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Czech Provincial Reconstruction Team (Logar Province, Afghanistan)  
Institute of Tropics and Subtropics Prague

# MILK COLLECTION CENTRE CONSTRUCTION GUIDE



Czech Republic Making a Difference in Afghanistan

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## **INTRODUCTION: DAIRY COOPERATIVE – A COMMUNITY DRIVEN ENTERPRISE**

Dairy farming is a common practice in agricultural societies all around the developing world. Milk and dairy products belong to important and full-valued food stuff. In rural communities home produced milk is used as a staple food in farming families.

Milk production is gradually increasing as more and more farmers in Afghanistan are able to produce more than their family consumes. Higher milk production together with increasing demand for locally produced food in urban areas creates a market for rural dairy farmers.

Dairy marketing and regular individual sales of small amounts of milk is difficult and for the majority of rural farmers an impracticable way to sell surplus milk production. A more feasible and sustainable method is through an association of rural farmers under an umbrella of dairy cooperatives. A dairy cooperative founded upon a strong membership base creates a powerful player in the local dairy market.

The FAO program Development of Integrated Dairy Schemes, was one of the most important steps for dairy farming restoration and the establishment of dairy cooperatives on the community level in Afghanistan. This program focused on meeting the urban customer's demand for dairy products from local producers. There have been at least three elemental steps which created a sustainable dairy business in Afghanistan: the construction of a dairy plant in Kabul city; the establishment of a provincial and regional dairy cooperative network; and last but not least, the establishment of a regular and sustainable market for dairy products in urban areas.

Since the beginning of FAO program three dairy cooperatives have been established in Logar Province which collect milk from farmers and send it to the Kabul Guzarga dairy plant on daily basis. These dairy cooperatives are associated under the Kabul Dairy Union.

One more independent dairy cooperative was established in Logar Province but with a different business plan. The dairy cooperative collects milk from farmers on a daily basis, processes it into dairy products (butter, yogurt, cheese) on-site in the milk collection centre, and sells these products in the Kabul market.

Since 2008 Czech PRT has taken over the role of the main donor to agriculture sector development in Logar. The Czech PRT is continuing the already begun process of dairy business development in Logar Province.

During the first year of Czech PRT cooperation with the Logar dairy cooperatives milk collection centre infrastructure improvement was identified as a priority. Capacity of the existing milk collection centers weren't keeping pace with increasing production and hygienic requirements.

The Czech PRT decided to invest in milk collection centre construction projects. The design of these centers was prepared by the Czech PRT together with representatives from the dairy cooperatives and the department of agriculture, irrigation and livestock. All parties did their best to find a simple solution for the construction of community-based milk collection centers.

The objective of this paper is to present the design concept prepared by the Czech PRT and Afghan communities in Logar Province. This design can be used as a guideline for potential Afghan or international donors in the field of dairy business development on how to construct community-based milk collection centers.

## 1. MILK COLLECTION CENTRE DESIGN

The milk collection centre (MCC) is designed as a U-shaped building closed by a main entrance gate to protect an inner courtyard.

It's composed of two wings. One wing belongs to the administrative section the other to the technology section. Both wings are strictly separated from each other for hygienic reasons. At the end of a corridor the wings are connected by the washroom section. The central part of the compound is designed as a courtyard large enough to accommodate a medium size truck. There is a potable water well belonging to the MCC. It's equipped with manual/electric pump connected to the centre's plumbing system. The

technology and washroom sections are plumbed and equipped with water taps and stainless steel sinks with There is a water tank on the roof which serves as water storage and to maintain water pressure in the plumbing system. Each room of the MCC is wired and connected to a diesel generator.



**Milk collection centre – inside the old building**

## **1.1 Technology section**

The technology section is composed of four rooms:

### **1.1.1 Milk collection room – registration desk**

The milk collection room serves as a milk collection and testing point. Before the milk is purchased, it is tested for freshness (milk acidity), butter fat content, and then weighed. All this information is logged in the dairy book to estimate price. After the milk is accepted, it's poured into a cooling tank.

The room is equipped with a stainless sink and tap with running water in the corner. Right under the window there is marble slab which serve as a laboratory table. This table is at the same level as the sink and connects the sink with the wall next to entrance room.

The milk collection room walls are painted with a washable oil-based paint. The window sill slants for hygienic reasons.

The collection room and storage room are connected by an inner door.

### **1.1.2 Milk storage room**

The milk storage room serves to cool and store the milk before processing or transportation to the dairy plant.

The walls and floor of this room are tiled in white. The window sill slants for hygienic reasons. There is a stainless sink and tap with running water in the corner of the room. There are two doors, the main entrance door leading into the courtyard and the door connecting the collection room with the storage room.

The only equipment in this room is the cooling tank with its electrical refrigeration unit. Tank capacity is chosen according to the highest daily milk yield during the summer season and the community dairy potential.

The cooling tank is raised above floor level by concrete blocks so that it's possible to accommodate a 40 liter milk can underneath the tank outlet. The outlet is easily accessible to connect to the suction line of milk transport trucks.

### **1.1.3 Cold technology room**

The cold technology room is for cold milk processing: cream separation and butter processing. The room is equipped with a manual/electric cream separator and electricity driven butter churn. Moreover there is a solar powered refrigerator for dairy product storage.

The walls and floor of this room are white tiled. The window sill slants for hygienic reasons. There is a stainless sink and tap with running water in the corner of the room. There is one door leading to the courtyard.

#### **1.1.4 Warm technology room**

The warm technology room is for hot milk processing. The room is equipped with a stove and steel pots for simple milk pasteurization.

