The start of something

October 3rd, 2018

Innovation, Technology & Capabilities for Access
Agenda

• Introductions
• BrandSafeway Info
• AWP/WFP Journey
• Our Approach
  - BrandNet, in-house tool
  - Challenges, current processes
  - Work Face Planning (WFP) / Adv. Work Pkg. (AWP)
  - Modeling / Laser scanning
  - Sample uses and illustrations
Company Overview

- Strong financial partner
- Healthy capital structure
- 8,000 jobsites in 30 countries
- $2.5B+ in rental fleet
- Industry-leading safety culture and performance
- More than 32,000 employees
- Brodest integrated soft-craft services
- 75M+ labor hours of integrated soft-craft service

2017 ENR Rankings

- #1 TOP 20 Firms in Painting
- #3 TOP 20 Firms in Concrete
- #4 OVERALL RANKING

Years Experience

- 100+ ACCESS
- 75+ COATINGS
- 50+ INSULATION
What were doing...

Some Key Items

- Primary focus, Energy & Industrial
- Applications in Refining, Chemical, Power and more....
- Scaffold budget issues (2X, 3X) that we can help solve....
- Using industry tools, our IP, BrandNet®, PM/Control, 3D Models to apply AWP/WFP concepts in Capital, Outage, Maintenance
- 3 Key Areas, leveraging AWP/WFP:
  - Identifying strategy/constructability improvements for better performance vs. more hours...
  - Integrated planning opportunities, reducing modifications, rebuilds
  - Construction Management opportunities to pre-kit, better plans, improve performance directly safety, schedule, cost...
- Reducing overall hour spends, improving access users safety and productivity directly and indirectly
- Better value for our client’s, margin opportunities
Resourcing AWP/WFP

Overview of our approach

- SME Team for Implementations, Key Projects, Backstop
  - AWP/WFP processes
  - Systems, integrations
  - Client requirements
  - Our processes
- Boilerplate successes, improve, iterative
  - Our team
  - Client team
- Create local resources via implementations…
  - Field culture
  - WFP resources
  - Systems…
- Local/Project Ownership just like Safety….inherent in what we do all day, everyday
- Industry training, our processes
- Making it scalable…
Let’s Do Something Together

AWP/WFP Journey
Challenges, issues, approaches

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Work to Date on AWP/WFP

Some Key Items

- COAA, AWP/WFP Conference, Committee
  Work…couple of decades now…
- Behind the scenes, learning the leading software packages, systems, making sure we can integrate…
  - Bentley
  - SmartPlant
  - Autodesk, Others
- Internal training, resource development…
  - Formal WFP
  - Systems
- Software, hardware, development…
  - Access
  - Insulation
- Pursuing clients to engage us in the process, learning, teaching others…
Recognizing the Can’t methods/actors in Implementations

Some light-hearted samples our team has come up with…fear of change is real

- **Cant-o-potamus**
  Person who won’t budge in regards to change typically, says they can’t before they try

- **Cant-a-lope**
  Person who runs from change, you can hear them yelling we can’t as they top the hill

- **Cant-a-saurus**
  Person or persons who yell loudly at change efforts claiming they can’t

- **Cant-fused**
  People who sabotage, slow walk change because they can’t

- **Cant-glomerate**
  A large group or project team who stick together to say they can’t

- **Cant-a-geddon**
  People who predict the end of the world because they can’t

- **Cant-tankerous**
  People who feel like they are not subject to the change effort and say it can’t be done…in a grumpy way…
Overview

• Challenges for a soft craft provider are many trying to work in the AWP environment….

• Requires substantial investments: systems; people; learning curve; etc..

• Variability in application of AWP approaches project to project, client to client…

• Investment direction hard to determine…

• Most clients and EPCs are still early in the maturity model of adoption of AWP, even WFP….focus is on metal crafts, not others…
# AWP Model

## Discipline Budget/Plan

### Project Conceptual DFL Hours-Sample

<table>
<thead>
<tr>
<th>Craft</th>
<th>Hours</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piping</td>
<td>575,000</td>
<td>36.1%</td>
</tr>
<tr>
<td>Electrical</td>
<td>225,000</td>
<td>14.1%</td>
</tr>
<tr>
<td>Equipment</td>
<td>100,000</td>
<td>6.3%</td>
</tr>
<tr>
<td>Structural</td>
<td>150,000</td>
<td>9.4%</td>
</tr>
<tr>
<td>Insulation / EHT</td>
<td>100,000</td>
<td>6.3%</td>
</tr>
<tr>
<td>Scaffold</td>
<td>242,500</td>
<td>15.2%</td>
</tr>
<tr>
<td>Fireproofing</td>
<td>100,000</td>
<td>6.3%</td>
</tr>
<tr>
<td>All Other</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td><strong>Target Hours</strong></td>
<td><strong>1,592,500</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

