A Summary of Iowa DOT Attendee Comments from the Transportation Research Board Annual Meeting

January 22-26, 1989

Iowa Department of Transportation

TRB Summary
January 1989

HIGHWAY DIVISION

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 29-Design and Construction Specifications for Concrete Bridges

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: The session dealt with the new standards for segmental concrete bridges developed through a NCHRP report. Clifford Freyermuth, the principle investigator for the project, presented the report and gave some insight into assumptions made in the report, load factors developed, and the strut and tie method of analysis. John E. Breen then followed with more information on the selection of the limit state values. Dave Goodyear, although in total agreement with the report, pointed out some places in which more work needs to be done, such as the method of determining temperature effects. George T. Markich presented a review of the segmental bridges constructed in Washington State and gave some insight into the things that would change with the new standards. Allan Harwood concluded the session with slides which showed construction problems of the past and his thoughts on how the new code will improve these problems.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 73A-Issues in Bridge Design, Part 1: Quality of Contract Documents

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: This session dealt with contract documents and how they can be improved. Contractors, William Peckham and Tom McCarthy, pointed out that they felt that contracts needed to show more detail, especially in the areas of rehabilitation plans, cable stayed bridge, and segmental bridges. They also felt that the standard specifications for these types of bridges were inadequate. Robert Morden, Arizona DOT, presented some methods that are being put into effect in Arizona to improve quality of the plans, such as peer review and increasing contractor involvement in the initial stages of bridge design. Robert Nickerson pointed out how discrepancies in plans is costly for all involved and that greater communication needs to come about between the designer and contractors.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 73B-Issues in Bridge Design, Part 2: Bridge Inspection Experience Improves Bridge Design

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: This session was a panel discussion between Robert Barnoff, Robert Cassano, Charles Seim, William J. Rogers, and Roland Berger. All agreed that the bridge designer needs to get more involved in all aspects of the bridge such as, specifications, materials, construction, and maintenance. Robert Barnoff showed results of a survey of State Bridge Engineers which revealed that few states have good communications between the design offices and the construction offices. Charles Seim pointed out that it is easier to design with future maintenance needs in mind than to build and try to maintain inaccessible parts. In conclusion, Roland Berger pointed out that it is important that the designer knows what is going on in construction but he must be careful not to get involved in directing the project.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 101-Steel Bridges

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: This session dealt with research that is being done on steel bridges. Baidar Bakht reported that since the late 1970's the Ontario Bridge Code has not imposed any deflection limits. The Ontario Ministry of Transportation has continuously been monitoring the bridges built since that time and have observed no detrimental effects and Bakht feels that AASHTO should eliminate their deflection criteria. The next two papers presented interim reports on NCHRP projects that will be concluded within the next year. The remainder of the papers dealt with different methods of how bridges could be strengthened. Methods included increasing the bridge stiffness, adding post-tensioning, and adding superimposed arches.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 150-Bridge Evaluation Through Static and Dynamic Testing

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: This session dealt with the live load impact factor and how it is defined, developed, and used. Baidar Bakht began the session by presenting eight different definitions of the impact factor that have been used in research. The definition that Bakht felt was correct was not the same as most of the audience. Much discussion took place on the different definitions. The next two papers presented computer simulations of bridge models using different trucks, surface roughness and vehicle speed. Both papers used different definitions of the impact factor and both papers generated much discussion from the audience. The final papers presented were specific examples of researchers trying to measure the effects of different dynamic loads on existing bridges. These papers examined earthquake loads and truck loads using strain gages and accelermeters and observed effects in the actual bridge less than predicted by AASHTO.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 209-Pile Abutments; Timber Decks; Service Life Prediction; Aesthetics

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design

COMMENTS: This session was sponsored by the Committee on General Structures and presented six papers that varied widely in their topics. Yi Jiang presented a method to predict the remaining service life of an existing bridge by using the information available in the bridge inventory. Robert Abendroth then presented the work done at ISU with integral abutment bridges. Ralph R. Mozingo of Pennsylvania State presented one method of improving the strength of timber bridges. He suggested reinforcing the bridge with steel plates. The next two papers presented work done at the University of Maryland on a two span plate girder bridge. Their research showed that AASHTO distribution factors are overly conservative. The last paper in the session showed the durability of a 150 year old cast iron bridge.

