May 22, 2014

Mr. Hannan, P.E., CFM
Harris County Flood Control District
Engineering and Construction Division
9900 Northwest Fwy.,
Houston, Texas 77092

Re: Response to Comments for LOMR for Brickhouse Gully;
City of Houston
Brickhouse Gully (E115-00-00)

Dear Mr. Hannan:

Below are our responses to the third HCFCD courtesy review comments to the LOMR for Brickhouse Gully dated April 4, 2014.

1. Comment: Previous coordination reveals that you have created a 1D/2D analysis to model this area. Please provide information from the analysis showing that flow is reasonable similar to the flow used in the HEC-RAS model for the split at the golf course.

Response: The previously created 1D/2D analysis XPSTORM model was used to show the general direction of overland flow leaving Brickhouse Gully. Peak flows in this model were not calibrated to peak flows in the steady HEC-RAS model due to the complexity of running the XPSTORM model with bridges.

A simplified 1D/2D XPSTORM model was made in response to this comment in order to verify the magnitude of flows leaving Brickhouse Gully and overflowing down Gessner Drive. The following data and parameters were used to develop the XPSTORM model:

- HEC-RAS cross sections from immediately upstream of Gessner Drive (HEC-RAS cross section 31967.0) to immediately upstream of Talina Way Drive (HEC-RAS cross section 31598.8) were input into the XPSTORM model.
- An SCS Typ II distribution hydrograph was used in the XPSTORM model. Rainfall depths were adjusted in the hydrologic parameters of the XPSTORM model in order to generate peak flows that were representative of the peak flows in HEC-RAS for the 10-year, 50-year, 100-year, and 500-year storm events. XPSTORM models for each rainfall event are attached.
- A stage-discharge relationship was developed in HEC-RAS based on running a series of flows in the Brickhouse Gully hydraulic model and checking the water surface elevation upstream of Talina Way Drive. This relationship was used as the tail water condition in the simplified XPSTORM model which terminates at Talina Way Drive.

Smart Engineering, Smart Solutions.
All annotation on image is as received from HCFCD. This is the only image found with overflow entering from Gessner as narrative states. Image was supplied as support to 2nd review response.
Signed topographic work map showing impossible flow path.
Impossible flow path shown on the LOMR
The impossible flow path shown on topographic work maps and the LOMR.
The LOMR arguments seem to conflict with City of Houston GIMS layers of Overland Drainage Areas and Sheet Flow. How does water enter the property from the west off Gessner? All of the Gessner sheet flow is shown going to the E115-09-00 tributary.
Property in 1989 before golf course.
Golf Course Floodway profile - where is the model that connects the golf course to the alleged overflow from Brickhouse Gully?
The proposed floodway.
Inundation at 90 feet. The proposed channel and ridge would not hold water.
Inundation at 91 feet. The proposed channel and ridge would not hold water.
Inundation at 92 feet. The proposed channel and ridge would not hold water.
Pine Crest Golf Course – Dynamic Flood Depths at Base Flood Event
(100 Year Flood)

| Pine Crest Golf Course: Flood Mitigation Potential Base Flood Detention Volume Calculation* |
|---------------------------------|--------|--------|--------|
| Area (sq ft)                    | Acres  | Acre ft | Average depth |
| 5,420,745                       | 124    | -229    | -1.8    |

* Volume Calculation based on the difference between the dynamic BFE flood water surface from LOMAR 0275 and LIDAR elevations from the HGAC08 survey.

Synopsis:
This highly-sculpted, golf course property accommodated approximately 229 acre feet of floodwater volume during a 100 year flood event. The developers are bringing in fill dirt, elevating the property and saving approximately 86 acre feet of detention volume. That leaves 143 acre feet of floodwater volume which cannot be detained on the property. The surrounding properties will be forced to accommodate this extra flood water during the next 100 year flood event.

In addition, the new housing development will cover a high percentage of the area with impervious surface. This surface is not offset with any detention volume (as required in Fort Bend County), further increasing the flood risk to local residents.