

## Annex 1

### For Lot # 1 , Lot #2, Lot # 3 TECHNICAL SPECIFICATION

#### Construction of Water Supply Systems for Post Harvesting Processes of Quality Coffee Production at AD Programme Areas of Loilen and Hopong Townships, Shan State, Myanmar

UNODC is currently implementing a long-term country strategy on alternative development aimed to improve the socio-economic situation of small farming communities and to gradually reduce the opium poppy cultivation under the Country Programme of Myanmar “Sub-programme 5.2: Sustainable livelihood alternative for opium poppy growing communities developed in line with international guidelines”.

To improve the socio-economic situation of project’s beneficiary farmers, to ensure the quality coffee production through the implementation of the most adequate post harvesting processes and sending to the international markets with higher prices, provision of services for construction of water supply systems for post harvesting process of quality coffee production is required to provide the adequate amount of irrigation water at every needed location of AD Programme Areas of Loilen and Hopong Townships.

#### 1 SITE CLEARING AND PREPARING WORK

- 1.1 The vendor shall do site clearing work of enough space for working. The vendor, before commencing any work, must identify and clearly mark by pegging the site locations and alignment of the construction items.
- 1.2 The construction of water supply systems includes:
  - ☐ Intake construction
  - ☐ Break Pressure Tank construction
  - ☐ Pipeline construction
  - ☐ Water Tank construction

#### 2 EARTH WORK

- 2.1 Excavation shall be in accordance with shape and dimensions mentioned in the design.
- 2.2 Dimensional layout of all structures and soil foundation materials are inspected and approved by the Infrastructure Specialist.
- 2.3 Filling shall be done with quality soil and up to designated height. Filling shall be placed in 1 feet layer and compacted until soil bearing capacity indicated as designed specification.

#### 3. CONCRETE WORK

- 3.1 For concrete batching, batch of material shall be weighed, and suitable means shall ensure exact measurement and dosage control of each material used for every batch of concrete.
- 3.2 Cement and inert materials shall be weight separately and in place sheltered from rain and wind. Measuring of the water shall be either by weight or by volume.
- 3.3 For masonry foundation, (1:3:6) Cement concrete must be used. (1:3:6) ratio means one is cement, three is sand and six is aggregate.
- 3.4 For flooring, (1:2:4) Cement concrete must be used. (1:2:4) ratio means one is cement, two is sand and four is aggregate.

#### 4 BRICK WORK IN (1:3) CEMENT MORTAR

- 4.1 (1:3) Cement mortar means one is cement and three is sand in weight.
- 4.2 Block brick (Lime concrete block \_ 11" x 4.5" x 6"), locally available and aged at least 1 year, has to be used in brick work reinforced at every 2 courses.
  
- 5 ½" THICK (1:3) CEMENT MORTAR PLASTERING
- 5.1 (1:3) Cement mortar shall be used for interior and exterior wall plastering.
  
- 6 PIPE INSTALLATION WORK
- 6.1 Intake and Break Pressure Tank

1 1/2" Ø G.I Pipe	Inlet, Overflow, Outlet & Washout pipes
1 1/2" Ø G.I End cap	Washout pipe
1 1/2" Ø G.I Union & Globe valve	Outlet
1" Ø G.I Pipe	Air-vent

## 6.2 Water Tank

1 1/2" Ø PVC Pipe	Inlet, Overflow, Outlet & Washout pipes
1 1/2" Ø PVC Ball valve	Outlet & Washout

All pipes and fixtures shall be laid carefully and as per instruction of Infrastructure Specialist.

## 6.3 Pipeline Construction for main supply line

- \_ The depth of the trench line in construction of main supply line should be 1'-6" deep. No specific width of trench, but 9". Trench line should be free of all sharp rocks which can cut into pipes.
- \_ The pipeline should be kept as far away from landslide areas, gullies, stream, etc.
- \_ The pipes must be properly joined and buried. If the pipe couldn't be buried, it should be fixed firmly with the hook or masonry block at the place.
- \_ No bushes, leaves, tree branches and large rocks allowed to use for back filled.

## 7 MATERIAL SELECTION

### 7.1 Cement

- \_ Portland cement for all masonry work is recommended.
- \_ Cement which should be used for construction must be stored in dry places.
- \_ Bagged or bulk cement which has become partially set or which contains lumps of caked cement shall be rejected.

