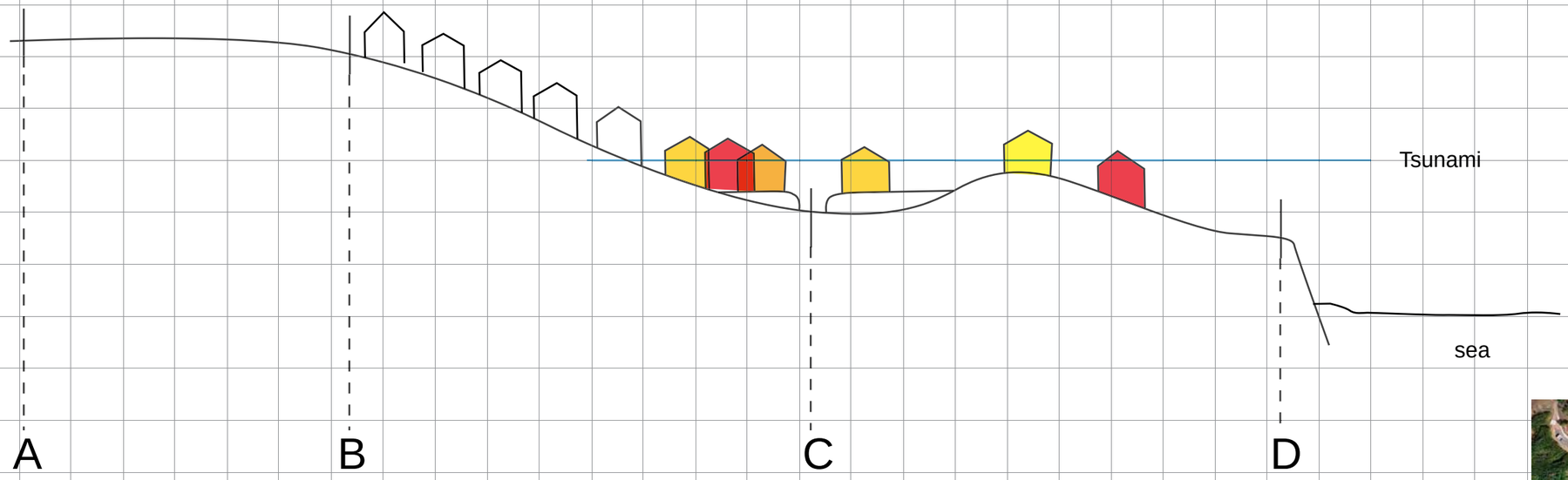


No houses are Damage

Some are damaged.

All of houses are damaged.

