MINUTES

of the

THIRTY-FIRST PACIFIC COAST CONFERENCE

ON ASPHALT SPECIFICATIONS

i. NOTICE OF CONFERENCE

Pursuant to notification and invitation by Professor C. L. Monismith, Moderator for the Conference, to leading governmental asphalt user agencies, asphalt and aggregate suppliers and asphalt mix producers and others interested in the various forms of asphalt and asphalt mixtures marketing in the area of the states of Alaska, Arizona, California, Hawaii, Nevada, Oregon and Washington, the Thirty-First Pacific Coast Conference on Asphalt Specifications was held at the University of California, Berkeley Pavement Research Center in Richmond, California on Tuesday and Wednesday, May 11-12, 1999.

The Conference was called to order at 9:00 a.m., Tuesday, May 11, 1999, by the Moderator, Professor C. L. Monismith.

ii. ATTENDANCE

The following were in attendance:

Asphalt User Agencies

1.	Alaska Department of Transportation	S. Gartin
2.	Arizona Department of Transportation	J. E. Nodes
		G. B. Way
3.	California Dept. of Transportation (CALTRANS)	R. N. Doty
		R. E. Reese
4.	Federal Highway Administration	J. D'Angelo
		S. Healow
		J. Lewis
		J. Massucco
		B. Neitzke
5.	City of Los Angeles	R. Villacorta
6.	County of Los Angeles	F. Lancaster
7.	Nevada Department of Transportation	C. Cook
		D. Weitzel
8.	Orange County Public Facilities	K. E. Smith

9.	Oregon Department of Transportation	J. Gower B. Patterson
10.	Washington State Deptartment of Transportation	D. Duffy J. P. Walter

Asphalt Producers & Materials Suppliers

1.	Albina Asphalt Co.	C. A. Clayton
2.	BASF	J. Rountree
3.	Chevron Products	K. McBride D. Miller
4.	Dupont	G. Babcock D. A. Scott
5.	Enichem Elastomers	M. Cisneros T. Nichols
6.	Equilon Enterprises	R. J. Holmgreen
7.	Exxon Chemical	D. Burrage
8.	Golden Bear	R. L. Staugaard
9.	Greka Energy	J. E. Partanen B. Stromberg
10.	Heritage Research Co.	R. D. Pavlovich
11.	Huntway Refining Company	D. Goss
12.	Idaho Asphalt Supply	D. R. Salomon
13.	Koch Materials Company	S. Charmot
14.	LTR	R. O. Friend
15.	McCall Oil & Chemical	P. Turpen
16.	NCAPA	R. D. Smith
17.	Owens Corning/Trumbull	D. R. Jones
18.	Oxnard Refinery	J. Chase
19.	Paramount Petroleum Corp.	S. W. Burhans J. C. Goldhammer
20.	Reed & Graham Lab Services	S. Gates F. Rancadore
21.	San Joaquin Refining Co.	D. Powell E. R. Starbuck
22.	Telfer Sheldon Oil Co.	H. Ho
23.	U. S. Oil & Refining Company	S. M. TecleMariam
24.	Valley Slurry Seal	J. Van Kirk
25.	Williams Alaska Petroleum	R. Lindsey

Visitors & Guests

1.	AASHTO	H. A. Tahir
2.	American Gilsonite	B. Ragan
3.	Asphalt Institute	R. E. Campbell

		R. P. Humer
4.	Consulting Engineers	R. S. Hodgson
5.	Husky Oil	R. Hinterleitner
6.	Industrial Negromex S.A.	M. Maldonado
7.	Nichols - Vallerga, & Associates	B. A. Vallerga
8.	UCB Institute of Transportation Studies	L. E. Santucci
9.	University of Nevada - Reno	J. A. Epps
		P. Sebaaly

Moderator, Legal Counsel & Secretary

1.	University of California, Berkeley, Moderator	C. L. Monismith
2.	Pillsbury Madison & Sutro, Legal Counsel	J. A. Hall S. Sridharan
3.	J. F. Pearring, Inc., Secretary	L. G. Economy J. F. Pearring

iii. POLICY ON ANTITRUST COMPLIANCE

It is customary that all Producer Representatives to the Conference adhere to Antitrust Compliance requirements. On the first day of the Conference, Ms. Savitha Sridharan Counsel, Pillsbury, Madison & Sutro reminded all Producer and Supplier Representatives present that the Conference has adopted a Statement of Compliance with Antitrust Principles, which is on file in the office of the Conference Secretary. On the second day, Ms. Judith Hall, also of Pillsbury, Madison & Sutro reiterated those remarks.

AGENDA

THIRTY-FIRST PACIFIC COAST CONFERENCE

ON ASPHALT SPECIFICATIONS

University of California, Berkeley
Pavement Research Center
Richmond Field Station

May 11-12, 1999

MODERATOR: Professor C.L. Monismith

REGISTRATION: Tuesday May 11, 1999, 8:00am, (Continental Breakfast)

CONFERENCE CONVENES: Tuesday May 11, 1999, 9:00am

i.	Notice of Conference	C. L. Monismith
ii.	Attendance	C. L. Monismith
iii.	Policy on Antitrust Compliance	S. Sridharan J. A. Hall
	Discussion Items	**Speaker**
I.	Introductory Remarks & Approval of Minutes	C. L. Monismith
II.	Paving Asphalt Committee (PAC) Report	J. Massucco
	A. Round Robin	S. M. TecleMariam
	B. Asphalt Rubber	G. B. Way
III.	PAC and Asphalt Mix Committee (AMC) Report	R. J. Holmlgreen
	A. Fatigue Task Group	R. E. Reese
	B. NCHRP 9-10	R. E. Reese
IV.	AMC Report	R. J. Holmgreen
	A. Compaction	J. Massucco
	B. Smoothnes	J. Massucco

