Autodesk Construction Technology for Advanced Work Packaging

Chuck Mies
Sr. Mgr., Business Development

Cody Austin
Technical Solutions Executive

Chris McDowra
WorkFace Planning Manager
Chuck Mies, Senior Manager, Business Development

Chuck is a member of the Autodesk Business Development Team focused on looking at the application of technology to the entire ecosystem of a project, extending from preliminary design through operations and maintenance. In this role Chuck works on a global scale with owners in Industrial and other segments as a resource to assist these clients and the firms that work for them understand the value of Building Information Modeling and the ways to maximize the value of BIM.

Cody Austin, Technical Solutions Executive

Cody is a member of Autodesk’s Technical Solutions Team focused on connecting Autodesk’s solution portfolio with Customer’s challenges, goals and strategic initiatives. He brings with him over 13 years of Industrial Construction experience including 4 Texas Gulf Coast projects with Zachry Group, laser scanning with Hi-CAD/LFM, plant design and engineering with AVEVA and now 6 years in his current role with Autodesk. Cody is also a member of CII RT 344 focused on improving supply chain visibility.

Chris McDowra, WorkFace Planning Manager

Chris is a WorkFace Planning Manager in KBR’s U.S. Construction Business Unit. Chris has over 18 years of Industrial Construction experience on projects across the globe. In his current role as a WorkFace Planning Manager, Chris manages and tracks the planning and field execution of Installation Work Packages and facilitates the project’s RFI, PDN and System Turnover processes.
Advanced Work Packaging
The Autodesk Vision and Areas of Focus
What We’ve Heard

Challenges with Traditional AWP Applications

- Not cost-effective to deploy on small projects
- Deployments take months
- On-premises with high administrative cost
- Paper-based, high latency workflows
- Proprietary standards
- Closed architectures, difficult integrations
- Design system dependent
Autodesk AWP Platform Vision

Key Principles

▪ Scalable (cost-effective on all projects)
▪ Deploy in minutes
▪ Cloud-based and mobile off-line
▪ Real-time, paperless workflows
▪ Industry standards compliant
▪ Robust APIs, many partners
▪ Design system agnostic (S3D, PDS, PDMS, etc.)
Autodesk AWP Platform
Autodesk BIM 360 & Autodesk Forge

Autodesk AWP Platform
- Design Collaboration
- VDC / BIM Management
- Project Management
- Cost Management
- Planning & Scheduling
- Layout & Verification
- Field Management
- Future Workflows

Common Data Platform (CDP)

Foundation Services
- Access Control
- Big Data Platform
- Object Store
- Transfer Avoidance
- Service Message Bus
- Derivative Service
- Translate
- Machine Learning
- Event Services
Our Focus
What is the Autodesk Near-Term Direction

- **AWP Companion** - Increase the return on your legacy WorkFace Planning investment

- **Scalable AWP** - Align the Autodesk platform to scalable AWP processes and workflows

- **Assemble Systems** - Leverage the acquisition to accelerate the Autodesk AWP Platform
AWP Companion
Increase the return on your legacy WorkFace Planning investment
AWP Companion Case Study

Project Approximations

- EPC - $500MM
- Texas Gulf Coast
- 2-Year Construction
- 1M Earnable Hours
- 1M Safe Work Hours
- 1000 Men & Women
- 2000 Tons of Steel
- 4000 Piping Isometrics
- 500 Piping IWPs
- 150 Process Systems
- PDMS, CADWorx, Tekla
AWP Companion Case Study
Model Conditioning & Status Visualization
AWP Companion Case Study
Information Access at the Work Front

- Complete 3D Model
- Work Packages & Test Packages
- P&IDs
- Piping Isometrics
- Detail Drawings
- Instrumentation Data
- Cable Schedule
- 4-Week Lookahead & Plot Plan
AWP Companion Case Study
RFI Initiation at the Work Front

- General Foreman implementation
- Photographic evidence
- Supporting documents
- Description
- Responsible contractor
- Reduced response time
- Simple user interface
AWP Companion Case Study
Paperless System Walkdowns & Turnover

- Paperless system walkdowns
- Punch, sync, done
- Greater context and visibility
- Automated reporting and dashboards
- Faster and smoother system turnover
- Walkdowns in the rain
AWP Companion Case Study
Real-Time Visibility & Automation
AWP Companion Case Study

