



# Engineering Construction Contracting Bureau (ECCB) Findings & Recommendations

October 14, 2021

Prepared by:



# Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>DISCOVERY FINDINGS .....</b>	<b>4</b>
<i><b>DEPARTMENT PROFILE.....</b></i>	<i><b>4</b></i>
<i><b>CURRENT STATE.....</b></i>	<i><b>5</b></i>
ECCB – Current Process Map.....	5
ECCB – Current In House Workflow.....	6
ECCB – Consultant Design Workflow.....	6
<i><b>DESIRED STATE.....</b></i>	<i><b>7</b></i>
ECCB – Desired In House Workflow .....	7
Wish List Items .....	8
<b>RECOMMENDATIONS .....</b>	<b>9</b>
Future Considerations .....	10
Next Steps .....	10

*Confidential*

October 4, 2021

Montana Department of Transportation  
Engineering Construction Contracting Bureau  
2701 Prospect Avenue  
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Thank you for taking the time to complete the U.S. CAD Discovery Process. During this journey your team has helped us gain a deeper understanding about the Engineering Construction Contracting Bureau (ECCB). By taking the information you provided in the Discovery Workbook and through our Discovery Workshop, we've compiled the information and summarized the findings within this document.

Our goal through this process is to help the ECCB achieve more. We understand the challenges that exist within the industry and your significant investments to make your Department of Transportation great. Through this process we trust that you will have also gained more insight into your organization.

Herein you will find our findings and recommendations. We anticipate that you will find this information useful in your pursuit to achieve more as an organization.

We look forward to strengthening our partnership with MDT and the ECCB.

Best Regards,

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## EXECUTIVE SUMMARY

Montana Department of Transportation (MDT) enlisted U.S. CAD to gather information about the Engineering Construction Contracting Bureau (ECCB) and provide recommendations based on our experience and knowledge. Through our Discovery Process, U.S. CAD was able to uncover insights about how the ECCB performs business, the technologies currently being used, required deliverables, existing pain points, and areas to improve efficiencies. The information gathered from the completed Discovery Workbook(s) and Discovery Workshop was used to help us better understand these areas of your organization and to prepare this document.

During our review of your Discovery Workbook(s), and while performing the Discovery Workshop we identified and noted the following items:

- ECCB primarily uses AASHTOWare for project data
- Use DocuPlot to generate PDF plan sets
- Adobe Acrobat DC is used during the review process
- Seek efficient ways to be notified of plan set updates
- Perform quantity takeoffs (estimates) manually
- Post PDFs to FTP site

This report highlights our understanding of the items listed above and our proposed recommendations as part of the MDT CADD Implementation process.

U.S. CAD did not observe an immediate need for ECCB to be trained on the AEC Collection design software. In the future, once other bureaus have implemented the AEC Collection, there is opportunity to increase collaboration and communication between ECCB and other bureaus using BIM 360.

This report is broken out into the following sections:

<b>Discovery Findings</b>	This section highlights key elements uncovered during the Discovery Process.
<b>Department Profile</b>	The organizational structure of the division and interactions with internal and external teams.
<b>Current State</b>	Current processes and solutions used, including pain points, receivables, and deliverables.
<b>Desired State</b>	This section captures our understanding of the team's desire state, wish list items, goals, and objectives.
<b>Recommendations</b>	In this section we provide our specific recommendations on process and solutions based on our findings during the Discovery Process.

## DISCOVERY FINDINGS

The following section highlights specific areas that were included in the Discovery process. Within each of the subsections below, U.S. CAD made specific notes regarding current challenges the Engineering Construction Contracting Bureau (ECCB) faces. These include tools used during the plan, specifications and estimate (PS&E) review process, and the collaboration/coordination of documents between MDT bureaus. These highlighted items are expanded upon in the Recommendations section further in the document.

The Discovery Findings have been summarized and included in the following sections:

- Department Profile,
- Current State, and
- Desired State.

The information documented in these sections provides the background for U.S. CAD's recommendations.

