

# LOUIS BERGER INTERNATIONAL, INC.

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Africa • Asia • Europe • Latin America • Middle East

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**PATTE D'OIE HOUSING PROJECT**  
**Dakar, Senegal**  
**REPORT ON**  
**SCHOOL REHABILITATION**  
**AID No. 681-77-078**

*Submitted by*

**LOUIS BERGER INTERNATIONAL, INC.**  
**100 Halsted Street**  
**East Orange, New Jersey**

**December 1977**

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December 2, 1977

Mr. Albert N. Votaw, Chief  
Regional Housing and Urban Development Office  
United States Agency for International Development  
B.P. 1712  
Abidjan, Ivory Coast

Dear Mr. Votaw:

We are pleased to submit herewith, in accordance with the scope of work defined in your letter to us of February 11, 1977, (Purchase Order No. 681-77-078), ten (10) copies of a separate final report concerning the School Rehabilitation at the Patte D'Oie Housing project in Dakar, Senegal. This final report reflects the comments in your letter of July 22, 1977 and our discussions of August 30. This final report, in conjunction with its companion report on Shifting Sands Stabilization and Housing Rehabilitation, completes our requirements under this purchase order.

As directed by you, three (3) of the ten copies of the final report are being sent directly to Ms. Sarah Frankel (SER/H) in Washington, D.C.

We appreciate the opportunity given us to perform these services for RHUDO and look forward to being of assistance to you in the near future.

Very sincerely,

LOUIS BERGER INTERNATIONAL, INC.

Fredric S. Berger

FSB:mm

**REPORT ON  
SCHOOL REHABILITATION  
AID No. 681-77-078**

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## I. REHABILITATION OF THE SCHOOL

The School building, except for the porch canopies, is structurally sound (see Photo No. 8\*). Several of the spans are on the verge of collapse. The canopies, which are structurally unsound, should be replaced by the prototype shown on SK-8. It is also recommended that the defective canopies be immediately demolished. The cost shown is only an estimate and detailed costing must await the bill of quantities that will be available during the final design of the canopy.

Flashing, as shown on SK-5, must be provided around the entire periphery of the school roof in order to protect the roofing and to prevent moisture from finding its way into the exterior walls.

Scheme II of SK-5 was selected because of its successful use on the project. Paxalumin (type 40 autoprotégée alu 8/100) was quoted by S.P.C.E. in Dakar (full address given on page 5) but any comparable material, similarly applied, would be adequate.

Scheme I would be very expensive; therefore, it will only be considered if American flashing can be imported at a reasonable (i.e., competitive) price. A hot mop or a long-fiber tar/asbestos solution is not recommended because they are relatively short-lived products.

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\*Numbering is consistent with the companion report on Shifting Sands Stabilization and Housing Rehabilitation.

The exterior walls should be coated with a rubber-based paint in order to impart dampproofing. Ten meters of spandrel must be rebuilt (see Photo No. 9).

A visual inspection of the roofs revealed them to be "dead flat." This lack of slope has caused puddles to form on the roof, producing a marked deterioration of the roofing and requiring the entire roof to be replaced.

The roofing deterioration has been accelerated by the lack of a protective gravel bed over the roofing. This protective gravel is a standard American practice for flat roofs: it is imperative that it be incorporated into any new roof. The estimates given include the cost of removing the existing roofing and, where required, leveling the roof with light-weight concrete. The new roofing will not pose any weight problem for the roof structure.

The possibility of patching the existing roofing was given some consideration. But, although patching would prolong the life of the roof for only several years, leaks would eventually develop around the patch lines and would not be worth the costs. Quotations were not obtained because contractors would not agree to guarantee their patching work.

The possibility of a cellular concrete fill to provide pitch to the roof was also considered. The additional weight should not pose any structural support problem; however, expansion could. Although the costs would be considerably higher, life would double (to about 20 years). No firm cost quotations were available.

