American Concrete Institute

The Industrial Revolution 4
in
Testing and Quality Control

Advanced Construction Technology Services (ACTS)

Outline of the Presentation

- ACI Certification Program
- Advanced Construction Technology Services Introduction
- The Industrial Revolution 4 in the construction industry
- The three breeds of automation
- The application of automation and digitalization on testing and quality control

ACI Certification Program

Certification

- Largest certifying body in the concrete industry
- Over 30,000 exams conducted each year
- Over 555,000 exams administered to date
- Certified individuals residing in 67 countries
- Over 117,000 Active Certifications
- Internationally recognized certification

25+ CERTIFICATION PROGRAMS

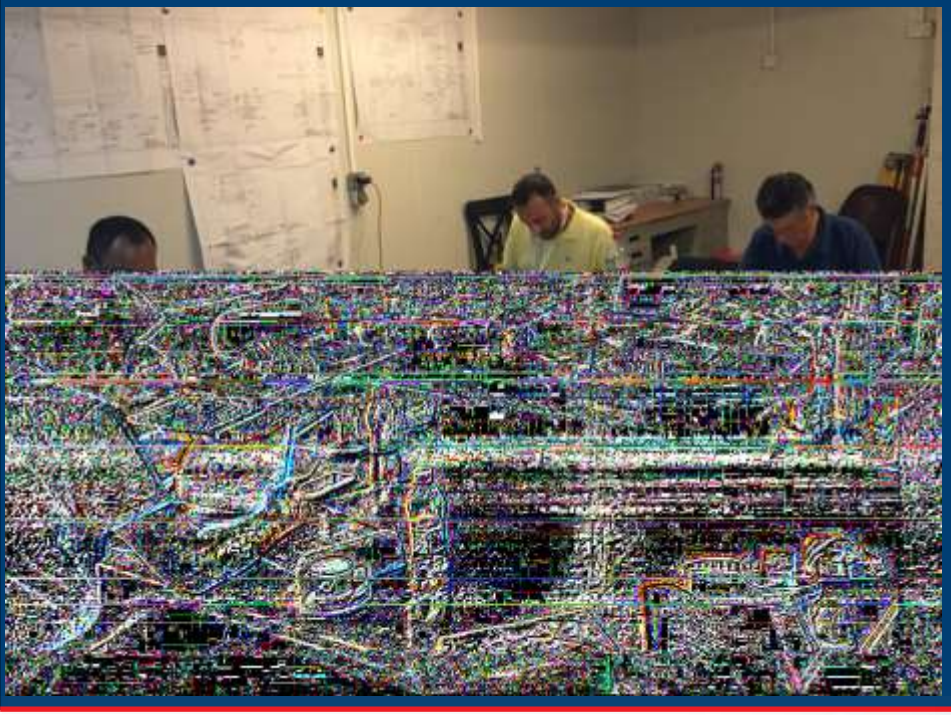
ACI has a certification program for you, whatever concrete specialty you need

CERTIFYING 20,000+
ACI CONCRETE SPECIALISTS EACH YEAR

From finishers and technicians, to supervisors, inspectors, and more, The American Concrete Institute has certified more than 400,000 individuals since the 1980s.

CERTIFICATION PROGRAMS

- Testing
- Inspection
- Construction Specialty



Why Get ACI Certified?

- Demonstrates/proves knowledge and skills
- Provides a mechanism for everyone “to be on the same page” – All agree how things should be done
- Makes the individual stand out from others
- Provides a sense of accomplishment - MOTIVATION
- Provides a track for career advancement

Certified Personnel in the Region

Saudi Arabia	957
Bahrain	10
Djibouti	32
Egypt	82
Iraq	39
Jordan	5
Lebanon	85
Oman	19
Qatar	129
U.A.E.	90

1448

- Field Technician
- Strength Technician
- Aggregate Tech 1 & 2
- Lab Tech 1 & 2
- Inspector & Trans Insp
- Quality Tech Manager
- Flatwork Finisher

Advanced Construction Technology Services Introduction (ACTS)

ACTS
ADVANCED CONSTRUCTION TECHNOLOGY SERVICES

Build on our credentials

Advanced Construction Technology Services (ACTS)

- **Established in 1996, Regional Third-party engineering, Inspection and consultancy firm specializing in quality control, materials testing and geotechnical engineering**
- **Local sponsoring group of the American Concrete Institute (ACI) for its certification programs in Riyadh**
- **One of the first companies to apply the industrial revolution 4.0 in the testing and inspection works.**

Advanced Construction Technology Services (ACTS)

The Kingdom Tower Project

- Tallest Building in the World (1,006 meters)
- Several Practices
- Several Involved Parties

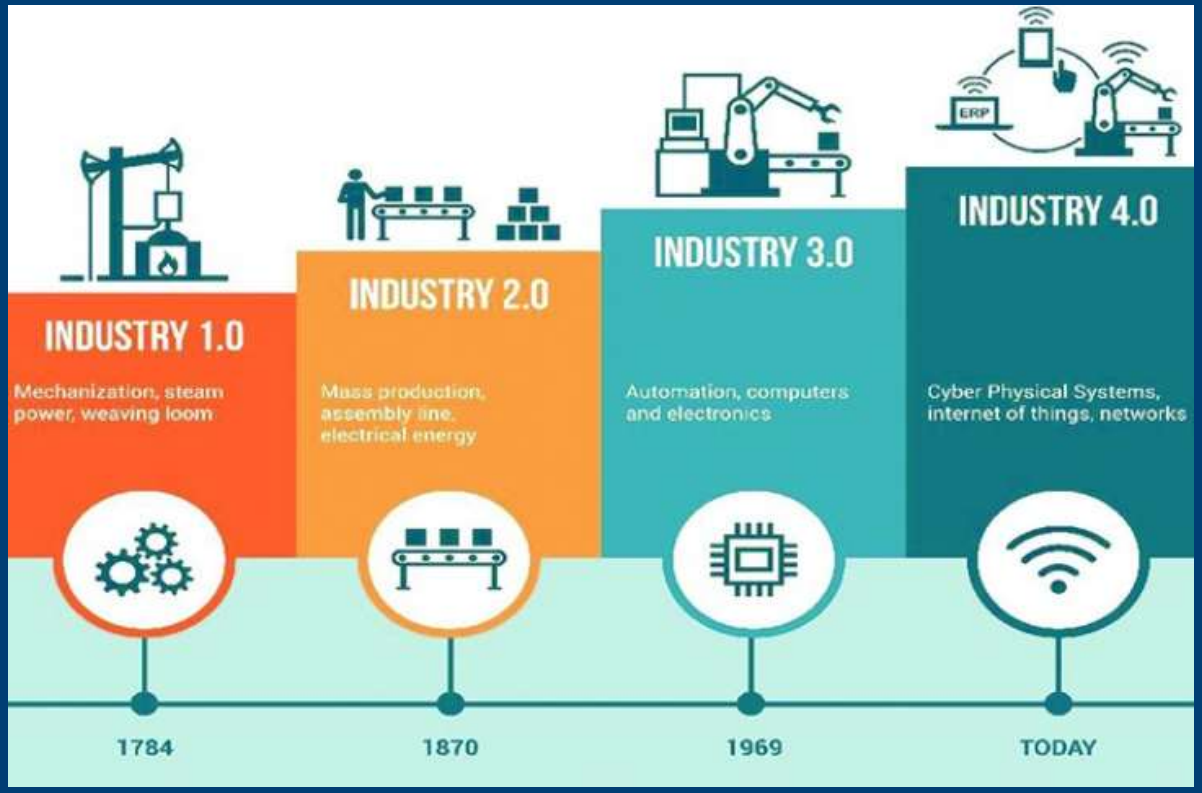
Advanced Construction Technology Services (ACTS)

