

A photograph of the Austin skyline in the background, with a concrete bridge railing in the foreground. The text 'Keep Concrete Weird' is overlaid in large, colorful, 3D letters. Below it, 'UNUSUAL PROJECTS' is written in white, bold, sans-serif capital letters. In the foreground, a concrete slab features a star and the word 'AUSTIN' stamped into it.

# Keep Concrete Weird

**UNUSUAL PROJECTS**



# 2025 SPRING CONVENTION

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**AUSTIN, TEXAS • APRIL 13 –  
16, 2025**

[www.icri.org](http://www.icri.org)



# CONCRETE REBELS

## **Ronnie Wills**

President & Founder

## **Belin Wills**

VP of Education & Marketing

*Aggregate Technologies*

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REBELS

CHALLENGE  
~~STATUS~~  
QUO

By leveling up...



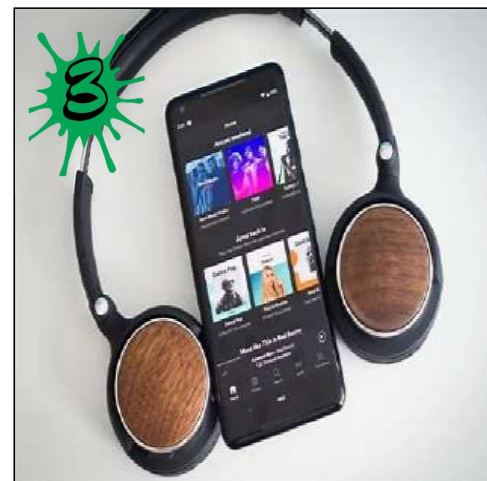
# REBELS

1,000 Songs...  
*In your pocket*

CDs



Virtually Unlimited...



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REBELS

Return-and-Relaunch Rocket



Moon Landing



Single-Cycle Rockets





# PROBLEMS



## Austin, we have a problem!

- Deadline crunches for projects
- Workforce issues
- Emergency Issues
- Bad pours
- Concerns over damaging rebar, beams, etc.
- Safety concerns
- Vibrations
- Sparks
- Environmental concerns
- Silica Dust Safety Concerns (OSHA)

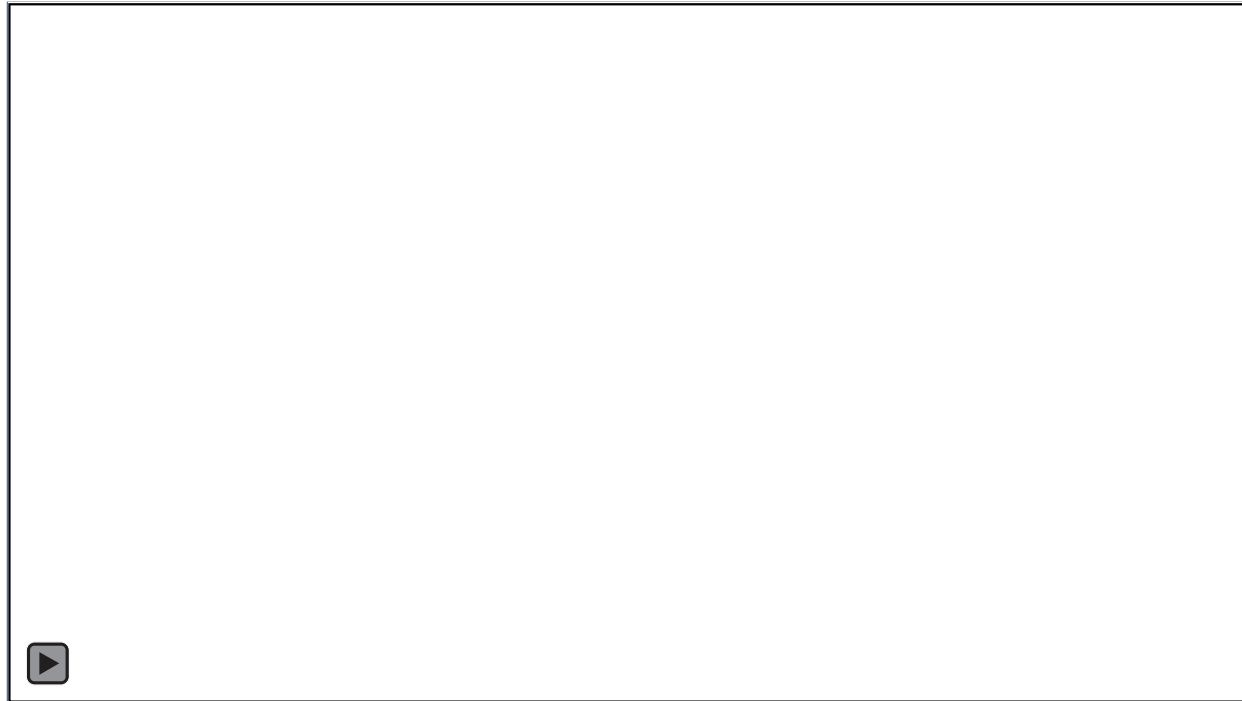


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**PNEUMATIC HAMMER-  
*JACKHAMMER*  
CHIPPING HAMMER**



When rebar or other embedded steel is struck by a jackhammer, vibrations will travel deep into the concrete to areas of sound concrete.  
**Vibrations cause Micro-Fractures.**