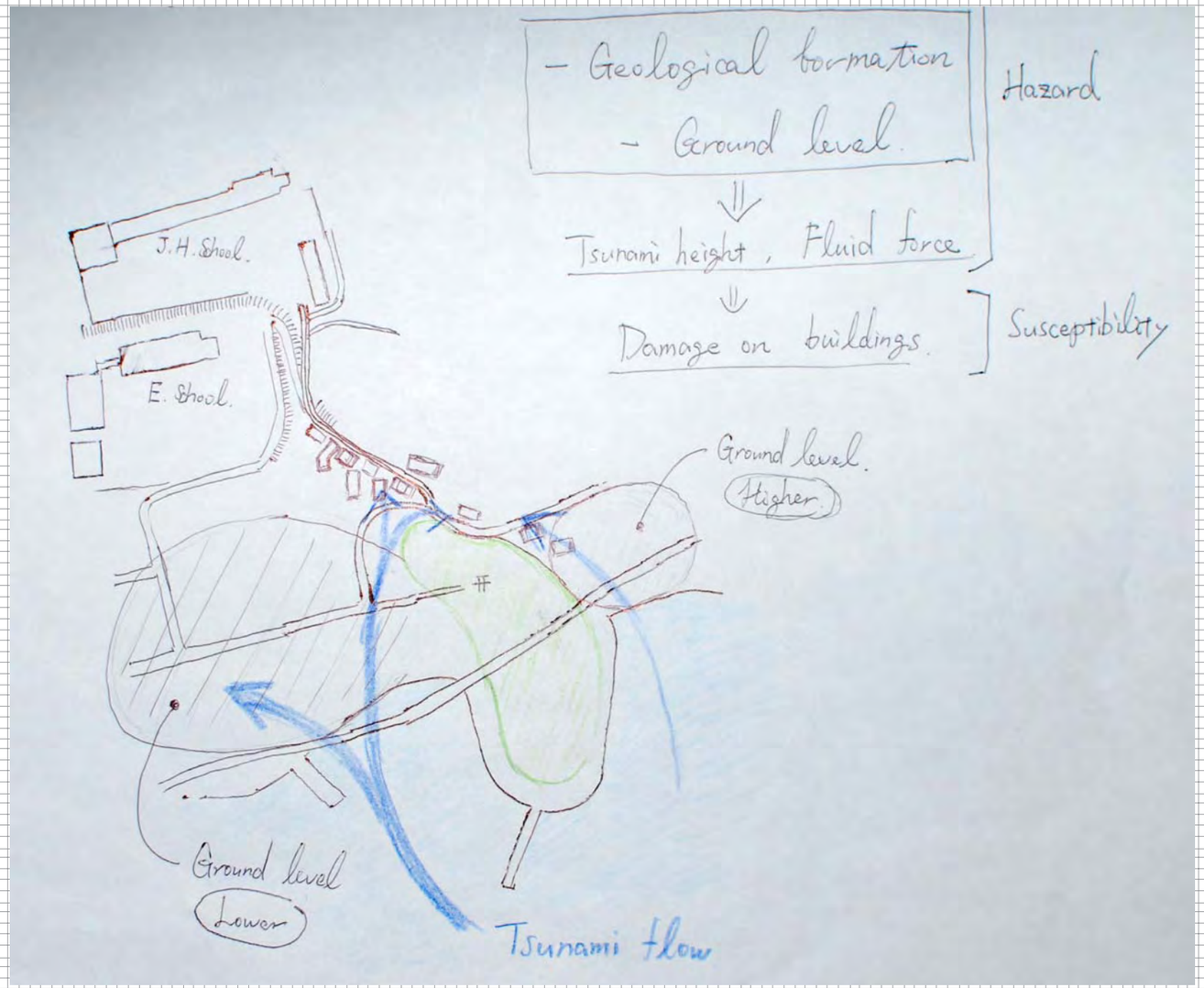
Description

This site is the street from the gate of junior high school to coast. It is gradually declining from north-west to south-east.

Observations / Inventory

(A to B)
From the gate of junior high school to the entrance of slope. The street is almost flat. Traces of tsunami damages are not found.
(B to C)
From the entrance to the bottom of slope. Ground level is declining. 5 or 6 houses are built along the street. Firstly, traces of tsunami damages are not found and people living here. However, stepping across a line, heavily damaged houses are shown up. The insides of damaged houses are completely destroyed and they are not available anymore.

(C to D)
From the bottom of slop to coast. Ground level is climbing a little and declining again. At the end this street meets coast. There are some houses facing to sea. The 1st floor parts of buildings are heavily damaged. One of them has been already repaired.



