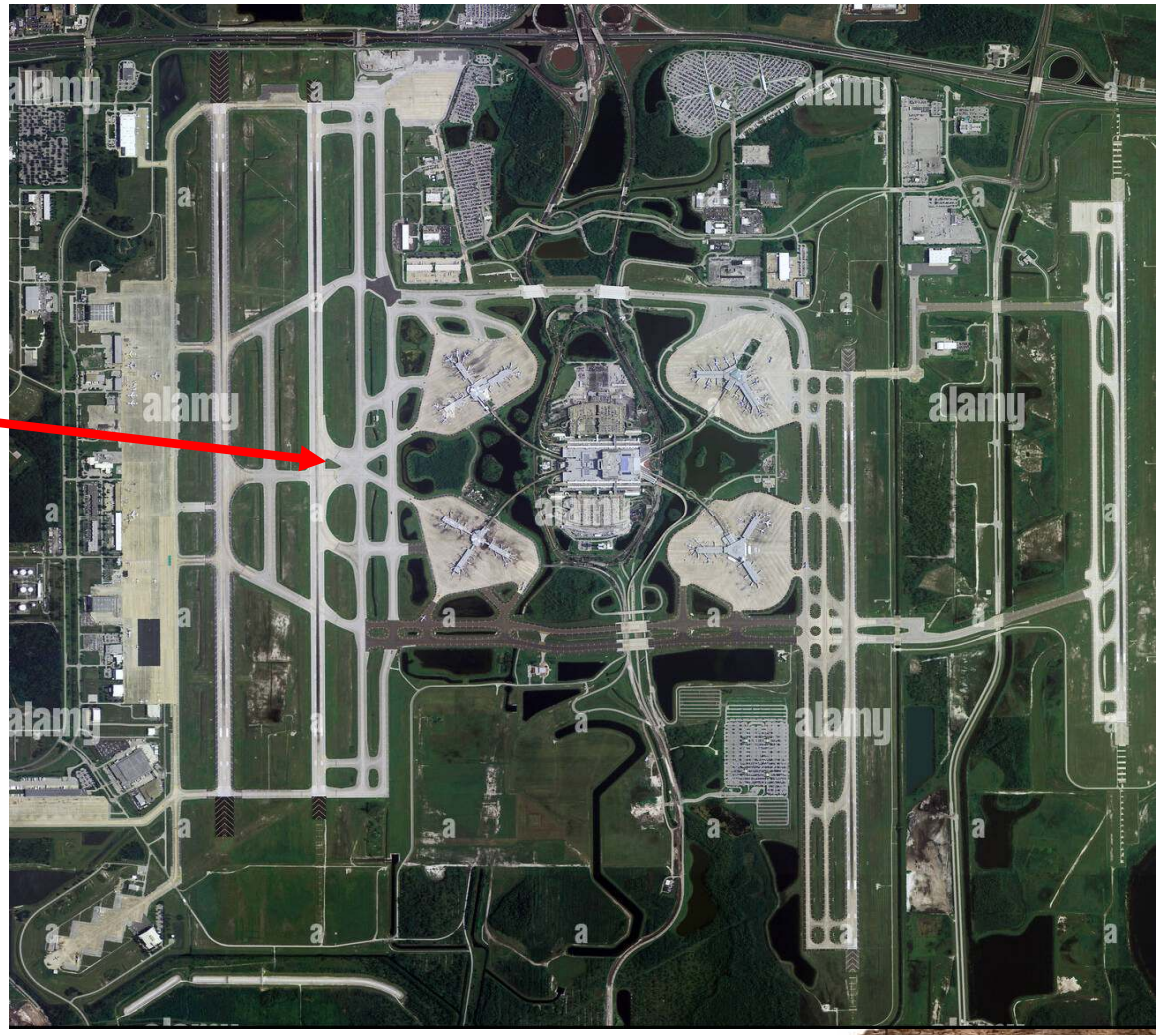
Class IV Fully Structural Slipline Application

