

**Draft Minutes
September 20, 2006**

By:

Jorge E. Pagán-Ortiz

**AASHTO TECHNICAL COMMITTEE ON HYDROLOGY AND HYDRAULICS
MEETING
April 4-6, 2006
Buffalo, NY**

AGENDA

AASHTO Technical Committee on Hydrology & Hydraulics
Agenda Spring 2006 Meeting

Tuesday April 4, 2006

- | | |
|---------------------|---|
| 8:00 am – 8:15 am | Dave Henderson – Call Task Force Meeting to Order, Housekeeping and Introductions |
| 8:15 am – 8:30 am | Welcome – Norm Schips, New York State DOT |
| 8:30 am – 9:30 am | Jorge Pagán – FHWA Perspective |
| 9:30 am – 10:00 am | Tim Hess – NCHRP Update |
| 10:00 am – 10:15 am | Break |
| 10:15 am – 11:00 am | NCHRP Proposals & Priorities |
| 11:00 am – 11:55 am | Kelley Rehm, AASHTO Update |
| 11:55 am – 1:00 pm | Lunch |
| 1:00 pm – 2:00 pm | Open Discussion – Direction, Progress, Concerns, Ideas |
| 2:00 pm – 3:00 pm | Karuna Pujara – MDM Chapter 22, Ground water |
| 3:00 pm – 3:15 pm | Break |
| 3:15 pm – 4:00 pm | Andrea Hendrickson – Chapter 21 Wetlands |
| 4:00 pm – 5:00 pm | New Assignment – MDM Chapter 20, Maintenance |

Wednesday April 5, 2006

- | | |
|--------------------|--|
| 8:00 am – 9:00 am | Matt O’Conner – MDM Chapter 19, Construction |
| 9:00 am – 10:00 am | Rick Renna – MDM Chapter 18, Coastal Zone |

10:00 am – 10:15 am Break

10:15 am – 11:00am Karuna Pujara – MDM Chapter 17, Bank Protection

11:00 am –12:00pm Dave Henderson – MDM Chapter 16, Erosion & Sediment Control

12:00 pm –1:00 pm Lunch

1:00 pm – 2:00 pm Mark Miles – MDM Chapter 15, Environment

2:00 pm – 3:00 pm Dan Ghere – MDM Chapter 14, Pump Stations

3:00 pm – 3:15 pm Break

3:15 pm – 4:10 pm Bill Bailey – MDM Chapter 13, Storm Drainage Systems

4:10 pm – 5:00 pm Merrill Dougherty – MDM Chapter 12, Storage Facilities

Thursday April 6, 2006

8:00 am – 9:00 am Richard Phillips – MDM Chapter 11, Energy Dissipators

9:00 am – 9:30 am Roy Mills – MDM Chapter 10, Bridges

9:30 am –10:00 am Te Ngo – MDM Chapter 9, Culverts

10:00 am –10:15 am Break

10:15 am –10:45 am Brooks Booher – MDM Chapter 8, Channels

10:45 am –11:15 am Rae Van Hoven – MDM Chapter 7, Hydrology

11:15 am –11:45 am Lotwick Reese – MDM Chapter 6, Data Collection

11:45 am –12:00 pm Norm Schips – MDM Chapter 1, Introduction & 3, Policy

12:00 pm – 1:00 pm Lunch

1:00 pm – 1:30 pm Mike Fazio – MDM Chapter 5, Planning & Location

1:30 pm – 2:00 pm Glenn Decou – MDM Chapter 4, Documentation

2:00 pm – 2:30 pm Jim Richardson – MDM Chapter 2, Legal

2:30 pm – 3:00 pm Technical Committee Business Session

3:00 pm – 4:00 pm Concerns of the States

4:00 pm Dave Henderson – Adjourn Technical Committee

TECHNICAL COMMITTEE MEMBERS	STATE	JOINED	REGION
Bill Bailey	Wyoming	1994	4
Brooks Booher	Arkansas	2002	2
Glenn DeCou	California	1994	4
Merril Dougherty	Indiana	1994	3 (absent)
Hani Farghaly	Ontario	2004	3
Mike Fazio	Utah	2001	4
Preston Helms	South Carolina	2001	2
Dave Henderson, Chair	North Carolina	2000	2
Andrea Hendrickson	Minnesota	2005	3
Rae Van Hoven	New Mexico	2004	4
Mark Miles, Vice Chair	Alaska	2000	4
Roy Mills	Virginia	1999	2
Te Ngo	Oklahoma	1991	4
Matt O'Connor/Bob Dawe	Illinois	2001	3 (absent)
Jorge Pagán-Ortiz, FHWA/Secretary	Wash., D.C.	2003	1
Karuna Pujara	Maryland	2005	1
Richard. Phillips	South Dakota	2002	4
Lotwick Reese	Idaho	1996	4
Rick Renna	Florida	2001	2
J. Richardson	Kansas	1996	3 (absent)
N. Schips	New York	2002	1
Duc minh Tran	Quebec	1999	1 (absent)
Alvin Shoblom	Oregon	2005	4
Amir Soltani	Nevada	2005	4 (absent)
Amy Ronnfeldt	Texas	2006	4

WELCOME AND INTRODUCTION:

1. Chairman Dave Henderson welcomed members and friends of the AASHTO Technical Committee on Hydrology and Hydraulics (TCHH) to the Spring 2006 meeting and thanked Norm Schips for arranging this meeting in Buffalo, NY. Chairman Henderson highlighted the fact that this was our meeting number 70. He also reminded the members of the committee that registration for the meeting was \$95.
2. Norman Schips welcomed everyone to Albany, New York and explained the structure of the NYDOT – there are 11 Regional offices in NYDOT and one main office located in Albany. He works under the Office of Engineering, Design Office and noted that Buffalo is under Region 5. He noted that the NYDOT is currently undergoing a re-organization. All regional directors report to a different person – they are trying to reorganize to change this. NYDOT is losing people and are trying to hire.
3. Chairman Henderson noted that Andrea Hendrickson, of MNDOT is officially a sitting member of the AASHTO Technical Committee on Hydrology and Hydraulics (TCHH). She represents AASHTO's Region 3. Also, Chairman Henderson noted that Alvin Shoblom, of ORDOT became a member of the committee and is representing AASHTO's Region 4. Alvin is a senior hydraulics engineers and has been with the ORDOT for 4-1/2 years.
4. It was suggested that members of the TCHH provide their background information to the Secretary.

FHWA PERSPECTIVES:

5. Jorge E. Pagán-Ortiz presented an overview of the FHWA's National Hydraulics Program and activities:
 - a. Functional Areas
 1. Scour Technology, Bridge Hydraulics, Culvert Hydraulics, Highway Drainage, Hydrology, Environmental Hydraulics
 - a. Scour Technology
 1. Second Edition of HEC-25 (ongoing) -- Contractor is University of South Alabama (Dr. Scott Douglass). Completion delayed by approximately 6 months. NHI Course is being developed parallel to second edition of HEC-25. Joe Krolak, Senior Hydraulics Engineer, FHWA Office of Bridge Technology, is leading this Task.
 2. HECs 18, 20 updates (delayed until FY '08)
 - a. HEC-18 to be updated with POA module, pressure flow research, K4 factor update, and results from NCHRP projects.
 3. HEC 23 Update (FY 07)
 - a. To be updated with POA module, results from NCHRP projects.
 4. Scour and Protection of Bottomless Culverts Phase II
 - a. Research conducted for MDSHA – being reviewed by Sterling Jones
 - b. FHWA will be reviewing draft report, too.
 - b. Procedure most likely to reside in HDS 5, but no final decision made, yet.
 10. Wave Load Synthesis Study (FY '06)
 - a. Research to be conducted at the University of South Alabama (Scott Douglas) and TFHRC Hydraulics Lab and Dr. Max. Sheppard
 - b. Expected results include: summary of literature review and wave force equations, laboratory testing to determine wave forces order of magnitude and a geotechnical analysis of wave forces to determine if these forces would jeopardize the stability of bridge foundations.
 - b. Bridge Hydraulics
 1. Module on Plan of Action for Scour Critical Bridges

