Industrial Project Success:
Utilizing Virtual Design Technologies in Lean Construction

LCI Webinar Series

September 2016
Introductions

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Visit BMWC at Booth #26
“Safety for Life”

Safety Moment

“INDUSTRIAL-STRENGTH CONSTRUCTION”
Today’s Agenda

- Corporate Overview and Lean Journey
- BMWC’s Virtual Design Capabilities on Lean Projects
- The Role of Virtual Design in a Lean Project
- Bringing it all Together: C3 Tower Setting in an Active Refinery
Since 1955

1500 Full-Time Employees

$300M Annual Revenue

14 Direct-Hire Services

“INDUSTRIAL-STRENGTH CONSTRUCTION”
Utilizing Virtual Design in Lean Construction Delivery

- Dimensional Control Integration
- 3D Laser Scanning
- 3D Detailing
- Clash Detection
- Reverse Engineering

- Design Assist
- Construction Visualization
- Spool Drawing Generation
- 3D Modeling
- Construction Layout
- Industrial BIM

“INDUSTRIAL-STRENGTH CONSTRUCTION”
Technology Used

- 3D Laser Scanner
- Robotic Total Station

- Augmented Reality
  - Mobile Devices

- Immersive Technology - VR
  - Oculus Rift
  - HTC Vive
### Benefits of Virtual Design in Lean Construction

BMWC Virtual Design Group provides Lean benefits in the following areas of construction:

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<th>Safety</th>
<th>Production</th>
<th>Project Lifecycle</th>
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<tr>
<td>Reduced Time on Site</td>
<td>Reduced Site Visits</td>
<td>Efficient Data Acquisition</td>
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<td>Gather Information Remotely</td>
<td>Minimized Field Welds</td>
<td>Minimized As-Built Modelling</td>
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<td>Reduced No. of Technicians</td>
<td>Improved Coordination</td>
<td>Reduced Design Review Time</td>
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<tr>
<td>Quality</td>
<td>Production</td>
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<td>Lower Rework Rates</td>
<td>Efficient Data Acquisition</td>
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<td>Improved Dimensional Controls</td>
<td>Minimized As-Built Modelling</td>
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<td>Improved Execution</td>
<td>Improved Coordination</td>
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"INDUSTRIAL-STRENGTH CONSTRUCTION"
Lean Project Delivery

Example Project

- Refinery Customer
- April 2016 Turnaround
- Replacement of Existing Tower Unit
- Set the standard going forward for all Tower Installs
Lean Project Delivery
3D Scanner Point Cloud
Lean Project Delivery
Segmentation and Modeling
Lean Project Delivery
Segmentation and Modeling

“INDUSTRIAL-STRENGTH CONSTRUCTION”
Lean Project Delivery
Virtual Installation
Lean Project Delivery

- Precision Anchor Bolt Alignment
- Shim Pack Calculations
- Tie-In Verification
Lean Project Delivery: Completed Install

Lean Install removed waste and improved:

- Safety
- Quality
- Production
Thank You

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