

PD-APP 253 53  
157-54546

Progress Report  
Southern Sudan Infrastructure Project  
Project No. 650-0031

Progress Report No. 3

Period Ending February 28, 1982

In accordance with Article IV, Paragraph B.3.A we are pleased to submit this progress report covering the period from February 1, 1982 through February 28, 1982. This report includes an attachment which summarizes total project hours by individual by discipline expended on the project to date. This attachment identifies individuals by professional and non-professional levels for those who have incurred times in the United States, Kenya and the Sudan.

As indicated in the report, the project manager, survey supervisor, soils engineer, maintenance engineer and senior architect incurred time on the project in Sudan during the month of February. The geotechnical subconsultant completed his field work and was demobilized to Nairobi in February. It is expected that all ground survey work will be completed during the month of March and the camps will be "broken down" and all equipment be turned over to USAID in Juba, Sudan.

TECHNICAL REPORT

FIELD ACCOMPLISHMENTS:

Project Manager spent the month of February on the project site in Sudan supervising the ground survey teams and completion of the geotechnical field effort. The Project Manager returned to the United States on February 28.

Geotechnical - The geotechnical field activities, including all field sampling and subgrade testing was completed during the first week of February and the field teams were demobilized to Nairobi on February 5, 1982. During the second week of February the contractor reviewed the soils testing procedures with the geotechnical subcontractor. It was observed that all sampling and testing presently performed met contract requirements and laboratory facilities were found to be in excellent condition. During February the geotechnical subcontractor received the first shipment of samples from the field and began the initial materials testing program. The development of the soils and materials report also was started in this period.

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Surveys - Ground surveys for topographic mapping and ground control has been completed for approximately 78 percent of the project. It should be noted that the primary spinal traverse has been completed for the project's entire length. Based on this survey the overall length of the project from Mundri to Wau is 489 kilometers. The Agreement and previous documentation for this project indicated a project length of only 440 kilometers.

Mapping has been produced for approximately 20 percent of the project at the close of this reporting period. All bridge site surveys have been completed on the project.

Building Systems - The senior architect completed his field work during the month of February, both in Sudan and Kenya. During this period the senior architect completed his review of the project sites and availability of materials in the Sudan. In addition, he completed his observation of construction techniques in Rumbek and Juba. Further, he reviewed the new facilities being financed by AID in Juba of the type of materials, method, cost and sources of supply for each of the projects.

Maintenance - The maintenance management team completed its field work during this reporting period. This field effort addressed the equipment requirements as well as the degree of road maintenance to be required for the subject project. The team focused its efforts on the regional maintenance centers located in Juba as well as the provincial centers located in Mundri, Mvolo, Rumbek, and Wau.

The maintenance team reviewed the entire project corridor as to the degree of maintenance currently being received and that to be projected. During this phase the team visited and reviewed each of the road site camps located along the project road as to staff, equipment, and housing facilities.

In addition, during this reporting period the maintenance team coordinated their work with the T. P. O'Sullivan group currently based in Juba evaluating regional maintenance on a project being funded by the International Bank for Reconstruction and Development. The major emphasis of this coordination was to determine the level of maintenance being established in Juba as well as to the degree of maintenance management techniques employed in the Sudan.

In addition, the maintenance team reviewed current maintenance activities being performed by a contractor on the Mundri to Juba road. This effort was directed toward the work efforts to be required in the implementation of the maintenance phase requirements of this project.

The maintenance team evaluated existing equipment and inventories found in the project corridor and related equipment available for the project. A detailed analysis will be made of equipment requirements supplemented by work completed by Lewis Berger International in the region on behalf of USAID.

This team returned to the United States to begin office work at the end of February.

#### OFFICE ACCOMPLISHMENTS:

Major work tasks which have been accomplished during this period in the office primarily address the areas of roadway, hydrographics and structures. Generally, specific work tasks associated with building systems and maintenance analysis program are held in abeyance pending the return of the field reconnaissance team. The specific work tasks accomplished are identified below:

Roadway - The roadway section received approximately 19 kilometers of topographic mapping at the final scale of 1:2000 during this reporting period. This mapping represents approximately 4 percent of the total project. The design team developed horizontal geometry and existing ground profiles for the roadway section depicted by the above mapping.

