Capital Project Lifecycle

Design

Construction Drawings

2D to 3D

3D to 2D

Construction

Built Environment

Field Review

Field Review

Inspection

Operations & Maintenance

Redline As-builts
Information Mobility Enabler

Design | Construction | Built Environment | Inspection | Operations & Maintenance

Field Review

Construction Modeling
Fills the gap between what design creates vs. what construction needs
Information Mobility

Design

Construction

Built Environment

Field Review

Inspection

Operations & Maintenance
Design to Construction to O&M Sample Data Flow

Contractor Instructions
Installing underdrains around stations 370+00 to 420+00

Model Component
Select pipe

Construction Steps
Trench
Bedding
Lay Pipe
Backfill

Inspection Checklist
- Ensure excavation width no greater than specified
- Ensure unsuitable material removed and replaced
- Check minimum bedding thickness
- Has the bedding material been compacted to standards?
- Has the contractor installed the culvert components to the horizontal & vertical tolerances specified?
- Has the backfill been placed and compacted uniformly in layers?
- Has the side and overlay zone been compacted to the specified requirements?

Inspection Data (Pay Items)
- Field Collect
  - Geotextile (718-99153)
  - Aggregate Volume (718-52610)
- Field Collect
  - Date
  - Length (715-05203)
  - Begin Station
  - Begin Offset
  - End Station
  - End Offset
  - Alignment
- Field Verify
  - Pipe Size
  - Pass Through
  - Begin Elevation
  - Begin Station
  - Begin Offset
  - End Station
  - End Offset
  - Alignment
  - Start Structure
  - End Structure
  - Slope
  - Material
  - Manning’s
  - Flow
Installing underdrains around stations 370+00 to 420+00

**Contractor Instructions**

- Length
- Pipe Size
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**Model Component**

- Select pipe

**Construction Steps**

- Trench
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- Pass Through
  - Begin Elevation
  - End Elevation

**Asset Mgt**
### All tasks

1. Does bedding provide continuous even support?  
   - **Pass**

2. Is bedding under each spigot location greater than 50 mm?  
   - **Pass**

3. Has the bedding material been compacted to achieve the specified compaction standard?  
   - **Pass**

4. Measure Geotextile if applicable (718-99153)  
   - 0

5. Measure aggregate volume (718-52610)  
   - 124
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<thead>
<tr>
<th>Seq. No.</th>
<th>Question</th>
<th>Answer</th>
<th>Transfer to PunchList?</th>
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<td>1</td>
<td>Does bedding provide continuous even support?</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Is bedding under each spigot location greater than 50 mm?</td>
<td>Pass</td>
<td></td>
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<tr>
<td>3</td>
<td>Has the bedding material been compacted to achieve the specified compaction standard?</td>
<td>Pass</td>
<td></td>
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<tr>
<td>4</td>
<td>Measure Geotextile if applicable (718-99153)</td>
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<tr>
<td>5</td>
<td>Measure aggregate volume (718-52890)</td>
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Benefits

Automated (ETL) asset management databases population
Database Interrogations:
- Audits
- Litigation search
- General queries
- Data mining and analytics
Benefits – Audits

Field Inspections Recorded → Manually typed into non-graphic system → Audit

Jan 2014: 2115’ guardrail

Install Guardrail:
10-Jan-14: 262’ @ 18+65 LT
13-Jan-14: 340’ @ 15+45 RT
14-Jan-14: 838’ @ 18+85 RT
15-Jan-14: 675’ @ 27+23 RT
Benefits – Audits

Jan 2014: 2115’ guardrail

Desktop Client

Query by
• element(s)
• work task(s)
• inspector(s)
• date range

Work Task = Install Guardrail:
13-Jan-14: 340’ @ 15+45 RT
10-Jan-14: 262’ @ 18+65 LT
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Benefits

- Increased time inspectors in field
- Mitigate inspector inexperience
- Better inspection quality
- Better contractor accountability

- Graphical referencing
- Checklist & linked docs
- Optional RTK GPS measurements, drone earthwork, RFID, etc.

Built Environment

Construction → Design → Inspection

Field Review

Operations & Maintenance
Benefits

Enables Advanced Work Packaging

1. Construction
2. Field Review
3. Inspection
4. Operations & Maintenance
5. Design

Built Environment
Advanced Work Packaging Maturity & Project Performance
Information Mobility Summary
- Enables Advanced Work Packaging
- More effective field operations
- Better agency reports
- Better position for audits and litigation
- Automated population of asset management databases