There are four gas burners, gas cylinders, and canopy digester installed in the room. There is one door leading to the courtyard. Right next to the warm technology room is the power station room with the diesel generator. The room can be equipped with more sophisticated technology for milk pasteurization in the case of a well developed dairy cooperative.



**Milk collection centre – inside the new building**

## **1.2 Administrative section**

The administrative section is composed of three rooms:

### **1.2.1 Guard room**

The guard room accommodates the MCC guard.

### **1.2.2 Management office**

The management office is where the daily work of the MCC is done by the management board, finance officers, and people active in milk collecting, processing, and dairy marketing.

### **1.2.3 Veterinary office/storage room**

In the administrative wing of the building there is one spare room which can be used as a veterinary office or storage room.



**Milk collection centre – outside the old building**



### 1.3. Washroom section

The washroom section is located at the back of the compound connecting the two wings to form a U-shaped building. There is a milk can washing area equipped with a large trough, tap with running water, two water closets, and one bathroom.

All parts of the washroom section are white tiled.



**Milk collection centre – outside the new building**

## 2. INSTALLED EQUIPMENT

The milk collection centre is equipped with a cool storage facility and basic dairy processing equipment. The aim in providing this basic equipment was to decrease dependency of the dairy cooperative on the dairy plant in Kabul and diversify dairy business opportunity for farmer communities.



### **Milk cooling tank**

To ensure increased milk shelf life it is necessary to keep it in a cool place. The milk cooling tank is an important constituent of each dairy cooperative. The tank is a practical way to dramatically improve milk hygiene and increase the amount of collected milk.

Dairy cooperatives were able to collect only the morning milking from the farmers due to the challenge of cooling the collected milk. Now farmers in Logar Province are able to sell their surplus from the evening milking as well. Theoretically the cooperative can double the daily amount of collected milk in the near future by using a milk cooling tank. This fact is important to take in account when estimating tank capacity.



### **Milk cream separator**

Cream is commonly used in Afghan cuisine. Afghans obtain milk cream by skimming cream off the milk surface. This is labor intensive and creates a high hygienic risk for the consumer.

The cream separator greatly improves the quality of milk cream and skimmed milk. The MCC in Logar Province was equipped with manual/electric milk cream separator. A capacity of 165 liters/hour was chosen according to the cooperative demand.



Milk cream is processed by shaking fermented cream to get butter. Afghans use different old style shaking equipment with a low hygienic standard.

The MCC in Logar Province is equipped with an electric stainless steel butter churn with a capacity of 50 kilograms.



#### **Solar refrigerator**

The solar refrigerator serves as temporary storage for unsold dairy products. It was chosen to reduce the risk of losing product due to electrical outages.



#### **Diesel generator**

All milk collection centre electrical appliances together with the lighting system and water pump are powered by a 10 kW diesel generator.

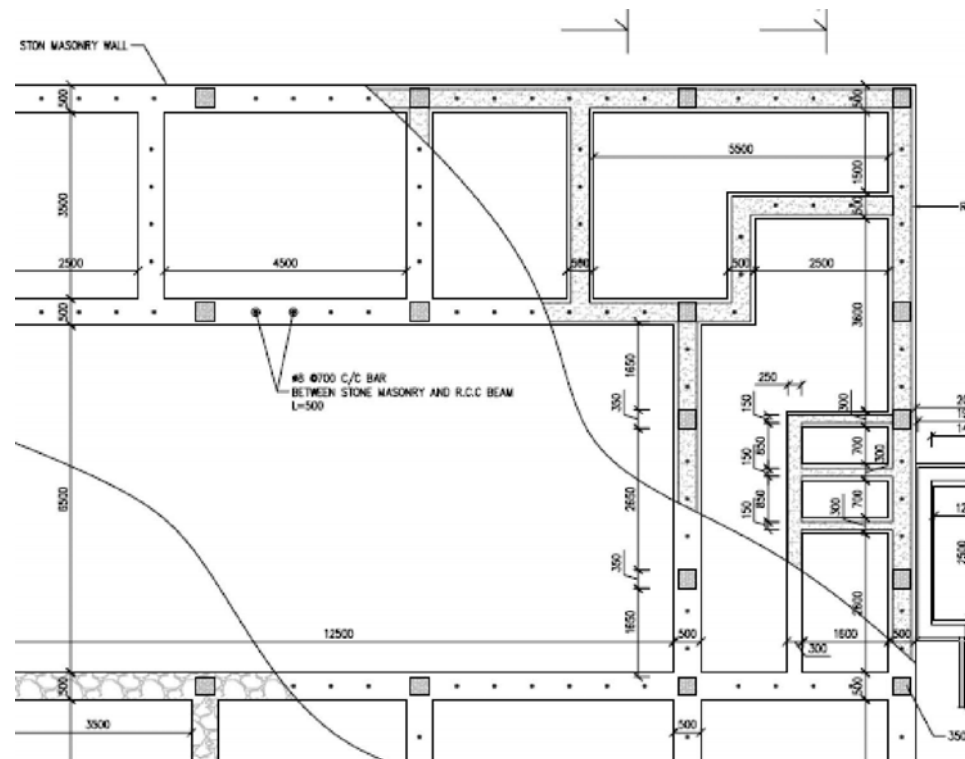
### 3. BUILDING SPECIFICATION

#### 3.1. Base

Square pad foundations are used to support an individual point load such as a structural column.

They are made of reinforced concrete. Strip foundations (trench fill) are used to support a load-bearing walls. They are made of:

- Plain concrete base resting on soil layers.
- Stone masonry foundation resting on the plain concrete base.
- Reinforced concrete edge beams resting on the stone masonry foundation.