## DEPARTMENT PROFILE

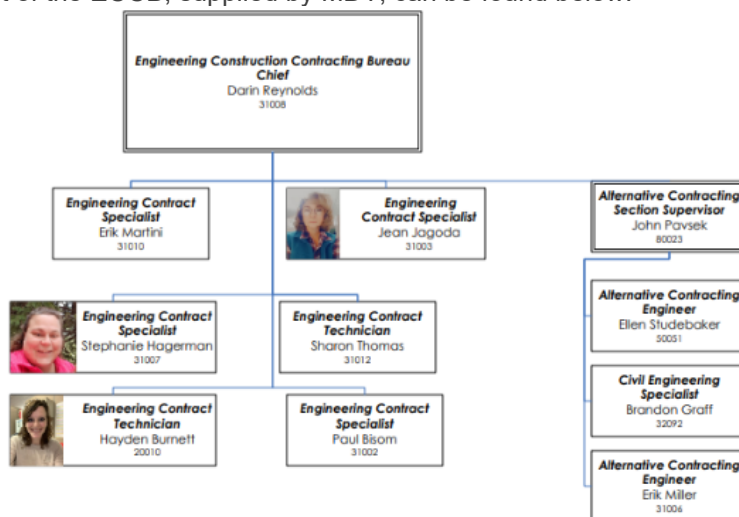
The Department Profile section provides our understanding of the organizational structure, key staff within the organization, departmental relationships, and how the ECCB interacts with other internal MDT functional areas, external agencies, and consultants/contractors.

The ECCB's primary focus is to compile and assemble plans, specifications, and estimates (PS&E) necessary for construction contract advertising and letting. The Bureau obtains contract plans and bid package information from the various functional areas involved in the project(s).

During the Discovery process, U.S. CAD was introduced to three (3) key staff members who are integral components of the ECCB; Darin Reynolds, Jean Jagoda, and Stephanie Hagerman. These staff members have immense knowledge and skills working within the construction contracting ecosystem. Their knowledge of the inner workings of MDT's ECCB process, and tools utilized, provided us with the needed details for a thorough understanding of day-to-day operations.

The key staff members, along with the additional ECCB staff, create, consume, and share related data with the public for contract letting. Some of the tools used by the ECCB include: AASTHOWare, MS Office (Word and Excel), Adobe Acrobat DC, DocuPlot, DocuSign, and Bid Express.

An Organizational Chart of the ECCB, supplied by MDT, can be found below.



## CURRENT STATE

The Current State section captures our understanding of the existing workflow, processes, and solutions used within the organization:

### **ECCB – Current Process Map**

Currently, the Engineering Construction Contracting Bureau (ECCB) begins the process of contract advertising when they are notified by transmittal from the MDT design staff that a new project has been initiated. ECCB receives preliminary drawings and/or bid packages with a Contract Plan Book (CPB).

Once the ECCB receives and collects the drawings, contract plans, and bid package from each functional area, typically part of the CPB, they begin the PS&E process. During this step, ECCB assembles all the contract documents then sends the package back to Road Design to initiate an internal review process. The initial PS&E process typically takes four (4) to six (6) weeks. This initial process requires back and forth communication and collaboration between ECCB and the functional areas. An Adobe Acrobat DC PDF review tool is used for collaboration and communications are typically done by email. Toward the end of this process, ECCB posts the preliminary plans to the Preliminary Bid Packages webpage link: <https://www.mdt.mt.gov/business/contracting/prelim-bid-packages.shtml>.

Once all documents have been updated based on the reviews and comments of the PDFs, the functional areas will stamp the PDFs as 'Approved for Advertising'. ECCB then posts the bid package to the website <ftp://ftp.mdt.mt.gov/contract/Advertised-Bid-Packages/> and the initial PS&E process is completed. This initiates the public RFI/Q&A process. Q&A forum webpage link: <https://www.mdt.mt.gov/business/contracting/qacurrent.shtm>.

During the RFI/Q&A period, there is consistent communication and collaboration with Road Design to answer the consultant/contractors' questions. This process potentially leads to changes to the design, quantities, and proposal. Once this period ends, MDT makes the necessary updates to the plans and proposal. This process requires continuous back and forth between ECCB and Road Design to produce the final plans, for signature.

ECCB currently uses the following technologies during the PS&E process.

- AASHTOWare
- MS Office Products (Word and Excel)
- Adobe Acrobat DC for review and comments
- Document Management System (DMS)
- DocuPlot
- DocuSign

Once the ECCB finalizes the bid package, the PDFs are posted to the FTP site for letting. It is our understanding that Bid Express is used during this final step.