## Traditional Methods...

- **Profile: Rough, uneven, fractured**
- **Texture: Jagged** with **micro-cracks** and **inconsistent depth**
- **Bond Strength: Weaker** due to **damaged substrate** and **loose aggregate**
- **Risk:** High potential for **microfractures**, reducing long-term durability





# ALWAYS ANOTHER WAY TO SKIN A CAT



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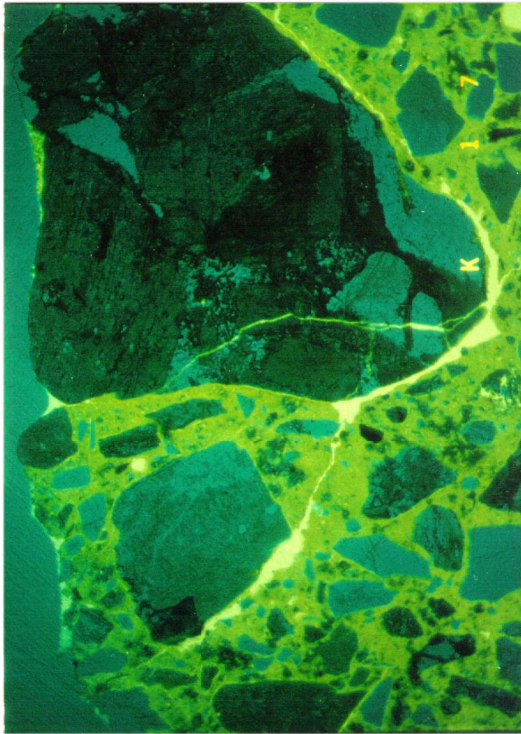
**HYDRODEMOLITION-**  
***A.K.A. "HYDROLAZING" OR***  
***"HYDROBLASTING"***

- USES **HIGH-PRESSURE WATER** JETS TO  
**SAFELY AND EFFICIENTLY**  
REMOVE CONCRETE BY PENETRATING  
ITS SURFACE,  
REACHING VOIDS AND MICRO-CRACKS.

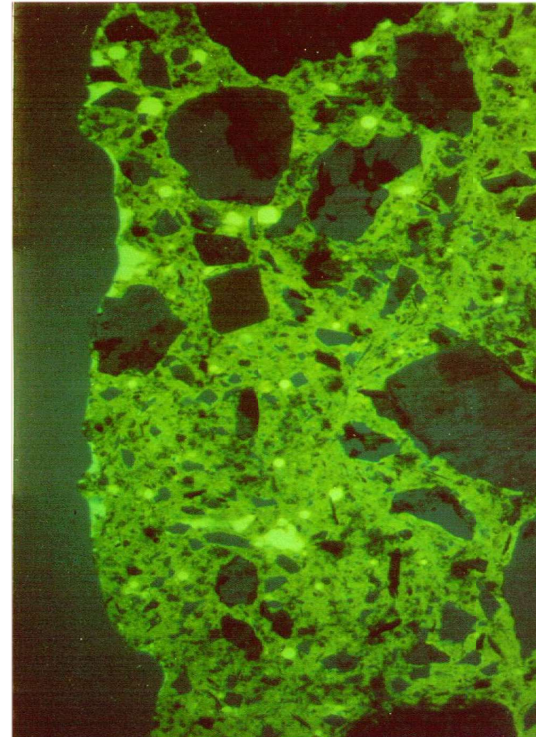
# What is HydroDemolition?



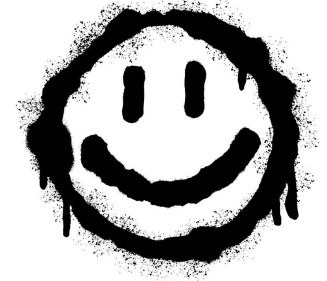
# Microcracks?



Pneumatic Hammer



HydroDemolition





## **NOT-SO SECRET CODES for Hydro...**

- Partial depth removal (1/4 inch-2.5 feet+)
- Remove only unsound concrete
- Preserve rebar
- Zero compromise on substrate integrity
- No dust or vibrations
- Particular pull off test requirement to hit a bond strength



## NOT-SO SECRET CODES for Hydro...

- **ICRI 310.2R** guideline lists HydroDemolition under ***methods*** for CSP 6-10



*1 smooth....10 is roughest*

- The choice of profile hinges on scale, access, and environmental factors.