PHOTOS

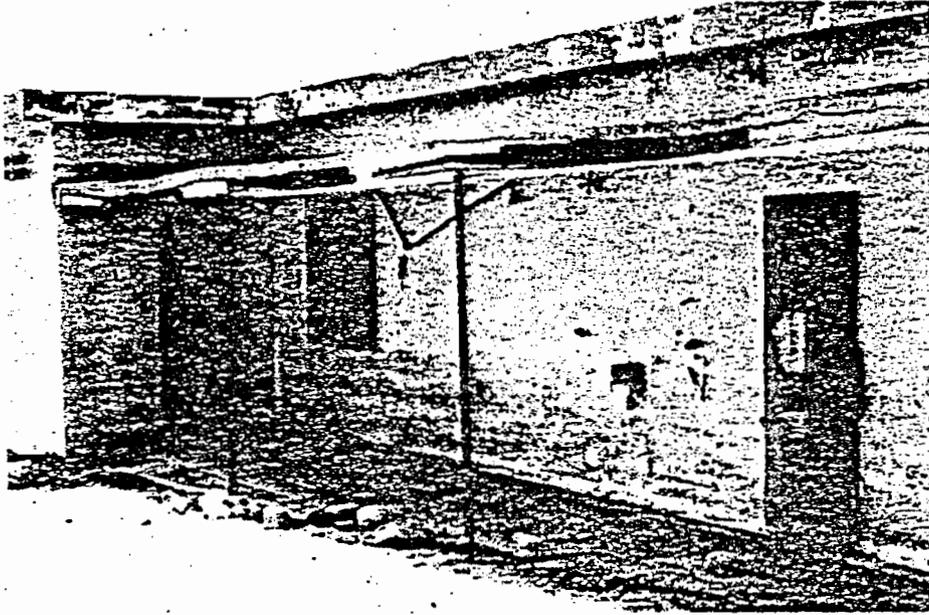


PHOTO No. 8

SCHOOL CANOPIES TO BE DEMOLISHED AND REPLACED\*