ATTENDEE: Bradley Barrett
SESSION NO. & TITLE: 173-Evaluating Scour at Bridges

SUGGESTED FOLLOW UP NAME & OFFICE: Bill Lundquist, Bridge Design
John Risch/Kermit Dirks,
Maintenance/Road Design

COMMENTS: Claude Harris of the National Transportation Safety Board discussed the findings of the NTSB's report on the April 1987, Schoharie Creek (New York) bridge failure. Their findings indicate several contributing causes to the failure: the structure was non-redundant; spread footings were founded on glacial material which eroded during the flood; riprap around the pier was not adequately maintained by the New York State DOT. The NTSB is recommending a change in the AASHTO Bridge Specs, Section 4.4.2.1, concerning the depth of footings.

John Ahiskog, FHWA, discussed revisions to the Bridge Coding and Recording Guide.

Everett V. Richardson, Colorado State University, discussed the need for more field and lab data, scour warning systems for critical bridges, and training in this area for engineers.

A panel of engineers discussed on-going scour evaluation in four states. They mentioned three necessary phases of this evaluation: a screening process to find the more critical bridges; the actual scour evaluation using hydrologic, structural and geotechnical analysis; and counter measures for scour-critical bridges.

Art Parola, Penn State University, discusses sizing riprap to protect bridge piers from scour.

ATTENDEE: Bob Steffes
SESSION NO. & TITLE: 112-Coping With Hazardous Waste Encounters: What to do Before a Crisis Strikes

SUGGESTED FOLLOW UP NAME & OFFICE: Robert North, Right-of-Way

COMMENTS: Potential problems and solutions were discussed by a panel covering perspectives from Legal, State, Environmental, Consultant and Cleanup Departments. It was stressed that liabilities for contaminated property when bought, owned or sold can be inseparable and retroactive. Property should be checked to be sure contamination liabilities are not being purchased. If contamination is found, an investigation should be started by the state before the EPA enforces it and do all that is possible to solve the problem without getting it on the National Priority List. The Colorado DOT offers a 4 hour in-house course on Hazardous Waste Management.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: A2K06-Subsurface Drainage

SUGGESTED FOLLOW UP NAME & OFFICE: Kermit Dirks, Road Design

COMMENTS: John Haas of Pavement Drainage System Company from Oconomowoc, Wisconsin gave a presentation on transverse interflow channel (TIC) under slab drainage. Two uses of this transverse drainage system were proposed. It was proposed on new construction that you place this geofabric wrapped polyethylene pipe under the location of each proposed joint. They have also done retrofitting by boring under each joint on older pavements. I understand that the cost of these TIC joints are relatively expensive. It may, however, be well to do a small portion of experimental retrofitting on some pavement that is exhibiting substantial pumping.

Gary Hoffman of the Pennsylvania DOT reported on a problem with a hydroway drain where a partially plugged outlet caused an 18 inch deep hydroway strip drain to fill 14 inches deep.

George Cochran of the Minnesota DOT reported on the use of a flat fin drain under dowel baskets which would also place them under contraction joints on a Minnesota project.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 148 - Roadside Safety Features, Part 1

SUGGESTED FOLLOW UP NAME & OFFICE: George Sisson, Road Design

COMMENTS: Dean Sicking of Texas A & M described a new device they are developing called a "guardrail extruder terminal". This is an impact device mounted on the leading end of a guardrail which flattens out the "W" beam as a vehicle slides it down the guardrail. Because of the flattening effect, the guardrail curls up in a coil and is no longer a hazardous object to the impacting vehicle. Deceleration rates were well below recommended maximums. Preprint 880484 was obtained and is available in my file. Asif Qureshy presented a paper on the concept of a split rail breakaway cable terminal. Essentially, this was a procedure to cut slots in a "W" beam guardrail 24" to 60" in length to weaken it and allow it to buckle as it was hit. The researchers thought this device was a relative success because it meets deceleration standards in NCHRP 230, has potential as a retrofit for a BTC and was low in cost. Preprint 880589 was obtained and is available in my file for those interested in reviewing this concept. Roger Stoughton of the California DOT reported on impact tests of light weight lighting standards. Using 35' high light poles with 20' long mastarms, full-scale crash tests were performed on cast aluminum breakaway couplings and triangular slip bases. In all cases, the lighting standards met requirements in NCHRP 230. Preprint 880608 was obtained and is available for inspection in my file. John Carney of Vanderbilt University reported on the Connecticut narrow hazard crash cushion. Basically, this is a series of thin wall pipe cells 4' high and 3' in diameter which crush as they are hit head-on. Eight cells for a total length of 24' were used for crash tests. The unit has a cable for anchorage and tension and performed relatively well for head-on hits as well as side hits. The cost is approximately $4,000 to $5,000. Preprint 880609 was obtained and is in my file. It contains a lot of good information on the construction and performance of this relatively new crash cushion. Ivor Laker of the United Kingdom Transport and Road Research Lab presented a paper on a high containment steel bridge guardrail. This was a rather substantial unit 4' or 5' high which was designed to contain heavily loaded trucks. Damage to vehicles striking this barrier was substantial and there was very little deflection from heavy truck collisions.