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# HydroDemolition

*With Hand Wand (Non-Automated)*



- **Slow speed**
  - **Lack of uniformity**
  - **Safety risks**  
*(exposure & operator fatigue)*
- 
- **Great for small, simple tasks**



# HydroDemolition

*With Hydraulics (Not Fully-Automated)*



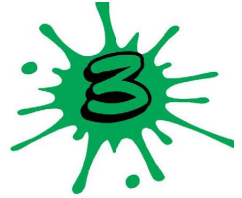
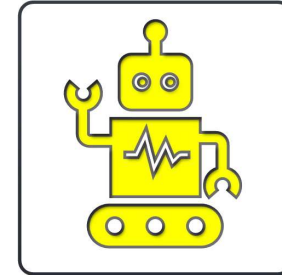
- **Lack of automation** *means efficiency & uniformity decreases*

- **Good safety-power balance**
- **Semi-automated**



# HydroDemolition

## *Fully-Automated & Robotic*



- **Projects where precision is key**
- **Programable robotics = uniformity**
- **Remotely controlled at a distance**



- **Confined spaces**
- **Weight restrictions**
- **Underwater projects**

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**Heights? Angles?  
Vertical?**

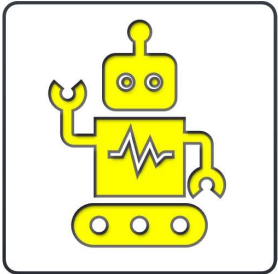
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## Fully Robotic Programming...



How does it work?

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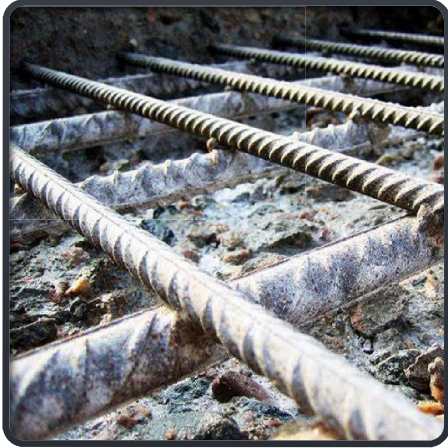


Concrete structures  
need maintenance and  
refurbishment.

How do we make  
repairs more  
economical?

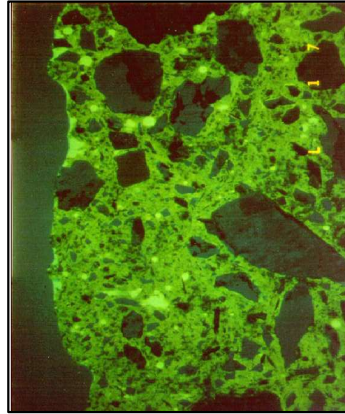
[www.icri.org](http://www.icri.org)