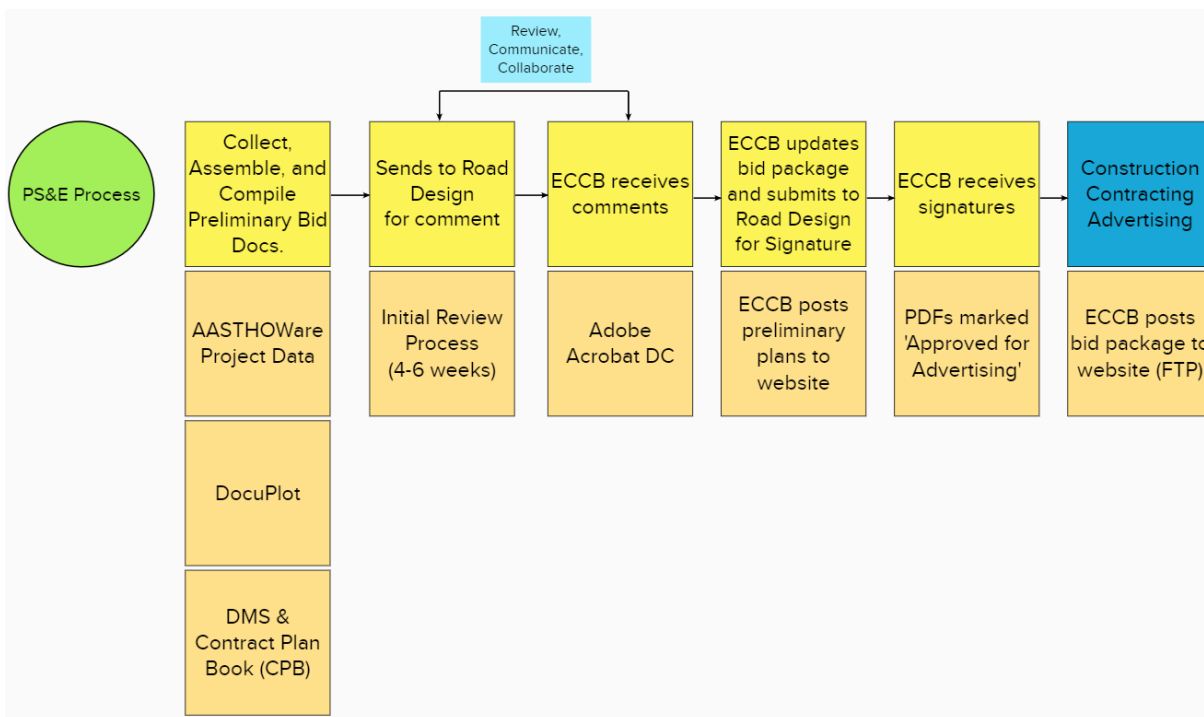
### **ECCB Current Activity Table**

Activity	Solution(s)	Additional Solution(s)
Collect, Assemble, Compile Documents	AASHTOWare	DocuPlot, PCMS, CPB
QTO & Estimates	Manual	
Road Design Review & Comments	Adobe Acrobat DC	email
Road Design Comments – Tracking	Adobe Acrobat DC	email
Bid Package Updates	AASHTOWare	DocuPlot, DMS, CPB, MS Office
Signatures	DocuSign	

### ECCB – Current In House Workflow

The graphic shown below represents our understanding of the current workflow. The graphic was created using an on-line whiteboard during the Discovery Workshop with key bureau staff.

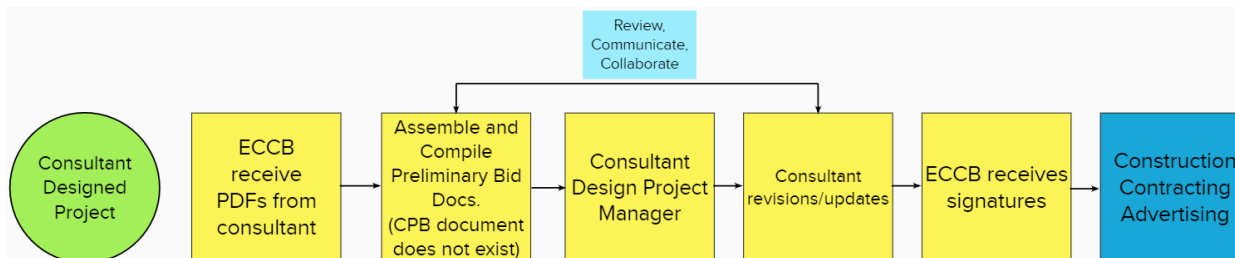
#### Project Initiation – Document Collection and Process:



### ECCB – Consultant Design Workflow

The graphic shown below represents our understanding of the current workflow when consultants are responsible for the design of a project. The graphic was created using an on-line whiteboard during the Discovery Workshop with key bureau staff.