V.	Conference Status on PG and Superpave Implementation	
	A. Alaska	S. Gartin
	B. Arizona	J. E. Nodes
	C. California	R. E. Reese
	D. Oregon	B. Patterson
	E. Nevada	C. Cook
	F. Washington	D. Duffy
	G. Los Angeles County	F. Lancaster
	H. Western Federal Lands	B. Neitzke
VI.	National Superpave Update	J. D'Angelo
VII.	Conference Action on PAC Recommendations	C. L. Monismith
VIII.	Conference Action on AMC Recommendations	C. L. Monismith
IX.	Appreciation to Joe Massucco	R. L. Staugaard
X.	Progress of AASHTO Activities	H. A. Tahir
XI.	Emulsion Committee Report and Recommendations	S. M. TecleMariam
XII.	Conference Action on Emulsion Committee Recommendations	C. L. Monismith
XIII.	Superpave Regional Centers	
	A. UN Reno	D. Weitzel
	B. UC Berkeley	L. E. Santucci
XIV.	WesTrack Update	J. A. Epps
XV.	Report from Rocky Mountain User Producer Group	J. E. Nodes
XVI.	Progress of ASTM Activities	S. W. Burhans
XVII.	Western Alliance for Quality Transportation Construction (WAQTC)	B. Neitzke
XVIII.	User Caucus Recommendation for New Chair	J. P. Walter
XIX.	Recommendations for Future Activities	J. P. Walter R. J. Holmgreen
XX.	Establishment of C. L. Monismith Award	Conf. Delegates

XXI.	Future Conferences	C. L. Monismith
XXII.	Resolutions	J. P. Walter R. J. Holmgreen
XXIII.	Appreciation to Moderator	Conf. Delegates
XXIV.	Adjournment	C. L. Monismith

I. INTRODUCTORY REMARKS AND APPROVAL OF MINUTES

Professor Carl L. Monismith opened the Conference by welcoming the representatives of the user agencies, asphalt producers, materials suppliers, visitors and guests to the University of California, Berkeley, Richmond Field Station for the Thirty-First Pacific Coast Conference on Asphalt Specifications (PCCAS).

Professor Monismith then presented an overview of what the Pacific Coast Conference envisioned when it was first organized in 1956 and what actions and accomplishments had taken place since its inception.

He stated that The Pacific Coast Conference on Asphalt Specifications was organized in 1956 for the following reasons:

- Reduction in the penetration grades of asphalt cement being used at the time - to five (5) from at least nine (9); those five designated as: 40-50, 60-70, 85-100, 120-150, 200-300.
- Uniformity of asphalt specifications in the Pacific Coast States.
- Any subject of mutual interest to Users and Producers

Membership in the PCCAS is made up of Governmental Agencies in the Pacific Coast States including: State Highway Agencies (Caltrans, Washington State Department of Transportation, Oregon Department of Transportation, etc.), Federal Agencies (Federal Highway Administration, United States Navy, Federal Aviation Administration, etc.) and local governing agencies (Contra Costa County, Los Angeles County, San Diego County, etc.) and Asphalt Producers in the states of Alaska, Arizona, California, Hawaii, Nevada, Oregon and Washington.

There are currently five Committees: Paving Asphalt, Emulsion, Recycling, Standing, and Asphalt Mix which was added in 1994.

Noteworthy accomplishments have included:

- 1957 2nd - Adoption of pen-graded specifications (five grades)
- 1961 4th - Adoption of Liquid grades (70, 250, 800, 3000)
- 1967 7th - Adoption of Rolling Thin Film Oven Test
- 1971 9th - Adoption of Cationic Asphalt Emulsion Specifications
- 1972 10th - Adoption of AR Grades
- 1979 16th - QS emulsions, recycling agents -- tentative adoption

During the past ten years considerable effort has been devoted to studies and discussions of asphalt cement specifications. These efforts have not, unfortunately produced a uniform specification for the region.

- 1994 26th - PBA -- optional use
- 1995 27th - PG (SHRP) trial use

Professor Monismith then asked the participants to consider the following as they deliberated issues facing the group:

- Necessity for having annual conference meetings
- Re-focusing activities on uniformity concept
- Exchange of information through Committees only, bringing action only before Conference Members for voting

Professor Monismith then relayed to the User Agency representatives that they needed to caucus and elect a new User Co-Chairperson, as Mr. Jim Walter, Washington Department of Transportation (WADOT) has requested that this be his last year as User Co-Chair.

Introduction of the Conference legal representative, Ms. Savitha Sridharan from Pillsbury Madison & Sutro was then made by Professor Monismith. Ms. Sridharan relayed to Conference Members they should be mindful of Antitrust Laws and refrain from discussing any matters related to competitive rivalry and customer pricing. Anyone wishing to receive guidelines to Antitrust should let her know as she has copies available, **APPENDIX I.**

Professor Monismith then took action relative to the **Minutes of the Thirtieth Conference** held at the University of California, Berkeley, Pavement Research Center, Richmond, California, May 11-12, 1998.

It was **Motioned, Seconded and Carried (MS&C)** that the Minutes of the Thirtieth Pacific Coast Conference on Asphalt Specifications be approved as prepared and distributed.

Mr. Jack Pearring, Conference Secretary, stated that copies of the "Organization and Purpose of the Pacific Coast Conference on Asphalt Specifications" that outline some of Professor Monismith remarks, were available for Conference Members, **APPENDIX II**. Mr. Pearring also reminded Members to please turn off all cellular phones and pagers during the meeting as courtesy to one another.

Professor Monismith then requested that each attendee state his/her name and company affiliation to the Conference so that the Minutes being recorded at this Conference are properly documented and distributed.

II. PAVING ASPHALT COMMITTEE (PAC) REPORT

Mr. Joe Massucco, Federal Highway Administration (FHWA) and Chair of the Paving Asphalt Committee (PAC) reported that the PAC and the Asphalt Mix Committee (AMC) met three times since the last Conference: August 17-19, 1998; December 14-16, 1998 and March 29-30, 1999 in Reno, Nevada. These Committees meet jointly as many binder issues and mix issues cannot be separated. Mr. Massucco reviewed the PAC and AMC Agenda, **APPENDIX III** indicating that early agenda items pertain to binder issues, middle portion to shared issues and the latter, to mix issues.

