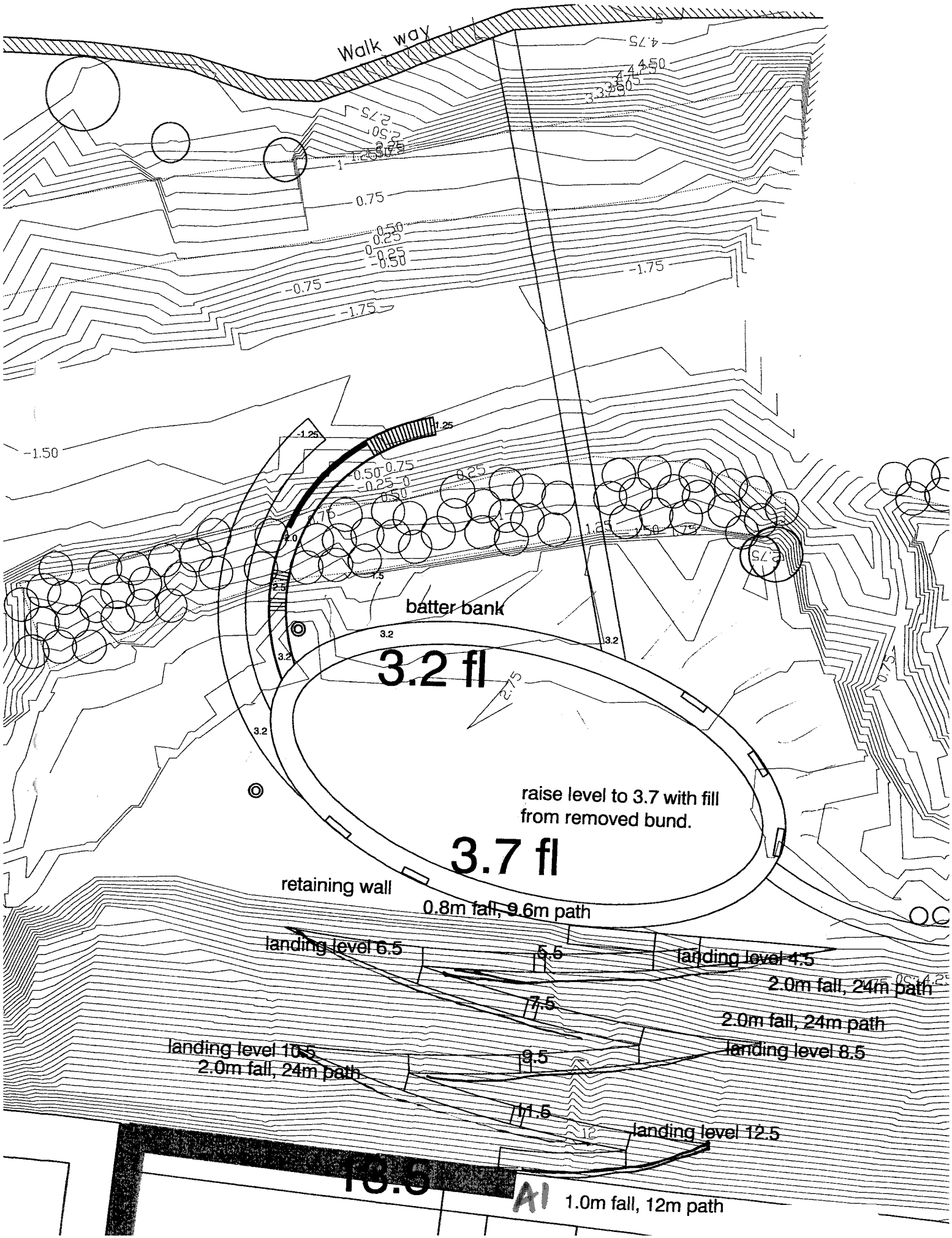
