



**Consultant's Civil Works Evaluation**

**Submitted by:**

**Alain Dubé**

**For:**

**Chemonics International Inc.**

USAID RAISE IQC No. PCE-I-00-99-00003-00, Task Order 808

**Madagascar Cyclone Recovery Program  
Rural Roads Infrastructure and Systems Rehabilitation  
ReCAP Project**

**October 2002**

**Republic of Madagascar**  
**ReCAP Project – Chemonics International - Lalana**  
**MISSION**  
**AIDE MEMOIRE – October 2002**

**INTRODUCTION**

1. Between October 2 and 20, 2002, Mr. Alain Dubé (Consultant) has reviewed the progress and quality of the work done under the USAID funded Chemonics - ReCap Project (PCE-I-00-99-00003-00, Task Order 808). The key findings and recommendations of this Consultant reflected in this Aide Memoire are based on the observations and information's provided by the various individuals and professionals met during this visit. The Consultant would like to express thanks and deep appreciation for the assistance and support provided by the ReCap's project team.

2. Overall the progress and quality of work is satisfactory. Several road construction contracts are about to be completed and pressure from the supervising engineers are proving to be effective as work pace has significantly increased in the last month. At this time, the consultant would proposes the main issues to focus on are the acceleration of ongoing civil work to be completed before the upcoming rainy season, the acceleration of the implementation of AUP's and their Union's and finally the negotiation of an extension of the Project Closing Date. This extension would allow: (i) the completion of road upgrading contracts; (ii) proper supervision during the defect liability period (12 month) (iii) monitoring and support of recently created AUP's and their Unions; and iv) completion of the wharf repairs at Manakara.

**A. CIVIL WORKS**

3. **Overall Status.** Out of 14 road contract packages (see Consultancy Report - Attachment 1 for detailed comments and recommendations):
- three (3) are completed (56,15 km);
  - eight (8) progress well and are expected to reach substantial completion by the end of the current Project Closing Date of December 15, 2002 (151,35 km);
  - one (1) progresses slowly (RT Ambavahadiromba to Antsahalemaka – Lot 3 – 13,50 km) and is recommended to be reduced by 1,770 km if completion targets are not met by October 17, 2002.
  - two (2) just started (RNT 14 PK 41 to 46 (5 km) and RP Fa 4 Ademaka-Manampatrana (6 km)).

The outstanding issues concern the following contracts:

4. **All Contract Packages.** This consultant recommended as safety/environmental issues: i) requirement for sub-contractor to provide safety glasses to quarry workers, ii) uses of Calcium Chloride flacks to reduce dust in village or more densely populated area, iii) interruption of quarrying activities in or next to river beds. A series of minor recommendations about the content of contractual documents where also made.

5. **Quality control of materials:** A contract to supervise quality controls of material should be reinitiated as soon as possible for all ongoing works and the selected laboratory audited;

6. **RNT 14 – Lot 1 and 2 – Ifanadiana - Ikongo:** There is no major issue with these contracts except for the contractual delays and penalties. It is estimated that both contractors will finish their works before December 15, 2002 if weather conditions allows it. Recommendations

were made concerning the supervision of both contracts. An assessment of the structural capacity and safety of PK 41 steel bridge should be requested in writing to “Travaux Publics” of Madagascar. Minor technical recommendations are presented in the consultancy report.

7. ***RN 12 / RP 1102F – Lot 1, 2 and 3 – Sahasinaka – Lokomby:*** Minor repairs are needed on lots that were completed in March/April 2002 before the AUP’s takes over road maintenance. Since completion of the work in 2002 for lot 1, 2 and 3, the road has stayed in very good condition which confirms the adequacy of the design and contractual specifications.

8. ***Tertiary roads in Imerimandroso – Ambatondrazaka area:*** All contracts except for lot 3 are expected to be completed before 2003. Work progress has significantly increased in the last month along with the support of Supervision Engineers (SE) in the sub-contractor’s planning. It is recommended to reduce the scope of work on lot 3 if targets set for October 17 are not met. Other minor recommendations were made.

9. ***Consultancy Services for Contract Supervision under DLP and implementation of AUP’s.*** Considering that many contracts will be completed in the month to come and that many AUP’s have just been created, it is recommended to restructure the supervising arrangements into the defect liability period. Essentially, the objective is to reduce costs and maximize the use of local resources. A proposal (amendment) should be submitted for USAID approval.

## **B. INSTITUTIONAL COMPONENTS**

10. ***AUP’s and Unions.*** The consultant recommended that material provided by sub-contractor’s (5% of basecourse) be strategically placed along each road to reduce cost of maintenance for AUP’s. It was also noted that there is a certain level of confusion in the perception of the AUP’s by politicians of different level of government (provincial versus national). The issue, about the possibility of implementing road toll on national roads was underline by one AUP. The project’s output should be publicized throughout all level of government. This consultant also believes that the success of the implementation of AUP’s and their Unions relies on adequate controls of collected funds, adequate priority in maintenance planning and intervention and minimal support throughout the first year of implementation. A Proposed Implementation Plan for AUP’s and Unions in the Ambatondrazaka – Imerimandroso area is presented in attachment 5.

10. ***Main Recommendations.*** A summary of the main actions this consultant would recommend is provided under Appendix 1.

**Attachments:**

- 1- Consultancy Reports
- 2- Contract summary and Estimated Date of Completion (EDC)
- 3- Technical specification summary
- 4- Proposed Documents
- 5- Implementation plan for AUP’s in Ambatondrazaka (MsProject)
- 6- Mission report

**Republic of Madagascar  
ReCap Project  
October 2002 Mission  
Proposed Actions to be Undertaken**

| <u>Actions</u>  | <u>Agents</u>     | <u>Deadline</u>    |
|---|-------------------|--------------------|
| <b>A. Civil Works</b>   |                   |                    |
| 1- Require Contractors to provide safety glasses to Quarry workers                | Chemonics         | ASAP               |
| 2- Use Calcium Chloride as a mean to reduce dust                                  | Chemonics         | ASAP               |
| 3- Stop quarrying activities next to river beds                                   | Chemonics         | ASAP               |
| 4- Reinitiate laboratory testing contract   | Chemonics         | ASAP               |
| 5- Require in writhing the evaluation of PK 41 bridge                             | Chemonics - USAID | ASAP               |
| 6- Reduce the scope of work of lot 3 in Ambatondrazaka                            | Chemonics         | 2002-10            |
| 7- Restructure team during DLP  | Chemonics-USAID   | 2002-12            |
| <b>B. INSTITUTIONAL COMPONENTS</b>  |                   |                    |
| 8- Strategically locate materials for AUP's                                       | Chemonics         | ASAP               |
| 9- Publicised throughout all level of government the outcomes of the project      | USAID             |                    |
| 10- Implement controls on income fund   | Chemonics - USAID | 2002-12            |
| 11- Train AUP on maintenance priorities   | Chemonics         | 2002-12            |
| 12- Provide adequate support to AUP's and Unions during the first 6 month of 2003 | Chemonics         | 2002-12 to 2003-06 |
|   |                   |                    |
|   |                   |                    |
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|   |                   |                    |
|   |                   |                    |
|   |                   |                    |

**CONSULTANCY REPORT**

**Alain M. Dubé, ing, M. Sc. (Consultant)**

**OCTOBER 2 TO 20, 2002**

The Consultant was provided with Terms of References and a digital copy of major contractual documents (contracts, quarterly reports, expert consultancy reports, etc,) before his departure. The objective of this consultancy was to provide engineering support to the Chief of Party and Local Engineering Staff of the Madagascar Cyclone Recovery Program, Rural Roads Infrastructures and Systems Rehabilitation (ReCap Project).

Specific tasks included:

- Review and make recommendations with regards to the ongoing construction works of roads and bridges along RNT 14 (Ifanadiana to Ikongo) and numerous tertiary roads in the Sahasinaka-Bekatra, Antanandava and Imerimandroso area (see information on roads in attachment no. 2);
- Review contracts, proposals and technical specifications and ongoing construction supervision for the above-mentioned roads. Provide training if necessary;
- Review ongoing implementation of AUP's and propose measures to accelerate their deployments before project closing date.

**Activities carried out during the mission:****1. Review of Contractual documents**

The Consultant acknowledges that a great deal of effort and experiences with the precedent Cap project has contributed to producing the current contractual documents. The following recommendations are made with regards to preparation and specifications of future contracts:

- Make appropriate references to testing procedures and classifications (AASHTO, LCPC, NFP, etc.);
- Specify, for all material used, testing frequencies (see attachment no 3);
- In the French version of contractual specifications, use “present tense” form for verbs instead of “present future”;
- Get contractors to provide Calcium Chloride (CaCl<sub>2</sub>) flakes as a mean to reduce and control dust in villages of more densely populated area. Construction equipment, vegetation removal from the road platform and additional traffic related to the civil work are creating a temporary rises in dust particles that should be dealt with;
- Modify standard drawings (Plan Type 02-02 et 02-03) included in the Technical Specifications, so that all cross sections drawings shows a properly drained subgrade (continuous 3% slopes toward ditches);
- Modify standard drawings (Plan Type 06-01) included in the Technical Specifications, so that FM2 drawings shows a properly drained subgrade (openings between masonry blocs);
- Create an independent reading committee to make last verifications of contractual documents before they are sent to contractors for proposals.
- Contractual documents recommend the transfer to AUP’s of contractual responsibilities related to the DLP. Since this requirement is not mandatory, it is therefore suggested to keep a minimal supervising staff (1 engineer and 3 to 4 social-organizers throughout that period. This reduced team would also be responsible for the support to AUP’s and their Unions.

## **2. Construction works on RNT 14 (Ifanadiana-Ikongo)**

The field visits started on October 6, 2002. The Chief of Party, M. Ralph Jean accompanied the consultant for this part of the field trip.

### **Lot 1 - Ifanadiana – Tolongoina**

### **Lot 2 - Tolongoina – Ikongo**

The consultant met with the supervising engineers (SE) at PK 00 (lot 1) and PK 46 (lot 2) and was later provided with a series of documents related to the supervision of the contract.

While in Manampatrana, the consultant reviewed the following documents: i) Laboratory Reports, ii) Notebook of Contradictory Measures, iii) Earthworks cross sections and volume calculations, iv) Notebook of Change Orders, v) Statutory meeting's proceedings and vi) Daily Operations Journal (DOJ).

The SE gave an overview of the situation comprising the progress to date, a description of his role as a supervisor and the difficulties encountered on the field. We discussed some technical aspects of the project and he also highlighted some specific problems. Both contractors are in penalty (1/1000 of contractual value per day for a maximum of 60 days) due to breach of reaching completion within contractual delays. This situation and involvement of SE's in sub-contractors activities have proved sufficient to accelerate work progress. After discussion with contractors, this consultant believes that additional involvement in sub-contractors operations may expose the Engineer to claims. A detailed field visit allowed us to note the following:

- Lot 1: Work progress as of September 3, 2002 (QR #6) was 74%. During the field visit, work progress was estimated at 85%. With regards to equipment, materials, labors and remaining works, it can be estimated that substantial completion will be attained before project closing date of December 15, 2002 (see attachment no 2).
- Lot 2: Work progress as of September 3, 2002 (QR #6) was 76%. During the field visit, work progress was estimated at 86%. With regards to equipment, materials, labors and remaining works, it can be estimated that substantial completion will be attained before project closing date of December 15, 2002 (see attachment no 2).
- Geometry, road design and quality controls and supervision where found to be adequate.

- Change Orders (CO) should be numbered and include a follow-up references/notes to action undertaken by the sub-contractors (what was done, when it was done, etc.) following their transmission to the contractor. All CO that have no follow-ups should be discussed at statutory meetings.
- Laboratory reports indicate conformity of most materials to contractual specifications. However, it was noted that compaction results are often below the required values (90/95 % of OPMD). It was confirmed by the SE that additional compaction was done on the faulty sections but this is not documented. It is recommended that indications on laboratory reports be made to CO's issued and follow-ups. Laboratory services were not audited by the consultant (testing procedure, blind samples, etc.)
- Laboratory and in situ testing of materials for both subcontracts should resume as soon as possible.
- Statutory meetings should concentrate on administrative (payments, etc.), technical (quality of material, design, specific interventions, etc.) and management issues (work schedule, production, etc.) instead of taking the form of a DOJ.
- A codified list of equipment (see attachment no 4) should be made and DOJ should include information on the number of hours worked, on stand-by or needing repairs for each of the equipment. In a claim situation, contemporary documents such as the DOJ can provide essential information.
- Verification is recommended on the estimation of quantities done and paid. Average cross section area methods used by the subcontractors to estimate cut and fill cubic meters and approved by the SE was observed to be faulty at one occasion.
- The construction work should comply with the environmental proposal prepared by Chemonics and presented to the ONE (Office National de l'Environnement) to obtain the Temporary Environmental Permit. Special attention is needed for activities that may cause spills of diesel fuel and oil near river beds. To prevent such contamination, quarry exploitation should be prohibited in a perimeter of 30 meters from river beds. We wish to highlight those specific points because violations of some environmental rules were still occurring.
- The Ministry of Public Works of the Government of Madagascar has not yet repaired the four bridges cited in Kenneth R. Rikard's and Frantz V. Joseph report. In the meantime, we strongly recommend that the Ministry assesses once again the structure of the bridge at PK 41 and decide if it is still safe for pedestrians and light trucks to cross it.