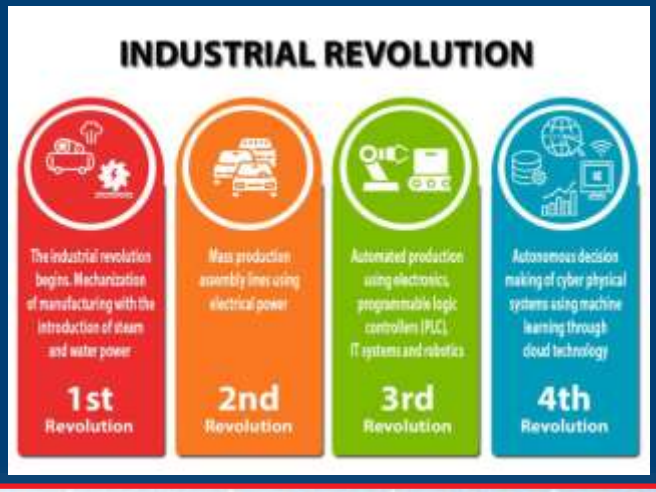
Riyadh Metro Project

- Total of 6 Lines to construct all over Riyadh
- 150 QC Technicians
- Fast Track Project
- Several Involved Entities

The Industrial Revolution 4 in the construction industry

Industrial Revolution 4





Industrial Revolution 4

- The construction industry is years behind the rest of the automated world.

- According to McKinsey Global institute's (MGI) Digitization Index, "Construction is among the least digitized sectors in the world. In the United States, construction comes second to last, and in Europe, it is in last position on the index."

Industrial Revolution 4

- Today, concrete is the most widely used man-made material
- Concrete's use in the modern world is exceeded only by that of naturally occurring water
- Technology did not impact the concrete industry much like the other industries

Industrial Revolution 4

Need for IR 4.0 in Testing and Quality Control

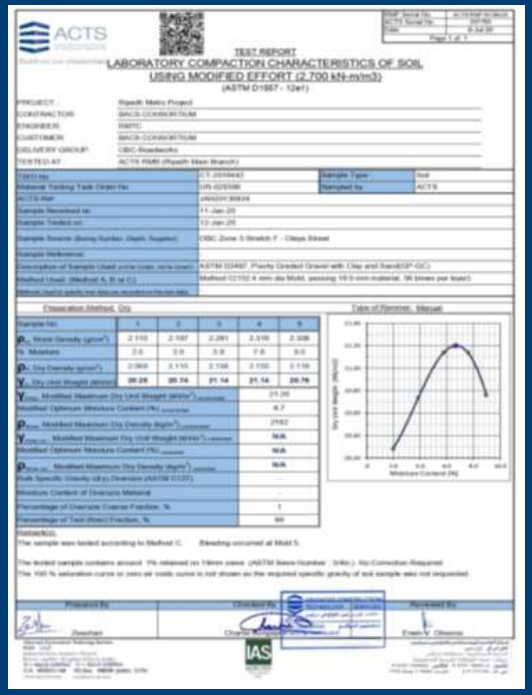
The three breeds of automation

The three breeds of automation

Automation Breeds Innovation	Automation Improves Accuracy	Automation Leads to Digitalization

The three breeds of automation

Innovation

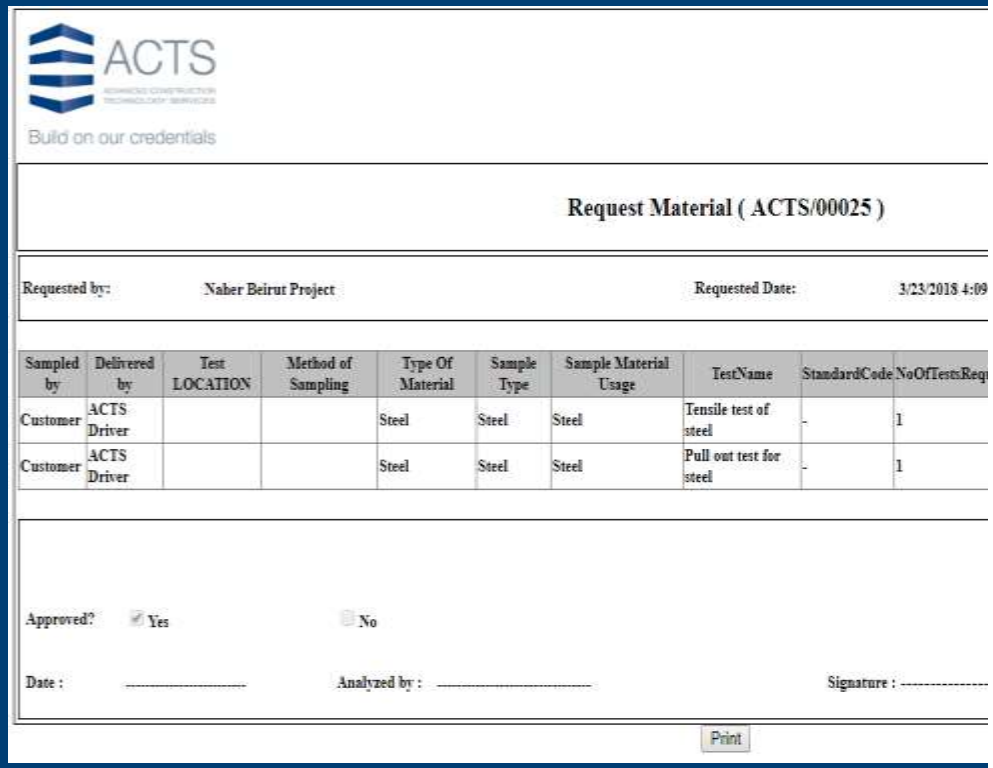


TEST REPORT

LABORATORY COMPACTION CHARACTERISTICS OF SOIL
USING MODIFIED EFFORT (2,700 kN-m/m3)
(ASTM D1557 - 12e1)