#### Project Initiation – Consultant Design Document Collection and Process:



## DESIRED STATE

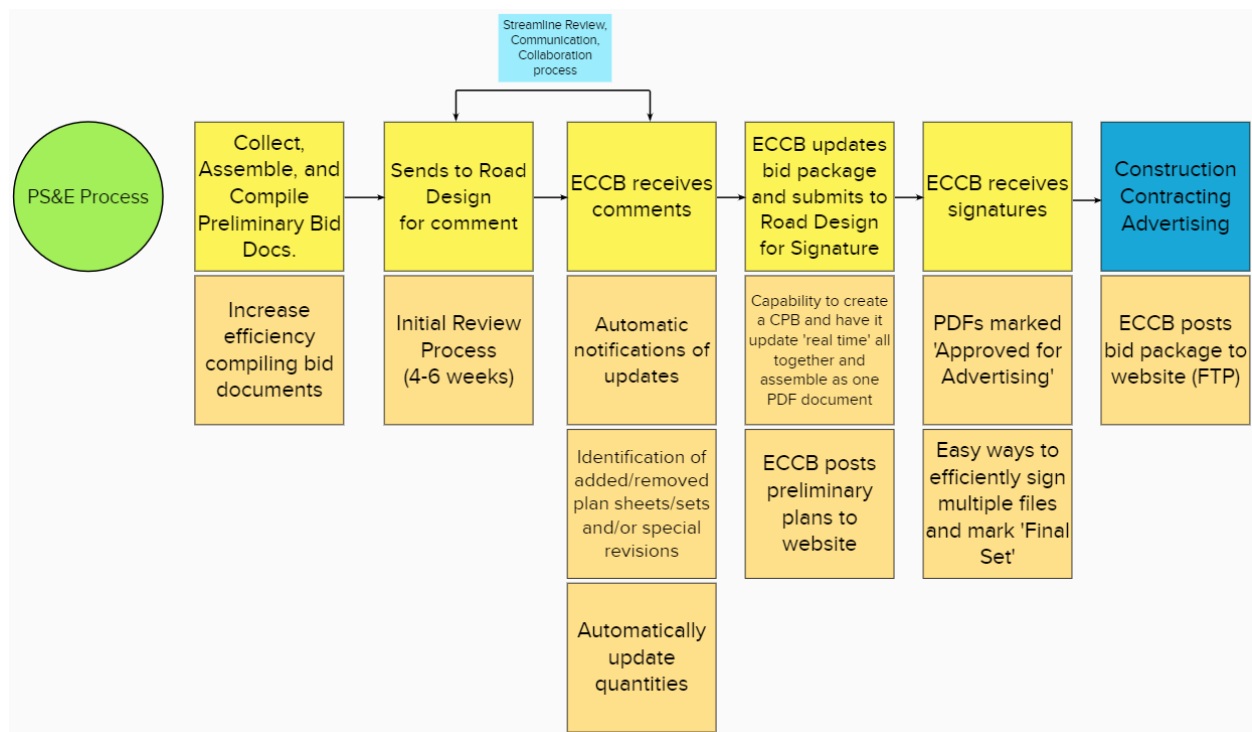
The Desired State section documents information shared by the Engineering Construction Contracting Bureau (ECCB) regarding the future desired workflows, processes, and solutions. While it is understood that not all items shared by the team members during the Discovery Process are addressed within this section, U.S. CAD has identified potential solutions and recommendations to help the ECCB move closer to achieving their goals of increasing efficiency. The potential solutions and recommendations are outlined and located under the Recommendations section of this document.

- Increase efficiency when compiling bid documents
- Increase collaboration efficiency when updates and changes occur
- Notifications of updates – specifically removal/addition of items to plan sets
- Automatically update quantities
- Best way to produce final set

### ECCB – Desired In House Workflow

Workflow Map created using on-line whiteboard during Discovery Workshop

Desired State – Document Collection and Process:





## **Wish List Items**

Below is a list of items that were identified and discussed during the Discovery Workshop as “Wish List” items:

- Automation
  - Automatically update quantities and estimates
  - Automate notifications of updates and changes
  - Capability to update CPB in ‘real time’
  - Efficient way to mark plan sets as ‘Final Set’
- Improve collaboration efforts with MDT functional areas
  - Data with MDT functional areas regarding most up to date plans
  - Awareness of what specifically has been changed/updated to the plans
  - Streamline collaboration/communication with Road Design
- Best way to produce final set.