Mr. Massucco then presented Conference Members a historical overview of the PAC charges from the Twentieth Conference in 1988 to the present. The Committee was originally charged with developing a performance based binder specification for modified asphalts. The "Yreka Four" Committee task group Members: Steve Escobar, Tony George, Joe Goodrich, and Ron Reese developed and proposed a climate and performance based specification (PBA) which was adopted for optional use at the 23rd Conference in 1991. The Paving Committee was then charged to further develop the PBA specification in coordination with the Strategic Highway Research Program (SHRP) binder research. Formulation of the Mix Committee took place in 1994 to assist in validation of the binder and mixture specifications as a system. At the 27th Conference in 1995 the Conference participants agreed to discontinue further development of the PBA specification and charged the Committee to concentrate its efforts on validation of the PG grading system. This was due to the fact that the PCCAS had significant input to the SHRP asphalt specification resulting from its efforts in developing the PBA system. Since the 27th Conference in 1995, the Committee has concentrated on validation of the PG binder specification and development of SHRP binder testing and acceptance criteria for Conference members.

Currently the PAC Task Groups include:

- Round Robin - concentrating on test procedures and issues of variability
- Asphalt Rubber - developing a specification
- Ignition Oven - test procedure for determining asphalt content
- NCHRP 9-10 - understanding of how PG grading system relates to modified asphalts
- Fatigue** - percentage of fatigue pavement failure related to binder

** The major issue trying to be resolved; joint Task group with Mix Committee

Mr. Massucco then stated that while most other User Producer Groups have been patterned after the PCCAS, we lag behind them in adoption/construction of Superpave projects. Problems attributed to many factors including such items as characterization of modified asphalts and personnel cutbacks have contributed to the slowing of validation work and have resulted in fewer members devoting efforts to the validation of Superpave. Mr. Massucco stated that while the current Evaluation Plan for PG focuses on uniformity, the group tends to lose sight of this effort.

A. Round Robin

Mrs. Shauna May TecleMariam reported on the progress of the Round Robin Study to Conference members. Twelve Laboratories participated in the study and it seems that members have gained insight into the importance of following testing procedures. Many factors affect results, time to heat samples before pouring of molds to preheating of DSR plates.

Highlighted points included:

- Everyone involved in the study aged the PAV for twenty (20) hours.
- Lowered results occurred using air baths versus water baths.
- Cooling the PAV pans to room temperature rather than pouring directly gave lower results.
- Cans with seams gave lower results.
- Results were directly proportional to variance in heating times of residue before pouring DSR sample - heating time: 45 -60 minutes = high results; 15 - 30 minutes = low results. In addition placing DSR sample on plates at elevated temperatures gave higher results.
- Conversely the conditioning time of the sample on DSR plates was inversely proportional: 10 - 15 minutes = high results; 20-30 minutes = low results.
- Everyone needs to scrape PAV pours.
- Before starting the test, maintenance of test temperature is critical; heating times of sample before pouring of molds for DSR and BBR ranged from 20 minutes to 120 minutes.
- There was also a wide range of results for those not waiting ten (10) minutes before starting test after sample is placed on plates.

Mrs. TecleMariam suggested that during the next round robin each laboratory follow test procedures exactly as described in the American Association of State Highway and Transportation Officials (AASHTO) standards. Recommendations were made to members to obtain upgrades from vendors on software. Evaluations on equipment being used are also being made during the study. The task group is asking for more member participation to obtain more data and improve on this study. A copy of Mrs. TecleMariam's report can be found as **APPENDIX IV**.

B. Asphalt Rubber

Mr. George Way, Arizona Department of Transportation, (ADOT) and Committee Chair for the Asphalt Rubber Task Group (ARTG) distributed to Conference Members a copy of the Proposed for Evaluation Rubber Modified Binder (RMB) Specification, **APPENDIX V**. The structure of this specification as it stands is under evaluation due in large part to a report presented by Dr. Gary Hicks, Oregon State University at the ARTG meeting in March of this year. The task group is proposing this RMB specification for evaluation by Conference members. The task group would like more industry input and participation in assessing this proposed specification. Caltrans currently has three (3) projects constructed using an MB specification that was the basis for this proposed specification.

III. JOINT PAC AND ASPHALT MIX COMMITTEES (AMC) REPORT

The major issue currently before both the PAC and AMC Committees is that of fatigue.

A. Fatigue

Mr. Ron Reese, Caltrans, reported to Conference Members the current work of the FHWA Binder Expert Task Group (ETG) - Fatigue Task Group and the PCCAS Task Group on procedures being followed to identify fatigue. The approach being that $G^*/\sin\delta$ does not correlate well with fatigue. The question remains what properties contribute to fatigue? Two studies are currently underway.

Mr. Reese stated that the relationship between strain/cycles to failure/linear viscoelasticity is a good one. The results of the evaluation showed that determining a specification approach giving consideration to the number of conditions to be met indicating the structural pavement section may be feasible. Proliferation of grades, however might then be a concern, so specification limits must be established.

B. NCHRP 9-10

Mr. Reese then gave Conference Members an outline of the National Cooperative Research Program (NCHRP) Project 9-10, recommending modification to Superpave binder tests for modified binders. The assumption relates to the need of a non-linear measurement for the binder contribution to fatigue. A binder fatigue test is developed testing modified binders using parallel plates at large strains. Differences were detected and specification limits proposed for "strong and "weak" structures; however no definitions were provided. Currently $G^* \sin\delta$ is in the specification for "weak" structures. Caltrans evaluation of field performance data showed no correlation to parallel plate "fatigue" data which resulted in a letter from the Conference being sent to NCHRP concerning the lack of correlation and validity of the hypothesis. A copy of Mr. Reese's overheads can be found as **APPENDIX VI**.

Mr. Joe Massucco then expressed his deep appreciation to all his Co-Chairs; Mr. Bob Staugaard, Co-Chair of PAC and both Dr. Rita Leahy and Mr. Rick Holmgreen, Co-Chairs of the AMC, and all Committee Members for all their hard work and input. On behalf of the PAC, Mr. Massucco offered to the Conference these recommendations for consideration:

1) PG Graded Binders for Optional Use and Evaluation.

2) Continue evaluation and clarification of a performance based specification for RMB.

3) Reconvene the Conference in 2000.