- a. Contractor is Ayres Associates
 - b. Draft POA Module delivered to FHWA.
 - c. Draft POA Template review by FHWA.
 - d. Completion expected in August 2006.
 - e. Cynthia Nurmi, Hydraulics Engineer, FHWA Resource Center, is leading this Task.
2. Unknown Foundation Summit
 - a. Held in Lakewood, CO (November 15-16, 2005)
 - b. Over 120 participants representing FHWA, State DOTs, Industry and the Academia.
 - c. Proceedings mailed to participants and State DOTs by memorandum dated January 19, 2006.
 - d. Team established: policy, guidance, training and research needs.
 3. Unknown Foundations Synthesis
 - a. Contractor – Scott Sabol, Associate Professor, Vermont Tech.
 - b. Completion expected in Fall 2006.
 - c. Cynthia Nurmi, Hydraulics Engineer, FHWA Resource Center is leading this task.
 4. HEC-9 Update
 - a. Completed and posted in FHWA's Hydraulics web site.
 5. Develop new algorithms for FST2DH (ongoing)
 - a. Dr. Larry Arneson, Principal Bridge Engineer – Hydraulics, FHWA Resource Center, is leading this Task.
 6. New HDS-7 on Hydraulics of Bridge Waterways (FY '06)
 7. Action Plan for coastal bridges susceptible to storm damages (FY '06).
- c. Culvert Hydraulics
 1. HEC-14 Update (ongoing)
 - a. Contractor is Kilgore Consulting and Management.
 - b. Final FHWA review comments transmitted to contractor.
 - c. Cynthia Nurmi, Hydraulics Engineer, FHWA Resource Center, is leading this Task.
 2. Develop HY8 Graphical User Interface (ongoing)
 - a. Contract awarded to EMSI.
 - b. Completion expected in December 2006.
 3. HDS-5 Update (FY '07)
 - a. Will be updated with new HY-8 software and NCHRP project 15-24 (hydraulic loss coefficients), HEC-14, improved culvert inlet/outlet research and scour at bottomless culverts.
 - d. Highway Drainage
 1. Develop new FHWA Storm Drain Software (FY '07)
 2. Develop new algorithms for WMS (FY '06)
 3. HEC-22 Update (FY '08)
 - a. Update with new storm drain software.
 - e. Hydrology
 1. Univ. of South Alabama-Coastal Transportation Research Center (Task Order Contract -- ongoing research)
 2. Coastal hydrology, storm surge high, water quality.
 3. Pooled-Fund studies to upgrade rainfall maps
 4. Announcement posted at the Texas Transportation Institute who sends it out to all states research engineers.
 - a. Could be a regional pooled-fund or national pooled-fund depending on number of

- states participating.
- b. Will be re-advertised due to lack of response from states.
- f. Environmental Hydraulics
 1. HEC-15 Updates (ongoing)
 - a. Completed!!!
 - b. Still working on the HTML conversion – should be completed this week.
 - c. Dan Ghere, Hydraulics Engineer, FHWA Resource Center, lead this Task.
 2. HEC-26 on Fish Passage (ongoing)
 - a. Contractor is Dr. Rollin Hotchkiss (now with BYU).
 - b. Bart Bergendahl, Senior Hydraulics Engineer, FHWA Central Federal Lands, is leading this Task.
 - c. Draft outline sent out for comments.
 3. Pooled-fund Study on Fish Passage at Large Culverts with Low Flow (FY '06).
 4. HEC-11 Updates (FY '06???)
- b. Hydraulics Engineering Web Site
 1. One FHWA Web site in Hydraulics Engineering
 - a. www.fhwa.dot.gov/engineering/hydraulics.
 - b. Serves as our “Community of Practice”.
 2. Structured by the “Functional Areas” previously presented
 3. Identifies FHWA contacts by Functional Area
 4. Please visit it . . . and . . . your input is welcomed!
 5. Contacts:
 - a. Dr. Eric Brown, Hydraulics Engineer, FHWA Resource Center-Baltimore, MD.
 - b. Ms. Michelle Cribbs, Highway Engineer, FHWA Office of Bridge Technology, Washington, D.C.
- c. NHI Training Courses in Hydraulics Engineering
 1. Second most popular category of NHI Training Courses
 2. 13 active courses
 3. NHI Courses to be Updated
 - a. FY 2006:
 1. NHI 135047 – Stream Stability and Scour for Bridge Inspectors
 - a. Update with POA Module.
 - b. Candidate for online training conversion.
 2. NHI 135048 – Countermeasure Design for Bridge Scour and Stream Instability
 - a. Update with POA, NCHRP projects on countermeasures and environmentally sensitive channel and bank protection.
 3. NHI 135065 – Introduction to Highway Hydraulics
 - a. Update with new HECs 14 and 15.
 - b. FY 2007:
 1. NHI 135010 – River Engineering for Highway Encroachments
 - a. Virtual tour for humid regions
 - b. Lesson on SAMwin Software.
 2. NHI 135081 – Introduction to Highway Software
 - a. Update with HY-8 (FY '07) and storm drain software (FY '08).
 3. Minor revisions to:
 - a. NHI 135056 – Culvert Design
 - b. NHI 135071 – SMS
 - c. FY 2008:
 1. NHI 135027 – Urban Drainage
 - a. Update with new storm drain software.

2. NHI 135046 – Stream Stability and Scour at Highway Bridges
 - a. Update with POA module, pressure flow research, K4 factor, and results from NCHRP projects, and rapid assessment procedure by Dr. Peggy Johnson.
3. NHI 135056 - Culvert Design
 - a. Update with new HY-8 software, NCHRP project on hydraulic loss coefficients, HEC-14, improved inlet/outlet research, scour at bottomless culverts.
- d. FY 2009:
 1. NHI 135028 – Storm water Pump Station Design
 - a. Update with new storm drain software.
 2. Minor revisions to:
 - a. NHI 135041 – HEC-RAS
 - b. NHI 135067 – Practical Highway Hydrology
 - c. NHI 135080 – WMS
4. NHI Courses to be Developed
 - a. 135082, Tidal Hydrology, Hydraulics and Scour at Bridges (ongoing)
 1. Kilgore Consultant Management.
 2. FY '07 completion delayed (probably until FY '08).
 3. Joe Krolak, Senior Hydraulics Engineer, FHWA Office of Bridge Technology is leading this Task.
 - b. Online Pre-requisite modules
 1. Hydrology (already developed – final draft).
 2. Basic stream stability and scour definitions (already developed – draft).
 3. Basic hydraulics concepts and definitions (FY '06).
 - c. Floodplain Policy and Guidance (FY '07-'08 ???)
 - d. Design of Culverts and Bridges for Fish Passage (FY '09 ???)
 - e. Tidal Hydraulics Modeling (FY '07 ???)
 - f. Sediment Transport (FY '07 ???)
 - g. Advanced HEC-RAS (FY '07 ???)
- d. National Bridge Scour Evaluation Program
 1. Memorandum sent out to FHWA Division Offices on March 23, 2006 to clarify several topics/issues:
 - a. Implementing a plan to comply with the updated NBIS regulation, 23 CFR 650.313.e.3), specifically for developing a Plan for Plan of Action for Scour Critical.
 1. Status of POA provisions (resources needed and target date for implementing a POA for each scour critical bridge) by May 5, 2006.
 2. Status report on progress made by DOTs towards developing a POA every April 15 and November 15 – report needed until all scour critical bridges have a POA.
 - b. Clarify definition of Scour Focus States.
 - c. Discuss Item 113 Coding Issues.
 - d. Discuss issues pertaining to bridges coded “U” and “T” for Item 113.
- e. Hydraulics Process Reviews
 1. Re-established in the FHWA National Hydraulics Program
 2. “Drainage Reviews” conducted for many years.
 3. Useful interaction between FHWA/State DOTs.
 4. Helped identify needs (research, technology and training).
 5. Tied to FHWA’s Bridge Program strategic plan
 6. FHWA will welcome State DOTs requests through FHWA Divisions
- f. Conference
 1. 2006 National Hydraulic Engineering Conference
 - a. Location, Dates and other Information:

1. San Diego, California; August 29-September 1, 2006.
2. Wyndham Emerald Plaza Hotel (\$129 plus tax)
3. Reservations: <http://www.wyndham.com/rates/main.wnt>
4. Deadline for reservations is August 6, 2006.
5. Pre-register at:
<http://www.fhwa.dot.gov/engineering/hydraulics/conference/hyd2006.cfm>
- b. Theme: "Where We've Been and Where We're Going."
- c. Topics to be covered:
 1. Scour modeling, stream stability, POAs, culverts (new, old, retrofitting and inspection), major flooding, and hydraulically related environmental issues.
6. Comments about items presented in FHWA Perspectives:
 - a. With regards to the rainfall map updates pooled-fund project, California DOT is going forward with its own updates.
 - b. The updates are not just a State DOT issue, but also one that involves other Federal agencies.
 - c. POA
 1. What other State DOTs are doing?
 2. it is too expensive to develop in Idaho (over \$10 thousand).
 3. NBIS memo has not reached all members of the committee.
 - d. Floodplain policy training should be a priority.
 - e. There are no discretionary funds for running the Hydraulics research laboratory under SAFETEA-LU.
 - f. Can FHWA look into the influence of a fender system on scour?
 - g. A pooled-fund study on fish passage in large culverts with low flows was posted on April 3, 2006.
 1. One of the objectives is to come up with guidelines for the design of more efficient culverts.
 2. Project consists of seven tasks.
 3. Will be modeling only the symmetrical half of a culvert.
 4. Funding level needed is \$200 thousand
 5. Suggested contribution per State DOT is \$15 thousand.
 6. Website to read more about this pooled-fund project is <http://www.pooledfund.org>. The solicitation number is 1074.

