

**Draft Minutes  
May 9, 2005**

**By:**

**Jorge E. Pagán-Ortiz**

**AASHTO TECHNICAL COMMITTEE ON HYDROLOGY AND HYDRAULICS  
MEETING  
October 4 - October 6, 2004  
Austin, Texas  
AGENDA**

**Monday October 4, 2004**

- |                     |   |
|---------------------|---|
| 8:00 am             | Barry Newman – Call Committee Meeting to Order and Introductions  |
| 8:10 am – 8:30 am   | Welcome – Dave Stolpa   |
| 8:30am – 9:30 am    | Jorge Pagan – FHWA Perspective  |
| 9:30am – 10:30 am   | Committee - Status of HDG, MDM and New Manuals  |
| 10:30 am – 10:45 am | Break   |
| 10:45 am – 11:15 pm | Tim Hess – NCHRP Project Update   |
| 11:15 am – 12:00 pm | Committee – NCHRP Project Planning and Problem Statements   |
| 12:00 pm – 1:00 pm  | Lunch   |
|                     | <i>Discussion of Changes to MDM &amp; HDG - Chapter Chairs</i>  |
| 1:00 pm – 2:00 pm   | General Discussion of <u>Policy</u> and <u>Procedures</u> Manuals   |
|                     | <i>Table Readings of Outlines for<br/>“Policy for Design of Highway Drainage Facilities”<br/>and<br/>“Recommended Procedures for Design of Highway Drainage Facilities”</i> |
| 2:00 pm – 2:30 pm   | Barry Newman – Chapter 1, Introduction  |
| 2:30 pm – 2:45 pm   | Jim Richardson – Chapter 2, Legal Aspects   |
| 2:45 pm – 3:00 pm   | Break   |
| 3:00 pm – 3:15 pm   | Norm Schips – Chapter 3, Policy   |
| 3:15 pm – 3:45 pm   | Glenn DeCou – MDM Chapter 4, Documentation  |
| 3:45 pm – 4:15 pm   | Mike Fazio – MDM Chapter 5, Planning and Location   |
| 4:15 pm – 5:00 pm   | Lotwick Reese – MDM Chapter 6, Data Collection  |

**Tuesday, October 5, 2004**

8:00 am – 8:45 am	Rae Van Hoven – Chapter 7 — Hydrology
8:45 am – 9:15 am	Brooks Booher – Chapter 8, Channels
9:15 am – 10:00 am	Te Ngo – Chapter 9, Culverts
10:00 am – 10:15 am	Break
10:15 am – 11:00 am	Roy Mills – Chapter 10, Bridges
11:00 am – 11:30 am	Barry Newman – Chapter 11, Energy Dissipators
11:30 am – 12:00 pm	Merril Dougherty – Chapter 12, Storage Facilities
12:00 pm – 1:00 pm	Lunch
1:00 pm – 2:00 pm	NCHRP 20-07(178) Scour at Bridge Foundations, Research Needs Study Update
2:00 pm – 2:25 pm	Bart Bergendahl, National Fish Passage Design Guidance
2:25 pm – 2:45 pm	Brain Roberts, TRB Problem Statements
2:45 pm – 3:00 pm	Break
3:00 pm – 5:00 pm	Dave Stolpa, ATC Long Range Plan, Technical Presentations

**Wednesday, October 6, 2004**

8:00 pm – 8:45 am	Bill Bailey – Chapter 13, Storm Drainage Systems
8:45 am – 9:30 am	Dan Ghere – Chapter 14, Pump Stations
9:30 am – 10:15 am	Mark Miles – Chapter 15, Surface Water Environment
10:15 am – 10:30 am	Break
10:30 am – 11:15 am	David Henderson – Chapter 16, Erosion And Sediment Control
11:15 am – 12000 pm	Barry Newman – Chapter 17, Bank Protection
12:00 pm – 1:00 pm	Lunch
1:00 pm – 1:45 pm	Rick Renna – Chapter 18, Coastal Zone
1:45 pm – 2:15 pm	Te Ngo – Chapter 19, Construction
2:15 pm – 2:45 pm	David Stolpa – Chapter 20, Maintenance
2:45 pm – 3:00 pm	Break
3:00 pm – 3:30 pm	Norman Schips – MDM Glossary
3:30 pm – 4:00 pm	Tamara Reid – Update of AASHTO Activities
4:00 pm – 4:30 pm	Barry Newman - Task Force Business Meeting
4:30 pm	Barry Newman - Adjourn Task Force Meeting

**WELCOME AND INTRODUCTION:**

1. Chairman Barry Newman welcomed members and friends of the AASHTO Technical Committee on Hydrology and Hydraulics (TCHH) to the Fall 2004 meeting.
2. Dave Stolpa also welcomed everybody to Austin, Texas. He indicated that the TXDOT is in the middle of a number of issues such as looking at toll roads (TXDOT Administration is looking up to this); He introduced Rose Marie Klee of his staff and indicated that he might be retiring in February 2005.
3. Minor changes were made to the agenda as members of the Technical committee have to either leave early on Wednesday or would like to make short presentations.
4. It was suggested to handle AASHTO businesses earlier in the agenda since most members leave early on the last day of our meetings.
5. The treasures, Mr. Dave Henderson, collected a \$95 registration fee.
6. Te Ngo brought to the attention of the chair that the Chapter 19 chair should be Norm Schips, and not him.
7. Need to check if Andrea Hendrickson will be officially a member of the TCHH.
8. A general discussion took place regarding concerns with the AASHTO editing group – the TCHH is concerned about having this group changing wording in the MDM – this should not be done at this point in time since the manuals have been approved.
9. Comments on the Little Rock Spring meeting should have been given to the Chair by 10/05. Any comments given will be edited and corrected by 10/06.

**FHWA PERSPECTIVES:**

10. Jorge E. Pagán-Ortiz presented an overview of the FHWA's National Hydraulics Program and activities:
  - a. FHWA National Hydraulics Team
    1. Headquarters: Jorge E. Pagán-Ortiz, Sterling Jones, Joe Krolak, (Research Hydraulics Engineer - Vacant), Larry Jones (NHI)
    2. Resource Center: Peter Osborn, Dr. Larry Arneson, Cynthia Nurmi, Dan Ghere, Dr. Eric Brown, Veronica Ghelardi
    3. Federal Lands Highway Program: Bart Bergendahl, Brian Beucler, Abbi Ginsberg, Dave Dajc, Peter Sletten, Dr. Thiet Nguyen, Dr. Mark Browning, Sven Leon
  - b. Emphasis of the FHWA National Hydraulics Program
    1. Research (FHWA Hydraulics Lab, NCHRP, State DOTs, Universities)
    2. Policy and Guidance
    3. 3 T's (Headquarters and RC):
      - a. Technical Assistance
      - b. Technology Deployment
      - c. Training
  - c. Focus Areas
    1. Scour Technology
      - a. First Edition of HEC-25 (ongoing)
      - b. Module on Plan of Action for Scour Critical Bridges (FY '05)
      - c. Update HECs 18, 20 and 23 (FY '05)
      - d. Second Edition of HEC-25 (FY '05)
      - e. Rapid Stream Stability Assessment (research completed)
      - f. Abutment Scour Database (ongoing research)
      - g. Scour and Protection of Bottomless Culverts Phase II (FY '04-'05)
      - h. Unknown Foundation Symposium (FY '05)