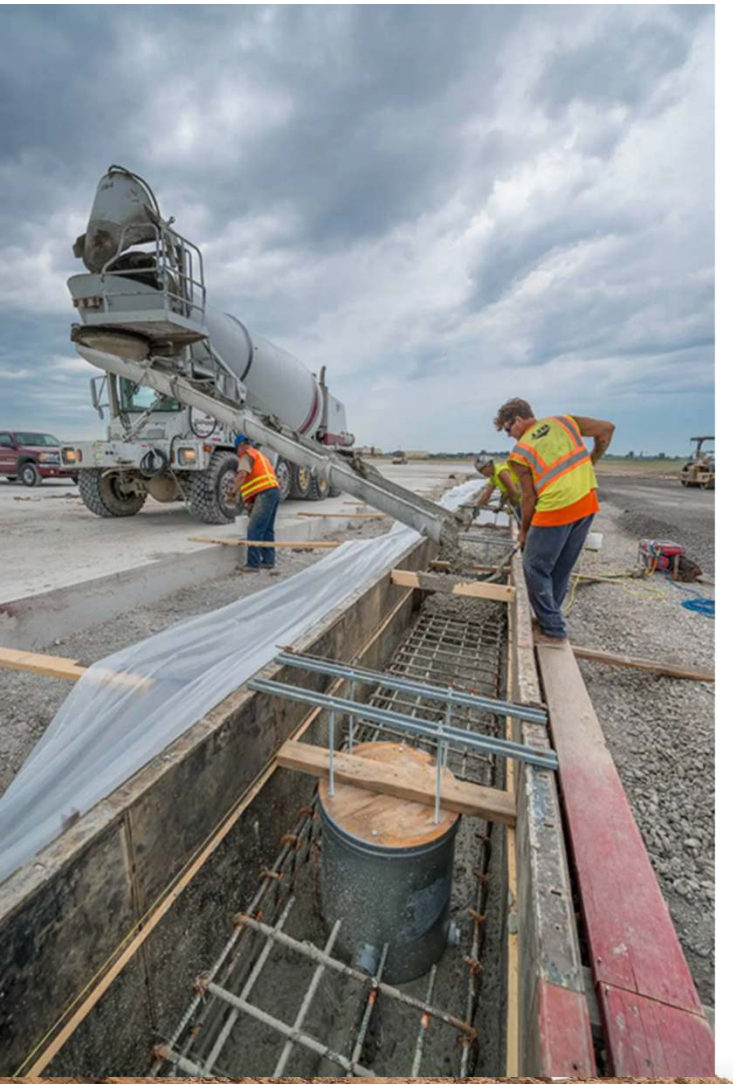
Orlando International Airport (MCO)
Runway 18L-36R Stormwater System Rehabilitation

Orlando International Airport (MCO)

MCO Runways

- 18L-36R longest & oldest
- New airplane design (Group VI)





Rehabilitation Scope

- Significant modifications
- Long periods of runway closure
- Pipes at end of useful life

Stormwater Rehab Scope

9 existing structure crossings

- 8 – 800 LF 36” RCP segments
- 1 – 1,200 LF 42" RCP segment
- Existing 6’ RCP segments
- Mortar joints failing

Design Requirements

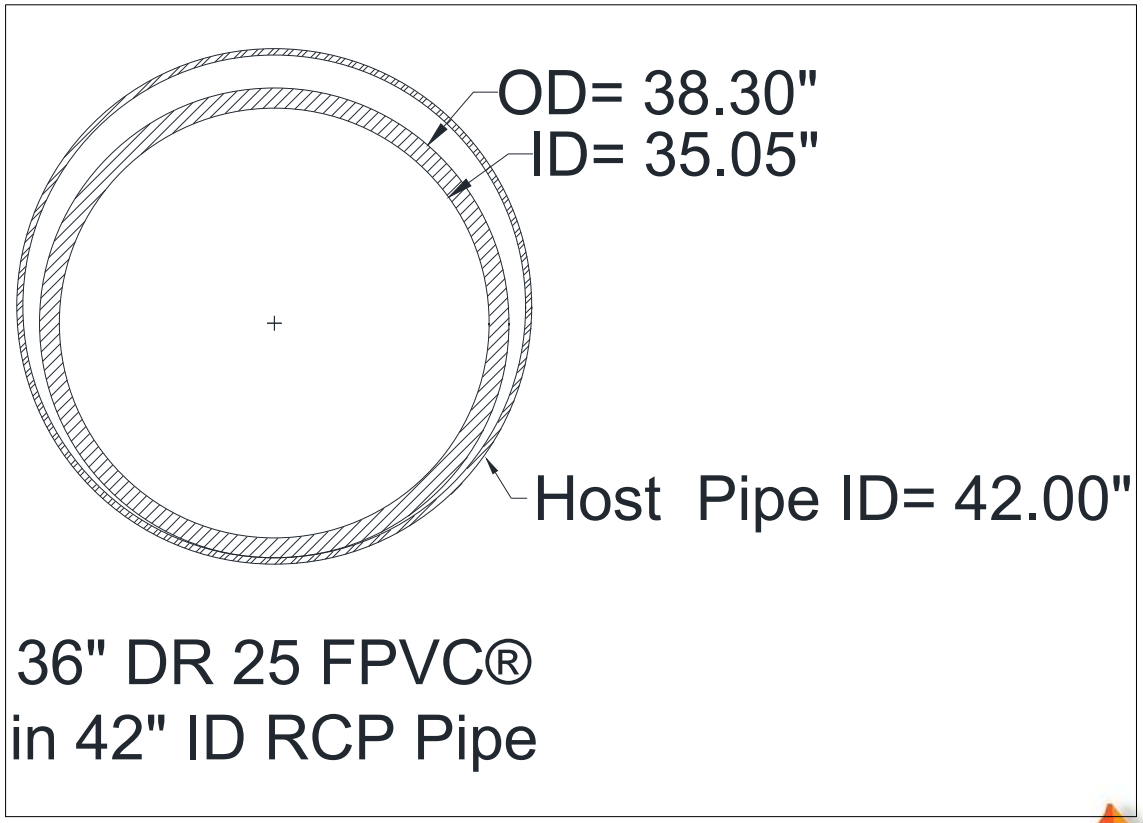
- Maintain capacity
- Structurally independent
- External loads
- Infiltration resistant
- Wet constructability (groundwater)

