

# Welcome to today's McCarthy Webcast

## BIM 360 Field Start-Up & Commissioning *Water and Waste Water Treatment Plants*

Presenter: David Heyde

# About the Presenter

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- Over 30 years experience
- Hard bid, design-build, CMAR
- Construction manager and Owner's Representative on the construction of several Wastewater Treatment Plant Expansion Projects.
- Development and Implementation of best practices for start-up, commissioning and plant turn-over for BIM 360



**David Heyde**  
LEED AP BD+C

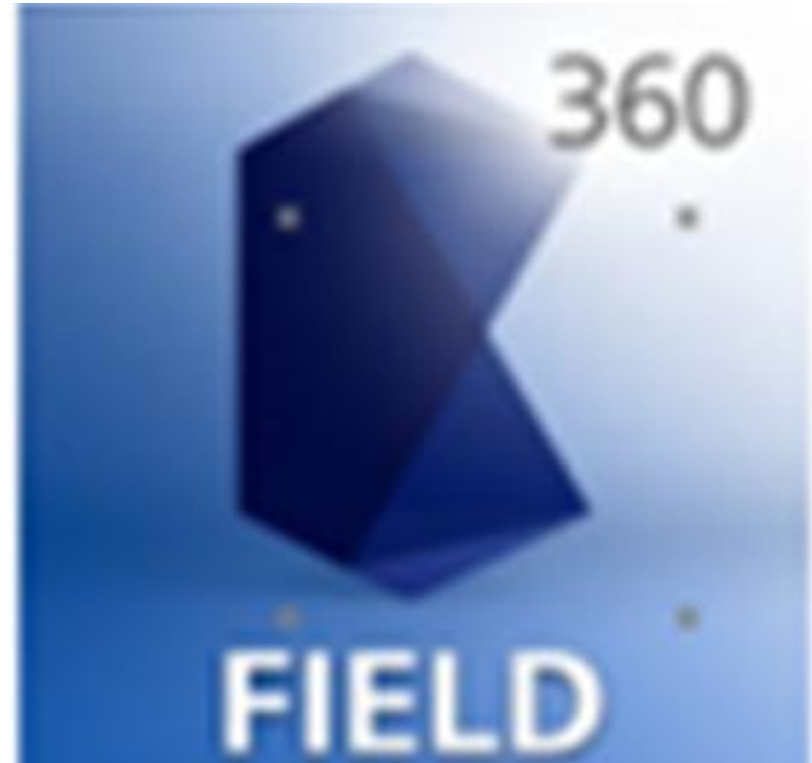
# McCarthy Building Companies

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- 55 Water and Wastewater Treatment Plants completed in the Southwest
- Over \$1.5 Billion in Project
- Markets served: AZ, CA, NV, CO, NM, and TX

# Start-up and Commissioning BIM 360 Field

- Start-up planning during pre-construction
- Phased implementation processes throughout construction
- Developing installation checklists for sub-systems for checkout and commissioning installation and testing
- Identifying performance testing requirements for equipment and process systems
- Planning functional testing programs from original design phase to on-line testing
- Preparation planning for the final plant operators turn-over



#### **Poll Question:**

How many people are familiar with BIM 360 Field?

- Never heard of it
- Familiar with it but never used it
- Have used it on a project

***SUBMIT response***

# MWRD South Secondary Improvements

PAR 1085





# MWRD South Secondary Improvements

PAR 1085 – Overall Site



# Chandler Airport Water Reclamation Facility Phase 1, 2, 3





# 91st Avenue UP05 WWTP Expansion Project B



# Identification Coordination

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## Mechanical, Electrical, Instrumentation Drawings

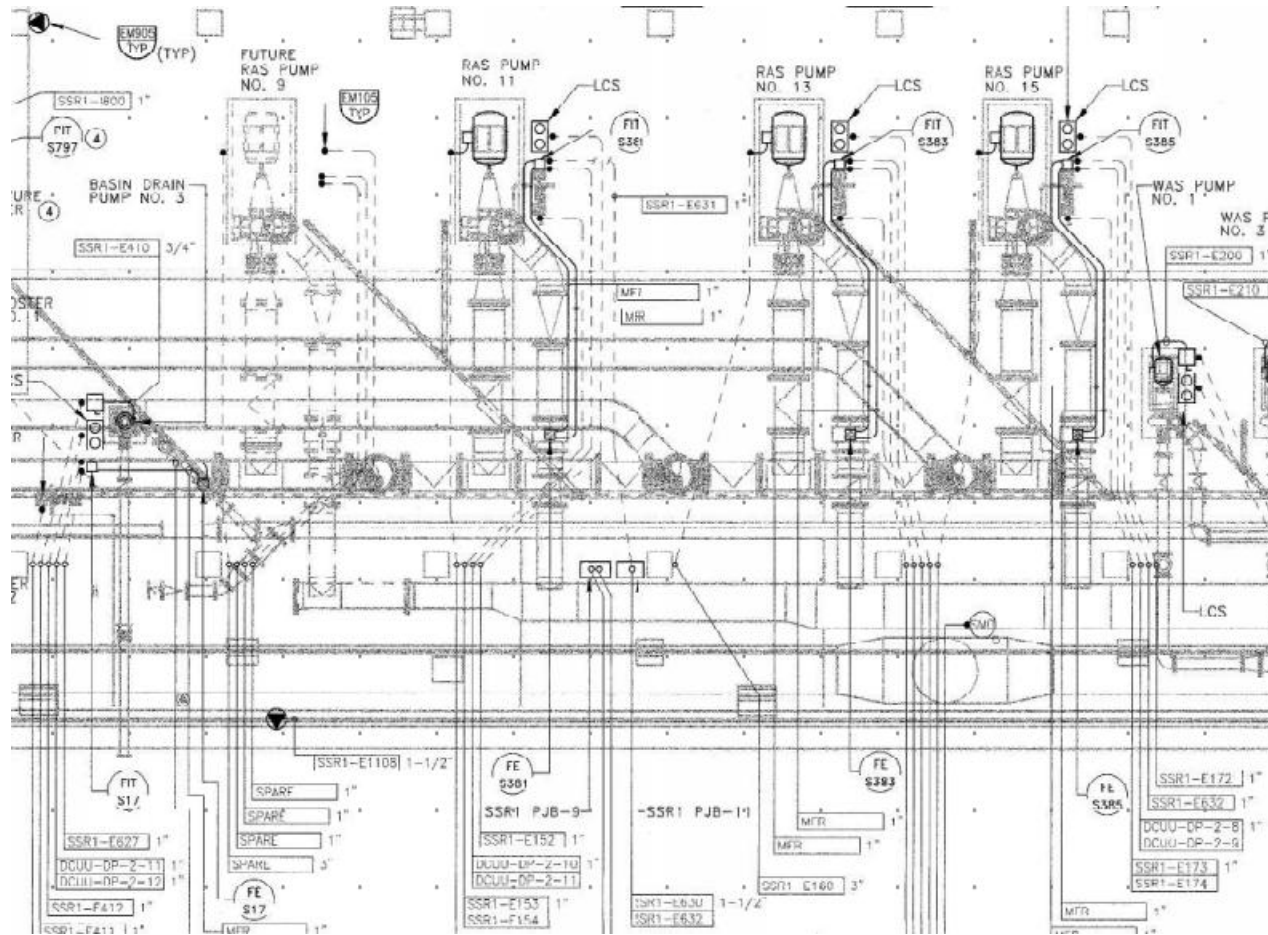
**Poll Question:**

During Start-up and Commissioning what is the most challenging factor?

