



Accelerated Precast Construction

American Concrete Pipe Association

Mountain States

American Concrete Pipe Association

- Advocate for long-lasting, resilient, and durable infrastructure
- Build Sustainable Communities
- ~250 Precast pipe and box plants across the nation

ACPA





Mountain States Concrete Pipe Association



**Geneva Pipe
and Precast**
A Northwest Pipe Company



Oldcastle Infrastructure™
A CRH COMPANY



A CRH COMPANY



Trevor McDonald, P.E.

Mountain States Director,
ACPA

- Licensed PE in Utah
- Municipal engineer
- International corporate financial control
- MBA and BS in Integrated Engineering
- Hiking, canyoneering, climbing, outdoors, archery
- Cooking





Jason Allen, P.E.
Technical Resource Engineer,

- Based out of Ogden, UT
- Licensed PE throughout the intermountain West
- Well-rounded civil engineer
 - Public Works
 - Water Resources
 - Municipal Planning
 - Hydraulic Modelling
 - Stormwater Design
 - Surveying



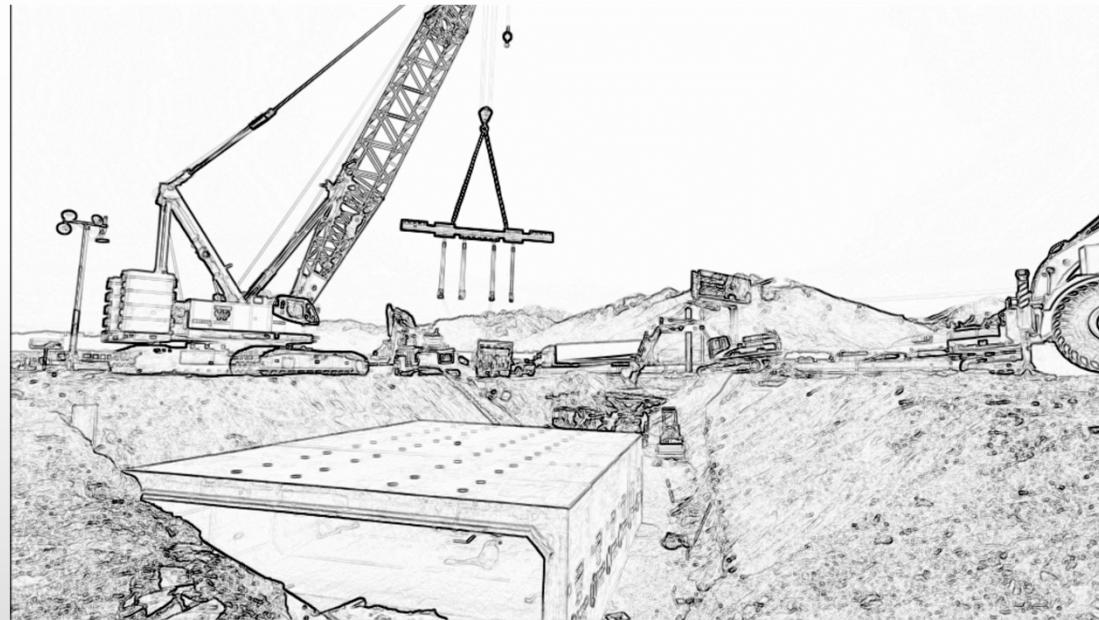
Key Points

- What is Accelerated Precast Construction?
- When is it appropriate?
- How can APC improve project delivery?

Accelerated Precast Construction

Uses Innovative:

