CALIFORNIA DEPARTMENT OF TRANSPORTATION

Independent Assurance Program Annual Report
Calendar Year 2011

Division of Engineering Services
Materials Engineering and Testing Services
Transportation Laboratory
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1. OVERVIEW

1.1. INTRODUCTION

Title 23 of the *Code of Federal Regulations*, Chapter I, Part 637, Subpart B, Section 637.205(a) (23CFR637.205(a)), the Federal Highway Administration's (FHWA's) quality assurance procedures for construction require the following:

> Each STD [state transportation department] shall develop a quality assurance program which will assure that the materials and workmanship incorporated into each Federal-aid highway construction project on the NHS [National Highway System] are in conformity with the requirements of the approved plans and specifications, including approved changes.

Key components of this quality assurance program are "acceptance" and "independent assurance." Independent Assurance (IA) programs may be project or system based. The California Department of Transportation (Caltrans) has chosen to implement a system based IA program.

Agencies choosing to implement a system based IA Program are required by 23CFR637.207(a)(2)(iv) to submit an annual report. In fulfillment of this requirement, this report is being submitted concerning activities of the Caltrans IA Program for calendar year 2011.

1.2. ANNUAL REPORT OVERVIEW

The Caltrans Independent Assurance (IA) Program provides a framework for ensuring that the quality assurance program, as outlined in the Caltrans *Construction Manual* and in project specifications, is supported by qualified technicians and accredited laboratories. The Caltrans IA Program provides periodic evaluation of the performance of sampling and testing personnel, testing equipment, and testing laboratories.

The purpose of this document is to provide:

- A discussion of IA activities from January through December 2011
- A discussion of the current IA Program
- Information on the Reference Sample Program (RSP)

1.3. SUMMARY OF ACTIVITIES: CALENDAR YEAR 2011

- **New IA Staff Certification** – Materials Engineering and Testing Services (METS) IA staff certified 2 new district IA staff.

- **District IA Staff Recertification** – METS IA staff recertified 34 district IA and local assistance IA staff.

- **The 2011 Annual IA Meeting** - The 2011 Annual IA Meeting was held on December 7 and 8, 2011.

- **District Process Reviews** - METS IA staff conducted district IA process reviews in the districts.

- **Technician Qualification** – Materials Engineering and Testing Services (METS) IA staff, district IA and local assistance staff qualified a total of 2855 technicians in Caltrans, local agencies and commercial laboratories.

- **Laboratory Accreditation** - METS IA staff, district IA staff and local assistance IA staff accredited a total of 454 Caltrans, local agency and commercials laboratories.

- **Equipment Calibration by METS IA Staff** – METS IA staff calibrated large equipment in 13 Caltrans and 16 local agency testing laboratories.

- **Reference Sample Program (RSP)** - The Reference Sample Program sent out aggregate proficiency samples to participating laboratories.

- **Local Assistance IA Staff** – Local Assistance IA staff reviewed 26 Quality Assurance Plans (QAP) for city and counties in 2011.

2. CALTRANS INDEPENDENT ASSURANCE (IA) PROGRAM

2.1. BACKGROUND

Since 1992, Caltrans has been committed to an IA program. Guidance for the program is outlined in the *Caltrans Independent Assurance Manual*, which can be located at the following website address:

<http://www.dot.ca.gov/hq/esc/Translab/ofpm/IAP.htm>

In 1994, Caltrans shifted from a project based process for reviewing technicians, equipment, and results to a system based process. In the system based process, a technician's qualifications are ascertained by written examinations, witnessed performance of tests, and results of testing on split samples of materials for corroboration of test results. Caltrans IA staff reviews equipment and laboratories annually; and laboratories participate in a statewide proficiency sampling program. 23CFR637.207(a) provides that this approach removes the necessity of project specific samples.

Caltrans views independent assurance as an important and integral part of its quality assurance program, but separate from individual project quality assurance efforts. Independent assurance is implemented by METS. The Division of Construction ensures individual project quality assurance. Quality assurance at the project level is outlined in the *Construction Manual*, which is located at the following website address:

<http://www.dot.ca.gov/hq/construc/manual2001/>

In keeping with the requirements of the IA Program and 23CFR637, Section 6-102C(2) of the *Construction Manual* instructs the construction engineer that:

All acceptance testers require certification. No tests or samples are to be taken on Caltrans projects unless the tester is certified in the test being performed.

District	Certified IA Staff			Number of Qualified Technicians			Accredited Laboratories											
							Caltrans			Local Agencies			Private Industry			Total		
	2011	2010	2009	2011	2010	2009	2011	2010	2009	2011	2010	2009	2011	2010	2009	2011	2010	2009
1	3	3	2	72	106	120	10	11	14	0	2	1	7	4	4	17	17	19
2	4	4	3	142	124	145	8	9	8	1	1	1	16	9	7	25	19	16
3	3	3	3	155	248	261	15	17	17	0	0	0	26	16	22	41	33	39
4	4	4	3	494	352	501	7	6	10	0	0	0	18	36	30	25	42	40
5	1	1	1	173	173	150	11	11	10	2	2	2	19	20	21	32	33	33
6	3	1	2	193	202	219	5	6	6	2	3	3	25	26	23	32	35	32
7	4	4	4	200	239	211	14	16	8	0	0	0	27	19	19	41	35	27
8	2	2	2	369	305	394	6	6	6	1	1	2	37	33	39	44	40	47
9	1	1	1	28	32	46	2	2	3	0	0	0	6	6	7	8	8	10
10	2	2	2	230	193	187	4	5	6	0	0	0	18	17	20	22	22	26
11	2	2	2	288	146	269	19	26	23	2	2	2	35	30	32	56	58	57
12	2	2	2	185	196	252	4	4	4	1	1	1	29	25	22	34	30	27
Total of all Districts	31	29	27	2529	2316	2755	105	119	115	9	12	12	263	241	246	377	372	373
Total For HQ IA	1	1	1	21	25	0	0	2	6	1	0	0	6	0	0	7	2	6
Total for Local Assistance IA	4	5	5	305	242	91	0	0	0	17	17	8	53	38	7	70	55	15
TOTAL	**36**	35	33	**2855**	2583	2846	105	121	121	27	29	20	322	279	253	**454**	429	394

TABLE 1: IA PROGRAM DATA FOR 2011

3. CALTRANS IA PROGRAM IN 2011

Shown in Table 1 is a summary of certified Caltrans IA staff, qualified technicians, and accredited laboratories for 2011.

3.1. INDEPENDENT ASSURANCE STAFF CERTIFICATION

In 2011, two new district IA personnel were certified by METS to replace staff in Districts 3 and 6.

3.2. ANNUAL RECERTIFICATION OF STATEWIDE IA STAFF

METS IA staff recertified 34 district and local assistance IA staff. The recertification consisted of a review of the proposed CT 304, "Method of Preparation of HMA for Test Specimens," which was significantly changed from the previous version. After the CT 304 review, a written exam was administered to IA staff on the new test method.

3.3. 2011 INDEPENDENT ASSURANCE ANNUAL MEETING

The IA Annual Meeting was held in December 2011. FHWA, METS, district IA staff, local assistance IA staff and District Materials Engineers were in attendance. Attendance by district IA staff is mandatory for IA recertification.

The following topics were covered:

- Overview of IA program in 2011
- AASHTO accreditation of district labs
- AASHTO test methods in Superpave pilot projects
- 2011 FHWA review in Caltrans
- Scale calibration
- 2011 Reference Sample Program
- IA scenarios
- District IA issues

3.4. DISTRICT IA PROCESS REVIEW

The *Independent Assurance Manual* requires an annual process/peer review to verify district compliance with Caltrans policies regarding independent assurance. The review consists of an examination of IA documents, records and procedures. METS IA staff conducts the review of the district IA program implementation. These reviews are intended to promote statewide uniformity in the Caltrans IA Program.

Districts were reviewed by METS IA staff in 2011. In general, all districts have improved their file systems. METS IA staff will continue to conduct process reviews in 2012.

3.5. TECHNICIAN QUALIFICATION

District IA staff, METS IA staff and local assistance IA staff qualified a total of 2855 technicians in 2011. This is an increase from the 2583 technicians accredited in 2010. This was due to a significant increase in tester certification in D-11 and in local agency related staff.

3.5.1 TECHNICIAN DISQUALIFICATIONS

Eighteen technicians were disqualified by district IA staff due to use of improper test procedures. In these cases, dispute resolution was not requested.

3.6 WRITTEN EXAM AND PRACTICAL STATISTICS

The 2011 data provided for the written exams and practical exams is shown in Table 2.

