

## RECONSTRUCTION WORK UPON SOLIMA PIER

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### 1. Introduction

Cotton growing in the hinterland at Mwanza Region is ginned locally and each year some 10,000 tons of cotton lint, up to 7,000 tons of (seed) cake and approximately 2,000 tons of oil is transported by barges from Solima to reach Mwanza for onward transmission by rail to Dar es Salaam, chiefly for the export markets. Solima is situated some 100 km from Mwanza just off the trunk road linking it to Musoma.

Tanzania Cotton Authority (previously the Lint & Seed Marketing Board) has been using the pier at Solima and until 1972 had experienced high recurrent maintenance costs and unsatisfactory working conditions.

After an examination on site, a relatively simple solution was proposed, which having been adopted has given trouble free service without maintenance.

### 2. Previous Installation

The pier consisted of a 126 m long rockfill breakwater of a circular alignment in plan having a 36 m long jetty on the inner side at the deep end. The jetty was constructed with a timber deck supported on steel rail pile bents in groups of two piles per bent, adjoining bents being braced with bolted angle section steel.

It was not possible to determine the date of the installation of the breakwater or of the jetty, however, the construction technique deployed suggested that the jetty was erected in about 1960 and that the breakwater was constructed some two years previously.

### 3. Local Damage

Wave action on the rockfill of 300 mm and under had produced failure of the breakwater side slopes and local damage of this type was clearly noticeable.

Extensive deterioration of the jetty timber deck, however, was the chief cause of the poor service by the pier.

### 4. Repairs

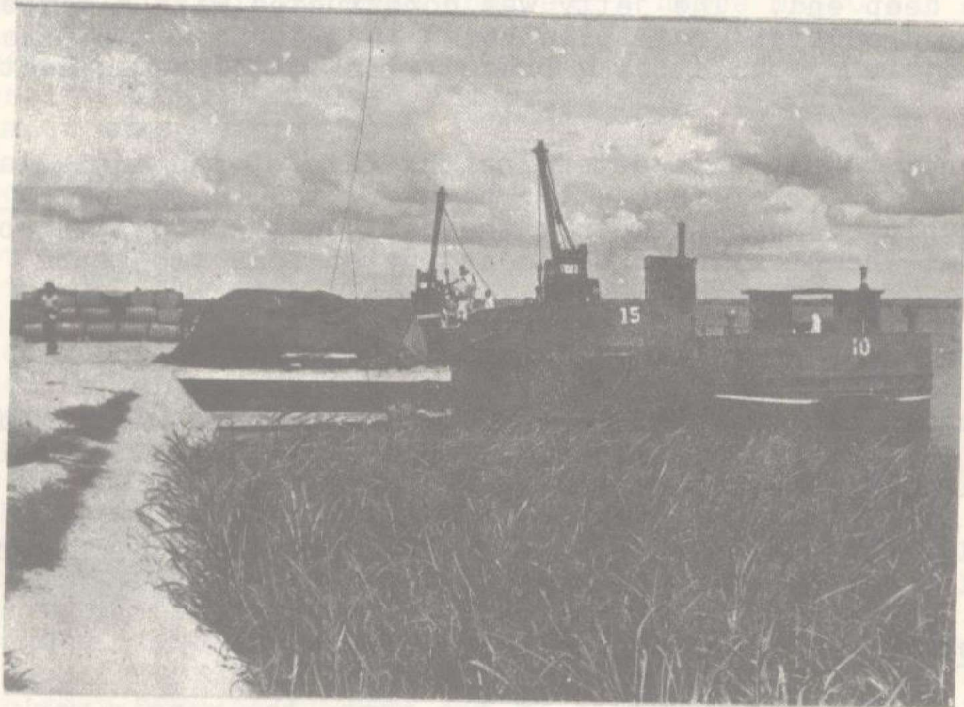
All evidence indicated that in the past, the repair work to the timber deck had been confined to the top members only and

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View on Jetty Steel Substructure after removal of timber deck. 20th June, 1972.



Solima Pier in Use. August, 1972.

consequently the progressive deterioration of the timber bearers below gave rise to the deck failure.

