



# Leonard Jackson Associates

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August 27, 1999

Dewberry & Davis  
8401 Arlington Boulevard  
Fairfax, Virginia 22031

Att: Ms. Jean Hough

Re: CLOMR - Rio Grande De Loiza  
Plaza Pinero - Site  
Canovanass, Puerto Rico  
LJA # 99023

Dear Jean:

Attached is an application for a Conditional Letter of Map Revision (CLOMR) for the Rio Grande De Loiza at the Plaza Pinero site in Canovanass, Puerto Rico.

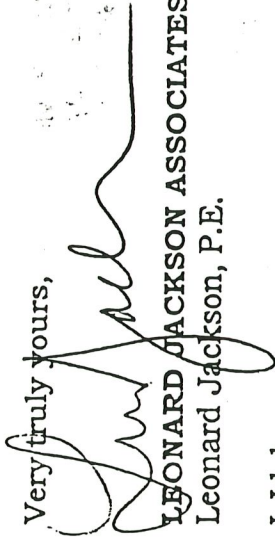
There is no record of the original SWMM hydraulic model analyses utilized by the Jacksonville District Corps of Engineers to prepare the effective Puerto Rico Flood Insurance Study in this area. To prepare this CLOMR request we obtained new survey and prepared a new HEC-2 model duplicating the effective base (100-year) flood profile. We then prepared a new Equal Conveyance Reduction Floodway model and propose an excavation to lower the river overbank within the effective floodway, thereby increasing river conveyance upon which to support this CLOMR request.

This procedure is as we discussed several months ago.

Attached is a more detailed description of the methodology employed for this work and a technical Appendix supporting the CLOMR request including forms and analyses.

Thank you for your assistance in this matter.

Very truly yours,



LEONARD JACKSON ASSOCIATES  
Leonard Jackson, P.E.

LJ:lcb  
Attachment

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## RIO GRANDE DE LOIZA, CANOVANAS, PUERTO RICO REQUEST FOR CONDITIONAL LETTER OF MAP REVISION (CLOMR)

### METHODOLOGY

A Conditional Letter of Map Revision (CLOMR) is sought for the Rio Grande De Loiza in Canovanas, Puerto Rico. The following outlines the methodology incorporated in support of this requested CLOMR.

#### 1. Background

The text of the effective Puerto Rico Flood Insurance study dated March 2, 1981 indicates that analyses for the Natural hydraulic profile and Floodway delineation incorporated the SWMM Hydraulic Model. This F.I.S. was prepared by the U.S. Army Corps of Engineers, Jacksonville District. The Corps of Engineers, F.E.M.A., and Dewberry & Davis have no record of these analyses. The source of existing data therefore is the published Flood Insurance Study consisting primarily of hydraulic profiles, Floodway table data, FIRM, and Floodway maps.

In the absence of original hydraulic analyses the following methodology was incorporated into this CLOMR request.

#### 2. Hydrology

Discharges on the Rio Grande De Loiza were derived from the data published in the effective Flood Insurance Study. The discharges in the subject reach of the requested CLOMR were extrapolated from a plot of discharge versus drainage area; data provided in the Summary of Discharges Table in the effective F.I.S.

#### 3. Hydraulic Model

In the absence of the original hydraulic model an HEC-2 model was prepared utilizing new survey obtained in the vicinity of the requested CLOMR. This HEC-2 model was calibrated to match the effective base (100-year) hydraulic profile of the river as published in the effective F.I.S.

#### 4. Floodway

The text of the effective F.I.S. indicates that Floodways were defined by determining which areas might be developed in the future and then drawing in floodway limits reflecting this determination. These limits were then analyzed using the SWMM model to confirm conformance with allowable rise limits. This method did not incorporate the "equal conveyance reduction" standard which is currently employed in Flood-

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way delineations. The SWMM hydraulic model does not incorporate an equal conveyance reduction sub-routine such as HEC-2.

In the vicinity of the proposed CLOMR there is minimal developable fringe area on either overbank of the Rio Grande De Loiza. The intent of this CLOMR request is to provide a developable fringe outside of appropriately amended floodway limits.

As a basis for our work, therefore, utilizing the new calibrated HEC-2 model we prepared a Method - 4 Equal Conveyance Reduction Floodway Analysis in the same manner as we would prepare for a current Flood Insurance Study. The resultant Floodway provides developable fringe areas on both sides of the river. The hydraulic profile of this new HEC-2 Floodway model conforms to current F.E.M.A. requirements allowing no rise exceeding 0.31 meters (one foot). We refer to this new Floodway model as the "Target Floodway Model."

This Target Floodway Model could be the basis for a Letter of Map Revision (LOMR). However, a further analysis was performed to determine how an excavation of the overbank area on the Plaza Pinero site would increase conveyance to allow the narrowing of the "target" floodway model limits to yield a greater developable fringe area. The proposed excavation would be the "Condition" required for this narrower Floodway for a CLOMR.

Successive iterative trial analyses were prepared whereby trial excavations in the overbank were analyzed in conjunction with trial Floodway Limits on the Plaza Pinero site yielding no rise in the Method 4 "Target" floodway profile. The floodway limits on the Northern (left) overbank area opposite the Plaza Pinero site were held at the encroachment limits set by the Method 4 - Target Floodway Analyses. A satisfactory combination of proposed overbank excavation and Floodway limits on the Plaza Pinero site were thereby defined.

In summary, this Conditional Letter of Map Revision request is based on a new HEC-2 hydraulic model that matches the effective base 100-year flood profile on the Rio Grande De Loiza. The proposed floodway limits satisfy current equal conveyance reduction criteria and are conditioned upon proposed excavation to provide additional conveyance within the floodway on the Plaza Pinero site.