TABLE 2: 2011 EXAM STATISTICS

	INITIAL WRITTEN EXAM FOR QUALIFICATION				INITIAL PRACTICAL EXAM FOR QUALIFICATION				WITNESS OR CORROBORATION TEST FOR REQUALIFICATION			
DIST.	# OF TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME	TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME	TOTAL EXAMS	# FAIL 1ST TIME	# FAIL 2ND TIME	# FAIL 3RD TIME
1	114	36	14	0	153	9	1	0	111	2	0	0
2	430	35	3	0	343	19	4	0	1155	31	2	0
3	721	127	2	0	450	1	0	0	1391	0	0	0
NR SR	72	2	0	0	58	0	0	0	66	0	0	0
4	841	69	8	0	711	25	1	0	1236	25	1	0
5	764	136	11	4	365	7	1	0	659	3	0	0
6	1576	337	24	4	1177	96	6	0	2186	6	0	0
7	571	84	0	0	256	9	0	0	1687	6	0	0
8	1146	212	24	4	623	8	0	0	1959	26	0	0
9	298	34	4	0	272	4	0	0	115	0	0	0
10	575	104	16	0	486	34	1	0	1102	10	2	0
11	636	102	12	0	600	50	0	0	526	5	0	0
12	764	136	11	4	365	7	1	0	659	3	0	0
METS IA	128	20	0	0	94	0	0	0	70	0	0	0
LIA 1,2,3	430	95	1	0	339	49	0	0	288	11	0	0
LIA 4,CR	431	64	6	0	283	3	0	0	594	2	0	0
LIA 6, SR	377	5	0	0	253	5	0	0	222	0	0	0
LIA 11,12	147	26	5	0	97	0	0	0	122	0	0	0

Note: NR SR – Northern Region Structures staff covering District 1, 2 and 3
LIA 1,2,3 – Local Assistance IA staff covering District 1, 2 and 3
LIA 4, CR – Local Assistance IA staff covering District 4 and Central Region
LIA 6, SR – Local Assistance IA staff covering southern District 6, 7, 8 and 9

As shown in the data, the major hurdle in the technician qualification process is passing the written exam and first practical exam.

3.6.1 PRACTICAL EXAMS FOR TECHNICIAN QUALIFICATION

In analyzing the data for the practical exams, the failure rate is lower. Failure to pass the practical examination will occur if improper test equipment is presented, if an uncorrected error

in proper test procedure occurs while demonstrating the test procedure, or if the technician fails to complete the paperwork or calculations correctly.

Witness or corroboration testing occurs when a technician is renewing their qualifications for a test method. In general, the failure rate is low which indicates that once a tester has been qualified for a test method they easily pass the annual requalification process.

3.7 LABORATORY ACCREDITATION

In 2011, METS IA, district IA staff and local assistance IA staff accredited a total of 454 Caltrans, local agency and commercials laboratories. This is an increase from the 394 laboratories accredited in 2010.

3.7.1 LABORATORY ACCREDITATION, REVOCATION AND DISPUTE RESOLUTION

Section 2.5, "Dispute Resolution" of the *Caltrans Independent Assurance Manual* states:

"A tester or laboratory may have its entire qualification or accreditation or its qualification or accreditation for specific test methods suspended or revoked if it is found not to conform to IA accreditation requirements."

In 2011, one laboratory had its accreditation revoked for a test method. The lab did not exercise the dispute resolution process.

3.8 CALTRANS LABORATORIES— EQUIPMENT AND CALIBRATION

Since 2002, METS has been instrumental in providing funding for testing equipment for the District Laboratories and Construction field laboratories throughout the state. Funding was provided by METS to the districts again in 2011 to purchase laboratory equipment and to provide required installation/calibration for the new equipment. With the development of the Superpave pilot specifications, Superpave gyratory compactors were purchased for all the district materials laboratories.

3.8.1 PROPER CALIBRATION OF TESTING EQUIPMENT

METS IA staff calibrates large testing equipment in the district laboratories. In addition, METS IA staff performs calibration of presses and compactors for Caltrans and local agencies on an annual basis. This ensures that all Caltrans' local agency large testing equipment is being calibrated uniformly.

In 2011, METS IA staff calibrated large equipment in 13 Caltrans and 16 local agency laboratories.

For smaller equipment, local IA staff is responsible for verifying the calibration of all testing equipment in accredited field laboratories. Some districts' IA staff is responsible for calibration of equipment in the district and field laboratories. While other districts' IA review the calibration records for district and field laboratories from private calibration services. Overall, all calibration records are reviewed by district IA staff, whether they are directly responsible for calibration of the equipment or not. The *Independent Assurance Manual* covers calibration procedures for equipment such as larger presses and scales.

3.9 CALTRANS REFERENCE SAMPLE PROGRAM (RSP) IN 2011

The *Independent Assurance Manual,* Section 2.4.4, "Proficiency Testing" states,

"The laboratory shall participate in all required proficiency sample programs to be accredited."

It is the laboratory's responsibility to maintain active status in proficiency testing of reference samples by testing and reporting the results.

Reference sample results are evaluated using a statistical evaluation system for determining the numerical ratings of each test method. In 2011, samples of aggregate were distributed to participating laboratories.

Full reports for the 2011 Reference Sample Program are located in Appendix A.

3.9.1 GOALS FOR REFERENCE SAMPLE PROGRAM IN 2012

The following table gives an approximate timeline for the 2012 reference sample program:

2012	Sample Type
First quarter	Fine Aggregate – CT 207, 234 and 235
Second quarter	Coarse Aggregate – CT 202
Third quarter	Hot Mix Asphalt - CT 382

3.10 CALTRANS TEST METHOD UPDATES

To address the need for updating Caltrans Test Methods and to coordinate the changes in test methods resulting from the implementation of the new hot mix asphalt specification, three expert task groups (ETG) were formed. These technical working groups include members of industry and Caltrans. District IA staff are members of these technical working groups. The purpose of these groups is to update the current Caltrans test methods to reflect state of the art practices in the hot mix asphalt field.

The groups are as follows:

- Hot Mix Asphalt ETG (HMATG): deals with all test methods related to hot mix asphalt
- Aggregate ETG (ATG): deals with all test methods related to aggregate for hot mix asphalt
- Other: deals with test methods not in the other categories that relate to hot mix asphalt

Additionally, Caltrans will be incorporating approximately 6 national standards into Superpave pilot projects in 2012. Pilot projects requiring the use of AASHTO and ASTM test methods are scheduled for construction in 2012.

3.11 LOCAL ASSISTANCE INDEPENDENT ASSURANCE PROGRAM

Chapter 16, Section 16.14, "Quality Assurance Program," of the Caltrans Local Assistance Procedures Manual, states "**local agencies must follow Caltrans Quality Assurance Procedures (QAP) for all projects on the NHS**". Therefore, for local agency projects on the NHS, Caltrans IA staff is responsible for providing IA services to local agencies.

Five Local Assistance IA positions were filled in December 2008. Local Assistance IA staff interacts on a regular basis with the district local assistance engineer (DLAE). In addition to providing IA services, the Local Assistance IA staff reviews local agency Quality Assurance Program (QAP) manuals for compliance with Caltrans Local Assistance requirements.

In 2011, 26 local agency QAP manuals were reviewed by Local Assistance IA staff. This is a significant decrease from the 67 QAP manuals reviewed in 2010. However, the QAP is required to be updated every five years once it is approved. Since many of these manuals were updated in 2010, Local IA did not expect a large amount of QAP submittals this year.

4. CALTRANS INDEPENDENT ASSURANCE PROGRAM HIGHLIGHTS FOR 2011

4.1 INDEPENDENT ASSURANCE MANUAL REVISIONS

An addendum to the 2005 Independent Assurance manual was issued in July 2011. This addendum allows a two year qualification period for testers that meet certain proficiency requirements. The tester may be granted a two year qualification for a given test method under the following conditions:

- The tester passes the initial written and practical exams
- The tester maintains qualification in a specific test method for two consecutive years
- The tester re-qualifies for that specific test method in the third year

If there is a lapse in qualification during this time period, the tester will be required to retake the written and practical exams.

District IA and local IA staff began to implement this new policy in 2011.

4.2 THE NEW SOUTHERN REGIONAL LABORATORY (SRL)

The Southern Region Laboratory (SRL) opened its doors in 2011. The main purpose of the SRL is to move some Translab specific testing functions to southern CA, and to consolidate the district materials laboratories for District 7, 8 and 12.

The Independent Assurance staff for Districts 7, 8 and 12 now report to the Southern Regional lab, and are no longer under the supervision on the District Materials Engineers in those districts.

4.3 QUALITY ASSURANCE (QA) STEWARDSHIP REVIEW OF THE CALIFORNIA DEPARTMENT OF TRANSPORTATION IN 2011

In 2004, representatives from the Federal Highway Administration (FHWA) conducted a quality assurance review of the Caltrans. The objective of the review was to review Caltrans Quality Assurance Program practices and procedures. Since the Independent Assurance program is an integral component of the Quality Assurance program, there was also a review of the IA program practices in procedures. After the initial review, FHWA provided recommendations to assist in improving Caltrans IA program, and improvements were made based on these recommendations.

