



American Concrete Institute

The Industrial Revolution 4 in Testing and Quality Control

Advanced Construction Technology Services (ACTS)



American Concrete Institute

دائما تتقدم

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



American Concrete Institute

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**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.

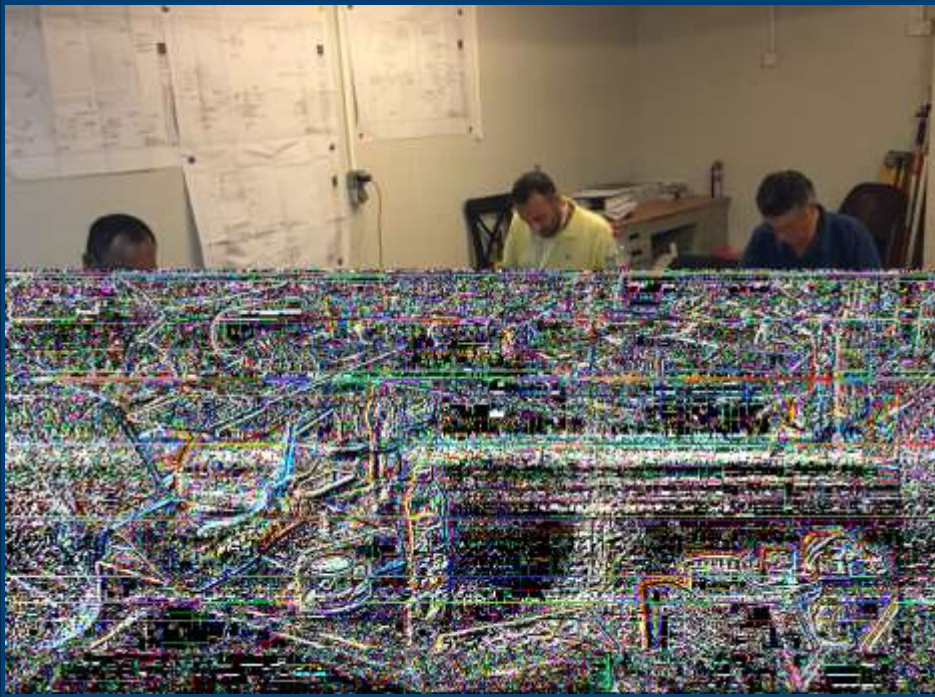


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CERTIFICATION PROGRAMS

- 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



2

Advanced Construction Technology Services Introduction (ACTS)



Build on our credentials



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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



3

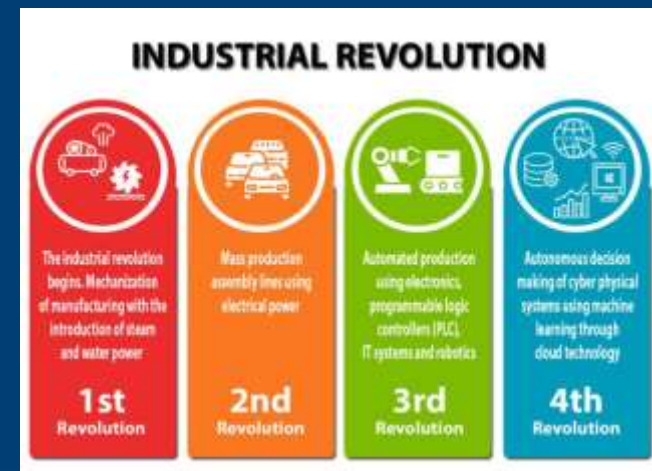
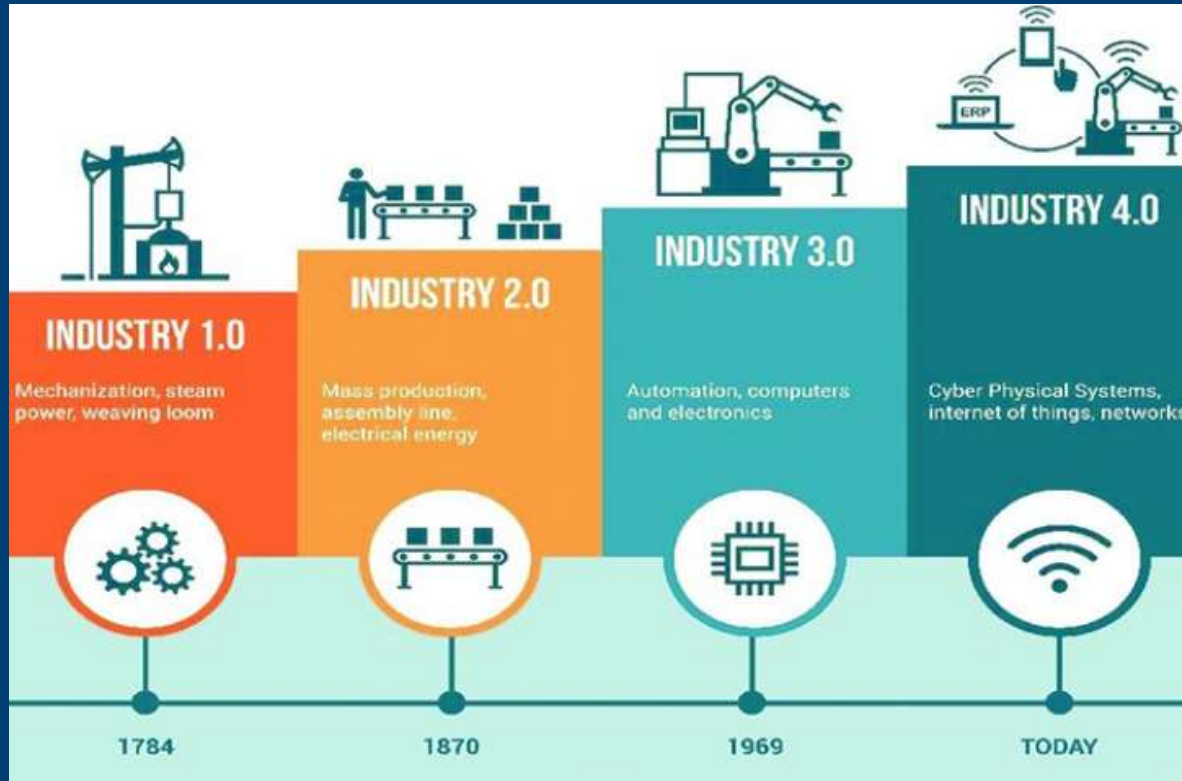
The Industrial Revolution 4 in the construction industry