Description

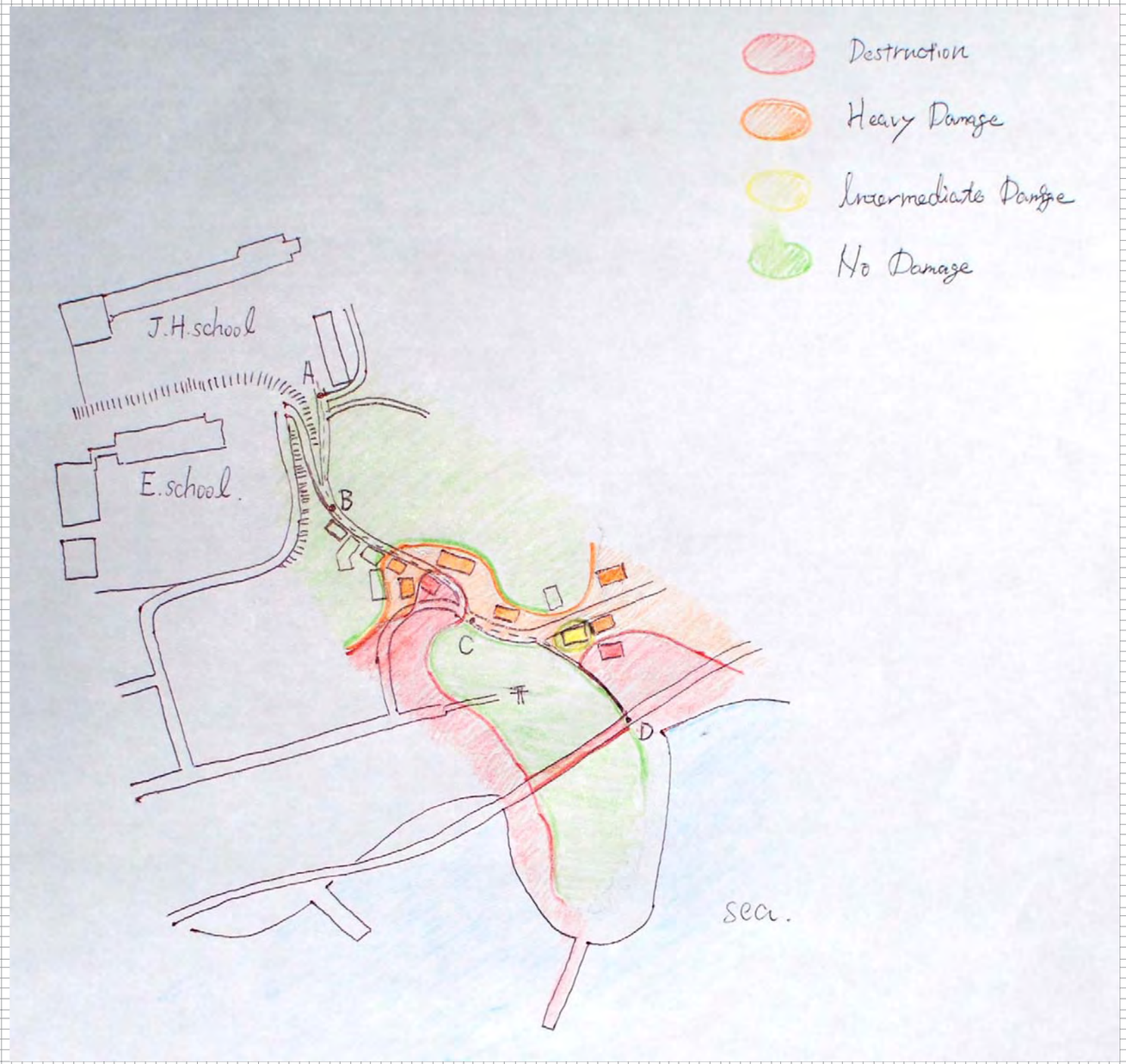
Walking down the slope, I found a clear boundary of tsunami damage. In higher area, building has no damage and people can live as usual. On the other hand, in lower area, the most of houses are heavily damaged and they are not available without repair.

Observations / Inventory

Ground level is a main factor for influencing damage from tsunami. However, in the lower area, damage degrees are different depending on locations even where the ground level of houses is almost same. Additionally, some houses located in inland got heavier damage than one in coast-line. It might be due to tsunami flows. There are two tsunami flows influencing building damages in this site . One came from the west side of the mountain with shrine, and the other came from east side of the mountain. Ground level of west side is lower than one of east side. Hence, fluid force is stronger in west side. Houses around point C might be damaged by flow from west side, and houses close to coast might be damaged by flow from east side. Thus, geological formation and ground level influence the extent and fluid force of tsunami, which influence damages on buildings.