In 2011, FHWA staff returned to California as a follow-up to its 2004 review. Caltrans Quality Assurance Program practices were reviewed in Headquarters, District 4 and District 10. Overall, the Independent Assurance program received positive reviews. However, there were three recommendations for improvement:

- The state should develop a process for required the written exam to be passed during the recertification process

- The state should develop a statewide database for tracking the qualification of technicians
- The state needs to develop a procedure to have district materials laboratories qualified in a consistent manner

These recommendations will be incorporated into the current IA program in 2012.

4.4 AASHTO ACCREDITATION OF CALTRANS DISTRICT MATERIAL LABORATORIES

As Caltrans moves towards implementing national standards, the issue of AASHTO accreditation of district material laboratories has come to the attention of METS management. In the past, the main Transportation Laboratory in Sacramento was accredited by AMRL and CCRL, and the district labs were under the umbrella of the Sacramento accreditation.

In 2009, METS proposed a pilot program for district materials laboratory AASHTO accreditation. The District 2 Materials laboratory volunteered to be a candidate for AASHTO accreditation. In 2011, the laboratory prepared for the site assessment by AASHTO. In January 2012, the laboratory received its AASHTO accreditation.

In 2012, the District 6 Materials lab and the Southern Regional Laboratory are preparing for AASHTO accreditation.

APPENDIX A

REFERENCE SAMPLE PROGRAM

METHOD OF TEST FOR FINE AGGREGATE GRADATION AND SAND EQUIVALENT

2011 PROFICIENCY TEST RESULTS

State of California Department of Transportation
Office of Roadway Materials Testing
Division of Engineering Services
Materials Engineering and Testing Services-MS #5
5900 Folsom Blvd
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REFERENCE SAMPLE PROGRAM

FINE AGGREGATE GRADATION AND SAND EQUIVALENT

2011 PROFICIENCY TEST RESULTS

1.0 OVERVIEW

In late 2011, the proficiency test for determining fine aggregate gradation and sand equivalent was initiated. These proficiency tests were based on two California test methods. Namely, CTM 202 "Method of Test for Determining Sieve Analysis for Fine and Coarse Aggregates" and CTM 217 "Method of Test for Sand Equivalent". The proficiency samples were prepared in the RSP laboratory. Each set of proficiency tests has an established target values to determine prior to sample distribution to minimize variability.

The sieve analysis for fine aggregate determines the particle size distribution of fine aggregates. The sand equivalent determines the relative proportions of detrimental fine dust or clay-like material in soil or fine aggregate.

The proficiency samples for each test methods were prepared in accordance to CT 202. The approximate target sample mass for fine aggregate gradation was 500 ± 10 grams using materials passing #4 sieve. The approximate target sample mass for sand equivalent was 1000 ± 10 grams also using materials passing the #4 sieve. The sample quantities used were deemed adequate to provide accurate results. The materials used in this proficiency tests originated from a single source to maintain uniformity and minimize variability.

The premise of the fine aggregate gradation and sand equivalent tests was to determine the participating laboratories proficiency in conducting the test, suitability of their test equipment, and their ability to achieve statistically satisfactory results.

The initial participants for this round of proficiency testing were 240 laboratories that include private, local agencies, and Caltrans. During the course of the proficiency testing, an additional 29 laboratories opted to participate. The final count for the participants was 269 laboratories.

The test results were broken down as follows. The fine aggregate gradation test results were based on individual sieve sizes. In other words, each sieve size has its own designated value. The sand equivalent test results were based on the average of three readings. Statistical analysis was conducted on each individual data set. The initial statistical analysis result was used as the basis for the proficiency scores.

2.0 ANALYSIS OF TEST RESULTS

2.1 EVALUATION CRITERIA

Test results were analyzed using a statistical evaluation system in which the mean (X) and standard deviation (s) was calculated for each test parameter. A rating score was then given to the test result based on the criteria shown in Table 1. A test result with a score of 3 or greater was considered acceptable. A test result with a score of 2 or less was considered unacceptable and a retest was required.

Table 1: Evaluation Criteria

Test Result	Rating	Interpretation of Results	Acceptance
X ± 1.0s	5	Very Good	Acceptable
X ± 1.5s	4	Good	
X ± 2.0s	3	Fair	
X ± 2.5s	2	Poor	Unacceptable
X ± 3.0s	1	Very Poor	

2.2 INITIAL TESTS

A total of 265 laboratories participated in the initial test for sand equivalent (SE) and 269 laboratories participated in the initial test for the fine aggregate gradation. Analyses for outliers in accordance with ASTM E 178 were conducted for both the SE and fine aggregate gradation. Table 2 summarizes the SE and fine aggregate gradation outliers. After excluding the outliers from the data set, the mean and standard deviation for each test parameter was calculated to determine the score for each of the respective test parameters. The analysis results are presented in Table 3 and 4 which summarizes the initial statistical analysis for both SE and Fine Aggregate Gradation.

Table 2: Labs and Tests Results Considered as Outliers for SE and Fine Aggregate Gradation

	# of Laboratories	Lab ID	# of Outliers
SE	265	110,482,33,352,270,241,182,461	8
Sieve			
# 4	269	3,27	2
# 8	269	179,451,143,3	4
# 16	269	596,63,303,289,451,359,144,218,3,417,462,26	12
# 30	269	596,303,289,250,451,359,144,218,3,462,26	11
# 50	269	582,596,303,48,289,237,451,359,219,144,218,3,462,292,25,26	16
# 100	269	582,596,303,257,48,289,451,359,219,144,218,246,3,462,26	15
# 200	269	596,303,257,48,289,80,359,219,144,218,246,462,26	13

Table 3: Summary of Initial Test Results for Sand Equivalent (CT-217)

Item	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
CT 217	265	63.4	2.59	190	37	16	11	11
			% of Total	72	14	6	4	4

Table 4: Summary of Initial Test Results for Fine Aggregate Gradation (CT-202)

Item CT-202 (fines)	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
# 4	269	99.9	0.191	267	-	-	-	2
			% of Total	99	-	-	-	1
# 8	269	73.2	1.094	186	46	15	7	15
			% of Total	69	17	6	3	6
# 16	269	54.6	1.002	189	30	29	5	16
			% of Total	70	11	11	2	6
# 30	269	39.9	1.033	187	44	21	-	17
			% of Total	70	16	8	-	6
# 50	269	26.4	0.892	196	-	52	-	21
			% of Total	73	-	19	-	8
# 100	269	17.4	0.909	195	-	49	-	25
			% of Total	72	-	18	-	9
# 200	269	11.5	0.899	197	-	48	-	24
			% of Total	73	-	18	-	9

RETEST

Laboratories whose test results were considered as outliers as well as laboratories that achieved a score lower than 3 were considered as unsatisfactory. These laboratories were given additional samples to conduct a re-test. The retest summary for SE and Fine Aggregate Gradation is presented in Table 5 and Table 6 respectively. Laboratories that failed on the retest were given a third sample to test; however, Caltrans IA staff would witness the tester conducting the test. A summary of the IA witness tests is presented in Table 7 and 8 for SE and fine aggregate gradation respectively.

Table 5: Summary of Re-Test Results for Sand Equivalent (CT-217)

Item	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
CT 217	22	63.4	2.59	17	4	-	-	1
			% of Total	77	18	-	-	5

Table 6: Summary of Re-Test Results for Fine Aggregate Gradation (CT-202)

Item CT-202 (fines)	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
# 4	2	99.9	0.191	2	-	-	-	-
			% of Total	100	-	-	-	-
# 8	22	73.2	1.094	13	3	3	2	1
			% of Total	59	14	14	9	4
# 16	21	54.6	1.002	16	3	1	-	1
			% of Total	76	14	5	-	5
# 30	17	39.9	1.033	12	2	1	-	2
			% of Total	70	12	6	-	12
# 50	21	26.4	0.892	16	4	-	-	1
			% of Total	76	19			5
# 100	25	17.4	0.909	21	-	3	-	1
			% of Total	84	-	12	-	4
# 200	24	11.5	0.899	18	-	3		3
			% of Total	75	-	12.5		12.5

Table 7: Summary of IA witness for Re-Test Results for Sand Equivalent (CT-217)

Item	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
CT 217	1	63.4	2.59	-	-	-	-	1*
			% of Total	-	-	-	-	100

Table 8: Summary of IA witness for Re-Test Results for Fine Aggregate Gradation (CT-202)

Item CT-202 (fines)	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
# 4	-	99.9	0.191	-	-	-	-	-
			% of Total	-	-	-	-	-
# 8	3	73.2	1.094	1	1			1*
			% of Total	33	33			33
# 16	1	54.6	1.002			1	-	
			% of Total			100	-	
# 30	2	39.9	1.033			1		1*
			% of Total			50		50
# 50	1	26.4	0.892			1		
			% of Total			100		
# 100	1	17.4	0.909		1			
			% of Total		100			
# 200	3	11.5	0.899	2		1		
			% of Total	75		25		

2.3 COMBINED RESULTS

A total of 265 laboratories participated for the sand equivalent and 269 laboratories participated in the fine aggregate gradation proficiency test. Four laboratories opted out for the sand equivalent test since their laboratory does not run this specific test. Respectively, Tables 9 and 10 shows the combined scores from both the initial test and retest for sand equivalent and fine aggregate gradation. The final combined scores are provided in Appendix C.

