

DOCUMENTATION OF CONCRETE MIX PERFORMANCE

AMT Engineers

Project Information

Project Number: Demo2
Project:: Tidal Research Facility
Client: Ken Ellis
Company: Henson Perkins
Address: 87143 E. 47th
Bldg K

Contract Number: HP-2013-73
Contractor: York Partners
Field Engineer: Leonard King

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Mix Information

Mix ID: 3000-C
Design Strength: 2000
Design Age: 7
Supplier: AJ-Mix
800 South River Drive
Gallipolis, GA, 34432

CEMENT: 575 LBS.
WATER: 50 GAL
FINE AGGREGATE: 1195 LBS.
COARSE AGGREGATE: 1914 LBS.
WATER REDUCER: 16 OZ.
AIR ENTRAINING: 4.7 OZ.
C8 Q8 U8

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Report Number	DATE OF TEST	CYLINDER STRENGTHS, psi			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	W/in Test C V
DEMO2	TEST	28	28	28														
1	7/22/2008	4200	----	----	3.00	4.0	65	4200	4200	---	---	---	---	---	---	---	---	
1.5	7/22/2008	4500	4550	----	---	5.0	50	4525	4363	230	5.3	---	---	---	50	50	---	1.02
2	7/22/2008	4700	4790	4750	---	---	70	4747	4491	275	6.1	275	6.1	4491	90	70	---	1.11
3	7/22/2008	4000	4050	4100	3.00	3.0	40	4050	4380	315	7.2	356	8.0	4441	100	80	80	1.21
4	7/22/2008	4100	4150	4200	3.00	3.0	40	4150	4334	291	6.7	377	8.7	4316	100	85	97	1.26
5	7/22/2008	4200	4250	4250	3.00	3.0	40	4233	4318	264	6.1	92	2.2	4144	50	78	83	1.14
6	7/22/2008	4190	4180	4170	---	3.0	40	4180	4298	246	5.7	42	1.0	4188	20	68	57	0.99
7	7/22/2008	4030	4200	----	---	---	40	4115	4275	237	5.5	59	1.4	4176	170	83	80	1.27
8	7/22/2008	4040	----	----	---	---	---	4040	4249	235	5.5	70	1.7	4112	---	---	---	---
9	7/22/2008	4000	4190	4130	4.00	4.0	50	4107	4235	226	5.3	41	1.0	4087	190	96	127	1.46
10	7/22/2008	3900	3950	4100	4.00	4.0	50	3983	4212	228	5.4	62	1.5	4043	200	108	187	1.63
11	7/22/2008	4500	4200	4450	4.00	4.0	70	4383	4226	223	5.3	205	4.9	4158	300	127	230	1.90
12	7/22/2008	4200	4290	4270	---	5.5	66	4253	4228	213	5.0	204	4.9	4207	90	124	197	1.84
13	7/22/2008	4200	4150	4130	---	---	77	4160	4223	206	4.9	112	2.6	4266	70	119	153	1.76
14	7/22/2008	4320	4220	4150	---	---	---	4230	4224	198	4.7	49	1.2	4214	170	123	110	1.81
15	7/22/2008	4370	4200		---	---	---	4285	4228	192	4.5	63	1.5	4225	170	126	137	1.90
16	7/22/2008	3800	3900	----	---	---	---	3850	4205	207	4.9	237	5.7	4122	100	125	147	1.92
17	7/22/2008	4500	----	----	---	---	---	4500	4222	213	5.0	331	7.9	4212	---	---	---	---
18	7/22/2008	4000	4000	4000	4.50	5.6	67	4000	4210	213	5.1	340	8.3	4117	0	117	90	1.79
19	7/22/2008	4110	4120	4130	4.50	5.5	66	4120	4206	208	5.0	261	6.2	4207	20	111	40	1.69
20	7/22/2008	4390	4280	4170	4.25	4.4	77	4280	4209	204	4.8	140	3.4	4133	220	117	80	1.78
21	7/22/2008	4600	4500	4400	4.50	3.6	88	4500	4222	208	4.9	191	4.4	4300	200	122	147	1.83
22	7/22/2008	4200	4250	4350	---	4.0	58	4267	4224	204	4.8	131	3.0	4349	150	123	190	1.84
23	7/22/2008	4350	4360	4390	3.75	5.0	69	4367	4230	201	4.8	117	2.7	4378	40	119	130	1.78
24	7/22/2008	3990	4440	4230	4.00	4.0	70	4220	4230	197	4.7	75	1.7	4284	450	134	213	1.99
25	7/22/2008	4200	4190	4170	2.25	2.4	77	4187	4228	193	4.6	96	2.2	4258	30	130	173	1.92
26	7/22/2008	4000	4010	4090	---	---	55	4033	4221	193	4.6	100	2.4	4147	90	128	190	1.90
27	7/22/2008	4210	4250	4290	4.00	---	---	4250	4222	190	4.5	111	2.7	4157	80	126	67	1.86
28	7/22/2008	4240	4420	4300	---	5.5	66	4320	4225	187	4.4	149	3.6	4201	180	128	117	1.89
29	7/22/2008	4260	4460	4320	3.75	5.4	77	4347	4229	185	4.4	50	1.2	4306	200	131	153	1.92