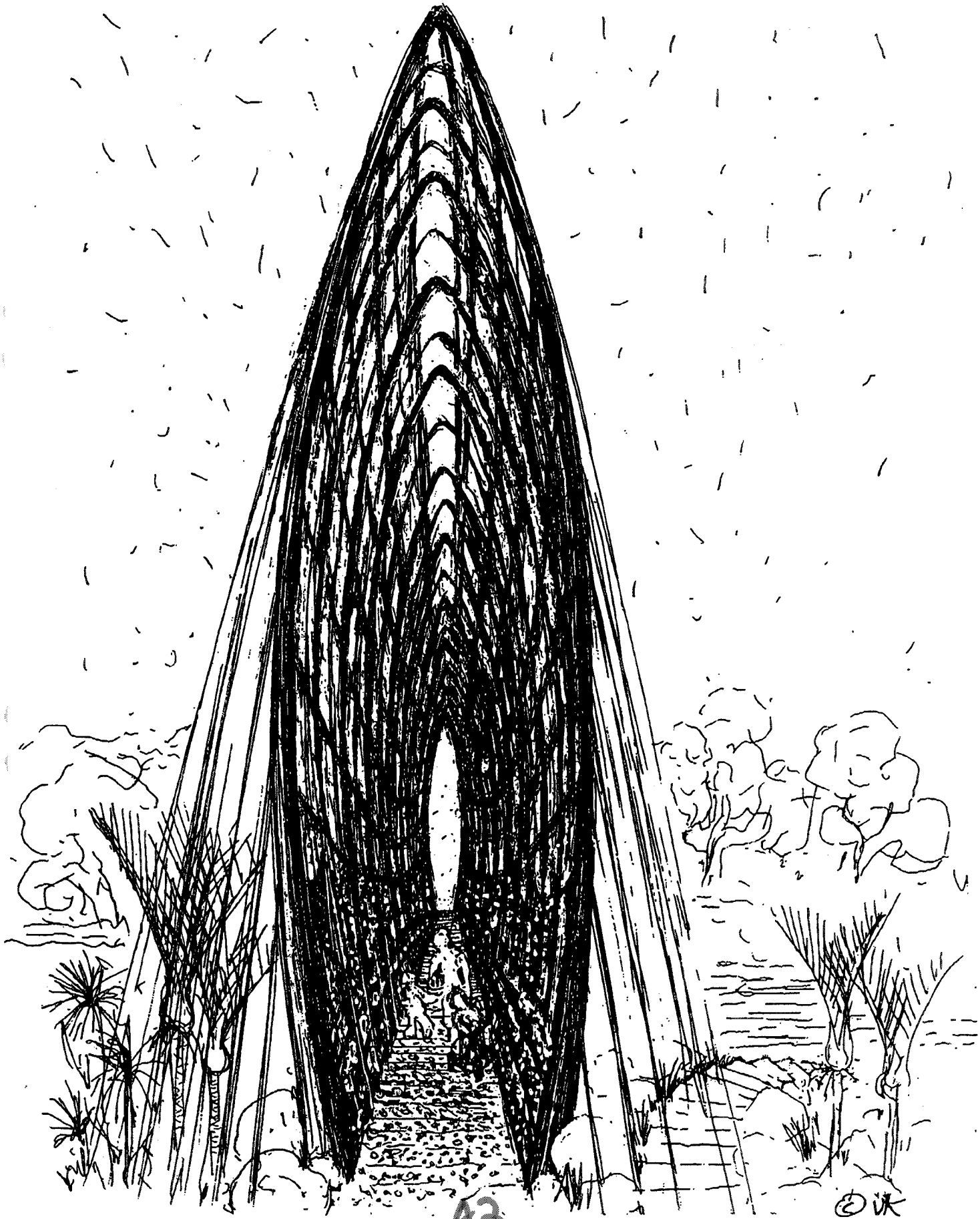