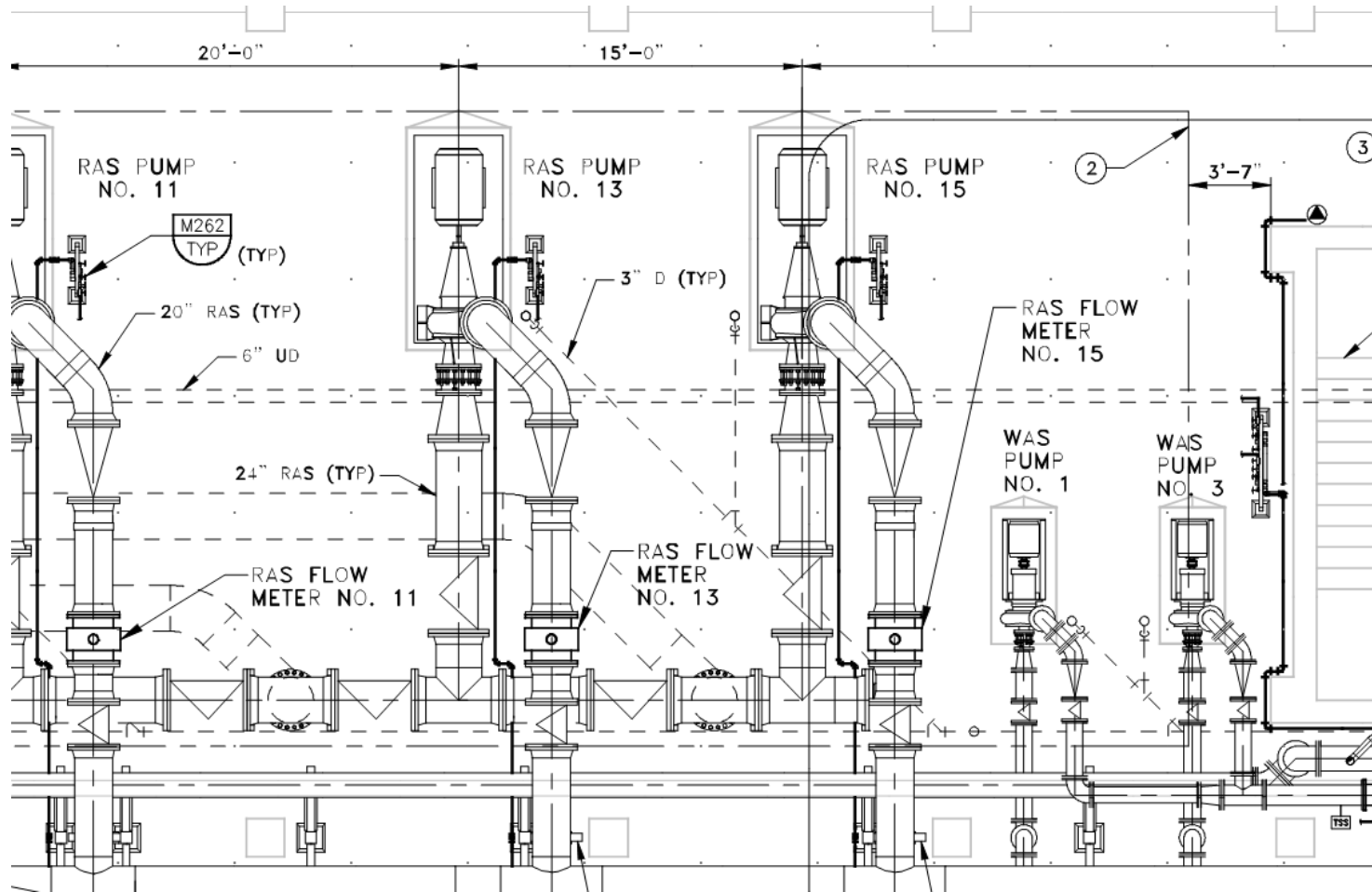
- Quantity of items to verify
- Coordination of contract documents
- Schedule