Table 9: Summary of Combined Test Results for Sand Equivalent (CT-217)

Item	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
CT 217	265	63.4	2.59	264	-	-	-	1
			% of Total	99	-	-	-	1*

Table 10: Summary of Combined Test Results for Fine Aggregate Gradation (CT-202)

Item CT-202 (fines)	# Lab	Average	Standard Deviation	Number of Labs Achieved Score of				
				5	4	3	2	1
# 4	269	99.9	0.191	269	-	-	-	-
			% of Total	100	-	-	-	-
# 8	269	73.2	1.094	200	50	18	-	1*
			% of Total	74	18	7	-	1*
# 16	269	54.6	1.002	205	33	31	-	-
			% of Total	77	12	11	-	-
# 30	269	39.9	1.033	199	46	23	-	1*
			% of Total	74	17	8	-	1*
# 50	269	26.4	0.892	212	4	53	-	-
			% of Total	79	2	18	-	-
# 100	269	17.4	0.909	216	1	52	-	-
			% of Total	80	1	19	-	-
# 200	269	11.5	0.899	217	-	52	-	-
			% of Total	81	-	19	-	-

2.4 OBSERVATIONS

During the initial test there were approximately 21 laboratories that failed SE and approximately the same number of laboratories failed the fine aggregate gradation test. A retest was performed by these laboratories for SE or fine aggregate gradation or the combination of both. Most of the laboratories were able to produce acceptable results; however, a few laboratories were not able to produce acceptable results. These laboratories were again provided with samples to run the third re-test with Caltrans IA staff witnessing the test. The following observations were noted by Caltrans IA while witnessing the retest. Possible cause of the initial failure in both SE and fine aggregate gradation maybe attributed to the following:

- Equipment:
    - Sieves – if not calibrated or not in a proper working order inaccurate results for each aggregate gradation are obtained which result in incorrect gradation percentages.
    - Shaker – if not calibrated or not in a proper working condition there will not be proper agitation of the aggregate in the sieves. In addition, the shaking time interval (too much time or not enough shaking time) will produce inconsistent results.
    - Measuring Tin – SE requires a specific volume of measuring tin (85 mL). Using an incorrect size will produce an inaccurate sand and clay reading.

- Test Procedures:
    - It was noticed that specific instructions were not followed, i.e., performing a wash on the fine aggregate gradation. The instruction specifically states not to wash the samples. Some of the test results indicate that the samples were washed. This is shown by a low percentage number for the #200 sieve.
    - Not following proper test procedure/s or best practice. It may be possible that the when performing the SE test, the fine particles may not have been adequately irrigated producing an inaccurate result. It is also possible that only one SE test was performed instead averaging a minimum of three tests per the RSP instruction sheet.
    - Arithmetic and round-off errors.

3.0 SUMMARY

- CT-217 – In the initial round of testing, 265 laboratories participated, 21 laboratories did not achieve an acceptable score. Samples were provided to conduct a retest and 21 laboratories passed with 1 laboratory failing. The failed laboratory performed the third test with Caltrans IA witnessing. The laboratory failed on the third try and was disqualified.

- CT-202 – In the initial round of testing 269 laboratories participated. 41 laboratories failed in the initial test. The failure constitutes laboratories whose results were considered outliers and those with results below a score of 3. Samples were provided to the failed laboratories for a retest, and 39 laboratories passed. 2 laboratories failed the retest and performed another test with Caltrans IA staff witnessing. 1 Laboratory failed

the IA witness and 1 laboratory failed to submit results, both laboratories are disqualified to run CT-217 and CT-202 (Fine Aggregate Gradation).

4.0 REFERENCES

ASTM, "Standard Practice for Dealing with Outlying Observations," Designation E 178 – 80.

Caltrans, "Independent Assurance Manual," Sacramento, July 2005.

APPENDIX – A

Test Results from Initial Test

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
3	62	5	93	1	54	1	39	1	26	1	17	1	11	1	10	3
5	66	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
6	66	5	100	5	73	5	55	5	41	4	28	3	18	5	12	5
9	63	5	100	5	72	4	55	5	41	4	28	3	20	1	13	3
10	61	5	100	5	74	5	55	5	41	4	27	5	19	3	13	3
11	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
12	61	5	100	5	73	5	55	5	41	4	27	5	18	5	12	5
16	65	5	100	5	74	5	56	4	42	3	28	3	20	1	14	1
17	63	5	100	5	72	4	54	5	40	5	26	5	18	5	12	5
18	67	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
19	63	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
20	64	5	100	5	74	5	55	5	40	5	26	5	18	5	11	5
21	61	5	100	5	74	5	56	4	41	4	27	5	18	5	11	5
23	69	2	100	5	73	5	54	5	40	5	27	5	18	5	11	5
24	63	5	100	5	73	5	54	5	40	5	27	5	18	5	12	5
25	65	5	100	5	70	1	53	3	39	5	30	1	17	5	12	5
26	62	5	100	5	71	2	51	1	35	1	18	1	8	1	1	1
27	60	4	500	1	75	3	56	4	40	5	27	5	18	5	11	5
30	62	5	100	5	72	4	54	5	40	5	27	5	18	5	13	3
32	60	4	100	5	73	5	54	5	39	5	25	3	17	5	11	5
33	72	1	100	5	74	5	56	4	41	4	28	3	19	3	14	1
39	62	5	100	5	72	4	53	3	39	5	25	3	17	5	11	5
42	64	5	100	5	73	5	55	5	40	5	27	5	18	5	11	5
43	61	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
45	66	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
47	63	5	100	5	73	5	55	5	39	5	26	5	17	5	11	5
48	65	5	100	5	74	5	57	2	43	1	30	1	21	1	15	1
49	60	4	100	5	74	5	56	4	41	4	27	5	18	5	12	5
53	64	5	100	5	72	4	54	5	39	5	26	5	18	5	12	5
54	63	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
55	64	5	100	5	73	5	53	3	39	5	25	3	17	5	11	5
56	65	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
57	59	3	100	5	73	5	55	5	41	4	27	5	18	5	13	3
58	65	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
59	63	5	99	5	74	5	55	5	40	5	27	5	18	5	12	5
62	68	3	100	5	72	4	54	5	39	5	26	5	17	5	11	5

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
63	64	5	100	5	74	5	50	1	41	4	27	5	17	5	11	5
64	60	4	100	5	74	5	55	5	41	4	27	5	18	5	12	5
65	61	5	100	5	74	5	55	5	40	5	27	5	19	3	13	3
66	60	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
67	61	5	100	5	73	5	54	5	40	5	26	5	18	5	11	5
68	61	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
69	62	5	100	5	74	5	56	4	41	4	27	5	19	3	12	5
71	63	5	100	5	73	5	55	5	39	5	26	5	18	5	11	5
73	66	5	100	5	74	5	53	3	39	5	26	5	16	3	10	3
74	60	4	100	5	72	4	54	5	39	5	26	5	17	5	11	5
76	64	5	100	5	72	4	53	3	39	5	25	3	16	3	12	5
80	64	5	100	5	73	5	54	5	39	?	25	3	16	3	3	1
81	61	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
84	66	5	99	5	72	4	54	5	38	3	25	3	16	3	10	3
88	63	5	100	5	72	4	53	3	39	5	26	5	17	5	12	5
89	62	5	100	5	74	5	55	5	41	4	28	3	18	5	12	5
90	67	4	100	5	73	5	54	5	40	5	26	5	17	5	11	5
93	61	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
94	68	3	100	5	74	5	56	4	41	4	27	5	18	5	12	5
95	68	3	100	5	74	5	54	5	40	5	25	3	16	3	10	3
96	62	5	100	5	73	5	54	5	39	5	26	5	17	5	10	3
97	61	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
98	65	5	99	5	74	5	55	5	40	5	26	5	17	5	11	5
99	61	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
100	68	3	100	5	74	5	55	5	40	5	26	5	17	5	11	5
104	69	2	100	5	73	5	54	5	39	5	26	5	17	5	11	5
110	78	1	100	5	74	5	56	4	41	4	28	3	19	3	13	3
111	64	5	99	5	73	5	54	5	40	5	27	5	17	5	11	5
113	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
114	65	5	100	5	72	4	53	3	39	5	26	5	17	5	11	5
117	66	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
119	65	5	100	5	74	5	56	4	42	3	27	5	18	5	12	5
122	67	4	100	5	72	4	55	5	39	5	27	5	21	1	18	1
131	64	5	100	5	71	2	53	3	39	5	26	5	17	5	11	5
135	59	3	100	5	73	5	55	5	39	5	26	5	18	5	12	5
137	64	5	100	5	74	5	56	4	41	4	28	3	19	3	13	3
139	64	5	100	5	74	5	55	5	39	5	26	5	17	5	11	5
140	60	4	100	5	74	5	55	5	40	5	26	5	18	5	12	5
141	63	5	100	5	75	3	55	5	39	5	26	5	17	5	11	5
142	62	5	100	5	75	3	56	4	41	4	27	5	18	5	12	5