- **Suggested solutions to specific problems:**

| <b>PK</b>                                | <b>ISSUE</b>                 | <b>DESCRIPTION</b>   | <b>PROPOSED SOLUTION</b>                |
|--|------------------------------|--|---|
| 8+600 to 8+800 and others (tight curves) | Damages to surfacing (40/70) | Insufficient lateral support and traffic damages the surface treatment (40/70) | Build a masonry edge (about 75 mm high) |

| <b>PK</b> | <b>ISSUE</b>     | <b>DESCRIPTION</b>                                      | <b>PROPOSED SOLUTION</b> |
|-----------|------------------|---|--------------------------|
| 7+300     | Moderate rutting | Soft base course (BC) material over a 100 meter section | Replace BC               |

| <b>PK</b>        | <b>ISSUE</b>    | <b>DESCRIPTION</b>                     | <b>PROPOSED SOLUTION</b>           |
|------------------|-----------------|--|------------------------------------|
| 16+500<br>23+600 | Slope stability | Unstable quarry slope and perched tree | Remove unstable rock mass and tree |
| 16+500<br>23+600 | Environmental   | Quarry exploitation near river bed.    | Stop quarry exploitation           |

| <b>PK</b> | <b>ISSUE</b>    | <b>DESCRIPTION</b>                              | <b>PROPOSED SOLUTION</b>                                  |
|-----------|-----------------|---|---|
| 28+000    | Slope stability | Gabion wall stop in the middle of a steep slope | Evaluate slope stability and extend gabion wall if needed |

| <b>PK</b> | <b>ISSUE</b>      | <b>DESCRIPTION</b>   | <b>PROPOSED SOLUTION</b>             |
|-----------|-------------------|--|--------------------------------------|
| 29+700    | Subgrade drainage | Lateral concrete wall does not allow proper drainage of subgrade | Create draining channel through wall |

| <b>PK</b> | <b>ISSUE</b>       | <b>DESCRIPTION</b>        | <b>PROPOSED SOLUTION</b> |
|-----------|--------------------|---------------------------|--------------------------|
| 37+400    | Erosion protection | Broken approach of bridge | Repair masonry           |

| <b>PK</b> | <b>ISSUE</b>  | <b>DESCRIPTION</b> | <b>PROPOSED SOLUTION</b>                        |
|-----------|---------------|--------------------|---|
| 59+400    | Environmental | Diesel leak        | Repair tank valve and remove contaminated soils |

## **2. Construction works on RN 12 Sahasinaka – Lokomby area**

**Lot 1 - RN 12 – Sahasinaka**

**Lot 2 - RN 12 – Sahasinaka - Bebaka**

**Lot 3 - RN 12 – Bebaka-Bekatra**

**RN 12-RP 1102F- Bekatra-Lokomby roads**

Because of delays due to a late train in Manampatrana and arrival in Manakara at a late hour, the field visit took place in the morning of October 9, 2002.

More than half of lot 2 (PK 11 to 26,5) has only undergone minor rehabilitation. These portions of the road shows light to moderate rutting and in some areas are in need of repairs. This consultant suggests adding this work to the ongoing ARR contract on the adjacent section of road.

Since completion of the work in March\April 2002 for lot 1, 2 and 3, the road has stayed in very good condition which confirms the adequacy of the design and contractual specifications. With the DLP coming to an end, contractors where required to conduct minor repairs before the Lokomby area six AUP's, (which was created almost 5 years ago under Cap) takes over maintenance.

The consultant also met with Mr. Calixte, a prosperous businessman and local administrator, in Sahasinaka. The consultant strongly believes that the success of the AUP's lies with individuals and enterprises, who shares interest in the quality of the regional road network.

## **3. Manakara Port**

Although included in the TOR, the installations where not visited because of a lack of time.

#### 4. Construction works in the Imerimandroso – Antanandava area - Tertiary roads

##### Lot 1, 2, 3, 5 and 6 - Imerimandroso

##### Lot 4 – Antanandava

Between October 10 and 13, 2002, the consultant visited tertiary roads and [AUP's in the Ambatondrasaka - Imerimandroso area](#). Work progress is summarized in the following table:

| Contract | Work Progress | Estimated Date of Completion<br>(EDC) |
|----------|---------------|---------------------------------------|
|          | 2002-09-30    |                                       |
| Lot 1    | 55%           | 2002-12-06                            |
| Lot 2    | 56%           | 2002-12-16                            |
| Lot 3    | 25%           | 2003-01-30                            |
| Lot 4    | 75%           | 2002-11-15                            |
| Lot 5    | 35%           | 2002-12-30                            |
| Lot 6    | 25%           | 2002-12-20                            |

Since September 30<sup>th</sup>, work progress has significantly improved on lot 5 and 6 contracts. Involvement of SE's in sub-contractors activities has proved sufficient to accelerate work progress for most contracts. After discussion with contractors, this consultant believes that additional involvement in sub-contractors operations may expose the Engineer to claims and should be kept to the actual level. Discussion with contractors also provided information on the feasibility for a rental pool of machinery. Most contractors were favorable to the idea as long as payment was made upfront. Solvability remains a main issue for those small/medium enterprises.

Work progress on lot 3 is still insufficient. This consultant recommends the contract be reduced by 1 to 2 kilometers and entrust to ARR or EGECA, if no significant progress is made by October 17, 2002. This last sub-contractor has confirmed that he has no other contractual obligation and readily available equipment on site to start right away. It is unlikely that Groupema will finish within or near contractual delays.

The consultants also recommended using either quartz blocks or submerge tree trunks to provide adequate bearing capacity for an additional 400 meters section of road near Andromba.

Although very few documents were available for comments, recommendations related to the supervision of contract presented in chapter 2. of this report applies to contract in this area. The consultant has provided training to both SE on this matter on October 11, 2002.

## **5. AUP's and Unions**

During the mission, the consultant met with several AUP's and Unions. (see attachment no. 6).

The consultant recommended that material provided by sub-contractor's (5% of basecourse) be strategically placed along each road to reduce cost of maintenance for AUP's.

The consultant insisted, with each AUP's met, over the importance of maintaining an efficient drainage infrastructure for the road.

It was also noted that there is a certain level of confusion in the perception of the AUP's by politicians of different level of government (provincial versus national). The issue, about the possibility of implementing road toll on national roads was underline by one AUP.

This consultant also believes that the success of the implementation of AUP's and there union relies on adequate controls of collected funds, adequate priority in maintenance planning and intervention and minimal support throughout the first year of implementation or at the least until June 2003.

Solutions for controlling collected funds could take the form of portable traffic counter or on site traffic evaluation.

With the assistance of Mr. Jules, the consultant has prepared an Implementation Plan for the 19 newly created AUP in the Ambatondrazaka region (see attachment no. 5). This plan calls for minimal support throughout the DLP.