The three breeds of automation

Accuracy



ACTS

Build on our credentials

Request Material (ACTS/00025)

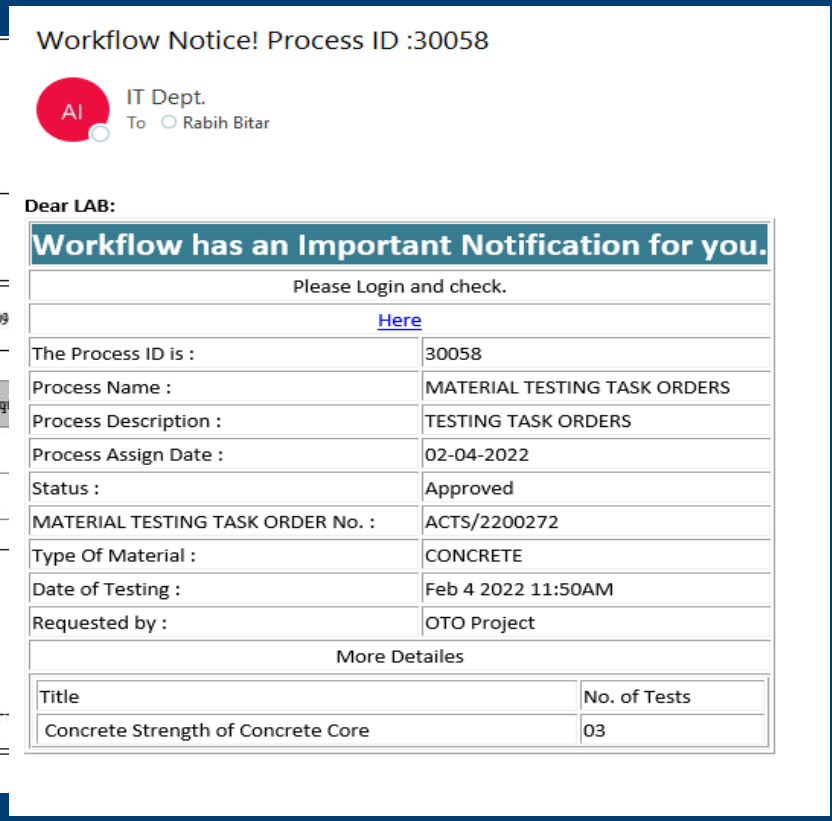
Requested by: Naber Beirut Project Requested Date: 3/23/2018 4:09

Sampled by	Delivered by	Test LOCATION	Method of Sampling	Type Of Material	Sample Type	Sample Material Usage	TestName	StandardCode	NoOfTestsReq
Customer	ACTS Driver			Steel	Steel	Steel	Tensile test of steel	-	1
Customer	ACTS Driver			Steel	Steel	Steel	Pull out test for steel	-	1

Approved? Yes No

Date : ..... Analyzed by : ..... Signature : .....

Print



Workflow Notice! Process ID :30058

AI IT Dept.
To Rabih Bitar

Dear LAB:

Workflow has an Important Notification for you.

Please Login and check.

Here

The Process ID is :	30058
Process Name :	MATERIAL TESTING TASK ORDERS
Process Description :	TESTING TASK ORDERS
Process Assign Date :	02-04-2022
Status :	Approved
MATERIAL TESTING TASK ORDER No. :	ACTS/2200272
Type Of Material :	CONCRETE
Date of Testing :	Feb 4 2022 11:50AM
Requested by :	OTO Project

More Detailes

Title	No. of Tests
Concrete Strength of Concrete Core	03

The three breeds of automation

Digitalization

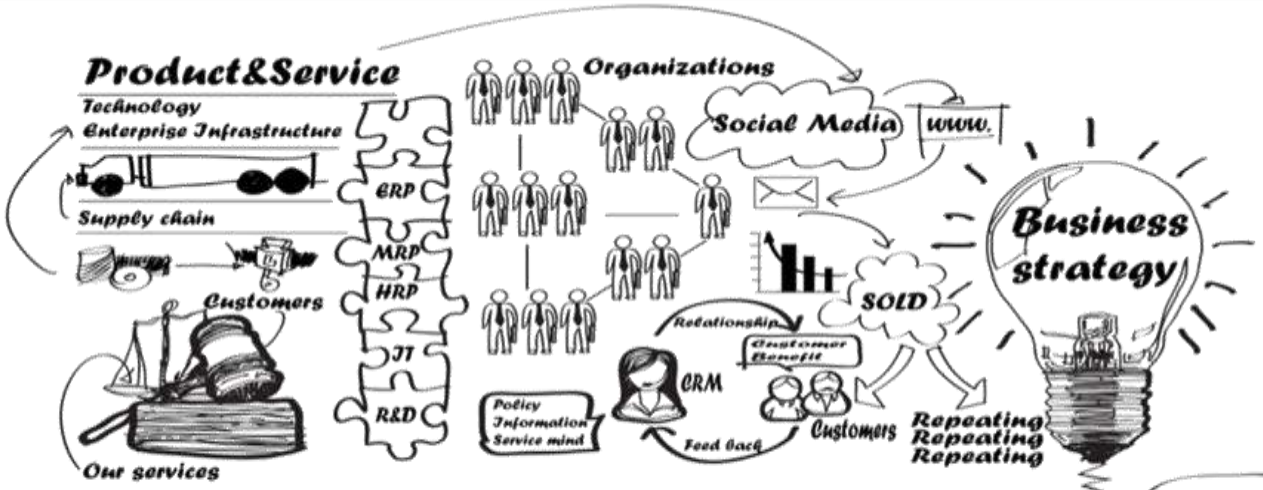
5

The application of automation and digitalization on testing and quality control

ACTS Model

IR 4 Application

ACTS LIMS



The IDEA

- What Did We Do and How we Did it?
- Innovation
- Benefits

IR 4 Application

WHAT DID ACTS DO?