Impact of Digitization

- Cultural change
- 5D mobilization confirmation
- Increased productivity
- Reduced rework
- Reduction of indirect roles
- Easy RFI = $$$
- Paperless system walkdowns
- Increased construction visibility
- Automated reporting

![BIM 360](image)

**Impact of Digitization**

- 1 Federated 3D Model
- 12,769 Drawings
- 20,270 Tags
- 433 RFIs
- 808 MC Punchlist
- 2,281 Photos
- 10+ Gigabytes

AS OF 9/28/18
“If you use any other product for Advanced Work Packaging, you still need a method to get the information into the field, and that is what BIM 360 allows you to do.”

Connie McLaughlin
Operations Manager
Scalable AWP
Our Observations from the COAA Report and Customer Workshops
Scalable vs. Traditional AWP

What’s different?

- Shorter project lifecycle, typically brownfield
- Repeatable, programmatic approach
- 2D deliverables, may not have a 3D model
- Contractors may not have extensive processes and systems
- Contract strategies may use maintenance contractors
- Packaging requirements & Planner roles may vary
- Owner as Construction Manager

The Challenge
Adapting AWP for projects under $100MM
“There is significant opportunity to apply AWP guidelines for projects under $100 million.”
“As part of the AWP best practice, there are many templates and tools available. However, they may or may not be applicable on smaller projects.”
“90% of our projects do not have a 3D model.”

Customer Quotation
Scalable AWP Customer Workshop
September 2018
Autodesk Scalable AWP Platform
Aligning the Autodesk platform to scalable AWP processes and workflows
Autodesk AWP Platform Vision
Applying BIM 360 to Scalable Projects

- **Scalable** (cost-effective to deploy on all projects)
- **Easy to Deploy** (minutes, not weeks)
- **Cloud-based** and mobile off-line
- **Paperless** – automated and data-centric
- **Real-time**, single-source-of-truth
- **Robust APIs** with extensive partner integrations
- **Design system agnostic** (S3D, PDS, PDMS, etc.)
# Create Work Package

Better Work Package Management with BIM 360

**Autodesk BIM 360 Field**

- Advanced Work Packaging
- Equipment

### Work Package Table

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Create Work Package

Add New Equipment

- Details
  - Location
  - Status
  - Activity ID
  - Constraint Free
  - Discipline
  - Discipline Sub-Type
  - Duration

Work Package:
Installation of Area 401 AG Piping

Location: 401_CWP_PI
Status: Planned
Activity ID: 1234567
Constraint Free: Yes
Discipline: PPE
Discipline Sub-Type: ABOVEGROUND
Duration:

Options:
- Save
- Close
Update Work Package Contents
Add Drawings, Details, etc.

Add file or folder from Library

Add file or folder  Cancel

Selected Document: 401-BBD-5102003-01.pdf

401-BBD-5102003-01.pdf
401-BBD-5102003-02.pdf
401-BO-601001-01-01.pdf
401-BO-601001-02.pdf
401-BWM-410102-01.pdf
401-BWM-6502001-01.pdf
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< Prev  1  2  3  4  5  6  Next >
Update Work Package Contents
Add Drawings, Details, etc.
Update Work Package Contents
Add Materials, Progress, Safety, Specifications, etc.
Update Work Package Contents
Add Materials, Progress, Safety, Specifications, etc.
Update Work Package Contents
Typical Paper-based ITRs / Checklists
## Update Work Package Contents

### Microsoft Excel ITR / Checklist Template Import

#### Checklist Name
- Required
- Controls whether this checklist is visible to any
- Controls whether non-conforming responses on this checklist will

#### Permissions
- Required
- Controls whether this checklist is visible to any

#### Auto Create Issue
- Optional

#### Display Number
- Optional
- Number for the checklist item OR group header.
- Recommend 4

#### Item Text
- Text for the checklist item OR group header.

#### Response Type
- Required

#### Drop-down Answers
- Optional
- If Response Type for a row is Single-Select List or Multi-Select List, fill in
- List answers that will auto-create non-conformances, separated by commas.

#### Default Answer
- Optional
- If filled in, make sure it matches up with a valid answer corresponding to the

#### Answers that create Non-conformances
- Optional

### REMINDER
- Don’t delete or rename columns - the spreadsheet will not import. It is OK to delete the rows below, including the sample data.