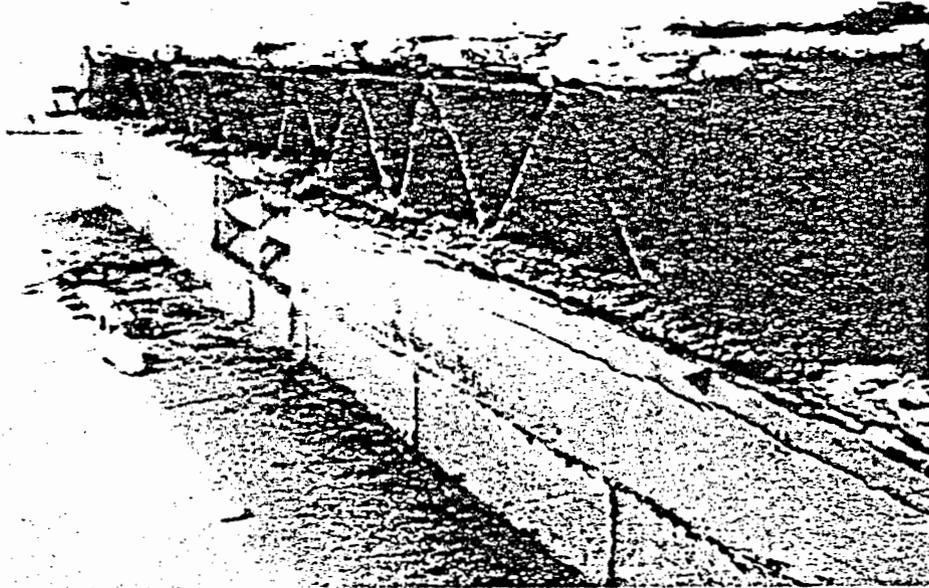
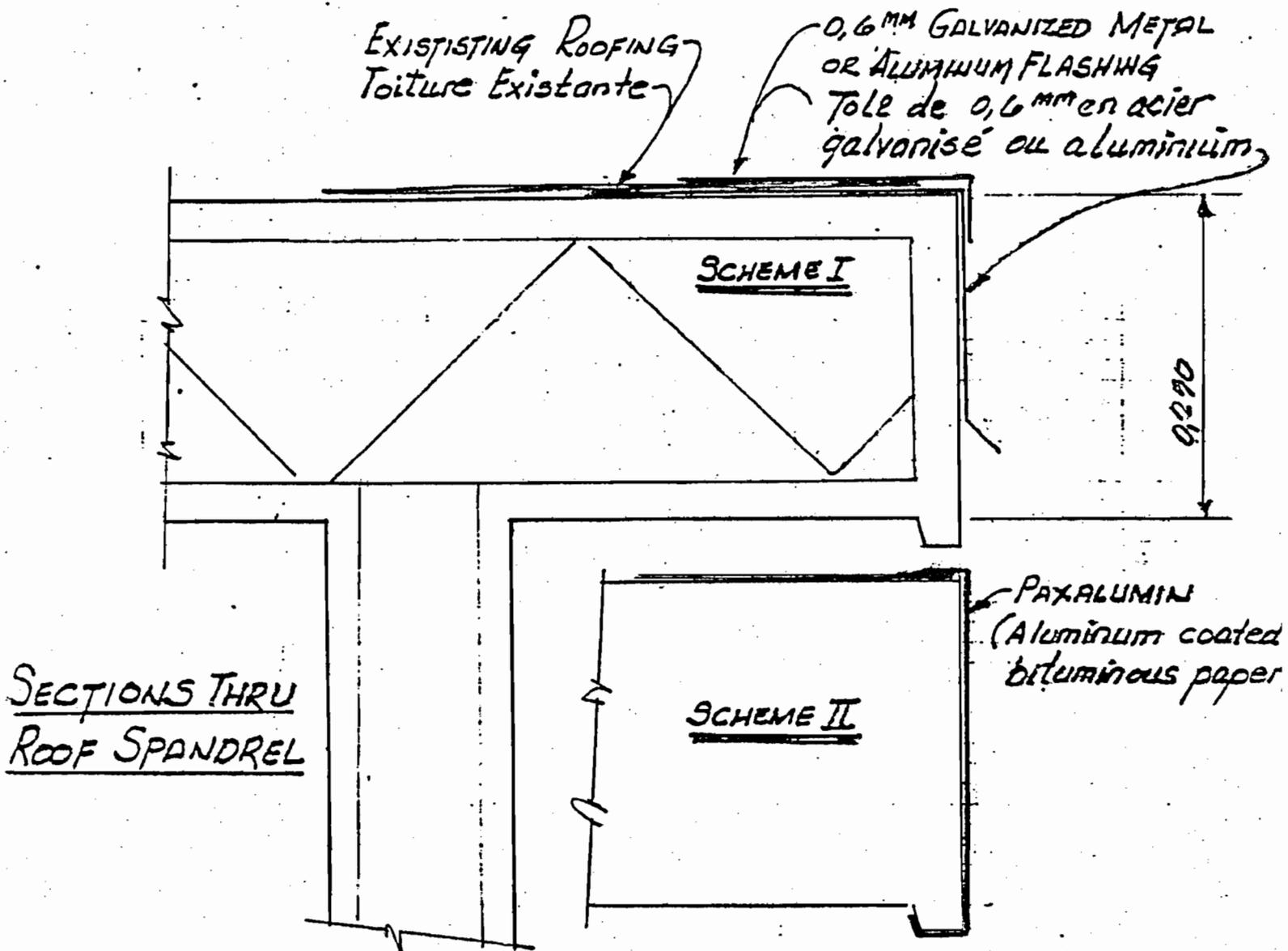