We took the initiative to take the Concrete Industry into one step forward. We managed to merge the testing and inspection industry with the latest modern technologies to produce a Sophisticated Software Applications which will make a big impact on the industry.

- *"Where Testing and Inspection meet Technology"*

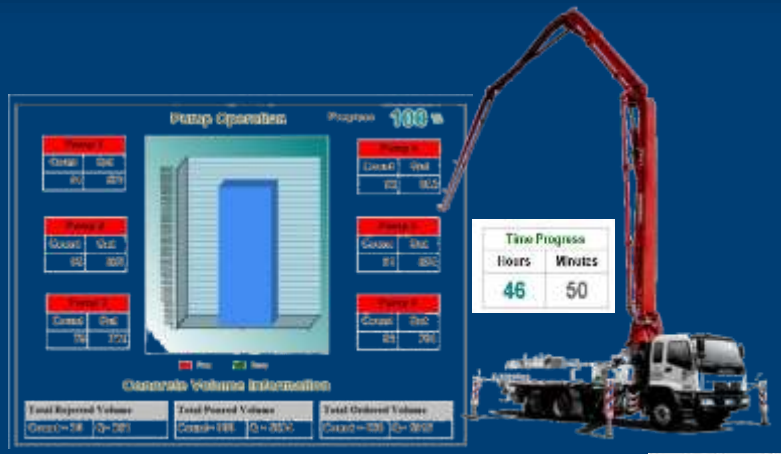
A team of Researchers, Software Engineers, Electronics and Communication Engineers and Mechatronic Engineers has teamed up to develop the most innovative solutions in the field of Concrete

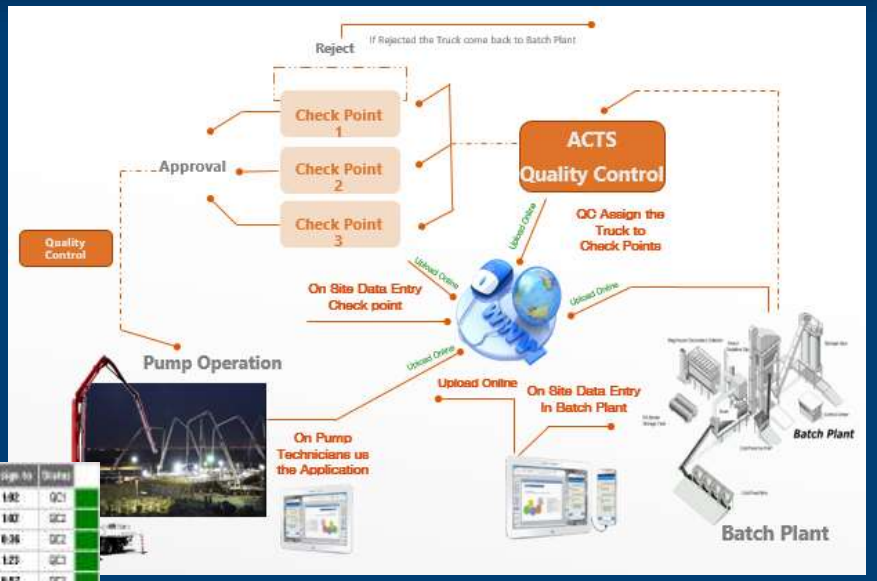
IR 4 Application

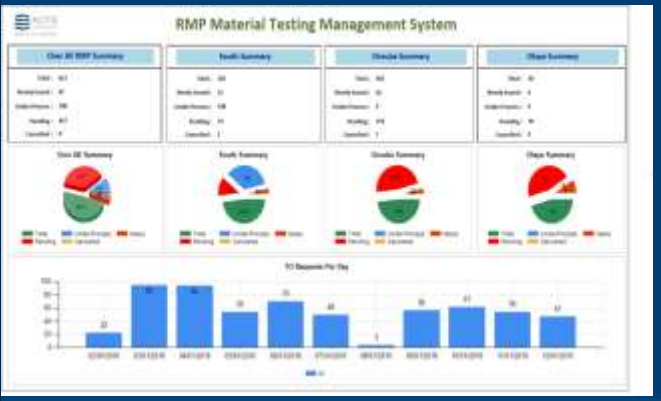
ACTS Digital Laboratory Systems

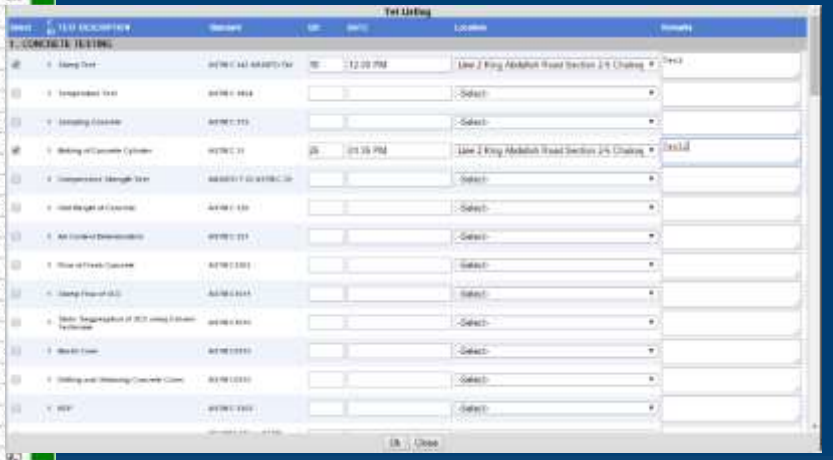
1. Laboratory Information Management System (LIMS)
2. Construction Quality Rating Agency (CQRA) for Inspections
3. Concrete Pouring Operations Features
4. Concrete Quality Control Features
5. Advanced & Automated Features