*SUBMIT response*

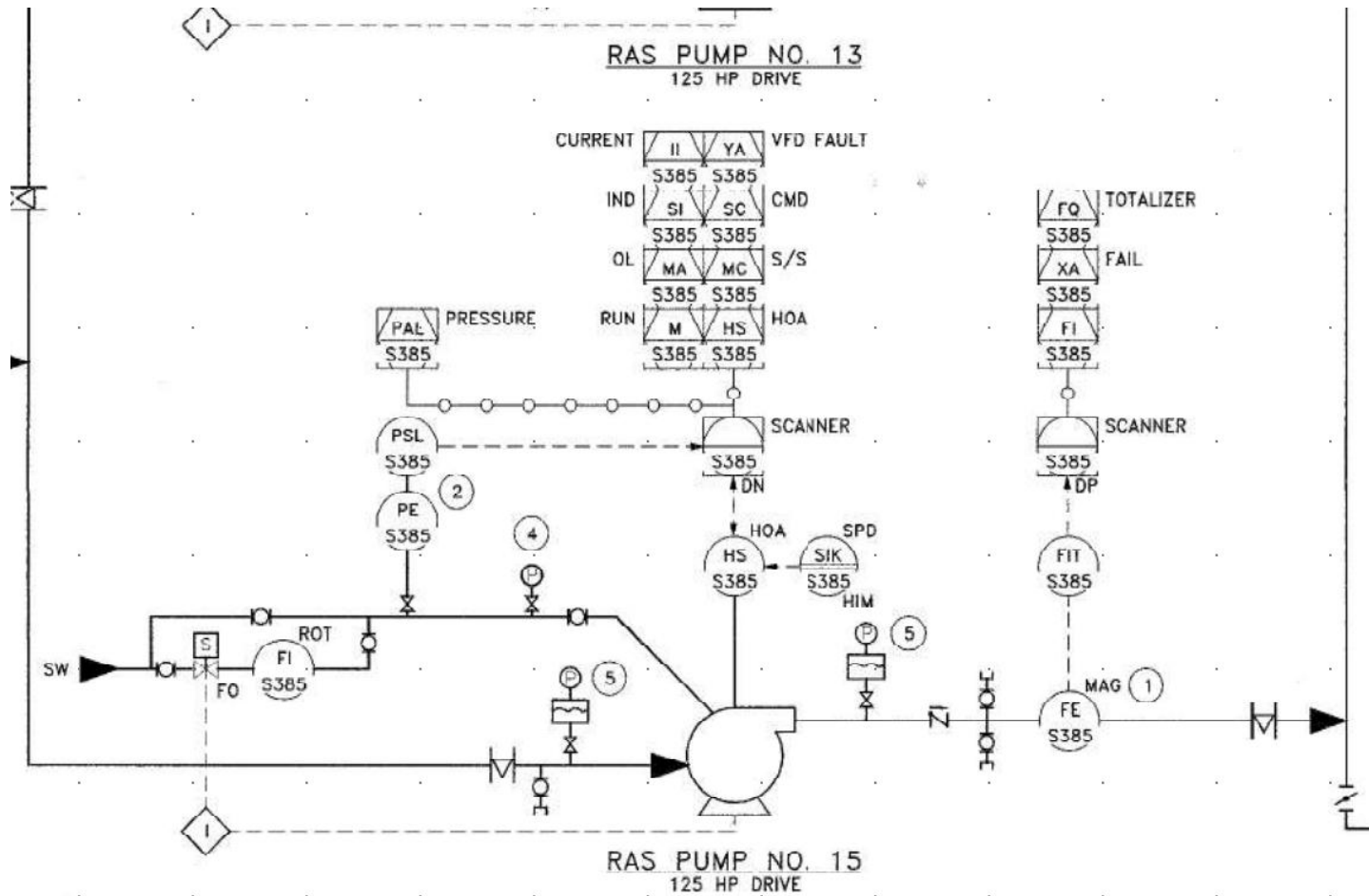
# Electrical Drawings

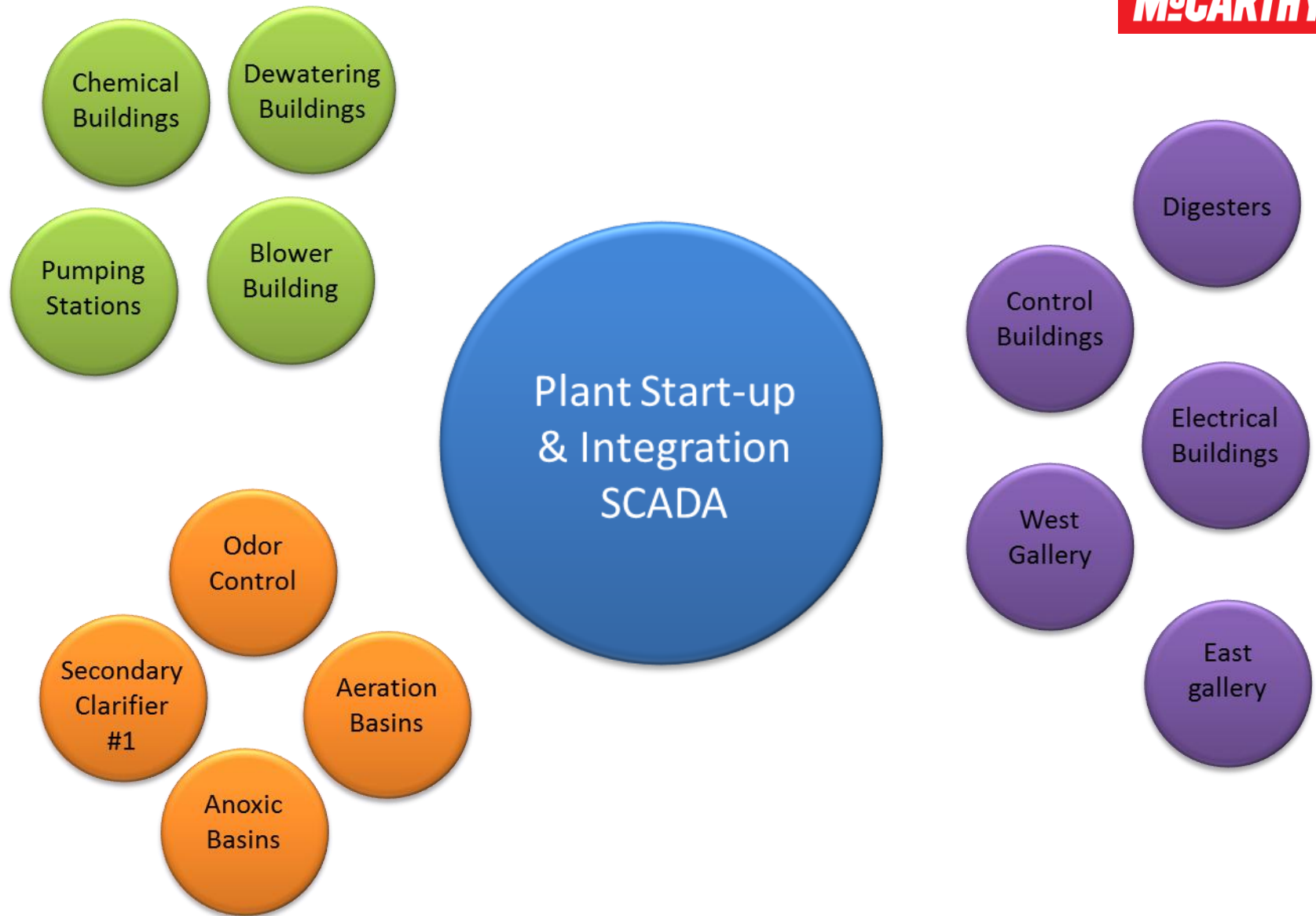


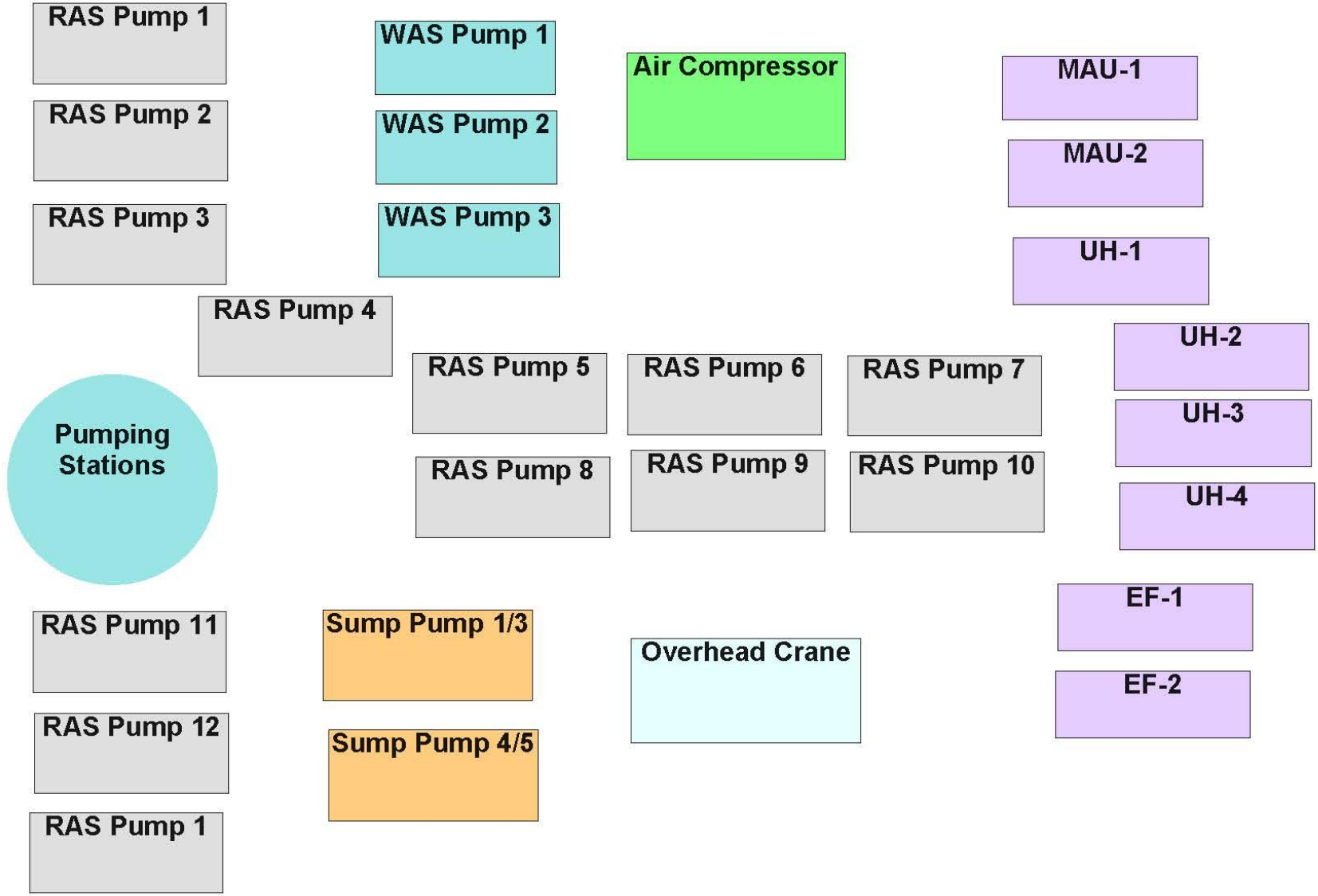
# Mechanical Drawings



# Instrumentation Drawing







# RAS Pump 11

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- Installation
- Alignment
- Grouting
- Coupling
- Bumping
- Pipe Testing
- Pipe Flushing
- Suction Pressure Gauge
- Discharge Pressure Gauge
- Seal Water Solenoid Valves
- Rotometer
- Air Release Valve
- Inlet Valve
- Discharge Valve
- Valve Actuators
- Flow Meters
- Performance Testing
- Noise Testing
- Vibration Testing
- Manufacturer Certificate of Installation and Operation
- Run Tests
- Local Start/Stop
- Remote Start/Stop
- Electrical Tests
- VFD Tests



# Plant Start-up

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## Sub Systems

|                             |         |
|-----------------------------|---------|
| Total Number of Sub Systems | 24+     |
| Total Number of Activities  | 10,000+ |

## Contributor's

|                        |     |
|------------------------|-----|
| Contractor             | 10+ |
| Subcontractors/Vendors | 25+ |

|                                    |     |
|------------------------------------|-----|
| Engineers/Owner Representatives    | 12+ |
| Excel Spread Sheet Original Copies | 1   |