Walk way
batter bank
3.2 fl
raise level to 3.7 with fill
from removed bund.
3.7 fl
retaining wall
0.8m fall, 9.6m path
landing level 6.5
landing level 4.5
2.0m fall, 24m path
2.0m fall, 24m path
landing level 8.5
landing level 10.5
2.0m fall, 24m path
landing level 12.5
A1
1.0m fall, 12m path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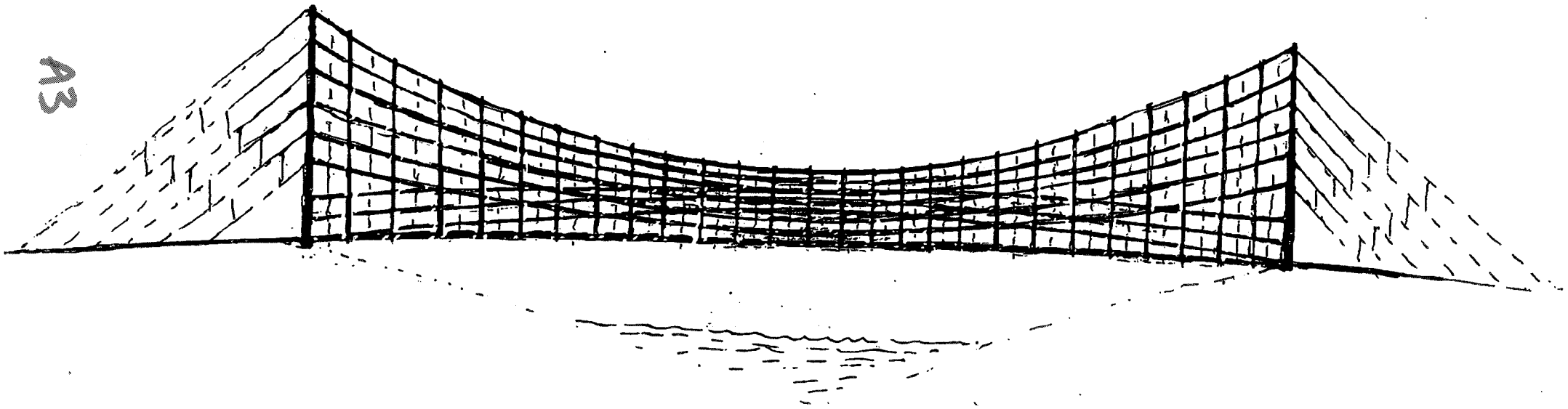
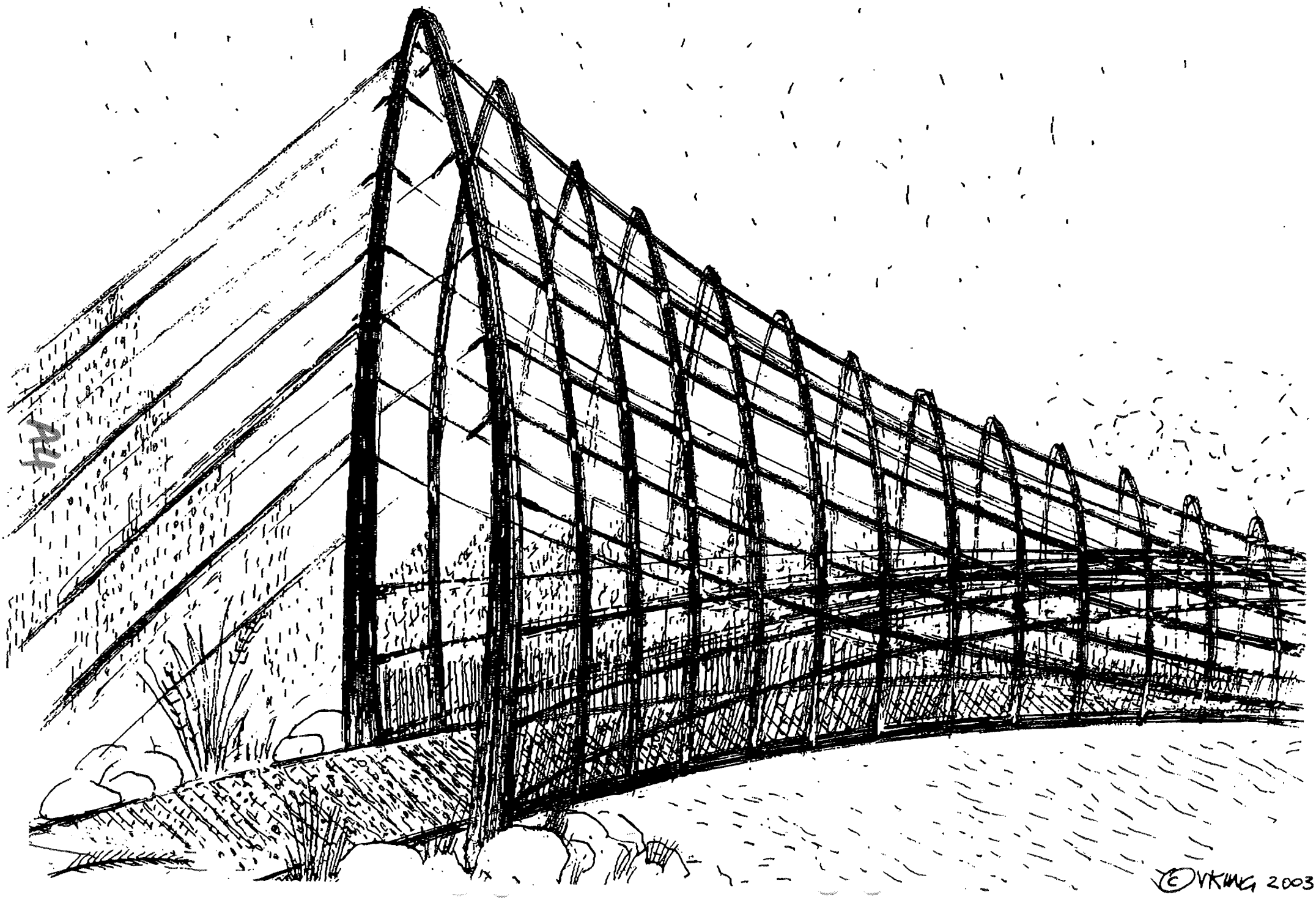
A3