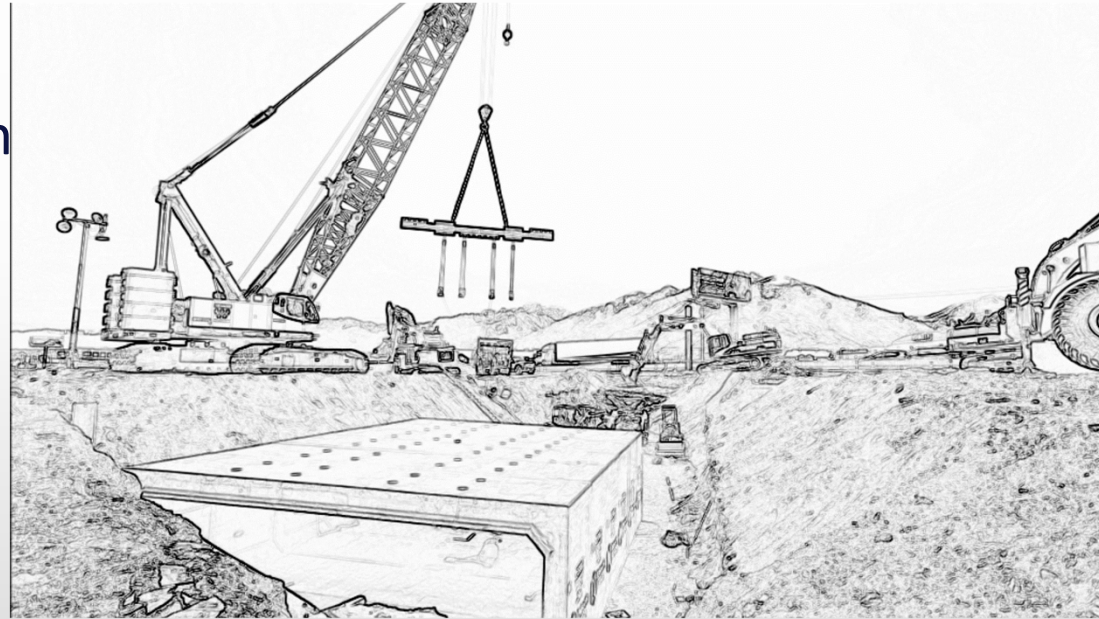
- Scheduling
- Delivery
- Design
- Manufacturing
- Construction



Accelerated Precast Construction

In order to:

- Reduce onsite construction time
- Reduce costs
- Improve safety
- Reduce road user impacts



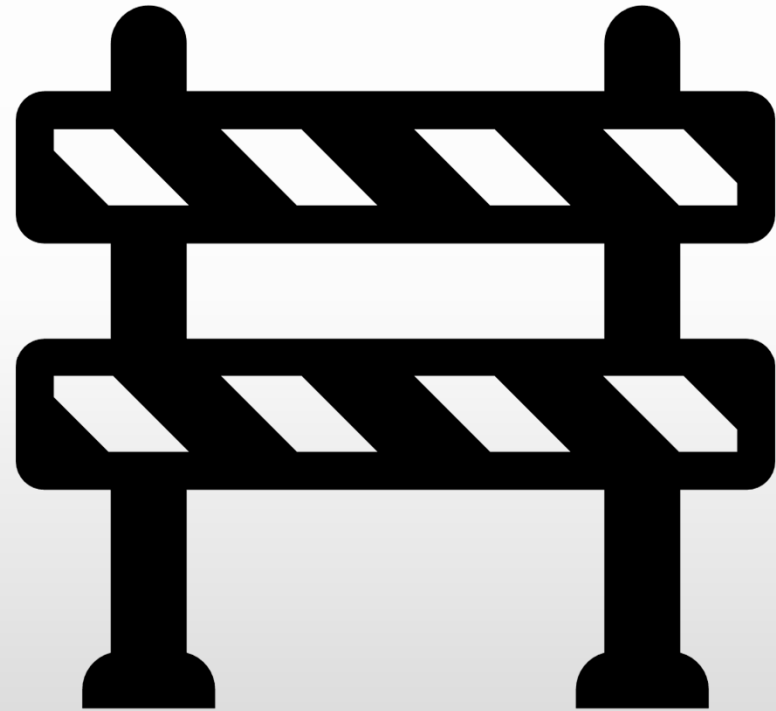
APC vs ABC

- Accelerated Precast Construction
 - Can be part of Accelerated Bridge Construction
- ABC sounds better than APC
 - Sometimes used interchangeable
- Usually replacing/ repairing aging short span bridges and culverts



Traditional Construction

- Road Closure
- On site down-time
 - Waiting on materials
 - Waiting on subs
- Material staging on site
- High impact to road users
- Longer construction time
 - Safety