RSP Fine Aggregate Gradation and Sand Equivalent
Proficiency Test Results
Office of Roadway Materials Testing

November 11, 2011

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
143	63	5	100	5	77	1	58	1	43	1	27	5	17	5	12	5
144	64	5	100	5	70	1	51	1	34	1	19	1	10	1	3	1
146	60	4	100	5	73	5	55	5	40	5	26	5	17	5	11	5
147	64	5	100	5	74	5	56	4	40	5	27	5	18	5	11	5
148	61	5	100	5	75	3	56	4	41	4	26	5	16	3	11	5
149	67	4	100	5	74	5	56	4	41	4	27	5	18	5	13	3
151	60	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
154	64	5	100	5	73	5	54	5	40	5	27	5	19	3	12	5
155	66	5	100	5	73	5	54	5	40	5	27	5	19	3	12	5
156	64	5	100	5	73	5	56	4	42	3	28	3	19	3	13	3
157	65	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
158	61	5	100	5	73	5	55	5	41	4	27	5	18	5	12	5
160	60	4	100	5	73	5	55	5	39	5	26	5	18	5	12	5
161	59	3	100	5	73	5	54	5	40	5	26	5	17	5	11	5
163	60	4	100	5	73	5	54	5	40	5	26	5	18	5	12	5
164	63	5	100	5	70	1	56	4	41	4	27	5	18	5	12	5
166	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
167	63	5	100	5	73	5	55	5	40	5	27	5	17	5	12	5
169	67	4	100	5	72	4	53	3	39	5	26	5	17	5	11	5
170	62	5	100	5	73	5	55	5	39	5	26	5	17	5	11	5
172	59	3	100	5	74	5	56	4	41	4	28	3	19	3	13	3
173	66	5	100	5	74	5	55	5	40	5	24	1	16	3	10	3
176	64	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
177	63	5	100	5	71	2	52	1	38	3	25	3	17	5	11	5
179	63	5	100	5	47	1	55	5	40	5	26	5	17	5	11	5
180	65	5	100	5	74	5	55	5	40	5	26	5	18	5	12	5
182	71	1	100	5	72	4	54	5	40	5	27	5	17	5	12	5
183	63	5	100	5	74	5	55	5	40	5	26	5	18	5	12	5
184	64	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
187	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
192	60	4	100	5	73	5	55	5	41	4	28	3	19	3	13	3
195	64	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
196	60	4	100	5	74	5	55	5	39	5	26	5	17	5	11	5
197	65	5	100	5	75	3	55	5	41	4	26	5	18	5	11	5
198	69	2	100	5	73	5	55	5	40	5	27	5	18	5	12	5
200	65	5	100	5	73	5	55	5	40	5	27	5	17	5	12	5
201	64	5	100	5	73	5	54	5	39	5	26	5	16	3	11	5
205	62	5	100	5	74	5	56	4	41	4	28	3	19	3	13	3
206	62	5	100	5	73	5	55	5	41	4	28	3	19	3	13	3
207	62	5	100	5	72	4	53	3	39	5	26	5	17	5	11	5

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
209	64	5	100	5	73	5	54	5	40	5	25	3	17	5	11	5
210	61	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
211	64	5	100	5	73	5	55	5	41	4	28	3	18	5	13	3
213	64	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
214	58	2	100	5	73	5	55	5	40	5	26	5	17	5	11	5
216	63	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
217	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
218	NA		100	5	71	2	50	1	33	1	18	1	8	1	1	1
219	68	3	100	5	74	5	56	4	42	3	30	1	22	1	17	1
221	63	5	100	5	75	3	55	5	39	5	26	5	17	5	11	5
222	64	5	100	5	74	5	54	5	39	5	26	5	17	5	11	5
224	63	5	100	5	73	5	54	5	40	5	26	5	17	5	12	5
225	63	5	100	5	73	5	54	5	40	5	27	5	18	5	12	5
226	63	5	100	5	75	3	56	4	41	4	27	5	19	3	12	5
228	66	5	100	5	74	5	54	5	40	5	26	5	17	5	11	5
237	61	5	100	5	73	5	56	4	42	3	38	1	20	1	13	3
239	70	1	100	5	74	5	55	5	41	4	27	5	18	5	12	5
241	54	1	100	5	74	5	56	4	40	5	27	5	17	5	11	5
244	63	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
245	67	4	99	5	73	5	55	5	40	5	26	5	17	5	11	5
246	64	5	100	5	73	5	56	4	42	3	29	1	21	1	15	1
249	61	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
250	62	5	100	5	73	5	54	5	10	1	26	5	17	5	11	5
252	59	3	100	5	73	5	55	5	41	4	27	5	18	5	12	5
255	61	5	100	5	73	5	55	5	40	5	26	5	17	5	11	5
256	67	4	100	5	75	3	57	2	42	3	27	5	18	5	11	5
257	63	5	100	5	74	5	55	5	40	5	28	3	21	1	17	1
263	60	4	100	5	73	5	55	5	40	5	26	5	17	5	11	5
265	67	4	100	5	73	5	54	5	40	5	26	5	17	5	12	5
266	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
267	64	5	100	5	74	5	55	5	40	5	27	5	17	5	12	5
269	66	5	100	5	72	4	53	3	38	3	25	3	16	3	10	3
270	71	1	100	5	73	5	54	5	39	5	26	5	17	5	11	5
271	67	4	100	5	73	5	54	5	40	5	26	5	18	5	12	5
272	61	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
273	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
277	66	5	100	5	73	5	54	5	39	5	27	5	17	5	11	5
280	65	5	100	5	71	2	53	3	39	5	26	5	17	5	11	5
281	58	2	100	5	73	5	55	5	39	5	26	5	17	5	11	5
282	65	5	100	5	73	5	54	5	39	5	26	5	16	3	11	5

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
283	65	5	100	5	73	5	53	3	39	5	26	5	17	5	12	5
285	66	5	100	5	73	5	53	3	39	5	26	5	17	5	12	5
286	64	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
288	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
289	65	5	100	5	70	1	49	1	32	1	18	1	8	1	1	1
291	60	4	100	5	76	1	57	2	43	1	28	3	19	3	13	3
292	NA		100	5	74	5	56	4	42	3	30	1	20	1	14	1
293	60	4	100	5	72	4	53	3	39	5	26	5	17	5	11	5
295	62	5	100	5	74	5	54	5	39	5	26	5	17	5	11	5
297	67	4	100	5	73	5	55	5	40	5	27	5	18	5	12	5
301	68	3	100	5	74	5	55	5	40	5	25	3	17	5	11	5
302	64	5	100	5	73	5	54	5	39	5	26	5	17	5	12	5
303	67	4	100	5	70	1	49	1	33	1	17	1	7	1	0	1
304	66	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
308	64	5	100	5	74	5	54	5	40	5	27	5	17	5	11	5
309	66	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
310	61	5	100	5	72	4	53	3	39	5	26	5	18	5	11	5
311	62	5	100	5	73	5	55	5	40	5	25	3	17	5	11	5
312	67	4	100	5	72	4	53	3	39	5	25	3	16	3	10	3
313	66	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
314	66	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
316	63	5	100	5	72	4	53	3	38	3	25	3	16	3	11	5
318	61	5	99	5	74	5	55	5	40	5	27	5	17	5	10	3
319	65	5	100	5	72	4	54	5	40	5	26	5	17	5	10	3
322	63	5	100	5	74	5	55	5	40	5	27	5	17	5	11	5
325	61	5	100	5	71	2	53	3	39	5	25	3	17	5	11	5
326	62	5	100	5	72	4	54	5	39	5	25	3	15	1	9	1
330	63	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
331	60	4	100	5	73	5	54	5	39	5	25	3	16	3	10	3
332	64	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
333	64	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
334	66	5	100	5	76	1	57	2	43	1	27	5	18	5	12	5
335	64	5	100	5	73	5	55	5	39	5	25	3	17	5	11	5
337	62	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
338	61	5	100	5	73	5	54	5	39	5	25	3	17	5	11	5
341	64	5	100	5	72	4	54	5	39	5	26	5	17	5	12	5
345	66	5	100	5	72	4	53	3	40	5	26	5	17	5	10	3
349	62	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
350	62	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
351	63	5	100	5	72	4	54	5	40	5	26	5	18	5	12	5

