

Tohoku Chapter, Architectural Institute of Japan Reconnaissance Report (09)  
of Arahama District, Sendai City  
The 2011 off the Pacific Coast of Tohoku Earthquake  
Released on March 28, 2011

Professor Reiji Tanaka, Tohoku Institute of Technology  
President of AIJ Tohoku Chapter  
(Translated by Shunsuke Otani, University of Tokyo)

This report describes tsunami damage of Arahama District, eastern part of Sendai City, approximately 30-minute drive from JR Sendai Station. Route map is shown at the end of this report (Fig. 1). The damage investigation was carried out along National Route 137.

The observed damage may be summarized as follows:

- (1) The outflow items were seen to increase beyond the Sendai Tobu Highway, but out flown houses could not be seen in this area (Photos 1 to 3).
- (2) Toward Arahama District, more damage was seen to houses and buildings (Photo 9).
- (3) Near the Sendai Municipal Arahama Elementary School, most timber houses were flown out and collapsed by tsunami attacks (Photos 10 and 11).
- (4) Damage of the Sendai Municipal Arahama Elementary School buildings is shown in Photos 12 and 13. The first two stories of the four-story reinforced concrete buildings were submerged under tsunamis and the first story of the building was filled with overflow materials. The buildings were retrofitted before the earthquake and structural damage was not observed.
- (5) No timber houses remained standing between the Arahama Elementary School and the coast. Only steel construction and reinforced concrete buildings were standing (Photos 14 to 18).
- (6) Photo 19 shows a breakwater embankment at the coast. No damage was observed to the embankment, but the tsunami wave crossed over the embankment.
- (7) Photos 20 and 21 show the hand rails on the embankment; one in the direction of tsunami flow suffered no damage, but the rail normal to the flow was damaged totally from its base.



Photo 1: Outflow items beyond the Sendai Tobu Highway; but houses were not damaged (1)



Photo 2: Outflow items beyond the Sendai Tobu Highway; but houses were not damaged (2)



Photo 3: Roads have been cleared



Photo 4: Tsunami wave reached the roof of the building although the building was not damaged.

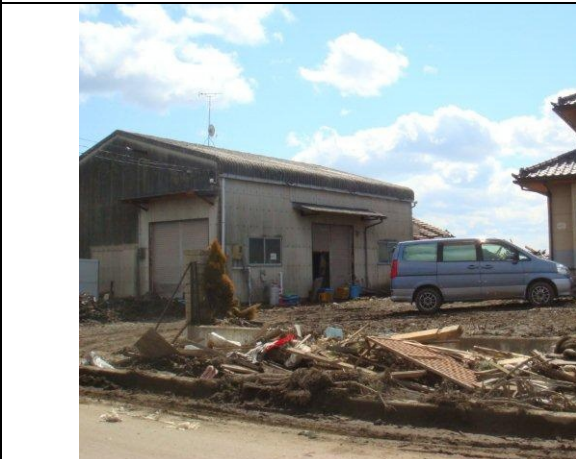


Photo 5: Tsunami wave reached the roof of a building.



Photo 6: No damage was observed to the concrete block masonry walls



Photo 7: Outflows were seen to increase. Tsunami wave reached beyond the floor level (1).



Photo 8: Outflows were seen to increase. Tsunami wave reached beyond the floor level (2).



Photo 9: Building damage was seen to increase as we approach Arahama District.



Photo 10: A house was completely washed away except for the foundation (1).



Photo 11: A house was completely washed away except for the foundation (2).



Photo 12: Overall view of the Sendai Municipal Arahama Elementary School; tsunami wave submerged the lower two stories.



Photo 13: Gymnasium of the Arahama Elementary School; tsunami water flooded inside to yield complete damage to the content.



Photo 14: Steel construction remained standing in Arahama District



Photo 15: Close up view of the building shown in Photo 14 (1).



Photo 16: Close up view of the building shown in Photo 14 (2).



Photo 17: Close up view of the building shown in Photo 14 (3).

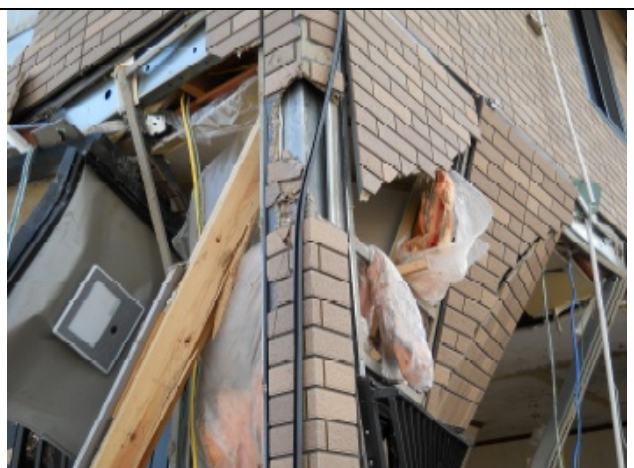


Photo 18: Close up view of the building shown in Photo 14 (4).



Photo 19: Undamaged Breakwater embankment



Photo 20: Damage of rails on the embankment (1).



Photo 21: Damage of rails on the embankment (2).

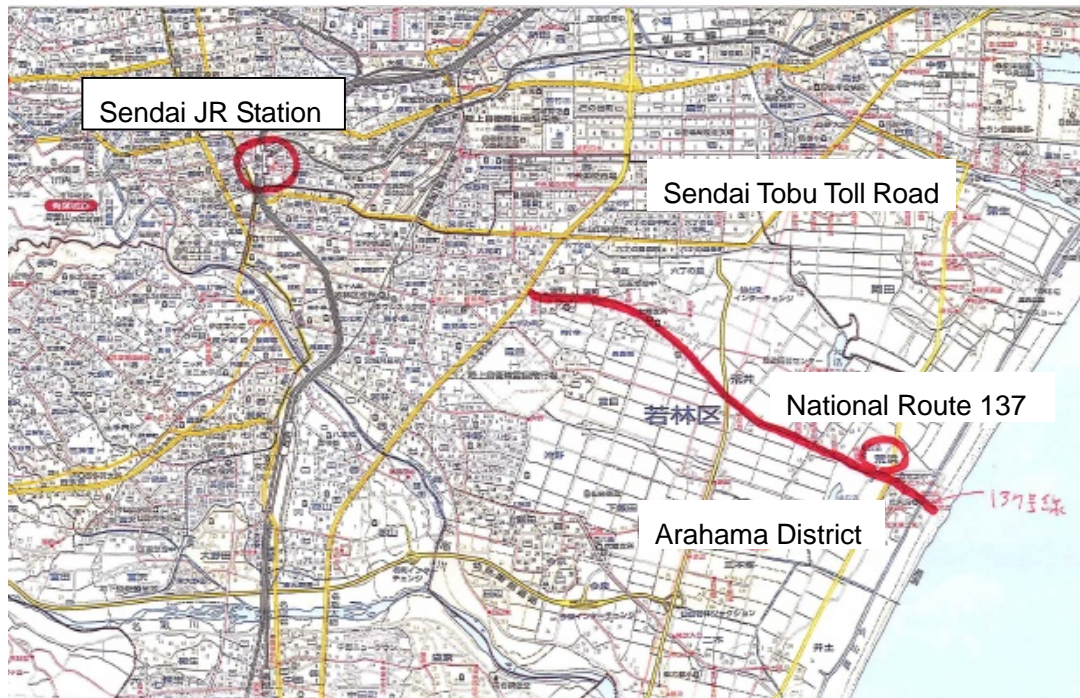


Fig. 1: Visiting route