

D-5

GORDON

1ST REPLY FROM GAINES (v. 17)

Reply to MVS comments on Ver 17
Andy Gaines 31 August 2002

Comment:

1. Last page of Ch.2 - goodness of fit described/defined
2. Last page of Ch.2 - Do not know what portions from the comparison report is mentioned. Added reference to other report - Gaines, Gordon, and Maynard (2002), but don't see that insertion of intro material would add to this section.
3. pg 3-1- add of
4. pg 3-2 - adversely - suggestion noted but no change; these techniques all affect reproduction of flow patterns and bed configuration, some of them however have negative affects. I agree that there is an affect, however, you even state only some of them are negative. Therefore, adversely implies that all the affects are negative. The wording of this paragraph reads: A review of the literally hundreds of references on loose-bed modeling reveals that guidance for design and operation of loose-bed models consists of similar sediment mobility and flow patterns yielding similar bed configuration. As will be discussed subsequently, some of the techniques for insuring similar sediment mobility can adversely affect reproduction of flow patterns and thus bed configuration. -- I don't see the problem with the revised wording which states that some of the techniques cause adverse effects. No additional change.
5. pg 3-2 delineated possible - changed
6. bottom pg. 3-4 - inconsequential - deleted. However, the comments on top of 3-5 are noted. Thalweg position is a factor of US boundary conditions which are also affected by a restricted thalweg. The restriction being talked about in the preceding para.s refers to the influence produced confining the channel within more or less fixed banks. Placement of training structures further reduces thalweg freedom to move -- they are placed in the river to shift the main thread of the channel to a desired alignment and to restrict width in order to increase depth. These restrictions are further influenced by the use of vertical distortion, slope exaggeration, and roughness distortions in the model. More detail on the specific influences can be provided regarding the effects of each of these if warranted/desired. The meandering thalweg in the Wolf channel does not dispute these conclusions because the small (relative to the MS) channel is more restricted thalweg movement. This results from a much lower width-depth ratio in the prototype Wolf. If structures had somehow been placed in the Wolf channel, more restriction in thalweg positional freedom would have resulted. I'm confused here. This topic seems to come up repeatedly throughout the report. How do we deal with this? Change wording from small-scale models to highly distorted models. There are cross-section comparisons where the model section has exaggerated scour depth as opposed to the prototype -- limiting the scour depth in the model could in no way result in the shape of the prototype section.

The position of the thalweg within that section would also most likely be different in the model because of the distortion effects.

The thalweg location is fixed within the channel banks. The more structures that are placed within the channel, the greater restriction is forced on the thalweg position. For example, at Salt Lake Chute (RM 133-140 above Cairo, IL on upper MS) there are a number of closely spaced dikes along the left bank; these dikes restrict where the thalweg is located -- almost to the point that they dominate where the thalweg is. If those dikes were not there, esp. around 140-141, then the thalweg would probably be aligned quite differently than exists with the dikes. Where just one or a few dikes are located, the thalweg is not "held" in a general position like where there are a number of closely spaced dikes like at Salt Lake Chute -- Thalweg location can switch from side to side more readily in this case.

Call if more explanation is needed to clarify this.

7. pg 3-7 - strike Thalweg position sentence

8. Comment on figures 3-2, 3-3, 3-4 pg 3-7 - These figures refer to hypothetical alignment and not any specific condition. Descriptions of these figures have been modified to indicate that they are hypothetical, not actual. In general, the position and response of the thalweg is depicted in these figures and associated discussions, not the upstream or downstream boundary conditions. Figure titles have also been modified to show Hypothetical I don't even agree with these figures being labeled hypothetical. They should be removed because they have no relevance to what actually may occur. These figures relate to previous comments (#6), but they are specifically intended to identify the variables involved, not depict any particular prototype configuration. These variables, in turn, help define what is of most importance when considering similarity between model and prototype. I use some of these variables in my conclusions.