- i. Particle Image Velocimeter Pressure Flow Scour Study (FY '05 )
- j. Select Exposed Foundation Scour Test (FY '05 research)
- 2. Bridge Hydraulics
  - a. Develop new algorithms for FESWMS 2D (ongoing)
  - b. HEC-9 Updates (ongoing)
  - c. New HDS-7 on Hydraulics of Bridge Waterways (FY '05)
- 3. Culvert Hydraulics
  - a. HEC-14 Updates (ongoing)
  - b. Develop HY8 Graphical User Interface (FY '04-'05)
  - c. HDS-5 Updates (FY '05)
  - d. South Dakota Culvert Study Effects on Inlet Geometry (research almost completed)
- 4. Highway Drainage
  - a. Develop new FHWA Storm Drain Software (FY '05)
  - b. Develop new algorithms for WMS (FY '05)
  - c. HEC-22 Updates (FY '05)
  - d. Particle Image Velocimeter Junction Loss Study (ongoing research – expect completion in December '04)
- 5. Hydrology
  - a. Univ. of South Alabama-Coastal Transportation Research Center (ongoing research)
  - b. Coastal hydrology, storm surge high, water quality, scour
  - c. Initiate Pooled Fund studies to upgrade rainfall maps (FY '05 research)
- 6. Environmental Hydraulic
  - a. HEC-15 Updates (ongoing)
  - b. New HEC-26 on Fish Passage (FY '04)
  - c. HEC-11 Updates (FY '05)
  - d. Substrate stability test for fish passage culverts (FY '05 research)
- d. NHI Training Courses
  - 1. 13 active courses
    - a. 135027 River Engineering for Highway Encroachments
    - b. 135027 Urban Drainage Design
    - c. 135028 Stormwater Pump Station Design
    - d. 135041 HEC-RAS, River Analysis System
    - e. 135046 Stream Stability and Scour at Highway Bridges
    - f. 135047 Stream Stability and Scour at Highway Bridges for Bridge Inspectors
    - g. 135048 Countermeasure Design for Bridge Scour and Stream Instability
    - h. 135056 Culvert Design
    - i. 135065 Introduction to Highway Hydraulics
    - j. 135067 Practical Highway Hydrology
    - k. 135071 Surface Water Modeling System with Flo2DH and SMS
    - l. 135080 Hydrologic Analysis and Modeling with WMS
    - m. 135081 Introduction to Highway Hydraulics Software
  - e. NHI Courses to be Developed
    - 1. 135082, Tidal Hydrology, Hydraulics and Scour at Bridges (FY '05)
    - 2. 135083, Tidal Hydrology and Hydraulics Modeling (FY '05)
    - 3. 135084, Sediment Transport (FY '05)
  - f. National Bridge Scour Evaluation Program
    - 1. Evaluations Completed: Over 344,000
    - 2. Scour Critical bridges: Over 26,000
    - 3. Unknown Foundations: About 86,000
    - 4. Tidal Bridges: Over 900

5. Scour Susceptible: Over 26,000
- g. Challenges
  1. Specifications for Countermeasure Design and Construction
    - a. Impact on bridge of the future?
  2. Need of Pooled-Fund Projects to Address Regional Problems?
  3. Plan Of Action for Scour Critical Bridges
  4. Unknown Foundations Symposium
  5. Software Development/Maintenance
  6. Infrastructure Research, Development and Technology's emphasis areas:
    - a. Bridge of the Future
    - b. Bridge Stewardship and Management
    - c. Bridge Safety, Security and Reliability
    - d. In other words, FHWA's research projects will have to be tied to these emphasis areas
    - e. Other research areas (storm drain, culvert, software development) would have to be funded with the assistance of State DOTs -- through pooled-fund projects
  7. National Hydraulics Conferences
    - a. Organize steering committee comprised of FHWA/State DOTs, etc.
    - b. Planning, scheduling and coordination of future conferences
    - c. FHWA will continue to provide funding resources
    - d. Steering committee approach is being used by the geotechs -- it has been working well!!!
  8. Re-establishment of Hydraulics Process Reviews
    - a. "Nationwide Drainage Reviews" conducted for many years
    - b. Useful interaction between FHWA/State DOTs
    - c. Helped identify needs (research, technology and training)
    - d. Tied to FHWA's Bridge Program strategic plan
    - e. FHWA will welcome State DOTs requests through FHWA Divisions

#### **NCHRP UPDATE:**

11. Tim Hess, NCHRP Program Officer who handles hydraulics, geotechnical and construction engineering, provided an update of NCHRP project activities related to hydraulics (**bolded** material below has been updated; other has been provided at earlier meetings):
  - 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 task force 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.
  - c. Division B synthesis projects are provided funds by SCOR through project 20-5 which is managed by Jon Williams ([JWilliams@nas.edu](mailto: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 must be submitted by September 15, 2004 in order to be considered at the March SCOR meeting. Both Research Advisory Committee and SCOR rank projects and then a combined ranking is prepared.
  - g. NCHRP solicitation for panel members – **May 31, 2005 is the deadline for submitting panel members.**
  - 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](mailto:nchrp@nas.edu).
- j. **Tim Hess suggested the TCHH should look at not only the scour area, but also topics into the hydrology and hydraulics areas.**
- k. **Tim Hess manages the NCHRP project activities in the areas of Hydraulics, Geotechnical and Structures. Also, he advised that NCHRP panels are comprised by representatives from State DOTs, FHWA, other Federal Agencies (such as the USGS), consultants and the academia.**
- l. Tim Hess provided a handout with the status of NCHRP projects.
- m. NCHRP Project Status Reports for Hydrology and Hydraulics (updated 5/13/03). Current status can be found at <http://www4.trb.org/trb/crp.nsf/NCHRP+projects>
  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) 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.
  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.
  4. 24-15 Bridge Scour in Cohesive Materials - \$350k TX A&M. The project is completed and final report is available (**NCHRP Report 516**). The panel received \$400k in continuation of funds to study abutment scour in cohesive soils.
  5. 24-16 Channel Migration - \$550k Ayres, Pete Lagasse. Project completed. Final report available is available (**NCHRP Report 533**).
  6. 25-12 Wet Detention Pond Research - \$580k by David Young of WSU. Final report will not be published. Report available for loan.
  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 Fall '05.
  11. 24-19 Environmentally Sensitive (Non-structural) Channel & Bank Protection - \$350k, John McCullah, Redding, CA -- awarded 6/2001, draft final report and target completion in 5/2004. **Final report to be published late in 2004 or early 2005.**
  12. 24-20 Prediction of Scour at Bridge Abutments - \$500k, contract awarded 4/2002 to Robert Ettama, University of Iowa. Project is limited to sand material. Expected completion is 10/2005.
  13. 20-07(146) Development of Software Verification Protocol for Hydrologic and Hydraulic Models - \$100k, panel members are: Saeed (chair), Barry, Te, Mark, Bill and Joe Krolak. Awarded to Univ. of SC for \$100k. Estimated completion is 07/2005.
  14. 15-24 Hydraulic Loss Coefficients for Culverts (FY 2003) - \$325K project awarded to Utah State University and has a 2006 completion.
  15. 24-23 Riprap Design Criteria, Specifications, and Quality Control (FY 2003) - \$350k project awarded to Ayres Associates with a 2006 completion.
  16. 24-24 Criteria for Selecting Hydraulic Models (1D/2D) (FY 2004) - **\$175K project awarded to Ocean Engineering Associates (Dr. Max Sheppard).**
  17. 24-25 Risk-based Guidelines for Determining the Need for Investigation of Unknown Bridge

- Foundations (FY 2004) -- **\$200K project awarded to GKY & Associates.**
18. 24-26 Effects of Debris on Pier Scour at Bridges (FY 2004). Funding increased from \$300k to \$600k to cover for research test at laboratory and report. **Project started in 06/2004.**
  19. 20-07-(162), Guidelines for the Correlation of Test Results from 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.**
  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, Recommendations for the Adoption of Bridge Scour Research by State Highway Agencies. Project funded for 2005 at \$250k. 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 already met.**