Drawing Name

Flow of Tsunami



Description

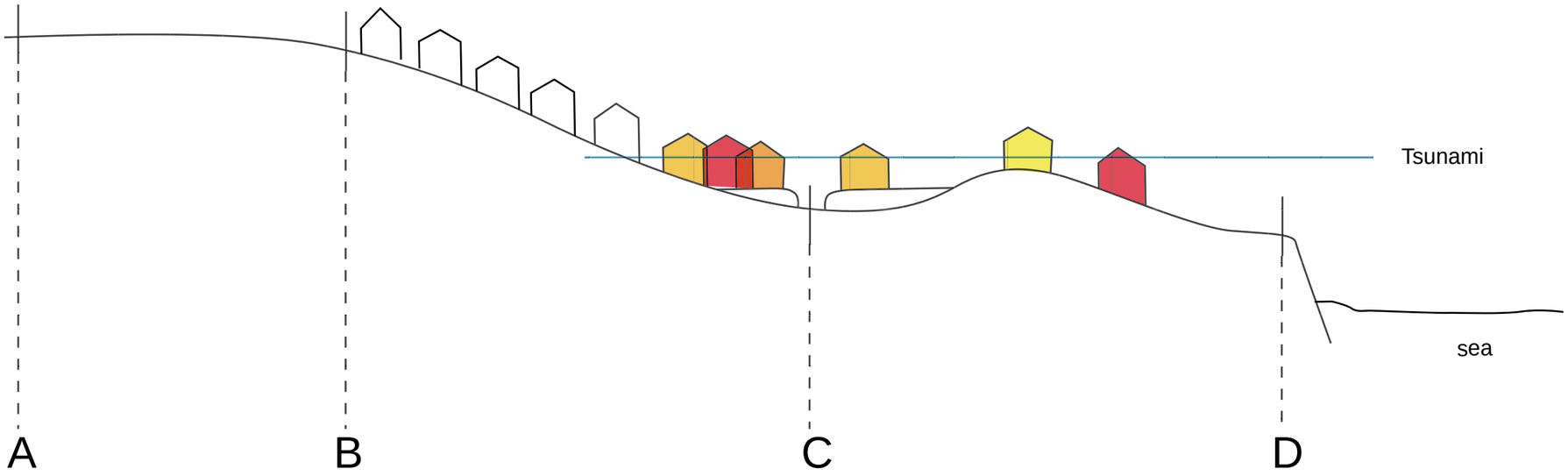
Based on the site analysis, the damage situation map is made. Damage contour is drawn at the center of the site.

