



# WHAT WORKS IN THE FIELD

## Real-World Concrete QA

[www.wavelogix.tech](http://www.wavelogix.tech)

Date: June 12, 2025

Presented by: Joe Turek





# Introduction

Wavelogix<sup>®</sup>, Inc. was founded in 2021 in partnership with INDOT and Purdue University to improve road and bridge reliability while reducing traffic disruptions.

Our REBE<sup>®</sup> Concrete Strength Sensing System provides real-time, in-place measurements of concrete properties, offering a more precise and versatile solution than traditional sensors.

With patented technology, Wavelogix eliminates the need for pre-set maturity curves, delivering accurate results across various projects and helping teams optimize schedules and reduce costs.





# Joe Turek

## President & COO

Joe Turek, received a bachelor's degree in Electrical Engineering (BSEE) in 1979 from the University of Notre Dame and an MBA from Northwestern's Kellogg School of Management in 1982.

He has been involved in manufacturing his entire career. He holds five patents involving high performance microwave telecommunications circuit board technologies and has been a registered Professional Engineer and a member of the IPC and IEEE.



# Ross Armstrong

## Quality Control Manager

With over 30 years of hands-on experience in concrete quality assurance across Tennessee, Kentucky, and beyond, Ross has led QC operations for some of the region's most demanding public and private sector projects.

His work has spanned multiple state DOT certifications, major ready-mix operations, and a deep commitment to ensuring durability, compliance, and consistency in every pour.



# AASHTO T412

## The Future of Strength Testing



### Acoustical Resonance Method

Determines real-time, in-place strength



### Increases ROI

Shift from traditional to real-time accurate testing



### January 2025

Massachusetts DOT adopts T412 in concrete specifications

# Benefits and Impact



## Calibration Free

Independent of mix design, temperature and moisture



## Real-Time Data

Monitors concrete strength up to 56 days and beyond



## Proven Reliability

Lower variability than cylinder, beam and core tests



## Cost & Time Savings

Enables faster project completions and earlier payments



## AASHTO T 412 - Compliant

Fully aligned with the new standard



Verification Testing :  
Fast Cure Concrete  
includes AASHTO-T 412

# REBEL Paving the Way

**Table M4.03.2-4: QC Testing Requirements for Hardened Concrete<sup>[1]</sup>**

Test Method	Quality Characteristic			Limits	
				Min.	Max.
Select One Method	AASHTO T 22 <sup>[2]</sup> ASTM C1074 AASHTO T 412	Compressive Strength (psi) for High Early Strength Concrete (M4.06.3)	24 Hours	2500	-
			3 Days	4000	-
			7 Days	5000	-
	Compressive Strength (psi) for Rapid Hardening Concrete (M4.06.4)	4 Hours	2500	-	
		24 Hours	4000	-	
		7 Days	5000	-	

[1] QC testing for hardened concrete is only required for high early strength concrete (M4.06.3) and rapid hardening concrete (M4.06.4).

[2] Three (3) 4 x 8 in. cylinders shall be cast and tested for each set specified for maximum aggregate size less than 1-1/2 inches. Two (2) 6 x 12 in. cylinders shall be cast and tested for each set specified for maximum aggregate size greater than 1 inch.

# Verification Testing : General Concrete Includes ASSHTO T-412

# REBEL Paving the Way

**Table M4.06.1-4(a): Verification Testing Requirements for Hardened Concrete**

Test Method	Quality Characteristic		Limits	
			Min.	Max.
AASHTO T 22 <sup>[1][2]</sup>	Compressive Strength (psi)	3 Days	Informational	
		7 Days	Informational	
		28 Days	Target	-
		56 Days	Informational	

- [1] Three (3) 4 x 8 in. cylinders shall be cast for each specified age for maximum aggregate size less than 1-1/2 inches. Two (2) 6 x 12 in. cylinders shall be cast for each specified age for maximum aggregate size greater than 1 inch.
- [2] Subject to Department review and Approval, the following in-place, non-destructive test methods may be used as an alternative to AASHTO T 22 for determining early age strength during construction for certain concrete applications as specified in the Division II: Construction Details Standard Specifications, contract document, or special provisions:
  - ASTM C1074 Standard Practice for Estimating Concrete Strength by the Maturity Method.
  - AASHTO T 412 Standard Method of Test for Real-Time Estimate of In-Place Concrete Strength Using Acoustical Resonance Method.