## **6. Meetings**

Please refer to Mission Report (see Attachment no 6)

| Attachment no 2  |                        |                |                   |                     |                        |              |            |                |                  |                     |
|--|------------------------|----------------|-------------------|---------------------|------------------------|--------------|------------|----------------|------------------|---------------------|
| Roads under rehabilitation - Routes en réhabilitation - Projet ReCap Project |                        |                |                   |                     |                        |              |            |                |                  |                     |
| Road   | Sub-contractor         | Cost<br>(WO/T) | Completion<br>(%) | EDC*<br>on 02/10/13 | Region                 | From<br>(PK) | To<br>(PK) | Lenght<br>(km) | Cost/km<br>(MgF) | Cost/km ***<br>US\$ |
| RNT 14 Lot 1   | EBMA                   | 5313888154     | 85                | 12/15/2002          | Ifanadiana-Ikongo      | 0+000        | 41+000     | 41.00          | 129607028        | 19940               |
| RNT 14 Lot 2   | EGECORAM               | 4211838470     | 86                | 12/15/2002          | Ifanadiana-Ikongo      | 46+000       | 93+000     | 46.00          | 91561706         | 14086               |
| RNT 14 Lot 3   | EBMA                   | 406068172      | 0                 | Nov. 15**           | Ifanadiana-Ikongo      | 41+000       | 46+000     | 5.00           | 81213634         | 12494               |
|  |                        |                |                   |                     |                        |              | sub total: | 92.00          | AVG:             | 15507               |
| RP Fa 4  | EGECORAM               | 383707877      | n/a               | n/a                 | Ademaka - Manampatrana | 0+000        | 6+000      | 6.00           | 63951313         | 9839                |
| RP 1103F/RN 12 Lot 1   | TAHINA                 | 875303500      | 100               | 2002                | Sahasinaka             | 0+000        | 12+150     | 12.15          | 72041440         | 11083               |
| RN 12 Lot 2  | TOLOTSOA               | 1543483116     | 100               | 2002                | Sahasinaka - Bebaka    | 0+000        | 26+500     | 26.50          | 58244646         | 8961                |
| RN 12 Lot 3  | ARR                    | 1266896200     | 100               | 2002                | Bebaka - Bekatra       | 26+500       | 44+000     | 17.50          | 72394069         | 11138               |
| RN 12 - RP 1102F   | ARR                    | 468656150      | n/a               | Nov. 30**           | Bekatra - Lokomby      | 0+000        | 32+360     | 14.22          | 32957535         | 5070                |
| Piste Lot 1  | TAHINA                 | 838277000      | 55                | 12/6/2002           | Imerimandroso          | 0+000        | 11+400     | 11.40          | 73533070         | 11313               |
| Piste Lot 2  | ARR                    | 629277800      | 56                | 12/16/2002          | Imerimandroso          | 0+000        | 7+300      | 7.30           | 86202438         | 13262               |
| Piste Lot 3  | GROUPEMA               | 930205805      | 25                | 1/30/2003           | Imerimandroso          | 0+000        | 13+500     | 13.50          | 68904134         | 10601               |
| Piste Lot 4  | EGECA                  | 751390696      | 75                | 11/15/2002          | Antanandava            | 0+000        | 11+400     | 11.40          | 65911465         | 10140               |
| Piste Lot 5  | TOLOTSOA               | 510705431      | 35                | 12/30/2002          | Imerimandroso          | 0+000        | 6+210      | 6.21           | 82239200         | 12652               |
| Piste Lot 6  | EGECORAM               | 916258991      | 25                | 12/20/2002          | Imerimandroso          | 0+000        | 13+820     | 13.82          | 66299493         | 10200               |
|  |                        |                |                   |                     |                        |              | sub total: | 140.00         | AVG:             | 10387               |
| Total  |                        | 19045957362    |                   |                     |                        |              |            | 232.00         |                  |                     |
| * EDC : Estimated date of completion   |                        |                |                   |                     |                        |              |            |                |                  |                     |
| ** Contractually based   |                        |                |                   |                     |                        |              |            |                |                  |                     |
| *** Based on an exchange rate of 6500 MgF for 1 US\$                         |                        |                |                   |                     |                        |              |            |                |                  |                     |
| EDC based on past/estimated production                                       |                        |                |                   |                     |                        |              |            |                |                  |                     |
| Road   | Significant activities | unit           | Quantities *      | Production/day      | DAYS                   | EDC          |            |                |                  |                     |
| RNT 14 lot 1   | Concret 150/350        | m3             | 3.5               | 2.5                 | 1                      | 11/1/2002    |            |                |                  |                     |
|  | Concret slabs          | m2             | 242               | 75                  | 3                      | 11/1/2002    |            |                |                  |                     |
|  | Steel bars             | kg             | 333               | 75                  | 4                      | 11/4/2002    |            |                |                  |                     |
|  | Line ditches           | m              | 400               | 50                  | 8                      | 11/1/2002    |            |                |                  |                     |
|  | Lite grading           | m              | 400               | 200                 | 2                      | 11/1/2002    |            |                |                  |                     |
|  | Subbase                | m3             | 350               | 120                 | 3                      | 11/1/2002    |            |                |                  |                     |
|  | Surfacing 40-70        | m2             | 1800              | 250                 | 7                      | 11/1/2002    |            |                |                  |                     |
|  | Local surfacing        | m2             | 7500              | 200                 | 38                     | 11/30/2002   |            |                |                  |                     |
|  | Cleaning               | m3             | 40                | 7                   | 6                      | 11/1/2002    |            |                |                  |                     |
|  | Masonry                | m3             | 65                | 5                   | 13                     | 11/1/2002    |            |                |                  |                     |
|  | Guardrail (steel)      | m              | 10                | 10                  | 1                      | 11/1/2002    |            |                |                  |                     |
|  | Painting (steel)       | m2             | 65                | 30                  | 2                      | 11/1/2002    |            |                |                  |                     |
|  | Turfing                | m2             | 9806              | 400                 | 25                     | 11/10/2002   |            |                |                  |                     |
|  | Ditch protection       | m              | 500               | 100                 | 5                      | 11/1/2002    |            |                |                  |                     |
| Vetiver  | m                      | 600            | 100               | 6                   | 11/1/2002              |              |            |                |                  |                     |
|  |                        |                |                   |                     | max                    | 11/30/2002   |            |                |                  |                     |
| Other activities following completion (borrow pit rehab., demob., etc.)      |                        |                |                   |                     | 15                     | 12/15/2002   |            |                |                  |                     |
| Road   | Significant activities | unit           | Quantities *      | Production/day      | DAYS                   | EDC          |            |                |                  |                     |
| RNT 14 lot 2   | Concret 150/350        | m3             | 3.08              | 2.5                 | 1                      | 11/1/2002    |            |                |                  |                     |
|  | Concret slabs          | m2             | 34.05             | 75                  | 0.5                    | 11/1/2002    |            |                |                  |                     |
|  | Steel bars             | kg             | 249               | 75                  | 3                      | 11/1/2002    |            |                |                  |                     |
|  | Line ditches           | m              | 21                | 50                  | 0                      | 11/1/2002    |            |                |                  |                     |
|  | Lite grading           | m              | 1120              | 200                 | 6                      | 11/1/2002    |            |                |                  |                     |
|  | Eartworks              | m3             | 796               | 100                 | 8                      | 11/1/2002    |            |                |                  |                     |
|  | Sbase and base         | m3             | 1533              | 120                 | 13                     | 11/1/2002    |            |                |                  |                     |
|  | Surfacing 40-70        | m2             | 5341              | 250                 | 21                     | 11/6/2002    |            |                |                  |                     |
|  | Local surfacing        | m2             | 2391              | 200                 | 12                     | 11/1/2002    |            |                |                  |                     |
|  | Cleaning               | m3             | 160.75            | 7                   | 23                     | 11/8/2002    |            |                |                  |                     |
|  | Masonry                | m3             | 23                | 5                   | 5                      | 11/1/2002    |            |                |                  |                     |
|  | Gabions                | m3             | 51                | 3                   | 17                     | 11/2/2002    |            |                |                  |                     |
|  | Drainage ditch         | m              | 125               | 10                  | 13                     | 11/1/2002    |            |                |                  |                     |
|  | Ditch maintenance      | m              | 2452              | 150                 | 16                     | 11/2/2002    |            |                |                  |                     |
| Turfing  | m2                     | 2140           | 150               | 14                  | 11/30/2002             |              |            |                |                  |                     |
| Ditch protection   | m                      | 1532           | 100               | 15                  | 11/1/2002              |              |            |                |                  |                     |
| Vetiver  | m                      | 325            | 100               | 3                   | 11/1/2002              |              |            |                |                  |                     |
|  |                        |                |                   |                     | max                    | 11/30/2002   |            |                |                  |                     |
| Other activities following completion (borrow pit rehab., demob., etc.)      |                        |                |                   |                     | 15                     | 12/15/2002   |            |                |                  |                     |
| Road   | Significant activities | unit           | Quantities *      | Production/day      | DAYS                   | EDC          |            |                |                  |                     |
| Tertiary road Lot 1 Imerimandroso  | Concret 150/350        | m3             | 38.61             | 2.5                 | 15                     | 11/1/2002    |            |                |                  |                     |
|  | Concret slabs          | m2             | 38.92             | 75                  | 0.5                    | 11/1/2002    |            |                |                  |                     |
|  | Steel bars             | kg             | 1874              | 75                  | 25                     | 11/21/2002   |            |                |                  |                     |
|  | Line ditches           | m              | 225               | 50                  | 5                      | 11/1/2002    |            |                |                  |                     |
|  | Lite grading           | m              | 1265              | 200                 | 6                      | 11/1/2002    |            |                |                  |                     |
|  | Eartworks              | m3             | 2134              | 100                 | 21                     | 11/16/2002   |            |                |                  |                     |
|  | Sbase and base         | m3             | 1079              | 120                 | 9                      | 11/1/2002    |            |                |                  |                     |
|  | Surfacing 40-70        | m2             | 2542              | 250                 | 10                     | 11/1/2002    |            |                |                  |                     |
|  | Local surfacing        | m2             | 0                 | 200                 | 0                      | 11/1/2002    |            |                |                  |                     |
|  | Culverts               | unit           | 6                 | 0.5                 | 12                     | 11/1/2002    |            |                |                  |                     |
|  | Masonry                | m3             | 5                 | 5                   | 0                      | 11/1/2002    |            |                |                  |                     |
|  | Gabions                | m3             | 10                | 3                   | 3                      | 11/1/2002    |            |                |                  |                     |
|  | Drainage ditch         | m              | 10                | 10                  | 0                      | 11/1/2002    |            |                |                  |                     |
|  | Ditch maintenance      | m              | 150               | 150                 | 0                      | 11/1/2002    |            |                |                  |                     |
| Turfing  | m2                     | 1206           | 150               | 8                   | 11/1/2002              |              |            |                |                  |                     |