NCHRP Update:

7. Chairman Henderson sent an e-mail to TCHH members dated March 27, 2006, in which he reports the following:
 - a. NCHRP projects funded by the SCOR for FY 2007.
 - b. NCHRP budget for FY 2007 was \$20.5 Million
 - c. There were 165 new research projects submitted at a cost of \$64.1 million with 21 continuation projects at \$9.9 million.
 - d. The SCOR programmed 33 new projects at \$11.2 million with 20 continuation projects at \$9.3 million.
 - e. Not all problem statements submitted by the TCHH were funded.
 - f. Those funded included:
 1. Time rate of Scour at Wide and Skewed Bridge Piers, E-10 – as a new research project.
 2. Abutment Scour in Cohesive Materials, 24-15(02) – continuation approval
 3. Development of Design Methods for in-Stream Flow Control Structures, E-08 – contingency project.

8. Kelley Rehm reported a problem with regards to the problem statement on Culvert Materials. It was sent to the flexible pipe committee and they did not act on it. The problem statement for this project has to be resubmitted. Chairman Henderson noted that NCDOT has a controversy with the industry as they are lobbying up to the Secretary's office. NCDOT does not object to flexible pipes because they meet AASHTO's material specifications. Kelley Rehm noted that she would be submitting the problem statement to the chair of the AASHTO subcommittee in design. Rick Renna suggested to send the problem statement to everybody in the TCHH. It was noted that Tim McGrath did a good job in reviewing the problem statement – brought in an asset management perspective. Kelley Rehm suggested that the TCHH put together a brief proposal and to expand it when writing the problem statement. Glenn DeCou stated that the TCHH should include the issue of service life in the problem statement.
9. Kelley Rehm stated that that the TCHH needs to be careful in adjusting the scope of E-08 projects, especially in dropping funding amount. Tim McGrath gave a good feeling on cost and suggested that it will be better to resubmit the problem statement. Chairman Henderson noted that the pipe material problem statement will be circulated among the TCHH members on 04/10/06 and comments would be needed by 04/11/06, but not later than 04/12/06.
- 10. The following information pertains to the status of NCHRP projects. Please note that it was not updated during the Spring 2006 meeting because there was no participation from an NCHRP staff – Tim Hess left NCHRP and his replacement has not been selected, yet:**
 - a. Background - TRB is a unit of the National Academy of Sciences, which is the operating arm for the National Academies. TRB has 5 Divisions. The two divisions of most interest to the technical committee are Division A Technical Activities and Division D Cooperative Research Council. NCHRP started in 1962 and the Transit CRP started in 1992. NCHRP has 13 FTEs that administers 160 active panels with 1100 panel members. The CRP homepage is trb.org.
 - b. Financial support is from State DOTs, which provide a 5.5% contribution from their State Planning and Research Federal-aid funds. The contribution is voluntary and comes through FHWA. The funding was \$3.5M in 1968, \$8.5M in 1991, \$15.3M in 1992 and \$17.7M in 1997. TEA21 increased funding to \$31 in 2004, and SAFETEA-LU should increase it to approximately 36M.
 - c. Division B synthesis projects are provided funds by SCOR through project 20-5 which is managed by Jon Williams (JWilliams@nas.edu).
 - d. Problem Statements - Ideas come from States, AASHTO and FHWA.
 - e. TRB committees can submit statements through AASHTO subcommittees.
 - f. Problem statements for FY 2007 must be submitted by September 15, 2005 in order to be considered at the March 31, 2006 Standing Committee on Research meeting. Both Research Advisory Committee and SCOR rank projects and then a combined ranking is prepared. The AASHTO TC on Hydrology and Hydraulics can still submit problem statements until November 1, 2005.
 - g. NCHRP solicitation for panel members -- May 31, 2006 is the deadline for submitting panel members. Chairman Henderson encouraged the TCHH members to step up and to volunteer to participate in NHCRP panels.
 - h. Most awards go to consultants or universities. About 90% of projects are published.
 - i. Problem statements should be submitted via e-mail to nchrp@nas.edu.
 - j. Tim Hess manages the NCHRP project activities in the areas of Hydraulics, Geotechnical and Structures. Also, he advised that NCHRP panels are comprised of representatives from State DOTs, FHWA, other Federal Agencies (such as the USGS), consultants and the academia.
 - k. Tim Hess provided a handout with the status of NCHRP projects. Tim Hess agreed to e-mail his handout to the TCHH members as requested by Chairman Henderson.
 - l. NCHRP Project Status Reports for Hydrology and Hydraulics -- current status can be found at <http://www4.trb.org/trb/crp.nsf/NCHRP+projects>. Reports are free for FHWA and DOTs won't

get charged for reports.

1. 21-5(2), Unknown Foundation Instrumentation - research has stopped, final report is complete and will not be printed. Report will be made available as an agency report.
2. 24-7(2), Pier Scour Countermeasures - \$450k Ayres Associates will include partnering with states for field verification. Phase 1 report is available for loan. Phase 2 guidelines started 4/01 for 3 years to 10/2004. Panel requested and got approval for \$350k for continuation of this project. Estimate completion 10/05. Report is due in 06/06.
3. 24-14, Scour at Contracted Bridge Sites - \$500k Art Parola/Dave Mueller - interim report, complete June 2003. USGS is matching with \$500k. Final report submitted in 6/2004. Final report available from NCHRP (Web Doc 83).
4. 24-15, Bridge Scour in Cohesive Materials - \$350k TX A&M. The project is completed and final report is available from NCHRP (Report 516). The panel received \$400k in continuation of funds, NCHRP 24-15(2), to study abutment scour in cohesive soils. Completion expected in 06/07.
5. 24-16, Channel Migration - \$550k Ayres, Pete Lagasse. Project completed. Final report available from NCHRP (Report 533, Web Doc 67, CD-48 and CD-49).
6. 25-12, Wet Detention Pond Research - \$580k by David Young of WSU. Final report will not be published. The unedited final report is available for loan by contacting NCHRP at NCHRP@nas.edu.
7. 21-07, Development of Portable Scour Monitoring Equipment - \$300k Ayres, Jim Schall, started 4/00 and is complete. Final report is available from NCHRP (Report 515).
8. 24-8, Scour at Bridge Foundations Research Needs - FY 98 -- three projects were funded from list: 24-14, 24-15 and 24-16. No projects funded in FY 99 or 2000, and 2 in FY 2001, 1 in FY 2002, 2 in 2003, and 1 in 2004.
9. 15-23, Technical support for MDM and HDG - \$283k, \$79k added in FY 2003. Project is completed.
10. 24-18, Countermeasures to Protect Bridge Abutments - #12 on 24-8, \$500k, Brian Barkdoll, Michigan Tech University, August 2003. Estimated completion is 03/2006.
11. 24-19, Environmentally Sensitive (Non-structural) Channel & Bank Protection - \$350k, John McCullah, Redding, CA -- awarded 6/2001. Project completed. Final report available (NCHRP 544).
12. 24-20, Prediction of Scour at Bridge Abutments - \$500k, contract awarded 4/2002 to Robert Ettama, University of Iowa. \$200k added. Project is limited to sand material and unprotected abutments. Effect of overtopping is being considered. Expected completion is 04/2007.
13. 20-07(146), Development of Software Verification Protocol for the Hydrologic and Hydraulic Models for Highway Planning and Design - \$100k, panel members are: Saeed (chair), Barry, Te, Mark, Bill and Joe Krolak. Awarded to Univ. of SC for \$100k. Project almost completed.
14. 15-24, Hydraulic Loss Coefficients for Culverts (FY 2003) - \$325K project awarded to Utah State University. Added \$500k and its completion is expected in 2007.
15. 24-23, Riprap Design Criteria, Specifications, and Quality Control (FY 2003) - \$350k project awarded to Ayres Associates. Completion expected on 03/2006.
16. 24-24, Criteria for Selecting Hydraulic Models (1D/2D) (FY 2004) - \$175K project awarded to Ocean Engineering Associates (Dr. Max Sheppard). Completion expected on 06/2006.
17. 24-25, Risk-based Guidelines for Determining the Need for Investigation of Unknown Bridge Foundations (FY 2004) -- \$200K project awarded to GKY & Associates. Completion expected on 06/06.
18. 24-26, Effects of Debris on Bridge-Pier Scour (FY 2004). Funding increased from \$300k to \$600k to cover for research test at laboratory and report. Project started in 06/2004. Completion expected on 10/2007.
19. 20-07-(162), Synthesis-of-Practice: Correlation of Bench-Scale and Large-Scale Testing on