ATTENDEE: Todd Hanson
SESSION NO. & TITLE: 55-Pavement Management, Part 2: Pavement Performance Models

SUGGESTED FOLLOW UP NAME & OFFICE: Brian McWaters, Road Design
Charles Potter, Materials

COMMENTS: This session dealt with research in the areas of predicting pavement performance. Kumares Sinha discussed the effects of pavement age and traffic loading on maintenance of the pavement. He noted that age has an effect on maintenance and that increased traffic loading has an effect on the age. William Patterson discussed models for predicting roughness with respect to time.

ATTENDEE: Bob Steffes
SESSION NO. & TITLE: 47-Highway Noise

SUGGESTED FOLLOW UP NAME & OFFICE: George Sisson, Road Design

COMMENTS: Average cost for highway noise barriers was given to be $100,000 per foot of height per mile. To prevent building excessively high barriers, a study was done to determine the noise equivalent source height of various vehicles. The source height was found for:

Semi-tractor/trailer = 1.0 m
Medium truck = 0.8 m
Small vehicles = 0.6 m

From a survey of appearance of noise barriers, it was concluded that a barrier should be more than an Engineer's solution to a noise problem. It should also have an aesthetic value for the community, from both sides of the barrier, showing some creative art.

ATTENDEE: Bob Steffes
SESSION NO. & TITLE: A2E03-Mechanical Properties of Concrete

SUGGESTED FOLLOW UP NAME & OFFICE: George Sisson, Road Design

COMMENTS: When using roller compacted concrete for highway sections, the finished surface has no macro texture or tining for frictional purposes. The use of a textured drum roller was proposed to give the desired finished surface.

ATTENDEE: Todd Hanson
SESSION NO. & TITLE: 12-Pavement Maintenance Management

SUGGESTED FOLLOW UP NAME & OFFICE: Lee Smithson, Maintenance

COMMENTS: Tom Maze discussed the similarities and differences between the Pavement Management system of Iowa, Arizona, and Pennsylvania. Kumares Sinha discussed the effects of routine maintenance on increasing pavement service life. The maintenance areas discussed were crack sealing, full depth, and partial depth patching. It was shown by certain models where a diminishing return was achieved by increasing maintenance expenditure.

ATTENDEE: Marcus Hall
SESSION NO. & TITLE: 4-Roadside Management

SUGGESTED FOLLOW UP NAME & OFFICE: Lee Smithson, Maintenance

COMMENTS: The session started with a panel discussion on the training and certification of pesticide applicators. Charles Reese from Environmental Protection Agency (EPA) emphasized the importance of training to prevent accidents. Doug Montgomery, Oklahoma Agricultural Extension service, explained their system of training and certifying applicators and how they deal with the public. Ronald Stahl presented the results of a survey on how other states train and certify their applicators. Four papers were then presented. The first was by Tom Denbow on the effects of ditch spraying on water quality. His results showed less runoff then past studies which had looked at spraying in fields. Dave Nelson, Pennsylvania DOT, presented a paper on removing trees along the side of the road to increase the amount of sunlight that hits the road. J. M. Dipaola and W. M. Lewis presented the next two papers, the first of which addressed the effect of cold weather on growth regulators applied to Bahiagrass and the second on herbicides to control Centipedegrass and Bahiagrass.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 9 - Traffic Operations and Control

SUGGESTED FOLLOW UP NAME & OFFICE: Dwight Stevens, Sam Basu - Office of Maintenance