|               | Ditch protection  |  | m    | 20           | 100            | 0    |     | 11/1/2002  |            |  |
|---------------|---|--|------|--------------|----------------|------|-----|------------|------------|--|
|               | Vetiver   |  | m    | 1004         | 100            | 10   |     | 11/1/2002  |            |  |
|               |   |  |      |              |                |      | max | 11/21/2002 |            |  |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |  |      |              |                | 15   |     |            | 12/6/2002  |  |
| Road          | Significant activities  |  | unit | Quantities * | Production/day | DAYS |     | EDC        |            |  |
| Tertiary road | Concret 150/350   |  | m3   | 39.53        | 2.5            | 16   |     | 11/5/2002  |            |  |
| Lot 2         | Concret slabs   |  | m2   | 0            | 75             | 0.0  |     | 11/1/2002  |            |  |
| Imerimandroso | Steel bars  |  | kg   | 2464         | 200            | 12   |     | 11/1/2002  |            |  |
|               | Line ditches  |  | m    | 195          | 50             | 4    |     | 11/1/2002  |            |  |
|               | Lite grading  |  | m    | 6290         | 200            | 31   |     | 12/1/2002  |            |  |
|               | Eartworks   |  | m3   | 2189         | 100            | 22   |     | 11/15/2002 |            |  |
|               | Sbase and base  |  | m3   | 301          | 120            | 3    |     | 11/18/2002 | +          |  |
|               | Surfacing 40-70   |  | m2   | 1260         | 250            | 5    |     | 11/1/2002  | +          |  |
|               | Local surfacing   |  | m2   | 0            | 200            | 0    |     |            |            |  |
|               | Cleaning  |  | m3   |              | 7              | 0    |     |            |            |  |
|               | Masonry   |  | m3   |              | 5              | 0    |     |            |            |  |
|               | Gabions   |  | m3   | 39           | 3              | 13   |     | 11/4/2002  |            |  |
|               | Drainage ditch  |  | m    |              | 10             | 0    |     |            |            |  |
|               | Ditch maintenance   |  | m    |              | 150            | 0    |     |            |            |  |
|               | Turfing   |  | m2   | 1120         | 150            | 7    |     | 11/1/2002  |            |  |
|               | Ditch protection  |  | m    |              | 100            | 0    |     |            |            |  |
|               | Vetiver   |  | m    | 78           | 100            | 1    |     |            |            |  |
|               |   |  |      |              |                |      | max | 12/1/2002  |            |  |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |  |      |              |                | 15   |     |            | 12/16/2002 |  |
| Road          | Significant activities  |  | unit | Quantities * | Production/day | DAYS |     | EDC        |            |  |
| Tertiary road | Concret 150/350   |  | m3   | 61.48        | 2.5            | 25   |     | 11/25/2002 |            |  |
| Lot 3         | Concret slabs   |  | m2   | 0            | 75             | 0.0  |     |            |            |  |
| Imerimandroso | Steel bars  |  | kg   | 4501         | 150            | 30   |     | 12/1/2002  |            |  |
|               | Line ditches  |  | m    | 480          | 50             | 10   |     |            |            |  |
|               | Lite grading  |  | m    | 8738         | 200            | 44   |     | 12/30/2002 |            |  |
|               | Eartworks   |  | m3   | 2483         | 100            | 25   |     | 11/25/2002 |            |  |
|               | Sbase and base  |  | m3   | 377.5        | 120            | 3    |     |            |            |  |
|               | Surfacing 40-70   |  | m2   | 3325         | 250            | 13   |     | 12/15/2002 |            |  |
|               | Local surfacing   |  | m2   | 0            | 200            | 0    |     |            |            |  |
|               | Cleaning  |  | m3   |              | 7              | 0    |     |            |            |  |
|               | Masonry   |  | m3   |              | 5              | 0    |     |            |            |  |
|               | Gabions   |  | m3   | 18           | 3              | 6    |     |            |            |  |
|               | Drainage ditch  |  | m    |              | 10             | 0    |     |            |            |  |
|               | Ditch maintenance   |  | m    |              | 150            | 0    |     |            |            |  |
|               | Turfing   |  | m2   | 1731         | 150            | 12   |     |            |            |  |
|               | Ditch protection  |  | m    |              | 100            | 0    |     |            |            |  |
|               | Vetiver   |  | m    | 102          | 100            | 1    |     |            |            |  |
|               |   |  |      |              |                |      | max | 12/30/2002 |            |  |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |  |      |              |                | 30   |     |            | 1/29/2003  |  |
| Road          | Significant activities  |  | unit | Quantities * | Production/day | DAYS |     | EDC        |            |  |
| Tertiary road | Concret 150/350   |  | m3   |              | 2.5            | 0    |     | 11/1/2002  |            |  |
| Lot 4         | Concret slabs   |  | m2   |              | 75             | 0.0  |     |            |            |  |
| Antanandava   | Steel bars  |  | kg   |              | 75             | 0    |     |            |            |  |
|               | Line ditches  |  | m    |              | 50             | 0    |     |            |            |  |
|               | Lite grading  |  | m    |              | 200            | 0    |     |            |            |  |
|               | Eartworks   |  | m3   |              | 100            | 0    |     |            |            |  |
|               | Sbase and base  |  | m3   |              | 120            | 0    |     |            |            |  |
|               | Surfacing 40-70   |  | m2   |              | 250            | 0    |     |            |            |  |
|               | Local surfacing   |  | m2   |              | 200            | 0    |     |            |            |  |
|               | Cleaning  |  | m3   |              | 7              | 0    |     |            |            |  |
|               | Masonry   |  | m3   |              | 5              | 0    |     |            |            |  |
|               | Gabions   |  | m3   |              | 3              | 0    |     |            |            |  |
|               | Drainage ditch  |  | m    |              | 10             | 0    |     |            |            |  |
|               | Ditch maintenance   |  | m    |              | 150            | 0    |     |            |            |  |
|               | Turfing   |  | m2   |              | 150            | 0    |     |            |            |  |
|               | Ditch protection  |  | m    |              | 100            | 0    |     |            |            |  |
|               | Vetiver   |  | m    |              | 100            | 0    |     |            |            |  |
|               |   |  |      |              |                |      | max | 11/1/2002  |            |  |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |  |      |              |                | 15   |     |            | 11/15/2002 |  |
| Road          | Significant activities  |  | unit | Quantities * | Production/day | DAYS |     | ETC        |            |  |
| Tertiary road | Concret 150/350   |  | m3   |              | 2.5            | 0    |     | 11/1/2002  |            |  |
| Lot 5         | Concret slabs   |  | m2   |              | 75             | 0.0  |     |            |            |  |
| Imerimandroso | Steel bars  |  | kg   |              | 75             | 0    |     |            |            |  |
|               | Line ditches  |  | m    |              | 50             | 0    |     |            |            |  |
|               | Lite grading  |  | m    |              | 200            | 0    |     |            |            |  |
|               | Eartworks   |  | m3   |              | 100            | 0    |     |            |            |  |
|               | Sbase and base  |  | m3   |              | 120            | 0    |     |            |            |  |
|               | Surfacing 40-70   |  | m2   |              | 250            | 0    |     |            |            |  |
|               | Local surfacing   |  | m2   |              | 200            | 0    |     |            |            |  |
|               | Cleaning  |  | m3   |              | 7              | 0    |     |            |            |  |
|               | Masonry   |  | m3   |              | 5              | 0    |     |            |            |  |
|               | Gabions   |  | m3   |              | 3              | 0    |     |            |            |  |
|               | Drainage ditch  |  | m    |              | 10             | 0    |     |            |            |  |
|               | Ditch maintenance   |  | m    |              | 150            | 0    |     |            |            |  |
|               | Turfing   |  | m2   |              | 150            | 0    |     |            |            |  |
|               | Ditch protection  |  | m    |              | 100            | 0    |     |            |            |  |
|               | Vetiver   |  | m    |              | 100            | 0    |     |            |            |  |
|               |   |  |      |              |                |      | max | 11/1/2002  |            |  |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |  |      |              |                | 15   |     |            | 12/30/2002 |  |