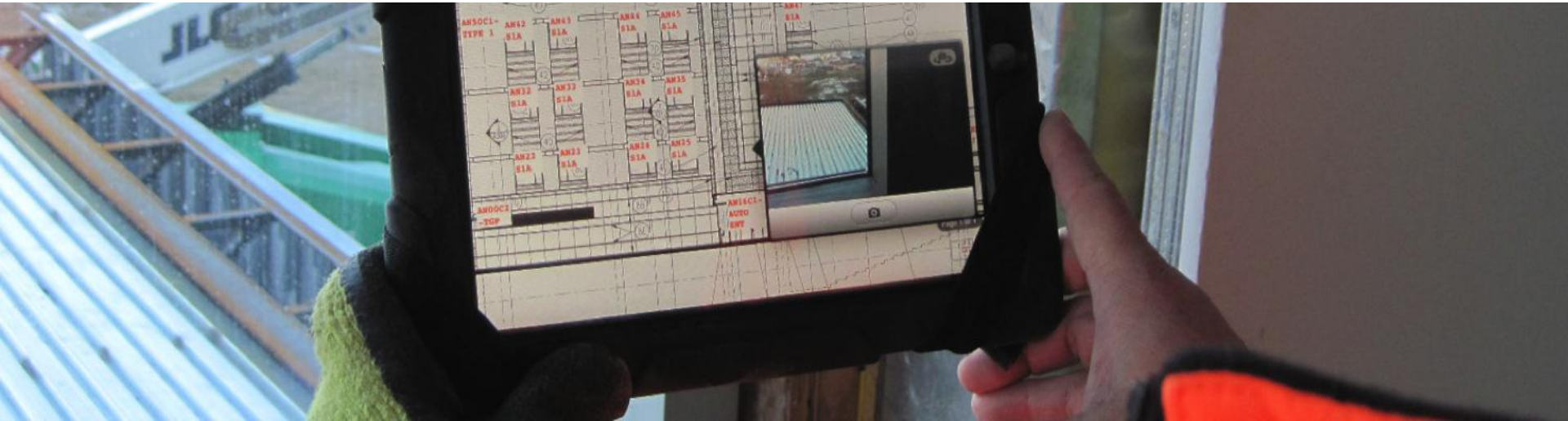
# RAS Pump No. 13

| ITEM    | DEVICE          | ITEM                     | QUALITY TEST FORM/DESCRIPTION OF TANK  | RESP          |
|---------|-----------------|--------------------------|--|---------------|
| RS13-09 | RAS Pump No. 13 |                          | VFD West RAS Pump No. 13 tests complete-West RAS PS Control Building 1   | MWRD          |
| RS13-10 | RAS Pump No. 13 |                          | ORT 2 DeviceNet West RAS Pump Station Control Building 1 Complete  | MWRD          |
| RS13-11 | RAS Pump No. 13 |                          | ORT 2 for DPI West RAS Pump Station Control Building 1 Complete  | MWRD          |
| RS13-12 | RAS Pump No. 13 | Pipe Test                | 20", 24", 30", 36", 48", 72" RAS Pipe Tests  | WSMC          |
| RS13-13 | RAS Pump No. 13 |                          | Clarifiers available to be filled with water for source of testing for RAS Pumps. Will need pump system set up to replenish/maintain water in clarifier for testing  | MWRD          |
| RS13-14 | RAS Pump No. 13 |                          | Aeration Basin available to pump water to  | MWRD          |
| RS13-15 | RAS Pump No. 13 |                          | source   | WSMC          |
| RS13-16 | RAS Pump No. 13 |                          | seal water   | Flowserve/MWI |
| RS13-17 | RAS Pump No. 13 |                          |  | AmWest        |
| RS13-18 | RAS Pump No. 13 |                          | pressure   | WSMC          |
| RS13-19 | RAS Pump No. 13 |                          | tes  | Flowserve/MWI |
| RS13-20 | RAS Pump No. 13 | Performance Test Level 2 | Test 2 hrs minimum for flow and head at rated conditions. Test flow at 2 additional pts, 1 at 25% below the rated flow and 1 at 10% above the rated flow. Record measured flow, suction pressure, discharge pressure, bearing temperatures and noise level at each condition | Flowserve     |
| RS13-21 | RAS Pump No. 13 | Noise Test Level 1       | Measure unfiltered overall A-weighted sound pressure level in dBA at 3 feet horizontally from the surface of the equipment and at a mid point of the equipment height.   | Flowserve     |
| RS13-22 | RAS Pump No. 13 | Vibration Test Level 2   | Measure filtered vibration spectra versus frequency in 3 perpendicular planes. Unfiltered Overall Limit (inches per second) .22/Any Filtered Peak Limit (inches per second) .18  | Flowserve     |
| RS13-23 | RAS Pump No. 13 | Bearing Temperature      | Record Bearing Temperature (ref. specification section 15050 and temperature protection requirement of max. 120 degrees as noted in 15050 2.07.  | Flowserve     |