IR 4 Application







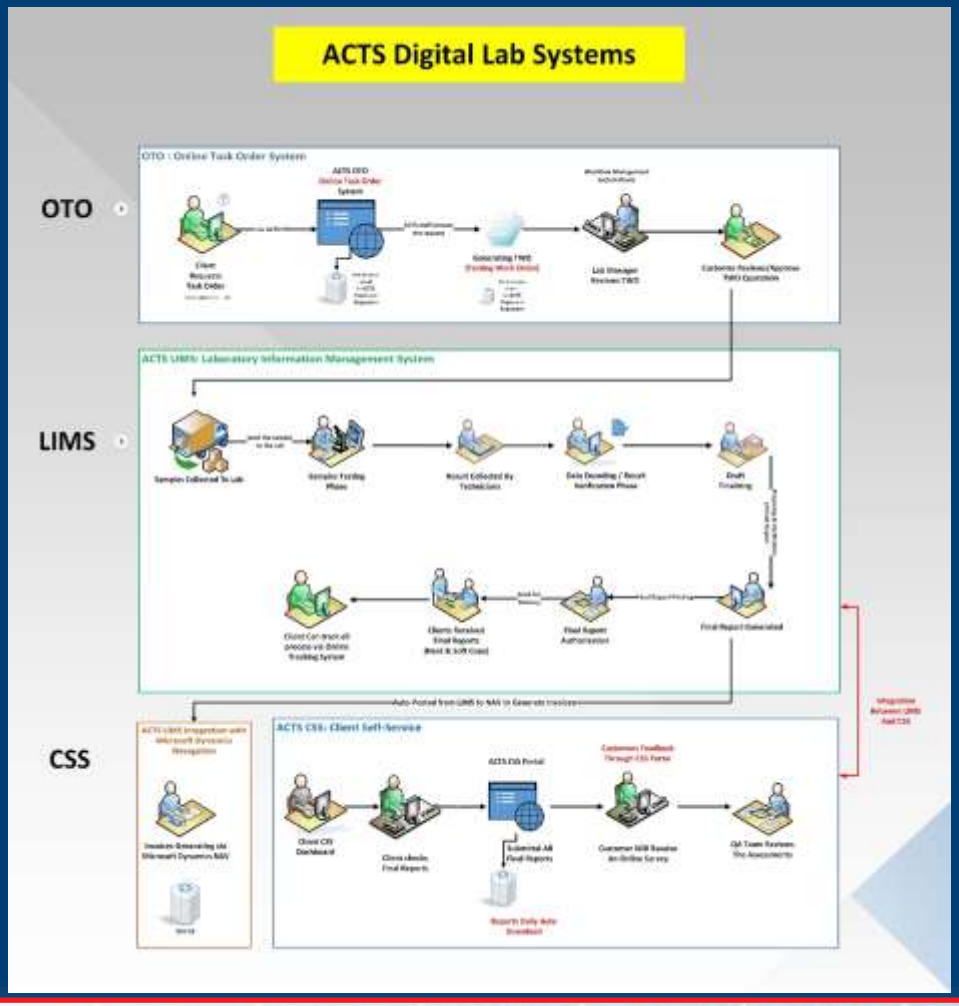


IR 4 Application

ACTS Digital Laboratory Systems

SaaS (software-as-a-service) LIMS ensures that our lab data solution is delivered and upgraded in a controlled, risk-aware manner

ACTS Labs systems allow you to effectively manage the flow of samples and associated data to improve lab efficiency and transfer from the old era to the new era of the digital laboratory.

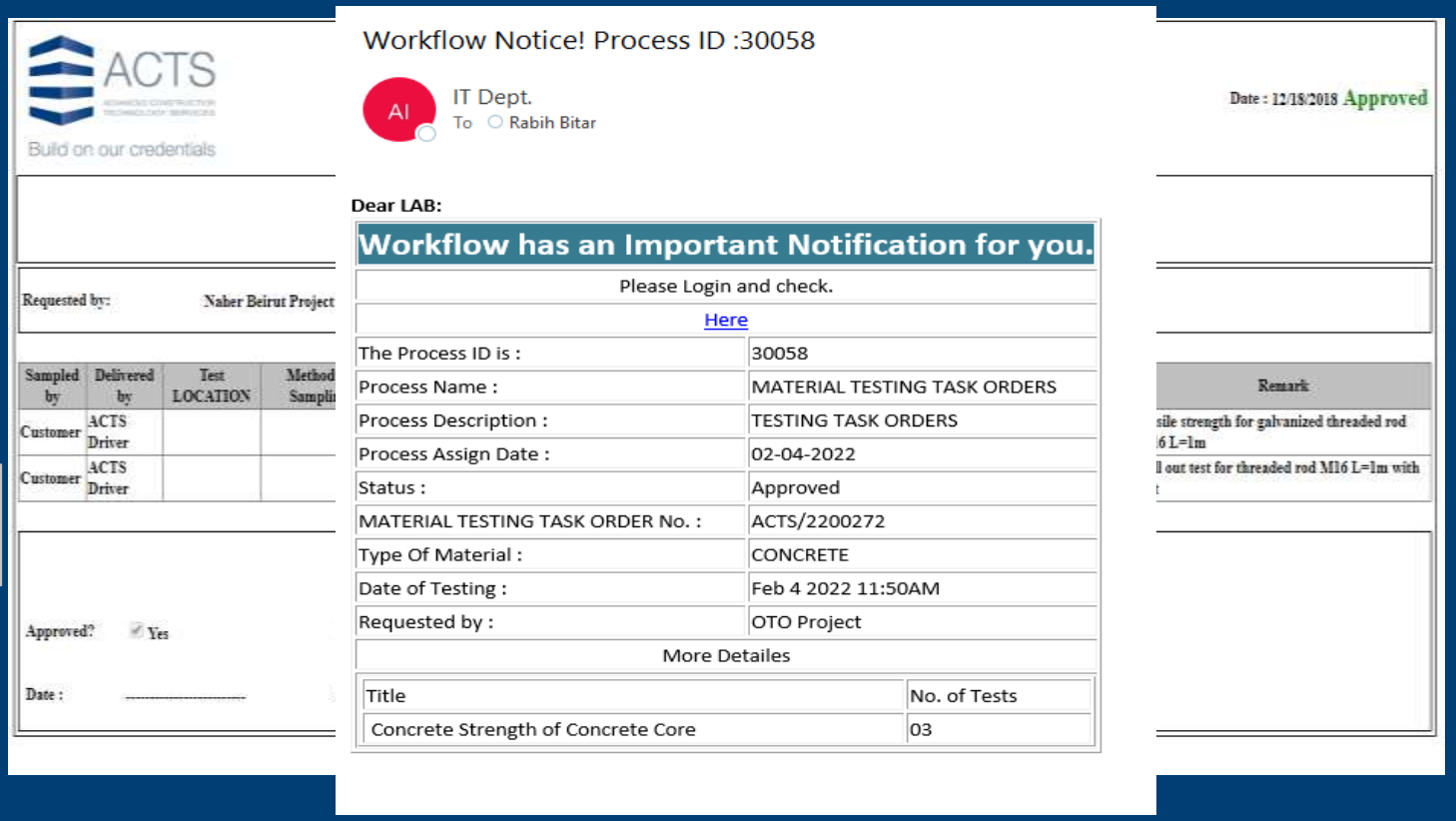


IR 4 Application

This feature will help to see the Progress Report based one projects or can also provide many projects for the same customer to see the total of Sample Requested and how many under Process, and How many samples still waiting and Finished.