**Foundation Plan**

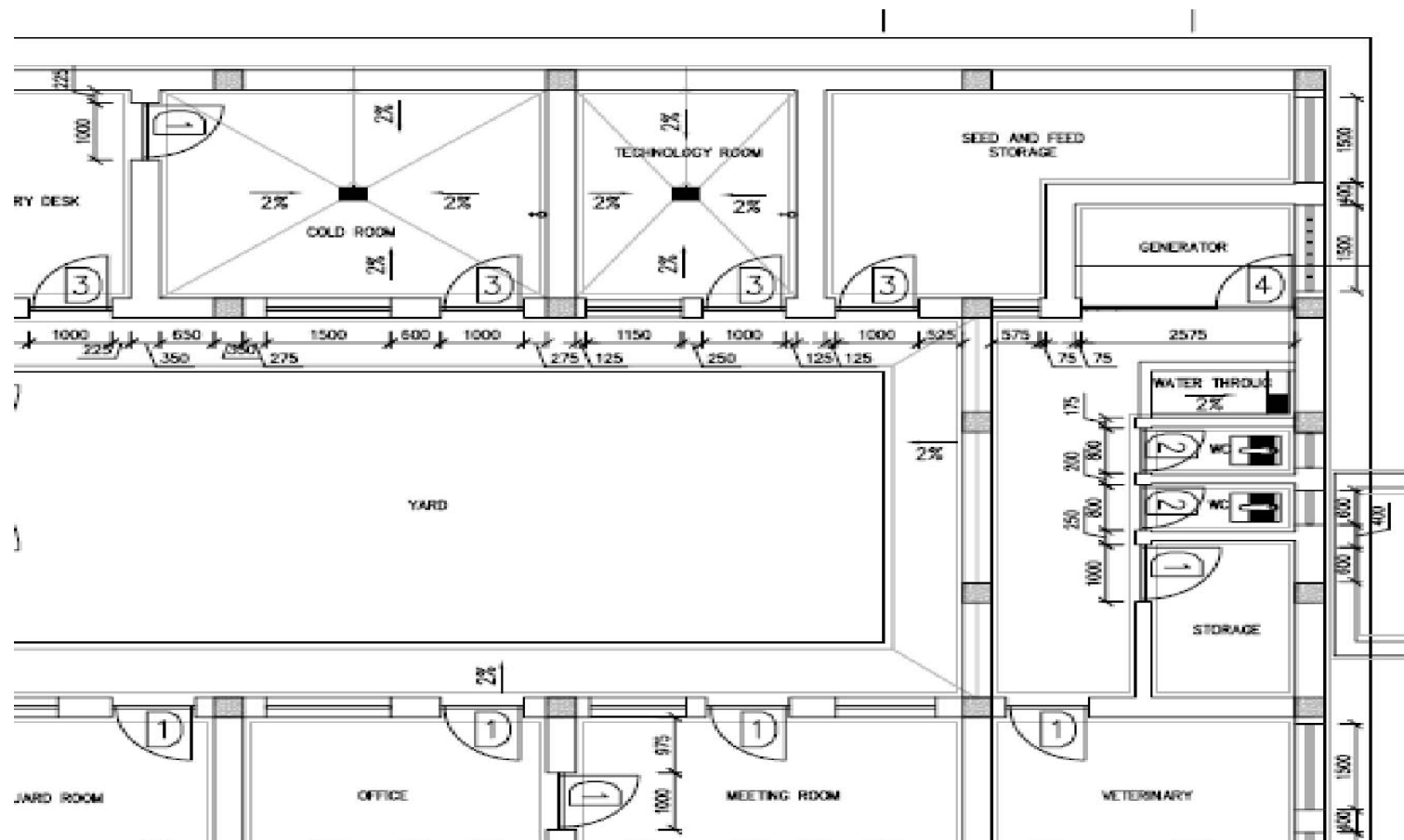
### 3.2 Super Structure

#### Structural Elements:

Columns: Reinforced concrete resting on a reinforced concrete base and extending vertically to the level of the ground floor ceiling  
Beams: Reinforced concrete resting on the columns at roof level  
Slab: Reinforced concrete resting on the beams