#### **PRESENTATION ON NCHRP PROJECT 20-07:**

12. Dr. Pete Lagasse, of Ayres Associates, presented a summary of the findings.
  - a. Tim Hess introduced the topic of this project, which was requested by the TCHH in Cody, WY.
  - b. Preliminary project findings were presented to the TRB AFB60 Committee on Hydrology, Hydraulics and Water Quality and at the FHWA 2004 National Hydraulics Engineers Conference.
  - c. Dr. Lagasse will appreciate receiving information pertaining to any research not included on this report.
  - d. Dr. Lagasee indicated that the base work for this project was done through NCHRP 24-08 during the period 1992-1995, and a report given to NCHRP in December 1996. The objectives of NCHRP 24-08 were to identify bridge scour and stream stability research needs, and to develop a strategic plan for research that would address these needs. Eight research categories were defined on NCHRP 24-08 to identify specific research needs to develop problem statements. Results from this project produced a 10-year strategic plan to expand state-of-knowledge of scour process and advance scour prediction methods. Thirty-five problem statements were defined, which included objectives, cost and schedule, and where sequenced to reflect priority, interdependency and cost.
  - e. NCHRP 20-07 worked on the evaluation and update of the NCHRP 24-08 strategic plan.
  - f. NCHRP 20-07 also identified research needs through a survey.
  - g. The final report of this project is due on December 1, 2004.

#### **PRESENTATION ON NEW FHWA PUBLICATION HEC-26**

13. Bart Bergendahl made a presentation on the FHWA initiative of developing a new HEC publication series, HEC-26 titled “Design of Fish Passage for Bridges and Culverts.”
  - a. Contractor is Washington State University (Principal Investigator: Dr. Rollin Hotchkiss).
  - b. This project will be a two year effort
  - c. Physical model will be used at the Skookumchuck Fish Hatchery in Washington.
  - d. Goal of this new HEC-26 is to incorporate state-of-art and state-of-practice on fish passage – will examine design to retrofit culverts to help juvenile fish (to increase passage).
  - e. Input being sought from FHWA/State DOTs/Resource Agencies/Other Federal Agencies.

- f. Washington Department of Fish and Wildlife's 2003 culvert inventory showed 33% of culverts are passable and 11% offer some kind of barrier.
- g. Input is being seek on the following:
  - 1. Is fish passage an issue in your State DOT?
  - 2. What is your State DOT current design guidance?
  - 3. What is your State DOT doing in this subject in the foreseeable future?
  - 4. What are issued you see for fish passage?
    - a. New Mexico reported tat they have problems with upstream velocities in the North part of the state. They design baffles using Maryland SHA design information.
    - b. The Pennsylvania Fish and Boat Commission looks at a broader scope for fish passage – they proposed 2 designs for box culverts
      - 1. < 4% slope -- 1" high baffle across the culvert
      - 2. > 4% slope – 12" high baffle with 4" notch
      - 3. baffle spacing: minimum 8' or the culvert width, whichever is greater.
      - 4. Box culverts are counter set by 1'.
      - 5. They evaluate the effectiveness during the drought season – if they see any dead fish upstream. So far it is working fine.
  - 5. Colorado DOT
    - a. Many culverts with fish passage requirements.
    - b. Work with Department of Fish and Wildlife.
    - c. Design Options:
      - 1. CVS or Culvert – it is buried
      - 2. Low flow channel provided in the middle of CVC.
      - 3. Colorado looks at any type of fish.
        - a. Two other issues:
          - 1. Culvert inlets – issue with the drop.
          - 2. Narrow channels use check-dam to elevate water.
  - 6. Washington is looking at how to help juvenile fish to pass.
    - a. If 100 acres or less, there is no requirement
  - 7. Virginia DOT – typically, on large streams, agency requires:
    - a. 6" minimum concentrated flow, maximum slope and velocities
    - b. COE expanded their jurisdiction
  - 8. South Dakota DOT – they have flat gradient streams
- h. How States are assessing their fish passage techniques?
  - 1. The U.S. Forest Service and State Fish and Game collaborate in an agreement for assessing their fish passage.
  - 2. WYDOT – considers all variables
    - a. Uses a conservative approach – software Fish X (for fish crossing) developed by the U.S. Forest Service.
    - b. There are no funds in the project to collaborate with the U.S. Forest Service to upgrade this software.
  - 3. Issue of fish passage has not hit yet Florida, Texas or Indiana.
  - 4. NCDOT – they deal with trout
    - a. Using baffles and sills in coastal areas
    - b. NCDOT is sponsoring some research on shading of the streams
    - c. Fish migration is more of a concern than shading.
    - d. Piedmont part of the state is of concern with the mussel population.



**TRB AFB60 COMMITTEE ON HYDROLOGY, HYDRAULICS AND WATER QUALITY**

14. Dr. Rollin Hotchkiss briefed the TCHH on the TRB AFB60 Committee activities.
15. He indicated that the AFB60 Committee will be looking at the TCHH to get problem statements funded.
16. AFB60 is sponsoring a conference on stormwater management for highways on July 11-13, 2005.
17. Vice-chair Mark Miles said that he would like to see the problem statements developed by the AFB60 Committee
18. AFB60 looks forward to work with the TCHH in the future.

**AASHTO PRESENTATION:**

19. Ms. Tamara Reid gave an update on current status of the 2003 MDM and HDG
  - a. She indicated that progress is being made in reviewing these manual – the proof reading process has been completed
  - b. Format issues with Chapters 1-8 of the HDG, and Chapters 1-9 of the MDM have not been resolved.
  - c. She indicated that AASHTO does not have an electronic file of the HDG's Chapter 15, Consultant's Chapter. Text files and graphics needed for this Chapter.
  - d. She was advised that this chapter (15) was given to Jim McDonnell at the Spring 2003 meeting.

**TEXAS RESEARCH**

20. Dr. William H. Asquith, of the USGS, made a presentation on research activities for Texas on hydrology (Author of presentation was David B. Thompson, of Texas Tech University).
  1. Texas Hydrologic Research from 1999 to 2004 -- Sponsored by TXDOT Research Management Committee 3.
  2. TX DOT spends about \$1.2 Billions on drainage related structures.
    - a. Uses rational method, hydrograph method, Bulletin 17B and regional regressions to estimate discharge
    - b. These methods have not been reviewed for many years
  3. Long-term research plan to investigate and enhance these methods.
  4. Database for research is contained in a synthesis of rainfall and runoff data for TXDOT Research projects 0-4193, and 0-4194
  5. Conclusion of Research
    - a. NRCS CN is not representative of the conditions in Texas.
    - b. NRCS rainfall distributions are not representative of TX storms.
    - c. NRCS dimensionless unit hydrograph is reasonable for many rural watersheds.
    - d. No conclusions for hydrologic scale research at this time – research ongoing
  6. Work to do:
    - a. Lack of hydrologic data.
    - b. Loss rate function
    - c. Relation between scale and design method
    - d. Low-slope regions
    - e. Spatial distribution scale and precipitation
    - f. High bed mobility streams
  7. Texas is also funding review of design storms through several additional projects.
    - a. Project results can be obtained through the following reports:
      1. Areal Factors for the Precipitation of the 1-Day Design Storm in Texas – Water Resources Investigation Report 99-4267.
      2. Atlas of Interoccurrence Intervals for Selected Thresholds of Daily Precipitation in Texas – Water Resources Report 03-4281.
      3. Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas –

- Scientific Investigation Report 2004-5041.
4. Empirical Hyetographs for Runoff-Producing Storms in Texas – Scientific Investigation Report 2004-5075.