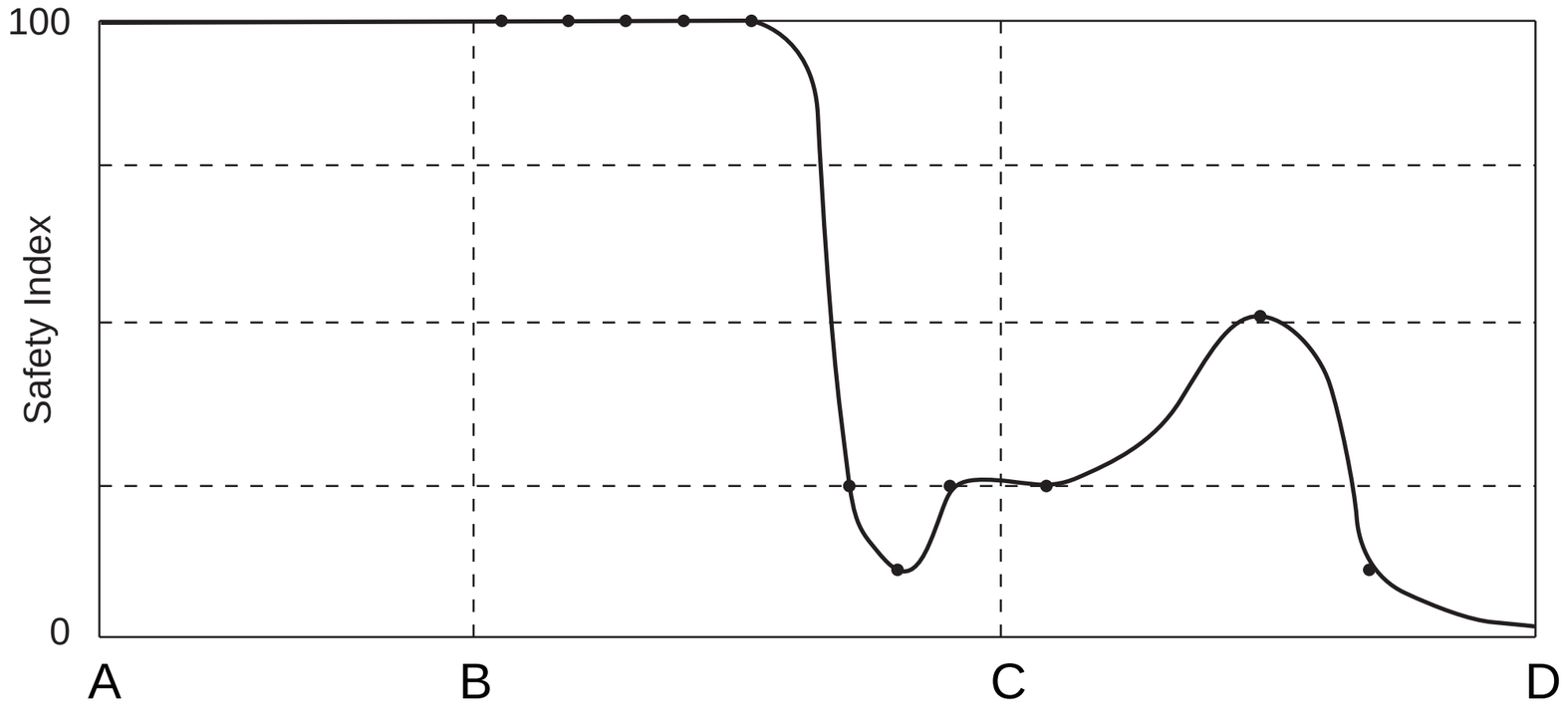
Observations / Inventory

Analysis

Drawing Name

Damage Situation Map





SAFETY INDEX

For land use plan for reconstruction, the risk of tsunami should be figired out. From the damage situation, following safety index is set up.

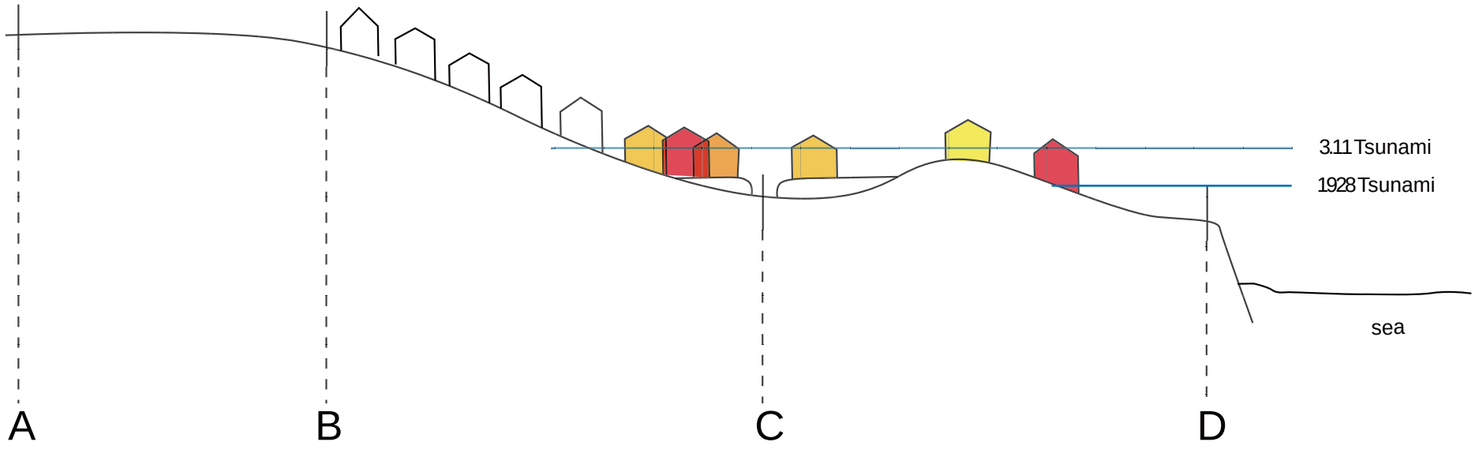
Destructed house is 10.

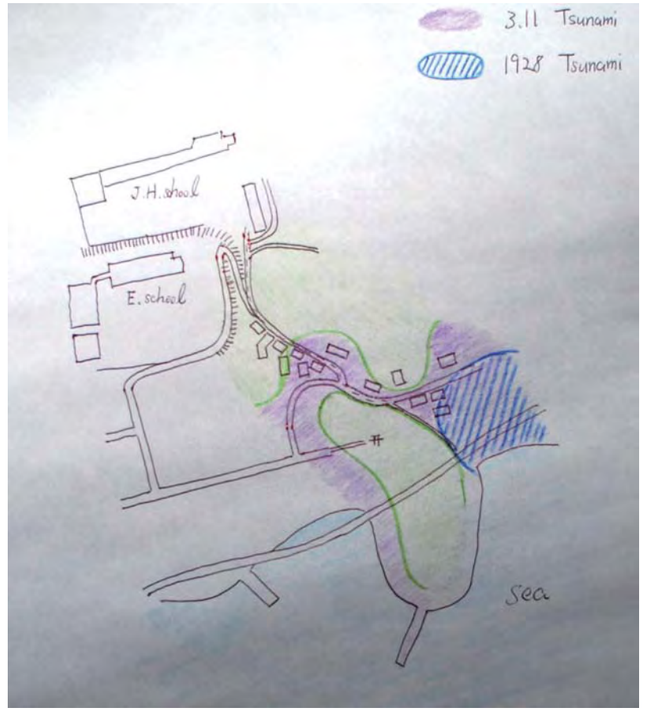
Heavily damaged house is 25.

