wavelogix®
BREAK FREE®

# REINFORCING RCC PROJECTS WITH REAL-TIME DATA

## Meet Jason Steenhoek

www.wavelogix.tech


**Date: August 14, 2025**

**Presented by:** Joe Turek


# Introduction

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

Our REBEL® 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.

# Jason Steenhoek

## Project Manager Choice Concrete

**Jason Steenhoek**, Project Manager at Choice Concrete, as we explore the evolution of **Roller Compacted Concrete (RCC)** and how real-time strength monitoring is changing the game.

Jason brings a one-of-a-kind perspective — from his early days on a family farm to leading large-scale paving and RCC projects across the Midwest. We'll dive into his journey through construction, his passion for innovation, and how technologies like the **REBEL sensor system** are helping contractors make faster, more informed decisions on the job.

Whether you’re a contractor, engineer, or just RCC-curious, this webinar is packed with insights, stories from the field, and practical examples of how real-time data is reshaping RCC applications in agriculture, municipal infrastructure, and beyond.

# 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[1]***

| Test Method | Quality Characteristic | | | Limits | |
|---|---|---|---|---|---|
| | | | | Min. | Max. |
| Select One Method | AASHTO T 22[2]<br>ASTM C1074<br>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[1][2] | 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[1]***

| Test Method | Quality Characteristic | | | Limits | |
|---|---|---|---|---|---|
| | | | | Min. | Max. |
| Select One Method | AASHTO T 22[2][3]<br>ASTM C1074<br>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 | | | |
|---|---|---|---|
| **Horizontal** | • Accelerate traffic release<br>• Eliminate cylinder breaks<br>• Enable early payment | **Geo Tech Houses** | • Expand market reach<br>• Reduce labor costs<br>• Boost profitability |
| **Vertical** | • Save time and costs<br>• Achieve 50% cost savings<br>• Improve project timeline by 50% | **Redi-Mix** | • Confirm product quality for customers<br>• Avoid costly replacements |
| **Slab** | • Verify flexural strength and flatness | **Precast** | • Optimize form removal<br>• Enable early shipment to customers |
| **Tilt -Up** | • Ensure safe, confident lifting | **International** | • Introduce new technology from the U.S. Laboratories |