Assurance of  
“Bad” Concrete  
Removal

+



No Microfractures

+



Bonding Surface  
50% Stronger

=



**Extend Life of Concrete  
Repair up to 3x'S**

## Each Project Has Unique Challenges



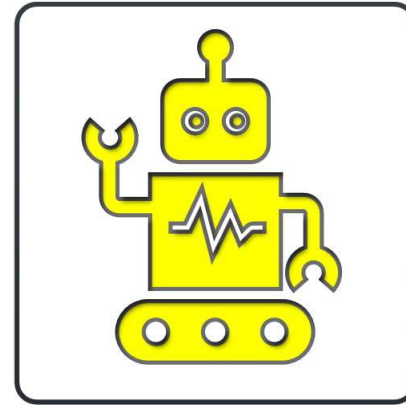
Cost of Labor &  
Safety Risks

+



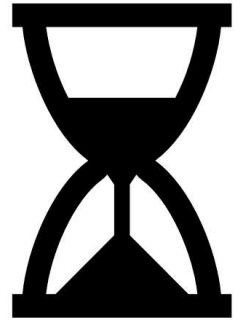
Cost & Safety Risks of Closures

+



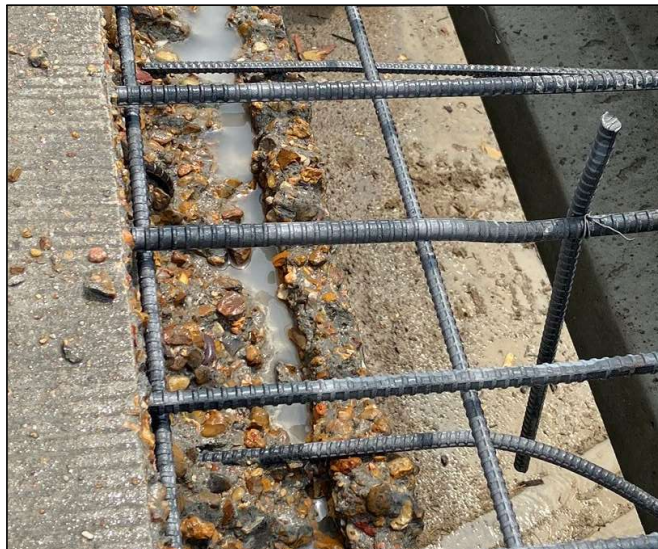
Robotics 25x's Faster

+



Timeline Issues

+



Cost of Damaging/  
Rebar, Beams, Surrounding  
Substrate

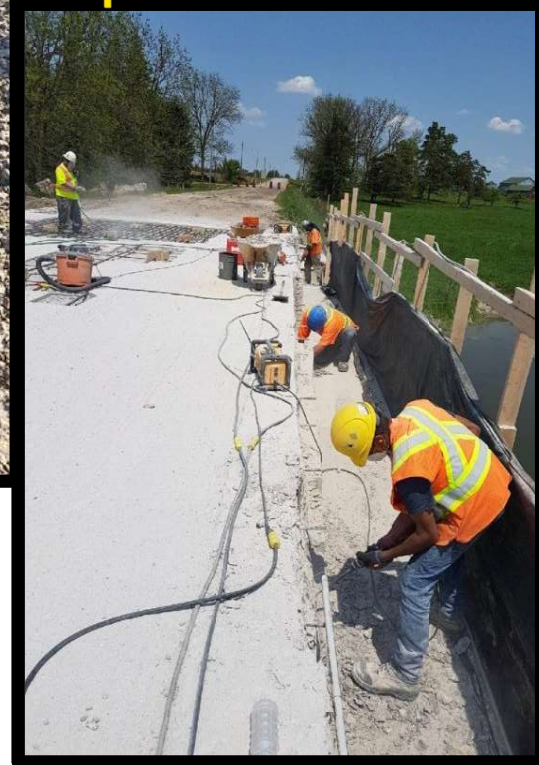


# EXAMPLE: BRIDGE-WIDENING WITH CHIPPING HAMMERS

- YOU'D NEED 10+ WORKERS
- DAMAGES STRUCTURAL BEAM, REMAINING CONCRETE & REBAR
- SAFETY ISSUES
- PRODUCTION IS 4-6 TIMES SLOWER THAN HYDRO
- UP TO 50 FEET OF CONCRETE REMOVED PER NIGHT.



CHALLENGE  
~~STATUS~~  
QUO





## BRIDGE-WIDENING WITH HYDRO

- Up to 150 ft of concrete removed per night with a **more uniform** outcome.





*Sustainability?*



## **(<) CARBON FOOTPRINT**

NO VIBRATIONS

Less noise

VIRTUALLY NO  
SILICA DUST

**TREATMENT &  
RECYCLING OF WATER**

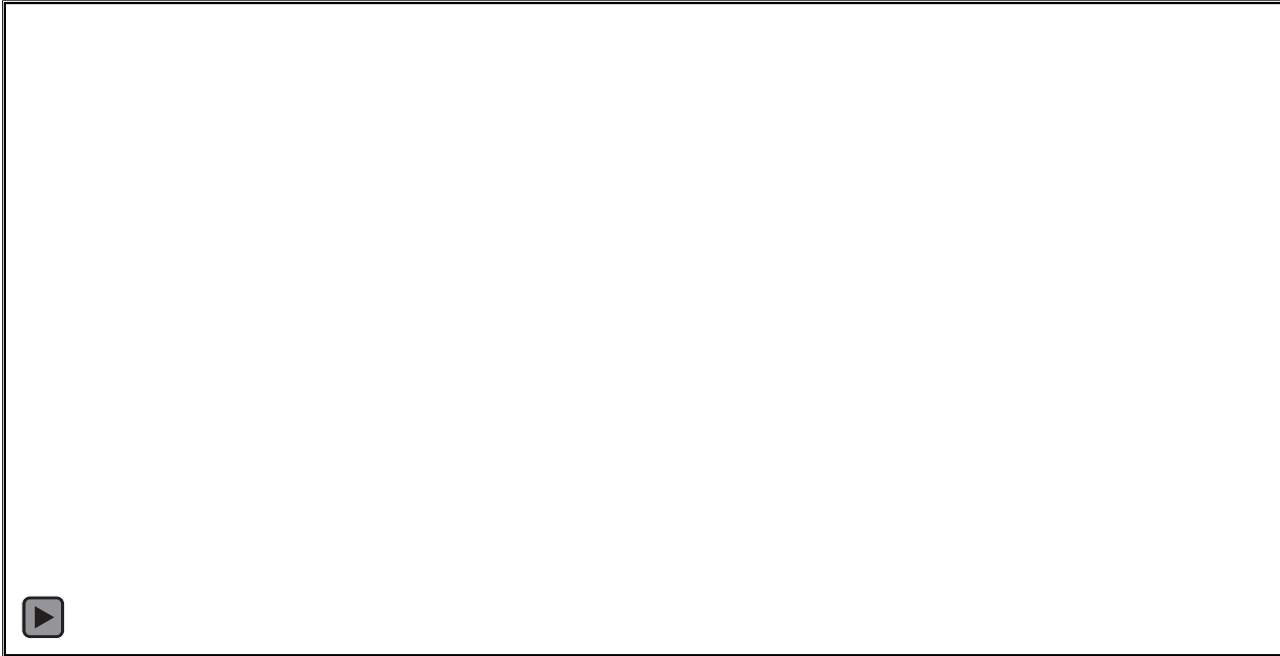




# Water

- **Many methods** of capture.
- Hydro-excavation trucks to suck up concrete and water.
- Water must be **potable.**  
(Tankers, frac tank, or hydrant)
- **Pump influences the production rate** & efficiency.

