Straight to Recording for All: Bridges as Philanthropy
Bridges in A Walking World – Building Bridges as Philanthropy

Introduction
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WALKING WORLD
78% of Kenya’s 44 million people live in a walking world.
Rivers prevent access to EDUCATION, HEALTH CARE, and MARKETS.
A bridge **TRANSFORMS** a village
DESIGN AND CONSTRUCTION

5 PHASES:

1. Survey
2. Design
3. Fabrication
4. Concrete Construction
5. Main Span Construction
Questions?

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Bridges in A Walking World – Simple Suspended Bridge Design

Presented by: Nate Bloss, P.E.
DESIGN AND CONSTRUCTION

5 PHASES:

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SURVEY

- SELECT A SITE
- SURVEY
- HIGH WATER
- SOIL SAMPLES
- COMMUNITY INFO
OBJECTIVES

- **SIMPLE** PEDESTRIAN FOOTBRIDGE
- EASY TO TRANSPORT
- CAN BE CONSTRUCTED W/ O HEAVY MACHINERY
- REQUIRES LITTLE MAINTENANCE
BASIC MATERIALS:
- DONATED WIRE ROPE (A603, 5/8” to 1¼” DIAMETER)
- BRITISH STEEL SECTIONS / REBAR ($F_y = 40$ TO $60$ ksi)
- 2.2 ksi CONCRETE (1:2:4 MIX WITH ~3” SLUMP)
- LOCAL, ROUGH CUT TIMBER (CYPRUS, BENDING STRENGTH ~15 ksi)
- OBJECTIVE
- MATERIALS
- LAYOUT
- DESIGN
CONSIDERATIONS:
- SPAN AND SAG (L/25 TO L/35)
- DIFFERENCE IN TOWER HEIGHT (L/30)
- FREEBOARD (2 TO 5 METERS)
- SUSPENDED VS SUSPENSION (DEPENDS ON SITE TERRAIN)
- DECK WIDTH (DEPENDS ON TRAFFIC)
DESIGN

COMPONENTS

A. DECKING
B. HANGERS
C. CABLES
D. STEEL TOWERS
E. STABILIZATION BLOCK
F. FOOTING
G. ANCHOR (DRUM VS BEAM)
H. WIRE ROPE GRIPS

- OBJECTIVE
- MATERIALS
- LAYOUT
- DESIGN
FABRICATION

1. Survey
2. Design
3. Fabrication
4. Concrete
5. Main Span
CONSTRUCTION

Concrete
CONSTRUCTION

- Layout Bridge
- Excavate
- Layout Cable
- Pour Anchors
- Pour Footings
- Erect Towers
- Layout Bridge
- Excavate
- Layout Cable
- Pour Anchors
- Pour Footings
- ERECT TOWERS
CONSTRUCTION

- Layout Bridge
- Excavate
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1. Survey
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5. Main Span
CONSTRUCTION

- Paint Steel
- Approaches
- Set Sag
- Launch Deck
- Fencing
- Backfill
CONSTRUCTION

- PAINT STEEL
- APPROACHES
- SET SAG
- LAUNCH DECK
- FENCING
- BACKFILL

Survey  Design  Fabrication  Concrete  Main Span
FINISHED BRIDGE
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Bridges in a Walking World – Simple Suspension Bridges

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ELEVATION—TOWER BASE CONNECTION

TOWER HINGE PIN
ELEVATION - TOWER SADDLE

STEEL PIPE
127 Dia. x 5.4 Wall
125 Long

L63 x 63 x 6 145 Long
Each Side of Steel Pipe

STEEL BASE PLATE
125 x 230 x 9.5

L63 x 63 x 6 150 Long
2 Required for Each Saddle
Cut Horizontal Leg to Fit

RMS COLUMN 200 x 100 x 6

(U.BOLT FROM A CABLE CLIP FOR 32mm DIA. WIRE ROPE)

PLACE 10mm LONG FILLET WELD AT EACH END OF PIPE (TYP.)

(TYP.) WELD LAST

(TYP.) WELD FIRST

WELD AT ENDS ONLY

SEE NOTE 1

SEE NOTE 2.

FILL WITH GROUT.

(IMAGE OF SIMILAR COMPONENTS AND MANUFACTURING)
DRILL HOLES PRIOR TO CUTTING OPENING, MINIMUM DIA. 9.5mm

DRILL 19mm DIA. HOLES FOR 5 ANCHOR REBARS SPACED AT 200mm O.C.

PLAN VIEW – ANCHOR CONNECTION
1 : 2.5

FILL INSIDE OF ANCHOR SADDLE WITH A 1:1 SAND-CEMENT GROUT PRIOR TO FITTING ANCHOR SADDLE INTO RHS

ANCHOR SADDLE
1 : 2.5

167mm DIA. PIPE WITH 5.4mm THICK WALL

ANCHOR REBAR
1 : 5
(5 REQUIRED IN EACH RHS)

TIE THIS END TO REINFORCING STEEL IN ANCHOR CORE

EXTEND THIS END THROUGH HOLES IN RHS

ANCHOR REBAR
ELEVATION — TOWER DETAILS

1 : 25
SUSPENDER DETAILS

HOOK DETAILS 1:2

SUSPENDER STOPPER 1:2

10mm DIA. ROUND BAR, 200mm LONG, BENT TO FIT 32mm DIA. CABLE

NUTS AND WASHERS (TYP.)

THREAD 40mm PRIOR TO BENDING

25x28x2 RHS 125 LONG

(16 REQUIRED)
Questions?
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