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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

ACTS
TEST REPORT
LABORATORY COMPACTION CHARACTERISTICS OF SOIL
USING MODIFIED EFFORT (2,700 kN-m/m²)
(ASTM D1557 - 12a1)

PROJECT: Rapid Main Project
 SUBMITTING FIRM: SACIS CONSULTANTS
 ENGINEER: SMTS
 CUSTOMER: SACIS CONSULTANTS
 SOLARITY GROUP: CBC Beersheva
 TESTED BY: ACTS Field Health Team Beersheva

TEST DATE: 01/20/2016
 REPORT DATE: 01/20/2016
 SHEET 1 OF 1

TESTING METHOD: Modified Proctor
 Sample Location: Site 5 - Station P - Class B Soil

TEST RESULTS:

Parameter	1	2	3	4	5
P_w (Water Content) (%)	2.150	2.167	2.281	2.193	2.208
P_m (Moisture) (%)	3.5	3.5	3.5	3.5	3.5
P_{max} (Dry Density) (g/cm ³)	2.060	2.133	2.190	2.133	2.130
P_{opt} (Dry Density) (g/cm ³)	20.28	20.74	21.54	21.54	20.76
Y_{max} (Modified Maximum Dry Unit Weight) (%)	91.30				
Modified Optimum Moisture Content (%)	8.7				
P_{min} (Minimum Dry Density) (g/cm ³)	2762				
Y_{min} (Minimum Dry Unit Weight) (%)	N/A				
Modified Optimum Moisture Content (%)	N/A				
P_{rel} (Relative Density) (%)	N/A				
Minimum Content of Fine Material (%)	1				
Percentage of Fine (Less than 75 μ m) (%)	60				

FIGURE 1: Graph of Specific Gravity vs. Moisture Content (%)

REMARKS:
 The sample was tested according to Method C. Blending occurred at Mid 5.
 The tested sample contains about 1% oil based on 100mm sieve. (ASTM Sieve Number 20). No Correction Required.
 The 100 μ m retained curve or pass at 75 μ m sieve is not shown as the required specific gravity of test sample was not required.


ISSUED BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]

ACTS Logo and IAS Logo



The three breeds of automation

Accuracy


ACTS
ADVANCED CONSTRUCTION
TECHNOLOGY SERVICES
Build on our credentials

Request Material (ACTS/00025)

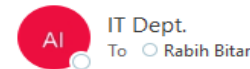
Requested by: Naher Beirut Project Requested Date: 3/23/2018 4:09