IR 4 Application

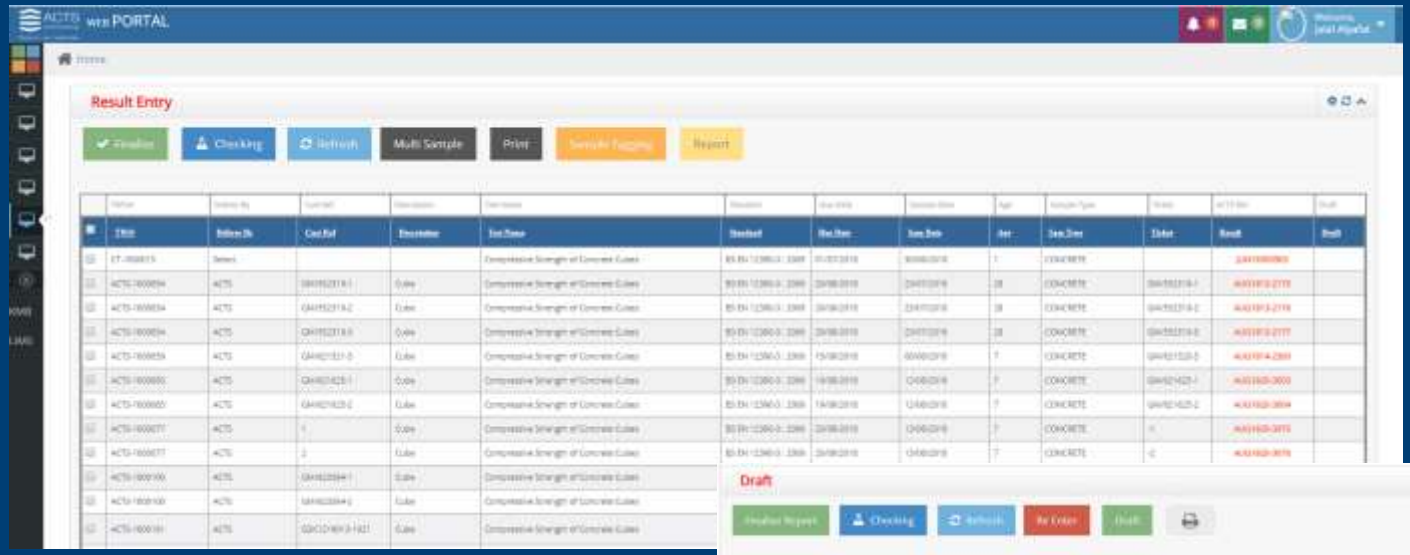
- Customer will be able to request a test material online through LIMS-CSS or by integration with customer's system.
- After processing the request order user can generate the report.
- You will be able to review, print track the status for each request
- The responsible Lab Team will receive a notification to initiate the sampling phase



IR 4 Application

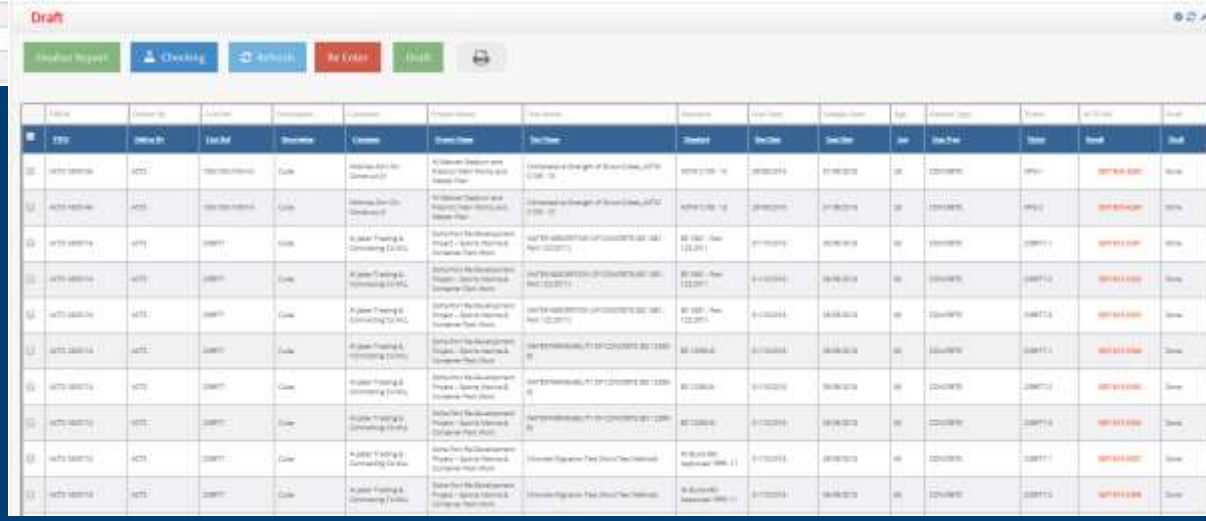
- Samples will be added by filling the sample registration page and adding the required fields
- After Successfully adding the samples a Notification Message appear
- LAB team collecting the sample from site
- Sample/s will have a unique QR code for full tracking process