### 7.2 Steel reinforcement

- \_ Steel bars and re-bars characteristics and dimensions is shown in drawing.
- \_ Bars shall be cleaned from rust and oil. Bars shall not be heated during these processes.
- \_ Reinforcement shall not be moved in order to bring it into a different position while pouring concrete.
- \_ No welding (tack weld) is permitted to steel bars and re-bars.

### 7.3 Aggregate

- \_ The characteristics of aggregates shall be selected according to the quality of concrete to be produced. Maximum aggregate gravel size shall be 1".
- \_ Aggregate used shall consists of good hard tough broken stone, gravel or shingle, free from dirt, clay, leaves or any organic matter or any admixtures of soft or decayed stone.

### 7.4 Sand

- \_ Sand shall be cleaned screened river sand and free from debris and salt.
- \_ Coarse sand shall be used in concrete & brick laying works. Fine sand shall be used in plastering work.

### 7.5 Water

- \_ Water used for mixing concrete shall be fresh, clean and free of any oil, organic matter or any substances injurious to the finished product.
- \_ If water seems not suitable to use, the vendor should seek further guidance from Infrastructure Specialist.

### 7.6 Brick

- \_ Local lime concrete block brick shall be aged at least one year.

### 7.7 Pipe and Fixtures, and diesel engine and power sprayer for pump water system

- \_ Pipes and fixtures (sizes and grades) shall be used as mentioned in above (item-6).

\_ Type and model of diesel engine and power sprayer must be provided as indicated in the specification in the priced bill of quantity.

8      CLEANING

8.1    After completion of work, thorough cleaning of work site area must be done by the vendor.

9      CHANGES

9.1    If the structural design will have to be changed, changes of specifications will be issued in time.

9.2    For any clarification related to construction, vendor should contact Infrastructure Specialist.

9.3    All works not complying with the above specifications must be redone at vendor's own cost.

## **Annex 1**

### **For Lot #4 Technical Specification**

1. Provision of Diesel Engine (China made) (WULING Brand, Rated Output 25 Hp, Rated Speed 2200 rpm, Voltage 230 KV)
2. Provision of Power Sprayer (China made) (Ousen Brand, OS \_ 120A1N, RPM 900 rpm, Sunction (l/min) ~ 116, Pressure (mpa) ~ 5.0, Require Power (kw) ~ 9.5)

## Annex-1

### For Lot #5

#### TECHNICAL SPECIFICATION

##### Construction of Forest Nursery

at AD Programme Areas of Hopong and Loilen Townships, Shan State, Myanmar (2019)  
(Dimension \_ Length 56' x Width 50' x Height 7'; Nursery Frame \_ G.I Pipes; 1 unit @ 21,000 Seedlings)

UNODC is currently implementing a long-term country strategy on alternative development aimed to improve the socio-economic situation of small farming communities and to gradually reduce the opium poppy cultivation under the Country Programme of Myanmar "Sub-programme 5.2: Sustainable livelihood alternative for opium poppy growing communities developed in line with international guidelines".

UNODC is now working with the opium growing farmers to provide alternative licit income opportunities by addressing the economic root cause of poppy cultivation and related environmental degradation. AD programme also addresses the problems of deforestation related to opium poppy cultivation through the implementation of enrichment and reforestation activities which also have positive spillover effects on livelihoods by protecting water sources and reducing erosion and soil degradation.

UNODC aims at transplanting the valuable forest tree seedlings/species to definite reforestation and enrichment areas and provide shade tree seedlings to be intercropped with coffee plantation as well. To improve the reforestation in the AD programme areas, provision of services for construction of forest nurseries are required to be able to provide the adequate amount of forest tree seedlings at every needed location of AD Programme Areas of Hopong and Loilen Townships.