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
352	56	1	100	5	75	3	58	1	43	1	29	1	20	1	13	3
353	65	5	100	5	76	1	54	5	39	5	26	5	17	5	11	5
354	64	5	100	5	74	5	55	5	39	5	26	5	17	5	11	5
355	62	5	100	5	75	3	55	5	40	5	26	5	18	5	12	5
356	66	5	100	5	74	5	54	5	40	5	25	3	16	3	10	3
358	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
359	65	5	100	5	70	1	48	1	32	1	17	1	7	1	0	1
360	66	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
361	66	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
364	70	1	100	5	75	3	56	4	42	3	27	5	18	5	12	5
367	63	5	100	5	73	5	55	5	41	4	28	3	19	3	14	1
368	64	5	100	5	73	5	55	5	41	4	27	5	19	3	13	3
369	64	5	100	5	73	5	54	5	40	5	25	3	16	3	10	3
370	62	5	100	5	74	5	55	5	41	4	27	5	19	3	13	3
375	61	5	100	5	74	5	57	2	42	3	28	3	19	3	13	3
377	65	5	100	5	73	5	55	5	40	5	26	5	17	5	11	5
379	60	4	100	5	73	5	55	5	40	5	27	5	17	5	11	5
381	66	5	100	5	75	3	55	5	40	5	27	5	18	5	13	3
383	62	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
384	64	5	100	5	73	5	54	5	40	5	26	5	18	5	12	5
385	66	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
389	63	5	100	5	74	5	56	4	41	4	29	1	19	3	13	3
390	64	5	100	5	74	5	56	4	41	4	26	5	17	5	11	5
393	69	2	100	5	73	5	55	5	40	5	27	5	18	5	12	5
394	60	4	100	5	73	5	54	5	40	5	26	5	17	5	11	5
396	68	3	100	5	72	4	54	5	39	5	26	5	18	5	12	5
400	58	2	100	5	73	5	54	5	40	5	27	5	18	5	12	5
403	66	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
405	67	4	100	5	72	4	53	3	38	3	25	3	16	3	10	3
407	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
407	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
413	58	2	100	5	76	1	56	4	41	4	26	5	17	5	10	3
417	64	5	100	5	73	5	66	1	41	4	27	5	18	5	12	5
418	63	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
418	63	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
420	68	3	100	5	74	5	55	5	40	5	26	5	16	3	11	5
432	66	5	100	5	73	5	53	3	39	5	26	5	18	5	12	5
442	61	5	99	5	75	3	55	5	41	4	26	5	18	5	11	5
444	68	3	99	5	72	4	54	5	39	5	26	5	17	5	12	5
449	61	5	100	5	73	5	54	5	40	5	26	5	18	5	11	5

Lab #	SE	score	#4	score	#8	score	#16	score	#30	score	#50	score	#100	score	#200	score
451	65	5	100	5	67	1	47	1	30	1	16	1	7	1	10	3
455	64	5	100	5	73	5	54	5	38	3	26	5	16	3	10	3
461	43	1	100	5	74	5	55	5	39	5	25	3	16	3	9	1
462	69	2	100	5	70	1	50	1	33	1	19	1	9	1	2	1
464	67	4	100	5	72	4	54	5	38	3	25	3	16	3	11	5
467	66	5	100	5	72	4	55	5	40	5	27	5	21	1	19	1
468	65	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
469	67	4	100	5	73	5	54	5	39	5	26	5	17	5	11	5
475	63	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
477	69	2	100	5	73	5	54	5	39	5	25	3	16	3	10	3
480	64	5	100	5	74	5	55	5	39	5	26	5	17	5	12	5
481	NA		100	5	74	5	55	5	40	5	27	5	18	5	12	5
482	71	1	100	5	75	3	55	5	39	5	26	5	16	3	11	5
483	58	2	100	5	73	5	55	5	40	5	27	5	18	5	12	5
485	63	5	99	5	72	4	53	3	39	5	26	5	17	5	11	5
501	64	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
556	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
561	61	5	100	5	75	3	55	5	41	4	27	5	18	5	12	5
562	65	5	100	5	74	5	54	5	40	5	26	5	18	5	12	5
565	60	4	100	5	73	5	55	5	40	5	27	5	18	5	12	5
574	68	3	100	5	74	5	55	5	41	4	26	5	17	5	11	5
578	64	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
580	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
581	62	5	100	5	74	5	55	5	41	4	26	5	17	5	11	5
582	63	5	100	5	74	5	56	4	42	3	30	1	21	1	14	1
587	62	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
589	68	3	100	5	73	5	55	5	40	5	27	5	18	5	11	5
590	71	1	100	5	74	5	55	5	40	5	27	5	18	5	12	5
593	67	4	100	5	71	2	52	1	37	1	24	1	15	1	9	1
595	NA		100	5	74	5	56	4	40	5	28	3	19	3	13	3
596	67	4	100	5	73	5	51	1	34	1	18	1	7	1	1	1
600	62	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
605	66	5	100	5	72	4	54	5	39	5	27	5	21	1	19	1

Legend:

Outlier, Failures (Sand Equvalent)
Outlier, Failures (Fine Aggregate Gradation

APPENDIX - B

Test Results from Retest

Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
3	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
9	63	5	100	5	71	2	53	3	40	5	27	5	18	5	12	5
16	65	5	100	5	73	5	55	5	39	5	27	5	17	5	11	5
25	65	5	100	5	74	5	55	5	39	5	25	3	16	3	10	3
26	62	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
27	60	4	100	5	75	3	56	4	40	5	27	5	18	5	11	5
48	65	5	100	5	73	5	55	5	40	5	27	5	19	3	13	3
63	64	5	100	5	73	5	54	5	40	5	25	3	16	5	10	3
80	64	5	100	5	73	5	53	3	39	5	26	5	17	5	11	5
131	64	5	100	5	73	5	55	5	40	5	27	5	17	5	12	5
143	63	5	100	5	74	5	54	5	40	5	26	5	18	5	14	2
144	64	5	100	5	73	5	55	5	39	5	27	5	18	5	12	5
164	63	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
173	66	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
177	63	5	100	5	72	4	53	3	39	5	25	3	17	5	10	3
179	63	5	100	5	75	3	56	4	39	5	26	5	16	5	10	3
218	NA		100	5	71	2	49	1	33	1	18	1	7	1	1	1
219	68	3	100	5	73	5	54	5	39	5	26	5	17	5	11	5
237	61	5	100	5	74	5	56	4	41	4	27	5	18	5	11	5
246	64	5	100	5	74	5	56	4	41	4	24	1	17	5	11	5
256	67	4	100	5	72	4	54	5	39	5	26	5	16	3	11	5
257	63	5	100	5	73	5	54	5	38	3	25	3	17	5	11	5
289	65	5	100	5	97	1	55	5	39	5	16	1	18	5	11	5
291	60	4	100	5	75	3	56	4	42	3	28	3	19	3	13	3
292	NA		100	5	73	5	54	5	40	5	27	5	17	5	12	5
303	67	4	100	5	75	3	56	4	41	4	27	5	18	5	12	5
325	61	5	100	5	72	4	54	5	40	5	26	5	17	5	12	5
326	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
334	66	5	100	5	73	5	55	5	40	5	27	5	18	5	13	4
352	62	5	100	5	74	5	56	4	41	4	28	3	19	3	13	3
353	65	5	100	5	74	5	55	5	38	3	24	1	11	1	7	1
359	65	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
375	61	5	100	5	73	5	55	5	40	5	26	5	18	5	13	3
389	63	5	100	5	73	5	54	5	39	5	25	5	17	5	12	5
413	66	5	100	5	74	5	56	4	41	4	27	5	18	5	12	5
417	64	5	100	5	72	4	54	5	40	5	25	3	17	5	11	5

Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
451	65	5	100	5	73	5	54	5	39	5	27	5	18	5	12	5
462	65	5	100	5	73	5	54	5	39	5	27	5	17	5	11	5
582	63	5	100	5	72	4	54	5	40	5	27	5	19	3	13	3
593	67	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
596	67	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5

Legend:

