What it was, and what it is – The journey of As-Built plans

Beau Quarles, P.E.
Assistant State Construction Engineer
As-Built Plans - What it was

As-Built Plans

- Construction staff had 2 sets of full size plans in field office
  1. Contract set (for information only/no markups)
  2. As-Built Set
    - Use on Construction revisions
    - Redline markups
  1 half size “working” set
    - Half size was carried in truck and used to redline field changes
  - Construction staff would transfer redlines from half size set to the As-Built set in the field office
  - At end of project, construction staff would submit hard copy of As-Built plans to the District office and mail to General Office for scanning and records
Shop Drawings - What it was

- **Shop Drawings Submittals**
  - Contractor submits 7 hard copies to project staff for distribution
  - Project staff then mails hard copies to appropriate office/offices for review
  - Markups are sent back to project staff

- **Issues with shop drawing submittals**
  - Shop drawings sent through mail carrier or driven to the appropriate office
  - Shop drawings could sit in mail room/on desk for multiple days or weeks before being delivered
  - Contactor could receive up to 7 copies of markups with duplicate markups and have to compile all comments from each copy.
As-Built Plans  - What it is….

- Implementation of Electronic As-Built Plans
  - Starting with December 2017 Letting, all as-built plans will be marked up using Bluebeam and uploaded to ProjectWise.
Bluebeam is a software application that allows users to markup, takeoff, organize, and collaborate with PDF files.

Why Bluebeam
- Integrated with ProjectWise
- Geared towards engineering practices
- User friendly
- Already owned software
Bluebeam License

- First purchase of licenses, October 12, 2015
  - 50 network licenses shared between whole department
  - Mainly used in preconstruction and document markups

- FY 18 had 350 network licenses
  - Shared between whole department

- FY 19 purchased 500 network licenses
  - Shared between whole department
Mobile Devices

➤ Getac Tablet
  • Hardware
    • Purchased 303 tablets for construction staff in 2017
    • Docking station
    • 22 inch monitor
    • Wireless mouse and keyboard for field use
  • Programs
    • ProjectWise
    • Microsoft Suite
    • Bluebeam
    • Google Earth

➤ I-Phone
  • All construction staff provided
  • Hot spot enabled in order to remote connect to network
Electronic As-Built Plans Process

- Construction staff access project plans through ProjectWise.
  - Each project has predefined folder structure for construction documents/plans
  - Connect to network from mobile hot spot
  - Allows staff to redline plans real-time in field if network connection is available.
  - All work is within Bluebeam and uploaded in ProjectWise.
Electronic As-Built Plans Process
Electronic As-Built Plans Process

Measure

The Measure group contains the Measurement and Calibration tools plus quick access to the various measurement modes.

Markup

The Markup group contains menu buttons for adding markups to a PDF.
Stamp revised sheet as “As-Built”
Electronic As-Built Plans Process

- End of project an email is sent to the Engineering Document Management (EDM) staff for processing
  - EDM staff assigns document/plan type
  - Set public access for external viewing
Shop Drawing Review Process

- **Shop drawings submitted through ProjectWise Deliverables**
  - PW Deliverables is cloud-based transmittal/submittal creation, tracking, and management service
  - Tracks receipt and status of submittals
  - Alerts individuals when submittals arrive and are due
ProjectWise Deliverables Management (PWDM) Workflow

**CONSULTANT - Create**

- **Login**
- **New Transmittal**
- **Send for Review?**
  - **NO** → **Issue Transmittal**
  - **YES**
    - **Name**
    - **Recipients**
    - **Documents**
    - **Schedule**

**GDOT - Respond**

- **Receive Email Notification**
- **Open Package**
- **Acknowledge Receipt**
- **Version All Files**
- **Review**
- **Compile Response**
- **Send Response**
- **Move Files to Standard Folder**
  - (New Versions of Files if applicable)

**CONSULTANT – Receive Responses**

- **Receive Email Notification**
- **Login**
- **Open Package**
- **View Responses**
- **Download Responses**

*Downloads from cloud*

*PORTAL: https://www.connect.bentley.com*

*PWE: ProjectWise Explorer*

*1. External_Create Transmittals.pdf*

*2. GDOT_Respond to Transmittals.pdf*

*3. External_Receive Responses.pdf*

*10/27/16*
Shop Drawing Reviews using Bluebeam
Shop Drawing Reviews using Bluebeam

- How are markups/responses combined into one PDF if you have multiple reviewers?
  - Individual identified in ProjectWise Deliverables workflow will combine all responses into one PDF
Combining Markups Into One PDF File Using Bluebeam
Combining Markups Into One PDF File Using Bluebeam

**Markup List Icon**
- Open master drawing
- Open markup list icon
- Click import comments icon
- Select pdfs to import markups from

**Import Comment Icon**

**Markup List**
Changing Individual Reviewer Names

1. Change reviewer name to an Office so Contractor/Consultant doesn’t know individual reviewer name.
Stamping Shop Drawings

➢ GDOT reviewer stamps approved or rejected

DATE: 10/18/2018
These drawings have been reviewed and contain our Review Comments. When these review comments have been properly addressed, please return 1 copies to the Ga. Dept. of Transportation.

Georgia DOT
Office of Bridge Design
By: DDF
Comparing Documents in Bluebeam

- Two options to compare multiple documents in Bluebeam

1. Compare Documents
   - Used to compare two PDFs and highlight the differences in split screen view.

2. Overlay Pages
   - Converts each document to a different color and stacks them on top of each other as layers in a new PDF.
Compare Documents Example
Feedback From Project Staff

**Pros:**
- Expedite review times for shop drawing approvals, traffic control plan submittals, RFIs
- Single submittal with all markups back to submitter for shop drawings
- Reduce the need for paper, scanners, and plotter

**Cons**
- NEW PROCESS – Getting buy in from seasoned staff
- No network access = duplicate work
- Difficult to use in the field
  - Locating correct plan sheets (each sheet is own file in ProjectWise)
  - Viewing tablet due to sun glare
Utilize Bluebeam Studio Session

- Online collaboration tool
- Users can add markups to the same PDF document together in real-time using Studio Sessions, or individually at any time while session in active
- All markup activity is tracked in the Record
- All markups are linked back to the Session PDF
- Built-in chat aids communication during collaboration
- Allow construction and preconstruction reviews to take place remotely and paperless.
Questions