

KAWASAKI STEEL TECHNICAL REPORT

No.21 (November 1989)

Civil and Architectural Engineering

Planning and Construction of Large Diameter Submarine Pipeline between Singapore and Malaysia

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Synopsis :

The largest diameter twin submarine pipeline was constructed and laid for a length of 2.5km. This 2200-mm-diameter pipeline was clad throughout its length with reinforced concrete of 238mm in thickness. The surface tow method was adopted for the first straight section and the bottom pull method for the major straight section. These two sections were then connected into a bend at a dry pit. As part of the design, the pipeline profile and the bearing strength and spacing of the rollers were determined to ensure that the pipeline was not overstressed during installation. Also equipment of various types to handle and launch the long and heavy pipe were carefully considered and designed. During pipe-layout the pipeline profile was checked and controlled by divers and computer simulation. The submerged weight was monitored by computer simulation and measurement of the tensile force of the pulling wire during each pulling operation.

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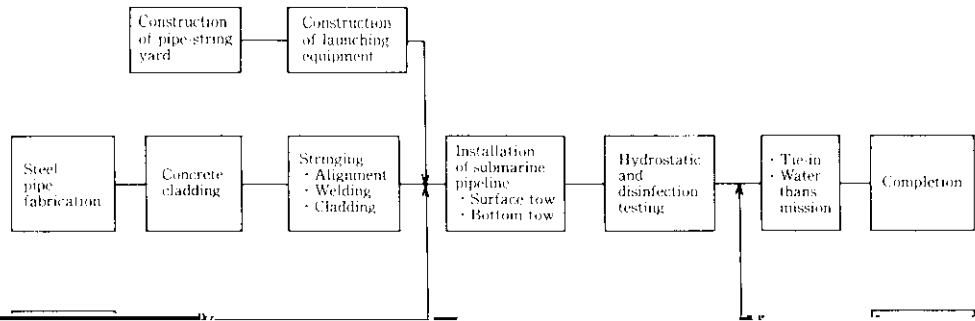
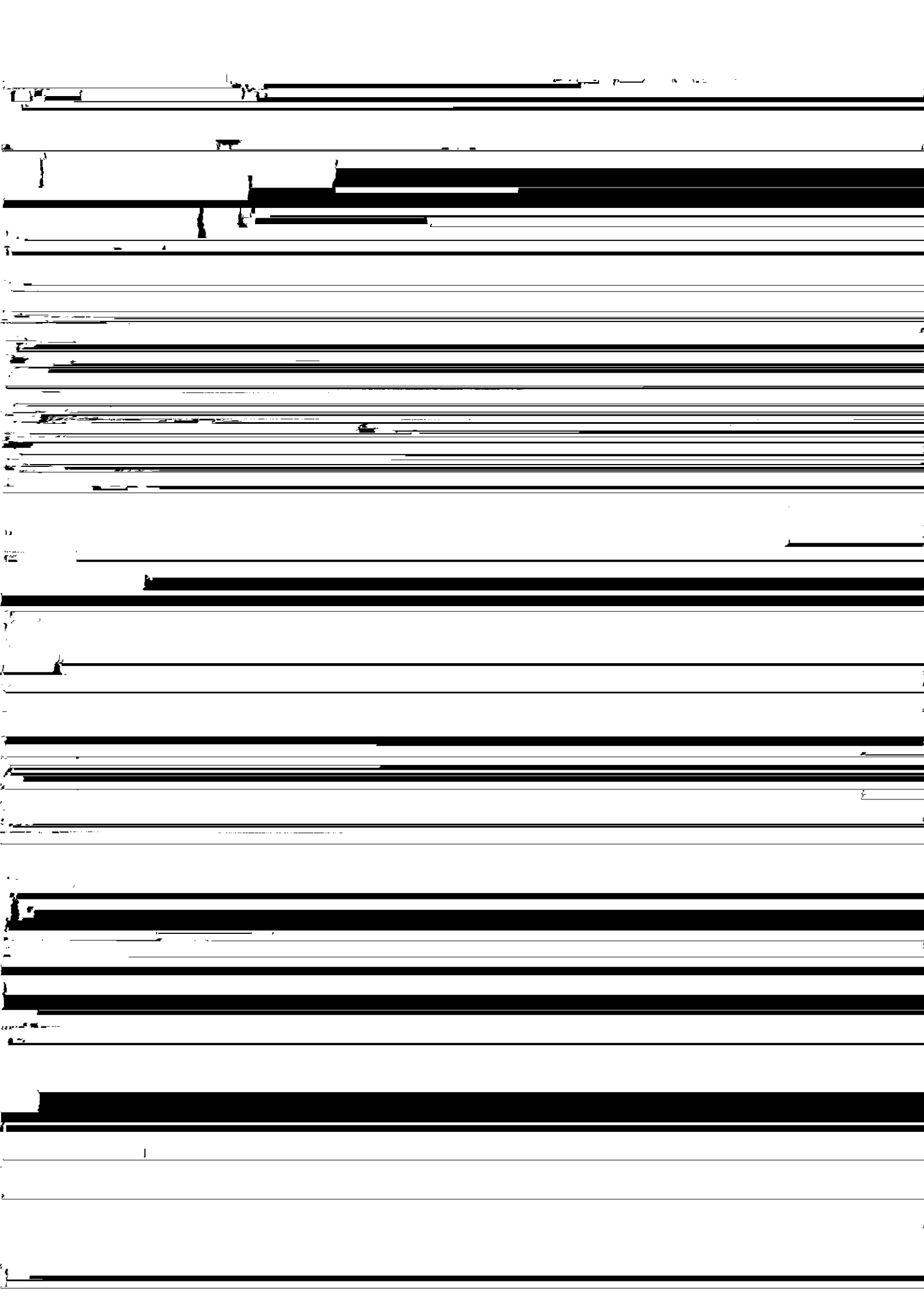


Table 1 Work specifications (permanent work)

2 Outline of the Project

The pipe has an internal diameter of 2 200 mm with reinforced concrete cladding. The total length laid in the

Item	Description	Quantity
Steel pipe	API 5L-X52 2 200 ϕ \times 19 t \times 7 500 L	5 500 t
Concrete cladding		

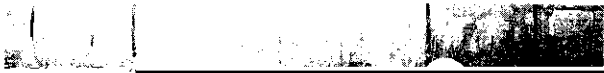


(A) 2 days
□ x = 326

□ Concrete with TBIM
■ Concrete with
Complast 430

160
140





were carried by two pipe bogies, each equipped with four 60-t hydraulic jacks.

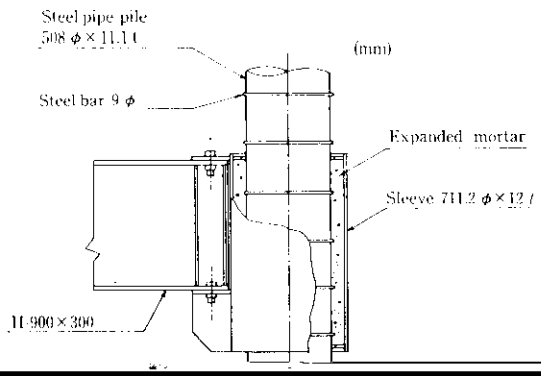
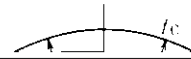


Table 4 Static modulus of elasticity of concrete



cial alignment tasks and external claims which were addressed with especial gratitude to the following: