Infrastructure Condition Assessment and Rehabilitation

Water and Wastewater Infrastructure Maintenance

May 2017
APS Redhawk Power Plant – Large Diameter Joint Repairs

- Internal Joint Seals on T-Lock Pipe
  - 60- and 72-inch cooling water pipe
  - Over 125 joints rehabilitated
  - 4 total weeks of work (2 phases)
  - Provided complete joint rehab
    - 300psi pressure rating
    - 250°F temperature rating
City of Phoenix –
66-inch PCCP Joint Repairs

- Internal Joint Seals on PCCP
  - 66-inch pipe 50gpm flowing water
  - 7 joints rehabilitated in 1 day
  - Provided complete joint rehab
    - 300psi pressure rating
    - 250°F temperature rating
City of Phoenix –
Small Diameter Joint Repairs

• Internal Joint Seals on Bar-wrapped Pipeline
  – 20-inch pipeline
  – 1 joint was not grouted when installed 20 years ago
  – Robotic CCTV equipment used to install 50-feet from access
  – Pipe was under driveway – unable to dig and repair
El Paso Water Utility – Concrete Cylinder Pipe Assessment

- Leak Detection / Condition Assessment
  - Acoustic / non-invasive technology
  - 20 and 24-inch bar wrapped pipe
  - Pipe El Paso International Airport runways
  - Utilized Echologics LeakFinder ST equipment
  - Determined average remaining wall stiffness
  - Identified air pockets in pipe due to inoperable ARVs
City of Mesa –
Large Diameter Pipeline Inspection

• 1 Year Warranty Inspection
  – 42-, 60-, 72-inch bar-wrapped pipe
  – Visual and sounding inspection
  – 12,000 feet of pipeline
  – Completed in 1 week
  – Report of inspection results
City of Mesa –
DIP Pipe Inspection & Disinfection Support

• CCTV Inspection of 24-inch DIP
  – Tee installation on existing pipeline
  – Inspection desired 1,000 feet in either direction of new tee
  – Robotic equipment used for pulling hose into pipe for spray disinfection
Mechanicsburg NAVFAC–Water Distribution Pipeline Rehab

- Rehab of 3+ Miles of 6-, 8-, 12-inch Cast Iron Pipe
  - Completed in two phases (2014/2015)
  - Bypass installed to maintain services during rehab projects
  - Replaced valves, hydrants, tees, crosses
  - Provided new pipeline within existing with no joints, 200psi rating, 100+ year life extension

CONSTRUCTION PRODUCT MARKETING
City of Mesa –

Large Diameter HDPE Rehab Inspection

- CCTV & LiDAR Inspection of 36-inch HDPE
  - 2,000 feet from single access point
  - Warranty inspection of 36-inch liner pipe inside 42-inch PCCP
  - Collected data on deflection, joint condition, and termination points
  - LiDAR provided imaging of pipe profile
City of Phoenix –
Distribution Pipeline Rehabilitation

- 12-inch ACP water pipeline
  - 500 feet of complete rehabilitation
  - Utilized Primus Line
  - Installed in pipe with 5 x 45° bends
  - Saved client 75% cost if replacement had been completed
  - Completed in busy traffic ROW
City of Peoria –
Pipe Leak Detection & Material ID

• 16-inch Existing Water Pipeline
  – 1,800 feet of PVC pipe
  – Echologics acoustic technology employed
  – Conducted leak detection and material confirmation under busy traffic ROW
  – Work completed at night in 6 hours
  – Used existing valve boxes, hydrants, 2 vacuum potholes to pipe surface
City of Mesa –
Large Diameter CCTV Inspection

- CCTV Inspection of 72- and 60-inch New Pipeline
  - 12,000 feet of bar-wrapped pipe
  - Post-installation inspection
  - Allowed City staff a record of pipeline condition 1 week before being placed into service
  - Assisted with disinfection
City of Chandler –
Large Pipe CCTV & PCCP Assessment