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 : _____

Workflow Notice! Process ID :30058



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 Details

Title	No. of Tests
Concrete Strength of Concrete Core	03

The three breeds of automation

Digitalization



5

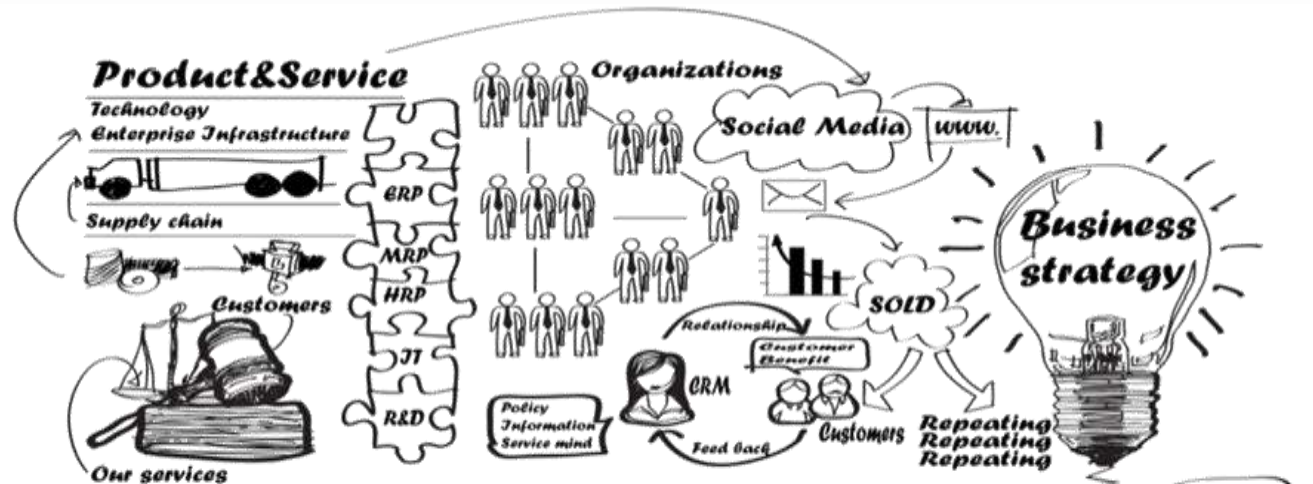
The application of automation and digitalization on testing and quality control

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

Pump Operation

Progress: 100%

Concrete Volume Information

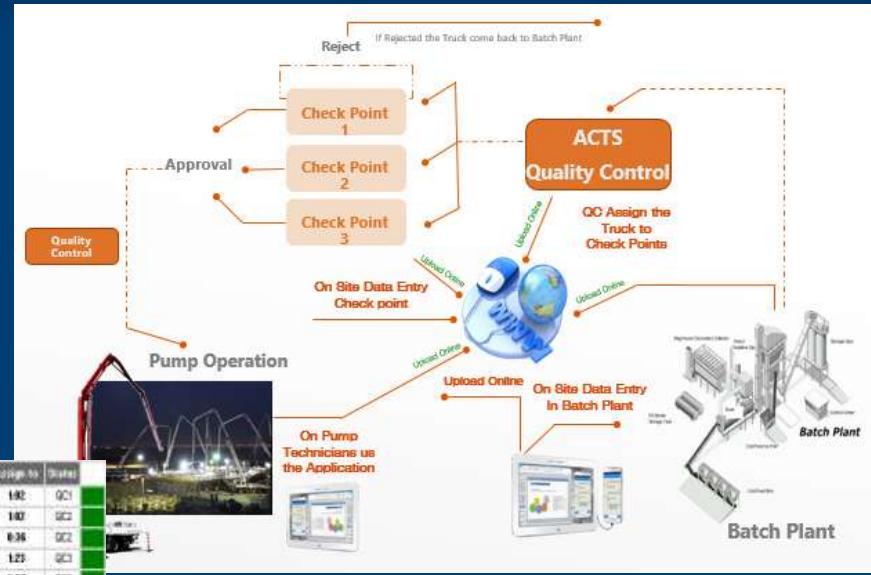
Target	Actual	Target	Actual
Concrete	100%	Concrete	100%
Water	100%	Water	100%
Cement	100%	Cement	100%

Total Reported Volume: Concrete=74 [0-200]
 Total Planned Volume: Concrete=100 [0-200]
 Total Ordered Volume: Concrete=100 [0-200]



Time Progress

hours	Minutes
46	50



Ticket No	Truck No	Departure	Arrived	The Difference	Assign To	Status
Promo Handayani	832074	024	23:56	22:52	192	QC1
Promo Handayani	832076	026	22:06	23:02	100	QC2
Promo Kala	898222	072	22:06	22:46	0:36	QC2
Promo Kala S / I / II	898281	94	22:06	23:03	1:23	QC2
Promo Kala	982186	075	23:02	23:06	0:07	QC2
Promo Kala S / I / II	982220	79	22:29	23:06	0:41	
Promo Handayani	832077	80	22:26	23:23	-0:53	
Promo Kala	898224	81	22:26	23:06	0:48	
Promo Kala S / I / II	898282	88	22:33	23:28	0:58	
Promo Kala	982189	022	22:36	23:29	0:53	
Promo Kala	898226	22	22:36	23:28	0:52	
Promo Handayani	832078	022	23:29	23:29	0:00	
Promo Kala S / I / II	980770	68	22:40	23:40	1:00	
Promo Kala	980226	72	22:44	23:27	0:43	
Promo Kala S / I / II	898283	67	22:47	23:37	0:50	
Promo Handayani	832079	942	22:50	23:50	1:00	
Promo Kala	980226	52	22:51	23:35	0:44	
Promo Kala	982220	88	22:53	23:48	0:47	
Promo Kala	980227	42	22:58	23:54	0:56	
Promo Handayani	832080	023	23:02	0:01	1:01	
Promo Kala	982121	84	23:06	23:57	0:51	
Promo Kala S / I / II	980771	33	23:08	23:52	0:44	
Promo Kala S / I / II	980771	35	23:11	0:01	0:58	
Promo Kala	980228	21	23:11	23:55	24:44:06	
Promo Handayani	832081	027	23:16	0:04	0:58	
Promo Kala	898230	027	23:07	0:11	0:54	
Promo Kala S / I / II	980772	18	23:29	0:12	0:52	