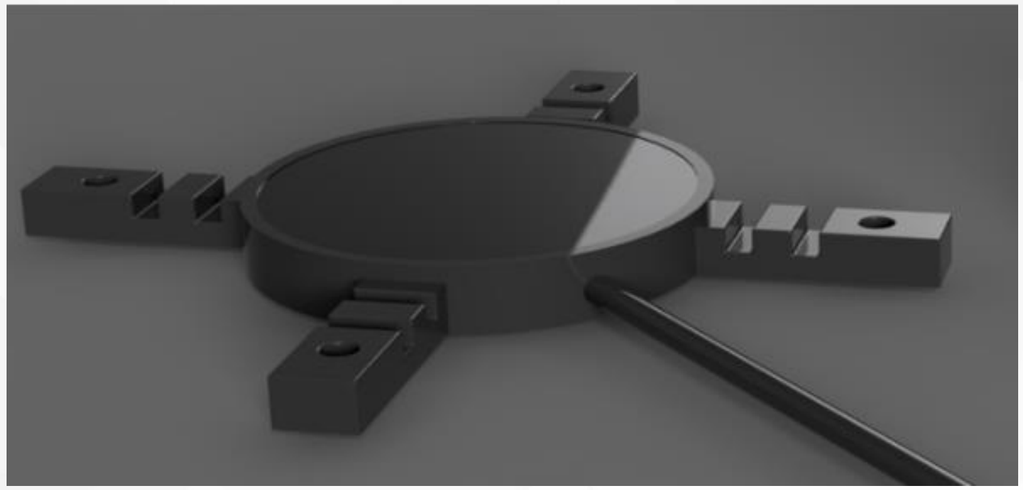
# The REBEL® System

**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

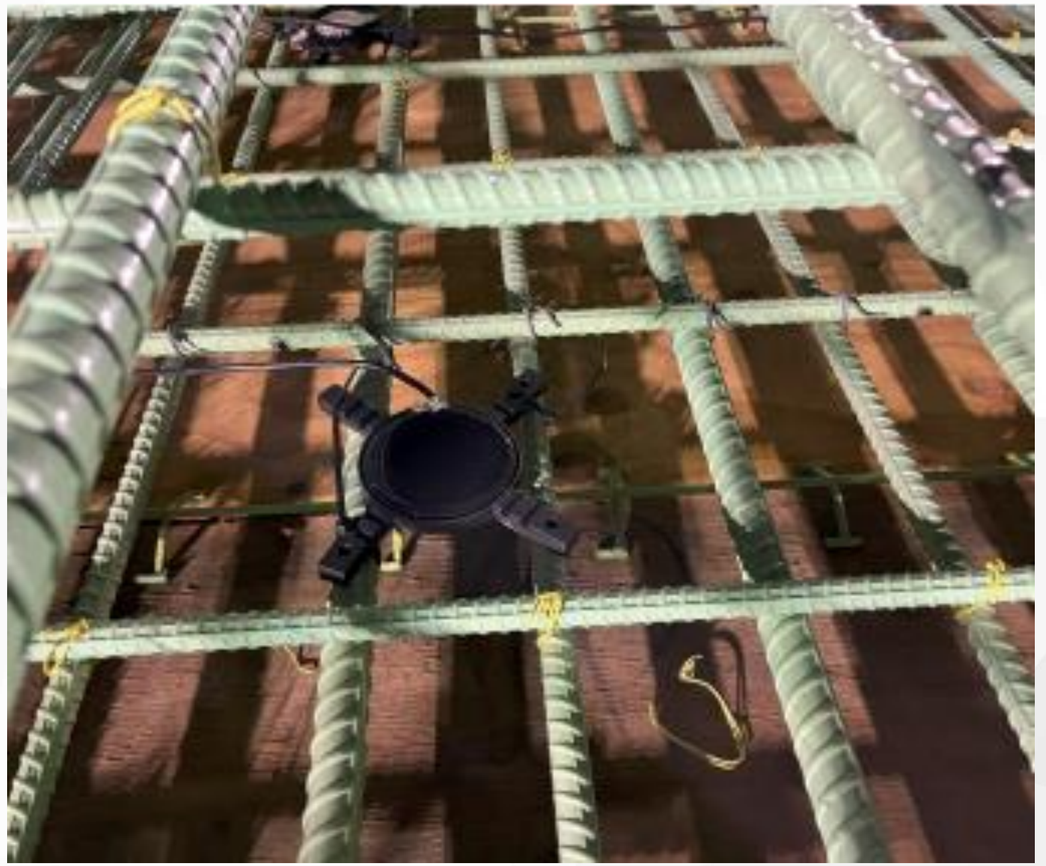

Inside:

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

# Easy TESTING SET UP

## Drop on Roadbed

## Strap to Rebar



# RCC Field Process

## Mill

## Convoy

## Transport


## Dump

## Spread

# RCC Field Process

## Roll


## Measure


## Get Stuck


## Bring In Cattle

# How to Make a RCC Cylinder

## Mix

## Pour

## Transport

## Fill

## In Thirds

# How to Make a RCC Cylinder

Weight

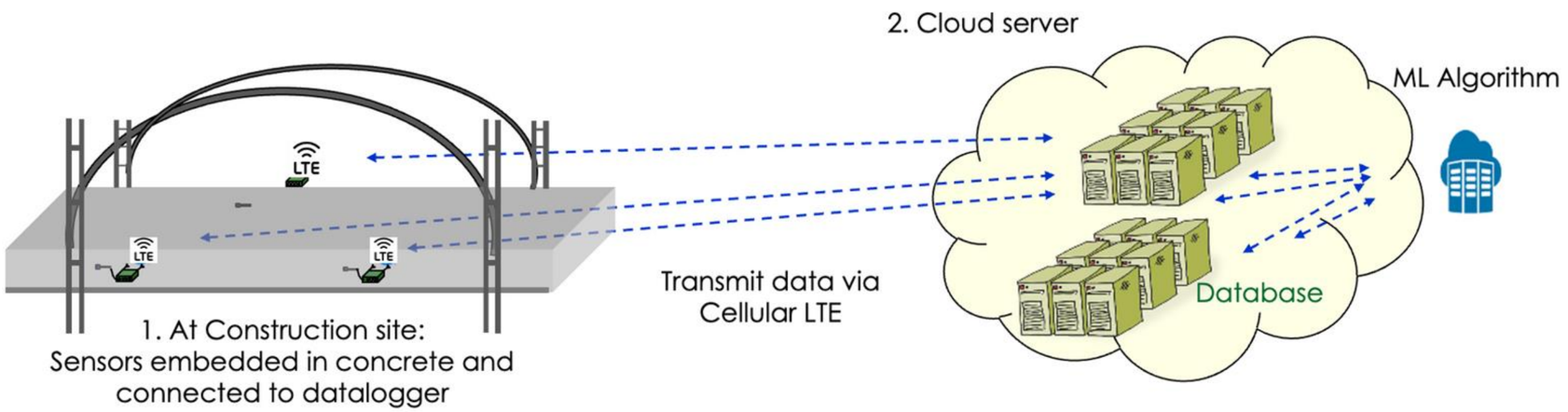
Vibrate

Check

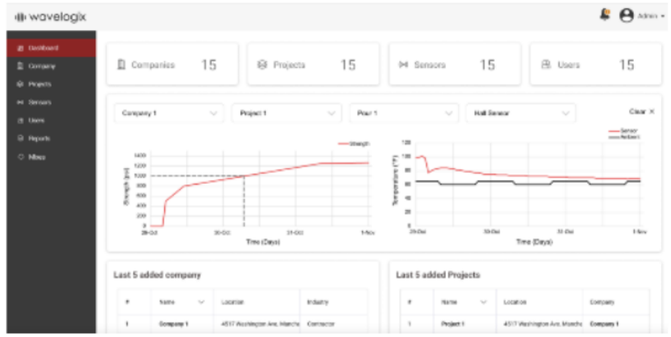
Finish

Smooth

# How It Works

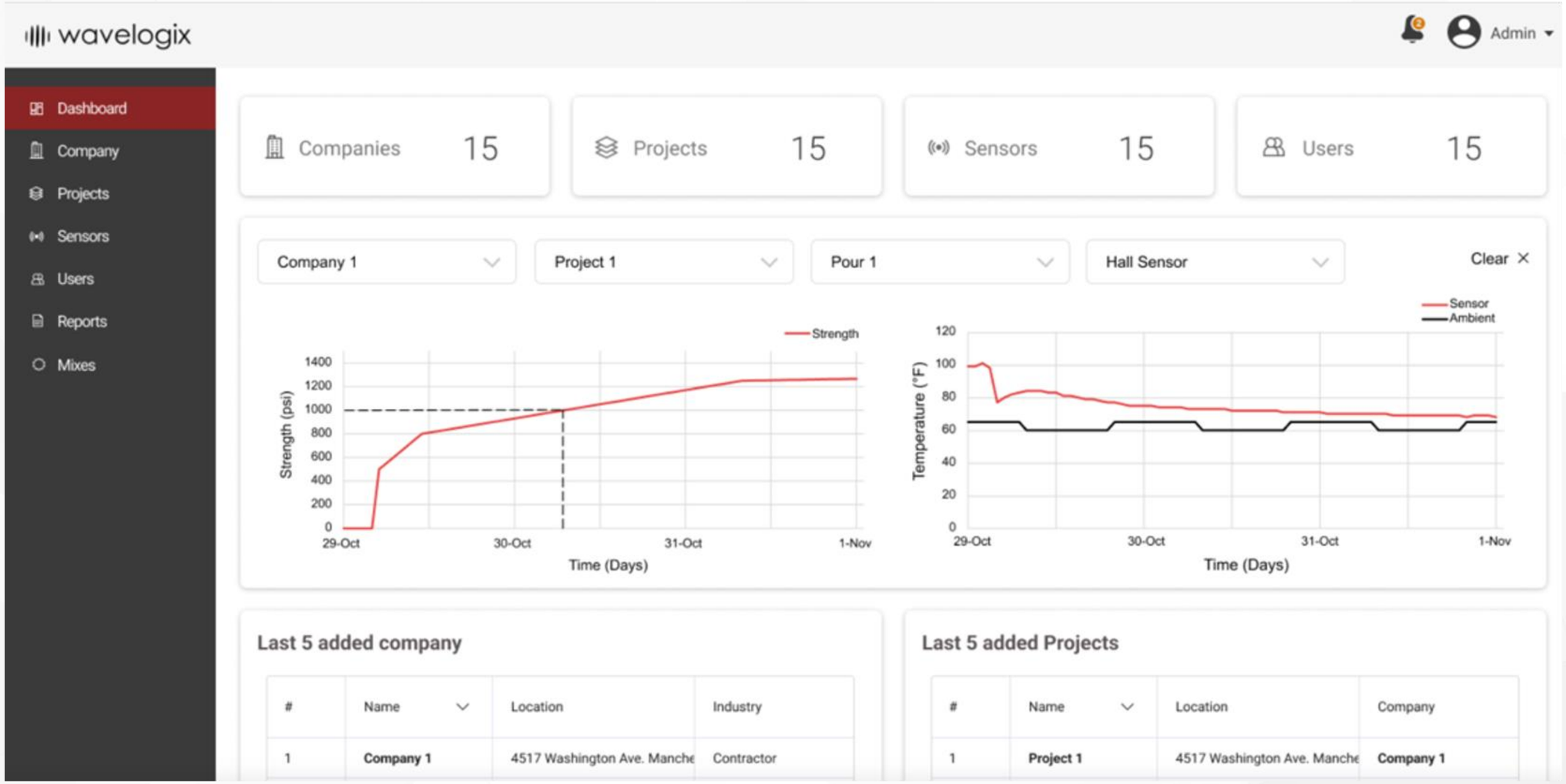



3. Front end




4. User Interface

# Dashboard and User Interface



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**Book a meeting:**

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

**Learn More:**

**sales@wavelogix.tech**

SCAN ME

# THANK YOU

WINNER OF 2021 ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS #GAMECHANGERS

TIME BEST INVENTIONS 2023

EDISON AWARDS GOLD 2024 WINNER