GEOSYSTEM® Software

Quality Control - Statistics for Concrete

Mix Performance Summary and Charts by ACI 214, 301 and 318

QC-Statistics Will Help You

- Track day to day changes in required average strength by ACI 301
- Determine the required strength for new mix designs by ACI 301
- Identify if the 3 test moving average falls below the design strength per ACI 301
- Prepare reports of mix performance for ongoing quality control of structural concrete
- Qualify additional mixes that do not have adequate history by ACI 318
- Rate mix performance by ACI 214
- Rate laboratory testing proficiency by ACI 214
- Prepare quality control charts per ACI 214
- Compare effects of variations in temperature, slump, air content and other parameters
- Compare results during different time periods
- Monitor strength gain from 7 to 28 days

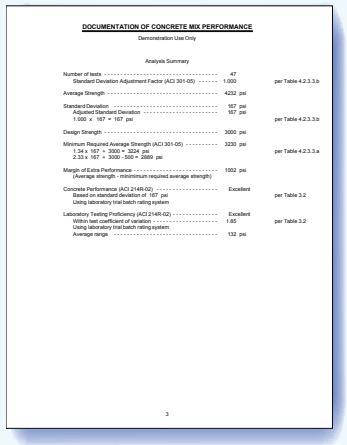
Simple user interface

Data Sources

- QC - Statistics is designed to draw concrete break data from the GEOSYSTEM QC-Concrete database.
- Data can also be entered manually using a Microsoft Access data entry form.
- Filters can be chosen to limit the analysis to particular projects, mixes, or values of slump, air content, temperature and other values recorded for each test.
- Results can be limited to specific time periods as well.

Reports Can Include

- Project information such as owner, location, contractor, architect, etc.
- Mix information such as quantities of the various mix components
- Statistics table
- Analysis summary
- Charts


DOCUMENTATION OF CONCRETE MIX PERFORMANCE

Demonstration Use Only

Analysis Summary

Number of tests	47	
Standard Deviation Adjustment Factor (ACI 301-05)	1.000	per Table 4.2.3.3.b
Average Strength	4232 psi	
Standard Deviation	167 psi	
Adjusted Standard Deviation	167 psi	per Table 4.2.3.3.b
1.000 x 167 = 167 psi		
Design Strength	3000 psi	
Minimum Required Average Strength (ACI 301-05)	3230 psi	per Table 4.2.3.3.a
1.34 x 167 = 3000 + 3224 psi		
2.33 x 167 = 3000 - 500 = 2889 psi		
Margin of Extra Performance (Average strength - minimum required average strength)	1002 psi	
Concrete Performance (ACI 214R-02)	Excellent	
Based on standard deviation of 167 psi		per Table 3.2
Using laboratory trial batch rating system		
Laboratory Testing Proficiency (ACI 214R-02)	Excellent	
Within test coefficient of variation	1.85	per Table 3.2
Using laboratory trial batch rating system		
Average range	132 psi	

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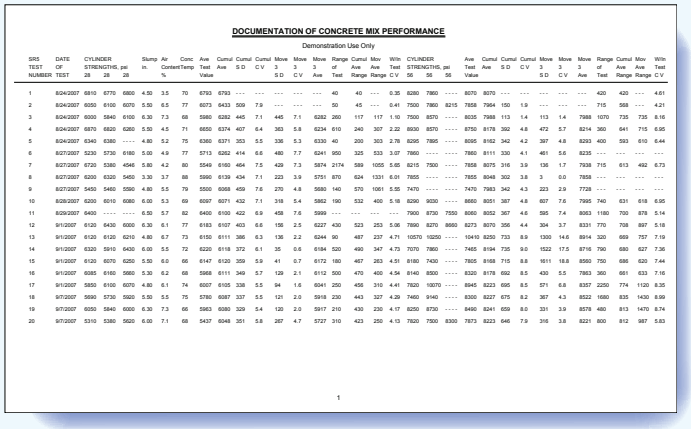
Analysis summary