A copy of these recommendations and Mr. Massucco's report are included as **APPENDIX VII.**

IV. AMC REPORT

Mr. Rick Holmgreen, Equilon Enterprises, Co-Chair of the AMC reported that due to sample size a tremendous commitment to testing is required in order to provide the AMC with data needed to analyze mix design. For that very reason, mix design lags behind the binder specification in validation of Superpave across the country as well as in our own Conference. Charges given to the AMC last year were:

1) Continue Participation with Mix and Models Expert Task Groups.

2) Continue to Experiment with Superpave Mix Technology (field and lab) and Share Superpave Experiences with Conference Members.

3) Work to Develop Guidelines/Specifications for Smoothness and Compaction.

Mr. Holmgreen reported that since neither sufficient time nor money has been available to properly evaluate Superpave mix design in the field or lab, much interest has been directed to the progress in the Mixture ETG Meetings and recommendations of the Mixture ETG to AASHTO. A summary of the "Proposed Changes to Superpave Mix Design" handed out by Mr. Holmgreen can be found as **APPENDIX VIII.**

The AMC expanded its scope to include conventional mixes as Superpave Mixtures are not widely used by Conference Members to date. The Superpave definition in aggregate size may influence the selection of lift thickness relative to maximum aggregate size.

Mr. Holmgreen summarized AMC's commitment to attentiveness with respect to Superpave implementation in order to fulfill its obligation to sufficiently understand Superpave before its use by Conference Members.

A. Compaction

Mr. Joe Massucco stated "If we just did what we know to be right, we wouldn't need Superpave, Build It Right!" Better performance of pavement is an objective that can be reached. Using information provided by UC Berkeley to Caltrans, factors to consider included:

- Range in minimum compaction values specified.
- Table showing current state of practice. Proposed specification capturing best practices of all members.

B. Smoothness

Public perception is important, and as such, surveys show the public judges a pavement by its smoothness. In addition, the performance life of a pavement is enhanced by its smoothness. Mr. Massucco handed out the "Guide Specification for Smoothness in Constructing Asphalt Concrete Pavements". **APPENDIX IX**. Mr. Massucco reviewed old and new ways of practices and measurement of pavement smoothness. He is recommending the Conference consider adoption of this smoothness/compaction specification by the next Conference. A copy of Mr. Massucco's overheads can be found as **APPENDIX X**

Mr. Holmgreen then recommended the following AMC charges to be deliberated by the Conference:

1) Explore new information derived by Conference members with respect to implementation of Superpave mix design.

2) Conference Members Evaluate Smoothness/Compaction Specification for proposed adoption by next Conference.

3) Reconvene the Conference in 2000: compelling reasons include changes occurring rapidly due to dissemination of information; i.e., ETG recommendations to AASHTO, direct tension device on line by next year.

A copy of Mr. Holmgreen's overheads can be found as **APPENDIX XI**.

V. CONFERENCE STATUS on PG and SUPERPAVE IMPLEMENTATION

Updating the Conference Members on the status of PG and Superpave Implementation began with the observation that in order to better understand the successes and difficulties with respect to practical use of these systems, Conference Members should be aware of other members experiences.

A. Alaska

Mr. Scott Gartin, Alaska Department of Transportation (AKDOT), reported that Alaska is divided into three major regions: North, South East and Central. The Central and South East regions have adopted PG Asphalt Binder even though the tendency is to specify AC-5. PG 52-28 and 58-28 binders containing modifiers have been used and there have been reports of rutting in some pavement sections constructed with these binders; yet answers as to why remain unclear. AKDOT is currently working to improve the elasticity of the PG graded mix. The Superpave van was out for two (2) months running concurrent projects showing how Superpave system works. To date there are no plans for Superpave Implementation.

B. Arizona

Mr. George Way, Arizona, Department of Transportation (ADOT), stated that Arizona has had Superpave in place for four (4) years. Specifications are being written and projects are being built. Currently working with UCB on a Superpave Shear Testing workshop. Details of Superpave Implementation were presented by Dr. Julie Nodes, ADOT: Full implementation of Binder Specification since 1997, using MP1 without modification. Arizona has its own model for binder grade selection being that SHRP system is not "hot" enough for Arizona. Currently looking at consistency of grade selection and how to consolidate grades from fifteen (15) down to three (3) major ones: PG 64-22, 70-10, and 76-16. Have designated some projects to look at how polymer modified asphalts perform and benefit Arizona.

Dr. Nodes then relayed information with respect to the mix stating that currently there is over one million (1,000,000) tons of Superpave in place. Arizona will continue to specify a limited number of projects as "full" Superpave, with approximately eighteen (18) projects per year. Most projects have been designed above the restricted zone according to contractors wishes; however plans are being made for designing some below the restricted zone in order to look at the mixes. All projects are contractor designed, paper verified by ADOT, acceptance by QA/QC type specification. So far ADOT is pleased with Superpave performance, yet have not had a full move toward Superpave implementation. Projects are designed with five percent (5%) air voids for Arizona climate, some concerns about low VMA high/VMA mixes, so have added a maximum VMA requirement. There is concern for the lack of an adequate strength test; have SST and using Hveem as well.

Dr. Nodes concluded that ADOT has learned:

- Lift thickness is very important; three times nominal maximum aggregate size as minimum.
- Original N_{des} tables controlled by temperature in Arizona.
- Coarse mixes (below the restricted zone) can be sensitive to small changes in gradation and percentage of binder.
- Some of the course mixes can almost be "too clean."
- Despite contractor concerns, ADOT had found that smoothness is not adversely impacted by use of Superpave mixes.
- Mix temperatures may need to be higher.
- High VMA mixes {especially when designed at four percent (4%) air voids} tend to be "rutters."
- Low VMA mixes (right at minimum).

Dr. Nodes then stated that complete implementation is still a few years off.

C. California

Mr. Ron Reese reiterated that California has no definite plans for implementation. There are, however, ongoing projects being analyzed. California is using the Superpave Shear Tester as a design tool and will be receiving validation data soon.