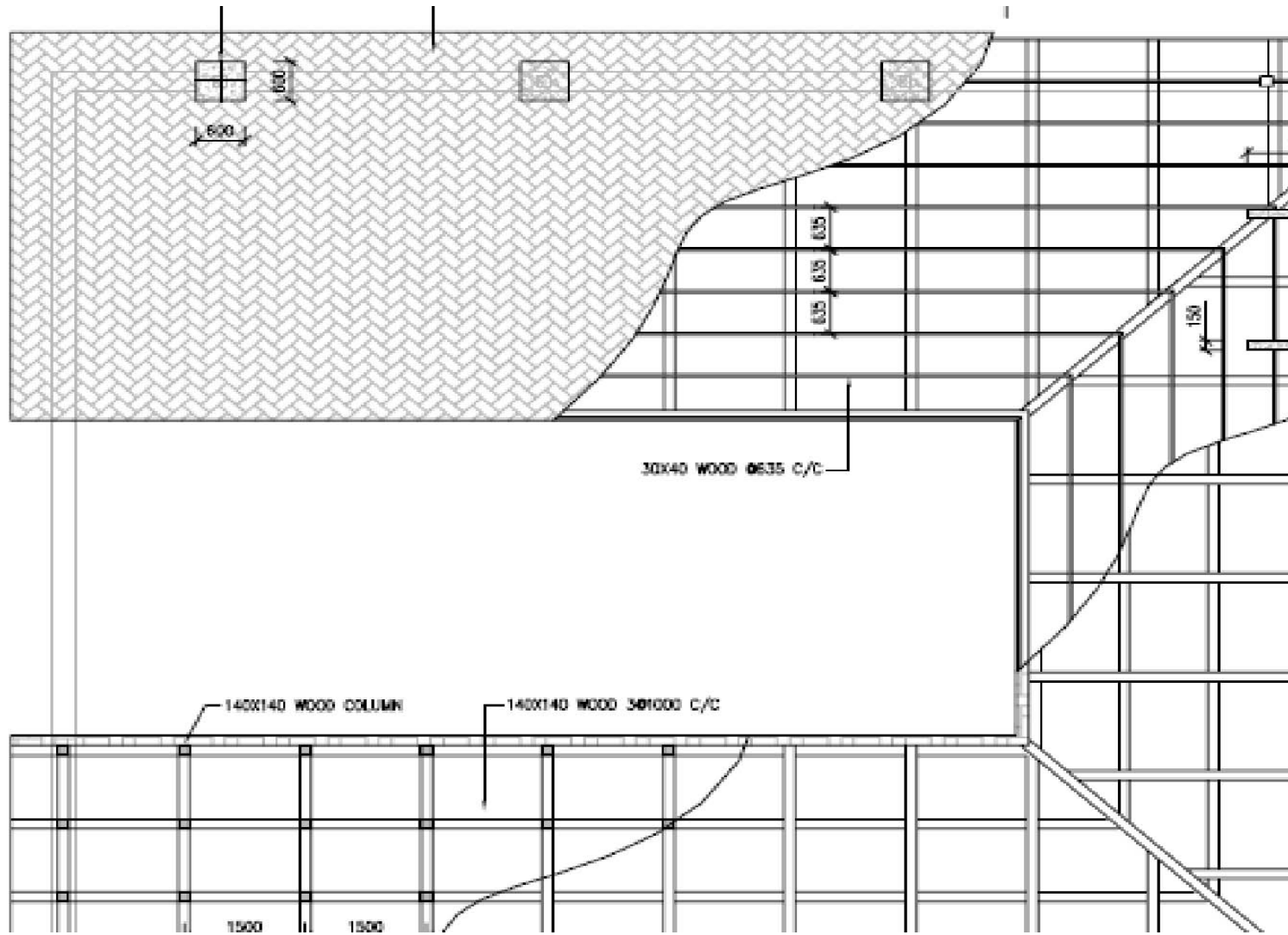
#### Non-Structural Elements:

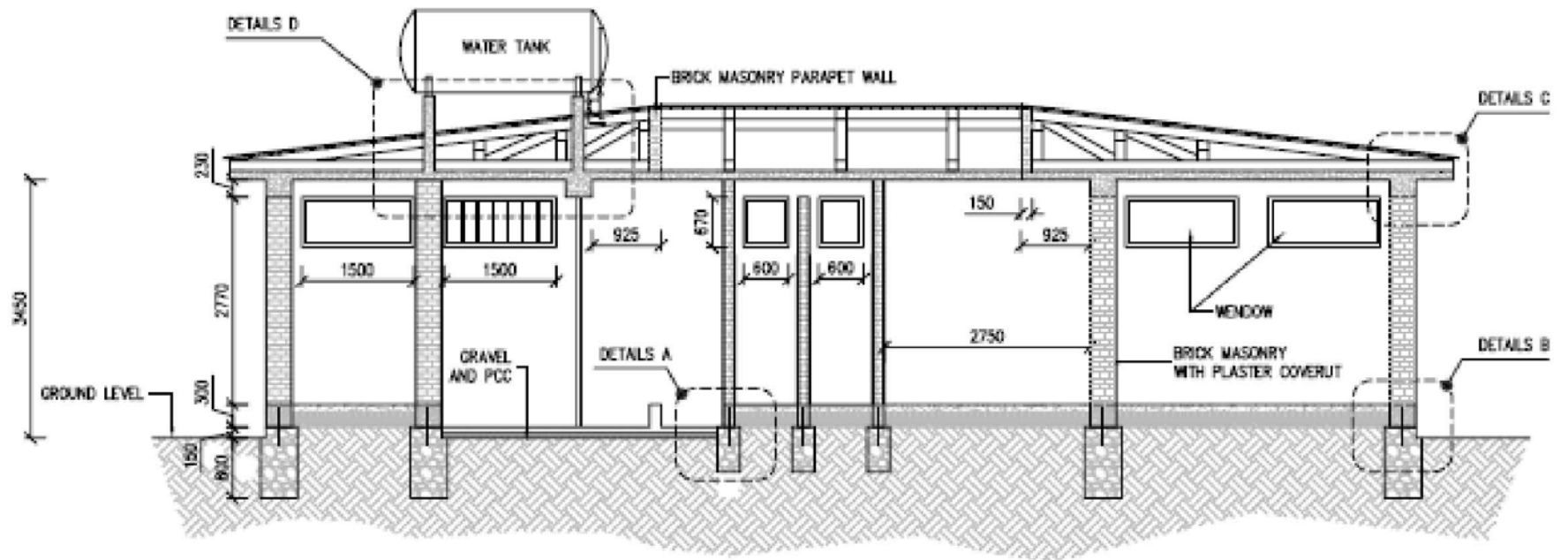
Walls: Burnt brick masonry filling the openings between columns  
Doors and windows: First class deodar wood  
Floor finishing: Ceramic tiles or plain concrete covering  
Wall finishing: Painting, plastering and tiling