- Rolled Erosion Control Products. Awarded to CSU, \$50k. Project to be completed in Spring 2005. TCHH needs to decide what to do with this project. Revised final report being reviewed by the panel – please let Tim Hess know if anybody is interested in the report.
20. 20-07(178), Evaluation and Update of NCHRP 24-08: Scour at Bridge Foundations-Research Needs Study. Ayres Associates, 25k – this project will help to update 24-08:
 - 24-08 -- the contractor compiled scour research from all over the World. The contractor identified 39 problem statements, which were then prioritized. Priorities have been pretty much followed during the last several years to conduct research on stream stability and scour at highway bridges.
 - 20-07(178) will consist on assessing the current knowledge in the areas of stream stability and scour technology through the conduct of a literature review, identify gaps in these areas, assess where research has taken us this far. An expert panel will be assembled to work in this scope. Funds approved for Phase I were \$25K.
 21. 24-27, Evaluation of Bridge-Scour Research. Project funded for 2005 at \$350k. A panel of experts will be selected to identify needs to fill the gaps and advance current technology on stream stability and scour, and make recommendations to AASHTO Technical Committee on Hydrology and Hydraulics. Panel met and proposals were received and evaluated, but no selection was made – project has been broken into 3 parts – abutments, piers and geomorphology. NCHRP will be re-advertising on a limited solicitation basis. Coastal engineering has been separated from this project and expanded because will be using University of South Alabama earmark funds.
 22. 24-29, Scour at Bridge Foundations on Rock. Project funded for \$750k. Proposals are due on 11/15/05.
 23. 15-36, Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences. Project funded for \$400k – it is the first hydrology project funded. Will Thomas is the chair. Proposals due on November 1, 2005.
 24. 36-02 Synthesis, Practices for Monitoring Scour Critical Bridges, \$30k awarded to Hardesty and Hanover. Completion expected in Spring 2006.
 25. 25-25(8), Developing performance data collection protocol for stream restoration, \$50k awarded to GKY and Associates.
 26. 25-9(1), Environmental Impact of Construction and Repair Materials on Surface and Ground Waters – Outreach and Training, \$100k awarded to Oregon State University. Completion expected on Fall 2005.

OPEN DISCUSSION:

11. HDG have not been published, yet; however, it will be published this year. Chapter 1-7, and 9-14 are good to go. Chapter 8 needs response to the recommended deletion issues raised by Mike Fazio – Mike indicated that he fixed the problem back in February 2006. Kelley Rehm suggested that he re-submits his work.
12. Norm Schips stated that he had a chance to look at the glossary and noted that the file given to him by AASHTO was not the same that he was looking at. Norm will re-submit his comments back to AASHTO.
13. Chapter 15, Consultants, is supposed to have a technical review. The new chapter on professional development went to ballot – there are some issues with the quality of some of its figures.
14. The HDG will go to print in early June – once comments from Linda (of AASHTO) are sorted out.
15. The TCHH work plan was due by the end of February – it will be updated and finalized by the end of this week. Chairman Henderson and Secretary Pagán-Ortiz completed the TCHH Work Plan (See **Appendix A**).
16. The TCHH by-laws should be sent to members of the committee.

17. Kelley Rehm stated that a report on guidelines for selecting a publication title should be released in about a month – it shows steps and a checklist to go through for selecting a title for a publication.
18. AASHTO staff suggested that we meet just once a year. They would like that the TCHH consider using other methods for meetings such as conference calls, web-type conference calls – this approach could be used on a quarterly basis. This approach has been very useful for other committees. The TCHH decided to write a letter to the AASHTO Standing Committee on Highways to indicate that it would not like to make a change.
19. A discussion took place about the use of articulated cable-tied blocks -- using the current methodology does not get that big size of blocks. Cable-tied blocks have been used in Utah. It was stated that it would be nice to re-visit the mechanism of failure for cable-tied blocks – may need another look at whether or not this could be a good topic for an NCHRP project. It was stated that the NCHRP project 24-7(2) would have been the vehicle to do some testing on cable-tied blocks, especially on the issue of burial needs; however, this project is winding down. It was stated that additional anchors increases the safety factor for articulated cable-tied blocks. Florida DOT is considering a research project on this topic. The TCHH decided to table this topic – it was suggested that the TCHH wait for the final NCHRP 24-7(2) report before doing anything further on the subject of articulated cable-tied blocks.
20. The TCHH visited briefly the topic of re-prioritizing, adding/deleting problem statements. Glenn DeCou led a discussion on the problem statement pertaining to hydroplaning effects, specifically about what is its intention. Is it to develop a design procedure? Would it be pointing back to the HEC-21 procedure? Te Ngo stated that Dave Halvolson devoted a lot of time on this subject. This topic was dropped from the manual because the TCHH was worried about the legal aspects of hydroplaning. Chairman Henderson suggested that the TCHH would need to review this problem statement and that consideration be given in the scope of the problem statement to develop a specification to mitigate hydroplaning effect. Rick Renna stated that TXDOT is doing work in this area. Hani Farghaly stated that the TCHH should try to avoid a reference to hydroplaning as it is a function of drivers, tire pressure. He stated that these parameters cannot be controlled by a designer -- hydroplaning just becomes one of the issues to be considered during design. Also, he stated that we may have to look into risk analysis and all factors would come into play – tire pressure, different speed – each one of these aspects become a design consideration.
21. Chairman Henderson stated that the next time for voting on problem statements is November 2006. It would be nice to have our problem statements revised by June 2006. The TCHH took a quick view at the current problems statement of the TCHH. Also, it took a quick view at the problem statements from the TRB AFB60 subcommittee on hydrology, hydraulics and water quality.
22. Rick Renna questioned if there is a need to address wave forces on an NCHRP project. He stated that he is concerned about duplicating efforts. Chairman Henderson stated that there were different institutions working on the same issues presented at the December 2005 wave load summit at the FHWA Research Facilities. It was stated that somebody needs to take the lead and oversee what research work is going on. It was stated that procedures for estimating wave force load action acting on a bridge would be disseminated soon.
23. Mark Miles, Mike Fazio and Andrea Hendrickson would be working on re-scoping problem statement priority number 1 – will consider using web-based conference and would try to have is ready by June 2006.
24. Glenn DeCou stated that he is concerned with the outcome of NCHRP 24-19, Environmentally Sensitive Channel and Bank Protection – he indicated that the report lacks concepts and that it seems that we have a design guideline before data. It was stated that the guidance presented in this report need a full scale testing. Glenn DeCou, Brooks Booher, Karuna Pujara and Lotwick Reese would be taking a look at this manual and come up with a problem statement.
25. Members of the committee stated that they need clarification on the TRB AFB60's problem statement number 12, which was ranked number 7 by the TCHH – need to talk with Will Thomas and seek clarification on this problem statement.

26. Chairman Henderson stated that there is a lot of concern that the TRB AFB60 Subcommittee on Hydrology, Hydraulics and Water Quality is too heavy on water quality. They are seeking for engineering practitioners to join the subcommittee to balance input from researchers and the academia.
27. It was reported that the TRB AFB60 Subcommittee on Hydrology, Hydraulics and Water Quality will have a symposium in 2007 on stream stability issues. Also, it was reported that the Hydraulics Subcommittee of AFB60 subdivided this committee as follows: Culverts, Stream Stability/Stream Restoration, and Bridge Hydraulics and Scour.
28. Hani Farghaly suggested that the TCHH should consider developing a problem statement on Benefits of Water Quality – for developing standards for water quality and for a monitoring study to look at the benefit of roadside ditches and money savings from storm water management. Hani volunteered to work on this problem statement – he would need the electronic version of the standard template to format this problem statement.
29. Chairman Henderson questioned if the TCHH should put together another problem statement on the subject of Analyzing Roadside Channel Treatment – this topic is tied to problem statements number 3 and 7.
30. Regarding problem statement on “Evaluation of Long-Term Performance of Best Management Practices” – it was suggested to add a line to address Hani Farghaly’s concerns with monitoring. However, Hani stated that he was concerned that by adding a monitoring component in this problem statement, it may be too much in the scope of this project. After considering Hani Farghaly’s point, Chairman Henderson suggested that the TCHH add another research problem statement on the subject of monitoring. Hani Farghaly will develop a proposed problem statement to Chairman Henderson who will forward it to the TCHH members for ranking consideration for our fall 2006 meeting.
31. Rae Van Hoven stated that in the Southwest they have lots of problems with sediment transport, especially with alluvial fans – she will work on a problem statement on this subject and give it to Chairman Henderson. Also, she needs an electronic version of the standard problem statement template for formatting her problem statement.
32. Rick Renna stated that there is a need to do research on applying (meaning trying to adapt) coastal engineering procedures to the highway environment and try to identify any gaps – he stated that he may not be able to go to Scott Douglas because he may not have the time to do this research. A problem statement has been written on this subject and he would like to offer it to the TCHH for voting. The topic title is “Coastal Engineering Procedures for Highway Applications.” Its scope is to identify procedures that are ready for prime time and to identify gaps.
33. Chairman Henderson indicated that he would need to have all new problem statements by June 2006 so that the TCHH can share them with the TRB AFB60 Committee.
34. Glenn DeCou indicated that he would like to see a problem statement on climate changes issues, their impact on society and infrastructure. Chairman Henderson suggested that the TCHH waits and see what direction is going to be taken on a national level. Glenn DeCou questioned what is the Federal DOT position on this issue (projection of sea level rise). Also, he stated that a Senate bill in California put out the Department of Water Resources need to look at all levees in California. It was mentioned that FHWA is sponsoring a symposium on ocean level rise.
35. Mike Fazio expressed a concern with the minutes – they are not getting to the committee members on time. Secretary Pagán-Ortiz is aware of this situation and is working on trying to get them to the TCHH members sooner.