D. Oregon

Mr. Bruce Patterson, Oregon Department of Transportation (ODOT), gave Conference Members a detailed report outlining the past and current use of Superpave Mix design in Oregon. In summary:

- In late 1997 and all 1998, fifty-eight (58) mix designs were prepared using the Superpave Mix Design procedure. Specimens were compacted utilizing both the gyratory and the Hveem compactor. Twenty-five (25) designs were determined by the Superpave process at four percent (4%) voids. Nine (9) were subsequently adjusted using a lower asphalt content based on field verification and compaction testing and three (3) of those experienced problems such as bleeding or over compaction relating to design In the other thirty-three (33) designs a higher or lower selected asphalt content was used rather than the Superpave recommended asphalt content. ODOT studies to date have shown that modifying mix design Hveem void targets downward will result in better pavement performance.

- In 1999 ODOT plans on using the Superpave design process including the latest changes to the procedure, compaction of samples ascertained by concurrent use of gyratory and Hveem, with the design based on results from the Hveem specimens.

- For 1999, the Contractor has the option of using either the Superpave or Marshall mix design process.

With respect to Superpave binder, Mr. Patterson stated currently PBA grades are specified. Issues which must be resolved before switching to PG grades include:

- Relationship of PBA grades to PG grades.
- Reliability of SHRP test procedures.
- Form of acceptance program.
- Is grade bumping necessary?
- Follow climate map or specify PG grades that match PBA grade?

Implementation of PG grading will hopefully proceed in the year 2000 if these issues are resolved. A complete copy of Mr. Patterson's report is included as **APPENDIX XII**.

E. Nevada

Mr. Chuck Cook, Nevada Department of Transportation (NDOT), reported on the status of implementation including: current projects, performance, evaluation, impediments, direction and a tentative time line.

Currently, there are thirteen (13) projects constructed using PG asphalt, ten (10) using conventional dense graded mixes and three (3) Superpave projects. Thirty-five (35) projects graded by the PG grading system using conventional AC will be comparing the AC grade versus the PG grade in a report in cooperation with University of Nevada Reno (UNR). A detailed description of the various projects underway in Nevada can be found in **APPENDIX XIII**.

Distress, particularly thermal and longitudinal cracking at elevations of sixty five hundred feet (6500') and above for Superpave and PG binder projects, were noticeable in the Spring of this year. No cracking prior to this time had ever been detected on projects using PG asphalt cement.

Testing of the PG materials used in these projects conform with the PG specification, it has been determined by the Modified Lottman test that mixes utilizing PG grades are more open to moisture damage than the AC graded mixes.

Impediments to implementation include:

- Equipment is expensive to obtain and operate, and in NDOT's experience not reliable.
- No strength test to verify mix design or project control.
- Models at present do not predict performance.
- Examination of performance data with respect to Superpave test sections has yet to be completed.
- Questions concerning performance of Superpave versus Hveem mixes.
- Correction of constructability and performance of projects using PG asphalt cement.
- Validation of PG binder specification and Superpave mix design procedure.

Additional requirements, such as toughness and tenacity or cold ductility tests, may be needed in order for PG binder to be implemented in Nevada. When Superpave design procedure is finally implemented, it will need to address moisture sensitivity with respect to clay content as this is a concern for Nevada. Realistically, PG binder implementation may occur by 2002, and Superpave will follow. Mr. Cook's complete report including charts and graphs is located as **APPENDIX XIV**.

F. Washington

Mr. Dennis Duffy, Washington Department of Transportation (WSDOT), reported that all projects after January 1, 1999 are PG graded. Three (3) different grades are in use depending on location within the state. Western sections will use PG 58-22, Northeastern and mountain passes PG 58-34, and the Southeastern portion will use PG 64-28. Bumping of one (1) to two (2) grades will be allowed in order to meet special traffic conditions.

Currently, there are twelve (12) new Superpave projects and three (3) of those will be using up to twenty percent (20%) Recycled Asphalt Pavement (RAP), one (1) will use lime, and one (1) Stone Matrix Asphalt (SMA). A Superpave implementation team has been assisting state and contractor personnel with design and testing. In addition, another group composed of laboratory personnel, FHWA, contractor, and suppliers have been keeping county, city, and consultants abreast of current progress with respect to Superpave.

Mr. Duffy's report can be found as **APPENDIX XV.**

G. L.A. County

Mr. Frank Lancaster, Los Angeles County Roads, reported that two (2) Superpave projects placed three years (3yrs.) ago in San Fernando show no adverse conditions to date but evaluations are continuing. He thanked Mr. Robert Humer and Mr. John D'Angelo for their assistance in data gathering process and for the Superpave trailer evaluations on three (3) new Superpave jobs presently underway. Status of implementation is to wait and follow Caltrans lead.

H. Western Federal Lands

Mr. Brad Neitzke, FHWA/ Western Federal Lands, stated that PG binders were exclusively in use. For 1999, there are three (3) Superpave projects in the works and four (4) more under contract for next year. No date was proposed for full Superpave implementation.

VI. NATIONAL SUPERPAVE UPDATE

Mr. John D'Angelo, FHWA stated that his primary function for the last eleven years (11yrs.) has been to assist in reviewing, evaluating, directing activities, addressing problems, and filling gaps all in relation to the Superpave system. The Binder ETG is addressing where Superpave Binder Specifications are currently headed. He reviewed the test equipment in use, associated problems and what test procedures are being refined in order to reduce variability.

Test Equipment include:

- Rotational viscometer
- Dynamic Shear Rheometer (DSR)
- Bending Beam Rheometer (BBR)
- Direct Tension Tester (DTT)
- Aging Equipment:
  Rolling Thin Film Oven (RTFO)
  Pressure Aging Vessel (PAV)

Mr. D'Angleo stated that the Superpave Binder is continually evolving and the ETG is reviewing needed changes and making recommendations. The next step will be working to address the problems associated with fatigue, new direct tension test, modified binders, low pavement temperature and supplier certification.

The Mixture ETG is debating issues associated with: the restricted zone, control points, fine aggregate angularity, N_{design}, short term aging, and RAP.

Highlights of Superpave Implementation activities include:

- SHRP Implementation - shifting of funds, FHWA current leader.

