**Memo for the Paper Flood Fragility and Loss Function**

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## 2-D Fragility Curves Data

Lognormal fitted fragility parameters are listed in Table 2. 2-D flood fragility curves based on flood depth as an intensity measure are included in the **Building\_Archetypes\_Data\_2D.xslx** which has several sheets named as follow:

**Depth:** x-axis of the fragility curve

**DS0\_2D:** y-axis of the DS0 fragility curves for the 15 Building archetype (F1,F2, …)

**DS1\_2D:** y-axis of the DS1 fragility curves for the 15 Building archetype (F1,F2, …)

**DS2\_2D:** y-axis of the DS2 fragility curves for the 15 Building archetype (F1,F2, …)

**DS3\_2D:** y-axis of the DS3 fragility curves for the 15 Building archetype (F1,F2, …)

**DS4\_2D:** y-axis of the DS4 fragility curves for the 15 Building archetype (F1,F2, …)

## 2-D Loss Curves Data

The same excel file **Building\_Archetypes\_Data\_2D.xslx**, there are other sheets for the loss Data:

**Loss\_M1\_2D:** y-axis of the component-based fragility curves for the 15 Building archetype

**Loss\_M1\_2D\_std:** y-axis of the standard deviation of the component-based fragility curves for the 15 Building archetype

**Loss\_M2\_2D:** y-axis of the fragility-based fragility curves for the 15 Building archetype

**Buildings\_Replacement\_Cost:** is the mean replacement cost for each building archetype to account for normalized loss curves.

The same excel file **HAZUS\_Data.xslx** contains the HAZUS-based loss data

## 3-D Fragility and Loss Surfaces Data

Each building archetype 3-D loss and fragility data are assigned in separate excel sheet. For example, **F1\_3D.xslx** contains six sheets as the following:

**Depth-Duration\_3D:** contains the x- and y-axis of the 3D fragility and loss surfaces

**F1\_DS0\_3D:** is the z-axis of DS0 fragility surface for the building archetype (F1)

**F1\_DS1\_3D:** is the z-axis of DS1 fragility surface for the building archetype (F1)

**F1\_DS2\_3D:** is the z-axis of DS2 fragility surface for the building archetype (F1)

**F1\_DS3\_3D:** is the z-axis of DS3 fragility surface for the building archetype (F1)

**F1\_DS4\_3D:** is the z-axis of DS4 fragility surface for the building archetype (F1)

**F1\_Loss\_3D:** is the z-axis of component-based direct loss surface for the building archetype (F1)

**Note:** I added a Matlab code that draw all the fragility and loss curve and surface just in case if you want to display any curve