DISCUSISON ON FUTURE DIRECTION OF TCHH:

36. Chairman Henderson indicated that his last meeting as chairman will be in October 2006, and that after his term, the chair will be a member of the subcommittee on design.
37. A suggestion was made that the TCHH would fit better under the Subcommittee on Bridges and Structures. AASHTO will be making a final decision on this in May 2006.
38. Chairman Henderson voiced his concern about this move. He highlighted that probably there is a

misunderstanding in AAHSTO about the structure of the TCHH – it is not just riverine hydraulics, but it covers the whole field of hydraulics engineering – the TCHH gets involved in the whole process – from the planning to the construction and maintenance whereas the Subcommittee on Bridges and Structures is narrow -- and that is why we fit better under the Subcommittee on Design. Chairman Henderson recommended that we come up with a functional area of responsibilities and noted that, if we stay under the Subcommittee on Design, the changes in the structure of the TCHH will be minimum; however, if we are shifted to the Subcommittee on Bridges and Structures, then the whole spectrum of the TCHH will change.

39. It was recommended that the TCHH should contact members of the Standing Committee on Highways (by e-mail or in person). The committee meets on May 2006 and will be voting on this issue at that time. We should articulate the pluses for maintaining our TCHH active and the importance of keeping it under the Subcommittee on Design.
40. Reference was made to the content of a letter from the Subcommittee on Design dated 11/16/05, which stated that the chairs of each technical committee shall be assigned by the technical committee members within the Subcommittee on Design. A suggestion was made that the TCHH put together an opinion about this change – any letter(s) expressing our concern about this move should be written to Mal Kerley/Alan Bealer by the first week of May 2006. Also, it was noted that TCHH members should lobby not only for our research needs, but also for the TCHH to stay under the Subcommittee on Design.
41. Chairman Henderson held an open discussion regarding the direction, progress, concerns and ideas concerning the status of the TCHH. He asked for volunteers to work on the issues pertaining to the rationale for recommending the TCHH remains under the Subcommittee on Design (SCOD) rather than being reassigned to the Subcommittee on Bridges (SCOB), and the rationale for recommending that the TCHH maintain a chair from within the TCHH membership. Rick Renna, Richard Phillips, Karuna Pujara and Mike Fazio volunteered to work on this and turned in a report with recommendations (**See Appendix B**).
42. A comment was made with regard to approaching the AASHTO Subcommittees on Design and the Subcommittee on Bridges and Structures regarding the status of our TC on Hydrology and Hydraulics -- we should be polite (careful) in what we want to say and how we are saying it. Chairman Henderson suggested that if we have the opportunity to meet with an AASHTO player to take advantage of the opportunity to lobby for our TC on Hydrology and Hydraulics.
43. Chairman Henderson will keep everybody in the loop with issue on committee status.

DISCUSSION ON LEVEL I AND LEVEL II MANUALS:

44. Chairman Henderson open the discussion by saying that there is a need for clarification on what constitutes policy and what constitutes procedures.
45. Chapter 22 was used as an example of a chapter that does not have a whole lot of policy.
46. Glenn DeCou questioned if the role of policy is to identify what the standard is.
47. Lotwick Reese stated that the Cody minutes detailed what a Level I, Level II and Level III is all about. Also, it was stated that the Fall 2004 minutes highlight that Bart Bergendahl (FHWA) shared information with the TCHH about what should be policy and procedures. It was recommended that the TCHH come up with a standard format and style for each chapter. Chairman Henderson stated that Lotwick Reese and Mark Miles would work together in defining/develop guidance for developing policy and guidance manuals in a users friendly format and to ensure a consistent format for the manuals that the TCHH will be developing.
48. Bart Bergendahl offered to share with the TCHH what Federal Lands has done on their policy manual.
49. Norm Schips questioned if the TCHH is looking at developing a document similar to the AAASHTO Green Book and the general consensus was that he was right. Hani Farghaly indicated that his department went through this exercise a while ago and they ended writing down definitions for policy – he offered to share what they have done.

50. Bart Bergendahl stated that policy should also include standards and criteria and that there is a need to define each one.
51. Hani Farghaly questioned if the TCHH will be providing the desired standards or a minimum design standard. It was recommended that the TCHH should give the minimum design standard. Another discussion took place with regards to whether or not the TCHH should decide where the standards should reside. It was recommended that the standards should be in the Policy (Level I) document and that as such, the TCHH may have to revise the title of the Level I document to include standards. Another discussion took place with regards to where the references should reside. It was recommended that they reside in both documents. In addition, it was recommended that references that are not used in the Level I and Level II documents should be deleted from these manuals.
52. Mark Miles stated that what he did during his first cut on procedures was to refer the reader to look at the following references for further information.
53. Kelley Rehm advised that in the Green Book, there is text on one page and a commentary in the other – it was recommended not to use side-by-side columns.
54. There was a motion to clarify what is that something different that we are trying to accomplish by doing a Level I and Level II document and to identify who would be the end user. The following clarification was offered – The manuals should be a reference to policy and guidance and documents that could be used to go to environmental agencies to show how things are done on a national level. It was further stated that the original intention of the MDM was that it would be a document that could be taken off the shell and customized for a specific area needs – and unfortunately, nobody bought it. It was the consensus that the TCHH needs to come up with a more users friendly manual.
55. The TCHH split in two groups to work each on policy and procedures. Mark Miles and Lotwick Reese worked on developing guidance that should be followed by the TCHH to work on policy and procedures. Lotwick Reese made a presentation about the guidance that he followed for developing his policy and procedures for his draft chapters. It was stated that the issue concerning using “should” versus “shall” should be clarified.
56. Bart Bergendahl stated that since the FHWA’s Federal Lands Highway Program has no authority to create policy, they substituted policy with standard practices. It was the general consensus of the TCHH that policy is for a high level of authority. Also, it was mentioned that while we may want to include policy in our manuals, roadway designers may not need it.
57. Glenn DeCou questioned what is the ultimate goal that we would like to achieve – Is it to develop a better document? Or, is it the type of practice that will produce a good quality design? Chairman Henderson stated that a previous chair of the TCHH indicated that AASHTO was concerned with the MDM – it has been their most expensive document with the lowest rate of return and that is the reason why the TCHH is trying to come up with an idea of how to make the manual more friendly and attractive to practitioners to use. Another big concern about the MDM was not having something that DOTs could easily adopt.
58. It was stated that policy will be a standard document and procedures could be a document with computational procedures – a more dynamic document.
59. A comment was made about people moving into more friendly, online manuals these days. Other comments followed such as doubts about what we would be accomplishing by breaking a manual into two or three manuals, questions about whether or not the MDM was marketed enough, and the appearance that the AASHTO manuals may be competing with the FHWA’s HECs and HDS. Also, the members of the TCHH understand that the FHWA HEC manuals represent guidance and procedures.
60. Jorge Pagán-Ortiz indicated that FHWA would have limited funding resources for updating its HECs and HDS in the foreseeable future, and that other funding sources may have to be considered for updating these publications such as pooled-fund projects.
61. Norm Schips stated that each area in hydraulics is sort of a unique area of expertise on its own – they are disciplines that are very detailed. Chairman Henderson stated that that is the point that leads the