- % Aligned with Company's AWP Systems, Processes, Tools: 59.7%
- % Other: 40.3%

Some projects experience Scaffold DFL% >30%

Positioning to facilitate our client’s ability to AWP/WFP more services
IWP

1. Cover page
2. Table of contents
3. Sign off sheets – review and completion
4. Constraint list & verification of constraint mitigation
5. WorkFace Planner’s report:
   • Scope
   • Interdependencies
   • Task list (detailed)
   • Resource requirements
   • Man hour allocation
   • Specialty tool requirement form
   • Equipment requirement form
   • Scaffold request form
   • Bill of Materials
6. QC documents and requirements
7. HSE requirements and documentation

Scaffold is a constraint…..but required in most scopes
High level overview, today’s topic

Optimization Planning

- Reduced hours, re-builds, mod.'s
- Better approaches...
- Accountability of users...
- Better baseline

Execution Optimization

- Plan to work to...
- Basis for Project Control
- Treated as a discipline...

Approved
High level overview, today’s topic

AWP/WFP leveraging BrandNet, Models, 3d Scans

BrandNet

3d Model Integration

Laser Scanning

Work Packages

Access Optimization

Virtual Planning

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Let’s Do Something

BrandNet

Program Basics, Key enabler for AWP/WFP

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Together
BrandNet - *Scaffold Industry’s Most Advanced Software*

**Scaffold Design**
- Supports numerous systems, flexible
- Designs with simple parameter inputs, 2d/3d outputs
- Accommodates any configuration, design/change...deck levels, guardrails, ladders, toe-boards, cages at various heights

**Estimation / Planning / Model Integration**
- Detailed Material and Labor costing estimates at project and scaffold Level, work packaging
- Tie designs to budgets, same system (labor and materials)
- Standalone planning capability or integrate with Primavera
- Integrated offering with Smart3D™ & Navisworks FEED and Execution opportunities

**Materials Management Support**
- Materials management tied to designs, budgets and plans.
- Material forecasting, based on FEED, validated through execution, control, time phased...
Let’s Do Something Together

Access Optimization
Strategy, Integrated Planning, Construction Management
Access Provider’s Perspective

Current Issues and Results

Access Costs

Provider Can’t Overcome (Alone)

Summary of Issues
- Baseline (% of DFL), inaccurate
- Access plan & process, lacking
- Access user accountability, non-existent
- Multiple users & plans, scaffold not treated as a discipline
- Excessive modifications & multiple scaffolds, reality

Typical Engagement, Areas of Opportunity

Feasibility
- Concept
  - Strategy / Constructability
    - 5%-10%
  - Planning
    - 10%-20%

FEED
- Early
  - 5%-10%
- Mature
  - 10%-20%

Contract
- Award
  - 5%-10%

Field
- Plan
  - Construction Mgt. / Execution

Early-in, AWP/WFP Approach
- 3 key areas of opportunity to add value
- Typically, we have only one
- Earlier engagement adds value
- Better approaches, reduce waste, improve productivity
- Workface Planning approach
Access Optimization Process

Baseline Planning – Case Study

• New unit build, early FEED
• Reviewed current model, current scopes with key construction and engineering stakeholders
• AFE was supported by process, ultimate RFQ for this service as well
• Known scopes clearly documented, process for contingencies

Work Pkg. Cover

Materials Data

Drawings

Detail Views
Workface Planning/Work Packaging

Translated, What We’re Doing

- **Strategy / Constructability**
  - Better or innovative ways to accomplish
  - Improve Safety, Quality, Productivity
  - Reduce hours, # of Access required

- **WFP/Planning**
  - Align access users needs at workface
  - Reduce modifications, re-builds
  - Reduce waste/stand-by, improve user’s productivity

- **Construction Mgt. / Execution**
  - Visual work package
  - Reduce waste, crew stand-by
  - Allow for planning prior to workface
  - Pre-kit materials
  - Improve safety, quality, & productivity
Detailed Scope Id. / Capture