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DEMO2	TEST	28	28	28														
30	7/22/2008	4100	4150	4160	4.50	---	66	4137	4226	183	4.3	114	2.7	4268	60	128	147	1.88
31	7/22/2008	4200	4200	4000	5.50	6.0	50	4133	4223	181	4.3	122	2.9	4206	200	131	153	1.92
32	7/22/2008	4350	4340	----	4.50	5.5	66	4345	4227	179	4.2	121	2.9	4205	10	127	90	1.87
33	7/22/2008	4110	----	----	3.00	3.0	44	4110	4224	177	4.2	129	3.1	4196	---	---	---	---
34	7/22/2008	4200	----	----	---	4.5	77	4200	4223	175	4.1	119	2.8	4218	---	---	---	---
35	7/22/2008	4230	----	----	---	---	55	4230	4223	172	4.1	62	1.5	4180	---	---	---	---
36	7/22/2008	4250	----	----	---	---	---	4250	4224	170	4.0	25	0.6	4227	---	---	---	---
37	7/22/2008	4240	----	----	---	---	---	4240	4224	168	4.0	10	0.2	4240	---	---	---	---
38	7/22/2008	4290	4500	3990	4.50	6.6	77	4260	4225	166	3.9	10	0.2	4250	510	139	240	2.05
39	7/22/2008	4360	4410	4400	4.75	6.7	88	4390	4229	165	3.9	81	1.9	4297	50	136	190	2.01
40	7/22/2008	4370	4240	4350	3.25	7.6	68	4320	4232	164	3.9	65	1.5	4323	130	136	230	2.00
41	7/22/2008	3800	3900	3950	4.00	4.0	66	3883	4223	171	4.0	275	6.5	4198	150	136	110	2.01
42	7/22/2008	4130	4080	4170	5.50	4.5	66	4127	4221	169	4.0	219	5.3	4110	90	135	123	1.99
43	7/22/2008	4300	4260	4240	5.00	---	55	4267	4222	167	4.0	194	4.7	4092	60	133	100	1.95
44	7/22/2008	4400	4250	4270	---	6.0	---	4307	4224	166	3.9	95	2.2	4233	150	134	100	1.96
45	7/22/2008	4500	4400	4450	3.50	3.2	32	4450	4229	167	4.0	96	2.2	4341	100	133	103	1.94
46	7/22/2008	4320	4330	4440	3.40	5.4	66	4363	4232	167	3.9	72	1.7	4373	120	132	123	1.93

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Analysis Criteria

Report Name: Demo number 2
 Report Description: Development data set 2
 Report File: Demo2.SRC

Project(s): Demo2
 Mix(es): 3000-C
 Supplier: use all
 Technician: use all
 Slump filter: No lower limit to no upper limit
 Air Content filter: No lower limit to no upper limit
 Temperature filter: No lower limit to no upper limit
 Test dates: 1/1/1900 to : 4/17/2014
 Specimen age: 28 days

Analysis Results (28 days)