[www.icri.org](http://www.icri.org)



400- **1,000 HP** pumps.





## *Live Content Slide*

*When playing as a slideshow, this slide will display live content*

**Poll: In concrete repair projects, what takes precedence for you?**

**Industries for HydroDemolition? ANYWHERE there is concrete, refractory material, rust or paint removal.**



**Buildings/structures**



**Chimneys**



**Parking garages**



**Tunnels**



**Berth/piers**



**Diaphragm walls**



**Petrochemical plants**



**Waste-water plants**



**Bridges**



**Hydropower plants**



**Pillars/piles**



**Airports**



**Nuclear**



**Roads**







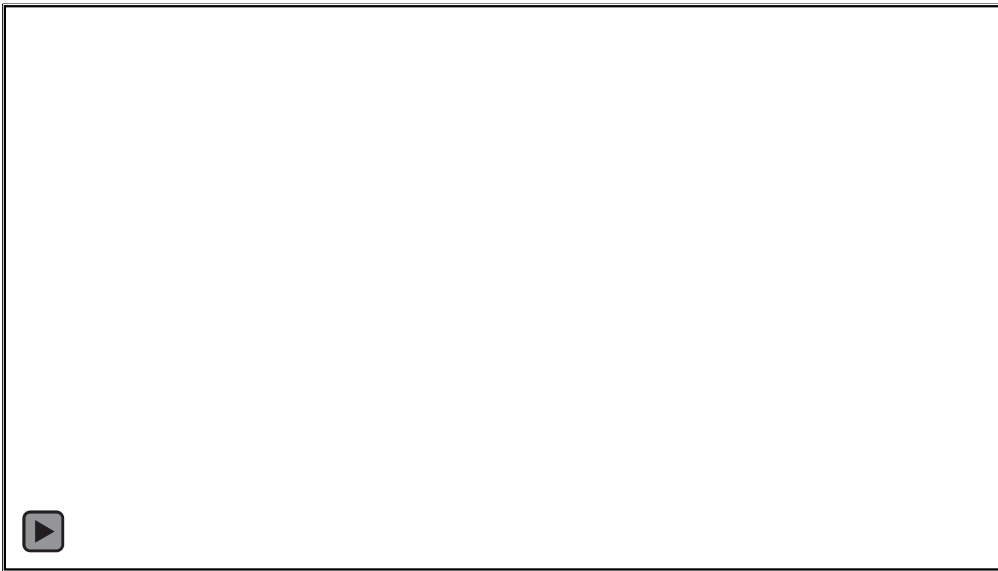