• 48-inch Existing PCCP Watermain
  – 4,000 feet of pipeline
  – Conducted visual & sounding and continuity testing on PCCP
  – Performed CCTV inspection
  – Supported disinfection of pipeline
  – Comprehensive summary report
City of Glendale –
In-Service Reservoir Inspection

• 10MG Reservoir Inspection
  – Completed with reservoir in service using remote operated vehicle
  – 12 hours of work conducted with complete reservoir inspected
  – Provided video footage of lining system defects and summary report
City of Phoenix –
Blower Pipeline Rehabilitation

• 18-inch Steel Pipeline Joint Rehab
  – Blower pipeline supplying air to aeration basin at WTP
  – Rubber joints leakage due to high temperatures in pipeline
  – Installed stainless steel / EPDM internal joint seals → Trenchless Solution
  – Provides 200psi and 275°F rating
City of Mesa –
Air Release Valve Assessment

- Air Valves on 42-inch Watermain
  - Condition assessment of existing air release valve
  - Evaluated condition and options for replacement or rehab of ARV
  - Pricing for maintenance options
Flagstaff Meadows – Manhole Inspection, Assessment, and Report

• Existing Sewer Manhole Assessment
  – Provided MACP assessment and report of manholes in Flagstaff community
  – Provided recommendations for future maintenance and repairs
City of Chandler –

Sewer Air Release Valve Assessment

- Air Valves on 42-inch Forcemain
  - Pipeline installed mid 2000’s
  - Conducted evaluation of sewer ARVs in 9 vault locations
  - Provided summary report
    - Pricing of repair vs. replacement
    - Recommended maintenance schedule
White Mountain Apache Indian Tribe–PRV and Air Release Valve Valve Assessment

- PRV & ARV on Watermain
  - Inspection and setting of PRVs to proper pressure
  - Assessment of ARVs
  - Data sheets developed for each PRV
  - Summary report
    - Recommended maintenance
    - Options for repair vs. replace
Tucson Water—
PRV Assessment and Maintenance

• PRV pilot and internal rebuilds
  – Inspection and setting of pilot systems on existing valves
  – Field support rebuilding pilot systems
  – Training for O&M staff on operation and troubleshooting
City of Phoenix—
Pump Control Rebuilds

- Rebuilding Ames 8 inch Pump Control Valves
  - 6 total valves disassembled and rebuilt with a repair kit
  - Completed in 1 workday
  - Startup and testing completed
City of Mesa – 20- & 24-inch Pipeline Assessment

• Leak Detection & Condition Assessment
  – 12,000 feet of 20- and 24-inch bar wrapped pipe
  – Non-invasive / acoustic technology used for determining average pipe wall stiffness
  – Comparative analysis report
City of Phoenix—
10-inch Gravity Thickener Drain Pipe

- Condition Assessment & Rehab
  - 85 feet of 10-inch DIP
  - Rectangular port plug valve mid pipe
  - CCTV inspection with Deep Trekker for difficult to access pipe
  - Rubber gasket joints and plug valve not holding pressure
  - Trenchless technology for rehab
Premises Properties – Chandler Pavilions UST Assessment

- Underground Storage Tank Inspection & Cleaning
  - Storm drain underground storage tank inspection
  - 96-inch Corrugated Metal Pipe
  - Cleaning services provided
  - Report and recommendation for long-term planning
Misc. Clients and Agencies – Valve Actuation Products & Startup

- Motor Operation of Valves – Design Support and Startup
  - Butterfly, gate, plug valves
  - Support and alternative analysis for retrofits
  - Setup of limits for both new and existing valves
City of Phoenix—Pump Control Valve Startup

• Install and Startup of Pump Control Valves
  – 12-inch pump control and pressure reducing valves
  – Rebuild of existing BPS
  – Installation and startup of valves
  – Butterfly valve installations

CONSTRUCTION PRODUCT MARKETING
City of Glendale—
Tank Inspection and Assessment

• Caustic Tank Inspection
  – Two tanks (6k and 14k gallon)
  – UT Testing completed on exterior
  – Testing completed in 1’ x 1’ grid
  – Report with recommendations
City of Mesa –
42 inch Water Transmission Main CCTV