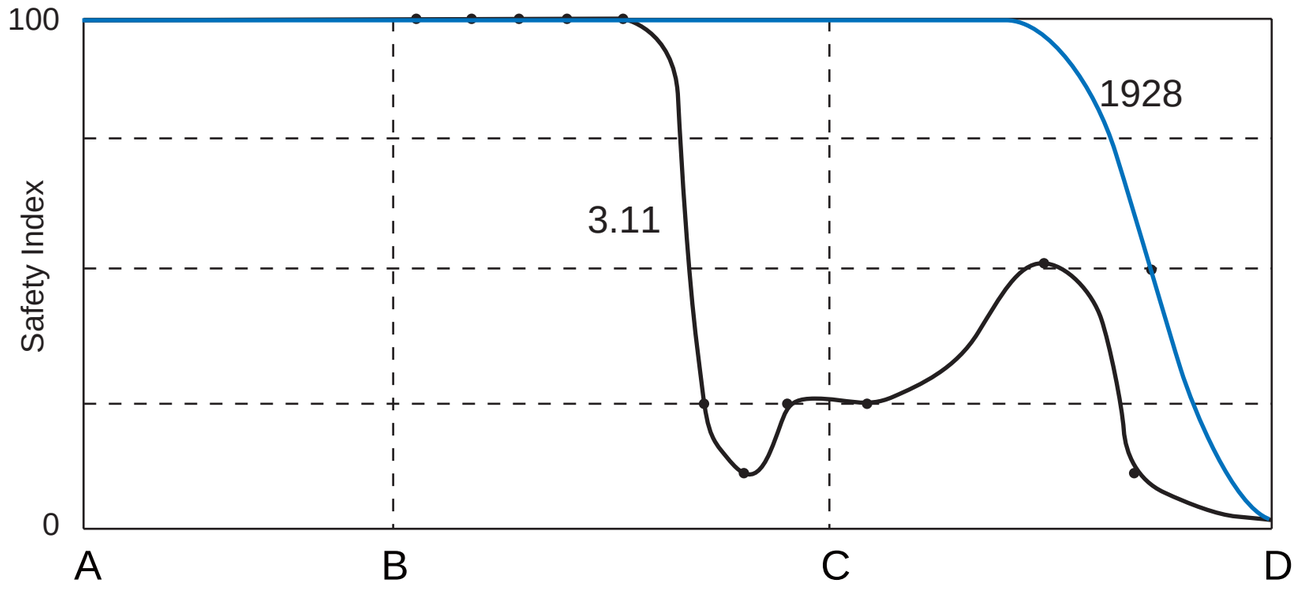
Intermidiate damaged house is 50.

No damaged house is 100.

Connecting the plotted dots, the chart of safety index is drawn. Comparing between this chart and section, it is found there is another factor except the ground level and the length from sea. It is possible to be due to geological formation.







UNCERTAINTY

Up to now, the risk of 3.11 tsunami has been mentioned. However, this area has been devastated by tsunami many times. Degrees of tsunamis are defferent depending on time. The height, area and estimated safety index of tsunami in 1928 are shown in section and figure. From the safety index figure, the risk of the area around C is different between 3.11 and 1928 tsunami. Generally,low-frequent tsunami is estimated to be larger than high-frequent tsunami based on statistics. Considering the uncertainty of statistics, a viewpoint of land characteristics should be carefully observed for deciding land use plan.

CONCLUSION

Through the site analysis and the observation of previous tsunami data, higher risk area is identified in the site. Considering the uncertainty of statistics, the land use should be decided from the observation of land characteristics.