| Road          | Significant activities  | unit | Quantities * | Production/day | DAYS | ETC           |            |
|---------------|---|------|--------------|----------------|------|---------------|------------|
| Tertiary road | Concret 150/350   | m3   |              | 2.5            | 0    | 11/1/2002     |            |
| Lot 6         | Concret slabs   | m2   |              | 75             | 0.0  |               |            |
| Imerimandroso | Steel bars  | kg   |              | 75             | 0    |               |            |
|               | Line ditches  | m    |              | 50             | 0    |               |            |
|               | Lite grading  | m    |              | 200            | 0    |               |            |
|               | Eartworks   | m3   |              | 100            | 0    |               |            |
|               | Sbase and base  | m3   |              | 120            | 0    |               |            |
|               | Surfacing 40-70   | m2   |              | 250            | 0    |               |            |
|               | Local surfacing   | m2   |              | 200            | 0    |               |            |
|               | Cleaning  | m3   |              | 7              | 0    |               |            |
|               | Masonry   | m3   |              | 5              | 0    |               |            |
|               | Gabions   | m3   |              | 3              | 0    |               |            |
|               | Drainage ditch  | m    |              | 10             | 0    |               |            |
|               | Ditch maintenance   | m    |              | 150            | 0    |               |            |
|               | Turfing   | m2   |              | 150            | 0    |               |            |
|               | Ditch protection  | m    |              | 100            | 0    |               |            |
|               | Vetiver   | m    |              | 100            | 0    |               |            |
|               |   |      |              |                |      | max 11/1/2002 |            |
|               | Other activities following completion (borrow pit rehab., demob., etc.) |      |              |                | 15   |               | 12/20/2002 |