Base map formats were finalized for both plan sheets and cross section drawings. Each of these portray the contractor's methods for presentation of all required data.

The design team has begun the development of preliminary profiles for the roadway segments for which mapping has been provided. The support of the preliminary vertical geometry, preliminary cross sections have been established at random points along the alignment.

A directive dated February 24, 1982 received from Mr. John Smith, Project Engineer, USAID Nairobi, indicated further design consideration on the subject project. Each of these 23 items will be considered as appropriate in the future design effort of the roadway and maintenance systems.

Hydrographics - Hydrographic activity was completed during this reporting period and addressed several items. These include the completion of aerial photographic interpretation and delineation of hydrographic features on 1:7000 scale worksheets. The delineation of major drainage basins was accomplished on 1:500,000 scale maps.

During February the delineation of minor drainage basins was defined on 1:250,000 maps. Also during this period a preliminary computation analysis of flood frequencies was completed for all major and minor river crossings in the study area. Coupled with this was the completion of preliminary computations of rainfall intensity curves to be used for minor drainage design throughout the project.

Initial preparations of technical memoranda of developing the methodology to be employed for hydrographics on the project was initiated during February. In addition, initial cross sections and structure approach profiles at all major river crossings was undertaken. This effort is to be utilized in the preparation of hydraulic models to be employed based on existing data and assumptions necessary to complete this task.

Structures - Work continued on the structural evaluation of each of the bridge structures on the project site. In addition, preliminary recommendations are being formulated for each of the existing structures for those to be retained, repaired, or replaced.

#### PLANNED ACTIVITIES:

Planned activities include work task for each appropriate project discipline and are outlined below:

Roadway - The recommended plan sheet and cross section format drawings will be submitted to Mr. John Smith, Project Engineer, USAID, Nairobi, for concurrent review by USAID and the Southern Sudan Ministry for Public Works, Transportation, and Communications.

The roadway division anticipates the receipt of an additional 60 kilometers of topographic mapping during the month of March. The design team will consequently continue development of preliminary horizontal and vertical alignments through this area. Preliminary working cross sections will be developed as required for alignment considerations.

The design team will also begin development of special item sheets of schematics, general legends, special details, etc. The team will additionally begin the development of bid documents and formats and materials identifications for cost estimating purposes.

Hydrographics - The hydrographic team will complete and publish its technical memoranda addressing methodologies for the project. In

addition, the major work tasks will include the continued analysis of field cross sections and profile data at major bridge crossings and initiate the development of hydraulic models for the project corridor.

Structures - The structural division will complete its final recommendations for each of the bridges under consideration in this project. It will publish the preliminary report on each of the structural evaluations.

Building Systems - Building systems team will begin assembling the base data and begin the development of the programming phase of their work during this reporting period. This programming phase will be dependent upon the recommendations of the maintenance analysis group pending the housing of the maintenance activities at Rumbek.

Maintenance - The maintenance team, upon compiling its field reconnaissance data, will develop an initial program of maintenance requirements for the project. It is expected that this evaluation will result in the program requirements for the building systems section.

#### ADMINISTRATIVE REPORT

A complete listing of project hours are contained in Attachment A of this report. Individuals and their hours are shown by appropriate disciplines in which their efforts have been utilized. Individual hours are summarized as those hours previously reported, those in this reporting period, and the total hours expended. An evaluation of the budgeted hours to the total effort is indicated by the percentage used.

Hours indicated on Attachment A include those hours on-site on field activities in Sudan. As previously reported, some items now exceed the anticipated budget for the items of work envisioned. These were previously communicated in Progress Reports 1 and 2 for delays initially experienced in the project.