COMMENTS: A. C. Bullen of the University of Pittsburg covered physical features of detectors and traffic signal parameters which affect delay. More details can be found in preprint 880343 which I have in my file. Jonathan Upchurch of Arizona State University summarized the effects of raising the speed limit to 65 mph on Arizona highways. Data collected at 26 locations revealed that speeds went up, the percentage exceeding 55, 60, and 65 went up, injury accidents and total accidents went up slightly, and there was little change in accident rates. he concluded that speeds went up about 3 mph and that it cannot be proven that speeds caused the change in accidents. Jerry Pigman of the University of Kentucky covered the experience they had with placing unmanned radar installations on an interstate route for speed control. There was a lot of public opposition to this procedure. The conclusions reached were that unmanned radar has a significant impact on vehicles traveling at higher speeds but only for those with radar detectors. Special permission from the Federal Government was required to perform this research project. James Bonneson of Texas A & M covered a proposed procedures for selecting traffic control at school crossings. It used a mathematical model based on assumptions on vehicular and pedestrian arrival distributions to determine whether adequate gaps are available. Preprint 880167 covering the details of this procedure was obtained. Stephen Celniker of the City of San Diego presented a new procedure for determining if four-way stops were justified. To avoid using them for speed control and diversions of traffic, a point system was developed to evaluate each location. Goals of the new policy were consistency, accountability, flexibility, and selectivity. Preprint 880556 covering the details of this four-way stop warrant procedure was obtained.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 56 - Pavement Friction and Vehicle Response

SUGGESTED FOLLOW UP NAME & OFFICE: Dwight Stevens, Dwight Rorholm Office of Maintenance; Friction Review Committee Members: F. Walker, J. Lane, and J. Smythe

COMMENTS: Stephen Forster of the Federal Highway Administration presented a paper on "Pavement Micro-texture and Its Relationship to Skid Resistance". He defined micro-texture as less than one-half millimeter which would penetrate a water film. His analysis compared the surface profile with skid numbers. He found that closer spaced pikes provided better adhesion. Preprint 880297 describing his research was obtained. This should be reviewed by all members of the Friction Review Committee to improve their knowledge on this subject. Bohdan Kulakowski of Penn State University measured the difference in skid-resistance on tangent sections and curves. He found little difference, although there were higher skid values on tangent sections. He made the statement that micro-texture recovers over the winter months indicating that there are seasonal variations in skid-resistance. James Wambold of Penn State University spoke on skid tests vs. macro/micro-texture. he found that the mean texture depth (MTD) and the British Pendulum number (BPN) were more sensitive to smooth tires. He said that micro-texture gives the skid number characteristics while macro-texture projects the road surface through the water film. He also said that grooved pavement does not have a higher skid number than before grooving was done. G. Descornet of the Road Research Center described criterion for optimizing surface characteristics. He listed performance requirements including skid number, tire wear, user comfort, fuel economy, reduced noise, vibration, rolling resistance, splash/spray, dynamic load, and vehicle wear. He talked about micro-texture and macro-texture as well as a new term called mega-texture which is approximately one-half the wave length of the tire print size. In other terms, this is 2" to 4" in size. He said the goals should be to provide macro-texture but avoid mega-texture.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 79 - Tort Liability: Armageddon for Highway Agencies?

SUGGESTED FOLLOW UP NAME & OFFICE: Dwight Stevens, Maintenance
Harold Schiel, Transp. Safety

COMMENTS: Daniel Turner of the University of Alabama reported on a survey he had taken of tort liability claims against state highway agencies. He talked about the number and dollar amount of claims in recent years. There are approximately 25,000 suits against state highway agencies annually. At the present time, there are $11 billion in claims pending. Approximately $160 to $200 million are paid out in settlement and defense costs. Most states have been successful in establishing caps on awards but the values of these caps have been increasing. I was able to obtain a copy of Mr. Turner's paper and have it in my file. Gary Gittings of Penn State University talked about the evolution of risk management in the state of Pennsylvania. He defined the five commonly recognized steps in risk management as: 1. Determination of objectives; 2. Identification of Risks; 3. Evaluation of Risks; 4. Considerations of Alternatives and Selection of Risk Treatments; and 5. Implementation, Management Control, Evaluation, and Review. I was able to obtain a copy of his report which goes into much more detail on their risk management program. It is available for those who might want to review it. Joseph Blaschke of Texas A & M spoke on research needed in defending tort liability cases. This included primary information such as accident reports,field data, and secondary information such as books and manuals. A lot of information can be obtained from literature searches and from organizations such as TRB, AASHTO, and FHWA. His conclusions were that it takes a lot of digging to gather the information needed to aggressively defend cases. Breland Gowan of the California DOT spoke on how manuals and standards are used in tort liability cases. He said that plaintiffs' lawyers are very aggressive in using manuals and standards against public agencies. He said that if you follow your own manual, you are in a much better position for defending a case. Also, he said documentation is extremely important. In writing manuals, he says, do not use inflammatory language and he advocate a strong use of the word "MAY" which will minimize the adverse effects of manuals. I was able to obtain a copy of his paper and it is available in my file for inspection.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 107 - Highway Visibility