# Road Work

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# HydroDemolition in Action



Parking garage wall



Overhead repair



# WASTE WATER TREATMENT PLANTS

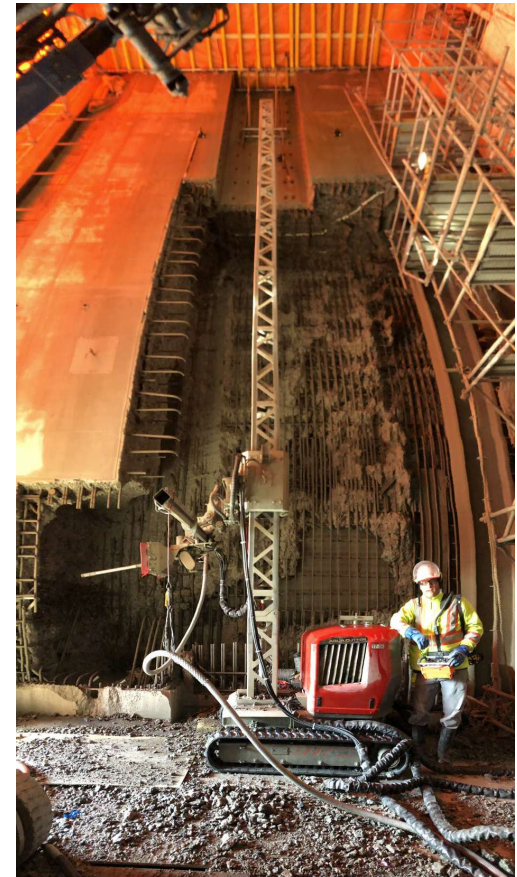




Dam Repair



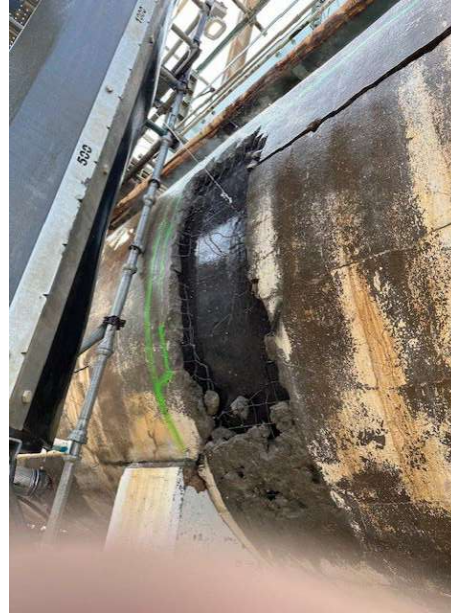
Tunnel Wall



30ft tall and 8 Feet deep

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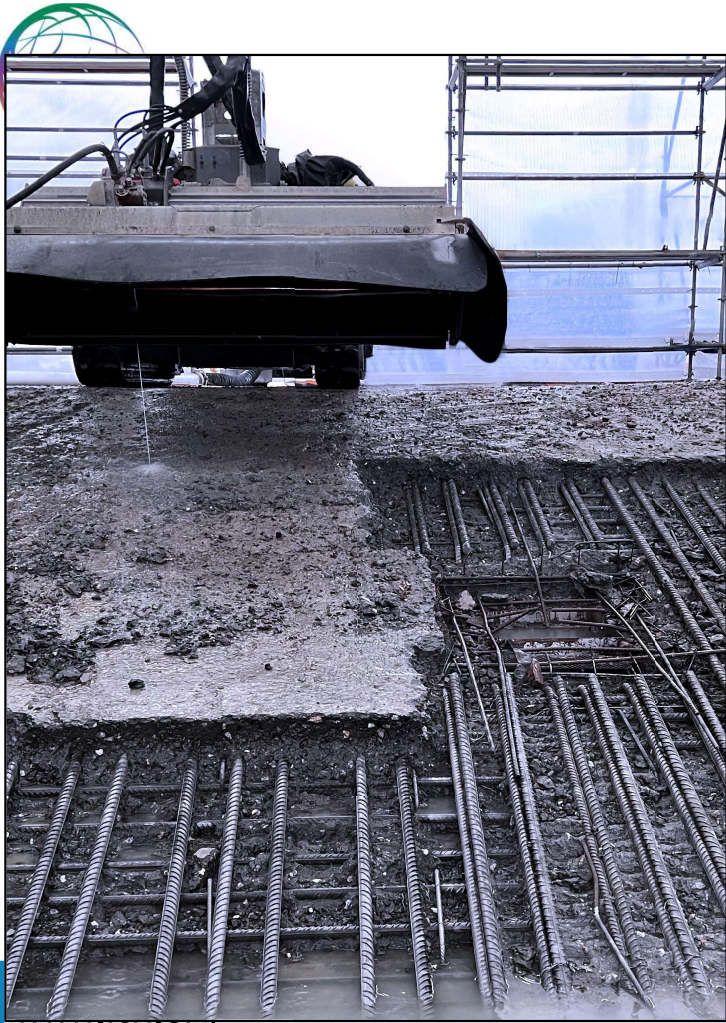


# Industrial Applications

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## Foundation Repair

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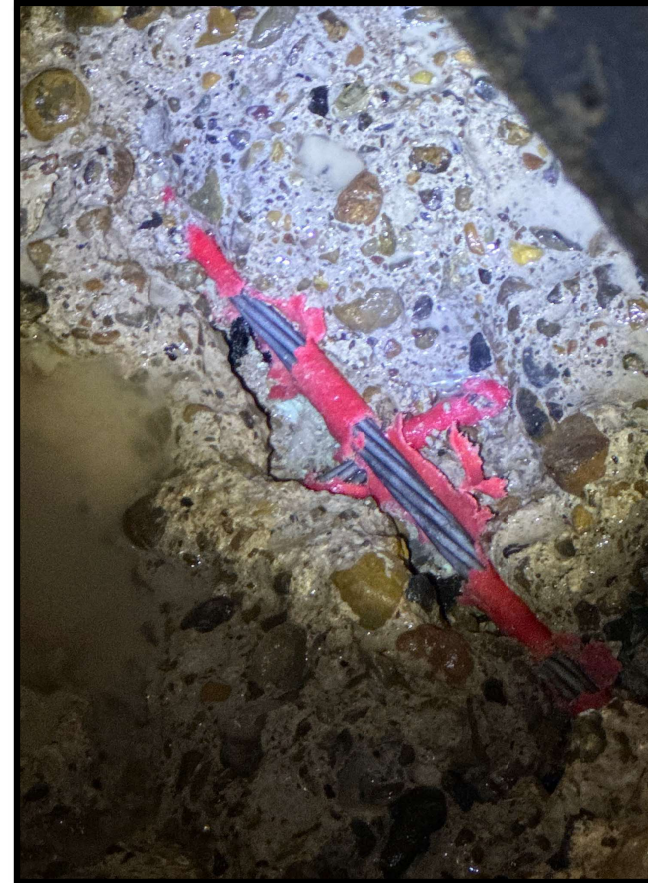