PROJECT 650-0031  
ATTACHMENT A  
PROJECT HOURS BY INDIVIDUAL  
BY PROJECT DISCIPLINE

MANAGEMENT AND LOGISTICS

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
S. E. Linyard	Project Manager	728.0	224.0	952.0	✓
R. A. Hubbard	Sr. Exec. Vice Pres.	0	0	0	952
P. E. Conrad	Exec. Vice Pres.	103.0	5.0	108.0	
R. A. Foy	Sr. Vice Pres.	0	0	0	
L. G. Byrd	Sr. Vice Pres.	11.0	2.0	13.0	
J. W. Bonniville	Vice President	84.0	0	84.0	
F. A. Henneycy, Jr.	Administration	220.7	0	220.7	205.0
R. E. Miller	Sr. Logistics	371.0	0	371.0	
J. B. Jones	Logistics	427.0	66.0	493.0	
Professional Sub Total		1944.7	297.0	2241.7	1084.7 42.7
Larry Scott	Draftsman	8.5	0	8.5	
B. McNairn	Tech. Typist	1.5	0	1.5	
N. King	Tech. Typist	11.0	0	11.0	
N. Nobbs	Tech. Typist	13.0	0	13.0	
M. Flynn	Tech. Typist	1.5	0	1.5	
Non-Professional Sub Total		36.5	0	36.5	1.9

## ATTACHMENT A - Continued

ROADWAY SECTION

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
✓ C. Hale	Division Director	497.0	72.5	569.5	
✓ B. Outlaw	Section Chief	80.0	134.0	214.0	
✓ S. Hopkins	Section Chief	0	0	0	
✓ R. Cromer	Specifications/ Cost Estimator	10.0	0	10.0	
✓ J. White	Specifications/ Cost Estimator	0	0	0	
✓ E. Doyle	Design Engineer	8.0	0	8.0	
✓ D. Legat	Design Engineer	0	0	0	
✓ W. Fussell	Designer	0	0	0	
✓ J. Summey	Designer	914.0	224.0	1138.0	
✓ R. Powell	Soils Engineer	528.0	96.0	624.0	
Professional Sub Total		2037.0	526.5	2563.5	17.9
✓ F. Helms	Technician	0	0	0	
✓ C. Triplett	Technician	0	0	0	
✓ A. King	Technician	0	0	0	
✓ V. Cook	Draftsman	12.5	10.0	22.5	
✓ R. Crapps	Draftsman	0	0	0	
✓ P. Sallings	Draftsman	0	0	0	
✓ S. Sheu	Technician	0	0	0	
✓ J. Smith	Technician	0	0	0	
✓ R. Styron	Draftsman	0	0	0	
✓ L. Dunn	Tech. Typist	6.5	12.5	19.0	
Non-Professional Sub Total		19.0	22.5	41.5	0.4

ATTACHMENT A - Continued

HYDROGRAPHICS

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
✓ L. J. Farrow	Utilities Engineer	11.0	0	11.0	
P. W. Prescott	Hydrologist	83.0	0	83.0	
G. R. Fischer	Hydrologist	472.5	137.0	609.5	
J. S. Cook	Hydraulics Engineer	492.5	25.0	517.5	
R. M. Steele	Designer	3.0	12.0	15.0	
T. F. Hilliard	Designer	29.0	49.0	78.0	
Professional Sub Total		1091.0	223.0	1314.0	27.7
D. L. Barnes	Draftsman	112.5	113.5	226.0	
F. Davis	Tech. Typist	12.6	5.8	18.4	
Non-Professional Sub Total		125.1	119.3	244.4	24.6

STRUCTURES

R. L. Whitaker	Sr. Structural Engr.	88.0	10.0	98.0	
J. A. White	Sr. Structural Engr.	296.0	0	296.0	
W. S. Huffstetler	Sr. Structural Engr.	4.0	0	4.0	
J. E. Lewis, Sr.	Structural Engineer	4.0	0	4.0	
H. D. Lewis	Structural Engineer	0	0	0	
T. A. Cockfield	Structural Engineer	0	0	0	
D. W. Taylor	Structural Engineer	0	0	0	
J. M. Doby	Structural Engineer	440.0	0	440.0	
Professional Sub Total		832.0	10.0	842.0	14.2
E. H. Fetner, Jr.	Technician	0	0	0	
H. J. Knoester	Technician	0	0	0	