Identifying and Optimizing the Access Example

- Typical access by access process
- Identify areas where multiple scaffolds can be combined
- Areas where small scaffolds can be customized to meet multiple user needs
- Access that can be re-sized to meet multiple users needs

**Typical Activity by Activity**

<table>
<thead>
<tr>
<th>Item</th>
<th>%</th>
<th>Hrs</th>
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</thead>
<tbody>
<tr>
<td>Tool Time</td>
<td>50%</td>
<td>75</td>
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<tr>
<td>Travel</td>
<td>10%</td>
<td>15</td>
</tr>
<tr>
<td>Logistics</td>
<td>20%</td>
<td>30</td>
</tr>
<tr>
<td>Safety</td>
<td>10%</td>
<td>15</td>
</tr>
<tr>
<td>All Other</td>
<td>10%</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td>100%</td>
<td>150</td>
</tr>
</tbody>
</table>

**WFP Approach**

<table>
<thead>
<tr>
<th>Item</th>
<th>%</th>
<th>Hrs</th>
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<tbody>
<tr>
<td>Tool Time</td>
<td>75%</td>
<td>67.5</td>
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<tr>
<td>Travel</td>
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<td>Logistics</td>
<td>10%</td>
<td>9</td>
</tr>
<tr>
<td>Safety</td>
<td>5%</td>
<td>4.5</td>
</tr>
<tr>
<td>All Other</td>
<td>5%</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td>100%</td>
<td>90</td>
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Workface Planning, MAP Approach

Leveraging Planning/Execution

- Productivity versus historical baseline
- Cost of that productivity in terms of crew rate / crew mix
- Quality/Waste Metric in terms of Scaffold Modifications, illustrating implementation of weekly workface planning...

As-Is Process | WFP Process

Mod Rate Index WTD / JTD

Quality-Modifications

Cost of Productivity

Productivity

Labor Rate WTD / JTD

- Productivity versus historical baseline
- Cost of that productivity in terms of crew rate / crew mix
- Quality/Waste Metric in terms of Scaffold Modifications, illustrating implementation of weekly workface planning...
3d Survey, Laser Scanning

• In-house team, deep capabilities
• As-built point cloud models and bubble view images
• Supports older non-3d model facilities, substantial variations in original design as-built
• General purpose and critical scopes
• Data used by numerous stakeholders
  • Craft
  • Planning
  • Safety
  • Operations
  • Procurement
• Virtual planning, capture measurements, provide mark-up
• Virtual facilities are the future

Uses:
• Virtual Planning
• Measure
• Volumes
• Mark-up/Meta Data
Work Package - sample

Location Data

Scaffold Data

Image

Scaffold in Workface

Location in Plant

Material Data

Design Data

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Standalone or Enhanced Scope Development Process

Enhanced Scope and aligned Work Package
SoCal DCU Unit – Sample Work Pack

Cover Sheet

Resources

As-built Visual, Summary Data

Materials, Labor

Construction Support
Results, Proof Point, recent TA

WFP Results

• Pre-TA
  • Pre-kitted 98%, reducing non-tool time
  • 94% of scopes built in Pre-TA

• TA Window
  • Early planning and scope mgt. reduced TA window headcounts, budgeted hours

• Post-TA
  • Scope balance, clear and concise
  • Re-budgeted, eliminated substantial P6 slack
  • Tight performance based on JTD parameters, tightened estimate

Safety

<table>
<thead>
<tr>
<th>Near Miss</th>
<th>1st Aid</th>
<th>Rec</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
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Productivity

<table>
<thead>
<tr>
<th>Data</th>
<th>Pre</th>
<th>TA</th>
<th>Post</th>
<th>TTL</th>
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<tr>
<td>Earned</td>
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<td>20,580</td>
<td>15,520</td>
<td>47,061</td>
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<tr>
<td>Actual</td>
<td>8,221</td>
<td>15,780</td>
<td>15,183</td>
<td>39,184</td>
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<tr>
<td>PI</td>
<td>1.33</td>
<td>1.30</td>
<td>1.02</td>
<td>1.20</td>
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</tbody>
</table>
Everyone plans...for their plan....

AWP/WFP is the common denominator, same plan...

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Next steps...questions...

Future for our team...

- Making WFP the Norm, AWP capabilities...
- Continued use of Virtual Planning mediums
- Adding additional services to the process, Insulation, Coatings and more

Questions, Follow-ups

- Questions
- Actions
- Information

Visit our booth and team for demonstrations, detailed information