PHOTO No. 9

SCHOOL

Roof Spandrel to be rebuilt ▲



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PROJET PATTE D'OIE, DAKAR, SENEGAL

AGENCY FOR INTERNATIONAL DEVELOPMENT

REHABILITATION STUDY

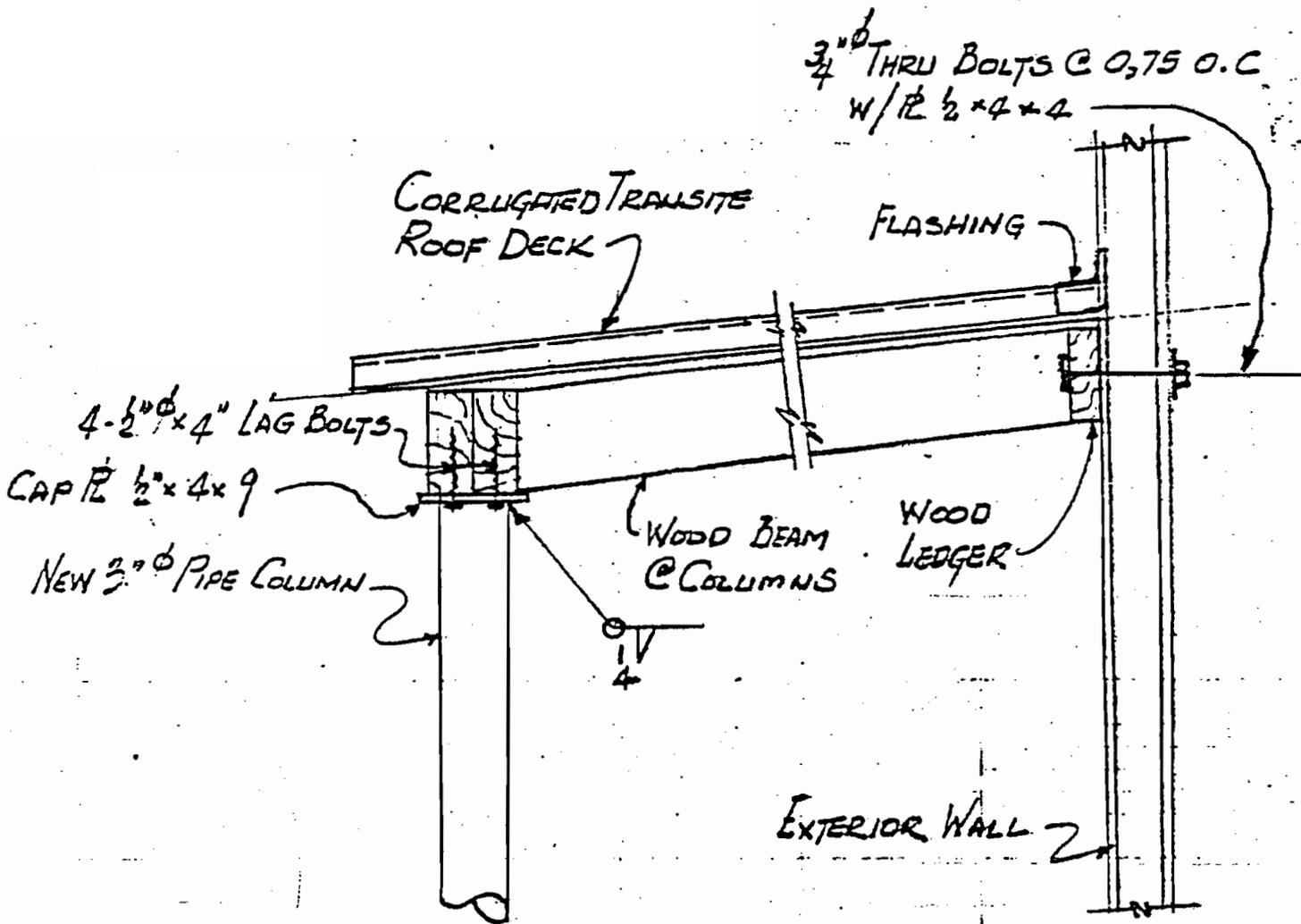
APRIL 1977

ROOF FLASHING

SCALE: SK-5

Société Louis BERGER

ingénieurs Architectes . Economistes



TYPICAL SECTION THRU  
NEW SCHOOL CANOPY Baldaquin

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PROJET PATTE D'OIE, DAKAR, SENEGAL