### 3.3 Roof Structure

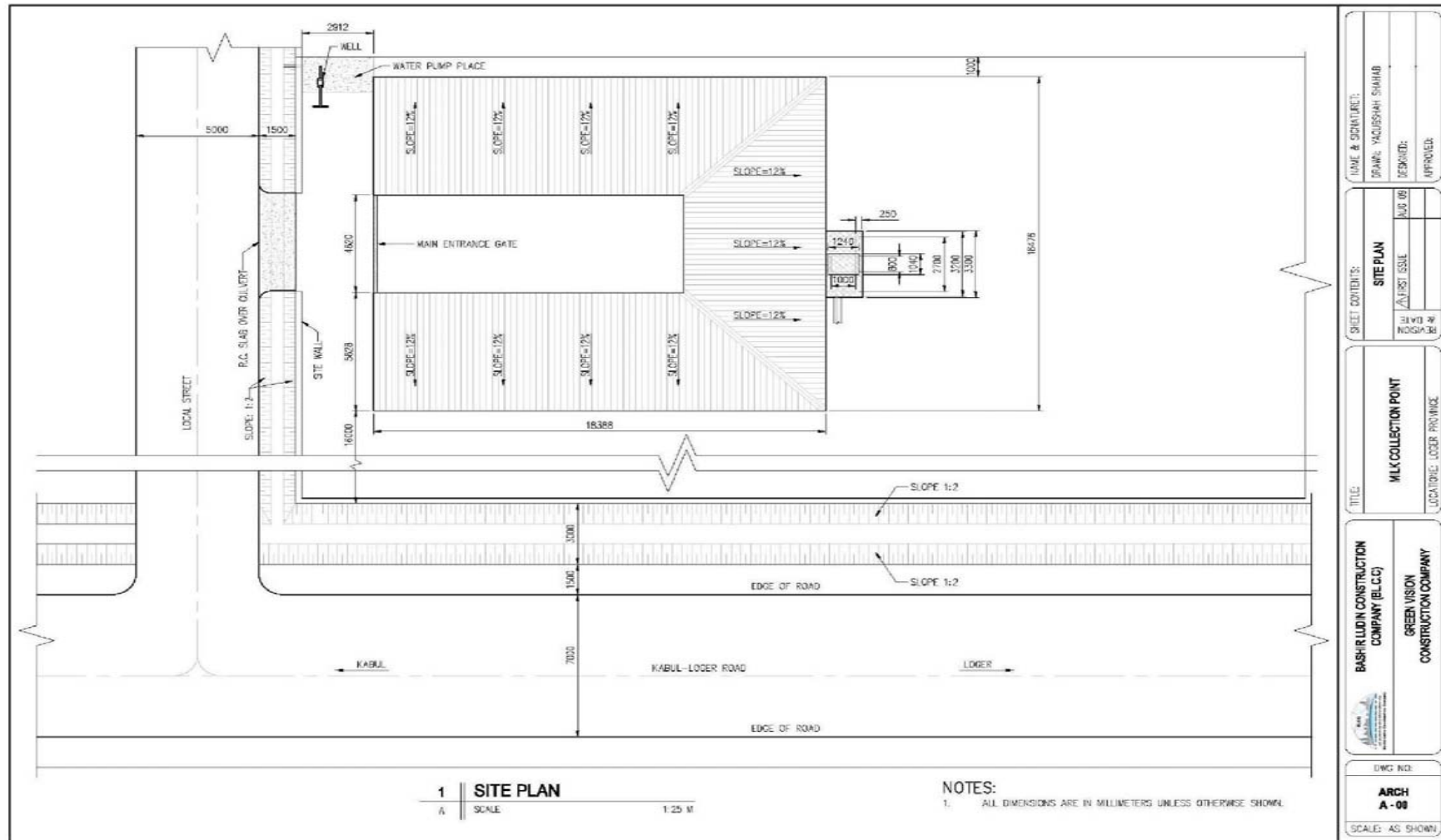
The roof structure comprises a set of trusses linked by a ridge, top plates and purlins, wooden board, waterproof underlay, roof sheeting and a GI metal sheet.