SUGGESTED FOLLOW UP NAME & OFFICE: Dwight Stevens, Maintenance

COMMENTS: Cyed Hussain of Bellomo-McGee Consulting Engineers presented a paper on the effects of light sources on highway sign color recognition. The objectives were to determine color recognizability and to set color standards. Nine light sources and seven colors of sheeting were used. It was found that fluorescent lighting provided the best color. Metal halide was the best overall light source. Preprint 880527 was obtained and is available in my file. Theodore Szczech of the 3M Company presented a paper on sign luminance as it relates to driver needs and traffic signing materials. This paper developed standards for comparing different sign sheeting materials and also, considered driver needs as a factor in developing performance requirements for sign sheeting materials. Preprint 880545 was obtained and is available in my file. Jay Rennilson of Advanced Retro-Technology described a new piece of equipment for measuring retro-reflection of pavement markings. It uses the laser technique and by using a filter, reads only the return laser beam reflected from the marking. Information is collected in a lap type computer. A proto-type is now being developed and may be available commercially within another year. Preprint 880488 on this presentation was obtained and is available in my file. Eugene Farber of the Ford Motor Company presented a paper on a model or procedure to determine how much light from headlamps reaches objects in the field of view. This presentation contained a considerable amount of research and theory with very little output which could be used by the practicing traffic engineer.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 132 - Traffic Safety in Construction and Maintenance Work Zones

SUGGESTED FOLLOW UP NAME & OFFICE: Dwight Stevens, Maintenance
Harold Schiel, Transp. Safety

COMMENTS: Russell Lewis, a consulting engineer, presented a paper on work zone control terminology. It covered concepts and definitions in the subject area of traffic control for highway construction, maintenance, and related activities. The objective was to achieve consistency in the use of terms and preparation of manuals, directives, contract documents, and by persons involved in training, reporting research findings, and otherwise communicating on work zone traffic control. Preprint 880235 was obtained and includes a glossary of many terms commonly used in the business. Gerald Ullman of Texas A & M presented a paper on traffic control for short duration maintenance operations on four-lane divided roadways. It evaluated four candidate control devices for advance signing. They included: 1. Road Work Ahead sign; 2. Symbol Transition sign; 3. Changeable Message Sign; and 4. "Lane Blocked" sign with a "X" indicating the closed lane. The "Road Work Ahead" sign was least effective while the changeable message sign was considered the best. The preprint 880565 was obtained and is available in my file. Jermone Hall of the University of New Mexico presented a paper on characteristics of construction zone accidents. He compared accidents which occurred prior to the construction work being done and during the construction activity period. It was found that the accident experience increased by approximately 26% during construction. It was found that there were deficiencies in their accident records system which results in a substantial understatement of crash experience in construction zones. Preprint 880139 on this subject was obtained and is available in my file.

ATTENDEE: Dwight Stevens
SESSION NO. & TITLE: 171 - Highway Right-of-Way Safety in the Clear Zone and Utility Installation

SUGGESTED FOLLOW UP NAME & OFFICE: Will Zitterich, Maintenance
George Sisson, Road Design

COMMENTS: Daniel Turner of the University of Alabama presented a case study on poles and urban clear zones. This was a study done for the city of Huntsville, Alabama. Considered were sign posts, signal poles, and utility poles. Ways to alleviate the safety problem included placing the utility underground, moving poles further from the road, eliminating poles, placing barriers in front of poles, and developing breakaway devices. They found that 90% of the accidents occur within 10' of the road. If a pole is placed 10' back of a curb, it was 1/3 as likely to be hit as it was 2' from the road. Preprint 880359 was obtained and is available in my file. It contained conclusions and recommendations on how to mitigate the problem of poles in the right-of-way close to the traveled way. Daniel Turner of the University of Alabama presented a survey of state utility manual clear zone provisions. A summary of state policies was prepared in tabular form. Although, there are many differences, common concepts and terms were found in many manuals. The author points out the need for greater standardization and training to increase understanding and uniformity. The AASHTO Roadside Design Guide was mentioned as the document which will influence future clear zone policy formulation. Preprint 880360 was obtained and is available in my file.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: Visit to the Federal Bureau of Investigation Paint Lab