## Synthèse des spécifications techniques de terrassement et de chaussée

| MATÉRIAUX  | ESSAIS\EXIGENCES        | RÉSULTATS            | FRÉQUENCE  | NOTE  |
|--|-------------------------|----------------------|--|---|
| <b>TERASSEMENT</b>                                     |                         |                      |  |   |
| REMBLAIS   | Limites Atterberg       | IP<25, WL<65         |  | Fréquences non spécifiée au contrat                           |
|  | Granularité             | 100% passant 15 cm   | 1/ XXX M3  | Homogénéité qualifiée de quel manière?                        |
|  | Densité PM              | Ypm>1,60             |  |   |
|  | CBR                     | gonflement <2%       | 1/500 m de piste   | Étude géotechnique et définition et étude des zones sensibles |
|  | CBR                     | >10 à 4 jours        | Identification des zones sensibles                                       |   |
|  | M/O                     | 0%                   |  |   |
| COUCHE ANTI-CAPILLAIRE                                 | Limites Atterberg       | IP                   |  | Pourquoi un essai de plasticité sur un sable?                 |
|  | Granularité             | 100% passant 15 cm   | 1/ 200 M3  |   |
|  | ES                      | ES > 85              |  |   |
|  | PERMÉABILITÉ            | Kh 5X10e4            |  | Unité cm/sec ?  |
|  | M/O                     | 0%                   |  |   |
|  | ÉPAISSEUR               | 15 cm                |  |   |
| COUCHE ANTI-CONTAMINANTE                               | Limites Atterberg       | IP< 6                |  | Pourquoi un essai de plasticité sur un sable?                 |
|  | Granularité             | CLASSE 0/5 CONCASSÉE | 1/ ??? M3  | Fréquence non spécifiée au contrat                            |
|  | ES                      | ES > 40              |  |   |
|  | M/O                     | 0%                   |  |   |
|  | Courbe granulo          | D15 < 5*d.85         |  | Coquille  |
|  | ÉPAISSEUR               | 15 cm                |  |   |
| <b>CHAUSSÉE</b>  |                         |                      |  |   |
| MATÉRIAUX SÉLECTIONNÉS                                 | Granularité             | 10% < 80 µm < 35%    |  | Précaution pour éviter la ségrégation                         |
|  | Granularité             | 100 % passant 65 mm  | 1/ 500 M3  |   |
|  | CBR                     | >25                  | ou environ 2500m2  | CBR >20 pour les matériaux en place                           |
|  | M/O                     | 0%                   | min. 2/gisements   |   |
|  | Limite Atterberg        | 10 à 15              |  |   |
|  | ÉPAISSEUR               | 15 cm                |  |   |
|  | Proctor modifié         |                      |  |   |
| CAILLASSES   | Micro-Deval et LA       | <35 (fraction 10/14) | 2/gisement de roche  | Cloutage (calibre 40/70) Macadam (calibre 20\70)              |
|  | Limite Atterberg        | 5 < IP < 15          | 1/500m3 de matrice   |   |
|  | Granulométrie           |                      | 1/100m3 de pierre conc.  |   |
| PAVÉS BOUTISSES  | Compression             | 20 Mpa               | ???  | Pas énorme... atteint facilement 40-60 Mpa                    |
|  | Résistance à l'usure    |                      |  | Méthode (CPP autres) non requis pour ignées intrusives        |
| Sable jointement et de pose                            | ES                      | 60-80                | ???  |   |
|  | Module finesse          | 2,2 à 2,8            |  |   |
|  | Granulométrie           | <5 mm                |  |   |
| Sable de riviere                                       |                         |                      |  |   |
| <b>Géométrie</b>                                       |                         |                      |  |   |
| Drainage   | Exutoire au 20 à 50 m.  | Selon pente          |  |   |
| Compacité  | Infrastructure-remblais | 90% PM par 25 cm     | 95% PM dernier 30cm  | Teneur en eau au 4 heures et une Pvsec au 50 m3               |
|  | Fondation - Plate-forme | 95 % du PM sur 30 cm | Compacteur 15 tonnes à pneus 1/50 m tolérance devers 1% et 3 cm/3 metres |   |
|  | Accotement              | 95% PM               |  |   |
| Pentes   | Talus dépôts            | 3H/2V                |  |   |
| Réception de la chaussée par secteur de 500 à 1000 m   |                         |                      |  |   |
| Clayonnage des talus de plus de 3 metres               |                         |                      |  |   |
| Fascine a niveau                                       |                         |                      |  |   |
| Reprofilage lourd equivaut à max 100 m3 par hectomètre |                         |                      |  |   |
| Transition longitudinale de 20 mètres pour la largeur  |                         |                      |  |   |

# Projets AUP Ambatondrazaka - Imerimandroso

Project Start Date: Mon 8/26/02

Project Finish Date: Mon 7/26/04

## Who Does What

| Resources and Assignments                                | Start        | Finish       | Work  |
|--|--------------|--------------|-------|
| Unassigned   | Mon 8/26/02  | Mon 7/26/04  | 0 hrs |
| <i>Volet Institutionnel</i>                              | Mon 8/26/02  | Fri 8/30/02  | 0 hrs |
| <i>Tombotsoa - 3 Imerimandroso (lot 1)</i>               | Tue 8/27/02  | Thu 10/3/02  | 0 hrs |
| <i>Avotra-1 Antanandava (lot 1)</i>                      | Tue 8/27/02  | Thu 9/26/02  | 0 hrs |
| <i>Teza - Antanandava (lot 1 et 6)</i>                   | Tue 8/27/02  | Thu 10/3/02  | 0 hrs |
| <i>Soangony - Antanandava (lot 1)</i>                    | Mon 8/26/02  | Wed 10/9/02  | 0 hrs |
| <i>Loharanontsoa - Imerimandroso (lot 2 et 5)</i>        | Mon 8/26/02  | Thu 9/19/02  | 0 hrs |
| <i>Tombotsoa-1 - Amparihitsokatra (lot 3)</i>            | Tue 8/27/02  | Thu 10/3/02  | 0 hrs |
| <i>Tombotsoa-2 - Amparihitsokatra (lot 3)</i>            | Tue 8/27/02  | Sun 10/6/02  | 0 hrs |
| <i>Fandrosoana - Amparihitsokatra (lot 3)</i>            | Tue 8/27/02  | Tue 10/8/02  | 0 hrs |
| <i>Betsianjava miray - Amparihitsokatra (lot 3 et 5)</i> | Tue 8/27/02  | Thu 10/10/02 | 0 hrs |
| <i>Soanavel - Imerimandroso (lot 3)</i>                  | Tue 8/27/02  | Tue 10/8/02  | 0 hrs |
| <i>Mirindra - Ilafy (lot 4)</i>                          | Mon 8/26/02  | Wed 9/11/02  | 0 hrs |
| <i>Mahasoa - Ilafy (lot 4)</i>                           | Mon 8/26/02  | Wed 9/18/02  | 0 hrs |
| <i>Miaradia - Ilafy (lot 4)</i>                          | Mon 8/26/02  | Thu 9/26/02  | 0 hrs |
| <i>Ezaka-2 - Ilafy (lot 4)</i>                           | Mon 8/26/02  | Fri 10/4/02  | 0 hrs |
| <i>Avotra-2 - Ilafy (lot 4)</i>                          | Mon 8/26/02  | Wed 10/9/02  | 0 hrs |
| <i>Ezaka-1 - Andomba (lot 6)</i>                         | Mon 8/26/02  | Mon 9/9/02   | 0 hrs |
| <i>Vonona - Andomba (lot 6)</i>                          | Mon 8/26/02  | Wed 9/11/02  | 0 hrs |
| <i>Ahitantsoa - Andomba (lot 6)</i>                      | Mon 8/26/02  | Wed 9/18/02  | 0 hrs |
| <i>Soafianatra - Andomba (lot 1 et 6)</i>                | Mon 8/26/02  | Wed 9/25/02  | 0 hrs |
| <i>Officialisation Préfecture</i>                        | Fri 10/11/02 | Thu 10/17/02 | 0 hrs |
| <i>Organisation de la formation</i>                      | Fri 10/18/02 | Thu 10/24/02 | 0 hrs |
| <i>Amparihitsokatra</i>                                  | Fri 10/25/02 | Tue 10/29/02 | 0 hrs |
| <i>Andromba</i>  | Wed 10/30/02 | Fri 11/1/02  | 0 hrs |
| <i>Antanandava</i>                                       | Mon 11/4/02  | Wed 11/6/02  | 0 hrs |
| <i>Ilafy</i>   | Thu 11/7/02  | Mon 11/11/02 | 0 hrs |
| <i>Imerimandroso</i>                                     | Tue 11/12/02 | Thu 11/14/02 | 0 hrs |
| <i>Formation technique des cantoniers</i>                | Fri 10/25/02 | Thu 11/14/02 | 0 hrs |
| <i>Création Union des AUPs</i>                           | Fri 11/15/02 | Thu 11/21/02 | 0 hrs |