#### 5. Reconstruction Proposals

Observing the performance by the larger size rockfill which was not unduly affected by wave action it was manifest that remedial works for the breakwater, particularly at the deep end, should be carried out entirely in rockfill of 400 mm size or over.

Possibility of replacing the whole of the timber deck by a reinforced concrete deck was examined next.

#### 6. Deck Design

Preliminary calculations showed that the dead weight of a concrete deck need not differ from that of the then existing timber deck. The steel supporting structure could therefore be re-used.

Economy and ease of construction on site had to be considered before embarking on the final solution. This consisted of insitu concrete beams and precast concrete deck units with insitu topping.

As the main beams had to be supported on steel rail piles which were at about 3.0 metre centres, the total deck thickness did not have to be more than 200 mm. As the lifting and positioning of the planks had to be done by manual labour, it was decided that the plank weight had to be as small as possible, hence 300 mm wide by 150 mm deep precast concrete planks with 50 mm insitu topping was specified. The expansion joints were provided at every other beam positions. The height of the main beams was determined by required minimum clearance above top water level and top of the pile bents - this height came to 725 mm.

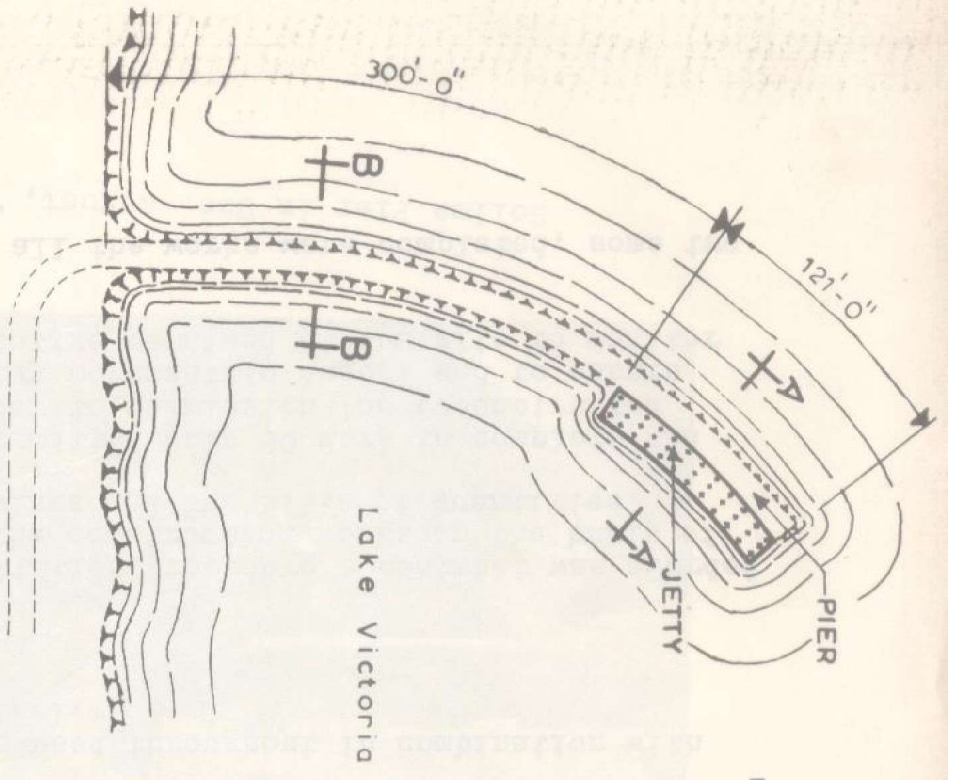
Grade 25 concrete was used throughout in combination with high yield reinforcing steel.