Test Listing

TEST DESCRIPTION	Material	SPC	DATE	Location	Priority
3. CONCRETE TESTING					
1. Slump Test	8982141 8982141	10	12:00 PM	Line 2 Ring Abdullah Road Section 2/4 Chasing	QC1
2. Temperature Test	8982141			-Select-	
3. Setting Consistency	8982141			-Select-	
4. Setting of Concrete Cylinder	8982141	26	01:35 PM	Line 2 Ring Abdullah Road Section 2/4 Chasing	QC1
5. Compressive Strength Test	8982141 8982141			-Select-	
6. Air Content of Concrete	8982141			-Select-	
7. Air Content of Fresh Concrete	8982141			-Select-	
8. Slump Test of SCC	8982141			-Select-	
9. Split Tensile Strength of SCC using External Testbed	8982141			-Select-	
10. Modulus	8982141			-Select-	
11. Sliding and Abrasion Concrete Comp	8982141			-Select-	
12. RCP	8982141			-Select-	

RMP Material Testing Management System

Overall Summary

480 / 480
 100% / 100%
 480 / 480
 480 / 480

480 / 480
 100% / 100%
 480 / 480
 480 / 480

480 / 480
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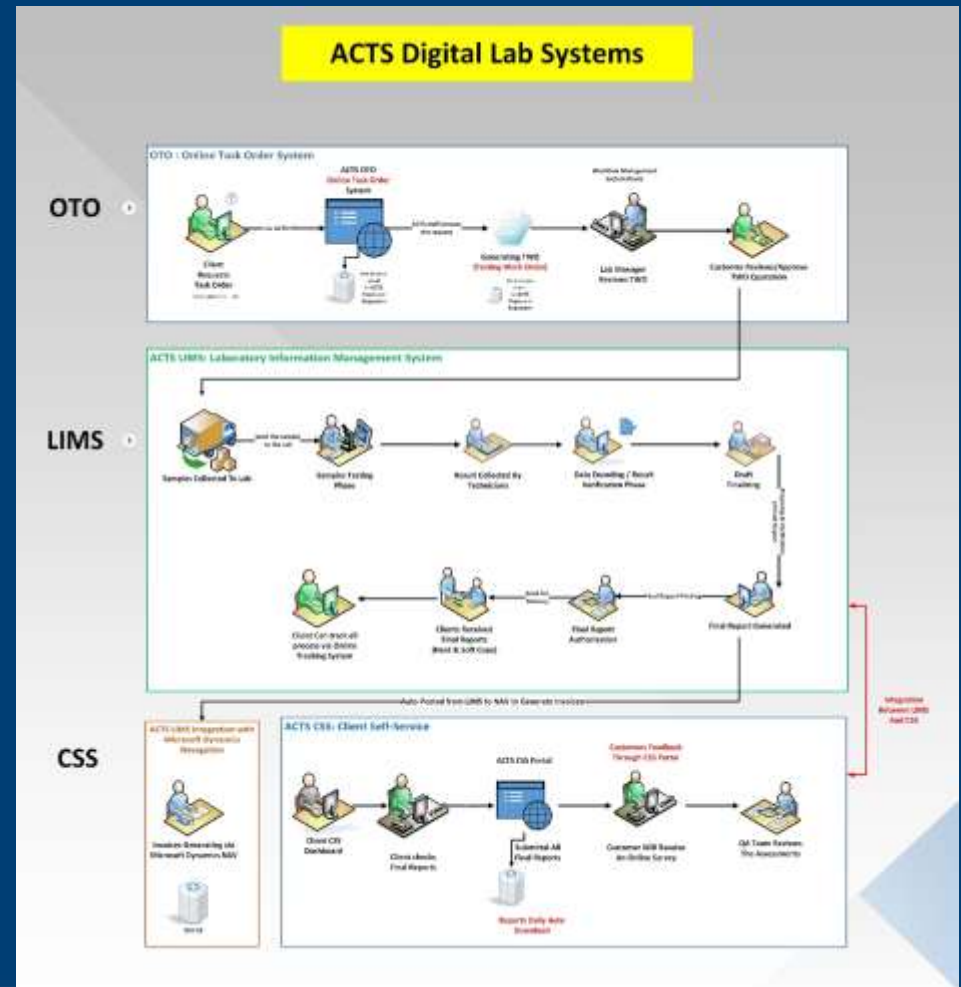
480 / 480
 100% / 100%
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IR 4 Application

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





Requested by: Naher Beirut Project

Sampled by	Delivered by	Test LOCATION	Method Sampli
Customer	ACTS Driver		
Customer	ACTS Driver		

Approved? Yes

Date : _____

Workflow Notice! Process ID :30058

 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
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Type Of Material :	CONCRETE
Date of Testing :	Feb 4 2022 11:50AM
Requested by :	OTO Project

More Details

Title	No. of Tests
Concrete Strength of Concrete Core	03

Date : 12/18/2018 Approved

Remark

ile strength for galvanized threaded rod
6 L=1m
il out test for threaded rod M16 L=1m with
t

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

ACTS WEB PORTAL

Result Entry

ID#	Order No.	Est.No.	Description	Specimen	Test Date	Start Date	Re. No.	Test Date	Age	Sample Type	Notes	ACI Code	Result	Unit
07-000015	0000		Compressive Strength of Concrete Cubes			03/01/2016	03/01/2016	00000016	1	CONCRETE		ACI 308.1R	2347000000	
ACTS-000004	4275	04492318.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-1	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-2	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.3	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-3	ACI 308.1R	463193.2177	MPa
ACTS-000004	4275	04492318.4	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-4	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.5	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-5	ACI 308.1R	463193.2178	MPa
ACTS-000000	4275	04492425.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	04492425-1	ACI 308.1R	463193.2000	MPa
ACTS-000000	4275	04492425.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	04492425-2	ACI 308.1R	463193.2000	MPa
ACTS-000007	4275	0	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	0	ACI 308.1R	463193.2075	MPa
ACTS-000007	4275	0	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	0	ACI 308.1R	463193.2075	MPa
ACTS-000000	4275	04492394.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-1	ACI 308.1R	463193.2075	MPa
ACTS-000000	4275	04492394.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-2	ACI 308.1R	463193.2075	MPa
ACTS-000001	4275	04492394.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-1	ACI 308.1R	463193.2075	MPa

Draft

2. Verification & Draft

ID#	Order No.	Est.No.	Description	Specimen	Test Date	Start Date	Re. No.	Test Date	Age	Sample Type	Notes	ACI Code	Result	Unit
07-000015	0000		Compressive Strength of Concrete Cubes			03/01/2016	03/01/2016	00000016	1	CONCRETE		ACI 308.1R	2347000000	
ACTS-000004	4275	04492318.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-1	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-2	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.3	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-3	ACI 308.1R	463193.2177	MPa
ACTS-000004	4275	04492318.4	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-4	ACI 308.1R	463193.2178	MPa
ACTS-000004	4275	04492318.5	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492318	04492318	28	CONCRETE	04492318-5	ACI 308.1R	463193.2178	MPa
ACTS-000000	4275	04492425.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	04492425-1	ACI 308.1R	463193.2000	MPa
ACTS-000000	4275	04492425.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	04492425-2	ACI 308.1R	463193.2000	MPa
ACTS-000007	4275	0	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	0	ACI 308.1R	463193.2075	MPa
ACTS-000007	4275	0	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492425	04492425	28	CONCRETE	0	ACI 308.1R	463193.2075	MPa
ACTS-000000	4275	04492394.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-1	ACI 308.1R	463193.2075	MPa
ACTS-000000	4275	04492394.2	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-2	ACI 308.1R	463193.2075	MPa
ACTS-000001	4275	04492394.1	Cube	Compressive Strength of Concrete Cubes	03/01/2016-2016	04/08/2016	04492394	04492394	28	CONCRETE	04492394-1	ACI 308.1R	463193.2075	MPa

IR 4 Application



IR 4 Application

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

Final Reports

Download PDF Refresh

You can download all data one time as per filtration in one folder

ID	ACTS Ref	Job Ref	Section	Concrete	Rebar/Steel	Test Name	Test Date	Age	Subst.	Test Day	Print	Report
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	1	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	2	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	3	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	4	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	5	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	6	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	7	40000000	40-00000	PDF
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475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	10	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	11	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	12	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	13	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	14	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	15	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	16	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	17	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	18	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	19	40000000	40-00000	PDF
475-00019	04-07-2004	4751	مبنى مستشفى مستشفى	25000000	25000000	مختبر	2007044	14072004	20	40000000	40-00000	PDF

TEST REPORT

Client: **مبنى مستشفى مستشفى**

CONCRETE REPORT ON SITE

Customer: **مبنى مستشفى مستشفى** Work Order No: **ACTS-00019**
 Condition: **مبنى مستشفى مستشفى** Sample Created on: **21-08-19**
 Report: **مبنى مستشفى مستشفى** Sample Created by: **ACTS**
 Sample Type: **مبنى مستشفى مستشفى** Concrete Supplier: **مبنى مستشفى مستشفى**

Sampling Details

Date of Sampling: **21-08-19**
 Location of Sampling: **RAFT FOUNDATION**
 Sampling Method: **ACTS/CP & CS**
 Environmental Condition: **مبنى مستشفى مستشفى**
 Air Exposure: **مبنى مستشفى مستشفى**

Sample Ref	1	2	3	4	5	6	7	8	9	10	11
Compressive Strength (MPa)	33.1	33.9	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
Compressive Strength (PSI)	478	482	466	466	466	466	466	466	466	466	466
Compressive Strength (ksi)	68.8	69.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1
Compressive Strength (MPa)	33.1	33.9	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
Compressive Strength (PSI)	478	482	466	466	466	466	466	466	466	466	466
Compressive Strength (ksi)	68.8	69.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1
Compressive Strength (MPa)	33.1	33.9	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
Compressive Strength (PSI)	478	482	466	466	466	466	466	466	466	466	466
Compressive Strength (ksi)	68.8	69.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1
Compressive Strength (MPa)	33.1	33.9	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
Compressive Strength (PSI)	478	482	466	466	466	466	466	466	466	466	466
Compressive Strength (ksi)	68.8	69.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1