- Superpave Management - involving all levels:

  Technical Working Group
  ETG's
  User/Producer Associations
  States
  Industry

- Major FHWA Initiatives for 2000:

  Technical Assistance Program/Support Services
  Superpave Pooled-Fund Equipment Purchase
  Mobile Laboratory Program
  National Asphalt Training Center
  Superpave Regional Centers/Westrack
  Research Activities/ALF/NCHRP
  Binder/Mix/Software Models ETG's

A copy of Mr. D'Angelo's presentation can be found as **APPENDIX XVI**.

VII. CONFERENCE ACTION ON PAC RECOMMENDATIONS

After much deliberation, adjustments and considerations, Mr. Joe Massucco on behalf on the PAC made these final recommendations to the Conference:

1) **Continue Validation of PG Graded Binders for Optional Use and Evaluation.**

2) **Continue Evaluation and Clarification of a Performance Based Specification for RMB.**

3) **Use and Clarify where Necessary Standard Test Methods**

The Moderator called for action by Conference Members on the PAC recommendation that these charges be given and it was,

MS&C, that these charges be given to the PAC.

(The vote result was unanimous.)

After further discussion and review, the Conference added another recommendation to charge the PAC:

4) **Use AASHTO or ASTM Standard Test Procedures where Appropriate for Binder Testing.**

The Moderator called for action by Conference Members on the recommendation that the PAC charges be amended to include this charge and it was,

MS&C, that this charge be added to the existing PAC charges.

(The vote result was unanimous.)

VIII. CONFERENCE ACTION ON AMC RECOMMENDATIONS

Mr. Holmgreen offered the following recommendations by the AMC to be given as charges by the Conference:

1) **Explore New Information Derived by Conference Members with Respect to Implementation of Superpave Mix Design.**

2) **Conference Members Evaluate Smoothness/Compaction Specification for Proposed Adoption by Next Conference.**

3) **Reconvene the Conference in 2000**

The Moderator called for action by Conference Members on the recommendation that the AMC charges be given and it was,

MS&C, that these charges be given to the AMC.

(The vote result was unanimous.)

IX. APPRECIATION TO Mr. JOE MASSUCCO

Mr. Bob Staugaard, Golden Bear Oil Specialties and Co-Chair of the PAC, extended on behalf of the PAC Committee and all other Committee and Task Group members special thanks to Mr. Joe Massucco for all his hard work and dedication to the PCCAS. He also extended his personal thanks and wishes for a successful "retirement." Conference members joined Mr. Staugaard in applauding Mr. Massucco's efforts.

X. PROGRESS OF AASHTO ACTIVITIES

Dr. Haleem Tahir, AASHTO, updated Conference Members on AASHTO's report on Superpave Implementation. He reviewed the TEA 21 bill and how its passing played a role in funding the shortfall for SHRP implementation work and the Long Term Pavement Performance Program (LTPP) for fiscal year 1999. AASHTO's Board of Directors passed a resolution allowing NCHRP to finance this deficit and in addition, asked The AASHTO Standing Committee on Research (SCOR) to develop a long term funding strategy. The Board also established a Steering Committee consisting of AASHTO and TRB to monitor the Superpave program in its entirety. To date a Committee consisting of State Representatives, FHWA, Industry, and Academia for the purpose of reviewing and prioritizing Superpave projects is in place The projects selected will then be submitted to the AASHTO Board of Director for further review and possible action.

Dr. Tahir reported that the Lead States Program which has many successes in transferring SHRP technology to the field was initiated by the task force on SHRP implementation. This task force is due to cease around September of 2000, and is working on a transition plan for the seven Lead States involved in the program.

Technical issues discussed include:

- FHWA preparing a report on SHRP implementation.
- TRB prepared brief on factors to be considered and lessons learned.
- AASHTO Lead State team, Superpave ETG, and AASHTO Subcommittee on Materials are processing changes in four Superpave protocols should be available June 1999.
- Subcommittee on Materials reviewing Stone Matrix Asphalt (SMA) protocols.

A complete copy of Dr. Tahir's report and overheads are included as **APPENDIX XII**.

XI. EMULSION COMMITTEE REPORT AND RECOMMENDATIONS

Mrs. Shauna-May TecleMariam, U.S. Oil & Refining and Co-Chair of the Emulsion Committee, reported on an American Emulsion Manufacturing Association (AEMA) Round Robin Study that involved eleven (11) laboratories using (6) different emulsions both modified and conventional. The main focus of the study was the method of recovery. Four (4) different recovery methods were utilized: ASTM Evaporation, 260 Distillation, 177 Distillation and Vacuum Distillation. The original and PAV residue were tested. The AEMA study concluded that SHRP testing is not related to performance of an emulsion. This study did agree with prior Emulsion Committee work that indicated the Rolling Thin Film Oven (RTFO) step is not necessary for testing emulsions. The AEMA recommendation derived from this study was that vacuum distillation is accepted as the method of obtaining modified emulsion residue regardless of grade.

Studies to be looked at in the coming year by the Emulsion Committee include:

- Evaluation of AEMA-ASTM D244 Vacuum Distillation and BASF-forced air oven recovery methods by round robin testing of one CRS-2P.
- Conventional and DSR testing on residue
- Does DSR relate to bleeding?

Mrs. TecleMariam stated that they are always looking for more laboratories to get involved. The next Emulsion Committee meeting is tentatively scheduled for October 4, 1999.

The Emulsion Committee recommendations to the Conference are:

1) Continue to identify performance of modified asphalt emulsions compared to conventional systems and develop functional limiting values for the modified asphalt emulsions.

2) Characterize the residue from various grades of asphalt emulsions and residue recovery methods available in the Conference Membership. Compare these data with current PBA/PG test methods to determine if there are common properties relating to performance.

3) Attempt to identify tests that relate to performance of the emulsion residue. (i.e. chip retention or adhesion)

The fourth (4th) charge given to the Committee last year:

4) Determine if any specifications can be combined or any performance tests can be improved for both modified and conventional emulsion systems

has been completed. The Committee's conclusion is that no one is willing to reduce or combine anything, and by working on the other charges the potential

to revisit this charge may occur in the future. It is recommended that this charge be eliminated.