# Verification Testing: Precast/Prestress Concrete Includes ASSHTO T-412

# REBEL Paving the Way

**Table M4.09.3-7: QC Testing Requirements for Hardened Concrete<sup>[1]</sup>**

Test Method	Quality Characteristic		Limits		
			Min.	Max.	
Select One Method	AASHTO T 22 <sup>[2][3]</sup> ASTM C1074 AASHTO T 412	Compressive Strength (psi)	Form Removal	70% of $f'_c$	–
			Prestressing Strand Release	80% of $f'_c$	–
			Termination of Protection from Adverse Conditions and Shipping	100% of $f'_c$	–

- [1] The specified compressive strength ( $f'_c$ ) is defined as the minimum compressive strength required to be attained at a specified age for a given concrete structure, as identified in construction standard specifications, contract document special provisions, and design plans.
- [2] Three (3) 4 x 8 in. cylinders shall be cast and tested for each set specified for maximum aggregate size less than 1-1/2 inches. Two (2) 6 x 12 in. cylinders shall be cast and tested for each set specified for maximum aggregate size greater than 1 inch.
- [3] For fiber reinforced concrete, specimens shall be filled in one lift and consolidated using external or internal vibration per AASHTO R 100. Rodding of test specimens shall be prohibited.

# REBEL® Sensor System Segment Applications

KEY BENEFITS			
<b>Horizontal</b>	<ul style="list-style-type: none"> <li>• Accelerate traffic release</li> <li>• Eliminate cylinder breaks</li> <li>• Enable early payment</li> </ul>	<b>Geo Tech Houses</b>	<ul style="list-style-type: none"> <li>• Expand market reach</li> <li>• Reduce labor costs</li> <li>• Boost profitability</li> </ul>
<b>Vertical</b>	<ul style="list-style-type: none"> <li>• Save time and costs</li> <li>• Achieve 50% cost savings</li> <li>• Improve project timeline by 50%</li> </ul>	<b>Redi-Mix</b>	<ul style="list-style-type: none"> <li>• Confirm product quality for customers</li> <li>• Avoid costly replacements</li> </ul>
<b>Slab</b>	<ul style="list-style-type: none"> <li>• Verify flexural strength and flatness</li> </ul>	<b>Precast</b>	<ul style="list-style-type: none"> <li>• Optimize form removal</li> <li>• Enable early shipment to customers</li> </ul>
<b>Tilt -Up</b>	<ul style="list-style-type: none"> <li>• Ensure safe, confident lifting</li> </ul>	<b>International</b>	<ul style="list-style-type: none"> <li>• Introduce new technology from the U.S. Laboratories</li> </ul>