AGENCY FOR INTERNATIONAL DEVELOPMENT

REHABILITATION STUDY

APRIL 1977

Société Louis BENGER

Ingénieurs Architectes Economistes

## II. CONSTRUCTION MATERIALS

The design of the rehabilitation of the school would be best carried out in the United States. Manufacturers' representatives can be consulted and material of American origin can be recommended. These results can then be taken to Senegal for cost comparisons with locally available material and the addition of construction costs.

It is recommended that the following building materials, of American manufacture, be investigated and priced:

- elastic paint
- roofing material
- flashing

III. COST ESTIMATE

- prices effective April, 1977
- add 1% per month for inflation
- all prices in U.S. Dollars

<u>ITEM</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>QUANTITY</u>	<u>COST</u>
<u>SCHOOL</u>				
New porch canopies	L.S.	-	L.S.	\$10,000
Flashing	L.M.	\$ 5.30	130	690
New spandrel at eave	M <sup>2</sup>	28.50 <sup>1</sup>	20	570
Point exterior walls	M <sup>2</sup>	12.00	380	4,560
New roofing	M <sup>2</sup>	13.40 <sup>2</sup>	400	5,360
Roof expansion joints	C.M.	10.00	10	100
SUB-TOTAL .....				\$21,280
20% FOR CONTINGENCIES ...				\$ 4,256
TOTAL .....				\$25,536 ✓

L.M. = Linear Meter

M<sup>2</sup> = Square Meter

L.S. = Lump Sum

<sup>1</sup> This unit price, \$28.50, is also an alternate price for restoring the deteriorated walls to their original condition.

<sup>2</sup> Price estimate is for removal of existing roofing and dividing of the roof with light-weight concrete where required.

The preceding cost estimate was based on figures provided by the following contractors in Dakar:

- 1) SOCIETE PARISIENNE DE CARRELAGES  
ET D'ETANCHEITE  
Roofing & Tile Work  
Mr. Pierre RUFAT
  
- 2) ENTREPRISE DE BATIMENTS ET TRAVAUX PUBLICS  
Masonry & Concrete Work  
Mr. EL HADJ ASSANCE DEMBA
  
- 3) ENTREPRISE J. P. BAUMANN  
Earthwork & Stone Masonry  
M.J.P. BAUMANN
  
- 4) SOCIETE J. PARGADE & CIE  
Painting & Plastering  
Mr. Roland FARNIER

IV. RECOMMENDATIONS FOR THE DESIGN AND FIELD SUPERVISION OF THE REHABILITATION

The approximate cost of the design of the rehabilitation of the school structure would be about \$15,000.00. This number would cover the cost of:

- specification preparation;
- design of the new structural elements;
- investigation of the existing plans and specifications in Washington, D.C.

Based upon the construction schedules provided by the various contractors, the rehabilitation should require three months of work. The approximate cost of field supervision would be:

- \$30,000 for a resident engineer, architect or a field superintendent;
- \$20,000 for office support personnel;

These figures are estimates subject to negotiation with the design and site supervision consultant.

Substantial savings could be obtained by combining the school rehabilitation and housing rehabilitation programs.

Because of the time pressures, we would recommend that SICAP serve as the general contractor for this work under the supervision of a consulting architect/engineer. Specialist subcontractors, where appropriate, should be employed. This assumes that AID contractual constraints would permit it.