



Technical Assistance Consultant's Report

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Democratic Republic of Timor-Leste: Baucau to Viqueque Highway Project

DRBFC Training Program

Prepared by
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For Ministry of Planning and Finance, Development Partnership Management Unit; and
Directorate of Roads, Bridges and Flood Control

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Asian Development Bank



MINISTRY OF PUBLIC WORKS



TA-9502 TIM: BAUCAU TO VIQUEQUE HIGHWAY PROJECT

6 DRBFC TRAINING PROGRAM

Reference No. TIM 51115 - 001
Prepared for Asian Development Bank



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Preface

This document is prepared to guide the development of the road network in Timor Leste and achieve the key road sector objectives included in the Strategic Development Plan 2011-2030. It is the outcome of a technical assistance (TA) funded by the ADB to support the Government of Timor Leste in this effort. The TA was designed to develop the following:

- Output 1a: Integrated national road network strategy and plan.** Support will be provided to DRBFC to draft a comprehensive national road network strategy and plan that will encapsulate the following: (i) 20-year capital investments and operation and maintenance (O&M) strategy, (ii) organizational reform plan to implement the strategy; (iii) defined levels of service (LOS) expected from the national road network that will include communication mechanism to the public for feedback and performance measurement; (iv) asset management plan linked to an appropriate asset management system to support network prioritization and intervention thresholds; (v) an operational manual and training for planning, budgeting, procurement, supervision, and monitoring and evaluation, and (vi) operational plan targeting development of national road contracting and consulting industry, human resources and capacity development, and financing instruments to support private sector participation. Suitable policy instruments would be considered to integrate the draft strategy and plan in the wider context of Transport Sector Master Plan currently under review and endorsement by the Government.
- Output 1b: Concept design for a sustainable road maintenance program.** This output will build on road maintenance initiatives by donors including ADB, JICA, European Union and the Roads for Development program financed by the Government of Australia to deliver (i) a draft policy paper to introduce Road Maintenance Fund; and (ii) a design for donor-supported 10-year road maintenance and operation program. An initial concept proposal for the program has been shared with the government and development partners, and broad support has been received (see attachment 1). An extensive stakeholders' consultations and high-level policy dialogue will need to take place to draft the policy paper and the program suitable for donors' technical and financial support.

This document provides an executive summary of the output of this work. It presents the key recommendations for the sustainable development and maintenance of the road network and it will hopefully serve as a reference and guideline in formulating the Government of Timor Leste's future road sector strategies and plans. The list of reports summarized here in order are:

OUTPUT	DELIVERABLE
1	Road Subsector Assessment
2	Road Investment and Maintenance Strategy
3	Maintenance Program 2020-2030
4	Road Maintenance Fund Policy Paper
5	Organizational Reform Plan
6	DRBFC Training Program
7	DRBFC Manuals for Operations
8	Road Asset Management Plan
9	Levels of Service
10	Operational Plan for National Industry

The TA's conclusions and recommendations are based on the professional judgement and views of the TA consultants derived through a series of seminars, workshops, and consultations with various government agencies and offices, under the overall guidance received from the Ministry of Public Works, the Ministry of Finance and the Asian Development Bank.

The team is grateful for the support and information provided to it by the various units within the DRBFC and other government ministries.

Executive Summary

1. This assignment is undertaken as part of the ADB Technical Assistance project TA-9502 TIM Baucau to Viqueque Highway Project. Fieldwork for the study was undertaken during August and September 2019.

Scope and Objective

2. The objective of this assignment was to undertake a gap analysis of the skills and competencies required to effectively perform the job responsibilities of DRBFC's Chiefs of Departments, and Heads of Sections within the Departments, and to and prepare a training schedule over the next three years to fulfil the training needs.

3. The gap analysis was based on self-assessments by the staff members, in consultation with ADB Team members, with some input from immediate managers. An indicative cash flow for the Training Program was developed based on prices obtained from a local private training provider on a non-obligatory basis.