Methods Considered

- CCCP
- CIPP
- Chemical grout
- Sliplining

Sliplining Materials Evaluated

- Bell & spigot PVC
- Ribbed HDPE
- Fusible PVC®



Bidding Process

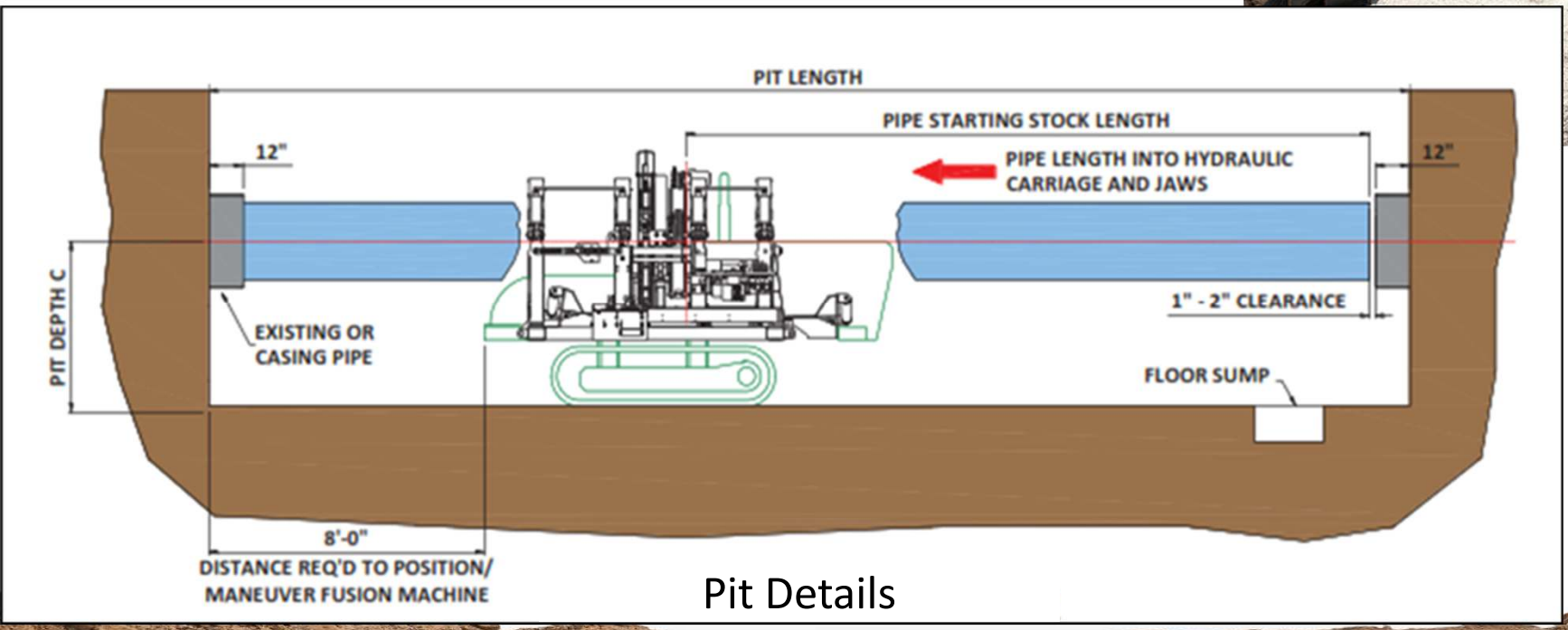
- Hubbard Construction Company, general contractor
- Significant rehabilitation improvements
- Total cost ~ $30 million
- Stormwater rehab cost ~ $2.5 million

Stormwater Rehab Construction Sequence

1. Pipe fusing & receiving pit excavations, demo
2. Pipe cleaning & CCTV inspection
3. Pulling proof
4. Fuse & pull slipline pipe
5. Grouting the annular space
6. Tie-ins & connections
7. CCTV verification inspection

Pit Excavations & Pipe Removal

- Fusing and receiving pits
- 80-100 ft long; 20 ft wide



Pit Details

Pipe Cleaning & CCTV Inspection

- High-pressure jetting
- Manned entry

Pulling Proof

- Validate clearance and alignment
- 25ft FPVC segment

Fuse & Pull Slipline Pipe

- 45ft FPVC segments
- 1 hour per joint
- Plug to prevent water intrusion
- Tensile strength

Grouting the Annular Space

- Low-density grout
- Eliminate ground water infiltration

Tie-Ins & Connections

- Post sliplining closure with mechanical joint sleeve
- Only 1 sleeve per segment

Sliplining Verification

- CCTV
- Reviewed fusion logs

Lesson Learned

- Complete groundwater mitigation not required
- Other methods require virtual elimination

Results

- Fusible PVC pipe installed via sliplining
- Class IV Structural Classification
- Accomplished design criteria & schedule requirements

Questions?

Bobby Palm, P.E.
AVCON Inc.
rhpalm@avconinc.com

Robert Tatum, P.E.
Underground Solutions Inc.
RTatum@aegion.com