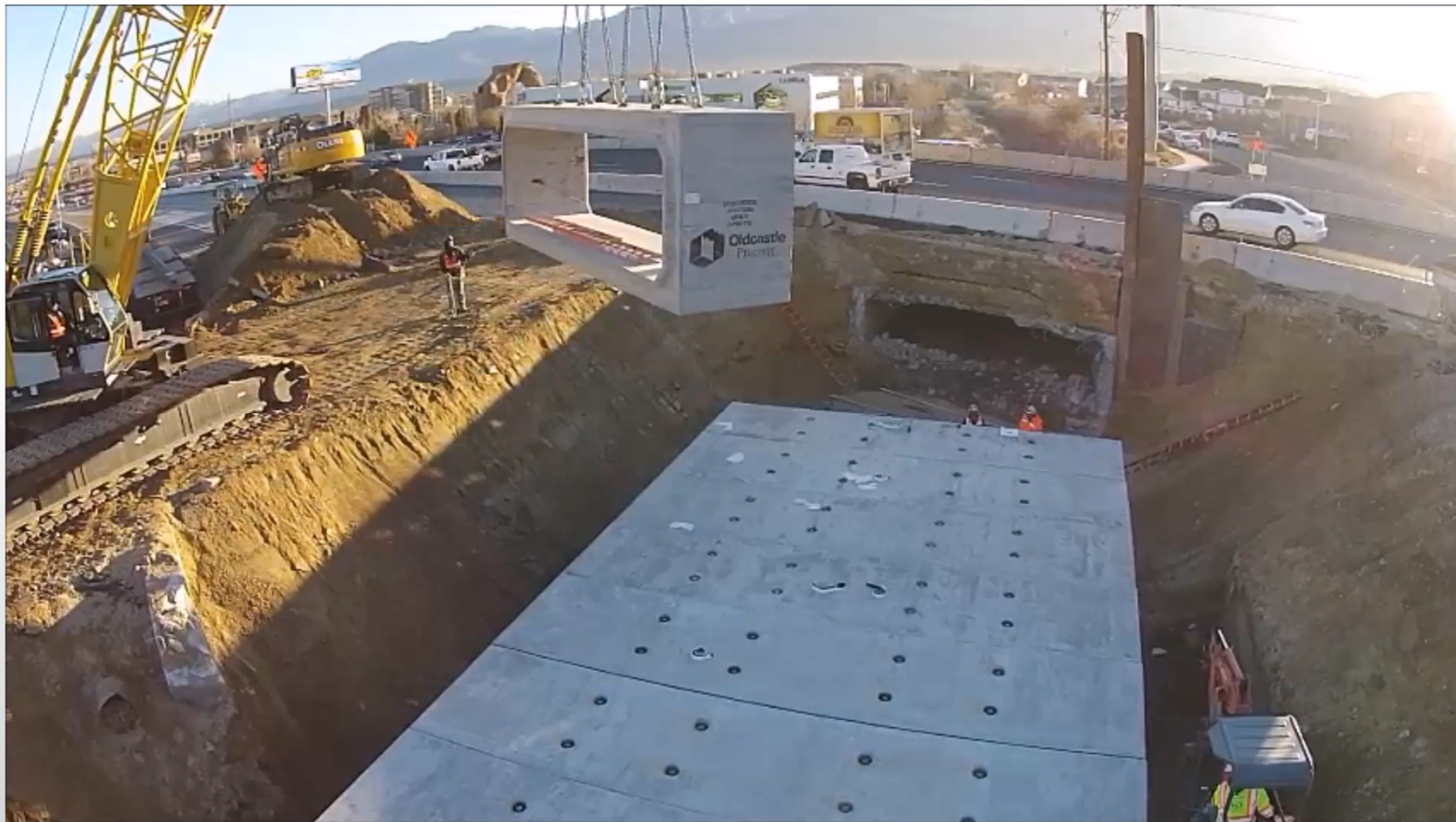


East Jordan Canal under I-15

- 24' x 6.5' box
- Could not touch freeway until March 1
- Water in canal by April 1
- CIP not even considered
- 13 pieces installed per day (one every half hour)
- Unit weight: 78,000 pounds