• 800 feet of 42 inch DIP
  – CCTV of existing pipe prior to being placed back into service
  – Pipe had been installed in 2010 and going to be placed in service
  – Inspection prior to startup to verify pipe condition
Las Vegas Valley Water District–Water Transmission Main CCTV

- Multiple Mobilizations
  - Dedicated potable water CCTV inspection
  - Completed while maintenance being completed on pipelines
  - Easy to mobilize equipment in busy ROW locations
Las Vegas Valley Water District—
42 inch Internal Joint Seal Installation

- 2 Seals Installed at Damaged Pipe Joint
  - Discovered pipe joint damage during downstream rehab project
  - Needed to be completed in short time
  - Mechanical joint seal installed with water flowing due to leaking valve
  - Completed within 1 week of PO
City of Phoenix Sewer ARV Inspection and Assessment

• 18 Sewer ARV Inspection & Assessment
  – Conducted performance monitoring of lift station associated with FM
  – Conducted manned inspection and assessment of vaults and ARVs
  – Identified repair, replacement, and preventative maintenance schedule
  – Evaluated performance of FM (energy vs flow)
Las Vegas Valley Water District—8 inch Watermain Rehab

- 450LF of 8 inch DIP under 215 Highway
  - 4 x 45 degree bends in alignment
  - Limited space for excavations
  - Pipeline was leaking at joints
  - 150psi rating was necessary
  - Primus Line rehab system installed
  - Project completed in 2 weeks
Las Vegas Valley Water District—
16 inch Watermain Rehab

- 1,800LF of Watermain at Sun City Development
  - High profile community with retired residents
  - Reclaimed waterline to supply golf course
  - 125psi operating pressure
  - Multiple 45 degree bends
  - PVC has been consistently failing without warning
White Mountain Apache
Watermain ARV Assessment & Replacement

• 6 Miles of 12 inch PVC Waterline
  – Failure was commonly occurring
  – Vapor lock in pipe after repairs made
  – 11 Existing ARVs were not releasing or allowing pipe to vacuum
  – Assumed that air in pipe contributing to failures
  – Replaced with Stainless Steel H-Tec Havent Combination ARVs
City of Tempe Leak Detection On-Call

- Performing On-Call Emergency Leak Detection
  - Using Gutermann Correlators and Loggers
  - Responding to calls in 4 hours or less
  - Contract can be piggybacked by other cities
  - Locating leaks at locations prior to Tempe digging
Christopher Creek, AZ Leak Locating

• Small Water Utility Near Payson with 12GPM Leak
  – Used 6 loggers in 750LF of pipe to find leak
  – Pipe was 1 inch to 4 inch PE, PVC, and galvanized
  – Leak was found in a pipe with 3 feet of cover
  – Hole at invert, not surfacing, migrating to Creek
  – Saved client $1,000s in water loss and energy costs
Upper Trinity Regional Water District
Large Diameter Internal Joint Seals

- 2 x 84 inch Internal Joint Seals
  - Leaking joints on pipe connecting reservoir to booster pump station
  - Creating wetland area on WTP facility
  - Part of a large WTP rehab project
  - Difficult access and confined space entry
  - Two seals installed in one workday
Arizona Game and Fish
Sterling Springs Fish Hatchery Pipe CCTV

- 6, 8, 10, 12, and 30 inch CCTV
  - Very difficult to access and environmentally sensitive area
  - Inspection of pipes ¼ mile from parking area
  - Assessment of pipe by internal CCTV
  - UT wall thickness take on exposed sections
City of Glendale

Sewer ARV Inspection and Assessment

• Inspection of 4 Sewer ARVs on Forcemain
  – Completed inspection of ARVs on FM
  – Evaluated repair and replacement needs
  – Inspection vault condition, piping, and isolation valves

[Images of sewers and ARVs]
Please call or e-mail us for additional information, pricing, or support

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