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# Easy TESTING SET UP

Drop on Roadbed



Strap to Rebar



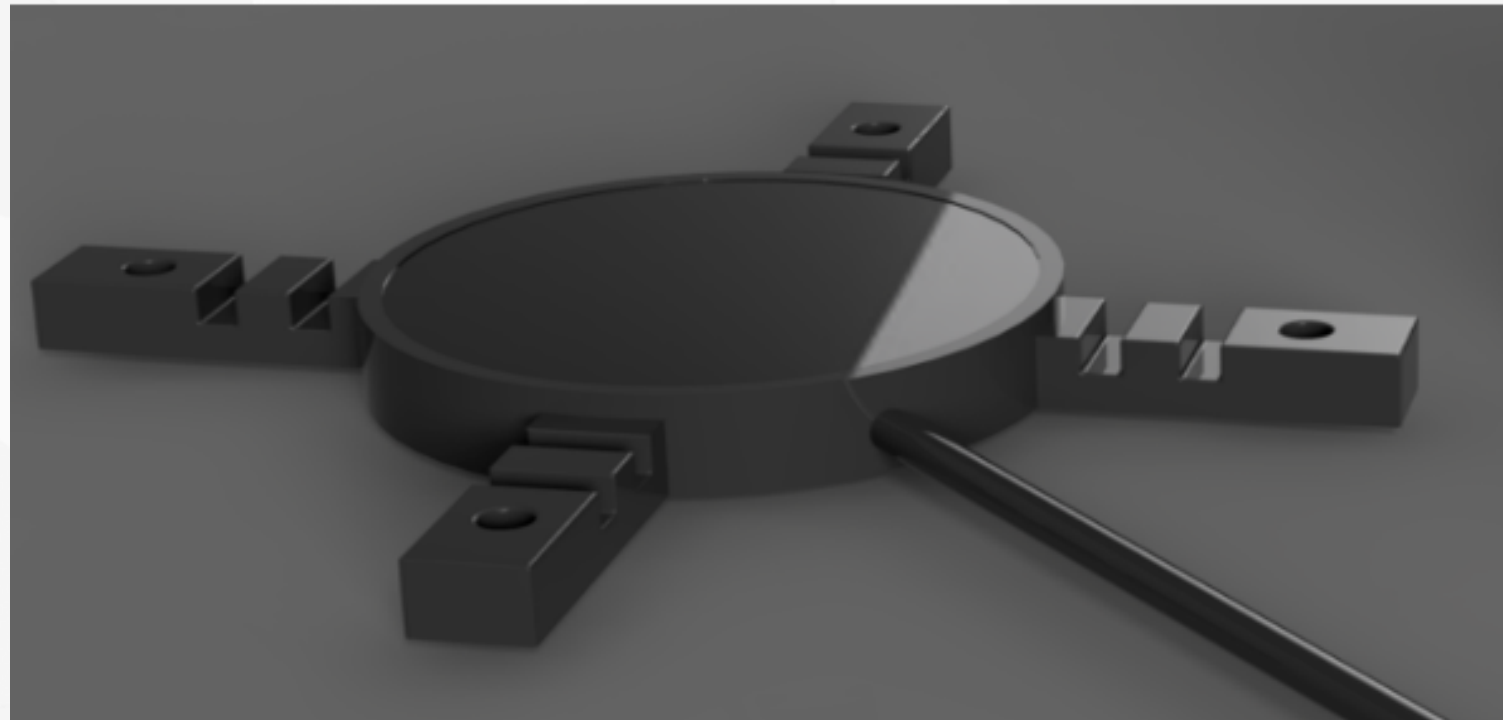
# The REBEL® System

**Miniaturized IoT Hardware for:**  
Data collection and Computational Transmission

**AI-guided algorithm for:**  
Concrete strength measurement Concrete strength prediction

## REBEL Sensor

Inside: Piezo wave generator and temperature probe



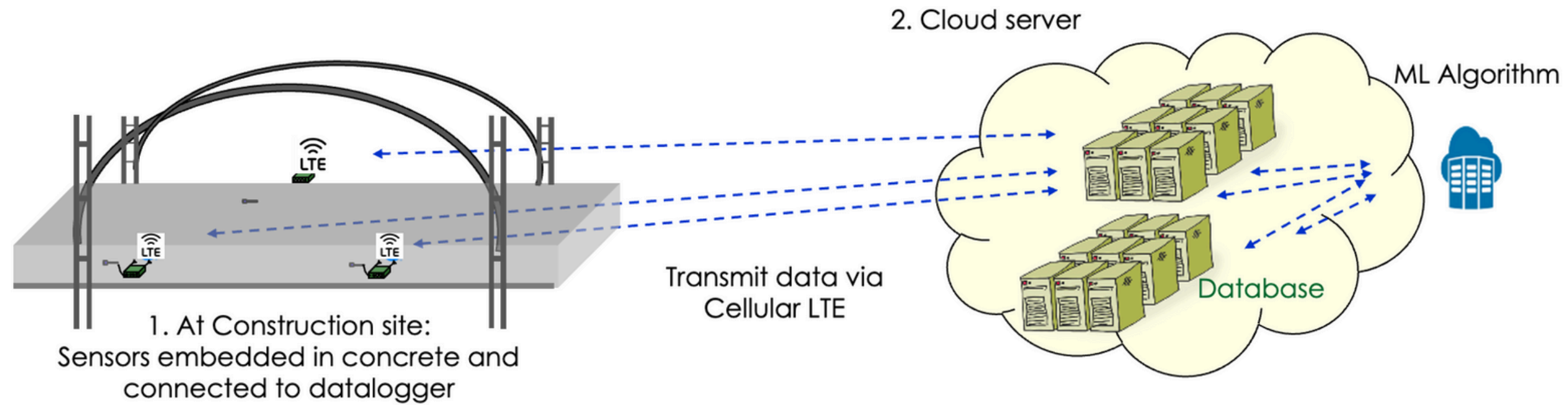
## REBEL Data Logger



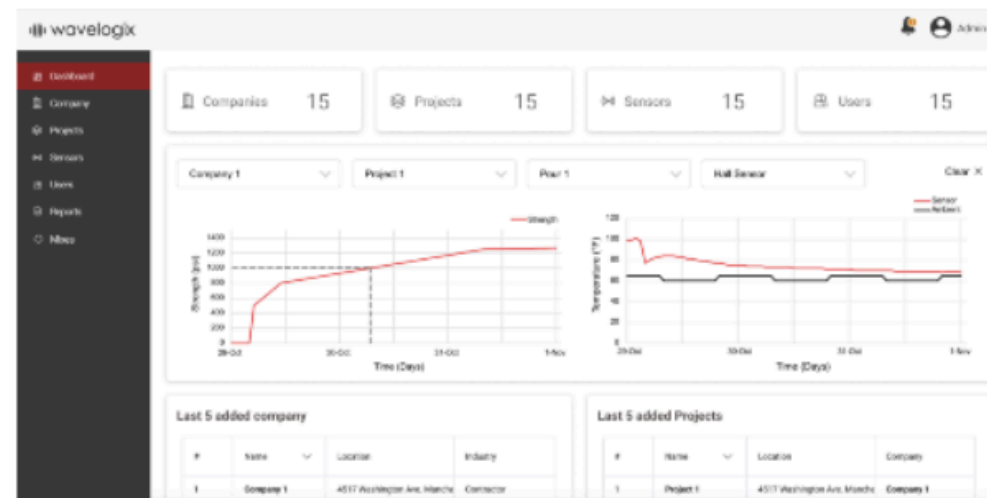
Inside:

- Impedance meter
- GPS location chip
- Cellular radio
- Lilon Battery (28 day capacity)
- Wireless recharging with a cradle charger
- Sealed case that can work under water
- Durable housing to withstand environmental pressures

# How It Works



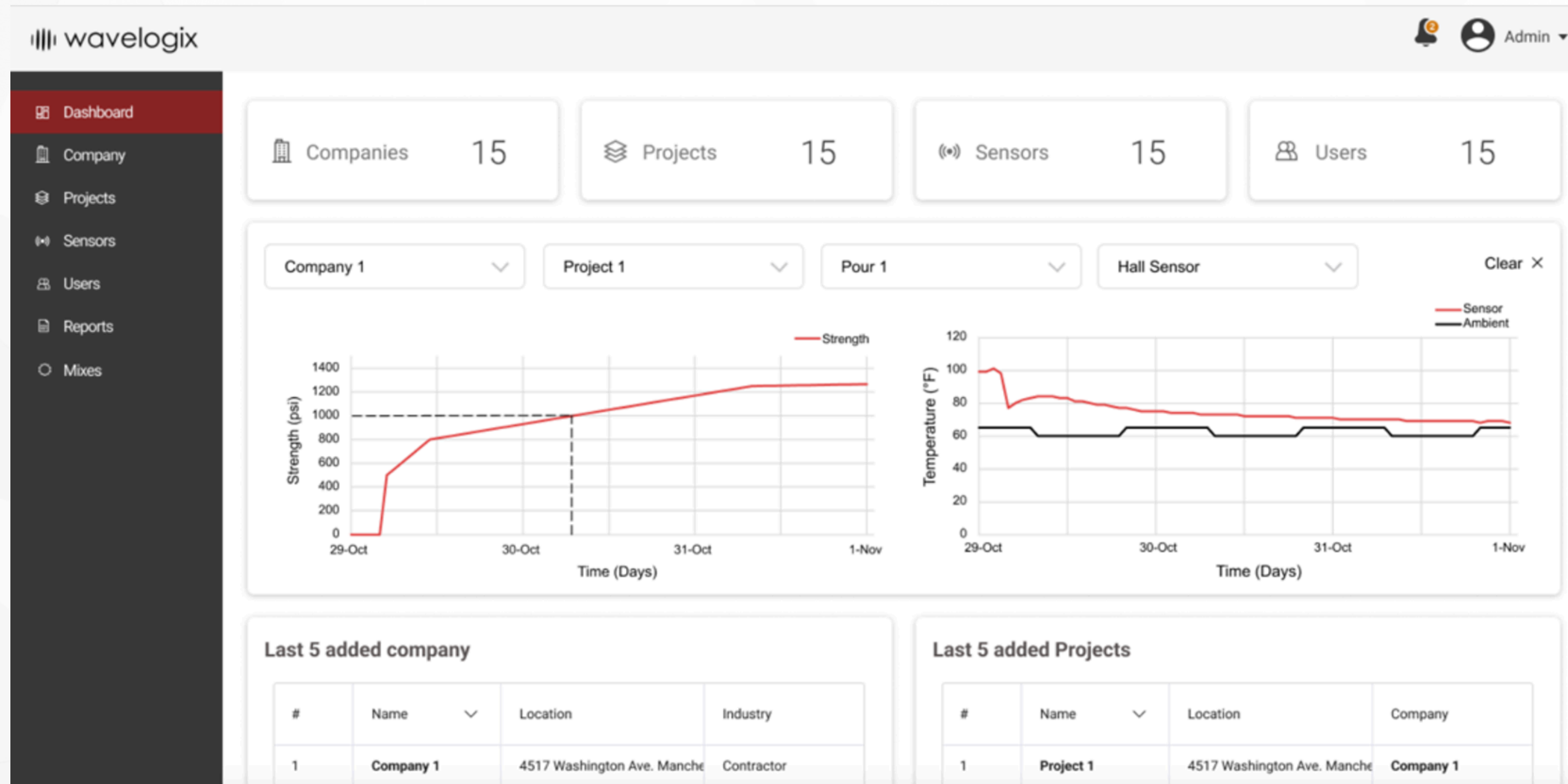
## 3. Front end



## 4. User Interface



# Dashboard and User Interface





**Book a meeting:**

Explore how the REBEL System can transform your concrete monitoring process!

**Learn More:**

[sales@wavelogix.tech](mailto:sales@wavelogix.tech)



**SCAN ME**

**THANK YOU**