- TCHH to its strong believe that it should be under the AASHTO Subcommittee on design.
62. Various members of the TCHH offered comments regarding the policy document (Level I) such as: a policy document would be adopted by DOTs; there will be an opportunity for DOTs to adopt a consistent policy – it would be a backbone – it will have minimum standards.
 63. Following this discussion, the TCHH decided to work on a pilot project – develop a template for guidance to be used for the technical and non-technical chapters.
 64. Each group presented an outline of their template.
 65. Members of the non-technical group were: Rick Renna, Mark Miles, Amy Ronnfeldt, Alvin Shoblom, Rae Van Hoven, Karuna Pujara, Glenn DeCou and Brooks Booher. Their outline consisted on: Introduction, General Considerations, Major Sub-categories (“What’s and Why’s, but not the How’s), recommendations and references.
 66. Members of the technical group were: Andrea Hendrickson, Bill Bailey, Mike Fazio, Richard Phillips, Hani Farghaly, Preston Helms, Roy Mills, Lotwick Reese, and Norm Schips. Basically, their outline consisted on: General procedure overview in the main document and the full procedure in an appendix.
 67. Members expressed concerns about the templates such as: What is an appendix and what is a procedure? Who is the target audience? Need to have a more streamlined document.
 68. Comments from several Chapter chairpersons and some of the co-reviewers revealed that many chapter chairs were struggling with how to segregate content of Policy Chapters, Level I, and the Procedure Chapters, Level II, documents. In response to concerns regarding appropriate content of the Level I vs. Level II, the TCHH has elected to shift gears and restructure the general format of the new MDM document. The TCHH reached consensus that we will abandon the titles of Level I and Level II thereby adopting temporary designations of “What & Why” (Level I) and “How” (Level II). The temporary designations will hopefully help committee members stay focused on content needs. It is the desire that this restructuring will offer clarity to help move our task forward with greater consistency among Chapters. The TCHH agreed that we could establish final title of the documents at a later date.
 69. The TCHH held a vote to consider three options for its manuals: A stand alone document (all inclusive) – pretty much the same as the MDM; Level I and Level II documents; and a single document with an overview of procedures, commentaries and independent appendixes (references and procedures). The TCHH voted for the latter option following the guidance presented in the document presented in **Appendix C**.
 70. Chairman Henderson stated that, based on the new direction taken by the committee, it may require a greater deal of coordination between other chapter chairs. The TCHH members may need to work on their chapters through the web – this could facilitate sharing information between a team as each one makes progress on their corresponding chapter, and at the same time see how others are making progress. Before we go that route, the TCHH needs to flush things out first. Kelley Rehm will check to make sure if the TCHH could get a password to work through the web.
 71. Chairman Henderson requested the members of the TCHH to start putting a date on any document that will be reviewed. Also, he indicated that chapter chairs need to take care of the level of effort needed in his/her chapter and that there will be a need to minimize re-writing. In addition, there could be a need to develop new chapters.
 72. There were questions regarding the need to have a chapter on wetlands – it as decided that it is needed because one may need a wetland for storm water management.
 73. Lotwick Reese suggested that the TCHH spends some time during the next meeting in doing similar teamwork in small groups to make progress that would be uniform for the new direction that we are taking. Also, a concern was raised regarding working on small groups and having some absentees – this could be a problem and should be properly addressed during the Fall 2006 meeting. The suggested approach recommended by Lotwick Reese and the concern regarding absentees during the TCHH meetings led the TCHH decide to change the method of document presentation at our meetings.

Beginning with the Fall 2006 meeting in Albuquerque, NM, the committee will be divided into subgroups to simultaneously discuss and refine Chapter reviews and comments. The number of subgroups established will be dependent on the number of members present and is estimated to be three (3) or four (4) groups of five (5) persons. Chairman Henderson anticipates gathering the collective body of members together daily to discuss progress, experiences, and/or issues. If there is warrant, the Chairman Henderson would reserve the right to conduct these group discussions during the morning and afternoon sessions.

74. Chapter chairs need to assess whether or not their corresponding chapters need to be stand alone chapters (i.e., documentation chapter, which perhaps could be a reference).
75. It was stated that the TCHH should decide whether or not the documentation and data collection chapters should be centralized – these chapters are static ones, i.e., not much change is expected.
76. It was recommended that the “What’s and Why’s” should go in the main document, and the “How’s” in the appendixes. Also, the TCHH should decide what to do with FEMA policies, EPA policies – there is a need for a chapter to be used for all general policies.
77. The question of “level of authority” for the MDM was discussed. It was determined that the MDM is to be a product for voluntary acceptance by the end users and not a mandated directive. Chairman Henderson will contact the Committee’s AASHTO Liaison, Ms. Kelley Rehm, to establish whether the MDM will be English only or to incorporate SI units. He will also request AASHTO’s most recent directives on style & publishing and whether or not there have been any recent changes. The findings will be distributed to all members under separate cover.

BUSINESS SESSION:

78. Ray Van Hoven will be hosting our Fall 2006 meeting in Albuquerque, New Mexico from September 26-28, 2006 – please keep in mind that we will have a full 3-day meeting.
79. Hotel rate is \$66 per night for one person; \$99 per night for two persons. Lat day for registering at the Albuquerque hotel is August 6, 2006.
80. There is a possibility that the Spring 2007 meeting will be held in Alaska (with Florida as a back-up).
81. Typical high temperature in Anchorage, Alaska during spring is between 50 to 60 degrees (sky areas close in July).
82. Mark Miles is generating some estimates. There is one kicker – lots of the hotels have lots of conferences going on. So, if the TCHH is going to make its decision to meet in Alaska for the Spring 2007 meeting, we have to decide now.
 - a. For travel, he is assuming that one will fly to Anchorage.
 - b. Airfare from the East coast should be between \$500-\$600 to Anchorage.
 - c. For lodging, he will try to find a hotel within the Federal per-diem rate allowance
 - d. The Alyeska Resort is about 45 miles from Anchorage. Their room rate is \$119 per night. However, the Federal per-diem is \$95. The meeting room is free if we have a minimum of 15 people staying at the Resort.
 - e. We could work with the hotel to upset lodging cost by assigning a fee to the conference room. Chairman Henderson introduced a motion to accept Mark’s proposal to try to work it out with the hotel and have the rooms at \$95. Mike Fazio second the motion and the members of the TCHH voted and the motion passed by unanimous decision. The committee will be moving in that direction.
83. The TCHH would explore the possibility to meet in Florida in Fall 2007, and in Washington, D.C. in Spring 2008.

ASSIGNMENT OF CHAPTER CHAIRS FOR HDG:

Chapter	HDG Title	Chapter Chair
1	Planning	Fazio
2	Hydrology	Van Hoven
3	Erosion	Henderson
4	Culverts	Ngo
5	Legal	Richardson
6	Channels	Booher
7	Bridges	Mills
8	Restoration	Fazio
9	Storm Drains	Bailey
10	Environmental	Miles
11	Coastal	Renna
12	Stormwater	Dougherty
13	Training	Phillips
14	Culvert Materials	DeCou
15	Consultants	Pujara
	Glossary	Schips

ASSIGNMENT OF CHAPTER CHAIRS AND TEAM MEMBERS FOR THE POLICY (LEVEL I) AND PROCEDURES (LEVEL II) MANUALS (*CHAIRMAN HENDERSON WILL DECIDE IF THIS WILL BE THE CHAPTER CHAIR ASSIGNMENT FOR THE SINGLE DRAINAGE DOCUMENT VOTED BY THE TCHH DURING THE SPRING 2006 MEETING*):

Policy (Level I)/Procedures (Level II) Manuals					
Chapter	Title	Chapter Chair	Team Members		
1	Introduction	Schips	Henderson	Mills	Booher
2	Legal	Richardson	Schips	Miles	Ghere
3					
4	Documentation	DeCou	Bailey	Fazio	Mills
5	Planning	Fazio	Richardson	Tran	O'Connor
6	Data Collection	Reese	Hendrickson	Helms	Pagan
7	Hydrology	Van Hoven	Fazio	Krolak	Bailey
8	Channels	Booher	Arneson	Nurmi	Farghaly
9	Culverts	Ngo	Phillips	O'Connor	Miles
10	Bridge	Mills	Arneson	Phillips	Pagan
11	Energy	Phillips	Ngo	Helms	Ronnfeldt
12	Storage	Dougherty	Bailey	Henderson	Hendrickson
13	Storm Drains	Bailey	Reese	Dougherty	Kerenyi
14	Pump Station	Ghere	DeCou	Reese	Bergendahl
15	Environment	Miles	Henderson	Renna	Pujara
16	Erosion and Sediment	Henderson	Dougherty	Van Hoven	Pujara
17	Channel Bank Protection	Pujara	Bergendahl	Farghaly	Booher
18	Coastal Zone	Renna	Henderson	Miles	Krolak
19	Construction	O'Connor	Ngo	Richardson	Ronnfeldt
20	Maintenance	Henderson	Booher	O'Connor	Dougherty
21	Wetlands	Hendrickson	Bailey	Nurmi	Henderson
22	Groundwater	Pujara	Renna	Miles	Fazio

PROBLEM STATEMENTS:

TCHH Vote on Problem Statement Priorities Fall 2005 Meeting, Sioux Falls, SD		
Problem Statement Number	2005 Rank	Topic
		AASHTO TCHH Topics
1	1	<i>Development of Design Methods for In-Stream Flow Control Structures, new problem statement assigned to Mark Miles</i> <i>Selection and design of in-stream flow structures in mitigating meander migration in channel bends (1)</i> <i>Design of in-stream grade control structures and stream habitat for degrading channels (2)</i>
2	3	<i>Time Rate of Scour at Wide & Skewed Bridge Piers</i> <i>Scour at wide and Skewer Piers (3)</i>
3	2	Evaluation of Long Term Performance of Stormwater BMPs
4	4	Effects of Riprap on Fish Habitat
5	9	Development of Bench Test Method for Determining Manning's "n"
6	5	Development of a Specification to Mitigate Hydroplaning Effects
7	8	Integration of Water Quality and Drainage Structure Design
8	14	In-Situ Scour Measuring Device
9	10	Development of a Prediction Model for Ice Jam Formation
10	16	Develop Hydraulically Efficient Bridge Rail
11	6	Multi-Parameter, Storm Model for Coastal Scour
		Revised 20-07 "Survey of Drainage Practice"
	TRB Subcommittee Rank	
		TRB AFB60 Hydrology Topics
12	7	Improvements in the Design Storm Approach for Estimating Peak Flows
13	17	Flood Frequency Analyses for Regulated Watersheds
14	19	Improved Procedures for Converting NEXRAD Reflectivity Data to Rainfall
15	17	Estimation of Long-term Continuous Hydrographs for Use in Scour Computations
16	18	Effects of Land-Use Changes on Channel-Forming Discharges
		TRB AFB60 Hydraulic Topics
17	13	Hydraulics and long-term environmental impacts and aquatic biology of culverts
18	11	Design of long and steep culverts for environmentally sensitive installations
19	12	Scour at bridges with unknown foundations
20	15	Field verification of scour prediction

COMMITTEE ACTIVITY SCHEDULE:

- 2006 Spring - Refine direction and scope of MDM revision
- 2006 Fall - Full committee review of first draft reformatted MDM document
- 2007 Spring - Full committee review of second draft reformatted MDM document
- 2007 Fall - Final committee review of reformatted MDM document
- 2008 Spring - Full committee evaluation of HDG update needs
- 2008 Fall - Ballot reformatted MDM document
- 2009 Spring - Publish reformatted MDM document
- 2009 Fall - Full committee review of first draft HDG updates
- 2009 Fall - Full committee review of second draft HDG updates
- 2010 Spring - Final review of HDG updates
- 2010 Fall - Ballot HDG, Policy, and Procedures
- 2010 Fall - Publish new HDG, Policy, and Procedures;
- 2010 Fall - Develop plan for next 5-year update

- Every Spring - Review NCHRP research needs/Assign problem statements/Submit by deadlines
- Every Fall - Prioritize and submit NCHRP research needs problem statements

FINANCIAL REPORT (As of April 6, 2006):

• Funds Available prior to Meeting:	\$3,786
• Registration Fees from Spring 2006 (\$95):	<u>\$2,470</u>
+ Subtotal	\$6,256
• Expenses (Food/breaks):	<u>-\$2,000</u>
• Total Balance	\$4,186

84. The registration fee will stay at \$95 for the Fall 2006 meeting in Albuquerque, New Mexico.

TC FUTURE MEETING LOCATIONS:

- 2006 Fall Albuquerque, New Mexico
- 2007 Spring Alaska or Florida (to be decided)
- 2007 Fall Washington, D.C. (to be decided)

AASHTO TECHNICAL COMMITTEE ON HYDOLOGY AND HYDRAULICS MEMBERS/MEMBER'S REPRESENTATIVES		
MEMBER	ADDRESS	TELEPHONE
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Mr. Brooks Booher Staff Hydraulic Engineer	AR State Highway & Transportation Dept. 10324 I-30, Little Rock, AR, 72209 PO Box 2261, Little Rock, 72203-2261	(501) 569-2589 FAX 569-2057 brooks.booher@arkansashighways.com
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Mr. Preston Helms Hydraulic Design Engineer	SC Department of Transportation P.O. Box 191, Columbia, SC 29202 955 Park Street, Columbia, SC 29201	(803) 737-1723 FAX 737-9868 helmspw@dot.state.sc.us
Mr. David Henderson, Chair State Hydraulics Engineer	NC DOT, 1590 Mail Service Center Raleigh, North Carolina 27699 1020 Birch Ridge Rd., 27610 (deliveries)	(919) 250-4100 FAX 250-4108 dhenderson@dot.state.nc.us
Mr. Mark D. Miles, Vice Chair State Hydraulics Engineer D&ES/Bridge	Alaska DOT and Public Facilities 3132 Channel Drive, Rm 100 Juneau, Alaska 99801	(907) 465-8893 FAX 465-6947 mark_miles@dot.state.ak.us
Mr. Roy T. Mills State Hydraulics Engineer	VA Dept. of Transportation 1401 East Broad St. Richmond, Virginia 23219	(804) 786-9013 FAX 225-3686 roy.mills@vdot.virginia.gov
Ms. Rae Van Hoven State Drainage Engineer	NM DOT 1120 Cerrillos Rd. Santa Fe, New Mexico 87505-1842	(505) 827-5323 FAX 827-5345 rae.vanhoven@state.nm.us

AASHTO TECHNICAL COMMITTEE ON HYDOLOGY AND HYDRAULICS MEMBERS/MEMBER'S REPRESENTATIVES		
MEMBER	ADDRESS	TELEPHONE
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Mr. James R. Richardson Road Design Leader	Kansas Department of Transportation Bureau of Design, Road Section 700 SW Harrison St. Topeka, Kansas 66603-3754	(785) 368-8292 FAX 296-6946 jimr@ksdot.org
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Mr. Jorge E. Pagán-Ortiz Principal Bridge Engineer – Hydraulics (Secretary)	FHWA, HIBT-20 400 7th Street, SW., Room 3203 Washington, D.C. 20590	(202) 366-4604 FAX 366-3077 jorge.pagan@dot.gov
Ms. Andrea Hendrickson State Hydraulics Engineer	Minnesota Department of Transportation 3485 Hadley Avenue North Oakdale, MN 55128	(651) 747-2162 FAX 747-2115 andrea.hendrickson@dot.state.mn.us

AASHTO TECHNICAL COMMITTEE ON HYDOLOGY AND HYDRAULICS MEMBERS/MEMBER'S REPRESENTATIVES		
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Mr. Amir Soltani	Nevada Department of Transportation	(775) 888-7619 FAX 986-3407 amir.soltani@sbcglobal.net
Ms. Amy Ronnfeldt Hydraulics Engineer	TxDOT 200 E. Riverside Dr. Austin, Texas 78704	(512) 416-2328 FAX 416-3098 aronnfel@dot.state.tx.us
AASHTO HIGHWAY SUBCOMMITTEE ON DESIGN OFFICERS		
Dr. Kam K. Movassaghi (Chair) Secretary, LA DOT & Development	P.O. Box 94245 1201 Capitol Access Road Baton Rouge, LA 70804-9245	(225) 379-1200 FAX 379-1851 kammovassaghi@dotd.state.la.us
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Ms. Kelley C. Rehm, P.E. AASHTO Staff Project Engineer - Technical Committee on Hydrology and Hydraulics	AASHTO 520 Suffolk Court Old Hickory, Tennessee 37138	(859) 433-9623 FAX (866) 301-1322 krehm@ashto.org

Appendix A

Technical Committee on Hydrology and Hydraulics 2006 Work Plan

Chair: Dave Henderson, North Carolina
Vice-Chair: Mark Miles, Alaska
Secretary: Jorge E. Pagán-Ortiz, FHWA
AASHTO Liaison: Kelley Rehm

Technical Committee Charge Statement:

Provide a committee of professionals with a diverse and comprehensive knowledge and expertise in the fields of hydrology and hydraulics who are responsible to develop and maintain AASHTO policies and guidelines. These policies and guidelines are widely used by practitioners in the planning, design, construction and maintenance, and regulatory compliance of all drainage related features of surface transportation facilities.

Publications Responsibility:

The AASHTO Technical Committee on Hydrology and Hydraulics is responsible for developing and updating the following documents:

- *Highway Drainage Guidelines*, 2004 (publication due in 2006)
- *Model Drainage Manual*, 2005.

Committee Work Underway/Planned for 2006:

The 2005 AASHTO Model Drainage Manual will be refined into an engineering document on policies and standards intended to:

- Expand the usefulness to a broader audience.
- Develop more users friendly documents.
- Serve as a supporting mechanism for a broader level of policies and standards.
- Serve as a concise authoritative document that provides an acceptable range of standards.
- Reduce the needs of future update maintenance of policies and standards.
- Avoid duplication of “how to” guidance.