SUGGESTED FOLLOW UP NAME & OFFICE: Kurtis Younkin, Materials

COMMENTS: I met with Dennis Ward, a chemist with the FBI, and discussed SEM methods for examining paint. Many of their techniques are similar to the ones I have been using. The FBI mounts and polishes a cross section of paint instead of examining the surface of a draw down. This eliminates problems due to pigment particles settling out and surface problems associated with pigments of various particle size.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: 26-Signing and Marking Materials

SUGGESTED FOLLOW UP NAME & OFICE: Kurtis Younkin, Materials

COMMENTS: Potters and Pave-Mark both recommend using silane coated beads for drop-on application in both epoxy and thermoplastic. This provides two optimum embedment of the beads and gives the best wet night reflectivity. Potters showed an impressive video demonstrating the superior wet night reflectivity of their large Visa-beads. Wet retroreflective measurements show the large beads to be 3-4 times brighter than the smaller, standard site beads. John Tielking of Texas reports that a bituminous adhesive works better than epoxy for raised pavement markers.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: A3C12-Committe on Coatings, Signing and Marking Materials

SUGGESTED FOLLOW UP NAME & OFFICE: Mark Callahan, Materials

COMMENTS: Ken Agent of Kentucky reported on their experience with thermoplastic. They have applied over 5 million feet of thermoplastic. The markings have been in place for over two years at 20,000+ ADT and still holding up well. The alkyd type gives better reflectivity then the hydrocarbon type 400 vs 200 med/ex/m^2. They have experienced some adhesion problems on PCC.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: 69-Corrosion of Steel in Concrete

SUGGESTED FOLLOW UP NAME & OFFICE: Mark Callahan, Materials

COMMENTS: Bob Heidersbach of California Polytechnic State University had a controversial paper reporting that cracks are necessary for the corrosion of steel rebar in concrete to take place. Several other presenters, including Mark Callahan, had evidence suggesting no cracks were necessary for corrosion of rebar to take place. Seems this would be a good problem to research using the SEM to map out the chloride distribution in a concrete sample to see if significant amounts were penetrating the concrete surface, or if the chloride was getting to the rebars only through cracks in the concrete.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: 107-Highway Visibility

SUGGESTED FOLLOW UP NAME & OFFICE: Kurtis Younkin, Materials

COMMENTS: H. L. Woltman of 3M presented a paper and concluded that signs should be replaced at a luminance of 75 med/m^2 or less. J. Rennilson reported on a new machine that mounts to a pickup and measures the retroreflectivity of pavement markings at speeds of 55 mph. The machine uses laser light and costs approximately $15 K.

ATTENDEE: Kurtis Younkin
SESSION NO. & TITLE: 219-Asphalt Chemistry

SUGGESTED FOLLOW UP NAME & OFFICE: John Adam, Materials

COMMENTS: Christine Curtis reported on the absorption rates of different functional groups to aggregate. Phenols and phenol-sulfides absorb to a greater degree than pyrenes. Mary Stroup-Gardiner reported on the precision of various methods to measure the asphalt cement content. Variations using centrifugal methods were 0.55%, variations using the nuclear gauge were 0.2%. Also Stroup-Gardiner reported that piling up samples of asphalt around the nuclear gauge can throw off readings by 0.1%.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: Strategic Highway Research Program, Sunday Meeting

SUGGESTED FOLLOW UP NAME & OFFICE: Bernie Brown/Bill McCall, Materials/Transp. Research

COMMENTS: Staff from the Strategic Highway Research Program discussed vehicle monitoring requirements for site evaluation. Discussions during the meeting and side discussions following the meeting lead me to believe that most states will be combining Federal Highway Administration Traffic Monitoring Guide and Strategic Highway Research Program vehicle monitoring requirements. Most states will probably propose vehicle monitoring programs that will be a compromise between gathering system data and site-specific data. Preliminary indications from Mark Hallenbeck, Consultant to the Strategic Highway Research Program and Richard Ingberg, Regional Coordinator for SHRP, indicated the Iowa Department of Transportation proposal for gathering data will be acceptable. "Framework for Traffic Data Collection for the General Pavement Studies Test Section" was distributed during the meeting. Copies have been given to Pat Cain, Transportation Inventory.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: A2D04-Characteristics of Bituminous Paving Mixtures to Meet Structural Requirements

SUGGESTED FOLLOW UP NAME & OFFICE: Rod Monroe, Materials

COMMENTS: A status of the final report on the AAMAS (Asphalt Aggregate Mixture Analysis System) was given by Harold L. VonQuintus of the Brent Rauhut Engineering Inc. This report shows the Marshall compaction to be one of the poorest in correlation with field compaction. One thing, however, they do not show is whether the Marshall varies greater or less than field compaction. The recommended type of laboratory compaction is the Texas Gyratory.