**Poll Question:**  
 What have you used on a project for record keeping and keeping track of start-up items?

- Excel spreadsheet
- Memory
- Other

*SUBMIT response*



# BIM 360 Field Features

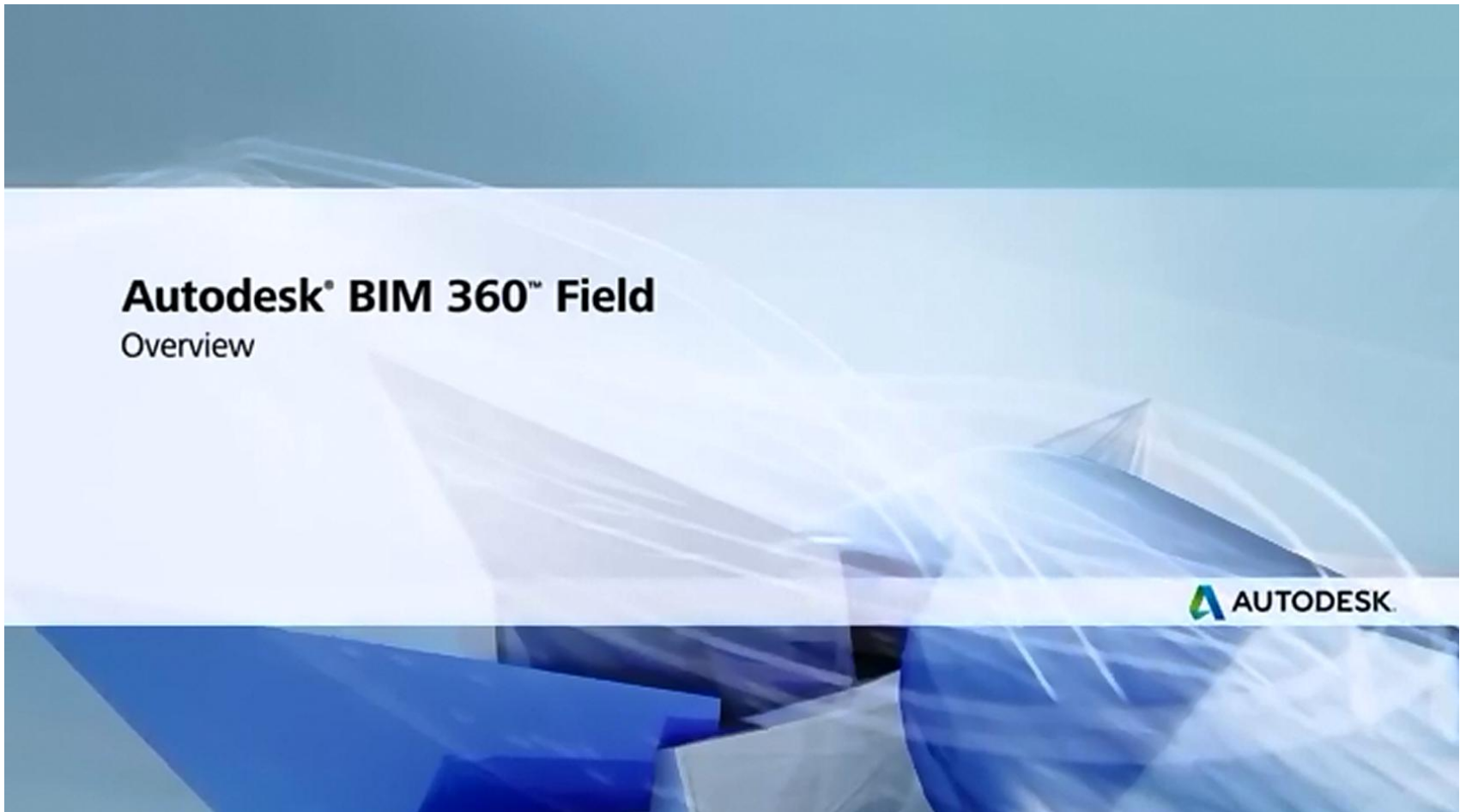
# BIM 360 Field

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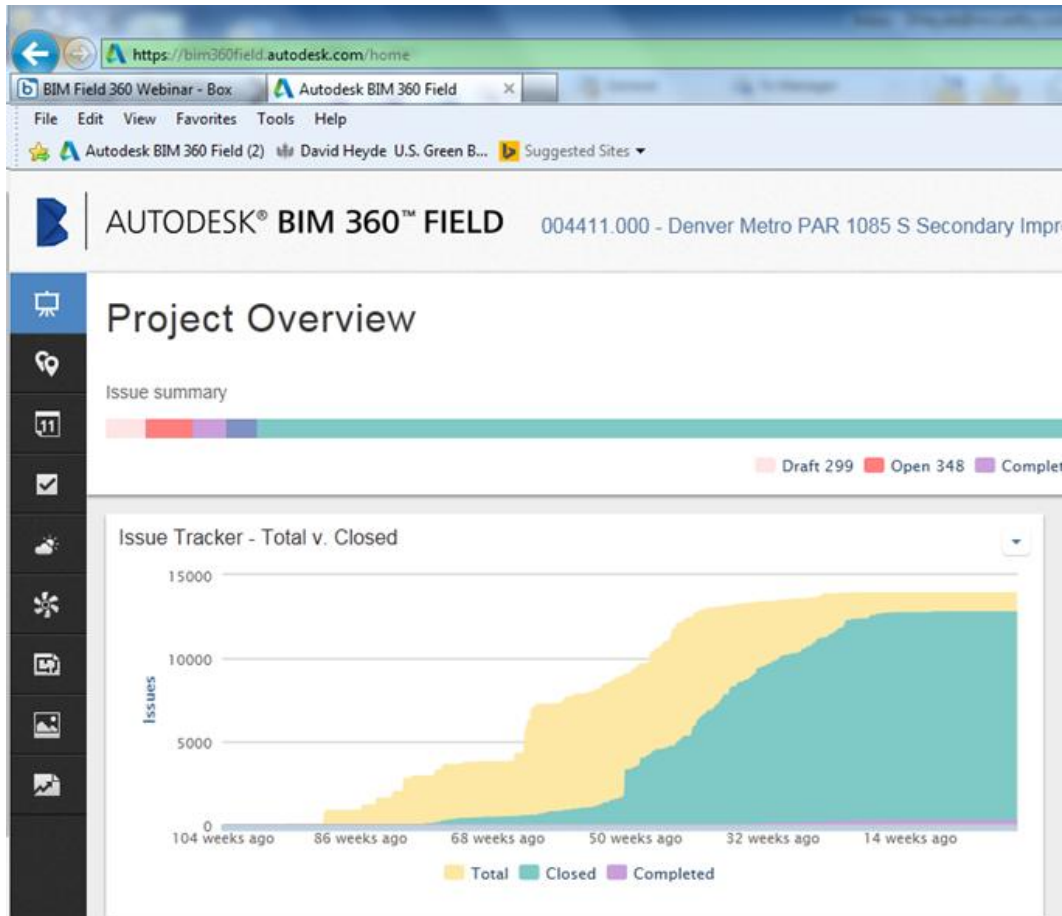
- Web based
  - Access from almost anywhere
  - Instantaneous
  - Tracking
  - Accountability
  - Easy Reports
  - Status of Completion
-

# BIM 360 Field

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# BIM 360 Field Web Interface



**BIM 360 Field Project Overview Screenshot**

# Tracking of Status Forms

| W RAS PS >11-RAS PMP No. 3 (24 issues)                    |   |                 |  |                                       |               |
|---|---|-----------------|--|---------------------------------------|---------------|
| Issue ID  | Description   | Location Detail | Status   | Company                               | Type          |
| 010781  | RAS Pump No. 3 ORT 2 for DP1 West RAS Pump Station Control Building 1 Completed |                 | Closed   | Metro Wastewater Reclamation District | Commissioning |
| <u>Comments</u>   |   |                 |  |                                       |               |
| David Heyde (dheyde@mccarthy.com) 04 Oct 2014 2:19 PM     |   |                 |  |                                       |               |
|   |   |                 | Closed   |                                       |               |
| Brian Ream (bream@carollo.com) 01 Oct 2014 4:50 PM        |   |                 |  |                                       |               |
|   |   |                 | Acknowledged   |                                       |               |
| David Heyde (dheyde@mccarthy.com) 06 Sep 2014 9:32 AM     |   |                 |  |                                       |               |
|   |   |                 | Complete   |                                       |               |
| David Heyde (dheyde@mccarthy.com) 26 Jul 2014 12:38 PM    |   |                 |  |                                       |               |
|   |   |                 | See Comments   |                                       |               |
| Brian Ream (bream@carollo.com) 24 Jul 2014 9:21 PM        |   |                 |  |                                       |               |
|   |   |                 | Flow meter #3 shows bad communication via Profitrace |                                       |               |
| Andy Nelson (anelson@mwr.dst.co.us) 10 Jul 2014 1:51 PM   |   |                 |  |                                       |               |
|   |   |                 | Flow meter is visible on the network                 |                                       |               |
| 010773  | RAS Pump No. 3 Verify Installation of Suction and Discharge Pressure Gauge      |                 | Closed   | Western Summit/McCarthy JV            | Commissioning |
| <u>Comments</u>   |   |                 |  |                                       |               |
| David Heyde (dheyde@mccarthy.com) 01 Jun 2014 5:25 PM     |   |                 |  |                                       |               |
|   |   |                 | Closed   |                                       |               |
| Nathan Evenson (nevenson@carollo.com) 31 May 2014 1:44 PM |   |                 |  |                                       |               |
|   |   |                 | Acknowledged   |                                       |               |
| David Heyde (dheyde@mccarthy.com) 22 May 2014 8:44 PM     |   |                 |  |                                       |               |
|   |   |                 | Complete   |                                       |               |

# Tracking of Status Forms

| W RAS PS >15-RAS PMP No. 11 (24 issues)                     |   |                 |        |                    |               |              |             |
|---|---|-----------------|--------|--------------------|---------------|--------------|-------------|
| Issue ID  | Description   | Location Detail | Status | Company            | Type          | Date Created | Due Date    |
| 010847  | RAS Pump No. 11 MCPOI Received  |                 | Closed | Flowserve US, Inc. | Commissioning | 18 Apr 2014  | 02 May 2014 |
| <b>Comments</b>   |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 15 Oct 2014 12:24 PM      |   |                 |        |                    |               |              |             |
| Closed  |   |                 |        |                    |               |              |             |
| Jeff Berlin (jberlin@carollo.com) 09 Oct 2014 8:38 AM       |   |                 |        |                    |               |              |             |
| Acknowledged, noting pending functional testing resubmittal |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 07 Oct 2014 4:25 PM       |   |                 |        |                    |               |              |             |
| Reference MetroTac 11312B-0036B Acknowledged                |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 17 Sep 2014 6:55 AM       |   |                 |        |                    |               |              |             |
| Submitted in MetroTrac                                      |   |                 |        |                    |               |              |             |
| 010865  | RAS Pump No. 11 Performance Test Level 2 Test 2 hrs minimum for flow and head at rated conditions. Test flow at 2 additional pts, 1 at 25% below the rated flow and 1 at 10% above the rated flow. Record measure flow, suction pressure, discharge pressure, bearing temperatures and noise level at each condition. |                 | Closed | Flowserve US, Inc. | Commissioning | 18 Apr 2014  | 02 May 2014 |
| <b>Comments</b>   |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 15 Oct 2014 12:24 PM      |   |                 |        |                    |               |              |             |
| Closed  |   |                 |        |                    |               |              |             |
| Jeff Berlin (jberlin@carollo.com) 10 Oct 2014 9:47 AM       |   |                 |        |                    |               |              |             |
| Acknowledged  |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 07 Oct 2014 4:39 PM       |   |                 |        |                    |               |              |             |
| Resubmitted in MetroTrac 11312B-0029C on 9/30/14            |   |                 |        |                    |               |              |             |
| David Heyde (dheyde@mccarthy.com) 03 Aug 2014 12:33 PM      |   |                 |        |                    |               |              |             |
| Performed   |   |                 |        |                    |               |              |             |