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Te Huruhuru Henderson Creek
Proposed Footbridge and Jetty

Concept Design Statement:

(1) Suspension Bridge

The work takes its form from symbols of the river: traditional watercraft, upturned vessels, eel traps, and fishing nets.

The work is proposed as a suspension bridge with arch shaped ends nominally twelve metres in height. The bridge spans fifty metres and creates a link from the surrounding residential area to the park, for pedestrians and cyclists.

It is envisioned that the arch form ends of the structure will provide a ceremonial gateway to acknowledge the tangata whenua and the importance of the crossing of water.

The gateway structure will be constructed from low maintenance and environmentally secure stainless steel. Nominally fifty metres in length, with the bridge structure suspended from the upright archway ends. Diminishing wishbone shaped frames will be spaced at intervals along the span of the bridge to a minimum height of four metres at the bridge centre, before rising again to the full end height.

Stranded Stainless steel cables nominally twenty two millimeters in diameter will pass through penetrations in the spacer frames and be interspaced with additional cables to help form the lattice ' net like ' structure.

An optional Power supply to the bridge for lighting, complete with transformers, could be positioned within the structural frames along the length of the bridge.

A handrail, one metre in height will run along the sides of the bridge to provide support for pedestrians and a feeling of enclosure and safety.

The handrail will be supported off the intermediate spacer frames.

Bridge decking is to be perforated aluminium. This non-slip aluminium plank section, will echo the lightness of the structure and cast delicate shadows onto the water and jetty below.

The iconic stainless steel coloured form would appear as a transparent and ephemeral structure surrounded by established indigenous trees, wetland plants and bird life.