B. A. Vallerga gave a subcommittee report on modified asphalt and noted that there were many modifiers and that these modifiers would be needed in asphalt mixtures to prevent rutting. Later in the meeting it was also noted that the quality of the asphalt cement and the grade of the asphalt cement were also both very important in preventing rutting of asphalt pavements. Very little emphasis was given on the aggregate characteristics that would reduce the problem of rutting in asphalt pavements. We suggested a session on that subject for the January 1990 annual meeting. Committee A2D04 agreed and a session of that type will be held in January 1990. Joan Pribanic, however, did note that a Montana study on rutting in interstate pavements showed that more fractured faces was the most important factor in reduced rutting.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: 66-Case Histories on Rutting Resistance of Asphalt Concrete Pavements

SUGGESTED FOLLOW UP NAME & OFFICE: Rod Monroe, Materials

COMMENTS: James Gee of the Arkansas State Highway and Transportation Department reported bad rutting of asphalt pavement in less than one year. An analysis of this pavement showed surface voids of only 0.9 in the wheel tracks. It was designed with 50 below Marshall and utilized 30% natural sand. Prior to 1980 they required only 92% of lab density. In 1980, they developed new specifications based on 75 below Marshall requiring stability of 1500 pounds, flow of 8-16, and required 96% of lab density. In the future they plan on using 85% crushed aggregate.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: 108-Effects of Tire Pressure on Pavement Structures

SUGGESTED FOLLOW UP NAME & OFFICE: Rod Monroe, Materials

COMMENTS: Two presentations during this session concluded that tire pressure increase is not a major problem when pavement thicknesses are 8 inches or more. They might be a problem with thinner pavements that might be used on secondary roads. The tire pressure has a small effect in comparison to the effect of load.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: 197-Aggregate Research

SUGGESTED FOLLOW UP NAME & OFFICE: Jim Grove & Kevin Jones, Materials

COMMENTS: A test developed at Cornell University by Kumar Natesaiyer under the direction of Ken Hover for test for alkali silica gel would be of value for use by the Iowa Department of Transportation. It utilizes a uranyl acetate solution sprayed on a piece of concrete to render alkali silica gel fluorescent under ultraviolet light. If there is fluorescent show, this identifies the alkali silica gel. An ultraviolet light is available in the Office of Materials and the uranyl acetate for this procedure has been ordered.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: 193-Asphalt Pavement Construction

SUGGESTED FOLLOW UP NAME & OFFICE: Rod Monroe, Materials

COMMENTS: A presentation at this session concluded that every 1% of air voids above the desired 4% would yield a 10% or one year loss of life due to inadequate compaction.

ATTENDEE: Vernon Marks
SESSION NO. & TITLE: 219-Asphalt Chemistry

SUGGESTED FOLLOW UP NAME & OFFICE: John Adam, Materials

COMMENTS: A presentation on "Precision of Methods for Determining Asphalt Cement Contents" by Mary Stroup-Gardiner supported our work that showed that the nuclear asphalt content gauges were very accurate, probably more accurate than other types of extractions. Her research showed an insignificant difference between extractions with various solvents.

ATTENDEE: Todd Hanson
SESSION NO. & TITLE: 69-Corrosion of Steel in Concrete

SUGGESTED FOLLOW UP NAME & OFFICE: Champ Narotam, Materials

COMMENTS: The first presentation was about how it was not possible to obtain corrosion of steel in concrete without voids and cracks. Next, Mark Callahan discussed the differences in corrosion between several deicing salts. CMA seemed to have the least affect as far as corrosion. H. Schell discussed the differences between several different reference cells for use in monitoring cathodically protected structures. The silver-silver chloride and the graphite reference cells were the most stable over long periods of time.