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 (28 days) -----	3000 psi	
Minimum required average strength (ACI 301-05) -----	3230 psi	per Table 4.2.3.3.c
1.34 x 167 + 3000 = 3224 psi		
2.33 x 167 + 3000 - 500 = 2889 psi		
Margin of extra performance -----	1002 psi	
(Average strength - minimum required average strength)		
Probability of a test below 3000 based on normal distribution is 0.00%		
Probability of a test below 2500 based on normal distribution is 0.00%		
Concrete performance (ACI 214R-02) -----	Excellent	per Table 3.2
Based on standard deviation of 167 psi		
Using laboratory trial batch rating system		
Laboratory testing proficiency (ACI 214R-02) -----	Excellent	per Table 3.2
Within batch coefficient of variation -----	1.93	
Using laboratory trial batch rating system		
Average range -----	132 psi	
Maximum 2 specimen range permitted to attain a rating of good: ---	182 psi	
Maximum 3 specimen range permitted to attain a rating of good: ---	273 psi	

The above statistical analysis will also qualify mixes

Mix ID: <u> AQM1 </u>	<u> AQM2 </u>	<u> AQM3 </u>	<u> AQM4 </u>
Strength: <u> AQS1 </u>	<u> AQS2 </u>	<u> AQS3 </u>	<u> AQS4 </u>

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Report Name: Demo number 2

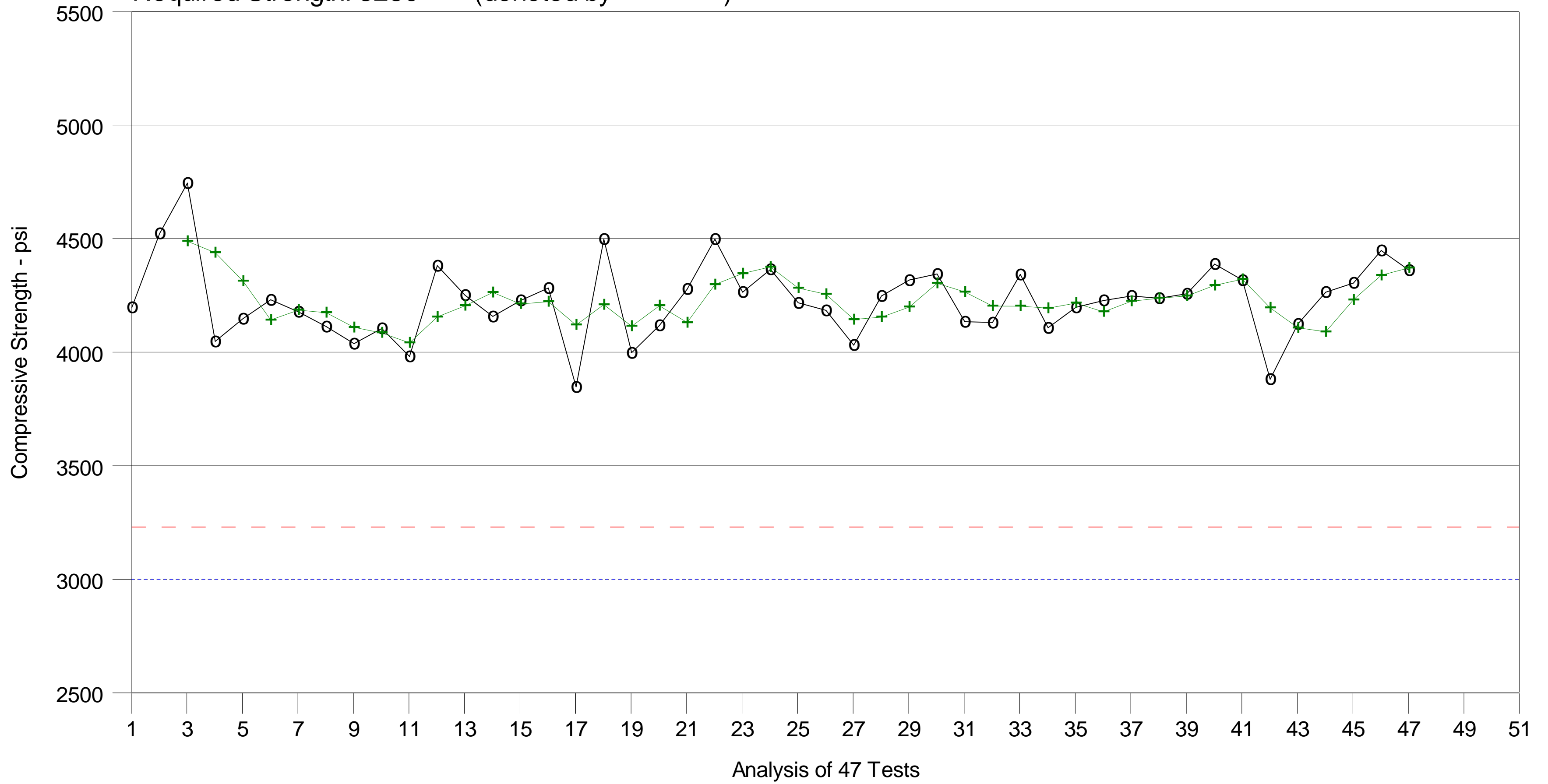
Report Description: Development data set 2