The TCHH is responsible for developing and ranking research problem statements, which are submitted through the committee chair to the TRB Research Advisory Committee and the AASHTO Standing Committee on Research for funding consideration. The committee will be reviewing its current problem statements during the Spring 2006 meeting. The TCHH members will develop new problem statements and update existing problem statements. The committee chair will communicate these problem statements with the TRB AFB60 Committee at their July 2006 meeting to avoid duplicating and competing research needs. The committee will establish priorities of its problem statements during the Fall 2006 meeting.

Meetings:

- AASHTO Technical Committee on Hydrology and Hydraulics Meeting, Albuquerque, New Mexico, September 26-28, 2006.
- AASHTO Technical Committee on Hydrology and Hydraulics Meeting, Spring 2007, Alaska or Florida (to be determined)

Research:

Research Underway (the outcome of the following research projects will be evaluated for potential

implementation in new AASHTO document and FHWA publications)

- NCHRP 15-24 Hydraulic Loss Coefficients for Culverts – estimated completion is 2007.
- NCHRP 15-36, Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences (estimated completion is Spring 2008)
- NCHRP 20-07(146), Development of Software Verification Protocol for the Hydrologic and Hydraulic Models for Highway Planning and Design (project report completed, but not accepted to date).
- NCHRP 20-07-(162), Synthesis-of-Practice: Correlation of Bench-Scale and Large-Scale Testing on Rolled Erosion Control Products. Revised final report being reviewed by the panel.
- NCHRP 24-7(2) Countermeasures Alternatives for Pier Scour (report due in 06/06).
- NCHRP 24-15(2) Bridge Scour in Cohesive Materials– (estimated completion is 06/2007).
- NCHRP 24-18 Countermeasures to Protect Bridge Abutments –(estimated completion is Summer 2006).
- NCHRP 24-20 Prediction of Scour at Bridge Abutments (estimated completion is 04/2007).
- NCHRP 24-23 Riprap Design Criteria, Specifications, and Quality Control (estimated completion is Summer 2006).
- NCHRP 24-24 Criteria for Selecting Hydraulic Models (1D/2D) –(estimated completion is 06/2006).
- NCHRP 24-25 Risk-based Guidelines for Determining the Need for Investigation of Unknown Bridge Foundations (estimated completion is 06/2006).
- NCHRP 24-27, Recommendations for the Adoption of Bridge Scour Research by State Highway Agencies – proposals were received and evaluated, but no selection was made. Panel decided to break project in three parts: abutments, piers and geomorphology. NCHRP will be re-advertising on a limited solicitation basis.
- NCHRP 24-29, Scour at Bridge Foundations on Rock (not awarded to date).
- NCHRP 25-25(8), Developing performance data collection protocol for stream restoration (awarded).
- NCHRP 36-02 Synthesis, Practices for Monitoring Scour Critical Bridges (estimated completion in Spring 2006).

Research Proposed:

- Problem Statement Priority No. 1, “Procedure For Determination of the Joint Probability of Design Peak Flows at Confluences of Streams and Rivers” (received NCHRP funding for FY ‘07).
- Problem Statement Priority No. 2, “Effects of Fractured or Degradable Rock on Pier Scour at Bridges” (to be re-prioritized in Fall 2006).
- Problem Statement Priority No. 3, “Development of Design Methods for In-stream Flow Control Structures” (selected for contingency funding, to be re-prioritized in Fall 2006).
- Problem Statement Priority No. 4, “Time Rate of Scour at Wide and Skewed Bridge Piers” (received NCHRP funding for FY ‘07).

5-Year Goals:

The AASHTO Technical Committee on Hydrology and Hydraulics (TCHH) decided at the Fall 2003 meeting that the Hydraulics Drainage Guidelines (HDG) and the Model Drainage Manual (MDM) are valued resources in the engineering community. The THCC elected to perform periodic maintenance on

the HDG to keep it reasonably current and reformat the MDM as discussed in the committee work section presented in this document.

Committee Activity Schedule:

- 2006 Spring - Refine direction and scope of MDM revision
- 2006 Fall - Full committee review of first draft reformatted MDM document
- 2007 Spring - Full committee review of second draft reformatted MDM document
- 2007 Fall - Final committee review of reformatted MDM document
- 2008 Spring - Full committee evaluation of HDG update needs
- 2008 Fall - Ballot reformatted MDM document
- 2009 Spring - Publish reformatted MDM document
- 2009 Fall - Full committee review of first draft HDG updates
- 2010 Spring - Full committee review of second draft HDG updates
- 2010 Fall - Final review of HDG updates
- 2010 Fall - Ballot HDG, Policy, and Procedures
- 2010 Fall - Publish new HDG, Policy, and Procedures;
Develop plan for next 5-year update
- Every Spring - Review NCHRP research needs/Assign problem statements/Submit by deadlines
- Every Fall - Prioritize and submit NCHRP research needs problem statements

Appendix B

AASHTO Technical Committee on Hydrology and Hydraulics (TCHH)

Issues:

- **AASHTO Headquarters has recommended to move the TCHH from the Subcommittee on Design to the Subcommittee on Bridges and Structures.**
- **The TCHH committee chair would be filled from membership of the Subcommittee on Design rather than from the TCHH membership.**

Rationale for recommending the TCHH remains under the Subcommittee on Design (SCOD) rather than being reassigned to the Subcommittee on Bridges (SCOB):

- ***Broad areas of technical expertise, policy-making, legal aspects, and staff development, are included within the responsibilities of the TCHH that are not included in the jurisdiction of the SCOB:***
 - *Hydrology*
 - *Roadway Drainage (pavement hydraulics, storm systems, channels)*
 - *Bridge Deck Drainage*
 - *Urban Drainage*
 - *Pump Stations*
 - *Stormwater Management (water quality and quantity)*
 - *NPDES Compliance*
 - *Floodplain Management*
 - *Groundwater Hydraulics*
 - *Culvert Hydraulics (energy dissipators, scour at culvert outlets)*
 - *Culvert Rehabilitation*
 - *Alternative Pipe Selection*
 - *Bridge Hydraulics*
 - *Coastal Hydraulics*
 - *Channel Stability and Scour (riverine and coastal)*
 - *Countermeasure (riverine and coastal, bridges and causeways)*
 - *Bank and Shore Protection (lakes and reservoirs)*
 - *Environmental Impact Analysis, Permitting, and Mitigation Support*
 - *Wetlands Hydrology / Hydraulics*
 - *Natural Systems Design (continuity of aquatic and upland species passage in riverine and tidal systems)*
 - *Erosion and Sediment Control*
 - *Riparian and Drainage Law*

- *As can be seen from the table below, the duties of the TCHH are much more relevant to the SCOD than the SCOB:*

<i>TCHH AREAS OF RESPONSIBILITY</i>	SCOD	SCOB
Hydrology	X	X
Roadway Drainage	X	
Bridge Deck Drainage		X
Urban Drainage	X	
Pump Stations	X	
Stormwater Management	X	
NPDES Compliance	X	
Floodplain Management	X	X
Groundwater Hydraulics	X	
Culvert Hydraulics	X	X
Culvert Rehabilitation	X	
Alternative Pipe Selection	X	X
Bridge Hydraulics		X
Coastal Hydraulics	X	X
Channel Stability and Scour	X	X
Countermeasures	X	X
Bank and Shore Protection	X	
Environmental Permitting and Mitigation	X	
Wetlands Hydrology and Hydraulics	X	
Natural Systems Design	X	
Erosion and Sediment Control	X	
Riparian and Drainage Law	X	

Members of the TCHH are not currently members of the Subcommittee on Bridges.

- *The SCOB, in some instances, has full representation from several states currently participating on the TCHH. This will preclude experienced and valued current TCHH members from membership on the SCOB.*

Rationale for recommending that the TCHH maintain a chair from within the TCHH membership:

- *Broad institutional knowledge of the TCHH.*
- *Broad knowledge of the areas of expertise already presented in this document.*
- *TCHH span of responsibilities range from planning through design, construction, maintenance, and litigation support.*

Appendix C

AASHTO Technical Committee on Hydrology and Hydraulics
Spring Meeting
Buffalo, New York
April 4-6, 2006

What is that we are trying to accomplish in replacing the MDM?

1. Expand the usefulness to a broader audience.
2. Develop more users friendly documents.
3. Develop a supporting mechanism (reference, backbone) for a broader level of standards.
4. Develop a concise authoritative document that provides an acceptable range of standards.
5. Develop a more stable document (less need to update) on **policies and standards**, and a more dynamic document on **guidelines and** procedures (more need to update).
6. Avoid duplication of the “how to” guidance.
7. Overview of procedure when there is an existing reference.

Options to be considered:

1. Stand alone document (all inclusive) – pretty much the same as the MDM: Vote: 2
2. Level 1 and Level 2: Vote: 6
3. Single drainage document with an overview of procedures, commentaries and independent appendixes (references and procedures). Vote: 8

No Vote: 1