PLANNING AND RESEARCH DIVISION

ATTENDEE: Bill McCall
SESSION NO. & TITLE: 22-The Problems With Freight

SUGGESTED FOLLOW UP NAME & OFFICE: Don Ward, Advance Planning

COMMENTS: Rolf Schmidt, Federal Highway Administration, discussed the topic, "Where Has All the Data Gone?" He indicated that the Paperwork Reduction Act has been a greater problem than dollars and staff in maintaining a data bank. He indicated future data will probably be gathered by tapping into electronic data interchange and automatic vehicle identification systems. He mentioned the USGS "TIGER" master data base of rail and highways. Dick Staley, R. A. Staley Consulting, talked about tomorrow's freight carriers. He predicted there would be four to five major intercity airlines with local rail lines supporting. Intercity trucks will be somewhat larger and longer with better design to support urban delivery. Automatic vehicle identification will be in common use by the year 2000 to support just-in-time delivery. He believes that axle and gross weight increases will be necessary to support efficient urban delivery during off-peak periods. Dave Liteny, Port Authority of New York and New Jersey, discussed handling overweight containers. He pointed out that international weight limits on containers are higher than U.S. limits. Overseas shippers know the cargo weight and the container weight but do not concern themselves with the total gross vehicle weight. Dealing with overseas containers will continue to be an issue.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: A5001-Conduct of Research Committee

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: Bill Brown, Office of Secretary of Transportation, talked about the University Transportation Program. The evaluation of the program will be done on-site, funding permitting, talking to clients and centers including all the states in the region. Criteria for the evaluation will include the quality of the research, its usefulness, and response to client requirements. Members of the committee voiced concern that centers were not contacting all the states in their region. Brown again stated that the results of the first year's work will determine continuation of the grant to the current center. This evaluation will be done at the Midwest Transportation Center and the Iowa Department of Transportation will be asked for evaluation. David Phillips, Federal Highway Administration, discussed the state of research. He indicated he felt the University Transportation Center Program should be considered as an extension of the states' HPR programs. He also suggests the program be integrated into the National Cooperative Highway Research Program.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: 85-Advanced Vehicle and Highway Technolgy

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: Discussion was presented on Intelligent Vehicle/ Highway Systems. The PATH project in California and the DRIVE program in Europe was discussed. David Willis, Vice President of the American Trucking Association, discussed "Where's the Demand for High Tech Solutions?" He pointed out the payoff of the trucking industry is increased customer service, profits, more efficient operations, and improvements in safety. Impediments to adopting high-tech solutions are the cost, basic conservatism in the trucking industry, driver human factors, and electronic equipment standards. An interesting note is that the Snyder Trucking Company has equipped 5,000 units with satellite location systems.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: A1B04-Weigh-in-Motion Committee

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: The scope of the committee has been expanded to include counting, classification and weigh-in-motion. Software is available from the Federal Highway Administration to create W tables from truck weight data. The session included a report by the Federal Highway Administration on evaluation of the low-cost automatic weight and classification system and also evaluated by Iowa and Minnesota. The objective was to accelerate loading on the weigh-in-motion transducer in ACC to cause failure. The pavement around the transducer failed. However, the transducer itself did not fail and was providing a usable signal when the pavement failed. The Federal Highway Administration intends to remove the transducers and use them in another application.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: A5T56-Task Force on Advanced Vehicle and Highway Technologies

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: I am a member of this newly formed task force that is in part to address the issues of urban congestion, air quality, and safety through Intelligent Vehicle/Highway Systems. Ford Motor Company, Chrysler, and GM made brief presentations from the manufacturers' perspective. Subcommittees were formed to deal with additional task force scope and definition, next year's conference session, research statements, and perhaps a newsletter. As the discussion continued, it became evident that a fully intelligent vehicle is going to require a much more highly trained driver than is currently necessary.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: Technology Transfer Meeting-Rural Technical Assistance Program

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: Richard Morgan indicated that he is going to ask for a much greater research, development, and technology transfer budget--perhaps in the neighborhood of $200-250 million. He may recommend that funding come off-the-top like HPR. He believes that the Federal Highway Administration will conduct mostly long-term research in cooperation with the private sector. He sees the National Cooperative Highway Research Program as the funding arm of AASHTO and states will conduct research on shorter term problems using HPR. Mr. Morgan is also in favor of the technology transfer centers and believes they have been quite successful. However, he is going to require the centers provide measures proving their success.

ATTENDEE: Bill McCall
SESSION NO. & TITLE: 207-Weigh-in-Motion Equipment Activities

SUGGESTED FOLLOW UP NAME & OFFICE: Bill McCall, Transp. Research

COMMENTS: The papers gave no additional knowledge regarding weigh-in-motion classification equipment and applications. The paper on "Accuracy of Weigh-in-Motion Scales and Peizo Cable" did further substantiate the Iowa and Minnesota results.