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<td>Verify installation is level &amp; plum.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Incorrect line slope</td>
<td>Incorrect line slope</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>5</td>
<td>Verify line slopes are correct per drawings.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Missing reinforcement</td>
<td>Missing reinforcement</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>6</td>
<td>Verify branches are located correctly.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Missing weepholes</td>
<td>Missing weepholes</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>7</td>
<td>Verify branches are reinforced (if required).</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Missing high point vent</td>
<td>Missing high point vent</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>8</td>
<td>Verify weepholes are in reinforcing pads.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Missing low point drain</td>
<td>Missing low point drain</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>9</td>
<td>Verify high point vents are installed.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Incorrect reducer place</td>
<td>Incorrect reducer type</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>10</td>
<td>Verify low point drains are installed.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Blinds missing</td>
<td>Blinds missing</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>11</td>
<td>Verify reducers are correctly located.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Incorrect cold spring</td>
<td>Incorrect cold spring</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>12</td>
<td>Verify the type of reducer is correct.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td>Missing field supports</td>
<td>Missing field supports</td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>13</td>
<td>Verify blinds are installed.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FO-061-ADSK-OC-027all</td>
<td>TRUE</td>
<td>TRUE</td>
<td>14</td>
<td>Verify cold springs are per drawings.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe Support</td>
<td>TRUE</td>
<td>TRUE</td>
<td>15</td>
<td>Verify field supports are installed.</td>
<td>Group Header</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reminder:** If any issues are found, correct them and update the spreadsheet accordingly.

**Important:** Always double-check the checklist items and responses before finalizing the report.

**Note:** Ensure that all relevant columns are filled out accurately to avoid any discrepancies in the final report.
# Update Work Package Contents

Associate ITR / Checklist Templates with Work Package

---

### Installation of Piping Systems

**Craft Supervisor**
- Verify piping is installed correctly.
- Verify material is correct.
- Verify flange rating is correct.

**Owner's Inspector**
- Verify installation is per drawing.
- Verify pipe sizes are correct per drawings.
- Verify branch locations are correct.
- Verify branches are reinforced as required.

**QC Inspector**
- Verify weepholes are in reinforcing pods.
Update Work Package Details

Planned Start / End - Duration
Monitor Work Package Constraints

Manage Constraints
Approve Work Package
Flag Work Package for Approval
Monitor Work Package Constraints

Constraint Free Work Package
Issue Work Package and Execute in the Field
Print Work Package and Deliver to Field
Execute in Field
BIM 360 Field
Paper!
Assemble Systems
Leverage the acquisition to accelerate the Autodesk AWP Platform
Introducing Assemble Systems

Assemble Systems at a Glance

Assemble is a System of Engagement

- Assemble combines and unlocks models, drawings, and point clouds
- Assemble conditions and organizes the data
- Assemble connects to your other construction systems

CONDITION – ORGANIZE
CONNECT
Introducing Assemble Systems

Five Key Areas

- Interactive Dashboards
- Custom Calculations
- Group project reports across organization
- Change management
- Near real-time data

- Cloud based by a browser or mobile device
- No software/no hardware needed
- Ease of use
- Immediately useful/access

- Autosave model updates
- Report by version
- Compare quantities between versions
- Two-way sync with Revit and Excel

- Group/Sort/Filter
- Edit/Create/Import
- Packaging/Coding/Coloring
- Job codes, Cost Codes, Est. Codes, Sub Codes
- Uniformat, CSI, ERP

- Plan rooms
- Estimating systems
- Scheduling
- Project Management
- Documentation
Cloud-Based Model Conditioning
Supplement Engineering BIM Models with Additional Data
Real-Time Status Visualization

Visualize any data in the context of your project model
Primavera P6 Integration

4D Visualization of the Path of Construction
Final Thoughts
Summary

Key Takeaways

▪ Now
  ▪ Autodesk BIM 360 can coexist and extend your current digital AWP process into the field
  ▪ Autodesk BIM 360 is your technology platform for your scalable AWP projects

▪ Next
  ▪ Assemble Systems brings new capabilities around cloud-based model conditioning, status visualization, schedule integration and many other possibilities

▪ After Next
  ▪ Stay Tuned, More to come!