Reviewed by: **Eng. Khalid** Date: **21-08-19**
 Signed by: **Eng. Khalid** Date: **21-08-19**

ACTS Logo

IR 4 Application

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

PROJECT: South Metro Project
CONTRACTOR: SDCS CONSTRUCTION
ENGINEER: SDCS
CUSTOMER: SDCS CONSTRUCTION
DELIVERY GROUP: CDC Roadworks
TESTED AT: ACTS PARS (South Metro Branch)

TEST NO: C.T. 2019442
LABORATORY TASK ORDER NO: 129 021598
ACTS JOB: 490201-0024
SAMPLE RECEIVED ON: 11 Jan 20
SAMPLE TESTED ON: 17 Jan 20
SAMPLE SOURCE (Jobing Number, Depth, Location): CDC Zone 5 Street F - Chops Street
SAMPLE IDENTIFICATION: 4.074 (1487) Flecky Graded (Gravel with Clay and Sand) (G.C.)
CONVERSION OF SAMPLE USED (units, code, note): Method C2112 4 mm No. 40, passing 10.0 mm material, 50 blows per layer
METHOD USED (Method A, B or C): Method C2112 4 mm No. 40, passing 10.0 mm material, 50 blows per layer

Classification Method, Use	1	2	3	4	5
P_{200} - Mass (grams)	2,110	2,187	2,281	2,316	2,308
% Moisture	2.0	2.0	2.0	2.0	2.0
P_{100} - Dry (grams)	2,069	2,135	2,196	2,252	2,196
Y_{200} - Dry (dry weight percent)	98.28	99.74	97.54	97.54	98.76
Y_{max} - Modified Maximum Dry Unit Weight (kN/m ³)	21.20				
Moisture (Optimum Moisture Content (%))	0.7				
P_{max} - Modified Maximum Dry Density (kg/m ³)	2782				
Y_{max} - Modified Maximum Dry Unit Weight (kN/m ³)	20.6				
Moisture (Optimum Moisture Content (%))	0.6				
P_{max} - Modified Maximum Dry Density (kg/m ³)	20.6				
Bulk Specific Gravity (g/g) (Density (ASTM D153))	---				
Moisture Content of American Method	---				
Percentage of Organic Content, %	1				
Percentage of Total Shrinkage, %	99				

REMARKS: The sample was tested according to Method C. Blending occurred at Mod 5.
The tested sample contains around 1% retained on 75mm sieve (ASTM Sieve Number - 20); No Correction Required
The 100% saturation curve or pore air void curve is not shown as the required specific gravity of soil sample was not requested.

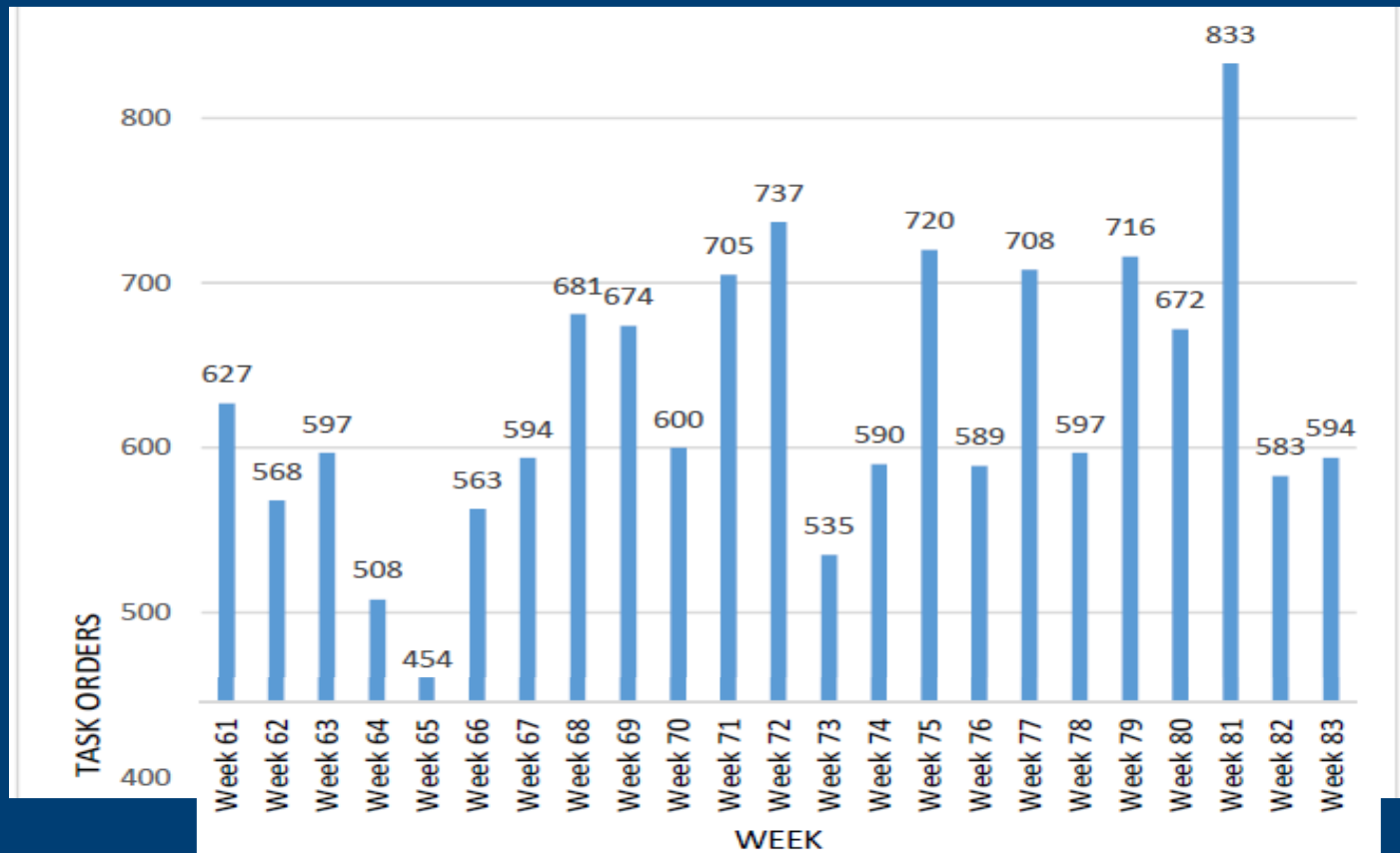
Prepared by: [Signature] Checked by: [Signature] Reviewed by: [Signature]