Failed Retest
Passed Retest

APPENDIX - C

Combined Final Scores from both Initial Test and Retest

Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
3	62	5	100	5	72	4	54	5	39	5	26	5	17	5	10	3
5	66	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
6	66	5	100	5	73	5	55	5	41	4	28	3	18	5	12	5
9	63	5	100	5	72	4	55	5	41	4	28	3	18	5	13	3
10	61	5	100	5	74	5	55	5	41	4	27	5	19	3	13	3
11	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
12	61	5	100	5	73	5	55	5	41	4	27	5	18	5	12	5
16	65	5	100	5	74	5	56	4	42	3	28	3	17	5	11	5
17	63	5	100	5	72	4	54	5	40	5	26	5	18	5	12	5
18	67	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
19	63	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
20	64	5	100	5	74	5	55	5	40	5	26	5	18	5	11	5
21	61	5	100	5	74	5	56	4	41	4	27	5	18	5	11	5
23	66	5	100	5	73	5	54	5	40	5	27	5	18	5	11	5
24	63	5	100	5	73	5	54	5	40	5	27	5	18	5	12	5
25	65	5	100	5	74	5	53	3	39	5	25	3	17	5	12	5
26	62	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
27	60	4	500	1	75	3	56	4	40	5	27	5	18	5	11	5
30	62	5	100	5	72	4	54	5	40	5	27	5	18	5	13	3
32	60	4	100	5	73	5	54	5	39	5	25	3	17	5	11	5
33	64	5	100	5	74	5	56	4	41	4	28	3	19	3	12	5
39	62	5	100	5	72	4	53	3	39	5	25	3	17	5	11	5
42	64	5	100	5	73	5	55	5	40	5	27	5	18	5	11	5
43	61	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
45	66	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
47	63	5	100	5	73	5	55	5	39	5	26	5	17	5	11	5
48	65	5	100	5	74	5	55	5	40	5	27	5	19	3	13	3
49	60	4	100	5	74	5	56	4	41	4	27	5	18	5	12	5
53	64	5	100	5	72	4	54	5	39	5	26	5	18	5	12	5
54	63	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
55	64	5	100	5	73	5	53	3	39	5	25	3	17	5	11	5
56	65	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
57	59	3	100	5	73	5	55	5	41	4	27	5	18	5	13	3
58	65	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
59	63	5	99	5	74	5	55	5	40	5	27	5	18	5	12	5
62	68	3	100	5	72	4	54	5	39	5	26	5	17	5	11	5

RSP Fine Aggregate Gradation and Sand Equivalent
Proficiency Test Results
Office of Roadway Materials Testing

November 11, 2011

Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
63	64	5	100	5	74	5	54	5	41	4	27	5	17	5	11	5
64	60	4	100	5	74	5	55	5	41	4	27	5	18	5	12	5
65	61	5	100	5	74	5	55	5	40	5	27	5	19	3	13	3
66	60	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
67	61	5	100	5	73	5	54	5	40	5	26	5	18	5	11	5
68	61	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
69	62	5	100	5	74	5	56	4	41	4	27	5	19	3	12	5
71	63	5	100	5	73	5	55	5	39	5	26	5	18	5	11	5
73	66	5	100	5	74	5	53	3	39	5	26	5	16	3	10	3
74	60	4	100	5	72	4	54	5	39	5	26	5	17	5	11	5
76	64	5	100	5	72	4	53	3	39	5	25	3	16	3	12	5
80	64	5	100	5	73	5	54	5	39	5	25	3	16	3	11	5
81	61	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
84	66	5	99	5	72	4	54	5	38	3	25	3	16	3	10	3
88	63	5	100	5	72	4	53	3	39	5	26	5	17	5	12	5
89	62	5	100	5	74	5	55	5	41	4	28	3	18	5	12	5
90	67	4	100	5	73	5	54	5	40	5	26	5	17	5	11	5
93	61	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
94	68	3	100	5	74	5	56	4	41	4	27	5	18	5	12	5
95	68	3	100	5	74	5	54	5	40	5	25	3	16	3	10	3
96	62	5	100	5	73	5	54	5	39	5	26	5	17	5	10	3
97	61	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
98	65	5	99	5	74	5	55	5	40	5	26	5	17	5	11	5
99	61	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
100	68	3	100	5	74	5	55	5	40	5	26	5	17	5	11	5
104	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
110	67	4	100	5	74	5	56	4	41	4	28	3	19	3	13	3
111	64	5	99	5	73	5	54	5	40	5	27	5	17	5	11	5
113	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
114	65	5	100	5	72	4	53	3	39	5	26	5	17	5	11	5
117	66	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
119	65	5	100	5	74	5	56	4	42	3	27	5	18	5	12	5
122	67	4	100	5	72	4	55	5	39	5	27	5	18	5	12	5
131	64	5	100	5	73	5	53	3	39	5	26	5	17	5	11	5
135	59	3	100	5	73	5	55	5	39	5	26	5	18	5	12	5
137	64	5	100	5	74	5	56	4	41	4	28	3	19	3	13	3
139	64	5	100	5	74	5	55	5	39	5	26	5	17	5	11	5
140	60	4	100	5	74	5	55	5	40	5	26	5	18	5	12	5
141	63	5	100	5	75	3	55	5	39	5	26	5	17	5	11	5
142	62	5	100	5	75	3	56	4	41	4	27	5	18	5	12	5

RSP Fine Aggregate Gradation and Sand Equivalent
Proficiency Test Results
Office of Roadway Materials Testing

November 11, 2011

Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
143	63	5	100	5	74	5	54	5	40	5	27	5	17	5	12	5
144	64	5	100	5	73	5	55	5	39	5	27	5	18	5	12	5
146	60	4	100	5	73	5	55	5	40	5	26	5	17	5	11	5
147	64	5	100	5	74	5	56	4	40	5	27	5	18	5	11	5
148	61	5	100	5	75	3	56	4	41	4	26	5	16	3	11	5
149	67	4	100	5	74	5	56	4	41	4	27	5	18	5	13	3
151	60	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
154	64	5	100	5	73	5	54	5	40	5	27	5	19	3	12	5
155	66	5	100	5	73	5	54	5	40	5	27	5	19	3	12	5
156	64	5	100	5	73	5	56	4	42	3	28	3	19	3	13	3
157	65	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
158	61	5	100	5	73	5	55	5	41	4	27	5	18	5	12	5
160	60	4	100	5	73	5	55	5	39	5	26	5	18	5	12	5
161	59	3	100	5	73	5	54	5	40	5	26	5	17	5	11	5
163	60	4	100	5	73	5	54	5	40	5	26	5	18	5	12	5
164	63	5	100	5	74	5	56	4	41	4	27	5	18	5	12	5
166	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
167	63	5	100	5	73	5	55	5	40	5	27	5	17	5	12	5
169	67	4	100	5	72	4	53	3	39	5	26	5	17	5	11	5
170	62	5	100	5	73	5	55	5	39	5	26	5	17	5	11	5
172	59	3	100	5	74	5	56	4	41	4	28	3	19	3	13	3
173	66	5	100	5	74	5	55	5	40	5	25	3	16	3	10	3
176	64	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
177	63	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
179	63	5	100	5	75	3	55	5	40	5	26	5	17	5	11	5
180	65	5	100	5	74	5	55	5	40	5	26	5	18	5	12	5
182	63	5	100	5	72	4	54	5	40	5	27	5	17	5	12	5
183	63	5	100	5	74	5	55	5	40	5	26	5	18	5	12	5
184	64	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
187	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
192	60	4	100	5	73	5	55	5	41	4	28	3	19	3	13	3
195	64	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
196	60	4	100	5	74	5	55	5	39	5	26	5	17	5	11	5
197	65	5	100	5	75	3	55	5	41	4	26	5	18	5	11	5
198	67	4	100	5	73	5	55	5	40	5	27	5	18	5	12	5
200	65	5	100	5	73	5	55	5	40	5	27	5	17	5	12	5
201	64	5	100	5	73	5	54	5	39	5	26	5	16	3	11	5
205	62	5	100	5	74	5	56	4	41	4	28	3	19	3	13	3
206	62	5	100	5	73	5	55	5	41	4	28	3	19	3	13	3
207	62	5	100	5	72	4	53	3	39	5	26	5	17	5	11	5

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Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
209	64	5	100	5	73	5	54	5	40	5	25	3	17	5	11	5
210	61	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
211	64	5	100	5	73	5	55	5	41	4	28	3	18	5	13	3
213	64	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
214	61	5	100	5	73	5	55	5	40	5	26	5	17	5	11	5
216	63	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
217	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
218	NA		100	5	73	5	53	3	38	3	25	3	16	3	10	3
219	68	3	100	5	74	5	56	4	42	3	26	5	17	5	11	5
221	63	5	100	5	75	3	55	5	39	5	26	5	17	5	11	5
222	64	5	100	5	74	5	54	5	39	5	26	5	17	5	11	5
224	63	5	100	5	73	5	54	5	40	5	26	5	17	5	12	5
225	63	5	100	5	73	5	54	5	40	5	27	5	18	5	12	5
226	63	5	100	5	75	3	56	4	41	4	27	5	19	3	12	5
228	66	5	100	5	74	5	54	5	40	5	26	5	17	5	11	5
237	61	5	100	5	73	5	56	4	42	3	27	5	18	5	13	3
239	60	5	100	5	74	5	55	5	41	4	27	5	18	5	12	5
241	63	5	100	5	74	5	56	4	40	5	27	5	17	5	11	5
244	63	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
245	67	4	99	5	73	5	55	5	40	5	26	5	17	5	11	5
246	64	5	100	5	73	5	56	4	42	3	26	5	17	5	11	5
249	61	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
250	62	5	100	5	73	5	54	5	10	1	26	5	17	5	11	5
252	59	3	100	5	73	5	55	5	41	4	27	5	18	5	12	5
255	61	5	100	5	73	5	55	5	40	5	26	5	17	5	11	5
256	67	4	100	5	75	3	54	5	42	3	27	5	18	5	11	5
257	63	5	100	5	74	5	55	5	40	5	28	3	17	5	11	5
263	60	4	100	5	73	5	55	5	40	5	26	5	17	5	11	5
265	67	4	100	5	73	5	54	5	40	5	26	5	17	5	12	5
266	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
267	64	5	100	5	74	5	55	5	40	5	27	5	17	5	12	5
269	66	5	100	5	72	4	53	3	38	3	25	3	16	3	10	3
270	65	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
271	67	4	100	5	73	5	54	5	40	5	26	5	18	5	12	5
272	61	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
273	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
277	66	5	100	5	73	5	54	5	39	5	27	5	17	5	11	5
280	65	5	100	5	71	2	53	3	39	5	26	5	17	5	11	5
281	60	4	100	5	73	5	55	5	39	5	26	5	17	5	11	5
282	65	5	100	5	73	5	54	5	39	5	26	5	16	3	11	5