Report File: Demo2.SRC

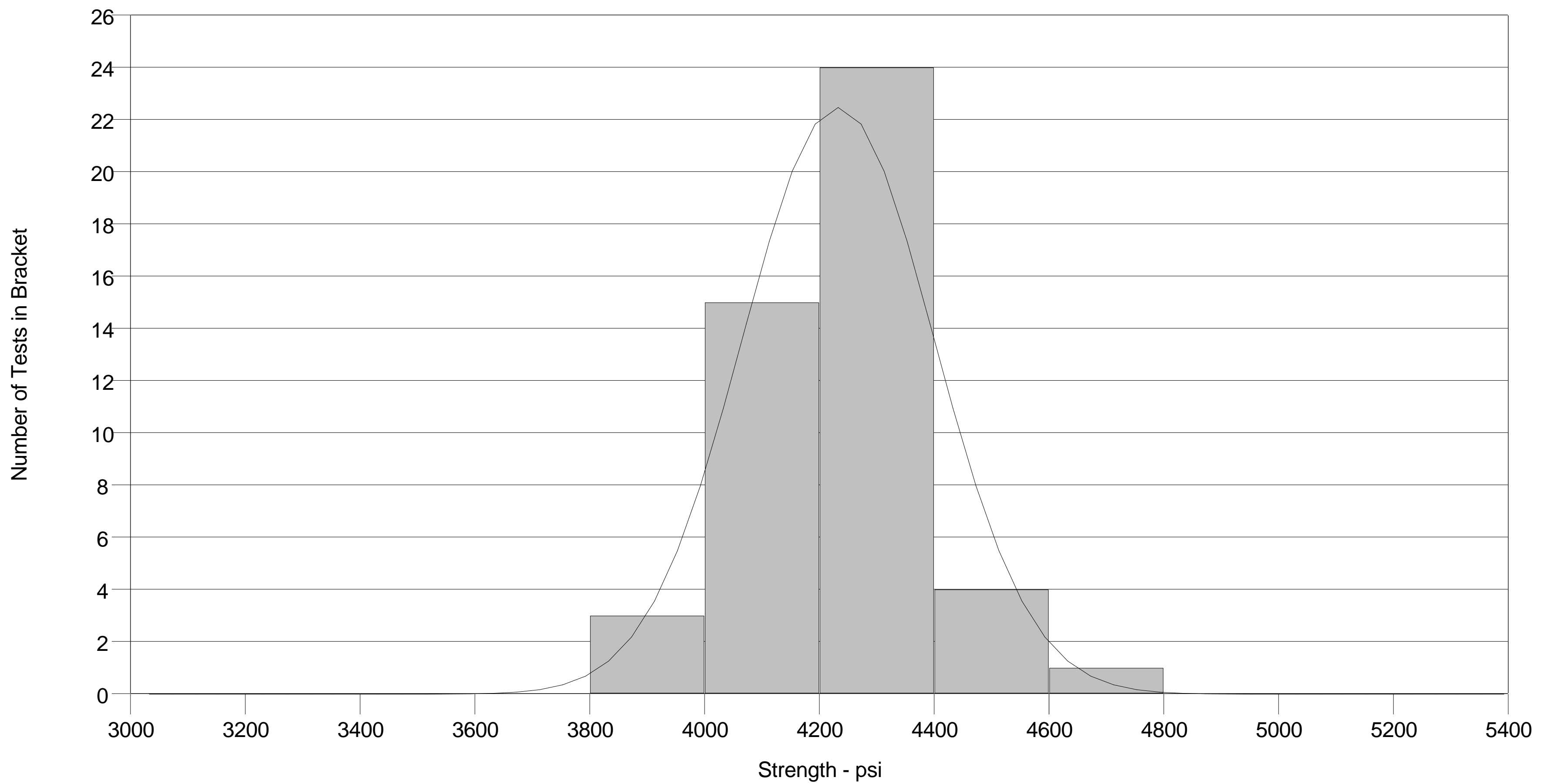
28 Day Strengths (o) and 3 Test Moving Average (+)