Project Scheduling and Coordination



Project Scheduling and Coordination



Innovation: Leveling Course



Innovation: Leveling Course



Innovation: Setting and Homing the Box



Innovation: Joint Gaps



Innovation: Continuous work, Day & Night



Utility Conflicts



Utility Conflicts



Final Tie-In





APC Fundamental Attributes

- Reduce:
 - Road User Impacts
 - Costs
 - Construction Time
 - Weather Related Delays

APC Fundamental Attributes

- Improve:
 - Durability
 - Quality
 - Work Zone Safety

APC Fundamental Attributes

- Minimize:
 - Environmental Impact
 - Impact to Existing Roadway Alignment

APC Fundamental Attributes

- Benefits:
 - Stretch budget dollars
 - Increased number of projects
 - Replace bridges/failed culverts
 - Value engineering
 - Provide cost saving options
 - Innovative/competitive options
 - Provide practical options
 - Meet challenging schedules

Time: The Key Factor

7200 West, SLC, UT

- 120 feet of 16' x 5' box
- Major Collector
- CIP was \$7,000 less than precast
- Planned on 8 weeks for installation
- Precast was installed in one weekend



Working Around Utilities/Shoring

13th East Trail, Sandy, UT

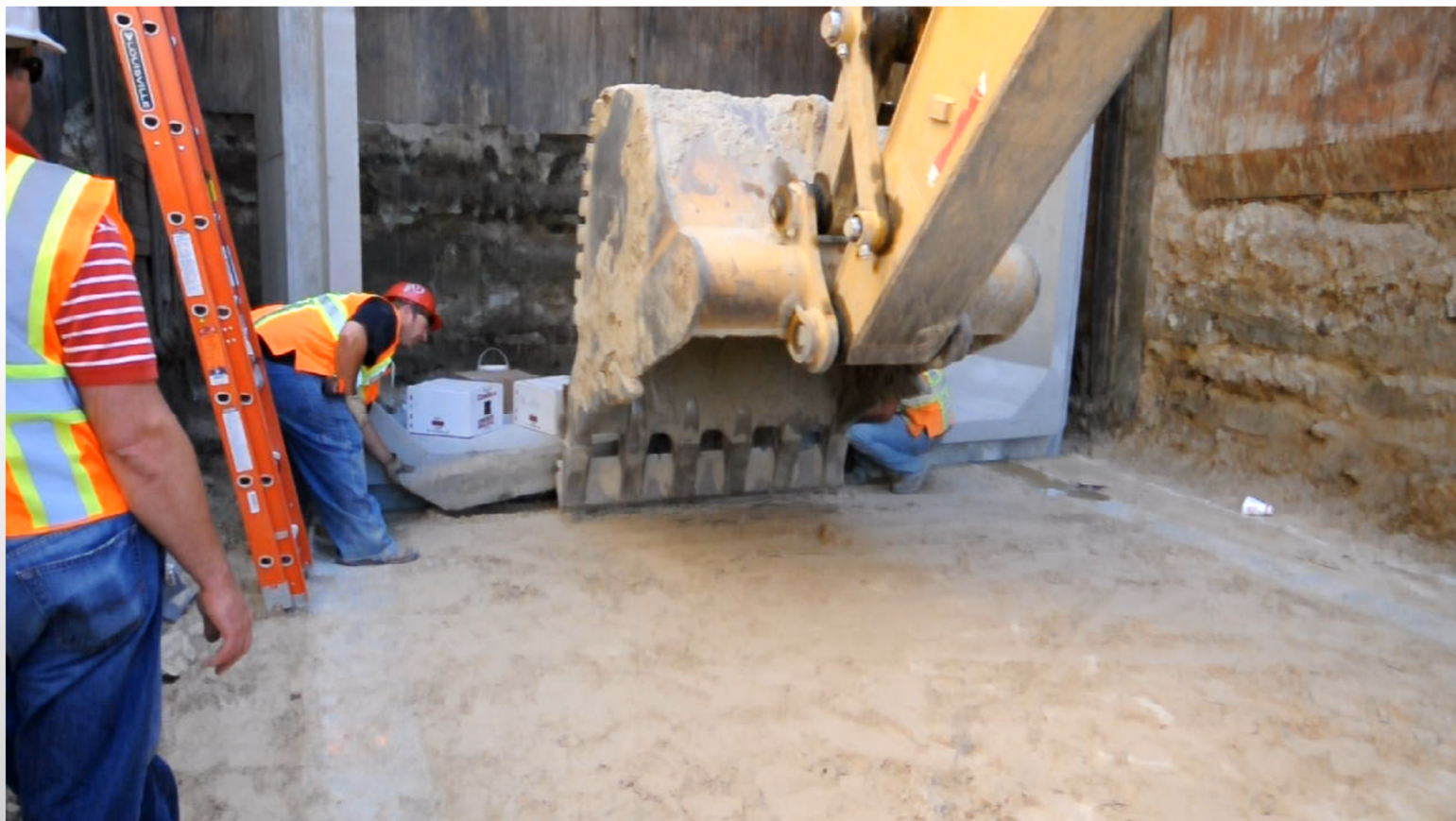
- 14' x 14' Equestrian tunnel
- Maintain traffic during construction
- 25' cover
- Utilities intact and structurally supported
- Used lean concrete footings