|   |              |              |       |
|---|--------------|--------------|-------|
| <i>Sélection de gardes de barrière</i>                      | Wed 11/27/02 | Tue 12/3/02  | 0 hrs |
| <i>Formation de gardes de barrière</i>                      | Wed 12/4/02  | Fri 12/6/02  | 0 hrs |
| <i>Implantation du péage</i>                                | Tue 12/17/02 | Wed 12/18/02 | 0 hrs |
| <i>Lot 1</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 2</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 3</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 4</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 5</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 6</i>  | Mon 8/26/02  | Mon 8/26/02  | 0 hrs |
| <i>Lot 1</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 2</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 3</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 4</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 5</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 6</i>  | Tue 8/27/02  | Mon 12/16/02 | 0 hrs |
| <i>Lot 1</i>  | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Lot-2</i>  | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Lot -3</i>   | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Lot 4</i>  | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Lot 5</i>  | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Lot 6</i>  | Tue 12/17/02 | Mon 11/17/03 | 0 hrs |
| <i>Accompagnement (budgetisation et priorisation)</i>       | Thu 12/19/02 | Wed 11/19/03 | 0 hrs |
| <i>Officialisation des transferts d'entretien Ent.- AUP</i> | Tue 11/18/03 | Mon 11/24/03 | 0 hrs |
| <i>Lot 1 -</i>  | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Lot-2 -</i>  | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Lot -3</i>   | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Lot 4</i>  | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Lot 5</i>  | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Lot 6</i>  | Tue 11/18/03 | Mon 5/3/04   | 0 hrs |
| <i>Audit</i>  | Tue 5/4/04   | Mon 7/26/04  | 0 hrs |

**MISSION REPORT - October 2 to 20, 2002**

From: **Alain Dubé, P. Eng., M.Sc., consultant**

Reference: Contract PCE-I-00-99-00003-00, Task order 808

**Task Performed**

Departure from Montreal, Canada: Oct. 2, 2002

Arrival in Antananarivo, Madagascar: Oct. 3, 2002

Departure from Antananarivo, Madagascar: Oct. 17, 2002

Arrival in Montreal, Canada: Oct. 20, 2002

**Terms of References (Summary)**

- Review work progress and contractors capacity to complete work within contractual delays;
- Review quality of design and implementation of work;
- Evaluate the supervision capacity and quality of supervision provided by the local engineering staff;
- Evaluate implementation progress of AUP's and suggest
- Provide punctual training and suggestions to improve supervision capacity of local engineering staff.

- 2002-10-02 and 03**      **Travel from Quebec, Canada to Antananarivo, Madagascar.**  
Review contractual documents for RNT 14 – Lot 1 and 2  
Night at Colbert Hotel
- 2002-10-04**            Meeting with ReCap engineering staff at project Office and clarifications of TOR with CP  
Review contractual documents for RNT 14 – Lot 1 and 2  
Review 5 and 6 quarterly progress reports.  
Night at Colbert Hotel
- 2002-10-05**            Review 7 quarterly progress reports and 2001 annual report.  
Review geotechnical survey for RNT 14  
Night at Colbert Hotel
- 2002-10-06**            Travel Antananarivo to Fianarantsoa  
Night at Tsara Guest House
- 2002-10-07**            Site inspection of RNT 14 (lot 1, 2 and 3) Ifanadiana to Ikongo  
Meet with AUP, Ikongo  
Travel from Ikongo to Manampatrana, Night at Chez Claude
- 2002-10-08**            Visit RNT 14 with USAID evaluator's (lot 1, 2 and 3)  
Work discussions with Antoine and Ralph Jean  
Travel by train from Manampatrana to Manakara, Night at Partenais Hotel
- 2002-10-09**            Site inspection of RN 12 from Sahasinaka to Lokomby  
Meeting with Lokomby AUP's Union  
Travel from Manakara to Ambatondrazaka with MAF.  
Meet with Project Director (S. Cameron). Night at Max Hotel
- 2002-10-10**            Briefing at LDI-ReCap office – Imerimandroso-Ambatondrasaka region  
Site inspection of tertiary road lot 3(Groupema) and 5(Tolotsoa)  
Night at Max Hotel
- 2002-10-11**            Meeting with Aimé and Gilbert (training) at LDI-ReCap Office  
Site inspection of tertiary road lot 4(Egeca)  
Meeting with Jean-Claude at LDI-ReCap Office. Night at Max Hotel
- 2002-10-12**            Site inspection of tertiary road lot 2(ARR), 1(Tahina) and 6(Egecoram)  
Night at Max Hotel
- 2002-10-13**            Meeting with Jules about AUP implementation plan at LDI-ReCap office  
Work on draft report – Night at Max Hotel

## **MISSION REPORT - October 2 to 20, 2002**

From: **Alain Dubé, P. Eng., M.Sc., consultant**

Reference: Contract PCE-I-00-99-00003-00, Task order 808

- 2002-10-14**                    Travel from Ambatondrazaka to Antananarivo on Air Madagascar  
Meeting with Chief of Party (Ralph Jean)  
Prepare draft report – Night at Colbert Hotel
- 2002-10-15 and 16**        Finalize draft report and prepare aide-mémoire  
Debriefing with USAID – Night at Colbert Hotel
- 2002-10-17**                    Travel Antananarivo to La Réunion  
(two nights stop over at own expenses)
- 2002-10-19 and 20**        Travel La Réunion to Montreal, Canada

Final Report (French and English version) to be submitted by November 4, 2002-10-11