# Summary Reports

| Location                                       | Draft | Open | Work Complete | Ready to Inspect | Not Approved | In Dispute | Un-resolved | Closed | Total | Past Due | % Complete |
|--|-------|------|---------------|------------------|--------------|------------|-------------|--------|-------|----------|------------|
| SW BLW Bldg >50-CARRB No.1                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 28     | 28    | 0        | 100.0%     |
| SW BLW Bldg>51 -West Stage 3- Diff-Wet Check   | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 4      | 4     | 0        | 100.0%     |
| SW BLW Bldg>52-West Stage 3/ML Splitter        | 0     | 0    | 1             | 0                | 0            | 0          | 1           | 19     | 20    | 1        | 95.0%      |
| SW BLW Bldg>53-NW BLWR MCP                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 4      | 4     | 0        | 100.0%     |
| SW BLW Bldg>54-Top Running Double Bridge Crane | 0     | 3    | 0             | 0                | 0            | 0          | 3           | 1      | 4     | 3        | 25.0%      |
| SW BLW Bldg>55-HVAC                            | 0     | 0    | 2             | 0                | 0            | 0          | 2           | 30     | 32    | 2        | 93.8%      |
| SW BLW Bldg>56-OH Door                         | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 2      | 2     | 0        | 100.0%     |
| SW BLW Bldg>57-Misc Items                      | 0     | 0    | 2             | 0                | 0            | 0          | 2           | 5      | 7     | 2        | 71.4%      |
| W Cifr   | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 2      | 2     | 0        | 100.0%     |
| W Cifr>01-PRED                                 | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 12     | 12    | 0        | 100.0%     |
| W Cifr>02-AREA STATUS                          | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 5      | 5     | 0        | 100.0%     |
| W Cifr>03-FUNCT TEST                           | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 5      | 5     | 0        | 100.0%     |
| W Cifr>04-TEST LOG SUM                         | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 9      | 9     | 0        | 100.0%     |
| W Cifr>05-CLFRF 1/ROT WEIRS                    | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 22     | 22    | 0        | 100.0%     |
| W Cifr>06-CLFRF 3/ROT WEIRS                    | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 22     | 22    | 0        | 100.0%     |
| W Cifr>07-CLFRF 5/ROT WEIRS                    | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 22     | 22    | 0        | 100.0%     |
| W Cifr>08-CLFRF 7/ROT WEIRS                    | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 22     | 22    | 0        | 100.0%     |
| W Cifr>09-CLFRF 9/ROT WEIRS                    | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 22     | 22    | 0        | 100.0%     |
| W Cifr>10-MISC                                 | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 5      | 5     | 0        | 100.0%     |
| W RAS PS>01-AREA STATUS                        | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 7      | 7     | 0        | 100.0%     |
| W RAS PS>02-FUNCT TESTS                        | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 8      | 8     | 0        | 100.0%     |
| W RAS PS>03-Mfr Instbil. Checks                | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 12     | 12    | 0        | 100.0%     |
| W RAS PS>03-PW                                 | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 3      | 3     | 0        | 100.0%     |
| W RAS PS>06-SW PMP 1                           | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 15     | 15    | 0        | 100.0%     |
| W RAS PS>07-SW PMP 2                           | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 15     | 15    | 0        | 100.0%     |
| W RAS PS>08-SW Tank                            | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 2      | 2     | 0        | 100.0%     |
| W RAS PS>09-SW Syst.                           | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 3      | 3     | 0        | 100.0%     |
| W RAS PS>10-RAS PMP No. 1                      | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 24     | 24    | 0        | 100.0%     |
| W RAS PS>11-RAS PMP No. 3                      | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 24     | 24    | 0        | 100.0%     |
| W RAS PS>12-RAS PMP No. 5                      | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 30     | 30    | 0        | 100.0%     |
| W RAS PS>15-RAS PMP No. 11                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 24     | 24    | 0        | 100.0%     |
| W RAS PS>16-RAS PMP No. 13                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 24     | 24    | 0        | 100.0%     |
| W RAS PS>17-RAS PMP No. 15                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 24     | 24    | 0        | 100.0%     |
| W RAS PS>18-RAS PMP's 11, 13, 15               | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 3      | 3     | 0        | 100.0%     |
| W RAS PS>19-SCUM PMP No. 1                     | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 26     | 26    | 0        | 100.0%     |
| W RAS PS>20-WAS PMP No.1                       | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 20     | 20    | 0        | 100.0%     |
| W RAS PS>21-WAS PMP No. 3                      | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 20     | 20    | 0        | 100.0%     |
| W RAS PS>22-WAS PMP No.'s 1 and 3              | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 9      | 9     | 0        | 100.0%     |
| W RAS PS>23-Basin Drain PMP No. 1              | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 26     | 26    | 0        | 100.0%     |
| W RAS PS>24-Basin Drain PMP No. 3              | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 26     | 26    | 0        | 100.0%     |
| W RAS PS>25-Sump PMP No. 1 and No. 3           | 0     | 0    | 6             | 0                | 0            | 0          | 6           | 27     | 33    | 6        | 81.8%      |
| W RAS PS>26-Sump System-PMP No. 1 & No. 3      | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 3      | 3     | 0        | 100.0%     |
| W RAS PS>27-Sump PMP No. 3/7                   | 0     | 0    | 6             | 0                | 0            | 0          | 6           | 27     | 33    | 6        | 81.8%      |
| W RAS PS>28-Sump System-Sump PMP No. 3/ No.7   | 0     | 0    | 0             | 0                | 0            | 0          | 0           | 3      | 3     | 0        | 100.0%     |

# Start-Up

The screenshot shows the Autodesk BIM 360 Field web application. The browser address bar displays 'https://bim360field.autodesk.com'. The page title is 'AUTODESK® BIM 360™ FIELD 004411.000 - Denver Metro PAR 1085 S Secondary Improve'. The interface includes a search bar, a toolbar with 'Add', 'Edit', 'Void', 'Print', and 'More Actions' buttons, and a sidebar with navigation icons. A filter sidebar is highlighted with a red box, containing fields for 'Filter' (set to 'All Issues'), 'ID', 'Description', 'Company', and 'Location'. The 'Location' dropdown is set to 'W RAS PS>11-RAS PMP No. 3'. A red arrow points to this dropdown. Below the filter sidebar, a black box with white text reads 'Start-up Location'. The main content area displays a table of issues with columns for 'ID' and 'Description'. The table contains 24 rows of issue data. The bottom of the interface shows a status bar with 'Filters', 'New', 'Edit', 'Remove', '1 of 24 checked', and 'Filter: All Issues'. The footer includes the Autodesk logo and copyright information: '© 2015 Autodesk, Inc. All rights reserved. Privacy | Terms and Conditions | Support | About'.