#### 7. Construction Works

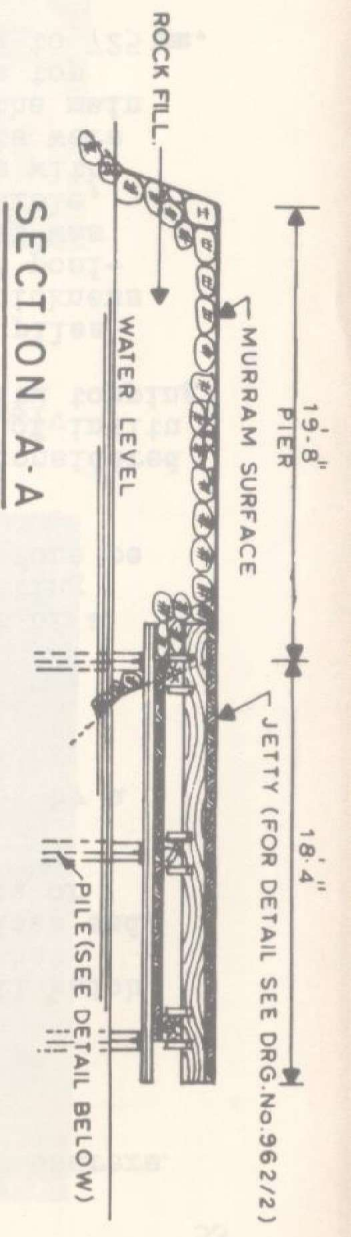
Following tender invitation procedure a contract was awarded in early June, 1972 for the construction works on the basis of detailed engineering drawings and the bills of quantities.

The Contractor was permitted only 80 days to complete the construction works in order to commission the reconstructed jetty in time for the heavy movement in August and to ensure this a resident representative remained at the site to monitor progress.

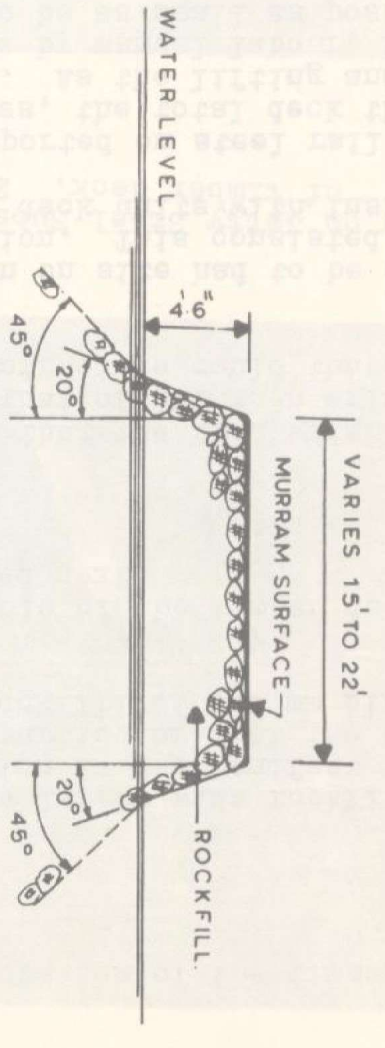
By 15th August, 1972 all the works were completed, some two weeks ahead of programme.



**LAYOUT PLAN**  
**EXISTING SOLIMA PIER**  
 SCALE: 1 INCH = 100 FEET

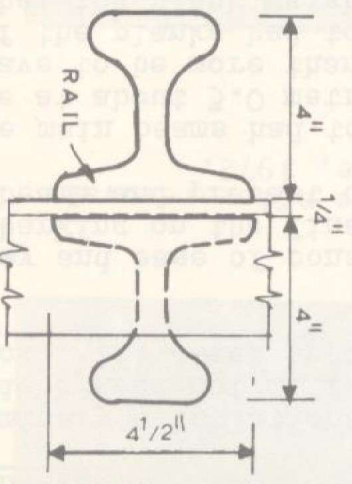


**SECTION A-A**



**SECTION B-B**

SCALE: 1/8 INCH = 1 FT.