Analysis Summary

- Minimum required average strength by ACI 301
- Margin of extra performance
- Concrete performance by ACI 214
- Laboratory testing proficiency by ACI 214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SR5 TEST NUMBER	DATE OF TEST	CYLINDER STRENGTHS, psi 28	28	28	Slump in.	Air Content %	Conc Temp	Ave Test Value	Cumul Ave	Cumul S D	Cumul C V	Move 3 S D	Move 3 C V	Move 3 Ave	Range of Test	Cumul Ave Range	Mov Ave Range	With Test C V	CYLINDER STRENGTHS, psi 56	56	56	Ave Test Value	Cumul Ave	Cumul S D	Cumul C V	Move 3 S D	Move 3 C V	Move 3 Ave	Range of Test	Cumul Ave Range	Mov Ave Range	With Test C V
1	8/24/2007	6810	6770	6800	4.50	3.5	70	6793	6793	---	---	---	---	---	40	40	---	0.35	8280	7860	---	8070	8070	---	---	---	---	---	420	420	---	4.61
2	8/24/2007	6050	6100	6070	5.50	6.5	77	6073	6433	509	7.9	---	---	---	50	45	---	0.41	7500	7860	8215	7858	7964	150	1.9	---	---	---	715	588	---	4.21
3	8/24/2007	6000	5840	6100	6.30	7.3	68	5980	6282	445	7.1	445	7.1	6282	260	117	117	1.10	7500	8570	---	8035	7988	113	1.4	113	1.4	7988	1070	735	735	8.16
4	8/24/2007	6870	6820	6260	5.50	4.5	71	6650	6374	407	6.4	363	5.8	6234	610	240	307	2.22	8930	8570	---	8750	8178	392	4.8	472	5.7	8214	360	641	715	6.95
5	8/24/2007	6340	6380	---	4.80	5.2	75	6360	6371	353	5.5	336	5.3	6330	40	200	303	2.76	8205	7865	---	8095	8162	342	4.2	397	4.8	8263	400	593	610	6.44
6	8/27/2007	5230	5730	6180	5.00	4.9	77	5713	6262	414	6.6	480	7.7	6241	950	325	533	3.07	7860	---	---	7860	8111	330	4.1	461	5.6	8235	---	---	---	---
7	8/27/2007	6720	5380	4546	5.80	4.2	80	5549	6160	464	7.5	429	7.3	5874	2174	589	1055	5.65	8215	7500	---	7858	8075	316	3.9	136	1.7	7938	715	613	492	6.73
8	8/27/2007	6200	6320	5450	3.30	3.7	88	5990	6139	434	7.1	223	3.9	5751	870	624	1331	6.01	7855	---	---	7855	8048	302	3.8	3	0.0	7858	---	---	---	---
9	8/27/2007	5450	5460	5590	4.80	5.5	79	5500	6068	459	7.6	270	4.8	5680	140	570	1061	5.55	7470	---	---	7470	7983	342	4.3	223	2.9	7728	---	---	---	---
10	8/28/2007	6200	6010	6080	6.00	5.3	69	6097	6071	432	7.1	318	5.4	5862	190	532	400	5.18	8290	9330	---	8680	8051	387	4.8	607	7.6	7995	740	631	618	8.95
11	8/28/2007	6400	---	---	6.50	5.7	82	6400	6100	422	6.9	458	7.6	5999	---	---	---	---	---	8730	7550	8060	8052	367	4.6	595	7.4	8063	1180	700	878	5.14
12	9/1/2007	6120	6430	6000	6.30	6.1	77	6183	6107	403	6.6	156	2.5	6227	430	523	253	5.06	7890	8270	8660	8273	8070	356	4.4	304	3.7	8331	770	708	697	5.18
13	9/1/2007	6120	6120	6210	4.80	6.7	73	6150	6111	386	6.3	136	2.2	6244	90	487	237	4.71	10570	10250	---	10410	8250	733	8.9	1300	14.6	8914	320	669	757	7.19
14	9/1/2007	6320	5910	6430	6.00	5.5	72	6220	6118	372	6.1	35	0.6	6184	520	490	347	4.73	7070	7860	---	7465	8194	735	9.0	1522	17.5	8716	790	680	627	7.36
15	9/1/2007	6120	6070	6250	5.50	6.0	66	6147	6120	359	5.9	41	0.7	6172	180	467	263	4.51	8180	7430	---	7805	8168	715	8.8	1611	18.8	8560	750	686	620	7.44
16	9/1/2007	6085	6160	5660	5.30	6.2	68	5968	6111	349	5.7	129	2.1	6112	500	470	400	4.54	8140	8500	---	8320	8178	692	8.5	430	5.5	7863	360	651	633	7.16
17	9/1/2007	5850	6100	6070	4.80	6.1	74	6007	6105	338	5.5	94	1.6	6041	250	456	310	4.41	7820	10070	---	8945	8223	695	8.5	571	6.8	8357	2250	774	1120	8.35
18	9/7/2007	5690	5730	5920	5.50	5.5	75	5780	6087	337	5.5	121	2.0	5918	230	443	327	4.29	7460	9140	---	8300	8227	675	8.2	367	4.3	8522	1680	835	1430	8.99
19	9/7/2007	6050	5840	6000	6.30	7.3	66	5963	6080	326	5.4	120	2.0	5917	210	430	230	4.17	8250	8730	---	8490	8241	659	8.0	331	3.9	8578	480	813	1470	8.74
20	9/7/2007	5310	5380	5620	6.00	7.1	68	5437	6048	351	5.8	267	4.7	5727	310	423	250	4.13	7620	7500	8300	7973	8223	646	7.9	316	3.8	8221	800	812	987	5.83