Methodology

4. The methodology adopted consisted of:

- Identifying Job responsibilities for Department Chiefs and Section Heads, through documentation available within the individual departments, or with the Training & Cooperation Department's Training Identification Section. The job responsibilities for each staff member were limited to six for ease of management;
- Skills needed to perform the job responsibilities for each of the staff were determined in discussion with the staff member, and where necessary in consultation with the Chief of the Department. The skill levels were categorised in three levels: Low, Medium, and High. Staff from the Training & Cooperation Department's Training Identification Section assisted the TA Team in these assessments;
- Training courses required to fill the skill gaps were decided by the TA Team in consultation with staff and Department Chiefs. Twenty-one training courses were identified, with a majority of them technical, with some non-technical or intermediate;
- Training courses for individual staff members were scheduled based on the urgency of the need, while creating groups of no more than 15 persons per training session. Cross-departmental grouping to teams that are likely to work on the same subject was also given consideration. For instance, Pavement Design and Construction training to a team from the Projects Department, the Construction Department, and the National Laboratory;
- Collating the individual training schedules to form the DRBFC Training Program was undertaken with consideration to minimising disruptions to routine DRBFC operations; minimising the cost by optimising the participant numbers per training session; and levelling training resource requirements;
- A tentative cash flow and budget for the Training Program was developed based on prices obtained from a local private training provider on a non-obligatory basis.

Way Forward

5. The proposed DRBFC Training Program is provided in Appendix A of this report. The total cost of the program is estimated to be just under \$250,000. The advantages of implementing this training program are improved effectiveness and efficiency of the workforce in delivering quality products and services, and improved job satisfaction leading to higher staff retention and lower staff turnover, thereby reducing workflow disruptions.

6. In order to obtain the maximum effect from the Training Program, consideration should be given to providing ongoing on-the-job training for a sufficient period after completion of formal training, together with periodic performance reviews. Part of this ongoing training could use actual projects (pilot projects) to provide hands on training in technical skills.

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1 Introduction

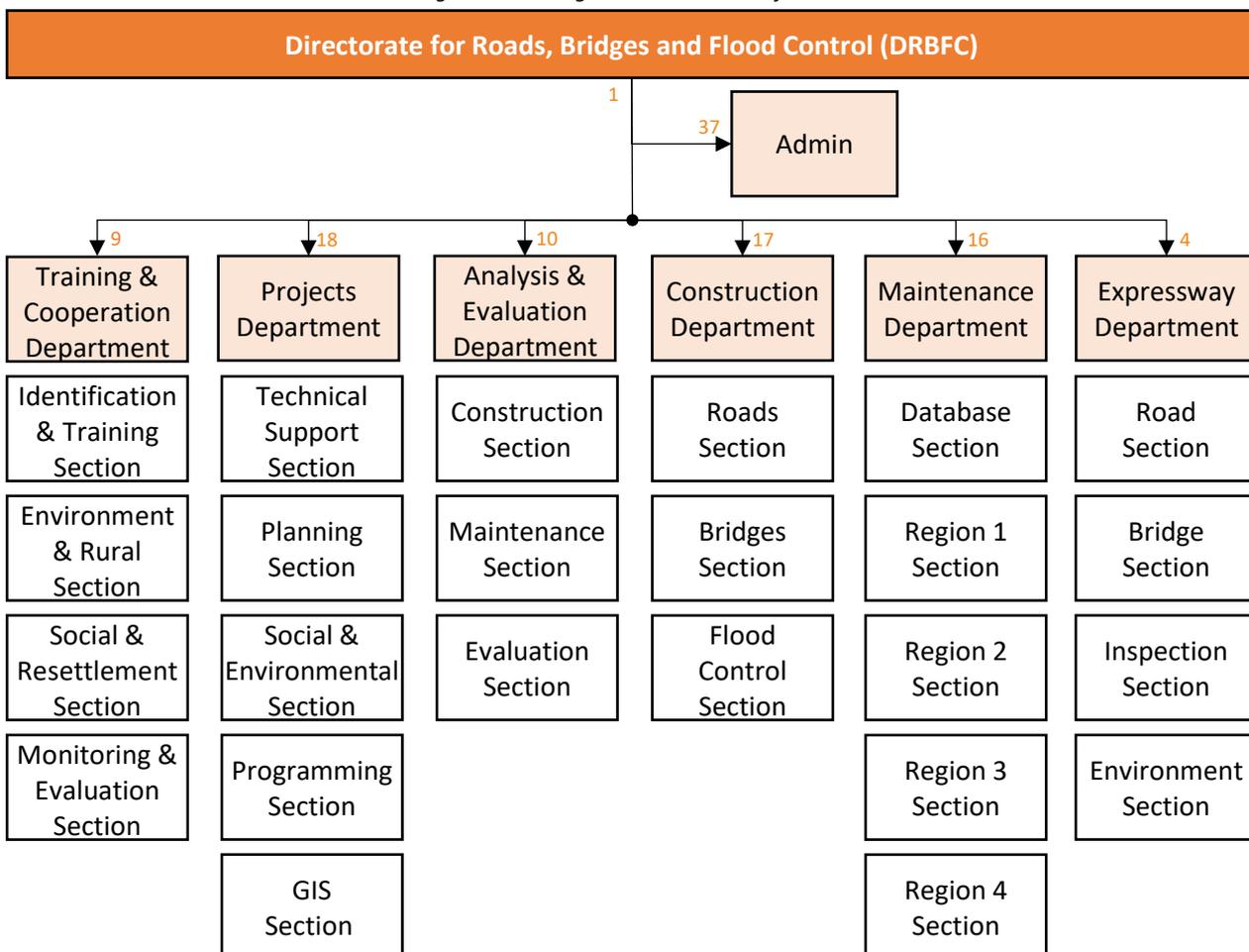
7. The scope and objectives of this document are listed below:

