

Tohoku Chapter, Architectural Institute of Japan  
Reconnaissance Report (19) on Minami-Sanriku-cho, Miyagi prefecture  
The 2011 off the Pacific Coast of Tohoku Earthquake  
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Disaster Committee, Tohoku Chapter

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This report shows photos of building damage in Shidukawa-Shiomi-cho District and Utatsu-Hosoura District, Minami-Sanriku-cho, Motoyoshi-gun (county), Miyagi prefecture. Minami-Sanriku-cho (town) is located approximately two hour drive from JR Sendai Station. Shiomi-cho District is in the south of the central part of Minam-Sanriku-cho, and faces the sea shore. Hosoura District is approximately 10 minute drive to the north of Shiomi-cho, and a fishery village facing a bay.

According to Miyagi prefecture, 437 were killed and 7,343 are evacuated as of April 10, 2011. The missing were under investigation. The map of visited places is shown at the end of this report (Figs. 1 to 3). Japan Meteorological Agency reported that the tsunami height in Minami-Sanriku-cho was 15.9 m (published on April 11, 2011).

#### 1. General features of damage in Shiomi-cho (town) district

- (1) The flood gate was closed at the time of tsunami attack, tsunami wave passed over the sea wall and reached as high as 16 m (Photo 1, location: No. 1 in Fig. 2).
- (2) Tsunami reached the third or fourth floor of buildings; the tsunami water reached the third floor of an evacuation building near the sea shore (Photos 2 to 5, No. 2 to 5 in Fig. 2, respectively).
- (3) Most of timber houses were washed away by tsunami, reinforced concrete buildings remained standing, and some steel buildings were also standing (Photos 6 to 8, No. 6 in Fig. 2).
- (4) In steel moment resisting frames, such as a gas station building, walls and roofs were washed away and only skeleton remained standing (Photo 9 to 11, No. 7 and 8 in Fig. 2).
- (5) Concrete block walls, anchor bolts at the foundation of a timber house, and utility poles fell in the direction of tsunami flow (Photos 12 to 15, No. 8 in Fig. 2).
- (6) Reinforced concrete public buildings remained standing, however, the inside was flooded and filled with mud and rubbish. The exterior walls were damaged by colliding driftage (Photos 16 to 21, No. 6, No. 2, No. 3, No. 3, No. 9 and No. 9 in Fig. 2, respectively).
- (7) The foundation and prestressed concrete piles of a tsunami evacuation building was exposed by wash out of ground soil (Photo 22, No. 4 in Fig. 2).

(8) Muddy sea water stays in the sank ground and could not be drained. The puddle was repeatedly filled with high tide (Photos 23 and 24, No. 9 in Fig. 2).

(9) Those houses located higher than the Matsubara (pine field) Park, were undamaged (Photo 24, No. 9 in Fig. 2).

(10) In Matsubara (pine field) Park, all pine trees were washed away from roots, monuments and exhibited items were either moved, overturned or washed away (Photos 25 to 31, No. 10 in Fig. 2).

(11) New utility poles are under erection, and electricity will be soon recovered (Photo 32, No. 8 in Fig. 2).



Photo 1: Flood gates were closed at the time of tsunami, tsunami wave passed over the girder for winding gates (blue color).



Photo 2: Tsunami wave reached the third floor of the reinforced concrete Shidukawa Hospital building (front panel says the tsunami of the 1960 Chilean Earthquake reached 2.8 m at the point).



Photo 3: Tsunami wave reached the fourth floor of a reinforced concrete super-market building; washed way fishery nets hang on the building; according to the area residents, many people were saved on the roof.



Photo 4: Tsunami passed over 6-m high retaining walls and damaged the houses on the higher level.



Photo 5: Tsunami evacuation area; tsunami reached the third floor of a condominium building; sign of evacuation area at the roof.



Photo 6: Reinforced concrete super-market and ceremonial buildings remained standing.

Photo 7: Reinforced concrete condominium and two-story buildings remained standing; skeletons of steel buildings on the left.



Photo 8: The JR Kesen-numa line. Piers were standing but the railway was washed away and the Shidukawa station was destroyed.

Photo 9: The steel skeleton of a gas station building remained; washed away rubbish stayed on the beams and columns on the right.



Photo 10: The steel skeleton of a commercial building remained; exterior walls and roofs were washed away.

Photo 11: Steel skeleton of a steel building remained.





Photo 12: Concrete block walls fell in the direction of tsunami wave flow.



Photo 13: The foundation of a timber house remained at the site. Most houses in Shiomi-cho district showed similar conditions.



Photo 14: Anchor bolts in the foundation was bent in the direction of tsunami flow.



Photo 15: Utility poles fell down in the direction of tsunami flow.



Photo 16: Minami-Sanriku Police Station building (reinforced concrete). The inside is filled with rubbish, and a hole was made in the right side wall by colliding objects.



Photo 17: The damage appeared small from the external observation of Shidukawa Hospital (reinforced concrete), but the entrance porch was struck with diameter 300 mm steel columns and H-300x500 section.



Photo 18: The inside of Shidukawa Post office building (reinforced concrete) was filled with wash away rubbish.



Photo 19: Damage of an exterior wall of a two-story reinforced concrete building; washed away objects must have hit the wall.



Photo 20: The exterior wall shown in Photo 19.



Photo 21: The condition and damage of an interior wall of the building shown in Photo 19.



Photo 22: The foundation of a four-story reinforced concrete condominium building near the sea shore; the foundation is exposed.



Photo 23: The ground settlement developed muddy puddle.





Photo 24: Sea water could not be drained due to ground settlement. High tide repeatedly flood the area. The school on the hill did not suffer damage.



Photo 25: Most pine trees were fractured at the root in Matsubara Park.



Photo 26: A steam locomotive was moved 20 m by tsunami and overturned.



Photo 27: The steam locomotive cut down a pine tree.



Photo 28: A Chile-Japan friendship monument was undamaged



Photo 29: Moai Statute on the base remained standing (right), the top of a tower monument was flowed out (left).



Photo 30: Playing facilities were undamaged.



Photo 31: Overturned plaque showing the height of the 1960 Chilean Tsunami.



Photo 32: New utility poles have been constructed.



## 2. General features of damage in Hoso-ura district

The route map is shown in Fig. 3.

- (1) 1-m high tide embankment with sliding doors was constructed, but tsunami wave passed over the embankment and caused damage (Photos 1 and 2; location No. 11 in Fig. 3)
- (2) The low land near the sea shore is filled with remains of timber houses and washed away rubbish (Photo 3, No. 12 in Fig. 3).
- (3) Roads were scooped out by tsunami, and were dangerous for use (Photo 4, No. 12 in Fig. 3).
- (4) Houses on higher land were undamaged (Photo 5, No. 12 in Fig. 3).



Photo 1: 1-m high tidal embankment with sliding door was constructed, but of no use.



Photo 2: Tsunami wave passed over the tidal embankment and caused the damage.



Photo 3: The low land near the shore was filled with washed away rubbish.



Photo 4: Road side was washed and dangerous for use.



Photo 5: Timber houses on the hill are undamaged.





Fig. 1: Route Map



Fig. 2: Map A (Shiomi district)



Fig. 3: Map B (Hoso-ura district)