Mrs. TecleMariam's report and charts can be found as **APPENDIX XVIII.**

XII. CONFERENCE ACTION ON EMULSION COMMITTEE RECOMMENDATIONS

Mrs. TecleMariam restated the following recommendations by the Emulsion Committee to be given as charges by the Conference:

1) **Continue to identify performance of modified asphalt emulsions compared to conventional systems and develop functional limiting values for the modified asphalt emulsions.**

2) **Characterize the residue from various grades of asphalt emulsions and residue recovery methods available in the Conference Membership. Compare these data with current PBA/PG test methods to determine if there are common properties relating to performance.**

3) **Attempt to identify tests that relate to performance of the emulsion residue. (i.e. chip retention or adhesion)**

The Moderator called for action on the Emulsion Committee recommendations and it was,

MS&C, that these recommendations be charged to the Emulsion Committee.

(The vote result was unanimous.)

XIII. SUPERPAVE REGIONAL CENTERS

A. UN Reno:

Mr. Dean Weitzel, Nevada Department of Transportation (NDOT), briefly updated the Conference regarding the success of training classes offered at the UNR Superpave Center as well as the successes of on site training currently available.

B. UC Berkeley:

Mr. Larry Santucci, University of California Berkeley Pavement Research Center, (UCBPRC) stated that this facility is not a Superpave Center, rather a SHRP Superpave Facility. Training classes offered at the UCB, Richmond Field Station include: "Asphalt Pavement Fundamentals--Design, Construction and Rehabilitation," three (3), three (3) day seminars will be held on October 12-14, 1999 in San Diego, California, February 1-3, 2000, in Modesto, California, and April 25-27 in

Sacramento, California. Two (2) one (1) day classes on "What's New in Asphalt Paving" will be held on October 6, 1999 in Fresno, California, and December 15, 1999 in San Diego, California. Also on the list is "Asphalt Pavement Maintenance" three one (1) day classes on, October 1, 1999 in Oakland, California, December 8, 1999 in Visalia, California, and February 8, 2000 in Vacaville, California. If more information is needed please contact Mr. Santucci at 510-231-9428. A copy of the Asphalt Seminar schedule is available as **APPENDIX XIX**.

XIV. WESTRACK UPDATE

Dr. Jon Epps, University of Nevada, Reno, discussed WesTrack, the FHWA's hot-mix asphalt performance-related specification test facility in Nevada. He reported that the trafficking operation is now complete. Approximately five million (5,000,000) ESAL's were applied to the track. Final sampling has been completed and shipped to University of California, Berkeley, Oregon State University, and the University of Nevada for testing. Reports should be finished by the end of January 2000. Lessons learned from WesTrack include:

- Difference in fuel use is associated with smooth versus rough pavement surface.
- Mechanistic mixture design methods predicted the performance of the pavement in fatigue.
- Superpave coarse graded mixtures used on WesTrack are sensitive to binder content and minus 200 fraction.
- Asphalt binder, aggregate, and mixture property variability will be reported on this summer.
- Calibration problems for ignition oven, asphalt binder content, and gradation were noted and methods are being developed to correct problems.
- Asphalt binder hardening data will be available this summer.
- In hot mix asphalt pavements, "T" section patches were more effective than conventional patching.
- Precision of methods used to measure performance has been determined.

A paper summarizing this information will be available in October at the Accelerated Pavement Testing Conference held in Reno.

XV. REPORT FROM ROCKY MOUNTAIN USER PRODUCER GROUP

Dr. Julie Nodes, ADOT, reported that the Rocky Mountain Asphalt User Producer Group's (RMAUPG) primary focus has been the effective implementation of Superpave technology. Their Conference is held annually in October. The next meeting is scheduled for October 5-7, 1999 in Phoenix, Arizona.

Leadership in the group is changing with the retirement of Mr. Bob Rask.

Some common concerns of the group include:

- Standardization of test methods.
- Certification and training of technicians.
- Effective utilization of Western Superpave Center.
- Pooling resources for research efforts.

Currently there are three subcommittees within the RMAUPG: Binder, Mix, and Specification.

The Binder Committee meets twice a year; once in conjunction with the annual meeting and once in conjunction with the Western Cooperative Test Group annual meeting. Their last meeting was primarily an opportunity to present information on proposed changes and current research. To date, a draft RMAUPG "Standard Practice for Certifying Suppliers of Performance Graded Binders" - modification of PP26 and the PCCAS version is being reviewed. Member agencies at present have agreed to disagree on binder acceptance procedures, future work planned to look at acceptance.

The Mixture Committee also meets twice a year. This group discusses common concerns and educates the group on any changes being made or attempted. This group is struggling to establish itself.

The Specification Committee also meets twice a year. They have established four (4) task groups to review state of the practice by participating members with the ultimate goal of standardization. The task groups are: Longitudinal Joints, QC/QA, Smoothness, and Moisture Sensitivity to review state of the practice within members with the ultimate goal of standardization.

XVI. PROGRESS OF ASTM ACTIVITIES

Mr. Steve Burhans, Paramount Petroleum discussed the progress of ASTM activities with respect to Metrification, RTFO procedure, Emulsion Specification, and drafts of ASTM versions of PAV Standard Practice and BBR test methods.

Metrification is being left up to the discretion of individual task force chairpersons as the directive to eliminate all references to non-metric units of its standards and specifications has been waived.

The revised RTFO procedure reported on last year is now in the current 19th edition of AASHTO "Standard Specifications." Changes include horizontal cooling of bottles, scraping of bottles as they are being removed from the oven, and changes in the technique requiring the bottles to remain rotating while awaiting their turn to be emptied.

Preliminary proposed emulsion specifications, D977 and D2397, have been revised to include the slurry seal emulsions QS-1h and CQS-1h. More changes to these specifications are likely.

Draft ASTM procedures for the PAV and BBR were distributed, **APPENDIX XX.** The deadline for ballot is May 21, 1999.