| ID     | Description   |
|--------|---|
| 010794 | RAS Pump No. 3 Functional Test 6 hour Run Test pe       |
| 010793 | RAS Pump No. 3 Bearing Temperature Record Beari         |
| 010792 | RAS Pump No. 3 Vibration Test Level 2 Measure filte     |
| 010791 | RAS Pump No. 3 Noise Test Level 1 Measure unfilter      |
| 010790 | RAS Pump No. 3 Performance Test Level 2 Test 2 hr       |
| 010789 | RAS Pump No. 3 PAL S373 Verify RAS Pump operat          |
| 010788 | RAS Pump No. 3 Verify flow indication through rotam     |
| 010787 | RAS Pump No. 3 FE/FIT S373 Verify flow indication c     |
| 010786 | RAS Pump No. 3 HS 373 Verify operation of pump in       |
| 010785 | RAS Pump No. 3 RECIRC PLAN Verify Recirculation         |
| 010784 | RAS Pump No. 3 Aeration Basin available to pump w       |
| 010783 | RAS Pump No. 3 Clarifiers available to be filled with v |
| 010782 | RAS Pump No. 3 20", 24", 30" 36", 48", 72" RAS Pipe     |
| 010781 | RAS Pump No. 3 ORT 2 for DP1 West RAS Pump St           |
| 010780 | RAS Pump No. 3 ORT 2 for DeviceNet West RAS Pu          |
| 010779 | RAS Pump No. 3 VFD West RAS Pump No. 3 tests c          |
| 010778 | RAS Pump No. 3 MCC SSR1-2 tests in West RAS PS          |
| 010777 | RAS Pump No. 3 Power and Control Cable terminater       |
| 010776 | RAS Pump No. 3 Verify operation of Seal Water Sole      |
| 010775 | RAS Pump No. 3 Verify installation of seal water contr  |
| 010774 | RAS Pump No. 3 Verify installation and operation of s   |
| 010773 | RAS Pump No. 3 Verify Installation of Suction and Dis   |
| 010772 | RAS Pump No. 3 MCOPI received                           |
| 010771 | RAS Pump No. 3 Motor Test Completed QCT-McDad           |

The screenshot displays the Autodesk BIM 360 Field web application. The main window is titled "Edit Issue 010771" and contains a form with the following fields:

- Issue type: Commissioning
- Issue ID: 010771
- Description: RAS Pump No. 3 Motor Test Completed QCT-McDade-Woodcock, Inc.-MTR
- Company: McDade-Woodcock, Inc.
- Status: Closed
- Date: 02 May 2014
- Location: W RAS PS>11-RAS PMP No. 3

Below the form is a comment section with the following entries:

- Joseph.taylor@viewit.com: 18 Sep 2014 5:21 PM Closed.
- jitzabie@corallo.com: 15 Sep 2014 3:21 PM Acknowledged.
- jeremy@mwelc.com: 23 Sep 2014 6:35 AM Complete. See attached.

Annotations with red arrows point to various elements:

- A red circle highlights the "Details" tab and the "Remind assigned company" button.
- A red arrow points from the "Remind assigned company" button to the "Company" field.
- A red arrow points from the "Details" tab to the "Attachments" section.
- A red arrow points from the "Details" tab to the "Add comment" text area.

Four callout boxes provide additional information:

- Start-up Item Details:** Points to the "Details" tab.
- Attachments:** Points to the "Attachments" section, which shows a file named "QCT-MM-MTR\_RAS\_Pump\_3.pdf".
- Attachment File →:** Points to a PDF document titled "PRECISION TESTING GROUP ELECTRICAL TESTING & ENGINEERING" with a table of inspection results.
- Item Sign off:** Points to the comment section.

# BIM 360 Field Library



The screenshot displays the Autodesk BIM 360 Field Library interface. At the top, the browser address bar shows the URL <https://field.autodesk.com/library>. The page header includes the project name "AUTODESK® BIM 360™ FIELD 004411.000 - Denver Metro PAR 1085 S Secondary Improvements" and the user "David Heyde".

The interface is divided into three main sections:

- Library:** A sidebar on the left containing a list of project documents. Two items are highlighted in yellow: "MWRD IO Checklist" and "DCU-W\_ORT\_Checkoff\_List\_-\_2014-01-13.PDF".
- Library Folder:** A central pane showing a list of files. The file "DCU-W\_ORT\_Checkoff\_List\_-\_2014-01-13.PDF" is selected and highlighted in yellow.
- Library Attachment:** A right-hand pane showing the details of the selected file, including its filename, creation/modification dates, and size. Below this, a preview of the PDF document is shown, which is a checklist table.

A "File Import Progress" dialog box is visible on the right side of the attachment pane, indicating that no files are currently being imported.

The previewed PDF document is a checklist table with the following structure:

| Item     | Description                       | Address                     | 087-1.1<br>Inspection of<br>Hardware or<br>Software | 087-1.2<br>Review Method<br>(Physical) Test | 087-1.3.2<br>Status<br>Comprehension<br>Classification | 087-2<br>Planning and<br>Communication<br>Test | 087-3<br>Verify Action of Signs and Confirm Corresponding<br>Change #1 (DCL/P/L) Reception | 087-3.1<br>Verify | 087-3.2<br>Manufacturer<br>Configuration | 087-3.3<br>Manufacturer<br>Functional<br>Testing | 087-3.4<br>Network<br>Operation<br>Testing |
|----------|-----------------------------------|-----------------------------|---|---|--|--|--|-------------------|--|--|--|
| DCU-W    | Network Field Station DCU         |                             | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
|          | Traditional I/O                   |                             |   |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM AMBIENT WIND MND         | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC OFF FLOW MND                  | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC OFF FLOW MND                  | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K757  | REC COMPRESSOR DISCHARGE          | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM AMBIENT WIND MND         | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM AMBIENT WIND MND         | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC OFF FLOW MND                  | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC OFF FLOW MND                  | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM TEMP MND                 | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM TEMP MND                 | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM TEMP MND                 | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750  | REC ROOM TEMP MND                 | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K751  | DCU-W 2000S 0075                  | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750A | DCU-W 2000S 1.1085 ST. DENVER, CO | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |
| AL_K750B | DCU-W 2000S 2.1085 ST. DENVER, CO | 2002 S. 1085 ST. DENVER, CO | 087-1.1<br>PASS                                     |   |  |  |  |                   |  |  |  |

# Benefits to You

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- Timely Start-up
- Higher Quality
- Less Issues
- Better Communication
- Manageable
- Closure

# Questions & Answers

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# Following Today's Web Cast

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Watch your inbox for directions on where to go for downloading today's presentation and recording.

**To contact our Speaker:**

David Heyde

[dheyde@mccarthy.com](mailto:dheyde@mccarthy.com)

The background of the slide is a photograph of a building's mechanical room. It shows a complex network of white and yellow pipes, ductwork, and electrical conduits. The room is brightly lit, and the perspective is from an elevated angle looking down into the space.

Thank You  
for Attending

See you at the next  
M<sup>c</sup>Carthy Event