- Undertake a gap analysis of the skills and competencies required to effectively perform the job responsibilities of DRBFC’s Heads of Departments, and Heads of Sections within the Departments;
- Determine the training needs for each of the staff (Section Heads and above) and prepare a training schedule to be undertaken over the next three (3) years, including initial training and on-the-job follow up;
- Collate the individual training schedules to form a master training program for the DRBFC over the next three years, from 2020 to 2022;
- Based on the prices obtained from a private sector training company in Timor Leste, on a no obligations basis, prepare the preliminary cash flow to implement the three-year training program.

8. Staff below the Section Heads level were excluded, mainly to keep the training program to a manageable level. Staff below Section Head level may be included as the training program gets underway, after obtaining better clarity regarding their job descriptions. Staff in the Admin Unit were also excluded, as the training program is focussed on the staff who deliver the services to the public and engage with stakeholders such as contractors.

9. The current organisation structure of the DRBFC, and the activities undertaken by each of the Departments is presented in Figure 1. Deliverable 3 under this assignment, Organisational Reform Plan, proposes a new organisation structure, geared towards outsourcing non-core activities, with DRBFC taking on more of a client management role. The training courses nominated in this proposed program takes into account the possibility of this transition.

Figure 1 Organization structure for DRBFC



2 Methodology

10. The following methodology was adopted in the gap analysis of the skills and competencies of DRBFC staff:

2.1 Identifying Job Responsibilities

11. The job responsibilities of the Department Chiefs and Section Heads were obtained by the following methods and were consolidated into six key responsibilities for ease of management.

- From the Job Descriptions that were available in some Departments, either as a separate document (e.g. Projects Department), or as part of the Department's draft Operations Manual (e.g. Maintenance Department)
- Through the Training & Cooperation Department's Training Identification Section
- Through the interviews with individual staff and their managers

2.2 Determining the Skills Needed and Skill Levels Available

12. The skills needed to perform the job responsibilities for each of the staff, were determined in discussion with the staff members, and where necessary in consultation with the Chief of the Department.