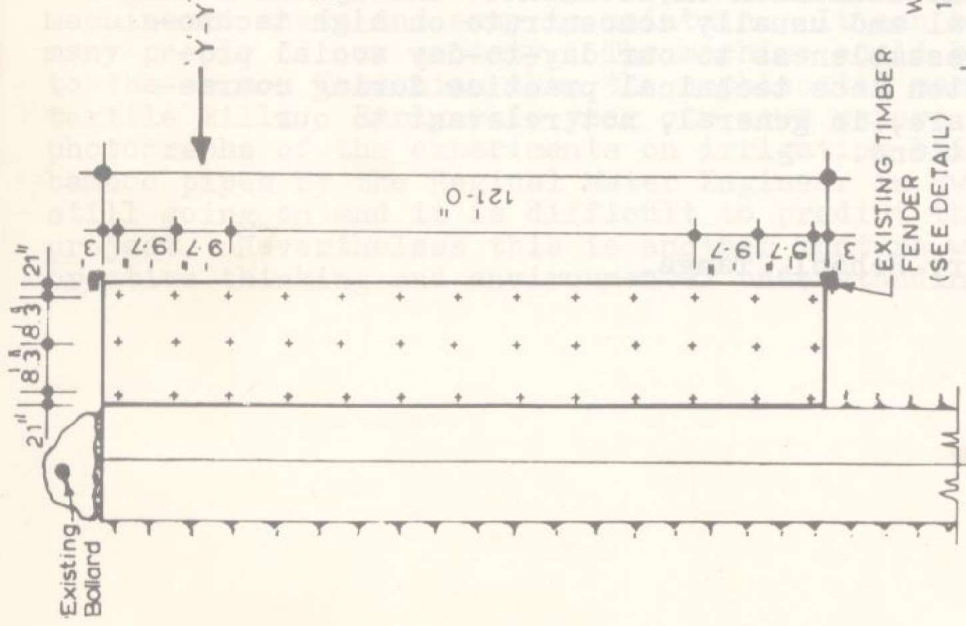


**PILE BENT DETAIL**

SCALE: 3 INCH = 1 FT.

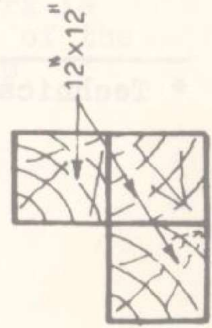
March '72

The Lint & Seed Marketing Board
<b>SOLIMA PIER</b> Previous Installations (SHEET 1)
<b>DRAWING No. 962/1</b>
<b>DESIGN PARTNERSHIP</b> Chartered Engineers Consulting Engineers DAR ESS SALAAM TANZANIA