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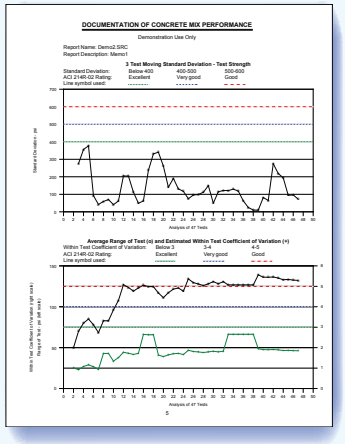
Statistics table with 2 ages of specimens

Statistics Table

- Running average strength
- Moving average strength
- Running average standard deviation
- Moving average standard deviation
- Running average coefficient of variation
- Moving average coefficient of variation
- Range of test
- Running average range of test
- Moving average range of test
- Within test coefficient of variation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Report Name: Demo2.SRC
Report Description: Memo1

3 Test Moving Standard Deviation - Test Strength

Standard Deviation: Below 400 Excellent | 400-500 Very good | 550-600 Good
ACI 214R-02 Rating:
Line symbol used:

Analysis of 47 Tests

Average Range of Test (o) and Estimated Within Test Coefficient of Variation (+)

Within Test Coefficient of Variation: Below 3 Excellent | 3-4 Very good | 4-5 Good
ACI 214R-02 Rating:
Line symbol used:

Analysis of 47 Tests

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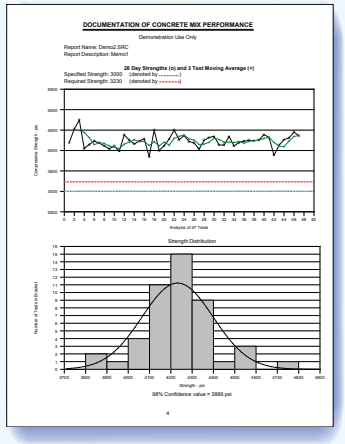
Charts

- Test strength
- Moving average strength
- Strength histogram
- Normal distribution curve
- Moving standard deviation
- Average range of test
- Within test coefficient of variation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Report Name: Demo2.SRC
Report Description: Memo1

28 Day Strengths (o) and 3 Test Moving Average (+)

Specified Strength: 3000 (denoted by .....)
Required Strength: 3230 (denoted by -----+)

Analysis of 47 Tests

Strength Distribution

Strength - psi

99% Confidence value = 3889 psi

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Standard deviation, range and coefficient of variation

Strength, moving average strength and histogram

More information on Quality Control - Statistics for Concrete and the entire line of **GEOSYSTEM®** Software at our website

WWW.GEOSYSTEMSOFTWARE.COM