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## ATTACHMENT A - Continued

STRUCTURES (Continued)

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
K. R. Campbell	Draftsman	0	0	0	
W. A. Yates	Draftsman	0	0	0	
M. W. Breeland	Draftsman	0	0	0	
J. M. Hartman	Draftsman	4.0	0.5	4.5	
M. A. Dickert	Draftsman	0	0	0	
R. G. Lawrence	Draftsman	0	0	0	
B. Kennedy	Tech. Typist	4.5	3.5	8.0	
Non-Professional Sub Total		8.5	4.0	12.5	3.9

BUILDING SYSTEMS

P. H. Bultman	Sr. Architect	144.4	89.0	233.4	
C. Carter	Architect	0	0	0	
N. Shah	Architect	0	0	0	
J. S. Smith	Architect	0	0	0	
J. R. Abrams	Architect	0	0	0	
T. O. Cook	Civil Engineer	5.5	0	5.5	
J. F. Harrelson	Designer	0	0	0	
J. N. Witty	Designer	0	0	0	
E. R. Ezekiel	Sr. Structural Engr.	0	0	0	
J. R. Brown	Structural Engineer	0	0	0	
N.C.S. Hsu	Structural Engineer	0	0	0	
S.C.H. Lee	Structural Engineer	0	0	0	

## ATTACHMENT A - Continued

## BUILDING SYSTEMS (Continued)

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
B. V. Flemming	Sr. Mech. Engineer	0	0	0	
W. V. O'Neal	Mechanical Engr.	0	0	0	
R. L. Walker	Mechanical Engr.	0	0	0	
D. E. Reider	Mechanical Engr.	0	0	0	
H. S. Capell	Sr. Elec. Engineer	0	0	0	
R. E. Sheppard	Electrical Engr.	0	0	0	
Professional Sub Total		149.9	89.0	238.9	8.0
P. Stallings	Draftsman	0	0	0	
J. Metz	Technician	0	0	0	
G. F. Fulmer	Technician	0	0	0	
E. L. Livchin	Technician	0	0	0	
M. Kozlov	Technician	0	0	0	
A. Rodrigues	Technician	0	0	0	
D. Turbeville	Tech. Typist	0	0	0	
M. Wools	Tech. Typist	0	0	0	
Non-Professional Sub Total		0	0	0	0
<u>MAINTENANCE</u>					
J. D. Arnoult	Maintenance Engr.	145.0	160.0	305.0	
A. D. Belsma	Asst. Engineer	120.0	160.0	280.0	
C. C. McMullen	Maint. Equip. Engr.	29.0	0	29.0	
M. C. Rissel	Maint. Engineer	6.0	0	6.0	

## ATTACHMENT A - Continued

MAINTENANCE (Continued)

<u>NAME</u>	<u>TITLE</u>	<u>HOURS PREVIOUS REPORTS</u>	<u>HOURS THIS REPORT</u>	<u>TOTAL HOURS USED</u>	<u>PERCENT OF BUDGET USED</u>
L. B. Stephens	Sr. Engineer	0	0	0	
R. R. Vique	Maint. Equip. Engr.	0	0	0	
R. E. Thompson	Maint. Engineer	0	0	0	
C. A. Parsons	Maint. Equip. Engr.	37.0	0	37.0	
Professional Sub Total		337.0	320.0	657.0	30.5
R. H. Walker	Draftsman	0	0	0	
R. V. Brant	Draftsman	0	0	0	
J. Netus	Tech. Typist	7.0	0	7.0	
J. Wood	Tech. Typist	.5	0	.5	
D. Aebicher	Tech. Typist	16.5	0	16.5	
B. Smith	Tech. Typist	5.0	0	5.0	
Non-Professional Sub Total		29.0	0	29.0	13.9
PROFESSIONAL TOTAL		6391.6	1465.5	7857.1	16.9
NON-PROFESSIONAL TOTAL		218.1	145.8	363.9	4.4