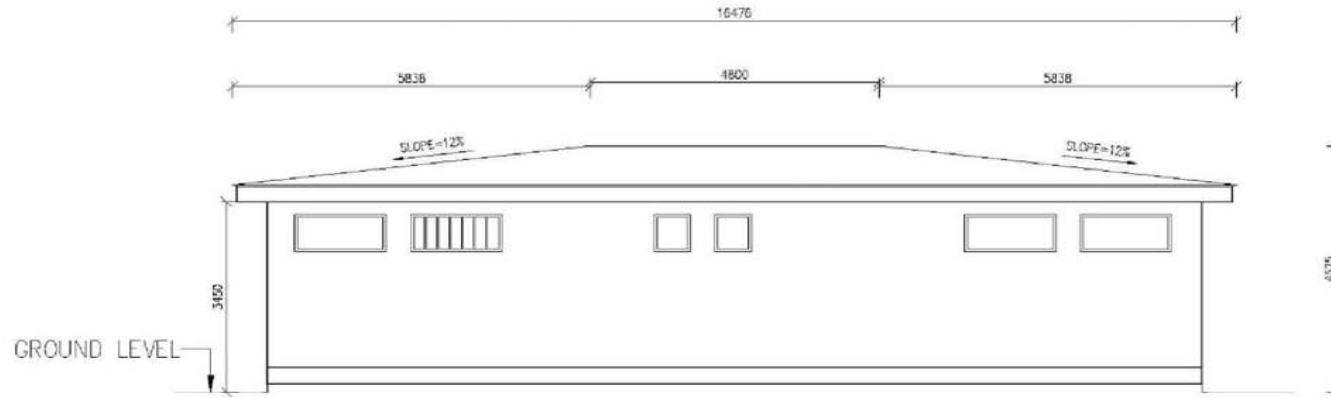
Cross Section

# 4. MCC DRAWINGS

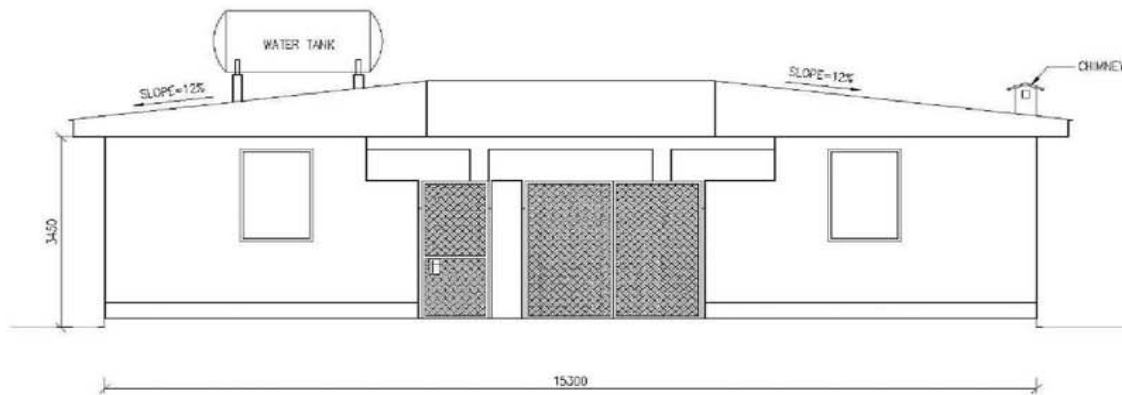


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	LOCATION: LOGER PROVINCE	
DRAWING NO:	ARCH A-08	
	SCALE: AS SHOWN	
NAME & SIGNATURE:	DRAWN: YAGHJESH SHAHAB	DESIGNED:
		APPROVED:





**1** | **BACK SIDE**  
A | SCALE: 1:75 M



**2** | **FRONT SIDE**  
A | SCALE: 1:75 M

**NOTES:**  
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

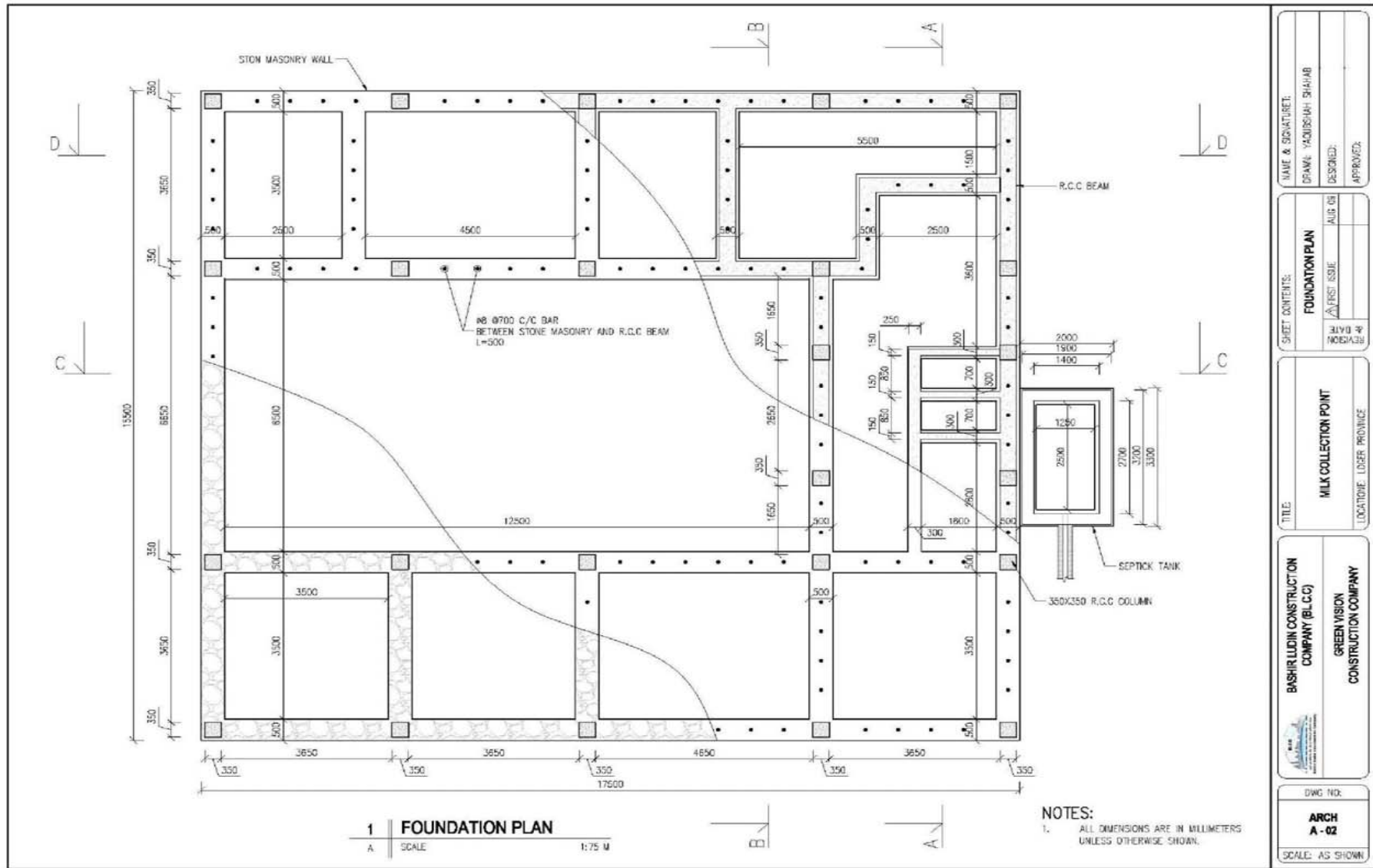
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DRAWN: YAKUSUHI SHAIAB	
DESIGNED:	
APPROVED:	