Specified Strength: 3000 (denoted by)

Required Strength: 3230 (denoted by - - - -)



28 Day Strength Distribution



99% Confidence value = 3844 psi

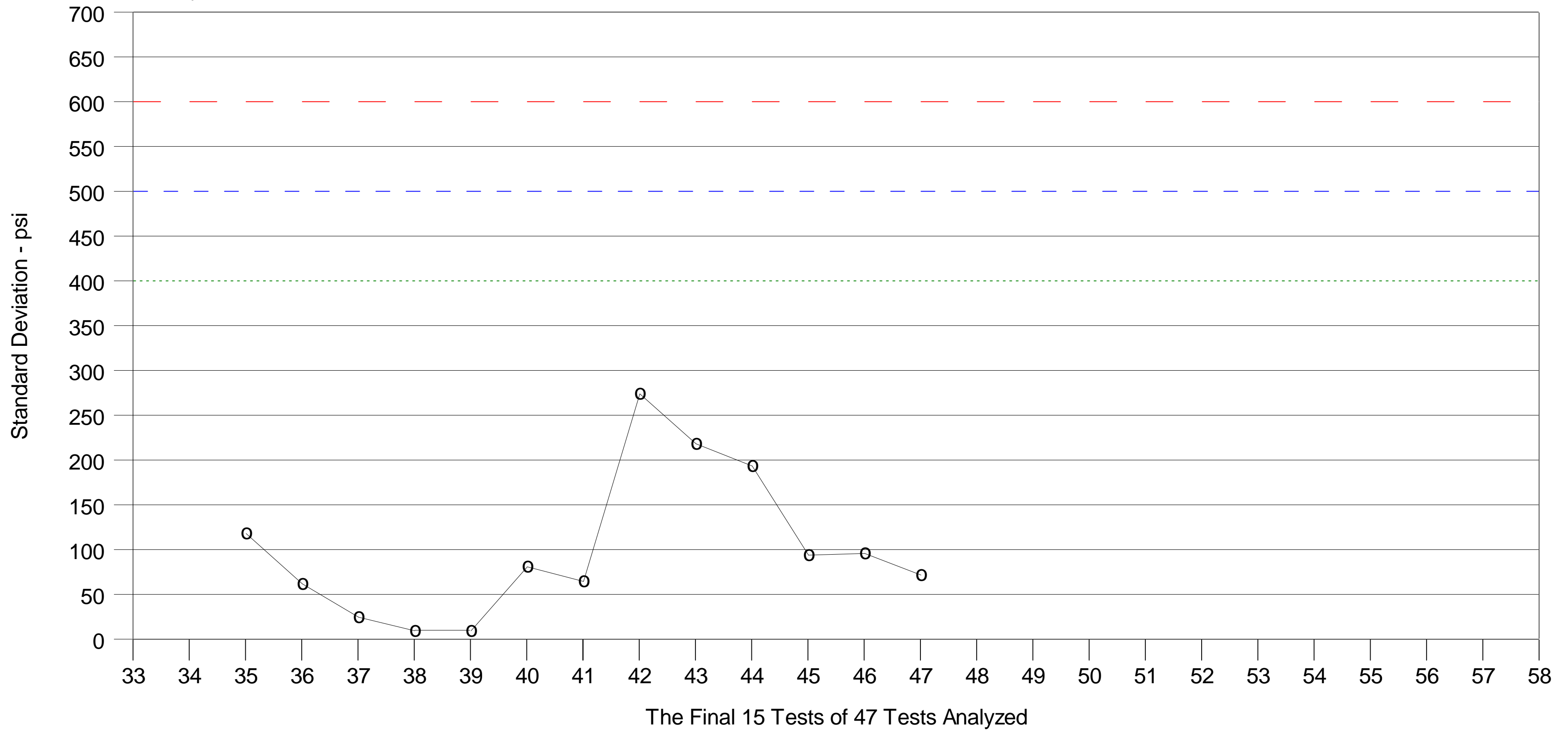
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Report Name: Demo number 2
 Report Description: Development data set 2
 Report File: Demo2.SRC