9.8. pg 3-12 - B/y of WES³ models is not available for +20 as used in the micromodel values shown in this para. The only numbers available for the WES models are at 0 LWRP. However at this water level, the B/y relationship between model and prototype are the same as shown (5 in MM to 50 in Prototype). The MM B/y values are 1/10 that of the prototype (Prot. B/y = MM B/y * 10) while WES B/y values are about 4/10 that of the prototype (Prot. B/y = WES B/y * 2.5). Please state this for comparative purposes Noted, reluctantly added. I don't feel it adds anything to the report or the outcome to keep dredging up the WES model numbers-- They were larger and generally had less distortion (coal-bed models). Therefore, the numbers will be closer to the prototype regarding the B/y ratio and the Froude number ratio as compared to the micromodels.

~~10.9.~~ pg. 3-12 - cross circulation - brief explanation added

- ~~11.10.~~ pg. 3-12 - next to last para. inconsequential - Strike sentence
- ~~12.11.~~ pg. 3-13 - para. deleted. I am now clear on what occurs with the rails. I don't think the paragraph should be deleted. Please clarify that the rails adjusted the datum. Defer to debate between Rob and Tom. I really don't see how this matters regarding conclusions about the micromodels. It doesn't matter what was done in the WES models regarding rails in making my conclusions.
- ~~13.12.~~ pg 3-17 - para after eq. (2). Discussion will be added regarding distortion in bends.
- ~~14.13.~~ pg. 3-18 - sect. 3.2.4: change section title to Performance Categories -- this section is heavily modified. Refer to re-write to make additional comments. Where is the rewrite? You should have revision copy.
- ~~15.14.~~ pg. 3-27 ref to 6-4 omitted.
- ~~16.15.~~ pg. 3-28 "on" added
- ~~17.16.~~ pg 3-29 - non-porous not added. This para. is talking about the framework which involved both experimenting with solid and porous structures. Ok – but the experiments also investigated a loose bed, (also change flag done to flat)
- ~~18.17.~~ pg 3-30 - added fixed bed flume. Last sentence not added -- use of controlled is speculative. Bed response is modified by use of porous dikes, but talking about specific details of scour depth and lateral extent is not quantifiable. This can be added to individual opinion. You can change the wording if you don't like the word controlled. We need to mention here that the models use a porous structure in an attempt to deal with these problems. See last sentence of 3.4.1. I think this says what you are talking about. No further changes made.
- ~~19.18.~~ pg 4-1 General section moved to beginning of viewpoints sections.
- ~~20.19.~~ pg 4-2 - Please verify table 4-1 listing of published MM investigations. There are probably more now. If so, these could be added at the bottom of the table. Paragraph before this table - 16 model studies published. Remove Big Creek, it was not published. Add Ballard's Island (Illinois River), 1:3600, 15:1, Side Channel Enhancement. Done
- ~~20.~~ chapter 4 - heavily redone. See following specific noted on comments What do you mean here See new chapter 4 -- case studies.doc -- which includes all MVS case studies and ERDC opposing viewpoints.
- ~~22.21.~~ pg 4-18 Need Vicksburg Front case study from MVS -- I have flow visualization, but nothing on basic model . section 4.3 wording changed in 1st and 2nd para. OK
- ~~23.22.~~ pg. 4-19, 20, 21 & 22 - sections suggested for moving to main report noted. The way these para read, they are more geared toward proponent's section. I put these

paragraphs into the sections where are thought they would fit. Who is making the decisions on what to put into the main body? Should we not be given the same opportunity to submit our thoughts as you have? Maybe Steve would agree. Maybe not. We'll never know until he sees it. I thought this was a joint report. For the most part, St. Louis has just been a reviewer of what has already been written. Should we just write three separate reports? If not, let's make it a team report!

24.23. pg bottom of 4-22 and 4-23, 25, & 26 - case study references eliminated per suggestion.