## RECOMMENDATIONS

Based on the information shared by the Engineering Construction Contracting Bureau (ECCB) through the Discovery Workbook and Discovery Workshop, U.S. CAD has prepared a summary of our recommendations. This information is prepared for you to consider as you make investments in moving toward your goals and objectives. We look forward to the discussions around these recommendations and next steps.

Currently, the ECCB does not utilize CAD software platforms for plan production or plotting. The Bureau could, however, benefit from being made aware of the plotting and reporting tools available within the Autodesk AEC Collection. They will also benefit from a working knowledge of BIM 360 as a document management system and collaboration tool. Having knowledge of the available tools and how they are being leveraged within other MDT bureaus will help bridge the data gap and improve efficiencies between ECCB and other functional areas.

U.S. CAD believes that integrating the ECCB into a BIM 360 workflow with the other MDT functional areas will provide easy access to files required by ECCB for construction contract advertising. The use of BIM 360, and its associated tools, will allow the ECCB to have a central location to collect, assemble, and compile preliminary and final bid documentation.

The utilization of tracking and comparing updated plans within BIM 360 may streamline the process when ECCB needs to be notified of what specific changes have been made to the plans. This will potentially increase efficiencies during the coordination/collaboration/review phase of the PS&E review process. In addition, it will aid the ECCB when tracking changes/updates and assist in managing special revisions. BIM 360 can provide notifications to the ECCB when plan sets are updated, and the utilization of drawing compare tools can be leveraged to identify specific items that have been changed. There are additional features of BIM 360, such as issue tracking, that may enhance efficiency with how the ECCB collaborates and communicates with other MDT functional areas.

U.S. CAD recommends that the Bureaus using the design tools within the AEC Collection utilize the quantity takeoff (QTO) features within the design software. This will enhance the accuracy of quantities when design changes are made, and plans are updated. The QTO information can be provided to the ECCB in report formats that ECCB can consider delivering as part of a bid package. This will allow the ECCB to proceed with confidence that quantities have been accurately captured.

In summary, U.S. CAD recommends establishing a project workflow that incorporates the ECCB PS&E process for construction contract advertising and letting. The utilization of BIM 360, drawing compare, and QTO tools will increase efficiencies throughout the entire organization.

### ECCB Recommended Activity Table

Activity	Solution(s)	Additional Solution(s)
Collect, Assemble, Compile Documents	BIM 360	AEC Collection (Plotting/Publishing)
QTO and Estimates	AEC Collection	
Road Design Review & Comments	BIM 360	
Road Design Comments – Tracking	BIM 360	
Bid Package Updates	BIM 360 & AASHTOWare*	AEC Collection (Plotting/Publishing)
Signatures	DocuSign	

\* Any quantity changes (coming from plan changes) will still need to be updated in AASHTOWare Project for reporting and for creating an addendum to the bid files advertised.

## **Future Considerations**

The ECCB may benefit from a high-level demonstration of what, and how, functional areas are storing data on BIM 360. BIM 360 can be used in the PS&E process between ECCB and the functional areas. There are tools within BIM 360 for issue tracking, comparing files, and version control that the ECCB can benefit from. Understanding how other functional areas are using BIM 360 may enhance the PS&E process for the benefit of the ECCB.

If the ECCB needs the ability to plot PDFs of current plans from the design software, MDT may want to consider giving the Bureau further insight on what functional areas need to do to provide ECCB with the data needed.

## **Next Steps**

Currently, U.S. CAD is still performing review sessions with MDT's functional areas. Upon completion of the review sessions with the other MDT functional areas, U.S. CAD and MDT will begin to determine suggested workflows to begin building a Road Map and Training Plan. Possible training topics for the ECCB may include:

- Plotting to PDF demonstration
- Navigating and using BIM 360
  - Document version control and notifications
  - Mark-up tools
  - Issue tracking
  - Review and Approval process
- Demonstration and/or training of drawing compare tools

During the development of the Road Map, Implementation Plan, and Training Plan, careful consideration of the ECCB workflows will be taken in to account. The ECCB, together with the MDT PMs for this project, should determine the necessity and timing of demonstrations and potential training in the future.