## PERFORMING HYDRODEMO **INSIDE AN EXISTING COMMERCIAL STRUCTURE?**

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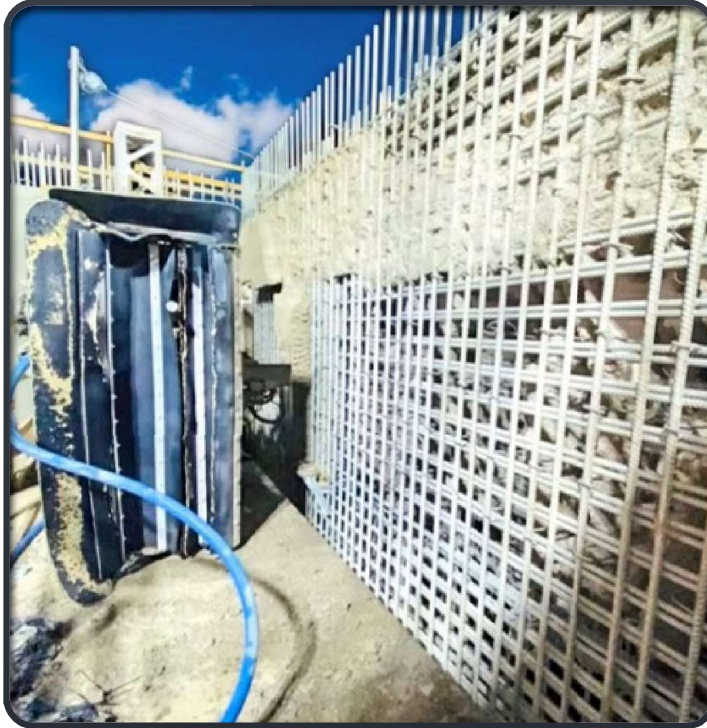




## Prestress Cables with Hydro?

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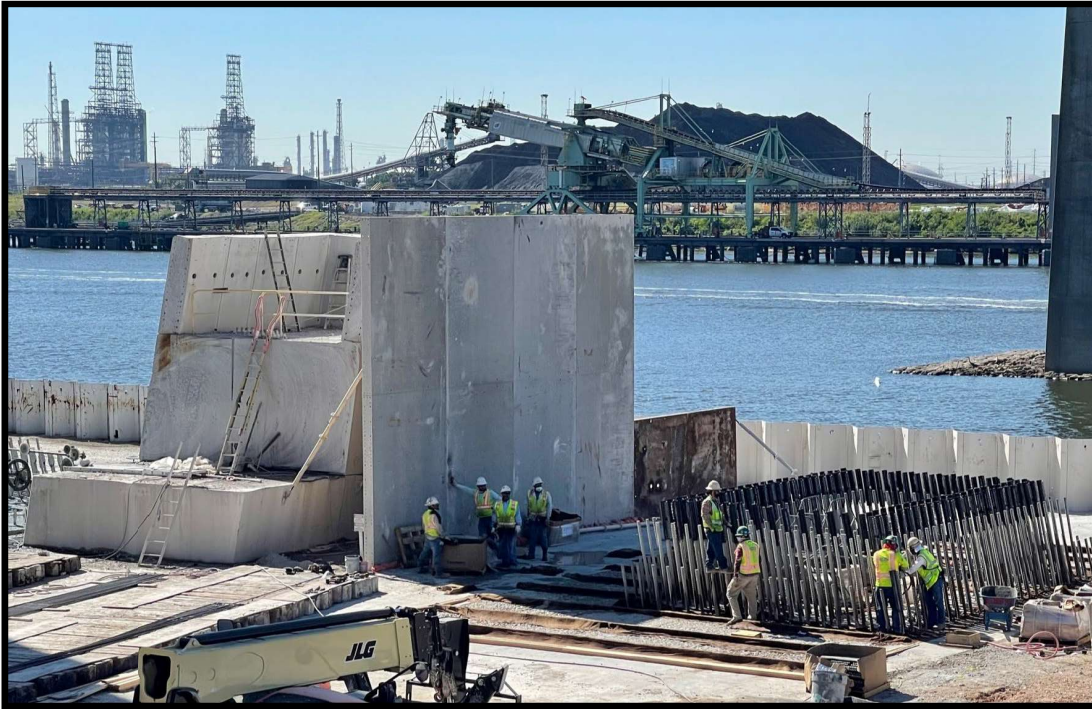