AS

(2) The Jetty

The concept proposed for the jetty will echo and reflect the sweeping forms of the adjacent suspension bridge. It is to be a more simple form which will not compete visually with the bridge and is to be constructed from robust and traditional wharf materials.

A concrete slip-way ramp will be positioned downstream from the bridge to greet waterborne vessels, small river waka and lightweight sports canoes.
The curved form of the slip-way ramp will 'appear to disappear' into the water where the ramp approaches the deeper levels of the river.

Beside the slip way, a space has been designed fora pouwhenua in consultation with Saul Roberts, to complement the waka
This art-work would be created by nominated artists from Te Kawarau A Maki.

The arc of the proposed slip-way ramp will reappear, on the upstream side, above the bridge, initially, as a skeletal form constructed from traditional wharf piles, making reference to former river history. This sweeping curved extension will eventually become a solid walkway and is the first of the three successive, stepped layers of the jetty. The curved ramps will provide access to the river at different stages of the tide. These layers may also be used as seating platforms.

Non-slip steps placed at nominated positions along the jetty levels will provide access to river craft. The jetty walkway decking is to be rough sawn saligna

A single curved semicircular walkway will form the pedestrian access pathway beneath the bridge.

The walkways will also provide areas for viewing the overhead suspension bridge as well as for passive recreational purposes.

Virginia King September 2003

THORNE DWYER
STRUCTURES

HENDERSON CREEK BRIDGE

1.1 Introduction

Following up on the preparation of a report outlining the design of the proposed cable suspension bridge over Henderson Creek it was considered prudent to further investigate the construction cost of this proposal. To that end Thorne Dwyer Structures approached a number of companies directly involved in the relevant types of work involved in order to obtain more accurate estimates of the costs associated with this project.

1.2 Approach

The project can be readily separated into four main components of the full project -:

1. Fabrication and supply of the bridge superstructure.
2. Assembly of superstructure on site.
3. Construction of foundations.
4. Erection of superstructure.

Cost estimates were sought from specialist contractors for each of these aspects of the project.

1.3 Fabrication and Supply of Superstructure

As set out in the design report the bridge structure is intended to be constructed using stainless steel throughout including the suspension cables. Sandvik NZ Ltd import and supply stainless steel and have connections with

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EMAIL engineer@tdstructures.co.nz

stainless steel fabricators. Additional components including the aluminium deck treads have been priced separately.

1.4 Assembly

In order to refine the costs associated with this section of the work I have proposed that the superstructure is assembled on site in two halves – one at either end of the bridge. The attached detail SD2 sets out my proposal for the temporary works required to brace the various elements of the bridge ready for lifting. Costs for this section of the work have been assessed by ASPEC Construction Ltd.

1.5 Construction of the Foundations

Based on the information provided in the design report ASPEC Construction Ltd have estimated the construction cost of the concrete piles and beams that form the bridge foundations.

1.6 Erection of the Bridge

Initially the portal arch frames at either end that the cables fix to will be erected on the foundations and propped in place with anchor cables secured.

As noted above and following discussions with NZ Crane Hire Ltd we propose to assemble the bridge in two halves.

The cables will be threaded through the ribs and links and tensioners fitted at the ends of each cable ready for connection to the portal arch frames at the ends and at midspan to their sister cables on the other half of the superstructure. Two 200 tonne cranes, one on each bank, will lift the bridge

sections into place and riggers will link the deck beams and cables together at midspan and connect the cables to tensioners at the portal arch frames either end.