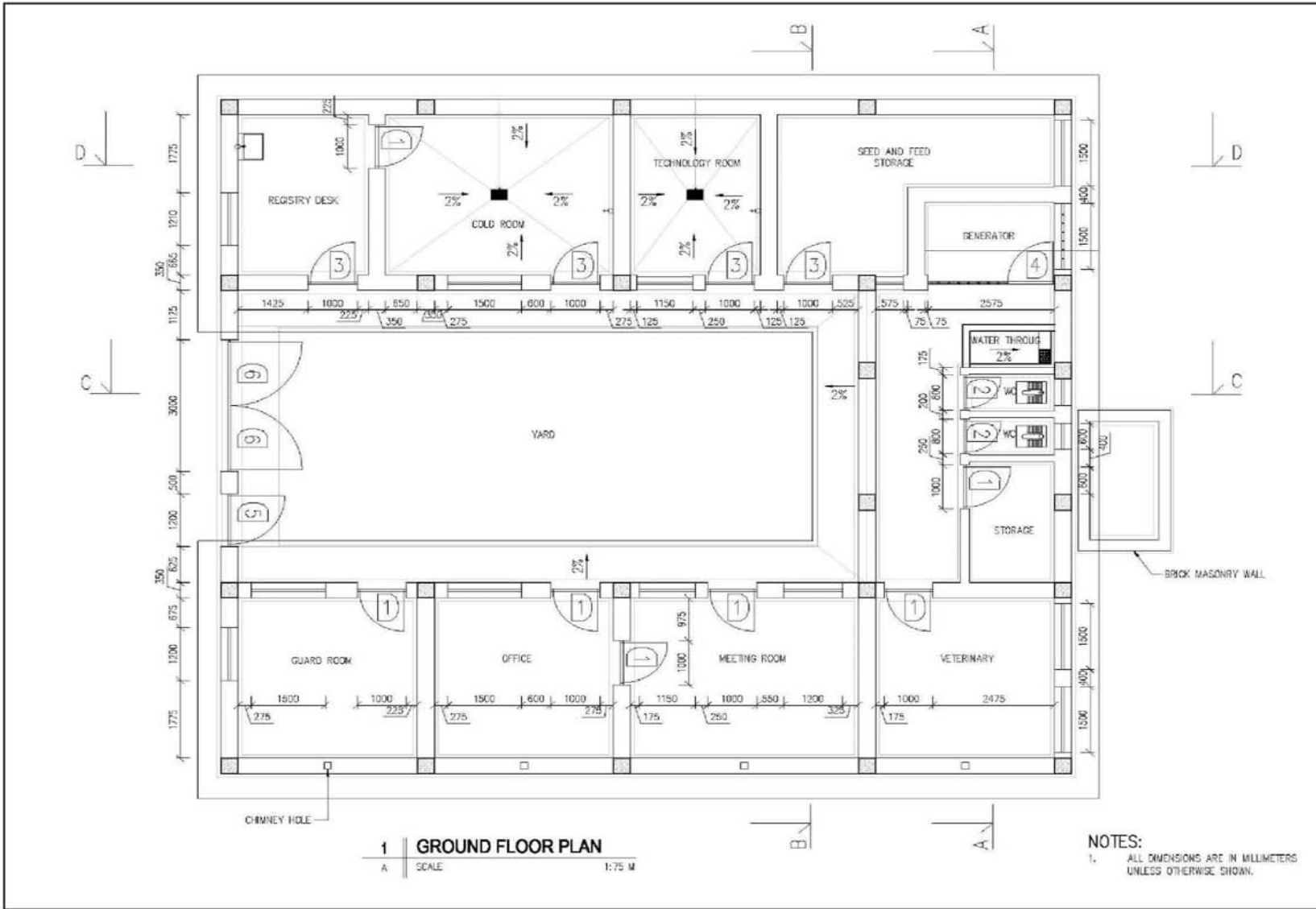
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<b>FRONT AND BACK SIDE</b>	
REVISION	DATE
1	AUG 08