13. The skill level of the staff members for each of the skills needed was based on a self-assessment by the staff members, with some input from the Chief of the Department. A broad categorisation of the skill levels to High, Medium, and Low was adopted for simplicity. This could be expanded to a more fine-grained assessment of say, a score between 1 and 10, as the training program matures.

14. Due to the large number of staff members that had to be assessed, 34 in total, assistance of the Training & Cooperation Department's Training Identification Section was obtained in conducting these skills assessments.

2.3 Format of Training Program

15. In order to obtain the maximum effectiveness from the training program to delivering DRBFC objectives, the following three-pronged approach is proposed:

- **Initial formal training course** in a workshop environment, with a maximum duration of 3 days. This needs to be conducted by a qualified trainer in the subject matter.
- **Ongoing informal 'on-the-job' training** for a period of about one year. The trainer in this instance could be a person with a sound working knowledge in the subject matter, and not necessarily the trainer who conducted the workshop. This could be the immediate manager of the staff member, or any of the international consultants working on the subject matter. The inputs of the trainer could be intermittent on an as required basis.
- **Annual performance assessments** on the usefulness and the effectiveness of the training in performing job responsibilities by the staff member. This needs to be conducted by the immediate manager of the staff member.

2.4 Formal Training Courses Required

16. The training courses required to fill the gaps in skills and competencies of staff members were decided by the TA Team, with some input from the Chiefs of Departments. The staff requests for training courses varied widely, and in some cases were not directly relevant to the job responsibilities. In such instances, the TA Team selected the most appropriate training course for the job responsibilities, with due regards to staff requests. Some examples are:

- Several staff members requested training in the project scheduling software Primavera, which is a high-end software capable of scheduling thousands of tasks. The TA Team determined that for the level of scheduling that DRBFC undertakes, involving a few hundred tasks at the most, MS Project will be a better alternative, as it is simpler to use and cheaper to buy.

- One staff member requested for training in topography. As the most relevant use of topography for DRBFC is determination of catchment areas for hydrological designs, a course in Hydrological and Hydraulic Design was included instead, which would be more beneficial in preparing design briefs for outsourcing and review of designs from external consultants.

17. None of the staff members interviewed requested for training in Work Health and Safety. However, this has been included as a mandatory training course for all staff, as the TA Team is of the view that this is a vital aspect that requires improvement within the DRBFC.

18. Twenty-one training courses are nominated to cater for the DRBFC staff requests. The following are the training courses nominated with a brief outline of each course.

Table 1 Proposed training courses for DRBFC management staff

Work Health and Safety
<ul style="list-style-type: none"> • Importance of safety, safe work environment, safe work methods, responsibilities of managers and individuals, ensuring safety in contract works.
Program Development and Management
<ul style="list-style-type: none"> • Program Development: Use of RAMS and detailed inspections, project selection criteria, project prioritisation, constraints with budgets, contractor & supervision resources. • Program Management: Tracking and reporting physical progress, expenditure, forecasts, against budget. Mitigating time and cost overruns. Concept of Earned Value.
Technical Report Writing
<ul style="list-style-type: none"> • Funding requests, progress reports, technical briefs, Terms of Reference. Key headings of reports. Writing style. Facts vs opinions. Use of tables, graphics, figures and photos to improve presentation.
Leadership and Team Management
<ul style="list-style-type: none"> • Leadership by example. Delegation of duties. Equitable workload distribution. Staff performance improvement and monitoring.
Hydrology and Hydraulic Design
<ul style="list-style-type: none"> • Topographical investigation. Catchment characteristics. Rainfall data. Return period. Design flood (Coefficient of runoff, Rational method). Design capacity of culverts and drains, size, geometry and alignment of culverts. Inlet and outlet protection. Climate resilience.
Road and Pavement Design
<ul style="list-style-type: none"> • Geometric design: horizontal and vertical curves, transitions and superelevation, design speeds and sight distances, intersection designs (urban and rural). • Pavement design: Design traffic, environmental factors, subgrade properties, pavement materials, design of structural thickness. Pavement rehabilitation, overlays and underlays. Holding treatments including spray sealing, thin overlays. Gravel Roads: Design principles; Material requirements. Lime and cement stabilization – advantages and limitations. Rigid (concrete) pavements. • Road safety devices including guard rails, guideposts, lines and markings.
Slope Protection Design
<ul style="list-style-type: none"> • Survey and investigation: topography, geotechnical, drainage, slope failure. Slope stability analysis: methods of analysis, factor of safety. Methods of slope protection: retaining walls, riveted wire mesh, rock bolting and shotcreting, vegetation. Types of retaining walls and design principles: masonry, gabion, reinforced concrete.
Road Condition Assessment
<ul style="list-style-type: none"> • Pavement distress types and their quantification: roughness, rutting, cracking, potholes, edge breaks, stripping, bleeding. Pavement rectification methods: Repair of potholes and edge breaks, crack sealing, spray sealing, overlays and underlays, rehabilitation, reconstruction. Surface and subsurface drainage: deteriorating effects on pavement and road formation, mitigating measures. Condition rating of guardrails, guideposts, signs, lines, markings.

Environmental and Social Safeguards Management

- Environmental Safeguards Overview: Environmental Screening; Environmental Licensing; Environmental Compliance. Review of Environmental Factors and developing mitigation measures. Environmental Management and Monitoring Plans. Ensuring contractor compliance to such Plans.
- Social Safeguards Provisions, Social Risk Mitigation Measures. Social Safeguards Compliance during Implementation. Resettlement Management.

Contract Supervision and Management

- Contract supervision: Quality Assurance and Quality Control contracts. Review of contractor's Quality, Safety and Environmental Management Plans and ensuring contractor compliance to their requirements.
- Contract Management: Management of scope, cost and time through progress review meetings, certification of progress payments, assessment and evaluation of contractors' claims for scope, cost, and time variations.
- Contract completion: Defects Liability management, final payment certification, contractor performance evaluation and reporting.

Project Management and Evaluation

- Project Management: Assessment of options and scope determination, survey and investigation, concept designs and community consultation, road safety considerations, detailed designs and tender documents, contract packaging, tendering and contract award. Monitoring and management of scope, quality, time, cost. Project completion reports.
- Project Evaluation: Expected Outputs and Outcomes, and level of achievement of those expectations. Lessons learnt and their dissemination for improvement of future projects.

Project Scheduling

- Principles of Gantt Charts: dependency relationships, floats, critical paths. Use of MS Project to create project schedules (Gantt charts), track progress, identify critical paths. Resource levelling. Use of critical path to assess contractor claims for time extensions.

Spreadsheets & Databases (MS Excel & MS Access)

- Determining whether to use Excel or Access (pros and cons).
- MS Excel: data entry, formulas and functions, formatting, alignment and text wrap, adjusting rows and columns, find and replace data, printing and sharing, charts and PivotTables, power functions such as IF and VLOOKUP, protecting worksheets and workbooks, sorting data, Goal Seek and Solver, macros.
- MS Access: Navigating Access, creating and modifying tables including importing from Excel, adding records including creation of forms for data entry, relational database with multiple tables, creating queries and reports.

Road Safety Management

- Hazard identification and risk assessment, mitigation measures and residual risks, road safety audits during design and construction, analysis of accident numbers and types on existing roads and developing mitigation measures.

English and Portuguese

- This training could be provided through accredited institutions on a part time basis (evening or weekend classes) to improve reading, writing, speaking and listening skills in English and Portuguese.

Cost Estimating

- Strategic, Concept, and Detailed cost estimates and when to use them. Cost estimates based on historical data - unit prices of either: activities, activity groups, or per km. Variation of unit prices with time, location, terrain, climatic conditions, and contractor availability. Use of Excel for cost estimating and cost tracking.

Risk Management
<ul style="list-style-type: none"> • Identification of internal and external risks to a project: technical, financial, social, political, resourcing. Assessment of the probability of identified risks eventuating. Consequences of the risks eventuating and the magnitude of their impact. Risk rating based on probability x consequence, and preparation of risk matrices. Identification of mitigation measures and residual risks after their implementation.
GIS Training
<ul style="list-style-type: none"> • Organise geographic data and other content for a mapping project. Display features on a GIS map and access information about them. Perform spatial analysis for queries. Share GIS maps and analysis results accessible through desktop, web, and mobile devices.
Training of Trainers
<ul style="list-style-type: none"> • Structuring sessions for effective learning. Delivering them with impact. Conducting post-course assessments. Integrating interactive activities for active participation of trainees. Creating strong learning environments.
Computer Aided Design & Drafting (CADD)
<ul style="list-style-type: none"> • Terminology, download, install and set up CAD software. Software interface. Help database and online support. Zooming and Panning. Choosing entities to draw with. Style sets. Cloning. Free drawing. Position location commands. Trim, extend, divide, delete, copy, shape drawing, dimensions.
Bridge Design and Rehabilitation
<ul style="list-style-type: none"> • Types of bridges, loadings, bridge design principles. Bridge rehabilitation including condition assessment of components, intervention levels, replacement of components including bearings, expansion joints.

2.5 Scheduling Formal Training Courses

19. The training courses for each staff member were scheduled on the following basis:

- The urgency of obtaining the training to perform the job responsibilities. This was based on the staff member's assessment, with input from the Chief of the Department.
- Grouping the staff members to specific training sessions, while limiting the maximum number of participants per training session to 15, in order to provide the optimum attention of the trainer to participants.
- Grouping cross departmental teams for applicable training sessions, so that the team can function effectively in delivering DRBFC services. For example, in providing training on Pavement Design and Construction, staff members who will be involved in that activity should be grouped onto the same training session. These include staff from: Projects Department (Planning Section and Technical Support Section); National Laboratory (Pavement testing group); Construction Department (Roads Section).

2.6 On-the-Job Training and Use of Pilot Projects

20. When providing on-the-job training on technical skills, consideration should be given to selecting pilot projects which can be used to provide hands on training to staff in the field. Some of the areas for such training would be: Work Health and Safety; Contract Quality Management, etc. Training provided through engagement in actual work is more effective and longer lasting.

2.7 Collating Individual Schedules for the Training Program

21. The training schedules for each of the staff members were collated to form the DRBFC Training Program, on a quarterly basis over a three-year period from 2020 to 2022. Following considerations were taken into account when collating the schedules:

- Minimising disruptions to routine DRBFC operations due to staff attending training courses.
- Minimising the cost of training by grouping the optimum number of participants to training sessions, aiming for an optimum number of 15 participants.

- Levelling the training resource requirements to avoid peaks or troughs. These included: training venues, trainers, and cash flow.

22. The Training Program after collating the individual staff training needs is in Appendix A.

2.8 Cash Flow Requirements

23. The current training resources in Timor Leste are not adequate to address the requirements of this Training Program. However, indicative prices for training courses available for trades people and plant operators were obtained from a private training provider, ISAT (<https://isat.tl/>) on a non obligatory basis, in order to provide a preliminary cost estimate and a cash flow for the Training Program. Based on these prices, following estimated costs per module were adopted:

- Technical training courses USD 2,500 per module.
- Semi Technical training courses USD 2,000 per module.
- Non-Technical training courses USD 1,500 per module.

24. The estimated cash flow for the Training Program is indicated in the table below.

Table 2 Estimated costs and cash flow for DRBFC Training Program

	2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Module #	1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Unit cost	\$1,500	\$2,500	\$2,500	\$2,500	\$1,500	\$1,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,000
Cashflow	\$51,000	\$15,000	\$25,000	\$10,000	\$4,500	\$13,500	\$22,500	\$15,000	\$17,500	\$37,500	\$17,500	\$6,000
Cumulative	\$51,000	\$66,000	\$91,000	\$101,000	\$105,500	\$119,000	\$141,500	\$156,500	\$174,000	\$211,500	\$229,000	\$235,000

3 Recommendations

25. It is recommended that the proposed Training Program be implemented for DRBFC Staff, firstly at the level of Section Heads and above, and later expanded to staff at levels below that, as the Program matures.

26. The key advantages of implementing the proposed Training Program are:

- Improving the effectiveness and efficiency of staff members in performing their job-related tasks, thereby improving the value for money to DRBFC from their employment.
- Improving the job satisfaction of staff members thereby increasing staff retention and reducing staff turnover.
- Reducing the need for new or additional staff, due to improved staff outputs, thereby reducing DRBFC's recurrent operational costs on staff salaries and associated costs. (i.e. A Lean and Mean Team).

Appendix A Proposed DRBFC Training

Table 3 Training Program for Training & Cooperation Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Mr. Nené Lobato Department Chief	4	Leadership & Team Management						1						
	7	Slope Protection Design							1					
	14	Road Safety Management								1				
	11	Project Management & Evaluation									1			
	1	Work Health & Safety	1											
Mr. Armino Andrade Identification & Training Section	19	Train the Trainer												1
	13	Spreadsheets & Databases (Excel & Access)										1		
	4	Leadership & Team Management						1						
	15	English & Portugese					1							
	1	Work Health & Safety	1											
Mr. Alfredo Escurial dos Santos Environment & Rural Section	4	Leadership & Team Management												
	11	Project Management & Evaluation									1			
	1	Work Health & Safety	1											
Ms. Inacia Quiteria L.I. Freitas Social & Resettlement Section	11	Project Management & Evaluation									1			
	15	English & Portugese					1							
	9	Environmental & Social Safeguards Management												
	1	Work Health & Safety	1											
Mr. Ângelo Ribeiro Monitoring & Evaluation Section	19	Train the Trainer												1
	4	Leadership & Team Management						1						
	3	Technical Report Writing			1									
	1	Work Health & Safety	1											

Table 4 Training Program for Projects Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Mr. Simão C. de A.Laranjinha Department Chief	2	Program Development & Management				1								
	3	Technical Report Writing			1									
	4	Leadership & Team Management					1							
	1	Work Health & Safety	1											
Mr. Rogério da Costa Freitas Technical Support Section	4	Leadership & Team Management					1							
	3	Technical Report Writing			1									
	5	Hydrology and Hydraulics Design							1					
	6	Road and Pavement Design						1						
	1	Work Health & Safety	1					1						
Mr. Lourenço Luis Planning Section	6	Road and Pavement Design						1						
	5	Hydrology and Hydraulics Design							1					
	7	Slope Protection Design								1				
	8	Road Condition Assessment				1								
	1	Work Health & Safety	1											
Mr. Santino Barreto Programming Section	2	Program Development & Management				1								
	1	Work Health & Safety	1											
	16	Cost Estimating										1		
	6	Road and Pavement Design						1						
	20	Computer Aided Design & Drafting (CADD)			1									
Mr. Armando Gama Social & Environmental Section	9	Environmental & Social Safeguards Management		1										
	1	Work Health & Safety	1											
Mr. Joaquim da Costa Social & Environmental Section	9	Environmental & Social Safeguards Management		1										
	1	Work Health & Safety	1											
Ms. Valeria Esperanca Social & Environmental Section	9	Environmental & Social Safeguards Management		1										
	1	Work Health & Safety	1											
Ms. Litígia Corbafo GIS Section	18	GIS Training		1										
	1	Work Health & Safety	1											
Sr. Marcos da Costa GIS Section	18	GIS Training		1										
	1	Work Health & Safety	1											
Sr. Porfirio (R4D) GIS Section	18	GIS Training		1										
	1	Work Health & Safety	1											

Table 5 Training Program for Construction Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19	
Mr. João Gregório de Carvalho Department Chief	10	Contract Supervision and Management										1			
	3	Technical Report Writing			1										
	11	Project Management & Evaluation													
	1	Work Health & Safety	1												
Mr. Domingos Ximenes Roads Section	10	Contract Supervision and Management										1			
	11	Project Management & Evaluation											1		
	12	Project Scheduling (MS Project)							1						
	1	Work Health & Safety	1												
Mr. Estêvão de Carvalho Bridge Section	10	Contract Supervision and Management										1			
	3	Technical Report Writing			1										
	12	Project Scheduling (MS Project)							1						
	1	Work Health & Safety	1												
Mr. Martinho Barreto de Sousa Flood Control Section	10	Contract Supervision and Management										1			
	3	Technical Report Writing			1										
	11	Project Management & Evaluation											1		
	13	Spreadsheets & Databases (Excel & Access)													
	1	Work Health & Safety	1												

Table 6 Training Program for Analysis & Evaluation Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Ms. Isabel Maria Lay Guterres Department Chief	11	Project Management & Evaluation										1		
	4	Leadership & Team Management						1						
	1	Work Health & Safety	1											
Ms. Lígia Mediadora A. Soares Construction Section	13	Spreadsheets & Databases (Excel & Access)											1	
	11	Project Management & Evaluation									1			
	1	Work Health & Safety	1											
Leonarda Brites Construction Section	13	Spreadsheets & Databases (Excel & Access)											1	
	11	Project Management & Evaluation									1			
	1	Work Health & Safety	1											
Ms. Paula Guterres Gama Maintenance Section	13	Spreadsheets & Databases (Excel & Access)											1	
	11	Project Management & Evaluation									1			
	1	Work Health & Safety	1											
Ms. Mariana Gama Evaluation Section	16	Cost Estimating											1	
	3	Technical Report Writing			1									
	1	Work Health & Safety	1											
Mr. Lourenço Pereira Evaluation Section	16	Cost Estimating											1	
	3	Technical Report Writing			1									
	1	Work Health & Safety	1											

Table 7 Training Program for Maintenance Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Mr. João Pedro Amaral Department Chief	4	Leadership & Team Management						1						
	12	Project Scheduling (MS Project)							1					
	1	Work Health & Safety	1											
Mr. António de Araújo Database Section	8	Road Condition Assessment				1								
	13	Spreadsheets & Databases (Excel & Access)												
	17	Risk Management												1
Mr. Duarte Ximenes de Deus Region 1 Section	1	Work Health & Safety	1											
	4	Leadership & Team Management						1						
	12	Project Scheduling (MS Project)							1					
	11	Project Management & Evaluation									1			
	20	Computer Aided Design & Drafting (CADD)			1									
Mr. Mouzinho Tilman Region 2 Section	1	Work Health & Safety	1											
	10	Contract Supervision and Management									1			
	7	Slope Protection Design								1				
Mr. Cristóvão da Costa Monteiro Region 3 Section	1	Work Health & Safety	1											
	11	Project Management & Evaluation									1			
	15	English & Portuguese					1							
Mr. Sabino da Costa Ventura Region 4 Section	1	Work Health & Safety	1											
	4	Leadership & Team Management						1						
	11	Project Management & Evaluation									1			

Table 8 Training Program for Expressway Department

NAME	MODULE NO.	TRAINING MODULE	2020				2021				2022			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			1	9+18	3+20	2+8	10+15	4	6+12	5+7	10+14	11+21	13+16	17+19
Mr. Fernando F.F.C. Freitas Department Chief	1	Work Health & Safety	1											
	12	Project Scheduling (MS Project)						1						
	21	Bridge Design & Rehabilitation									1			
Mr. Celestino E.X. Road Section	11	Project Management & Evaluation									1			
	7	Slope Protection Design							1					
	21	Bridge Design & Rehabilitation									1			
	10	Contract Supervision and Management								1				
Mr. Manuel P. da Silva Environment Section	1	Work Health & Safety	1											

local people
global experience

SMEC is recognised for providing technical excellence and consultancy expertise in urban, infrastructure and management advisory. From concept to completion, our core service offering covers the life-cycle of a project and maximises value to our clients and communities. We align global expertise with local knowledge and state-of-the-art processes and systems to deliver innovative solutions to a range of industry sectors.