Delivery and Oversized Loads



Lean Footing



Work around conflicts



Sometimes a lot of conflicts



Sometimes a lot of conflicts



APC Starts with Design

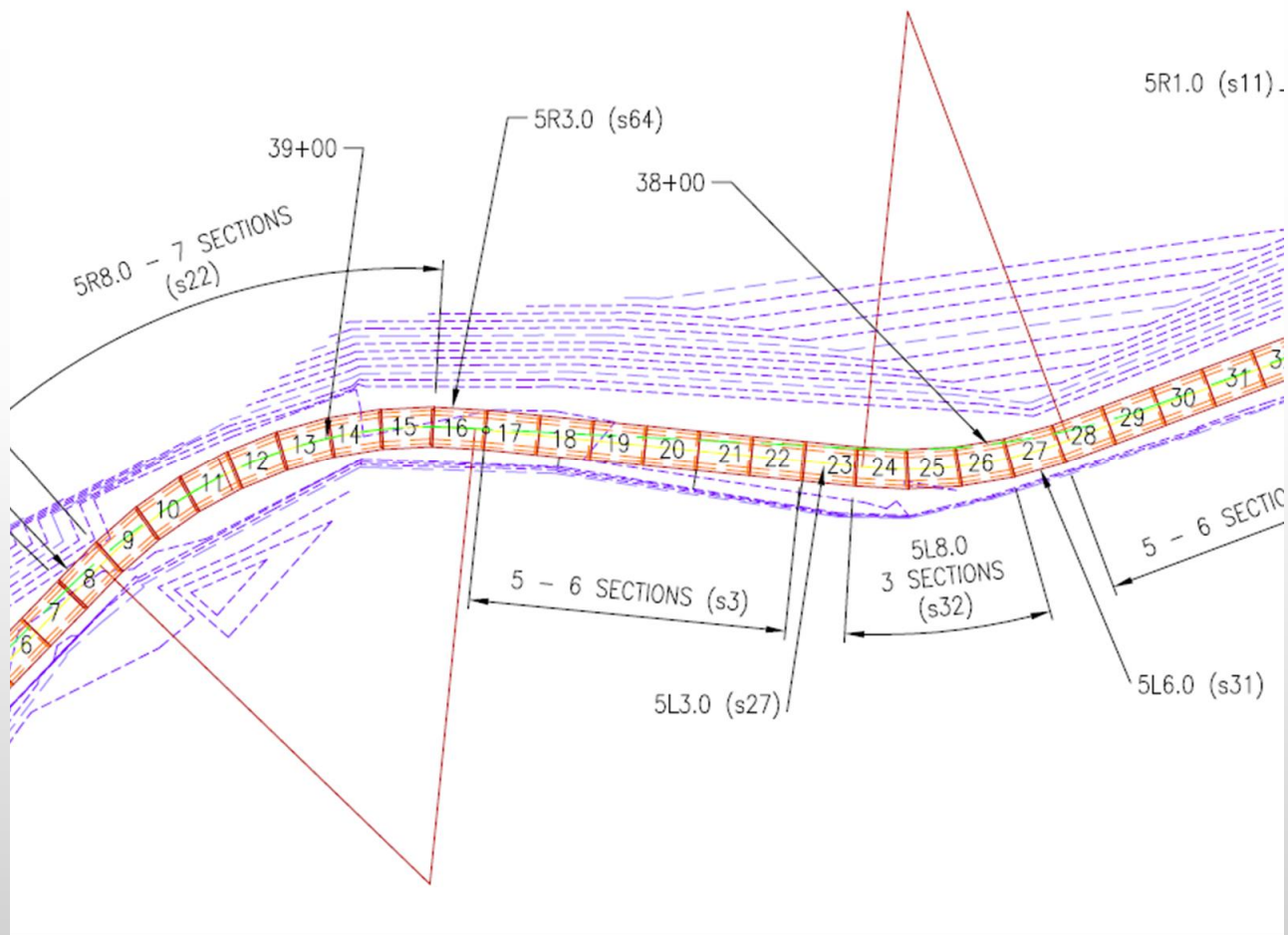
Logan Canyon – Restrictions

- Lots of curves
- Winter hour construction (8 hours a day)
- No access road