### **IDAHO'S POA PRESENTATION**

21. Lotwich Reese made a presentation of Idaho DOT's work on Plan of Action (POA) for scour critical bridges.
  - a. Presented a condensed version of a presentation made during the FHWA National Hydraulics Engineers Conference in Asheville, NC.
  - b. 1-1/2 years ago the Idaho DOT contracted Ayres Associates to help them with a POA project.
  - c. Two manuals came out of this project to prioritize bridges based on a risk analysis of +/- 350 scour critical bridges.
  - d. The idea was to get a priority of bridges and install countermeasures on them.
    1. Office manual – procedures for prioritize bridges.
    2. Field Manual – step-by-step process for maintenance people to prepare a POA for that bridge.
      - a. Diagram for establishing a monitoring system
      - b. Establish some marks on the bridge with arrows to inform when monitoring should be started and another mark of when a bridge should be closed.
    3. Their POA is based on 4 categories of scour critical bridges (A, B, C, and D).
    4. It includes unknown foundations and scour critical bridges.

### **COLORADO DOT PRESENTATION**

22. Amanullah Mommandi made a presentation of ongoing activities at CODOT:
  - a. CODOT just finished their drainage manual
  - b. Kept a chapter on pump stations – used 2 pump stations with a I-35 project.
  - c. A pipe failure occurred on I-70, which is a main interstate between the East-West – this failure was an eye opening.
    1. CODOT has no program for inspecting culverts.
    2. Cost for replacing this culvert was \$3M for construction and \$4M for detour
    3. Based on this experience, CODOT started a culvert inspection of over 1,000 culverts – most of them are metal.
      - a. It was found that 99% of them are not in good shape.
    4. Most of their culverts are on deep fills.
    5. Only option is to provide lining.
    6. For emergency purpose, CODOT looks at big culverts first.
    7. New criteria for culverts on Interstate – 36" minimum diameter.
      - a. Culvert service life has been averaging 25-35 years when they were supposed to last about 50 years.
    8. Main problems have been with abrasion, corrosion and problem at joints.
      - a. CODOT is changing their specifications for joints.
      - b. They are not allowing certain materials under I-70.
      - c. There are about 1,000 culverts from Denver to Grand Junction.
      - d. CODOT plans to inspect all state-owned culverts.
      - e. CODOT will initiate abrasion and corrosion guidelines.

### **PRESENTATION ON LONG RANGE PLANNING FOR RESEARCH PROJECTS**

23. Dave Stolpa made a presentation of a concept paper on "Long Range Planning for research in Hydrology and Hydraulics for Highway Projects."

- a. He emphasized in the need to develop a structure to work closely with the TRB AFB60 Committee on Hydrology, Hydraulics and Water Quality.
- b. He recommends that a common group should work in both groups, the TCHH and the AFB60 Committees.
- c. It was recommended to look at each of the categories on Dave's paper and try to organize them.
  1. Once it is organized, then we should look at the needs identified by DOT's in each area.
  2. We should decide what are our goals for each subcategory – this could help to identify whether the need is regional in nature or nationwide.
  3. Based on this process, we can come up with problem statements.
24. Chair Newman stated that there is a need to do research in other areas. He recommended the TCHH should seek other ideas (problem statements) from the AFB60 Committee.
  - a. There are design issues on storm drains that should be considered for problem statements.
25. Chair Newman said that whoever has a dual representation should communicate with the AFB60 Committee on what our concerns are.
26. Vice-chair indicated that the AFB60 Committee's generation of problem statements is 6-months out of phase with regards to the TCHH.
27. It was mentioned that the AFB60 Committee should be transmitting their problem statements to the TCHH after their January meeting.
28. It was recommended that an effort should be made to bring everybody together (AFB60, TCHH and FHWA), and create a steering committee for better communication and hopefully do one conference sponsored by these institutions.
29. Also, it was recommended that each Chapter chair should look to generate a list of research topics associated with each chapter.

#### **PROBLEM STATEMENTS:**

30. The TCHH started discussion on prioritizing its problem statements. Dave Stolpa passed a draft paper for a long-term range planning for research (problem statements) in hydrology and hydraulics for highway project, which should serve to improve communication between the TCHH and TRB Committee AFB60 (see summary of his presentation on a concept paper on "Long Range Planning for Research . . ."). One problem statement that generated quite a bit of discussion was the Crucial Nationwide Hydrologic/Environmental Data Precipitation Atlas. There were questions regarding whether or not Precipitation Atlas 14 was worthy for States without an updated rainfall data. It was agreed that the best approach will be to look at the whole country to determine how or what protocol (framework) should be used.
  - a. Chair Newman made a short presentation on PennDOT's design guidance (Chapter 10 of PennDOT design procedures) for precipitation information from NOAA and how it is used in PA.
  - b. The TCHH brainstormed about revising the title and scope of problem statement "Crucial Nationwide Hydrologic/Environmental Data Precipitation Atlas" if it was to be turned in as a problem statement recommended by the TCHH. It was agreed to rename it to "Procedure for Determination of Joint Probability of Design Peak Flows at Confluences."
  - c. The TCHH proceeded to prioritize its problem statements – 14 problem statements were considered (from list developed during the Spring '03 meeting in Indianapolis, IN). Mark Miles introduced another problem statement on "Development of Design Methods for In-Stream Flow Control Structures." Rick Renna introduced the title for another problem statement on regression equations for 100-year coastal scour, "Multi-Parameter, Storm Model for Coastal Scour" – a pilot project on this subject is in progress in Florida.
  - d. The TCHH edited the list of problem statements developed during the Spring '03 meeting, and reduced this list to 11 problem statements, and added two new problem statements (one introduced by Mark Miles and another by Rick Renna), and another 3 projects.
  - e. From Spring '03 Meeting:

1. Effects of Fractured or Degradable Rock on Pier Scour at Bridges - prepared by Phil Thompson and Dr. Joe Haggerty based on #13 of 24-8 (voted #2).
  2. Procedure For Determination of Joint Probability of Design Peak Flows At Confluences - Barry Newman will develop Problem Statement (voted #1).
  3. Time Rate of Scour at Wide & Skewed Bridge Piers - #8 on 24-8, Phil Thompson/Jorge Pagán (voted #4).
  4. Development of Bench Test Method for Determining Manning's n for Culverts - Phil Thompson (voted #7).
  5. Effects of Riprap on Fish Habitat - prepared by Dave Bryson (voted #6).
  6. Evaluation of Long Term Performance of Stormwater BMPs - Barry Newman/Raja Veeramachaneni (voted #5).
  7. Development of a Specification to Mitigate Hydroplaning Effects - Phil Thompson drafted with consideration of NCHRP 1-29 and legal case studies (voted #8).
  8. Develop Hydraulically Efficient Bridge Rail – TXDOT may do this study starting in FY 2006) David Stolpa (voted #12).
  9. Development of a Prediction Model for Ice Jam Formation - Saeed Choudhary (voted #11).
  10. In-Situ Scour Measuring Device - Bart Bergendahl (voted #10).
  11. Integration of Water Quality and Drainage Structure Design - Raja Veeramachaneni/Dave Henderson (tabled until 2007) (voted #9).
- f. New Problem Statements:
1. Development of Design Methods for In-Stream Flow Control Structures, Problem Statement Written by Mark Miles (voted #3).
  2. Multi-Parameter, Storm Model for Coastal Scour (Re-do Hurricane Data), pilot study is in progress, Rick Renna (voted #13).
- g. In Progress:
1. 24-8, Scour at Bridge Foundations Research Needs - Dr. Larry Arneson drafted a one page 20-7 request for SCOH funding after the meeting and provided to Jim McDonnell.
- h. 20-07 Study:
1. Coordinated Update of Rainfall Maps in U.S. - David Stolpa updated based on TXDOT study (Joe Krolak and Mark Miles will review and update Problem Statement).
- i. No Problem Statement
1. Coastal and Tidal Waterway Stability and Scour - Mark Miles will use NCHRP 24-8 (tabled).
- j. The TCHH decided to submit the top four problem statements.
- k. It was also recognized that Problem Statement No. 7 was important, "Development of a Specification to Mitigate Hydroplaning Effects," but won't be submitted at this time (it ranked #8). Comments concerning hydroplaning followed: "One would be surprised how a small film of water can cause a hydroplaning problem"; "Hydroplaning is a concern during construction in Colorado – there has been a high number of incidents during construction – there is a need to define how drainage should be accommodated during construction.