1.7 Cost Breakdown

1. Fabrication and supply of superstructure

• Supply of stainless steel including cables	$ 270,000
• Fabrication of stainless steel components	$ 180,000
• Fabrication and supply of aluminium deck treads	$ 30,000
• Allowance for cable to rib fittings	$ 40,000
Total fabrication cost	$ 520,000

2. Assembly of superstructure on site

• Supply of materials	$ 10,000
• Fabrication and assembly	$ 15,000
• 30 tonne crane hire (1 week)	$ 10,000
Total assembly cost	$ 35,000

3. Construction of the foundations

• Excavation and construction	$ 130,000
Total foundation cost	$ 130,000

4. Erection of bridge

• Fabrication of lifting beams	$ 6,000
• Lift test with 100 tonne crane (2 days)	$ 10,000
• 2 x 200 tonne crane hire (1 week)	$ 80,000
• Rigger gang (1 week)	$ 10,000
Total erection cost	$ 106,000
TOTAL COST ESTIMATE	$ 791,000

1.8 Summary

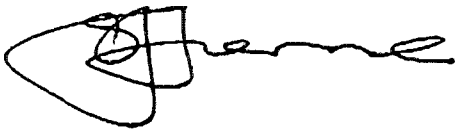
The above costings have been collated on the basis of quotations and estimates obtained from companies specialising in the various areas of the work.

Costs for Items 1 – 3 have been based on information supplied by Thorne Dwyer Structures and reasonable allowances have been included for contingencies. Stainless steel has been allowed for throughout and generous allowance has been made for foundations. Costs for Item 4 are based on a best estimate of time involved and again generous allowance has been made for contingencies.

It is important to note however that these costs are based on preliminary analysis only. In addition to that suspension cable bridges of this size and type are unusual (if not unheard of) in New Zealand and thus the estimate of work involved in the erection phase particularly is difficult. I confirm however

that based on my discussions with the various companies noted in the report the figures shown make reasonable allowance for the work involved.