- Transport up to 3,000 feet
- 100% waterproof
- Completed before secondary water turned on

5'x5' box and 60" gasketed pipe

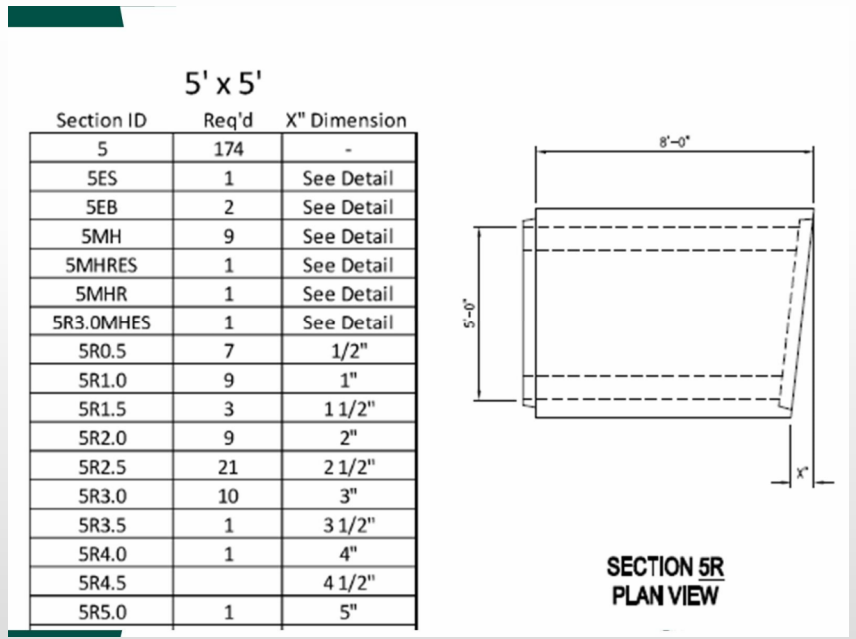


Design with Manufacturer



Logan Canyon – Design

- 62 combinations of bevels
- Bevels from ½” to 8”
- Bevels over 3” – had to buy new headers