#### **DISCUSSION ON NEW AASHTO DOCUMENTS (LEVEL I and LEVEL II):**

31. Level I document should be equivalent to the AASHTO Green Book.
32. Level II document should be about procedures to do what is presented in the Level I (policy) document. Comments were made about the current MDM (e.g., is too big of a document; changes are warranted to make it a better document to digest and a better sale document; in its current format it was too hard to use).
33. With regards to units, it was discussed that, for a Level I document, the metric (SI) unit of measurement will be first followed by the English system of units in parenthesis -- FHWA and AASHTO follows this nomenclature.
34. Chair Newman recommended each chapter chair to take a look at the issue on organization of the

MDM and HDG as of how the TCHH should organize each chapter content.

35. It was suggested to move definitions to the glossary of each document – they will have to be looked at before moving them to a glossary.
36. For a Level II document, it could be two volumes – one volume in SI and another in English.
37. Clarification is needed regarding the numbers in parenthesis – are they considered minimum or maximum values? It was suggested to refer to numbers in parenthesis as recommended values.
38. A solid definition is needed for policy and criteria – these definitions should be included in a glossary.
39. Bart Bergendahl shared the proposed language being considered by FLH for policy, standards, guidance and criteria follows (he will welcome any input from the TCHH):
  - a. For consistency and guidance purposes, the following definitions for policy, guidance, standards, and criteria will apply:
    - *Policy* - guiding principle; general course of action that is to be followed without exception. (Example: Scour analyses for foundation design shall be conducted on all new or replacement bridges.)
    - *Standard* - a fixed reference to guide the work. No variance without written justification. (Example: Scour analyses for bridge foundation design shall be conducted by evaluating the overtopping and 100-year floods, as a minimum.)
    - *Guidance* - Suggested actions to meet policy, standards, and expectations. (Example: The minimum scour components to be evaluated for bridge foundation design should be long-term degradation, contraction scour, and local scour. Other scour components should be included in the analysis as dictated by site conditions.)
    - *Criteria* - tests, in addition to standards, used to measure/judge achievement of objectives. May vary project-to-project. (Example: The maximum headwater to diameter ratio for culverts on streams with significant bed-material sediment load should be 0.75 for the design event.)

Specific procedures and recommended methods, including computer software, are to be included in the updated manual by reference only, whenever possible. Information, such as design aids and numerical examples demonstrating how to perform a particular analysis, are not to be included in the updated, unless considered absolutely necessary and approved by FHWA.

40. Chair Newman requested the TCHH to take a close look at the definitions of policy (considering the FLH definitions and the HDG glossary) and come up with recommendations ASAP.
41. With regards to symbols, if it is a common symbol, meaning one used in a Level I document, then it should be included in the Level II document, too. Otherwise, it should just be in a Level II document.
42. It was further clarified that if symbols in the Level II document change, then the Level I would need to change, too.
43. MDM Chapter 1, Introduction (Chair: Barry Newman):
  - a. It was suggested that material coming out of this chapter for the Level II (Procedure) manual should have no exclusive copyrights on the Level II (Procedure) manual – agencies can do whatever they want with it; however, material for Level I (Policy) manual should have a strong copyright statement -- one cannot copy anything from the HDG or from the Level I document without written permission from AASHTO.
  - a. With regards to section 1.2 of this chapter, example problems should be included if they are not redundant – add or leave examples only if they will add value to the document.
  - b. Page 1.2 – the year is 1999, not 1989.
44. MDM Chapter 2, Legal Aspects (Chair: James Richardson):
  - a. Most of its content is actually on Federal regulations (e.g., Rivers Act, Clean-water Act, etc.).
45. MDM Chapter 3, Policy (Chair: Norm Schips):

- a. Section 3.3.6 -- Noise walls material could be tied to floodplain regulation
  - b. Section 3.3.7 -- The TCHH agreed to remove air quality material from this section.
  - c. It was suggested to add one more category to design standards.\
  - d. The TCHH Chair suggested that the Chapter Chair works on this chapter and e-mail it to the committee for comments.
  - e. Chapter Chair indicated that the committee should agree on what our sense on the definitions (i.e., are they close or are they out of question?).
  - f. Chapter chair agreed to look at FLH definitions and draft any proposed on this chapter.
46. MDM Chapter 4, Documentation (Chair: Glen DeCou):
- a. The documentation section of the policy chapter should have a write-up about the minimum level of documentation established.
  - b. Chapter chair should look at data archiving.
47. MDM Chapter 5, Planning and Location (Chair: Mike Fazio):
- a. Section 5.2.6 could be set as policy, specifically the principal factors to be considered on locating a stream crossing.
  - b. Chapter chair will take a look at this chapter and come up with a draft policy for the next meeting.
48. MDM Chapter 6, Data Collection (Chair: Lotwick Reese):
- a. The chapter chair indicated that most of this chapter will be on procedures (Level II).
  - b. Suggested to add bullets on the following topics:
    1. Soil type, gradation, future land use, hydrology and hydraulics data for adjacent structures, location information, as-built information for navigation, gaging information/location (i.e., is the stream gaged?), when data should be collected?, reservoir information, confluence data. Flood history, debris potential, aquatic habitat, inspection records/reports, coastal storms events (hydrologic date), phone logs/interview logs (formal records of whom you spoke to), data collection should be provided to the person responsible for assigning “n” values, including photos, NFIP Maps should also be included, and controls.
49. MDM Chapter 7, Hydrology (Chair: Rae Van Hoven):
- a. Table 7.2 – Design Frequencies – Interstates not designed for  $Q_{10}$  frequencies.
  - b. Double parenthesis removed on Level II.
    1. Page 7-10 – Section 7.6.3 – needs to be edited.
      - a. Dr. Larry Arneson will write a section on WMS.
    2. Page 7-11 – USGS envelope curves –should be moved to Policy (Level I).
  - c. Level I – Policy:
    1. Double parenthesis removed.
    2. Explanation as of why use 200 acres is documented in Level II, page 7-35, Section 7.1.7.3
    3. Log-Pearson III discussion in Level I – should be used for all routine designs.
    4. Discussion regarding Bulleting 17B – 10-year minimum record does not have to be continuous – Pennsylvania recommends it be continuous.
    5. Vice-chair Miles indicated that one should use the most accurate method – he suggested adding a bullet saying to use the most accurate method and a commentary to expand on this. Also, he indicated that sometimes a peak method is appropriate, and some other times a graphical method is more appropriate.
    6. Chair Newman recommended the TCHH to share with Chapter chair Van Hoven any information that could be used to address this issue.
    7. Vice-chair Miles suggested adding a bullet pertaining to suitable computer programs – which may be used with the assumption that the user is aware of their assumptions and limitations.
    - 8.
50. MDM Chapter 8, Channels (Chair: Brooks Booher):
- a. Chapter chair asked if there will be a policy chapter in the policy manual – the TCHH agreed that there should be one. It will be called “Policy on the Design of Channels.”