IR 4 Application



1. Testing & Result Entry

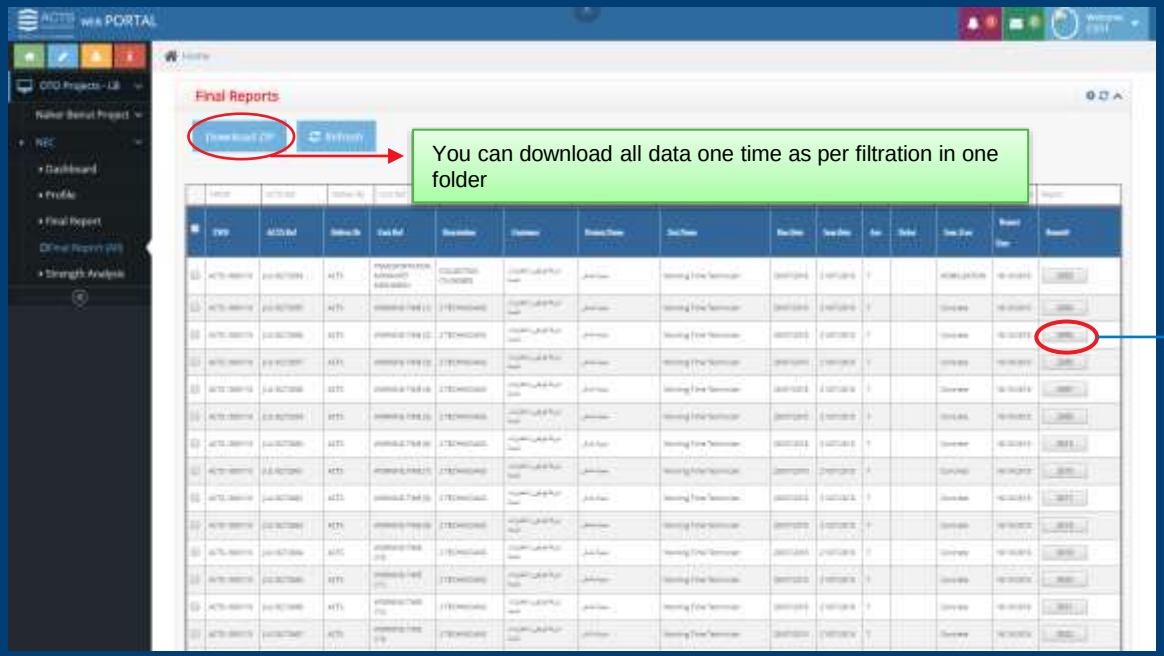
2. Verification & Draft



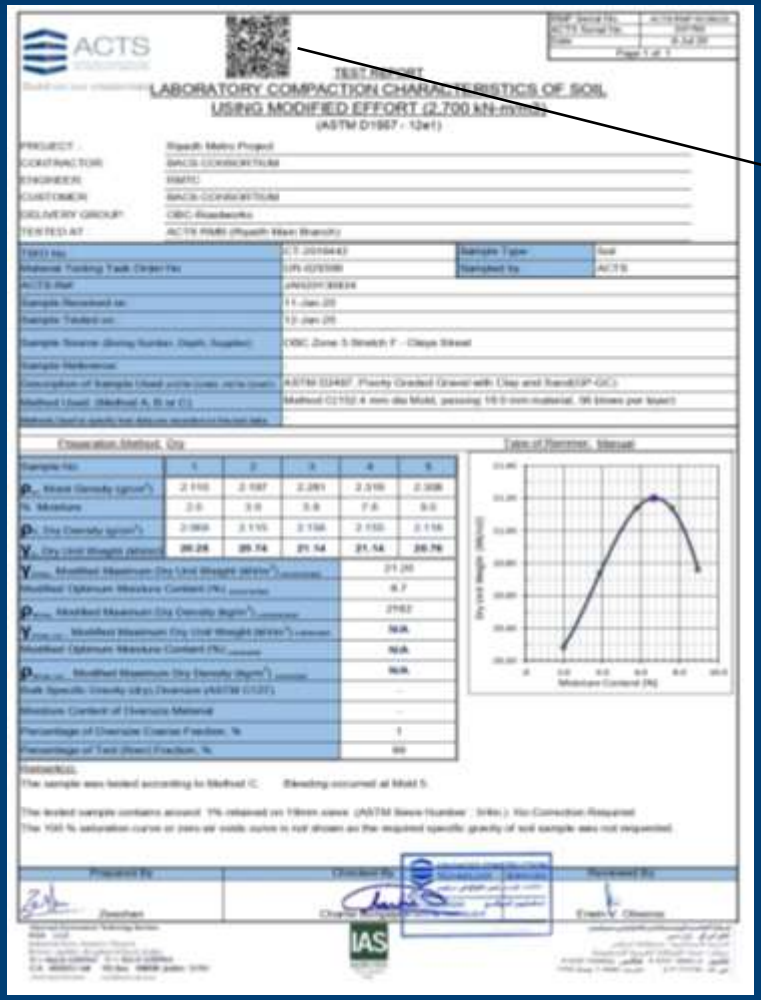
IR 4 Application

IR 4 Application

Another feature for client to monitoring and download & flitter for overall final report with archiving (Electronic Signature & Stamp) with different items