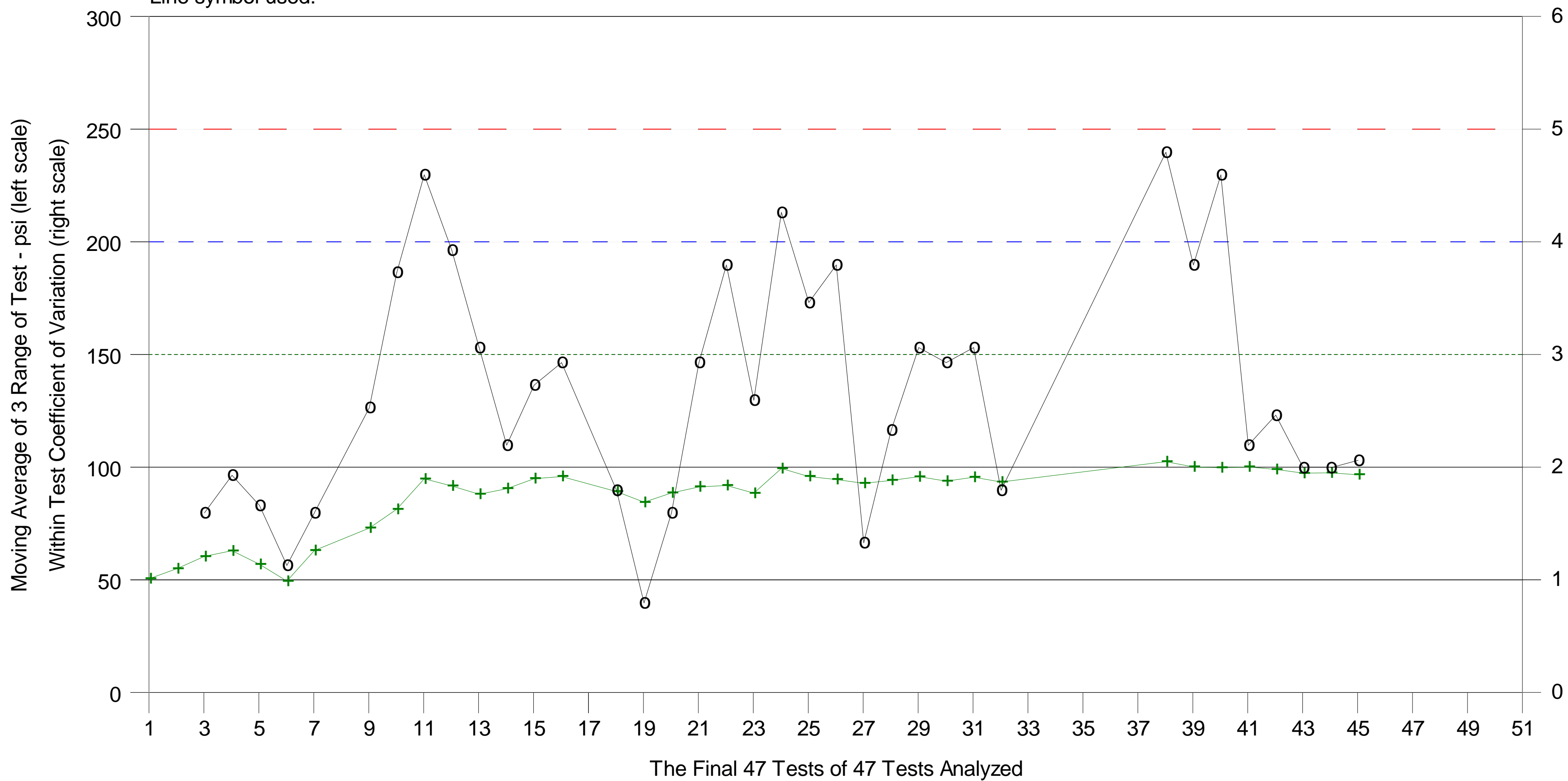
3 Test Moving Standard Deviation - 28 Day Test Strength

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



Estimated 28 Day Within Batch Coefficient of Variation (+) Moving Average Range of 3 28 Day Tests (o)

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



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Report Name: Demo number 2

Report Description: Development data set 2

Report File: Demo2.SRC

28 Day Strength (o) - Slump (+) - Air Content (x) - Concrete Temp (*)