#### 1 SITE CLEARING AND PREPARING WORK

- 1.1 The vendor shall do site clearing work of enough space for working. The vendor, before commencing any work, must identify and clearly mark by pegging the site locations and alignment of the construction items including germination beds.
- 1.2 The construction of forest nursery includes:
  - ☐ Forest nursery @ galvanized iron pipe frames
  - ☐ Provision of germination beds with lime block brick side walls
  - ☐ provision of cement concrete flooring at walk way

#### 2 EARTH WORK

- 2.1 Excavation shall be in accordance with shape and dimensions mentioned in the design.
- 2.2 Depth of earth digging for posts shall be of sufficient depth as mentioned in the design specification. Dimensional layout of all structures will be inspected and approved by Infrastructure Specialist.

#### 3. CONCRETE WORK

- 3.1 For concrete batching, batch of material shall be weighed, and suitable means shall ensure exact measurement and dosage control of each material used for every batch of concrete.
- 3.2 Cement and inert materials shall be weight separately and in place sheltered from rain and wind. Measuring of the water shall be either by weight or by volume.
- 3.3 For masonry foundation and flooring at walk way, (1:3:6) Cement concrete must be used. (1:3:6) ratio means one is cement, three is sand and six is aggregate.

- 3.4 For footings of G.I Posts, size is 9" x 9" x 1'-3" depth, (1:2:4) Cement concrete must be used. (1:2:4) ratio means one is cement, two is sand and four is aggregate.
- 4 BRICK WORK IN (1:4) CEMENT MORTAR
- 4.1 (1:4) Cement mortar means one is cement and four is sand in weight.
- 4.2 Block brick (Lime concrete block \_ 11" x 4.5" x 6"), locally available and aged at least 1 year, has to be used in brickwork.
- 5 ½" THICK (1:4) CEMENT MORTAR PLASTERING
- 5.1 (1:4) Cement mortar shall be used for interior and exterior wall plastering.
- 6 G.I PIPE INSTALLATION WORK FOR FRAMES OF NURSERY
- |                             |  |
|-----------------------------|--|
| 2" Ø G.I Pipe               | Posts  |
| 2" Ø G.I Socket, Tee, Elbow | For pipe joining as per necessary                  |
| 1 1/2" Ø G.I Pipe           | Tie beams  |
| 1 1/2" Ø G.I Socket         | For joining of pipe for tie beams as per necessary |
| 2 1/2" Ø G.I Pipe           | To be used for joining of Tie beams to G.I Posts   |
- \*\*\* G.I Pipes manufactured from Vietnam must be used.
- \*\*\* All pipes shall be laid carefully as per instruction of Infrastructure Specialist.
- \*\*\* All G.I pipes must be properly joined and welded at necessary. Welded joint must be painted with red oxide primer, three coats.
- 7 MATERIAL SELECTION
- 7.1 Cement
- \_ Portland cement for all masonry work is recommended.
  - \_ Cement which should be used for construction must be stored in dry places.
  - \_ Bagged or bulk cement which has become partially set or which contains lumps of caked cement shall be rejected.
- 7.2 Aggregate
- \_ The characteristics of aggregates shall be selected according to the quality of concrete to be produced. Maximum aggregate gravel size shall be 1".
  - \_ Aggregate used shall consist of good hard tough broken stone, gravel or shingle, free from dirt, clay, leaves or any organic matter or any admixtures of soft or decayed stone.
- 7.3 Sand
- \_ Sand shall be cleaned screened river sand and free from debris and salt.
  - \_ Coarse sand shall be used in concrete & brick laying works. Fine sand shall be used in plastering work.
- 7.4 Water
- \_ Water used for mixing concrete shall be fresh, clean and free of any oil, organic matter or any substances injurious to the finished product.
  - \_ If water seems not suitable to use, the vendor should seek further guidance from Infrastructure Specialist.
- 7.5 Brick
- \_ Local lime concrete block brick shall be aged at least one year.
- 7.6 Roofing material
- \_ Horti-net with length 100 yd x width 2 yd and shade 50% must be used for roofing of nurseries.
- 7.7 G.I Pipe
- \_ Good quality pipes and accessories (Vietnam made) with above mentioned sizes must be used for frames and rails of nurseries.

8 CLEANING

8.1 After completion of work, thorough cleaning of work site area must be done by the Vendor.

9 CHANGES

9.1 If the structural design will have to be changed, changes of specifications will be issued in time.

9.2 For any clarification related to construction, vendor should contact Infrastructure Specialist.

9.3 All works not complying with the above specifications must be redone at Vendor's own cost.