MATERIALS ENGINEERING CONSULTANCY FOR PUNTLAND HIGHWAY AUTHORITY

CONSTRUCTION MATERIALS TESTING –TECHNICIAN TRAINING COURSE
PHASE I –THEORETICAL TRAINING - LEVEL I & II

Terms of Reference (ToR)

Prepared by

Puntland Highway Authority (PHA)

In collaboration with

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SRMP Office Garowe

C/o Puntland Highway Authority Compound

June 2016

A. Responsibilities

The Materials Engineer

- Conducts trainings and capacity building for Puntland Highway Authority Technical Staff, other governmental partners in Puntland and other parts of Somalia as well as local contractors

B. Tasks

- Organizes and carries our class room training on the PHA premises in Garowe or where required in Puntland complying with international Standards, enabling the agency to conduct the following QC/QA laboratory and field testing:
- Soil Tests as per the standard specification requirements
- Aggregate tests for asphalt & Concrete works
- Concrete tests including mix design of different classes of concrete
- Asphalt tests as per standard specification requirement
- Other tests as may be required by the International Technical Advisor

This Quality Control Technician Training Program will require students gain working knowledge of the following International Standards, Specifications and Practices.

TABLE I: Required test methods, practices and specifications for Level I & II

S/No.	*STD. TEST DESIGNATION*			*TEST NAME/METHOD*
	ASTM	*AASHTO*	*BS*	
AGGREGATE TESTING – Level I				
1	*D75*	*T2*		*Standard Practice for Sampling Aggregates*
2	*C702*	*T248*		*Reducing Samples of Aggregate to Testing Size*
3	*C117*	*T11*		*Materials Finer Than 75-µm Sieve by Washing*
4	*C36*	*T27*		*Sieve Analysis of Fine and Coarse Aggregates*
5	*C127*	*T85*		*Specific Gravity and Absorption of Coarse Aggregate*
6	*C128*	*T84*		*Specific Gravity and Absorption of Fine Aggregate*
7	*C566*	*T255*		*Total Moisture Content of Aggregate by Drying*
8	*C40*	*T21*		*Organic Impurities in Fine Aggregate for Concrete*
AGGREGATE TESTING – Level II				
9	*C131*	*T96*		*Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine*
10	*C142*	*T112*		*Clay Lumps and Friable Particles in Aggregate*
11	*D4791*			*Flat and Elongated Particles in Coarse Aggregate*
12	*C29*	*T19*		*Bulk Density (Unit Weight) and Voids in Aggregate*
13	*C88*	*T104*		*Soundness of Aggregates by Use of Sodium Sulfate or*

				Magnesium Sulfate
14	*C123*	*T113*		*Lightweight Pieces in Aggregate*
15	*D2419*	*T176*		*Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test*
16	*D5821*			*Determining the Percentage of Fractured Particles in Coarse Aggregate*
17	*C33*			*Standard Specification for Concrete Aggregates*
SOIL TESTING – Level I				
18	*D4318*	*T89*		*Liquid Limit Test*
19	*D4318*	*T90*		*Plastic Limit Test*
20	*D2488*			*Classification of Soils for Engineering Purposes*
21	*D698*	*T99*		*Moisture Density Relationship (Standard method)*
22	*D1557*	*T180*		*Moisture Density Relationship (Modified method)*
23	*D1556*	*T191*		*Field Density Test (Sand Cone Method)*
24		*T224*		*Correction for Coarse Particles in the Soil Compaction Test*
SOIL TESTING – Level II				
25	*D1883*	*T193*		*California Bearing Ratio*
CONCRETE TESTING – Level I				
26	*C172*	*T141*	*1881-101*	*Sampling Freshly Mixed Concrete*
27	*C143*	*T119*	*1881-102*	*Slump of Hydraulic Cement Concrete*
28	*C1164*			*Temperature of freshly Mixed Concrete*
29	*C192*		*1881-108*	*Making & Curing Specimens for Strength Testing*
30	*C39*		*1881-116*	*Compressive Strength of Concrete*
CONCRETE TESTING – Level II				
31		*ACI 211*		*A brief overview of Concrete Mix Design Procedures*
BITUMEN TESTING				
32	*D5*	*T49*		*Bitumen Penetration Test + general overview of other bitumen tests*
HOT MIX ASPHALT TESTING				
33	*D1559*	*T245*		Marshall Method Mix Design of HMA Overview
34	*M323*			Volumetric Method Mix Design of HMA Overview
35	*D140*	*T40*		Sampling Bituminous Materials
36	*D979*	*T168*		Sampling Bituminous Paving Mixtures
37		*T328*		Reducing HMA Samples to Testing Size
38		*T166*		Bulk Specific Gravity (Gmb) of Compacted Hot Mix asphalt (HMA) Using SSD Specimens
39		*T269*		Standard Method of Test for Percent Air Voids in Compacted Dense and Open Asphalt Mixtures
40	*D2041*	*T209*		Theoretical Maximum Specific Gravity (Gmm) and Density of Hot Mix Asphalt (HMA
41	*D2172*	*T164*		Quantitative Extraction of Asphalt and Gradation of

				Extracted Aggregate from HMA Mixtures
42	*D3549*			Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens

THEORETICAL TRAINING - AN OUTLINE OF THE CLASSROOM SESSIONS

Days	***Time***	***Session No./Topics presented***	***Delivery Method***	***Resources***	***Assessment***
1-10	*08:00-16:00 Includes Breaks*	*Preparation of Presentation materials, Manuals & Handouts*			
11	*08:00 -16:00 Includes Breaks*	***General Introductions:*** *a) QC/QA Programs b) General Laboratory set up & proper house keeping c) Construction Materials Basics d) Why certifications matter?*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals, Whiteboard, papers/pens*	***Group work:*** *-Discussions, Observations, Group exercises*
12	*08:00 -16:00 Includes Breaks*	*1.0 Standard Practice for Sampling Aggregates*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
13	*08:00 -16:00 Includes Breaks*	*2.0 Reducing Samples of Aggregate to Testing Size*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
14	*08:00 -16:00 Includes Breaks*	*3.0 Materials Finer Than 75-µm Sieve by Washing*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
15	*08:00 -16:00 Includes Breaks*	*4.0 Sieve Analysis of Fine and Coarse Aggregates*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
16	*08:00 -16:00 Includes Breaks*	*5.0 Specific Gravity and Absorption of Coarse Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out*	***Group work:*** *-Discussions, Observations,*

				manuals,	*Group exercises*
17	*08:00 -16:00 Includes Breaks*	*6.0 Specific Gravity and Absorption of Fine Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
18	*08:00 -16:00 Includes Breaks*	*7.0 Total Moisture Content of Aggregate by Drying*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
19	*08:00 -16:00 Includes Breaks*	*8.0 Organic Impurities in Fine Aggregate for Concrete*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
20	*08:00 -16:00 Includes Breaks*	*9.0 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
21	*08:00 -16:00 Includes Breaks*	*10.0 Clay Lumps and Friable Particles in Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
22	*08:00 -16:00 Includes Breaks*	*11.0 Flat and Elongated Particles in Coarse Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
23	*08:00 -16:00 Includes Breaks*	*12.0 Bulk Density (Unit Weight) and Voids in Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
24	*08:00 -16:00 Includes Breaks*	*13.0 Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
25	*08:00 -16:00 Includes Breaks*	*14.0 Lightweight Pieces in Aggregate*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
26	*08:00 -16:00 Includes Breaks*	*15.0 Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
27	*08:00 -16:00*	*16.0 Determining the*	***Presentations***	***Course***	***Group work:***

	Includes Breaks	*Percentage of Fractured Particles in Coarse Aggregate*	*Questions and answers*	***Material:*** *hand-out manuals,*	*-Discussions, Observations, Group exercises*
28	*08:00 -16:00 Includes Breaks*	*17.0 Standard Specification for Concrete Aggregates*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
29	*08:00 -16:00 Includes Breaks*	*18.0 Liquid Limit Test*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
30	*08:00 -16:00 Includes Breaks*	*19.0 Plastic Limit Test*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
31	*08:00 -16:00 Includes Breaks*	*20.0 Classification of Soils for Engineering Purposes*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
32	*08:00 -16:00 Includes Breaks*	*21.0-Moisture Density Relationship (Standard method)*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
33	*08:00 -16:00 Includes Breaks*	*22.0 Moisture Density Relationship (Modified method)*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
34	*08:00 -16:00 Includes Breaks*	*23.0 Field Density Test (Sand Cone Method)*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
35	*08:00 -16:00 Includes Breaks*	*24.0 Correction for Coarse Particles in the Soil Compaction Test*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
36	*08:00 -16:00 Includes Breaks*	*25.0 California Bearing Ratio*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
37	*08:00 -16:00 Includes Breaks*	*26.0 Sampling Freshly Mixed Concrete*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
38	*08:00 -16:00*	*27.0 Slump of Hydraulic*	***Presentations***	***Course***	***Group work:***

	Includes Breaks	*Cement Concrete*	*Questions and answers*	***Material:*** *hand-out manuals,*	*-Discussions, Observations, Group exercises*
39	*08:00 -16:00 Includes Breaks*	*28.0 Temperature of freshly Mixed Concrete*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
40	*08:00 -16:00 Includes Breaks*	*29.0 Making & Curing Specimens for Strength Testing*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
41	*08:00 -16:00 Includes Breaks*	*30.0-Compressive Strength of Concrete*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
42-43	*08:00 -16:00 Includes Breaks*	*31.0 A brief overview of Concrete Mix Design Procedures*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
44	*08:00 -16:00 Includes Breaks*	*32.0 Bitumen Penetration Test + General Overview of other Bitumen Tests*	***Presentations*** *Questions and answers*	***Course Material:*** *hand-out manuals,*	***Group work:*** *-Discussions, Observations, Group exercises*
45-51	*Examination days-5 standard tests per day*				
52-54		*Exam Corrections/Evaluations*			
55-60		*Final reports*			
NOTE: Phase I training for both levels I & II will require up to 60 working days. If Level II tests (highlighted yellow) are excluded the training will take between 44 to 46 days (assuming participation of 6 to 10 students).					

Other duties and responsibilities

- Performs any other duties as assigned by the International Technical Advisor (m/f) and PHA chief executive officer (CEO).

C. Required qualifications, competences and experience

Formal Education

- University degree (BSc) in Civil Engineering, Construction Management related fields or Equivalent

Professional Experience

- Experience in Material Testing and/or work in a construction material laboratory: minimum 15 years
- A minimum of 10 years of professional experience including working knowledge of the disciplines involved for similar assignments
- Prior experience must include planning, preparation and executing construction material testing, including financial-, procurement- and contractual management for construction material laboratories
- Prior experience must include procurement of goods and services using procurement procedures of development agencies and overall quality assurance of construction works carried out by local construction companies
- Familiarity with standards and norms for quality control under FIDIC Conditions of Contract, inclusive of certification contractor's quality statements and monitoring of quality control
- Strong experience in training and certifying field & laboratory technicians following international standards and best practices
- Proven experience in coordinating team's composed of regional and local technical specialists

Other qualifications

- Strong design, presentation and communication skills
- Team player and intercultural competence
- IT-skills including MS-Office
- Language: fluency in Somali, full proficiency in English
- Intercultural Competence
- Good working knowledge of modern telecommunication systems
- Willingness to travel where needed
- Experience in teaching, capacity building and "On-the-job-training"

D. Deliverables:

1) 34 days face-to-face sessions in a classroom setting delivering presentations, Questions & answers and group discussions
2) Exams, exam evaluations and certifications for all students that succesfully complete the training and pass the open book exams
3) Full printed course materials for each participant to keep as a reference material
4) Full printed and softcopy of course materials to PHA/GIZ for their records
5) Progress reports during training & Final Reports

E. Location of assignment: Garowe, Puntland. May involve travel to project sites outside Garowe.

Module/Learning Outcomes:

Certified Testing Technicians who successfully complete these courses will be able to demonstrate the knowledge of, and ability to conduct & interpret the results of all the basic field and laboratory tests listed in Table I above and perform calculations necessary to report the data from each test.

Deadline for Submission: 10th January 2017 @1800hrs
Mode of submission: Soft copies through GIZ procurement email - procurement.kenya@giz.de

Due to provisions of the project implementation agreement, only Somali Nationals and Companies Registered in Somalia are requested to apply.

Technical Assessment Grid of Offers

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Section	**1500**	Project Short Title	**Sustainable Road Maintenance Project**	Date	**08.11.2016**
AV	**Christoph Schmidt**			PN	**PN**
Assessor				VN	**VN**
Version					

			Company 1		**Company 2**		**Company 3**		**Company 4**		**Company 5**	
	(1) Criteria	(2) Weighting in %	(3) points (max.10)	(4) assessment (2)x(3)	(3) points (max.10)	(4) assessment (2)x(3)	(3) points (max.10)	(4) assessment (2)x(3)	(3) points (max.10)	(4) assessment (2)x(3)	(3) points (max.10)	(4) assessment (2)x(3)
1.	**Appropriateness of suggested concept and work plan**											
1.1	Interpretation of objectives	2										
1.2	Strategy (technical concept/alternative concepts)											
1.3	Implementation methods: Management of processes, Cooperation, Steering structure, Learning and Innovation	3										
1.4	Work schedule and time schedule	5										
1.5	Monitoring and evaluation concept (as part of L+I)	5										
Total 1.		**15**										
2.	**Technical backstopping / Knowledge Management**											
2.1	Staff and backstopping conception (as part of the steering structure))											
2.2	Know ledge and information management (as part of L+I)	3										
Total 2.		**3**										
3.	**Consideration of local resources**											
4.	**Qualification of proposed staff**											
4.1	Expert 1:											
4.1.1	General qualification											
	- BSC Material Engineer	7										
	- at least 10 years experience in laboratory material testing	25										
4.1.2	Specific qualification											
	- special field											
	specialized in road construction materials, as soil, concrete	25										
	- management experience											
	- ability to w ork in a team	5										
4.1.3	Regional experience / Know ledge of country											
	state country / region	5										
4.1.4	Language skills											
	state language: fluently in Somali and English	10										
Subtotal 4.1		**77**										
4.2	Cont....											
4.2.1	General qualification											
	- training											
	- professional experience											
4.2.2	Specific qualification											
	- special field											
	IT know ledge and experience	5										
	- management experience											
	- ability to w ork in a team											
4.2.3	Regional experience / Know ledge of country											
	state country / region											
4.2.4	Language skills											
	state language											
Subtotal 4.2		**5**										
Subtotal 4.6		**0**										
4.7	Composition of the team											
Total 4.		**82**										
Grand Total 1. – 4.		**100**										
	Assessment in %			**0**		**0**		**0**		**0**		**0**
	place											
5.	**Special advantages / risks (see extra page)**											
	place											

I hereby declare that I conducted this evaluation independently and to the best of my know ledge and belief. I w ill treat the information confidentially and not pass on any particulars of the on-going evaluation procedure.

Date, signature

MATERIALS ENGINEERING CONSULTANCY FOR PUNTLAND HIGHWAY AUTHORITY

CONSTRUCTION MATERIALS TESTING –TECHNICIAN TRAINING COURSE
PHASE II –PRACTICAL TRAINING - LEVEL I & II

Terms of Reference (ToR)

Prepared by

Puntland Highway Authority (PHA)

In collaboration with

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SRMP Office Garowe

C/o Puntland Highway Authority Compound

June 2016

A. Responsibilities

The Materials Engineer

- Is responsible for Planning and Developing a proper QC/QA and Quality Management System (QMS) for the Highway Authority of Puntland (PHA)
- Ensures compliance with all standard specifications, standard operating practices and conditions of contracts

B. Tasks

- Carries out laboratory assessments within Puntland Highway Authority (PHA) in Garowe and determines available equipment inventory and required balance to be procured
- Introduces a digital reporting and recording system for quality management systems using state-of the-art custom made software.
- Establishes a central construction materials testing laboratory on the PHA premises in Garowe or where required in Puntland complying with international Standards, enabling the agency to conduct the following QC/QA laboratory and field testing:

    - Soil Tests as per the standard specification requirements
    - Aggregate tests for asphalt & Concrete works
    - Concrete tests including mix design of different classes of concrete
    - Asphalt tests as per standard specification requirement
    - Other tests as may be required by the International Technical Advisor

This Quality Control Technician Training Program will ensure students acquire the required practical knowledge to perform the following International Standards, Specifications and Practices.

TABLE I: Required test methods, practices and specifications for Level I & II

S/No.	*STD. TEST DESIGNATION*			*TEST NAME/METHOD*
	ASTM	***AASHTO***	***BS***	
AGGREGATE TESTING – Level I				
1	*D75*	*T2*		*Standard Practice for Sampling Aggregates*
2	*C702*	*T248*		*Reducing Samples of Aggregate to Testing Size*
3	*C117*	*T11*		*Materials Finer Than 75-µm Sieve by Washing*
4	*C36*	*T27*		*Sieve Analysis of Fine and Coarse Aggregates*
5	*C127*	*T85*		*Specific Gravity and Absorption of Coarse Aggregate*

6	*C128*	*T84*		*Specific Gravity and Absorption of Fine Aggregate*
7	*C566*	*T255*		*Total Moisture Content of Aggregate by Drying*
8	*C40*	*T21*		*Organic Impurities in Fine Aggregate for Concrete*
AGGREGATE TESTING – Level II				
9	*C131*	*T96*		*Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine*
10	*C142*	*T112*		*Clay Lumps and Friable Particles in Aggregate*
11	*D4791*			*Flat and Elongated Particles in Coarse Aggregate*
12	*C29*	*T19*		*Bulk Density (Unit Weight) and Voids in Aggregate*
13	*C88*	*T104*		*Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate*
14	*C123*	*T113*		*Lightweight Pieces in Aggregate*
15	*D2419*	*T176*		*Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test*
16	*D5821*			*Determining the Percentage of Fractured Particles in Coarse Aggregate*
17	*C33*			*Standard Specification for Concrete Aggregates (Theory Sessions Only)*
SOIL TESTING – Level I				
18	*D4318*	*T89*		*Liquid Limit Test*
19	*D4318*	*T90*		*Plastic Limit Test*
20	*D2488*			*Classification of Soils for Engineering Purposes (Theory Sessions Only)*
21	*D698*	*T99*		*Moisture Density Relationship (Standard method)*
22	*D1557*	*T180*		*Moisture Density Relationship (Modified method)*
23	*D1556*	*T191*		*Field Density Test (Sand Cone Method)*
24		*T224*		*Correction for Coarse Particles in the Soil Compaction Test*
SOIL TESTING – Level II				
25	*D1883*	*T193*		*California Bearing Ratio*
CONCRETE TESTING – Level I				
26	*C172*	*T141*	*1881-101*	*Sampling Freshly Mixed Concrete*
27	*C143*	*T119*	*1881-102*	*Slump of Hydraulic Cement Concrete*
28	*C1164*			*Temperature of freshly Mixed Concrete*
29	*C192*		*1881-108*	*Making & Curing Specimens for Strength Testing*
30	*C39*		*1881-116*	*Compressive Strength of Concrete*
CONCRETE TESTING – Level II				
31		*ACI 211*		*A brief overview of Concrete Mix Design Procedures*
BITUMEN TESTING				
32	*D5*	*T49*		*Bitumen Penetration Test*
HOT MIX ASPHALT TESTING				
Not applicable in Puntland at this stage therefore no tests are specified.				

TABLE II - PRACTICAL TRAINING - AN OUTLINE OF THE CLASSROOM SESSIONS

TABLE II - PRACTICAL TRAINING - AN OUTLINE OF SESSIONS

Days	***Time***	***Session No./Topics presented***	***Delivery Method***	***Resources***	***Assessment***
1	08:00 -16:00 Includes Breaks	*1.0-Standard Practice for Sampling Aggregates* *2.0-Reducing Samples of Aggregate to Testing Size*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
2	08:00 -16:00 Includes Breaks	*3.0-Materials Finer Than 75-µm Sieve by Washing* *4.0-Sieve Analysis of Fine and Coarse Aggregates*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
3	08:00 -16:00 Includes Breaks	*5.0-Specific Gravity and Absorption of Coarse Aggregate* *6.0-Specific Gravity and Absorption of Fine Aggregate*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
4	08:00 -16:00 Includes Breaks	*7.0-Total Moisture Content of Aggregate by Drying* *8.0-Organic Impurities in Fine Aggregate for Concrete*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
5	08:00 -16:00 Includes Breaks	*9.0-Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine* *10.0-Clay Lumps and Friable Particles in Aggregate*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
6	08:00 -16:00 Includes Breaks	*11.0-Flat and Elongated Particles in Coarse Aggregate* *12.0-Bulk Density (Unit Weight) and Voids in Aggregate*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
7	08:00 -16:00 Includes Breaks	*13.0-Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate* *14.0-Lightweight Pieces in Aggregate*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
8	08:00 -16:00	*15.0-Plastic Fines in Graded*	Hands-on	***Course***	**Group work:**

	Includes Breaks	*Aggregates and Soils by Use of the Sand Equivalent Test* *16.0-Determining the Percentage of Fractured Particles in Coarse Aggregate*	practical training	***Material:*** hand-out manuals,	-Discussions, Observations, Group exercises
9	08:00 -16:00 Includes Breaks	*18.0-Liquid Limit Test* *19.0-Plastic Limit Test*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
10	08:00 -16:00 Includes Breaks	*21.0-Moisture Density Relationship (Standard method)* *22.0-Moisture Density Relationship (Modified method)*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
11	08:00 -16:00 Includes Breaks	*23.0-Field Density Test (Sand Cone Method)* *24.0-Correction for Coarse Particles in the Soil Compaction Test*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
12	08:00 -16:00 Includes Breaks	*25.0-California Bearing Ratio (CBR Test)*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
12	08:00 -16:00 Includes Breaks	*26.0-Sampling Freshly Mixed Concrete* *27.0-Slump of Hydraulic Cement Concrete*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
13	08:00 -16:00 Includes Breaks	*28.0-Temperature of freshly Mixed Concrete* *29.0 -Making & Curing Specimens for Strength Testing* *30.0-Compressive Strength of Concrete*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
14	08:00 -16:00 Includes Breaks	*31.0-Concrete Mix Design Procedures*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises
15	08:00 -16:00 Includes Breaks	*32.0-Bitumen Penetration Test*	Hands-on practical training	***Course Material:*** hand-out manuals,	**Group work:** -Discussions, Observations, Group exercises

16-25	*Examination days-Practical exams at the rate of 3 standard tests per day*				
26-28		*Corrections/Evaluations*			
29-30		*Final reports*			

Other duties and responsibilities

- Performs any other duties as assigned by the International Technical Advisor (m/f) and PHA chief executive officer (CEO).

C. Required qualifications, competences and experience

Formal Education

- University degree (BSc) in Civil Engineering, Construction Management related fields or Equivalent

Professional Experience

- Experience in Material Testing and/or work in a construction material laboratory: minimum 15 years
- A minimum of 10 years of professional experience including working knowledge of the disciplines involved for similar assignments
- Prior experience must include planning, preparation and executing construction material testing, including financial-, procurement- and contractual management for construction material laboratories
- Prior experience must include procurement of goods and services using procurement procedures of development agencies and overall quality assurance of construction works carried out by local construction companies
- Familiarity with standards and norms for quality control under FIDIC Conditions of Contract, inclusive of certification contractor's quality statements and monitoring of quality control
- Strong experience in training and certifying field & laboratory technicians following international standards and best practices
- Proven experience in coordinating team's composed of regional and local technical specialists

Other qualifications

- Strong design, presentation and communication skills
- Team player and intercultural competence
- IT-skills including MS-Office
- Language: fluency in Somali, full proficiency in English
- Intercultural Competence
- Good working knowledge of modern telecommunication systems
- Willingness to travel where needed
- Experience in teaching, capacity building and "On-the-job-training"

D. Deliverables:

1) 15 days/31 sessions of practical hands-on training, Questions & Answers and group discussions
2) Practical tests, evaluations and certifications for all students that succesfully complete the practical training and pass the practical tests
3) Full printed course materials for each participant to keep as a reference material
4) Progress reports during training
5) Final Reports

E. Location of assignment: Garowe, Puntland. May involve travel to project sites outside Garowe.

Module/Learning Outcomes:

Certified Testing Technicians who successfully complete these courses will be able to demonstrate the knowledge of, and ability to perform all the basic field and laboratory tests listed in Table I and perform calculations necessary to report the data from each test.

Deadline for Submission: 10th January 2017 @1800hrs
Mode of submission: Soft copies through GIZ procurement email - procurement.kenya@giz.de

Due to provisions of the project implementation agreement, only Somali Nationals and Companies Registered in Somalia are requested to apply.