3 Hazard_Inv_map module

This module maps hazard intensities at control points in a hazard scenario to the building level. To achieve this—and currently as the only method implemented within the inventory linkage model—the `Inverse_d4` method is used. This is a weighted average approach, described as follows: Referring to Figure1, suppose the four closest control points to each building centroid are identified. Let the distances from these control points to the building centroid be denoted as d_i, and the corresponding intensity values at these points be F_i. Then, the intensity F_j at building j is calculated using an inverse-distance weighted average:

$$F_j = \frac{\sum_{i=1}^{4} \frac{F_i}{d_{ij}}}{\sum_{i=1}^{4} \frac{1}{d_{ij}}}$$

This formulation ensures that closer control points have a greater influence on the estimated intensity at the building location.
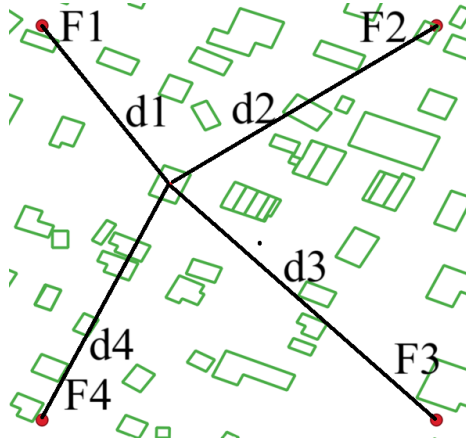

Figure 1: Matching buildings with the closest 4 control points.