- b. Change U.S. Army Corps of Engineers to USACE in Section 8.1.2
51. MDM Chapter 9, Culverts (Chair: Te Ngo):
- a. Fourth bullet in Section 9.1.1 will be edited to say “Federal regulations defines any structure greater than 20’ as a bridge” -- Chapter chair may delete this bullet after further review, at the TCHH suggestion.
  - b. Chapter chair has made several editorial changes to this chapter.
  - c. Edited second bullet of Section 9.3.2.3 to read “Considering increasing the culvert height above the total of the maximum observed ice buildup.”
  - d. Table 9.4 (page 9.22) shows minimum culvert size.
  - e. Pages 9.24-9.26 includes procedure for calculating skew angle (table 9.5).
52. MDM Chapter 10, Bridges (Chair: Roy Mills):
- a. Chapter chair shared a letter from one of his assistants, John H. Matthews, P.E., who was tasked to provide input and recommendations on the proposed separation of the AASHTO model Drainage Manual.
    - 1. His initial impression is that separating the MDM into 2 manuals will not provide any benefit to the engineering community.
    - 2. Suggested that a better way would be to separate the material by topic covered rather than by Guideline vs. Policy vs. Procedure.
    - 3. Provided definitions of what is guideline, policy and procedure
    - 4. He segregated Chapter 10 based on his view of how definitions applied to engineering.
  - b. Chapter chair indicated that content of this Chapter is mostly on policy. He will solicit comments from the TCHH and proposed to have a draft chapter for next meeting.
  - c. It was suggested to break scour and bridges in two separate chapters.
  - d. Chapter chair would like to keep both together.
  - e. Hydraulic design flow chart presented in Figure 10.5 is for process to complete bridge design.
53. MDM Chapter 11, Energy Dissipators (Barry Newman):
- a. Chapter chair edited overview.
  - b. Definitions were removed.
  - c. Symbol table will be removed to Level II Chapter.
  - d. Edited first sentence under Section 11.2 to read “Highway . . .”.
  - e. A discussion took place regarding Chapter 9 (Culverts) guidance that after 6 ft/sec, one will need to provide an energy dissipator or protection at the culvert outlet – this is inconsistent with guidance presented in Section 11.3.1.2 of Chapter 11.
  - f. It was decided to edit Section 11.3.1.2 to read “. . . maximum non-erosive velocity . . . with higher exit velocities require consideration of an energy dissipator or protection at the culvert outlet.”
  - g. The committee was also informed that FHWA is updating HEC-14.
  - h. List of dissipator types (from old HEC-14) will stay consistent with new HEC-14.
  - i. It was discussed that a natural scour hole is a type of dissipator – the size of the scour hole drives the size of a structural dissipator.
  - j. Edited page 11-6 – bullet below table 11-2.
  - k. Section 11.7 (page 11-10) recommends the HEC-14 procedure be followed.
  - l. Flood frequency for dissipators should be the same flood frequency used for culvert design.
    - 1. Colorado – design frequency is 25-years, but check frequency is used so that we don’t violate other conditions.
    - 2. Dr. Rollin Hotchkiss indicated that if check for 100-year, the design parameters may not be applicable.
    - 3. Chapter Chair indicated that one needs to look at the water surface elevation for the 100-year – if it causes backwater, we have to look at that.
    - 4. Vice-chair Miles indicated that Alaska DOT is using dissipators exclusively for fish passage.

5. Chapter Chair added to Section 11.3.1.1 – the design storm should be tied to the anticipated damage.”
  6. Vice-chair Miles added that the design storm for the energy dissipator is not necessarily tied to the design event for the culvert or the performance of the culvert.
  7. Chapter chair suggested to standardize a template for policy, but it was viewed that going this route may be a little bit premature to do.
54. MDM Chapter 12, Storage Facilities (Chair: Merrill Dougherty):
- a. Chapter chair proposed to re-title this chapter to “Water Quality and Quantity Management.”
  - b. Some members of the TCHH commented that by doing this it will open the chapter to many other areas (broaden scope).
  - c. Chapter chair indicated that we could add best management practices.
  - d. Other DOTs manuals, such as that of TXDOT, deals with quantity management.
  - e. It was recommended not to make a storm water management chapter at this time as it would impact other chapters in the manuals – therefore, the TCHH decided to keep the chapter title unchanged.
    1. It was recommended to add a statement in the purpose of the manual that this chapter will cover the quality and quantity concerns associated with the storm water storage.
55. MDM Chapter 13, Storm Drain (Chair: Bill Bailey)
- a. Chapter chair gave a handout covering design frequency policy, design criteria and Hydroplanning and Torque Steer Design Policy.
    1. Design Frequency Policy – design frequency is selected to meet site conditions. The design frequency is set to limit street spread to the design frequency. This limits traffic delay and accidents that may be attributed to hydroplaning or torque steering problems caused by concentrated curb or gutter flows. The design frequency is selected based on roadway functions or ADT. Adjacent developed property that may be subjected to inundation may require the use of a 100-year frequency. The storm runoff from the larger events may be conveyed by either surface channels, Gutters or enclosed systems
    2. Design Criteria (Standards)
      - a. To limit street spread (minor storms):
        1. Collectors – ADT < ### 5-years – one lane of traffic each direction.
        2. Arterials -- ADT < ### 10-years – no encroachment on traveled way.
        3. Interstate -- ADT < ### 50-year.
      - b. To limit developed property inundation the major storm system will meet a 100-year frequency.
    3. Hydroplanning and Torque Steer Design Policy
      - a. Concentrated Gutter Flows:
        1. The hydroplaning conditions may be limited using the allowable street spread for the storm drain design frequency. Super elevation geometry may influence the inlet design and placement.
      - b. Sheet Flow Conditions:
        1. The potential hydroplaning may be effectively reduced depending on pavement type and surface finishing. This is the responsibility of the pavement design engineer. Hydroplanning is generally not a problem for high intensity storms since the prudent drivers slow or stop due to visibility problems. Avoidance of hydroplaning is considered driver responsibility since the driver has the most practical means available to prevent accidents.
      - c. Chair Newman indicated that in Pennsylvania the DOT has to do something with pavement drainage design – design storm should not inundate the highway – gutter flow, inlet flow (i.e., spread going to roadside) should not go to the traffic lane.
      - d. Chair Newman is very uncomfortable with allowing inundation of traffic lanes – indicated



that there should be an absolute standard (fixed standard) – for a given condition there should be a design criteria.

- e. Discussion on this subject moved to the design frequency versus spread width presented on Table 13.2 – Chair indicated that this table does not meet 23 CFR 650 Subpart A.
  - f. Te Ngo indicated there is a lawsuit in Oklahoma from a motorbike rider who drove in a highway section with water on a lane and indicated that people that are not engineers are looking at our books.
  - g. Bill Bailey indicated that more scientific methods are needed.
  - h. Chair Newman indicated that Table 13.9.4 is basically the same table presented in HEC-22.
  - i. Bill Bailey indicated that everybody is using different values – he suggested that the TCHH should develop a policy – also, he questioned if the TCHH should recommend a range.
  - j. Chair Newman indicated that PennDOT would like functional classification for setting the allowable spread criteria on highways.
  - k. Chair Newman suggested that the Chapter chair (Bill Bailey) should come up with a recommendation. Also, he indicated that the Green book has a statement saying that 2% slope is considered to be adequate for pavement drainage.
  - l. It was decided that the Design Criteria table will be part of a Level I document.
  - m. A brief discussion took place on how to handle policy on water quality aspects. No decision was made on this subject.
  - n. Another brief discussion took place on MS4 permits and it was mentioned that DOTs would have to comply with this permit – don't know how far the TCHH would like to go on this subject – it was suggested that a brief discussion on MS4 permit procedures will be warranted to include in this chapter.
56. MDM Chapter 14, Pump Stations (Chair: Dan Ghere):
- a. Policy and Criteria should be easy to separate and that there are not many issues in this chapter.
  - b. Chair Newman recommended that the listed design considerations in this chapter should become policy and procedures will be in the Level II manual.
57. MDM Chapter 15, Surface Water Environment (Chair: Mark Miles):
- a. Wetland and fish passage information came out of this chapter. The fish passage information will be residing in the culvert chapter. There will be only a small reference to fish passage in section 15.3.3.5.
  - b. There is a number of statement letters of resource agency mandates with regards to engineering design criteria – it says that one should use resource agencies design criteria.
  - c. Chair Newman indicated that there is a need to comply with regulatory requirements – it is either a regulatory or not – if it is not, then we should not be spending funds on it.
  - d. Chapter chair indicated that there are a lot of places in this chapter with subsections on introduction and then bullets, which are not needed – will change bullets to a narrative.
  - e. The TCHH agree to change cognizant resource agencies to the appropriate resource agencies.
  - f. Chapter chair questioned if we should get into details or just be general regarding channel classification (Section 15.3.3.2.1) – it was recommended to just point one to procedures on HDS 6 on a general statement.
  - g. Chapter chair will be replacing sentence 10 on page 15-13 with “A proposed design shall be preserve or enhance stability.”
  - h. With regards to Section 15.3.3.4 (Wetlands) – this section is intended to satisfy regulatory agencies – the use of wetlands shall be classified according to applicable regulatory requirements.
  - i. Appendices of this chapter should go to the procedure manual.
58. MDM Chapter 16, erosion and Sediment Control (Chair: Dave Henderson):
- a. Chapter chair passed a handout on this chapter, which basically breaks down chapter table of