IR 4 Application

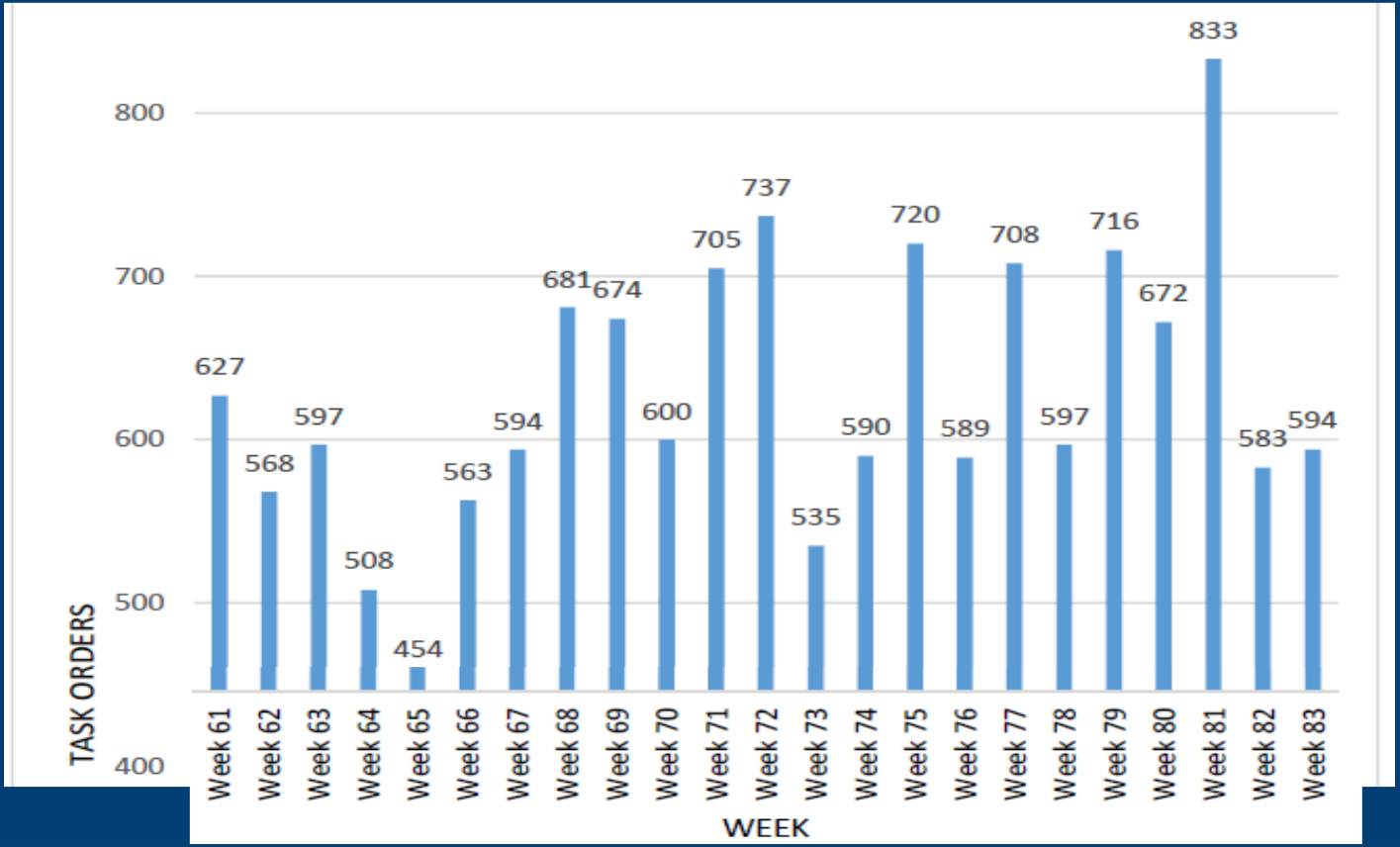


LABORATORY COMPACTION CHARACTERISTICS OF SOIL
USING MODIFIED EFFORT (2,700 kN-m/m³)
(ASTM D1557 - 12e1)

Scan the code to check the report online version via ACTS-LIMS app.

IR 4 Application

In Large Scale Work



IR 4 Application

Inspection

IR 4 Application

Inspection

IR 4 Application

Inspection

IR 4 Application

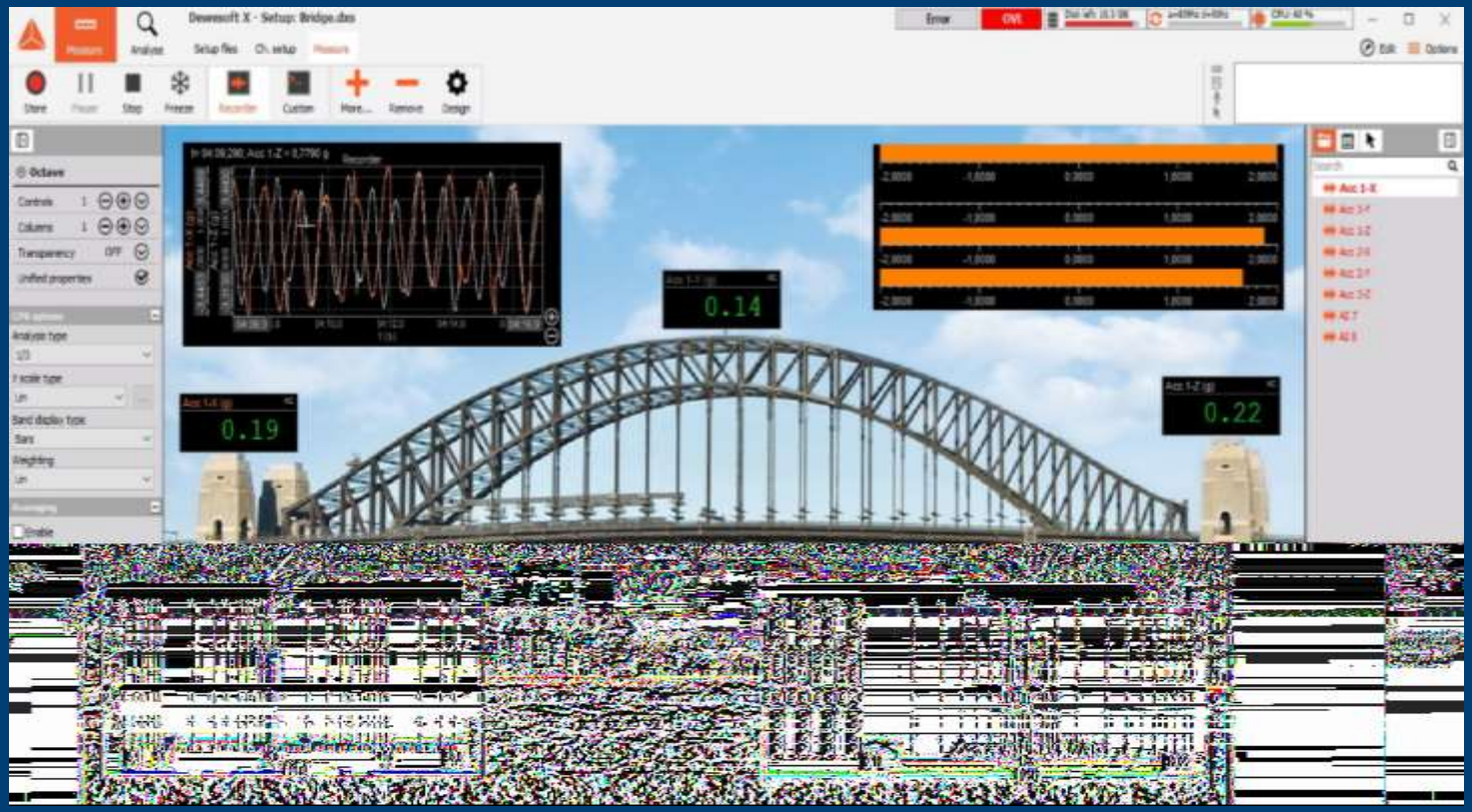
Inspection

This technology includes the different checklists and automatically generates the reports up to the client's satisfaction.

Once generated, notifications are directly sent to the clients and actions taken accordingly. The actions taken can be updated on the online platform which make the platform dynamic in nature.

IR 4 Application

Structural Health Monitoring Systems



Thank you

For the most up-to-date information please visit the American Concrete Institute at:
www.concrete.org