Mr. Burhans complete report is included as **APPENDIX XXI.**

XVII. WESTERN ALLIANCE FOR QUALITY TRANSPORTATION CONSTRUCTION (WAQTC)

Mr. Brad Neitzke, FHWA/WFLHD presented a video to the Conference detailing the Transportation Technician Qualification Program (TTQP) and Laboratory Qualification Program. The objectives of the TTQP are:

- Develop highly skilled, knowledgeable materials sampling and testing technicians
- Promote uniformity and consistency in testing
- Provide reciprocity for qualified technicians between participating agencies
- Create a harmonious working atmosphere between the public and private employees.

Training consists of five (5) modules: Aggregate, Asphalt, Concrete, Embankment and Base, and In-Place Density. A materials testing technician must pass the written and performance tests in each module in order to become qualified. Training materials include:

- CD ROM Instructor Guide,
- CD ROM Participant Handbook
- Administrative manual
- Registration & Information Handbook
- Computer Based Training CD's
- PowerPoint Presentation CD's
- Introductory Video

The WAQTC also supports a website providing useful information about the TTQP and other programs. Individuals completing the qualification requirements have the opportunity to be included in a registry linked to the site. Idaho is currently the only State having a link and providing information. A copy of Mr. Neitzke's overheads and report is included as **APPENDIX XXII.**

XVIII. USER CAUCUS RECOMMENDATION FOR NEW CHAIR

After careful consideration and deliberation, Mr., Jim Walter, announced that the User Agencies had caucused and were in agreement that the new User Agency Representative would be Mr. George Way.

It was unanimously agreed that the Minutes show sincere appreciation and thanks on behalf of the Pacific Coast Conference for Mr. Jim Walter's many years of outstanding service.

XIX. RECOMMENDATIONS FOR FUTURE ACTIVITIES

Mr. Jim Walter, Co-Chair for the User Agencies, stated that as many new tasks are being taken on by the Conference, it should be careful to try and finish current tasks first. With respect to PG asphalts, SHRP work on schedules for adoption of PG has been postponed; the time has come for the Conference to stop talking and take action to adopt PG graded binder specifications. Holding a Conference next year will be worthwhile considering the number of new faces. After that, reconsider having Conference every two years.

Mr. Rick Holmgreen, Co-Chair for the Producer Representatives, thanked Mr. Jim Walter on behalf of the Producer Agencies.

Mr. Holmgreen also thanked Mr. Joe Massucco for guiding the PAC with fairness and a desire to follow a technologically correct direction.

Personally and on behalf of the Members of the Conference, appreciation was extended to Mr. Carl L. Monismith and Mr. Jack Pearring for all their efforts in direction and guidance in making the Pacific Coast Conference possible.

XX. ESTABLISHMENT OF THE CARL L. MONISMITH AWARD

A motion was made that official establishment of the Carl L. Monismith Award as a means of recognition for the Conference as defined by the Steering Committee for contributions made above and beyond the call of duty.

MS&C, by unanimous decision and applause that the Carl L. Monismith Award be so established.

XXI. FUTURE CONFERENCES

By action taken during the Conference Action on PAC segment of this Conference, the User and Producer representatives assembled agreed to schedule the Thirty-Second Pacific Coast Conference on Asphalt Specifications for May 16-17, 2000, at the University of California Berkeley, Richmond Field Station.

XXII. RESOLUTIONS

At the conclusion of the Conference, the following Resolution was passed by the User Agency Representatives in attendance:

Whereas, government agencies use asphalt materials in construction and maintenance of pavements for transportation facilities and

Whereas, the quality, durability, and uniformity of asphalts, as well as their continued supply is in the interests of everyone and

Whereas, the present state-of-the-art is insufficient to permit comprehensive development of completely informative and meaningful specifications or effective control procedures and

Whereas, financial and environmental constraints require the controlled development of technology for the production and use of asphalt materials and

Whereas, it is evident that the combined understanding, knowledge, efforts, and tolerant viewpoints of both Producers and Users are needed to solve these problems. Now be it;

Resolved that all the asphalt Users here present express sincere appreciation for the continuing efforts of the Producers of asphalt for their initiation of, and involvement in, the many Pacific Coast Conferences on Asphalt Specifications, the latest being held at the University of California at Berkeley, Richmond Field Station on May 11-12, 1999, and strongly urge that such Conferences be continued, it being the firm consensus that such Conferences are in the public interest.

In response, the Producer representatives in attendance unanimously passed the following resolution:

Whereas, the purpose of the Pacific Coast Conference on Asphalt Specifications is to promote quality, durability and uniformity of asphalts and uniformity of asphalt specifications, and

Whereas, considering the diversity of specifications among Conference Member agencies, the workings of the Conference provides a forum for discussion of asphalt problems, and provides technical study on asphalt subjects, and

Whereas, The Paving Asphalt Committee of the Conference, charged to re-evaluate the specifications adopted by User agencies in previous years, has diligently pursued the task of introducing a Performance Based System leading to the ultimate acceptance of Performance Graded Binders, and

Whereas, this same Paving Asphalt Committee composed jointly of User and Producer representatives, has undertaken its task with combined understanding, knowledge, efforts, and tolerant viewpoints; Now be it;

Resolved that all the Asphalt Producer representatives here present express sincere appreciation for the continuing efforts of the User agency representatives for their initiation of, and involvement in, the many Pacific Coast Conferences on Asphalt Specifications, the latest being held at the University of California at Berkeley, Richmond Field Station on May 11-12, 1999, and strongly request that such Conferences be continued.

XXIII. APPRECIATION TO MODERATOR

By general acclamation, the Conferees expressed their sincere thanks and appreciation to Professor Carl L. Monismith for his excellent handling of the Conference as Moderator. His detailed knowledge of the subjects discussed and expertise in guiding all of the deliberations for the past thirty-six years, has contributed immeasurably to the successes of all the Conferences. In the same action, the Conferees expressed appreciation to the staff of the University of California, Berkeley, Richmond Field Station for making its facilities available.

XXIV. ADJOURNMENT

Expressing his thanks, Professor Monismith adjourned the Conference at 2:05 p.m. on Wednesday, May 12, 1999.

Lisa G. Economy
Assistant Secretary

RATIFIED:

Jack Pearring
Secretary

APPROVED:

C. L. Monismith
Moderator