Precast Custom Beveled Boxes



Efficiently Exceeded Project Requirements

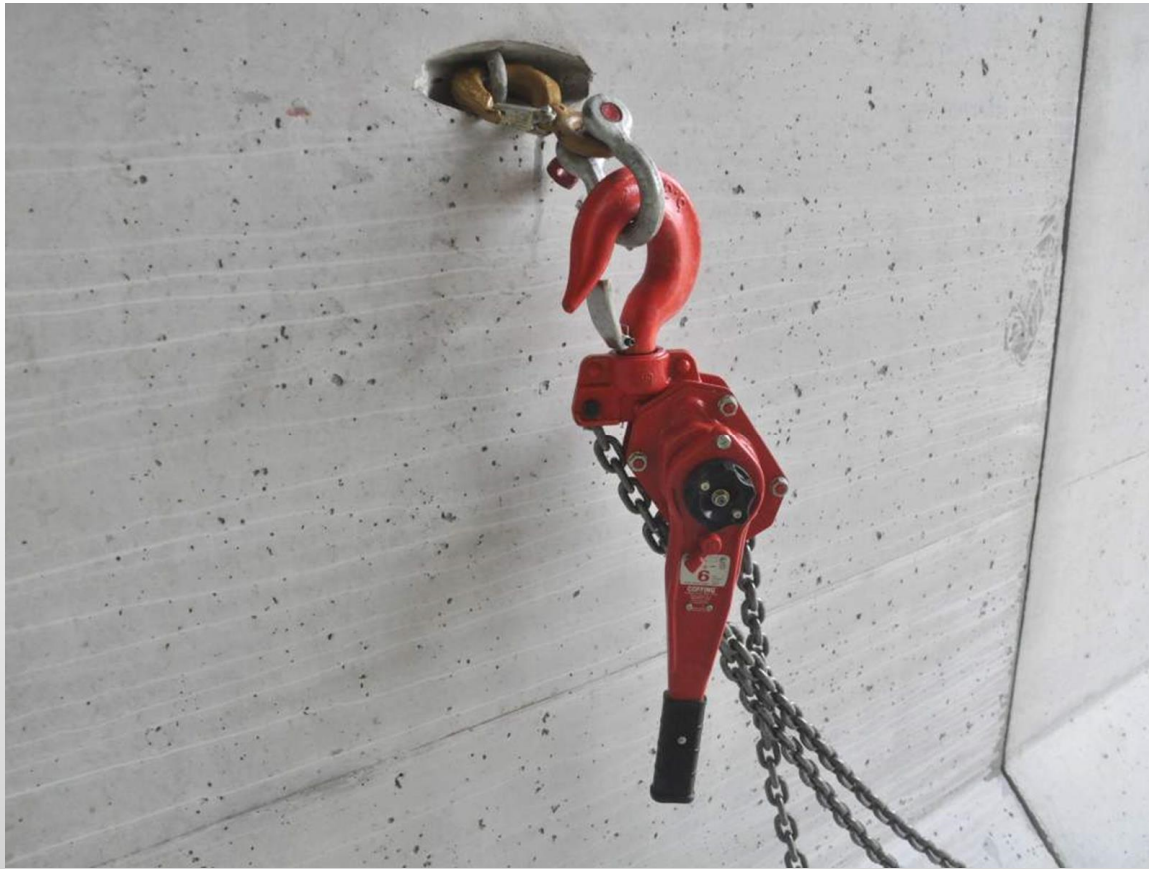


Results

- Averaged 144 feet installed per day
- 6 times faster than CIP
- Pulling inserts and “come-alongs”
- Leak free with Sikaflex



Insert and Come-Along



Insert and Come-Along



Homing Joints



Huge Success!



Other Custom Solutions

- Drop Piece under Railroad
- Keep Railroad Operational



APC – Railroads and Shallow Cover



Off-Peak Hours

- Maintain Capacity on I-15
- Operation hours:
 - Start Friday at 10pm
 - Finish Monday at 6am
 - Backfill, asphalt, and cooled by 6am
- Always keep two lanes open
- Installed in 3 weekends



Jack and Bore Under Interstate

- 36" inch pipe
- 2.5 miles of pipe, most under freeway
- Could not disrupt traffic



Protect Joints









Exit Pit



Aesthetics and APC

- Jackson Hole Tunnel
 - 26' x 15' three-sided clam shell design
 - Maintain area aesthetics
 - Combined precast and cast-in-place



Beveled 3-Sided Clamshell Boxes





Clamshells welded together









Accelerated Precast Construction

Innovative Methods

- Scheduling
- Delivery
- Design
- Manufacturing
- Construction

Results

- Reduce On-Site Construction Time
- Reduce Costs
- Reduce Impact on Road Users and Environment
- Improve Safety

Thank You!

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