

Review Form 3

Journal Name:	Journal of Engineering Research and Reports
Manuscript Number:	Ms_JERR_130296
Title of the Manuscript:	Three New Approaches to estimating Energy Losses in Stepped Spillways with the Channel slope of 8.9o.
Type of the Article	Original Research Article

PART 1: Comments

	Reviewer's comment	Author's Feedback (Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.		
Is the title of the article suitable? (If not please suggest an alternative title)		
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.		
Is the manuscript scientifically, correct? Please write here.		
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.		
Is the language/English quality of the article suitable for scholarly communications?		
Optional/General comments	The argument that tests at other slopes are not easily interpolated to 8.9 degrees is valid, but the reasons are not clear for having a special interest in the slope angle of 8.9 degrees. It seems the only reason may be that it is the existing slope angle of the flume used for the study. Since the title emphasizes this specific slope, a stronger justification should be given of the value of studying this particular slope. The slope of the test flume is stated as 8.9 degrees but the geometry of the steps is described as step height = 0.1 m and step length (tread length) of 0.2 m. This does not correspond to a slope of 8.9 degrees (assuming that step treads are horizontal), but rather a slope of 26.57 degrees. I do not believe the width of the test flume is ever stated. Citations are given at times in numbered format, like [1], [15], [11, 12] [27] but references are	

Review Form 3

	not numbered. In section 2.B it is stated that “The authors analyzed about 500 [missing word?] with complete data...”. What is the missing word? Tables containing all experimental data should be provided. Eq. 8 uses coefficient α_2 twice and is missing α_4. The symbol y_c is used, but d_c is used in all plots. How did the authors choose Nh/d_c as the appropriate dimensionless parameter for the x axis of the plots? Were N and h constant for all data points? Data analysis details are not explained. Presumably, the dual-tip phase detection probes were used to determine flow velocity, air concentration, and flow depth, but the manner in which each was determined (especially flow depth in aerated conditions) is not explained, and the use of these data to calculate the energy loss is also not explained. There are various methods and assumptions that could be important and should be explained. All of the plots show $\Delta H/H_{max}$ vs. Nh/d_c but it is never explained how the tests were run. Does each data point represent a different flow rate in the flume or a different step number down the length of the flume? (i.e., is it N or d_c that varies? Were data always recorded at the same step and was it always in the aerated flow zone, or were any data collected in the clear-water flow at the upstream end of the slope?) The subheading for results states “Developed Models for the Nappe/Transition/Skimming Flow Regime” but the authors never identify which data points are in each regime. They state that “discharges had transition and skimming flow rates of $0.035 \leq q_w \leq 0.234 \text{ m}^2/\text{s}$” but this still does not state where the separation between transition and skimming occurred. Were any data collected or analyzed in nappe flow? The extremely small values of exponents in equation 9 suggests that variables N and h have almost no importance in that equation. Correlation coefficient values seem very suspicious, especially those that are very close to 1.0, despite the fact that the curves generally do not fit the data as well as such coefficient values would suggest. Even the correlation coefficients of about 0.88-0.9 appear to be much too large	
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Review Form 3

	considering the visible difference between the curves and the measured data points. The authors must re-check how these were calculated. One data point in Run 4 appears to be an outlier due to serious experimental error or a change in fundamental behavior of the flow that is not explained. All figures should show blue data points for measured data and ONLY an orange line for the developed model curves. (No orange data points should be shown.) The orange points are not measured data, and the exact value of Nh/d_c at which data points were calculated to plot the curve was arbitrary. Only the curve itself is relevant. The fit of curves to the measured data is poor. Why is this? For example, Figure 10 shows a curve that is the same shape as the measured data, but the curve is offset well below the actual data points. Why were 3 different models created? Are they meant to serve specific purposes or do they have other significance? Model 1 crosses through the middle of the data points but does not follow the general trend/shape/slope of the measured data. Models 2 and 3 do a better job of following the shape/trend/slope, but they are offset from the actual data. (They run parallel to the data, but do not match them.) There are numerous grammatical mistakes, awkward phrases, and typographic errors (especially in the reference list). The text should be carefully edited and reviewed, perhaps with the aid of a native English speaker or professional editing service. Conclusions states: The results from the developed models, Eq (9) to Eq (11), compare well with the measured data sets (Run 1 to Run 4) in terms of energy dissipation, with the coefficients of correlation that range between 0.95 and 1.0.	
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Review Form 3

PART 2:

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Are there ethical issues in this manuscript?	(If yes, Kindly please write down the ethical issues here in details)	

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