- contents with recommended material for a Level I and Level II manual, respectively.
- b. Line 8 of Section 16.1.1 (Background) was edited to read “of ecosystems, costly penalties and cease-and-desist orders resulting in project delay.”
  - c. Lines 17-19 of Section 16.1.2 (Federal Policy) were edited to read “. . . Control Act (FWPCA), Sections 9 and 10 of the Rivers and Harbors Act, and the National Pollutant Discharge Elimination System (NPDES) permit.”
  - d. A paragraph was added to Section 16.1.2 (Federal Policy) to read “A NPDES permit requires a Stormwater Pollution Prevention Plan for industrial activities (including linear construction projects) under Phase I for undisturbed areas of 5 acres (2 ha) or more, and Phase II for disturbed areas between 1 acre and 5 acres (0.4 ha and 2 ha). For those States that do not operate under delegated authority for Sediment and Erosion Control, a Notice of Intent (NOI) is required. The NOI is a USEPA, NPDES form titled “Notice of Intent (NOI) for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY Under a NPDES General Permit”.
  - e. Line 29 of Section 16.1.3 (AASHTO Policy) was edited to read “. . . and Streets (2001) as follows:”.
  - f. Lines 6-7 of Section 16.1.4 (State Policy) were edited as follows: “Specific legislated sediment control acts exist in many States or must be addressed as part of . . . to meet their State regulations.
  - g. Lines 9-12 of Section 16.1.4 (State Policy) were edited as follows: “Qualified personnel within . . . erosion control construction for preparation of planting specifications for both temporary and permanent ground cover.”
  - h. Lines 18-19 of Section 16.1.4 (State Policy) were deleted; and lines 20-21 were edited as follows: “In States . . . the potential problem.”
  - i. Section 16.2 (Erosion And Sediment Control Plan) was eliminated.
  - j. Chapter Chair also indicated that double parenthesis will be eliminated.
  - k. A question about NPDES permits was brought to the attention of the Chapter Chair – he indicated that if you are permitted under Phase I, then you don’t need to get permit for Phase II; however, if you are operating under Phase I permit, then you don’t need to be permitted under Phase II.
59. MDM Chapter 17, Bank Protection (Chair: Barry Newman):
- a. Section 17.1.3 -- Symbol table (17-1) will come out.
  - b. Section 17.2 – Policy to provide protection for highway embankment for minimizing destruction to natural stream.
  - c. Table 17-2 will be included in Policy – delete sentence above this table -- Te Ngo recommended adding a definition or discussion on design event above this table.
  - d. There is a need to clarify minimum criteria definition for Table 17-2 for other design events -- need to justify criteria for 3’ of freeboard and 1’ of freeboard on this table.
  - e. Equations presented in Section 17.3.1.2.2 should be moved to procedures document.
  - f. Will take double parenthesis from page 17-3. Also from section 17.7.5.
60. MDM Chapter 18, Coastal Zone (Chair: Rick Renna):
- a. Major changes were made on this chapter – discussion added regarding the use of coastal engineers for coastal engineering work; provided guidance as of when this discipline (coastal engineering) is needed and that involvement of coastal engineers is needed at an early stage on the design process; expanded guidance on coastal storms (page 18-4).
  - b. It was suggested to add a policy statement that reads like “hydrologists and hydraulics engineers should work with coastal engineers to ensure that highway design criteria are satisfied.”
  - c. Need input from Glen DeCou regarding spelling of “Tsunamis – should it be “tsunamis”?
  - d. Need to add material on “Low pressure storms from Alaska” -- Mark Miles and Rick Renna will get in touch to determine how to handle the subject on this chapter.
  - e. It was suggested to add 25-year, 50-year to last sentence of section 18.2.2 (page 18-5).
  - f. Another suggestion was to edit second sentence of Section 18.2.2 to say “. . . is being estimated for a coastal bridge, 100-year coastal storm parameter . . . “.

- g. A question on how to define the 50-year and the 100-year was brought to the table while discussing this chapter. Rick Renna indicated that we don't have to – statistically we should be targeting scour. Ultimately, we should target it to time-dependence. He pointed out that slow moving storms of small intensity could be devastating. For example, Hurricane Francis, a slow moving Category 2 storm caused more damage than Hurricane Charlie, a fast moving Category 4 storm. Also, Rick Renna indicated that it is FLDOT's criteria to design for survivability – they will allow overtopping. This criteria is emphasized in Section 18.2.2. The TCHH Chair suggested the Chapter Chair to make this point crystal clear in this section – consider a discussion of this criteria in a new paragraph – and consider discussion on setup criteria for overtopping, and criteria for storm survivability.
  - h. There is a new section on hurricane rainfall hydrology (page 18-5) – Rick Renna would like to add Alaska's perspective on this section – Mark Miles suggested asking California and Oregon, too. Also, Rick Renna would like input from ILDOT regarding the Great Lakes.
  - i. Mark Miles suggested adding a Section titled "Coastal Storm Rainfall" (e.g., Section 18.2.4, Coastal Storm Rainfall; Section 18.2.4.1, Hurricane Rainfall").
  - j. Te suggested changing "ACOE" to "USACE."
  - k. Amanullah Mommandi, of CODOT, suggested to regionalize Section 18.2.1 – the TCHH agreed and added "hurricanes and nor'easters in the U.S. East coast and typhoons and tsunamis in the Pacific – Mark Miles volunteered to help editing this section.
  - l. New section added (Section 18.3.3).
  - m. Rick Renna made a point regarding Section 18.3.2, which discusses the selection of scour depths from analysis of waves rebound from piers and seawalls and compare it with storm currents (page 18-6) – he would like to see this guidance in HEC-25.
61. MDM Chapter 19, Construction (Chair: Norm Schips):
- a. Chapter chair recommended changing title to "Temporary Facilities Associated with Construction" – it was suggested to consider "Temporary Detours" instead.
  - b. This chapter should discussed level of risk for a temporary structure and criteria to use as for what storm event use.
62. MDM Chapter 20, Maintenance of Drainage Facilities (Chair: Dave Henderson):
- a. Dave Stolpa indicated that the hydraulics section of TXDOT is not responsible for maintenance.
    - 1. Their role is more in support of their districts; however, their districts have the final word.
    - 2. It was mentioned that Plan of Action for scour critical bridges may fall under the hydraulics section; however, it is something that we cannot dictate to DOT managers.
    - 3. It was mentioned that more than policy, this chapter should be more of guidance and support.
    - 4. With regards to hydraulics issues related to maintenance – there should not be two sets of criteria (one for maintenance and another for design).
    - 5. There is not clear who would be the audience for this chapter – it was recommended that this chapter should address maintenance requirements that designers should be aware of. Also, this chapter should include guidance on what kind of support a maintenance section would need from a hydrology and hydraulics section.
  - b. Chairman Newman indicated that in Pennsylvania, maintenance do the emergency design on culvert repair/replacement – they have to follow design guides that designers follow – generally, they run their design through design squads.
  - c. Chapter chair will take another look at this chapter.
63. Next meeting – second table reading of Level I document
- a. Chapter chairs should make available their second draft of policy one month prior to next meeting.
64. TCHH will check with AASHTO if they can provide secured FTP sites – if they cannot, Dave Henderson may be able to help.
65. Chapter chairs do not need to track changes at this point in time.