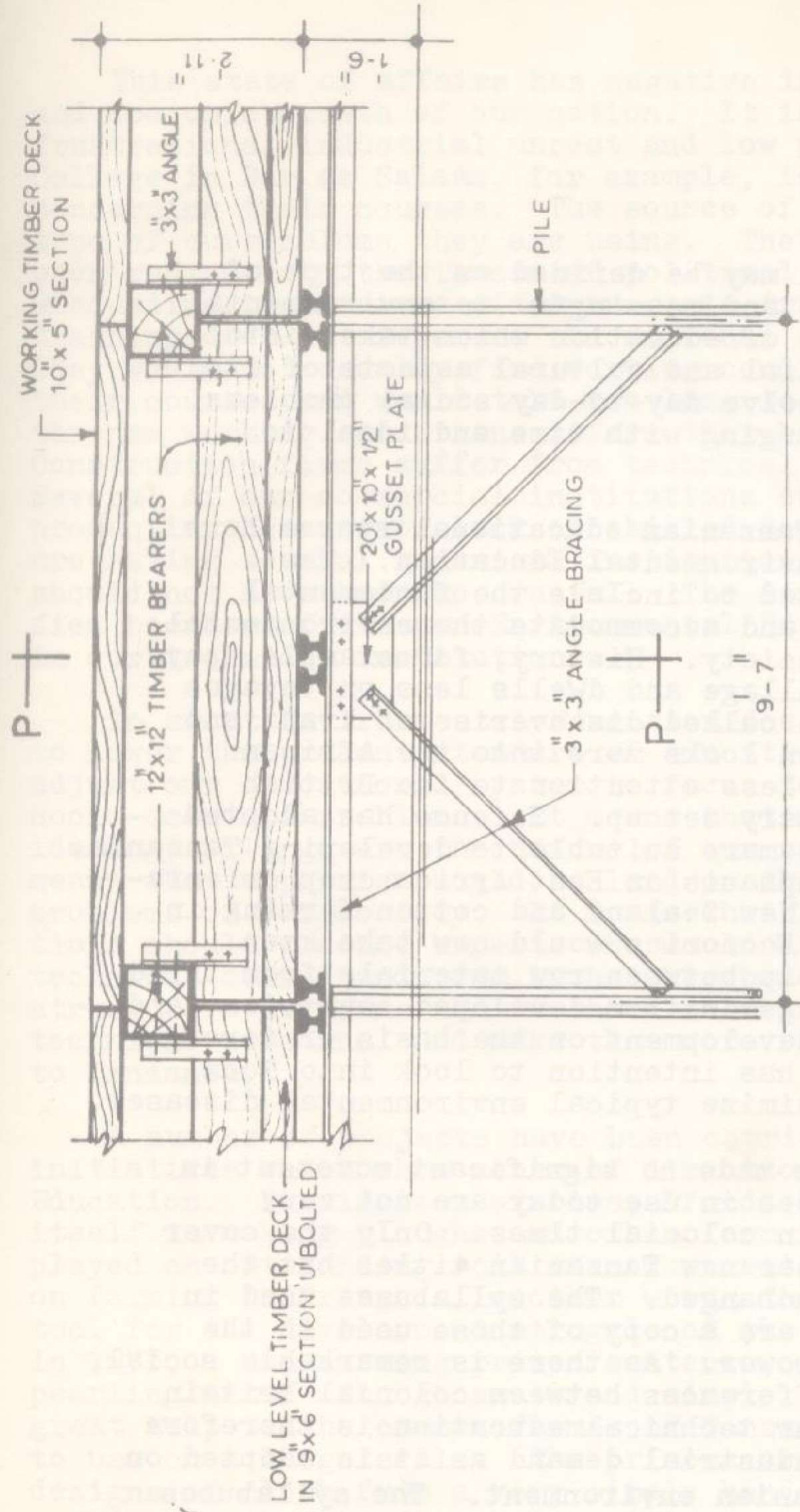
**PILING LAYOUT PLAN**

SCALE: 1 IN. = 32 FT.



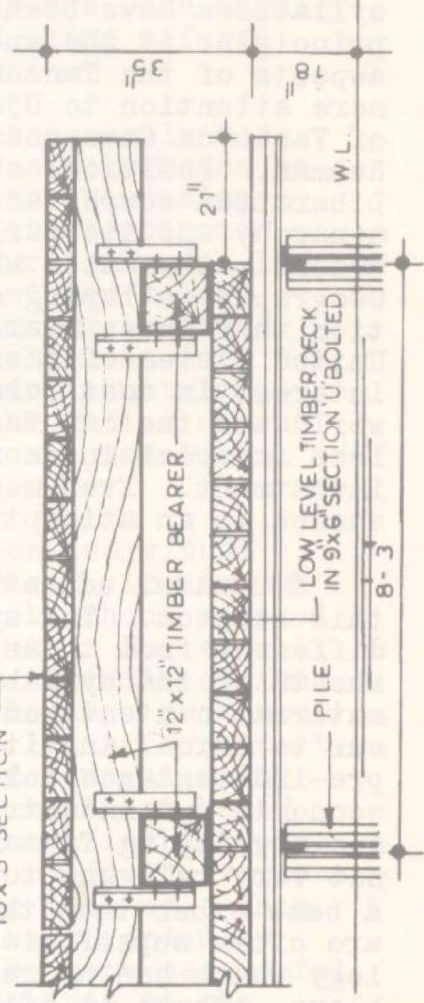
**TIMBER FENDER DETAIL**

SCALE: 1 IN. = 2 FT.



**ELEVATION ON Y-Y**

SCALE: 3/8 IN = 1 FT.



**SECTION P-P**

SCALE: 3/8 IN = 1 FT.

The Lint & Seed Marketing Board

**SOLIMA PIER**

Previous Installations  
(SHEET 2)

**DRAWING No. 962/2**

**DESIGN PARTNERSHIP**

Chartered Engineers  
Consulting Engineers  
DARES SALAAM TANZANIA