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

IR 4 Application

In Large Scale Work



IR 4 Application

Inspection



This is the First Company to use
Android Mobile Based Construction
Audit Software

Quality Assurance

The image displays the CQRA logo, which features a blue shield with a green lion and the letters 'CQRA' below it. To the right, a banner reads 'This is the First Company to use Android Mobile Based Construction Audit Software' and 'Quality Assurance'. Below the banner, there are three screenshots of the mobile application: a login screen with fields for Username and Password, a home screen with 'Start Audit', 'Monitor Task', and 'Logout' buttons, and a central image of an Android tablet and several smartphones.



Operation of WEB Level Users

Home Page:

1. Users Maintenance
2. Master Maintenance
3. Trade Maintenance
4. Checklist
5. Reports
6. External Alerts
7. Internal Alerts
8. Log Out

The image shows a screenshot of the CQRA web application. The top navigation bar includes links for Home, Users Maintenance, Trade Maintenance, Checklist, Reports, External Alerts, Internal Alerts, and Log Out. The main content area displays 'Welcome to CQRA' and a small image of a smartphone showing a construction site.

IR 4 Application

Inspection



This is the First Company to use
Android Mobile Based Construction
Audit Software

Quality Assurance

The image displays the CQRA Quality Assurance application interface. It features a central graphic of an Android smartphone with the Android logo on the screen, surrounded by several other smartphones. To the left is a 'Login' screen with fields for 'Username' and 'Password', and buttons for 'Login' and 'Exit'. To the right is a 'Home' screen with buttons for 'Start Audit', 'Monitor Task', and 'Logout'. The CQRA logo is visible in the top left corner.



Operation of WEB Level Users

Home Page:

1. Users Maintenance
2. Master Maintenance
3. Trade Maintenance
4. Checklist
5. Reports
6. External Alerts
7. Internal Alerts
8. Log Out

The image shows a screenshot of a web application interface. At the top right is the CQRA logo. Below it is a navigation menu with items: Home, Users Maintenance, Trade Maintenance, Checklist, Reports, External Alerts, Internal Alerts, and Log Out. The main content area displays 'Welcome to CQRA'. There is also a small image of a smartphone showing a construction site on the right side of the header.

IR 4 Application

Inspection

Operation of WEB Level Users



Home Page:

1. Users Maintenance
2. Master Maintenance
3. Trade Maintenance
4. Checklist
5. Reports
6. External Alerts
7. Internal Alerts
8. Log Out



CQRA

UPLOAD

Home

Start Audit

Mockup

Allocate Task

Logout

Username

Enter Username

Enter Password

Login Exit

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.

The screenshot displays a report titled "Management Information System Report" for ACTS. It includes a table with four rows of inspection findings and recommendations. Below the table, there are sections for "Key Issues that require attention of the Top Management", "NCR Checklist", and a table with project details. A small photograph of a construction site is also visible.