**SUGGESTIONS TO IMPROVE MINUTES:**

66. Add traditional list of Chapter chairs and the list of committees.
67. Member roster needed by Region and date that the member was appointed to the committee
68. Need to figure out how many members are missing and how to get full membership in the TCHH.
69. Need to follow-up with subcommittee on design whether or not Andrea Hendrickson is/ is not a member of the TCHH.
70. List of action items is needed.
71. On another business pertaining to the minutes, a motion to approve the Fall '03 minutes and Spring '04 minutes was proposed by the TCHH Chair Newman. Roy Mills entered the motion and Rae Van Hoven second the motion. The TCHH voted in favor to approve the minutes.
72. Need to find copy of the TCHH by-laws.
73. Need to find a copy of the TCHH mission statement.
74. Need to find out how many members per region the TCHH can have.

**STATE DOT REPORTS**

75. Roy Mills, VADOT
  - a. State is facing a funding problem.
  - b. Legislation reluctant to provide funds.
  - c. DOT downsizing to central groups.
  - d. Central groups are more of a policy group.
  - e. Decentralizing technical work.
76. Matt O'Connor, ILDOT
  - a. ILDOT is facing a similar situation as Virginia.
77. Mark Miles, AKDOT
  - a. DOT has not being able to rehire
  - b. Designing kind of blind –shelf projects and then have to address new environmental concerns.
78. Bill Bailey, WYDOT
79. Dave Henderson, NCDOT
  - a. Involved with alternative pipe materials
    1. Lobbyists come to offices and try to convince the NC Secretary of Transportation and Legislators.
  - b. Constant problem with environmental agencies.
    1. Constantly raising the bar on their needs
    2. \$1.2 B construction program held up by environmental program permit
  - c. State suffered a lot of damages during pass of Hurricanes Frances and Ivan.
80. Dave Stolpa, TXDOT
  - a. Same concerns as VA, AK and WY
  - b. The TXDOT administration staff was visited by cities and counties who indicated voiced their concern about being told that they are not in compliance with NFIP.
  - c. DOT is working on how they can assist in resolving differences – the hydraulics section trying to clarify NFIP so that cities and counties can understand from where the DOT is coming from.
  - d. Some districts are not signing on NFIP.
81. Rae Van Hoven, NMDOT
  - a. The state has a new Governor – and is changing the organization – now they are a DOT.
  - b. NMDOT is using WMS, GPS – all the latest technology.
  - c. WMS training scheduled for November '04, and HEC-RAS for February '05.
  - d. NM is starting a new project – scanning 10 cabinets of files for the last 30 years.
82. Merrill Dougherty, INDOT
  - a. He has a full staff.
  - b. Two people hired are former employees that came back to the DOT from the private sector.

- c. The DOT is struggling with resource agencies, especially with the USCOE.
  - 1. New projects basically have been stopped by the USCOE.
- 83. Norm Schips, NYDOT
  - a. DOT going through a transformation/reorganization – from 12 districts to 4 centers
  - b. With regards to pipes – they allow all types of pipes – no more that 15’ fill allowed.
    - 1. Steel pipes – big issues since some failures occurred in the past – difficult ot proceed with this material.
    - 2. Pipe usage in New York is still way down.
- 84. Preston Helms, SCDOT
  - a. 40 people retired – experienced engineers left training young personnel.
  - b. DOT cannot increase personnel level.
  - c. DOT has 8 on-call consultants for H&H projects.
- 85. Richard Phillips, SDDOT
  - a. Held erosion control training and brought county people and suppliers.
  - b. Some projects delayed by environmental issues.
- 86. Amanullah Mommandi, CODOT
  - a. Developed pipe material lining (based on their experience with the I-70 pipe failure).
  - b. DOT has 5 different trench widths use pipe width plus 18” in both sides of the pipe.
  - c. DOT has approximately 9,000 miles of highways for 14 people – State divided in 8 regions.
  - d. From design to construction is where they have most of the problems on erosion control implementation.
  - e. DOT is writing another design manual (State-wide manual).
  - f. Amanullah Mommandi provides training on drainage to roadway designers and maintenance.
- 87. Barry Newman, PennDOT
  - a. DOT does not seem to have a funding problem since their state program is not funded through general fund – they get funds from gas tax, licensing fees.
  - b. Design schedule is generally flat.
  - c. Governor’s idea – if one retires before June 29, 2004, you get a retirement package; after that date, you got a different package with a lot of deductibles – several DOT employees retired.
    - 1. State is conducting pre/post testing on training for its employees.
    - 2. State is hiring high school graduates or 2-year college graduates.
    - 3. H&H section sees a project after it gets to the regulatory agencies.
    - 4. All projects reviewed had priority comments – serious problems, which got permit approval.
    - 5. H&H section finished last year a guide for design on erosion, sediment and storm water controls for PennDOT.
    - 6. H&H section finished a maintenance field reference for erosion and sediment control primarily for maintenance foreman.
    - 7. There is no staffing support on the H&H section for Barry.

**TC WORK PLAN FOR THE NEXT 5 YEARS:** The AASHTO Technical Committee on Hydrology and Hydraulics 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 Technical Committee elected to perform periodic maintenance on the HDG to keep it reasonably current and reformat the MDM to create a more “user friendly” reference source by developing a three tier document as follows:

LEVEL 1 – “A Policy on Drainage of Transportation Facilities”.

LEVEL 2 – “Recommended Procedures for Drainage Design of Transportation Facilities”.

LEVEL 3 – “List of additional procedures for Drainage Design of Transportation Facilities” (On the web only).

**COMMITTEE ACTIVITY SCHEDULE:**

- 2004 Spring -- Separate MDM into Policy (Level 1) and Procedures (Level 2)
- 2004 Fall – First table readings on Policy outlines and chapters (Level 1)
- 2005 Spring – Table readings of Policy chapters (Level 1)
- Request NCHRP 20-07 funding to assist with new MDM; assistance to begin in 2006
- 2005 Fall – Table reading of Procedures (Level 2)
- 2006 Spring -- Continue Table reading of Procedures (Level 2)
- 2006 Fall – Final table readings of Policy (Level 1) and Procedures (Level 2)
- 2007 Spring – Table reading of HDG Updates
- 2007 Fall – Final review of HDG, Policy, and Procedures
  
- 2008 Spring – Develop additional Procedures (Level 3);  
Ballot HDG, Policy, and Procedures
- 2008 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

**FINANCIAL REPORT (As of October 6, 2004)**

- Funds Available (As of October 4, 2004): \$1,591.14
- Registration Fees (\$95):
  - + Cash 570.00
  - + Checks 1,235.00
  - + Subtotal \$3,396.14
- Expenses (Food/breaks): - \$259.80
- Total Balance \$3,136.34

**TC FUTURE MEETING LOCATIONS:**

- 2004 Fall Austin, Texas
- 2005 Spring Sacramento, California
- 2005 Fall Sioux Falls, South Dakota
- 2006 Spring Buffalo, New York

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