

14.8 Structures in the Red River

1) Distribution of the river facilities

The Study Team carried out a through survey of the existing river facilities such as groins, training walls and slope protection works in the Red River Hanoi Segment.

There are four groups of groins, some of which are buried in sand bars. Some of them have not be identified before. There is one training wall and five slope protection works. There locations are shown in **Figure A14.8.1**.

2) Examples of the river facilities

Shape and structure are measured for all the above facilities. An example of the groin group at Tam Xa is shown in **Figure A14.8.2**, or KT1 to Kt12. It has a structure of permeable submergible concrete piles with the crown height of 7-7.5m. There is the trend of erosion at the downstream shore of down stream-tilted groins. Perpendicular groins do not have this phenomenon.

Another example of typical groins is shown in **Figure A14.8.3**, or Groins K2 and K3 at Phu Gia. Their structure is of stones and rubbles with the crown height of 5-6m. K3 has been partly broken

Generally speaking the above groins are effective to protect the shore and catch sediments.

An example of slope protection is shown in **Figure A14.8.4**, which is the slope protection at Tu Lien. It is free stone masonry with concrete frames with rubble stone base. The crown height is about 10m.

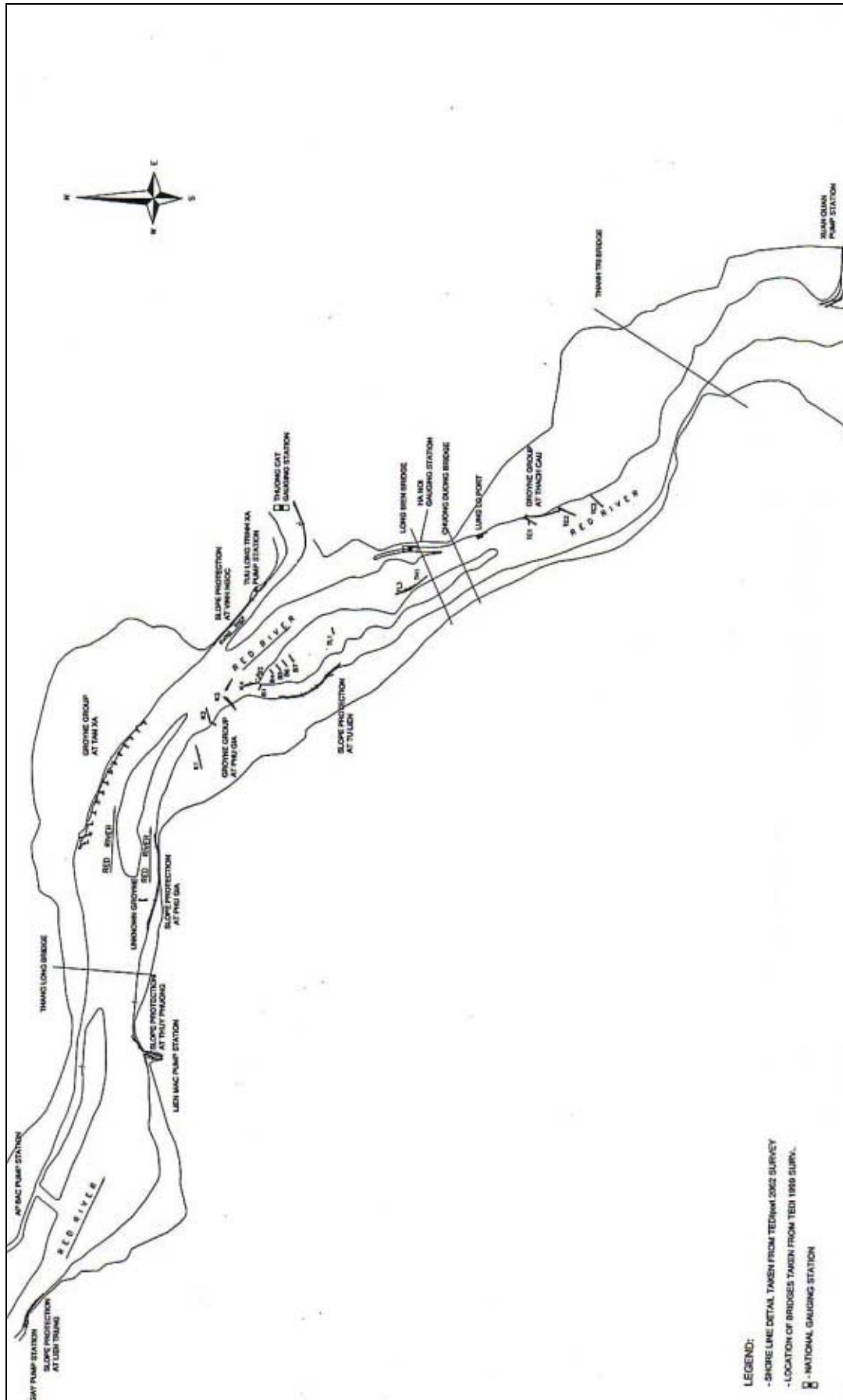


Figure A14.8.1 Distribution of Structure in the Red River

Source) JICA Study Team

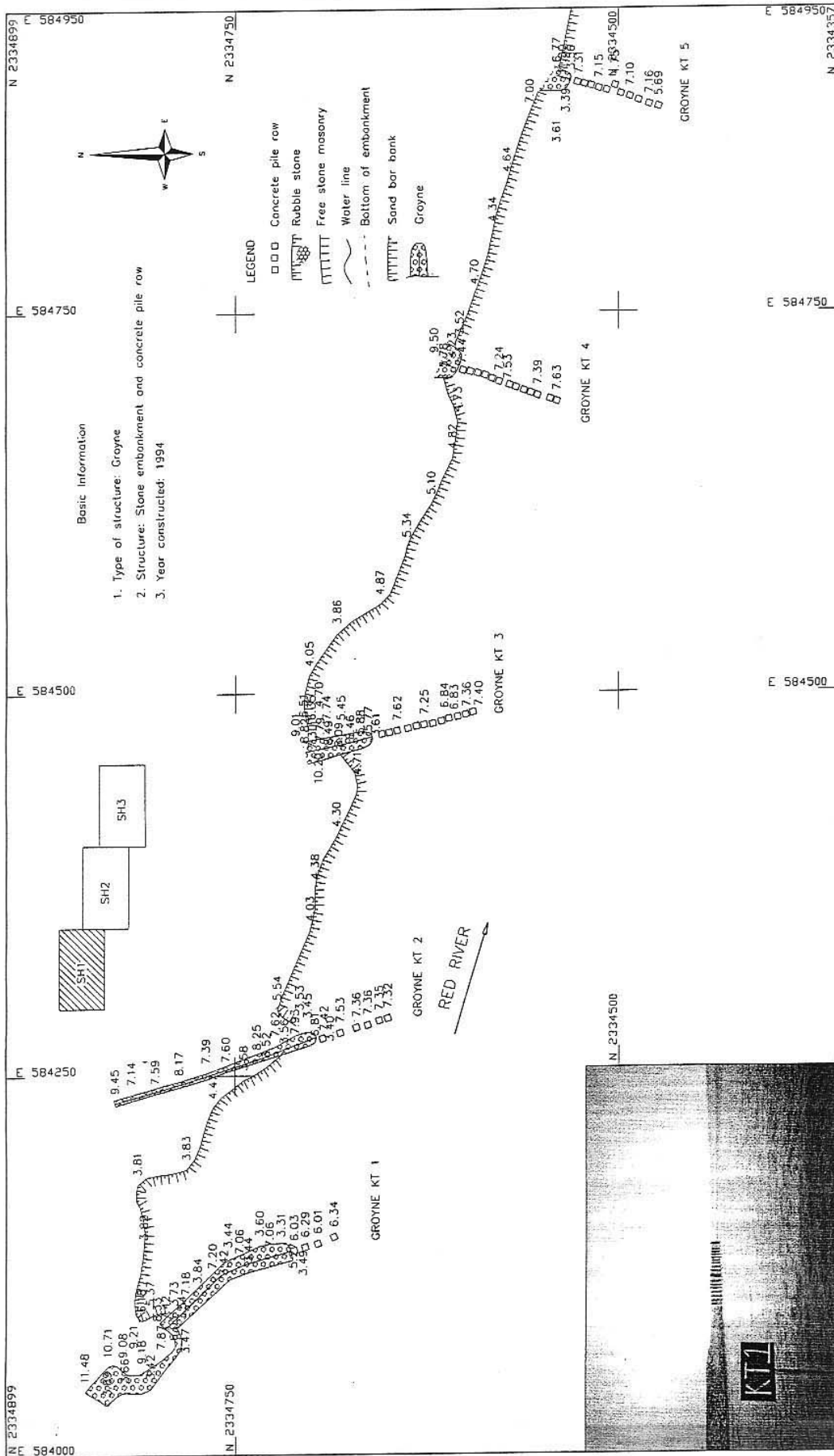


Figure A14.8.2 Groins KT1 –KT5 at Tam Xa

Source) Jjca Study Team

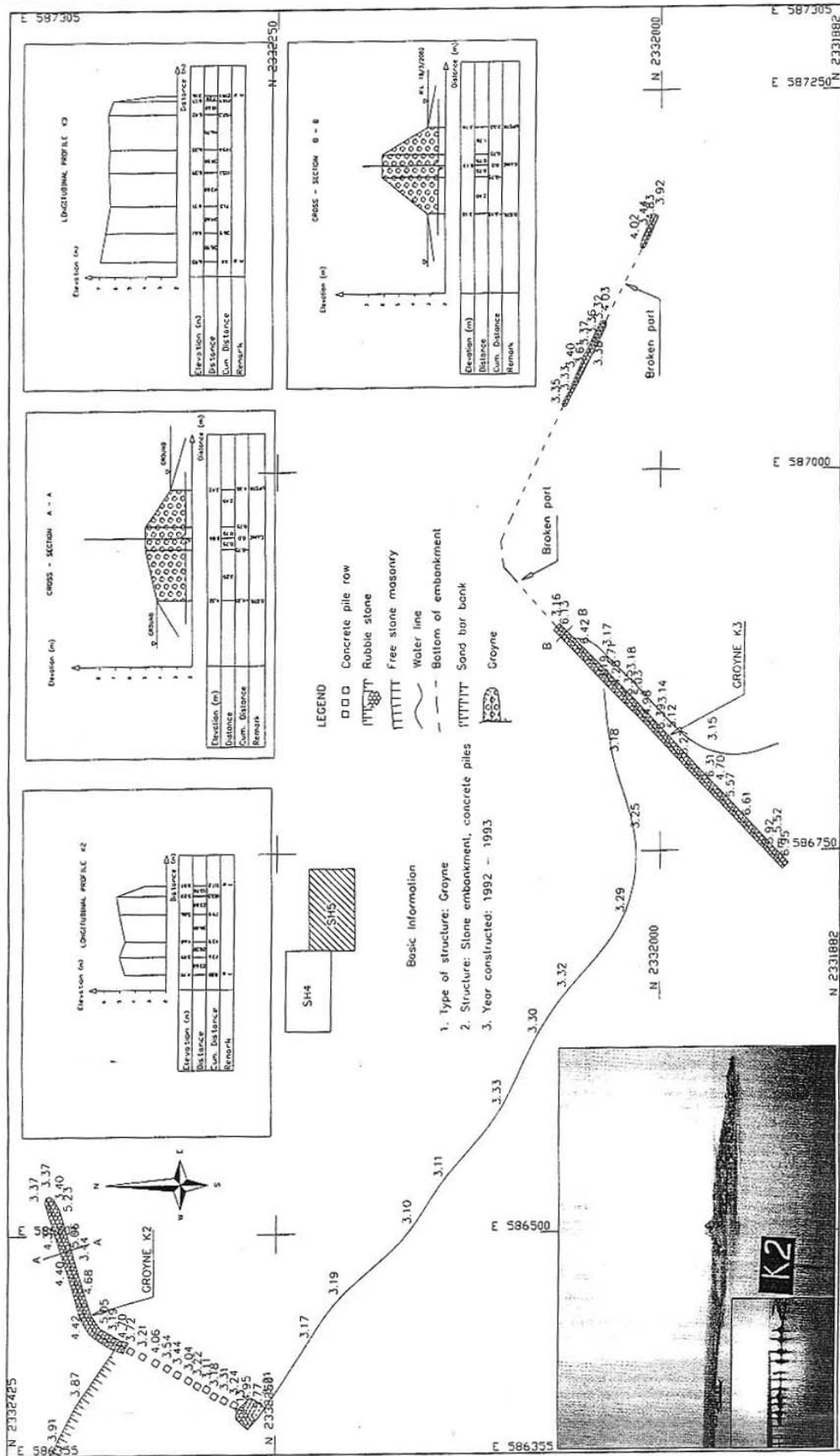


Figure A14.8.3 Groins K2 - K3 at Phu Gia

Source) JICA Study Team

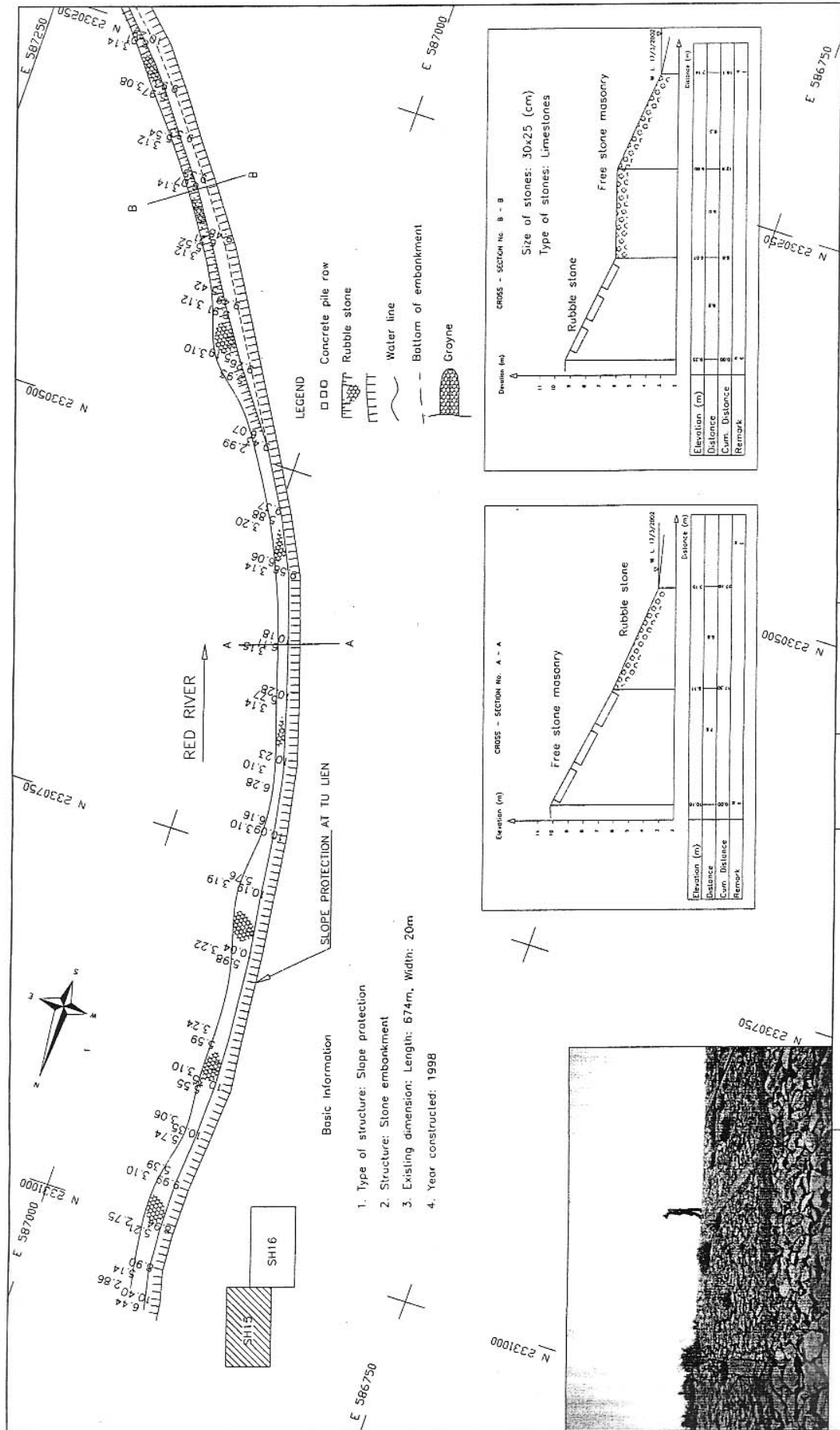


Figure A14.8.4 Slope Protection at Tu Lien

Source) JICA Study Team