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Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
283	65	5	100	5	73	5	53	3	39	5	26	5	17	5	12	5
285	66	5	100	5	73	5	53	3	39	5	26	5	17	5	12	5
286	64	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
288	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
289	65	5	100	5	72	4	55	5	39	5	26	5	18	5	11	5
291	60	4	100	5	75	3	56	4	42	3	28	3	19	3	13	3
292	NA		100	5	74	5	56	4	42	3	27	5	17	5	12	5
293	60	4	100	5	72	4	53	3	39	5	26	5	17	5	11	5
295	62	5	100	5	74	5	54	5	39	5	26	5	17	5	11	5
297	67	4	100	5	73	5	55	5	40	5	27	5	18	5	12	5
301	68	3	100	5	74	5	55	5	40	5	25	3	17	5	11	5
302	64	5	100	5	73	5	54	5	39	5	26	5	17	5	12	5
303	67	4	100	5	75	3	56	4	41	4	27	5	18	5	12	5
304	66	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
308	64	5	100	5	74	5	54	5	40	5	27	5	17	5	11	5
309	66	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
310	61	5	100	5	72	4	53	3	39	5	26	5	18	5	11	5
311	62	5	100	5	73	5	55	5	40	5	25	3	17	5	11	5
312	67	4	100	5	72	4	53	3	39	5	25	3	16	3	10	3
313	66	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
314	66	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
316	63	5	100	5	72	4	53	3	38	3	25	3	16	3	11	5
318	61	5	99	5	74	5	55	5	40	5	27	5	17	5	10	3
319	65	5	100	5	72	4	54	5	40	5	26	5	17	5	10	3
322	63	5	100	5	74	5	55	5	40	5	27	5	17	5	11	5
325	61	5	100	5	72	4	54	5	39	5	25	3	17	5	11	5
326	62	5	100	5	72	4	54	5	39	5	25	3	17	5	11	5
330	63	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
331	60	4	100	5	73	5	54	5	39	5	25	3	16	3	10	3
332	64	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
333	64	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
334	66	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
335	64	5	100	5	73	5	55	5	39	5	25	3	17	5	11	5
337	62	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
338	61	5	100	5	73	5	54	5	39	5	25	3	17	5	11	5
341	64	5	100	5	72	4	54	5	39	5	26	5	17	5	12	5
345	66	5	100	5	72	4	53	3	40	5	26	5	17	5	10	3
349	62	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
350	62	5	100	5	72	4	53	3	39	5	25	3	16	3	10	3
351	63	5	100	5	72	4	54	5	40	5	26	5	18	5	12	5

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Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
352	62	5	100	5	75	3	56	4	41	4	28	3	19	3	13	3
353	65	5	100	5	74	5	54	5	39	5	26	5	17	5	11	5
354	64	5	100	5	74	5	55	5	39	5	26	5	17	5	11	5
355	62	5	100	5	75	3	55	5	40	5	26	5	18	5	12	5
356	66	5	100	5	74	5	54	5	40	5	25	3	16	3	10	3
358	64	5	100	5	74	5	55	5	40	5	27	5	18	5	12	5
359	65	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
360	66	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
361	66	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
364	63	5	100	5	75	3	56	4	42	3	27	5	18	5	12	5
367	63	5	100	5	73	5	55	5	41	4	28	3	19	3	13	3
368	64	5	100	5	73	5	55	5	41	4	27	5	19	3	13	3
369	64	5	100	5	73	5	54	5	40	5	25	3	16	3	10	3
370	62	5	100	5	74	5	55	5	41	4	27	5	19	3	13	3
375	61	5	100	5	74	5	55	5	42	3	28	3	19	3	13	3
377	65	5	100	5	73	5	55	5	40	5	26	5	17	5	11	5
379	60	4	100	5	73	5	55	5	40	5	27	5	17	5	11	5
381	66	5	100	5	75	3	55	5	40	5	27	5	18	5	13	3
383	62	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
384	64	5	100	5	73	5	54	5	40	5	26	5	18	5	12	5
385	66	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
389	63	5	100	5	74	5	56	4	41	4	26	5	19	3	13	3
390	64	5	100	5	74	5	56	4	41	4	26	5	17	5	11	5
393	64	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
394	60	4	100	5	73	5	54	5	40	5	26	5	17	5	11	5
396	68	3	100	5	72	4	54	5	39	5	26	5	18	5	12	5
400	56	1	100	5	73	5	54	5	40	5	27	5	18	5	12	5
403	66	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
405	67	4	100	5	72	4	53	3	38	3	25	3	16	3	10	3
407	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
407	62	5	100	5	72	4	54	5	39	5	26	5	17	5	11	5
413	66	5	100	5	74	5	56	4	41	4	26	5	17	5	10	3
417	64	5	100	5	73	5	54	5	41	4	27	5	18	5	12	5
418	63	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
418	63	5	100	5	73	5	54	5	40	5	27	5	17	5	11	5
420	68	3	100	5	74	5	55	5	40	5	26	5	16	3	11	5
432	66	5	100	5	73	5	53	3	39	5	26	5	18	5	12	5
442	61	5	99	5	75	3	55	5	41	4	26	5	18	5	11	5
444	68	3	99	5	72	4	54	5	39	5	26	5	17	5	12	5
449	61	5	100	5	73	5	54	5	40	5	26	5	18	5	11	5

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Lab #	SE	Score	#4	Score	#8	Score	#16	Score	#30	score	#50	score	#100	score	#200	score
451	65	5	100	5	73	5	54	5	39	5	27	5	18	5	10	3
455	64	5	100	5	73	5	54	5	38	3	26	5	16	3	10	3
461	66	5	100	5	74	5	55	5	39	5	25	3	16	3	11	5
462	65	5	100	5	73	5	54	5	39	5	27	5	17	5	11	5
464	67	4	100	5	72	4	54	5	38	3	25	3	16	3	11	5
467	66	5	100	5	72	4	55	5	40	5	27	5	17	5	11	5
468	65	5	100	5	73	5	54	5	40	5	26	5	17	5	11	5
469	67	4	100	5	73	5	54	5	39	5	26	5	17	5	11	5
475	63	5	100	5	72	4	54	5	40	5	26	5	17	5	11	5
477	63	5	100	5	73	5	54	5	39	5	25	3	16	3	10	3
480	64	5	100	5	74	5	55	5	39	5	26	5	17	5	12	5
481	NA		100	5	74	5	55	5	40	5	27	5	18	5	12	5
482	66	5	100	5	75	3	55	5	39	5	26	5	16	3	11	5
483	62	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
485	63	5	99	5	72	4	53	3	39	5	26	5	17	5	11	5
501	64	5	100	5	73	5	55	5	40	5	27	5	18	5	12	5
556	63	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
561	61	5	100	5	75	3	55	5	41	4	27	5	18	5	12	5
562	65	5	100	5	74	5	54	5	40	5	26	5	18	5	12	5
565	60	4	100	5	73	5	55	5	40	5	27	5	18	5	12	5
574	68	3	100	5	74	5	55	5	41	4	26	5	17	5	11	5
578	64	5	100	5	73	5	54	5	39	5	26	5	17	5	11	5
580	62	5	100	5	74	5	55	5	40	5	26	5	17	5	11	5
581	62	5	100	5	74	5	55	5	41	4	26	5	17	5	11	5
582	63	5	100	5	74	5	56	4	42	3	27	5	19	3	13	3
587	62	5	100	5	73	5	55	5	40	5	26	5	17	5	12	5
589	68	3	100	5	73	5	55	5	40	5	27	5	18	5	11	5
590	67	4	100	5	74	5	55	5	40	5	27	5	18	5	12	5
593	67	4	100	5	74	5	55	5	40	5	26	5	17	5	11	5
595	NA		100	5	74	5	56	4	40	5	28	3	19	3	13	3
596	67	4	100	5	73	5	55	5	40	5	26	5	17	5	11	5
600	62	5	100	5	72	4	53	3	38	3	25	3	17	5	11	5
605	66	5	100	5	72	4	54	5	39	5	27	5	17	5	11	5

Disqualified Laboratories