Sl. No.	Issues	Recommendation
1	At most locations it is observed that there is big gap between door frames and wall, or while fitting a door frame without filling a gap there is an sufficient anchorage of door wall wall. Also to which there are chances that the frame may get loose in future while operating the door shutters.	The opening gap should be checked before fitting the door frame and if any repairing or correction required should be done before fitting the frame to assess the proper anchorage of door frame with wall surface.
2	The light point is observed just above the header of the door, so while both light and fan are on there there will be continuous reflection of light due to arrangements of the header and which may affect the end user.	The design team may look up to the same point to necessary changes. Light point may be shifted as per present condition on site.
3	The door frames are not installed properly which may lead to damages and hoodness in the door frame.	The material should be checked on level ground and height of each should reviewed to avoid the main balance of the frame. Standard Storage guidelines of door frame must be followed.
4	The quality of PVC film coating is not up to the mark. The thickness, unevenness, short length are observed at many locations.	All the doorery panel should be replaced by new one of required size and contractor should be asked to repair all the deficiencies and see the progress of work already completed before in given time limit period. If required the payment must be kept on hold till all the deficiencies work is not completed.

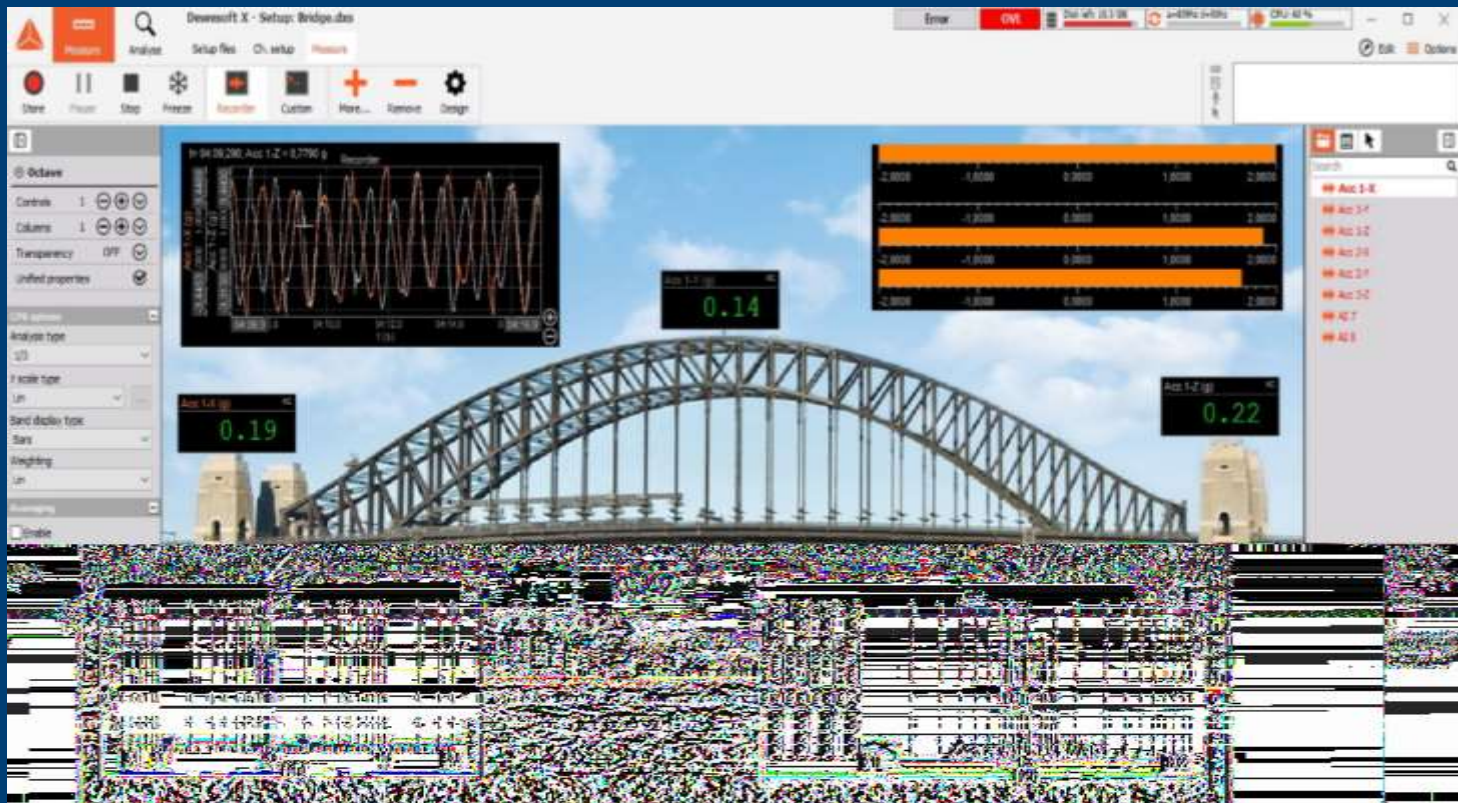
Key Issues that require attention of the Top Management :

NCR Checklist			
Sl. No.	001	Open Date	18-Sep-2018
Structure	Block 1	Stage	2nd Floor
Contractor	S.A.C.	Trade	False Ceiling Works with Organize Details

NCR Description: Also, grid section started even before civil electrical works done false ceiling is incomplete
Location: 525 -Kitchen Building
Remark: Beam false ceilinging job not resumed before start false ceiling work.

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



American Concrete Institute

دائما تتقدم