- Application mistakes
- “Bad” pour
- Concrete does not meet requirements

## “Oopsie Daisy” Projects



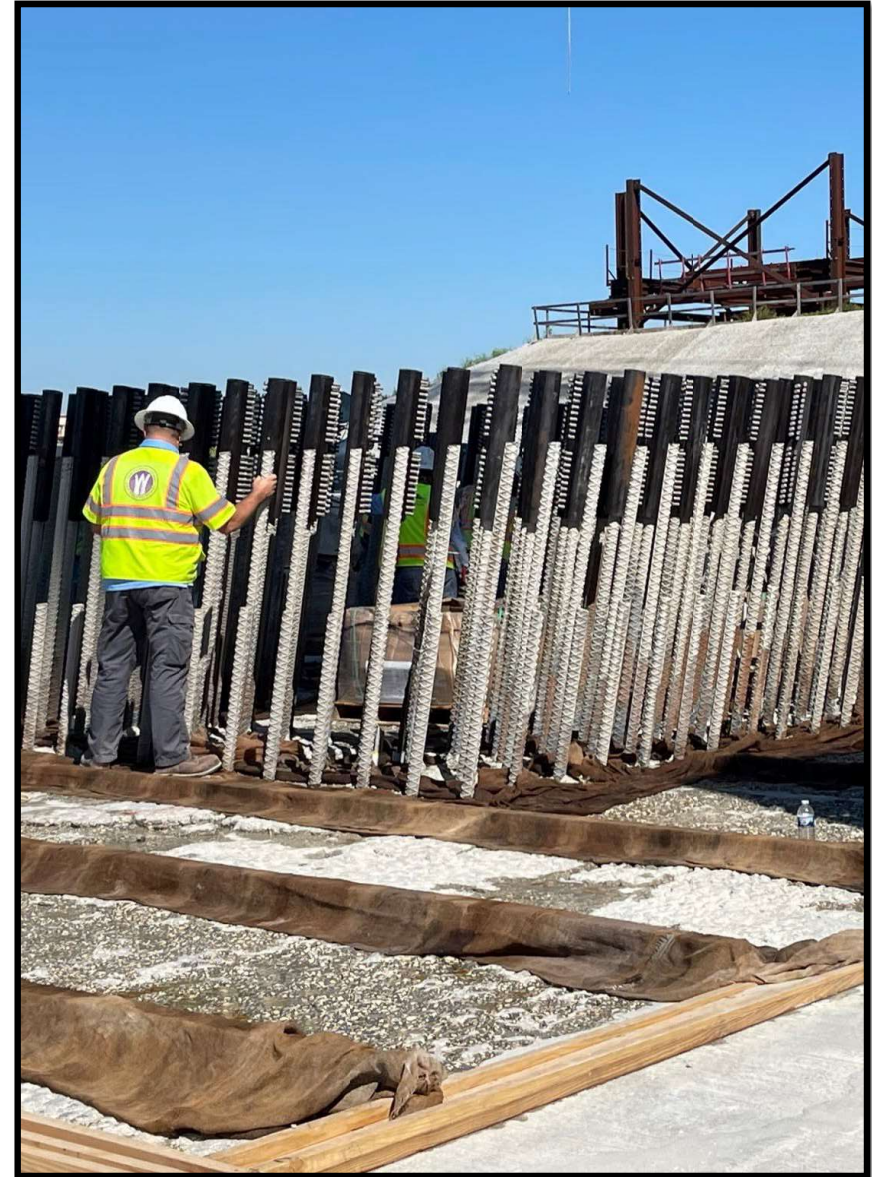




## Design Flaws?!

Multiple methods of concrete cutting & removal involved, including HydroDemolition to expose & preserve rebar.

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# *Emergency* Projects



*A Race to Finish...*



# Compromised Slab



Courtesy: Brandon Clement/LSM







CHALLENGE  
~~STATUS~~  
QUO

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# ANY QUESTIONS?



## THANK YOU

ICRI REBELS!

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# SESSION EVALUATION

## Resources

Evaluate this Session



To complete the session evaluation, open the ICRI Convention App.

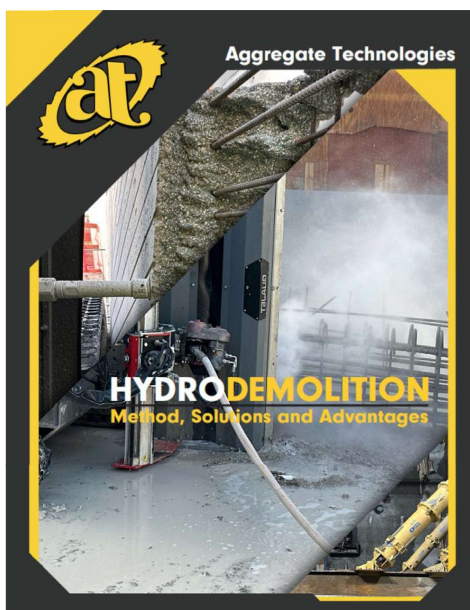
Under **Plan Your Event**, select Schedule, and then the Technical Session you are attending. Select the sub-session you are attending, scroll down to Resources, and select Evaluate this Session.



**AGGREGATE  
TECHNOLOGIES**

*Coast to Coast!*

THE LEADERS IN THE INDUSTRY OF  
**HYDRODEMOLITION**



- **AggregateTechnologies.com**

- Safety Ratings & Awards
- "LEVELING UP" Since 1997!
- Cutting & Removing Concrete
  - Complex Projects
  - *Capabilities Statement*