Signed



Report prepared by S.J. Thorne B.E., Reg. Eng. 5 November 2003

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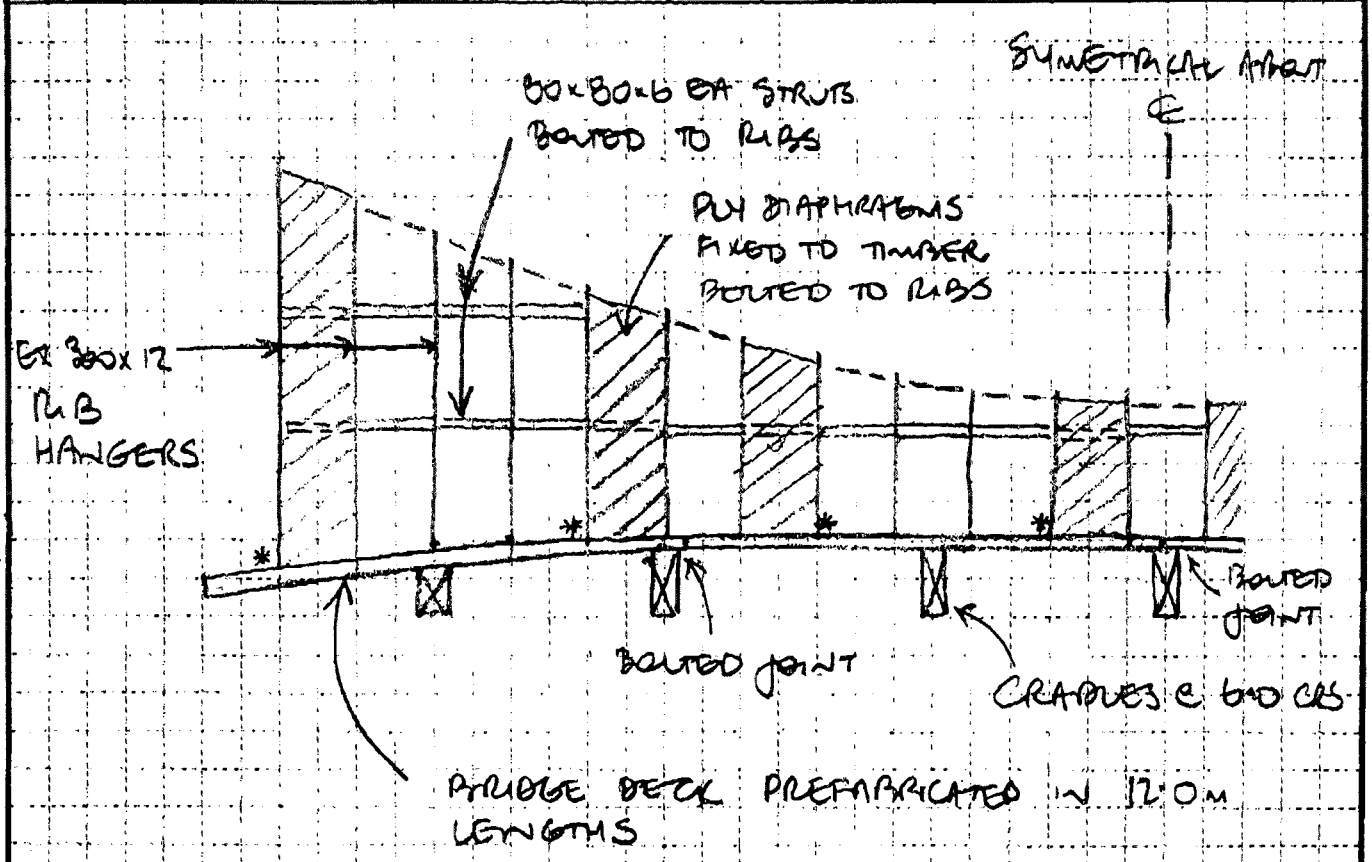
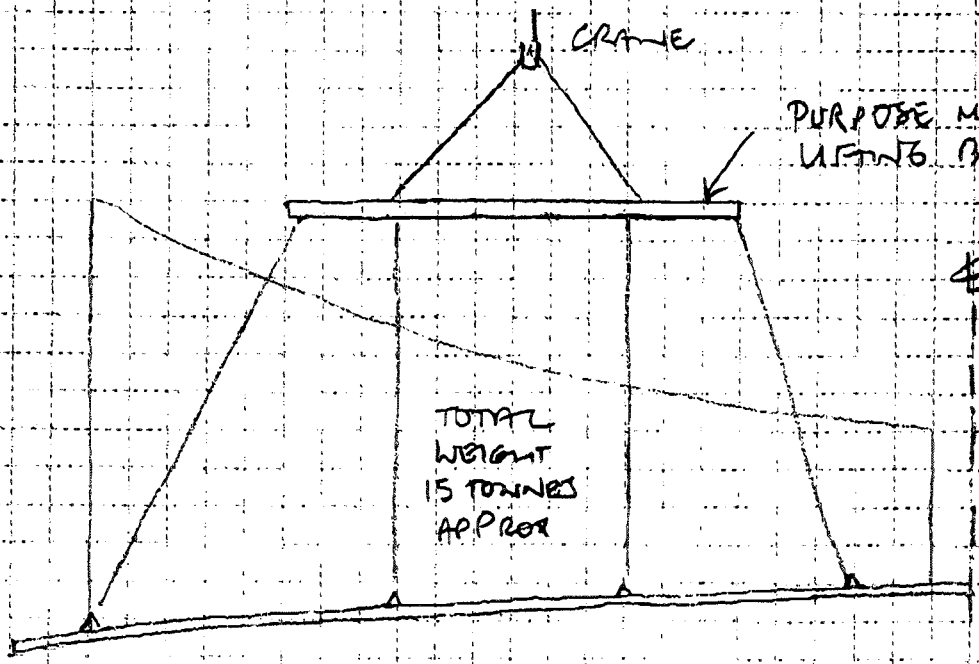
THORNE DWYER
STRUCTURES

CONSTRUCTION

JOB NAME: BRIDGE	SD2
SECTION:	
JOB No:	DESIGNED: SGT
DATE: 30.10.03	



NOTE: THREAD CABLES PRIOR TO LIFTING



POSSIBLE LIFTING ARRANGEMENT

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