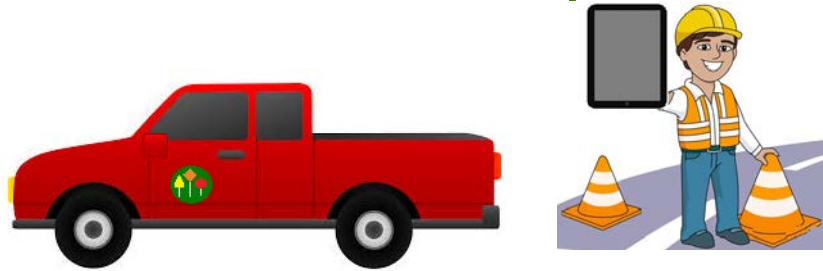
CONTRACTOR		GENERAL NAME OF PROJECT									
SUBCONTRACTOR		CONTROL SECTION ID - JOB NUMBER									
CONCRETE SUPPLIER		ROUTE									
MAXIMUM TIME		STRUCTURE NUMBER									
WEATHER		REPORT NUMBER	DATE								
MAX. WATER ADDED PER CYD (GALLONS)		REASON:									
BEAMS/CYLINDERS MADE (Ba, Time, #, etc.)		CURING COMPND. USED (GALLONS)									
Intended Air % to %		TEMPERATURES - AIR - SLUMP Intended Slump to									
TIME	ATMOSPHERE	CONCRETE	AIR CONTENT %	SLUMP	CYLINDERS BEAMS	TIME	ATMOSPHERE	CONCRETE	AIR CONTENT %	SLUMP	CYLINDERS/ BEAMS
LOT #	LOT SIZE	SUBLOT #	SUBLOT SIZE	RANNOE #	QA Cylinder ID	Discrepancy Cylinder					
COMMENTS											
ITEM OR CODE NO.	STA. TO STA.	GRADE OF CONC.	LENGTH	WIDTH	DEPTH	MEASURED SQ. OR CU. YARDS	CYCL. PLAN	CYCL. USED	CYCL. WASTE	OVER UNDER %	
REMARKS OR COMPUTATIONS (Use back if necessary)											
MIX OR STREET TECHNICIAN										DATE	



- ▶ ProjectWise mobile app allows for submittal of electronic inspection forms to the project file all from mobile device

Kent County Road Commission

E-construction: Field Perspective



- ▶ Less office time = more site time
- ▶ Face time with office staff = quick decisions = less project delays waiting for answers
- ▶ Ability to attach unlimited photos to report. A picture is worth 1000 words.
- ▶ Having access to project file via ProjectWise allows inspector to pull documentation on site. msls, Blue Sheets, etc

The ProjectWise Team

- ▶ Heather VerHage Administrator
- ▶ Janis Sherman MDOT Support
- ▶ Greg Vanis Consultant Support
- ▶ Stuart Laakso Construction Support
- ▶ Mike McInerney Local Agency Support
- ▶ Bob Biggar IT Support
- ▶ Nikk Anderson IT Support

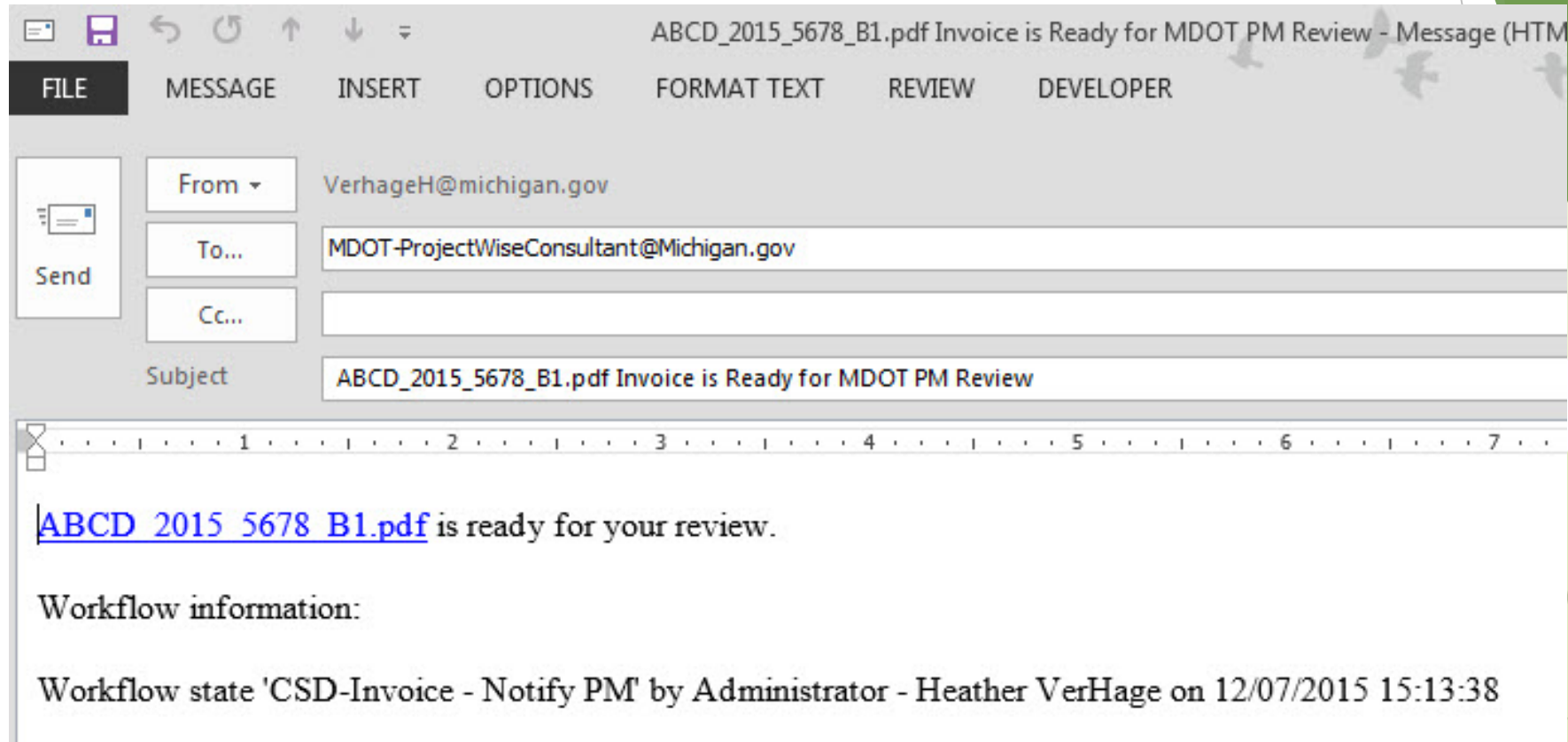


External Partners

- Approximately 2,829 External Users
 - 154+ Consultant Firms
 - 383+ Contractors
 - 34/83 Counties
 - 23 Cities
 - 79 Airports
- Permissions Set per Stakeholder



Email - HTML





E-Construction Successes

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