TITLE:	<b>MILK COLLECTION POINT</b>
LOCATION:	LOSER PROVINCE

**BASHIR LUDIN CONSTRUCTION COMPANY (P.L.C.)**  
GREEN VISION CONSTRUCTION COMPANY

DWG NO:	<b>ARCH A-01</b>
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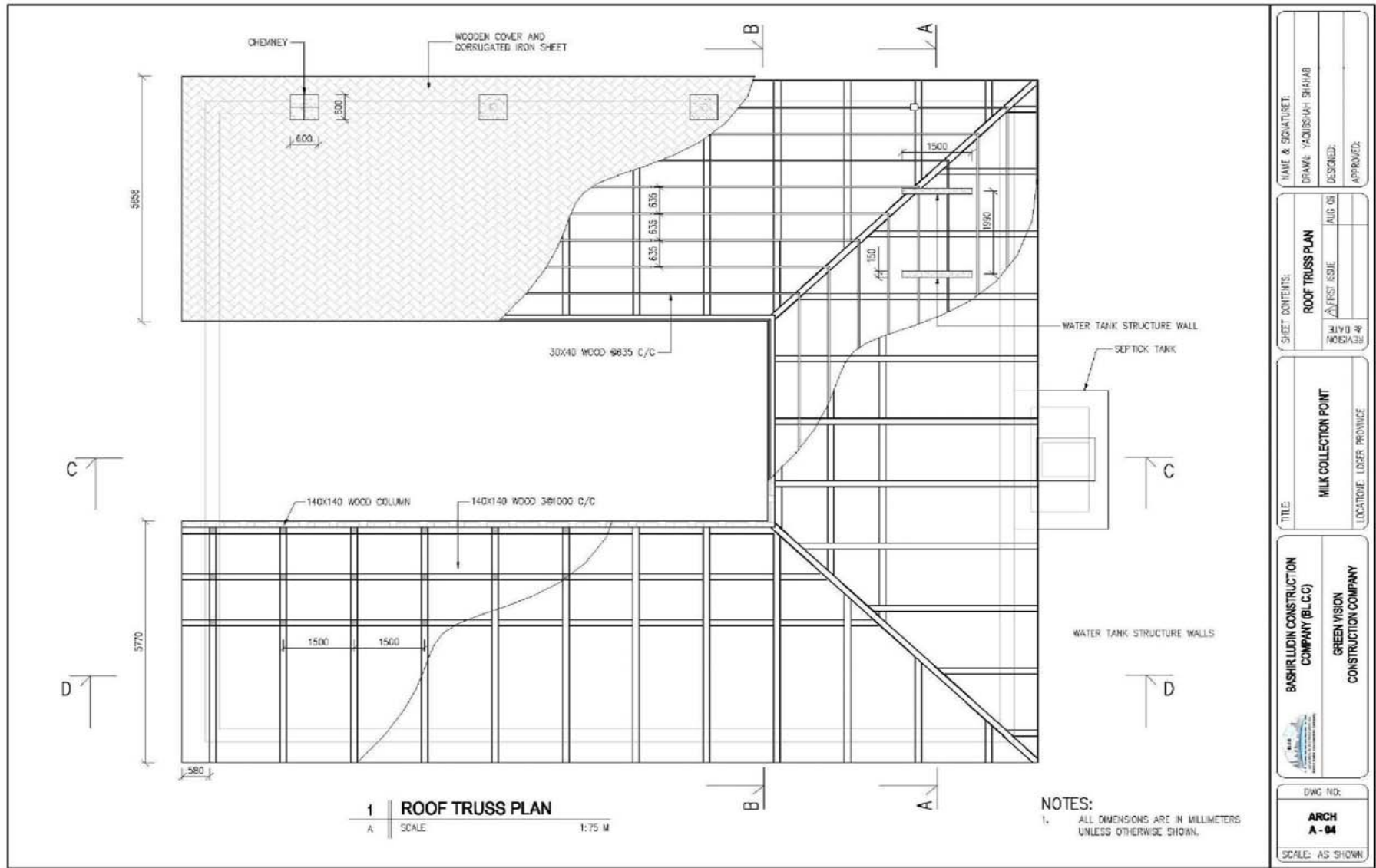




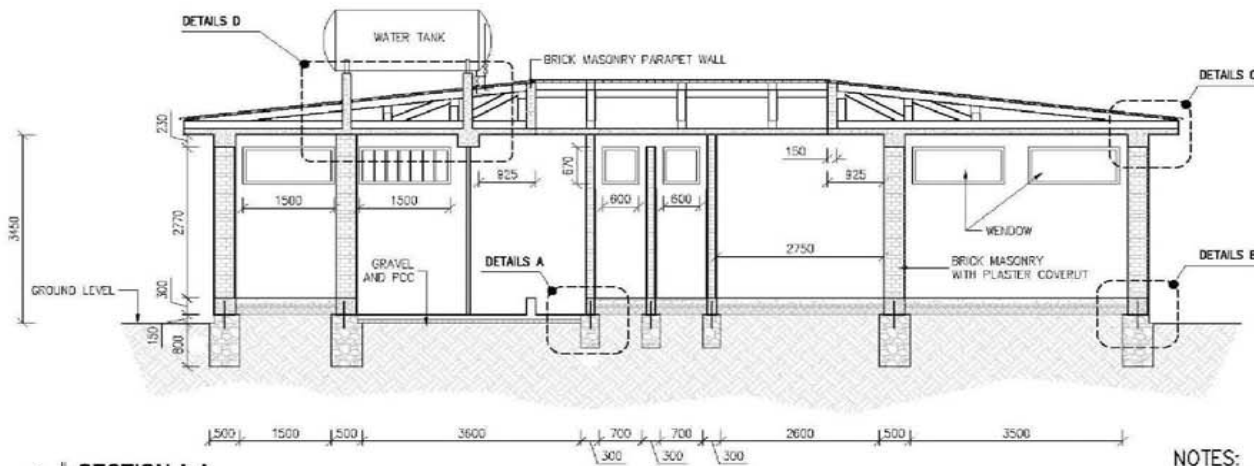
**1 GROUND FLOOR PLAN**  
 A SCALE 1:75 M

**NOTES:**  
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

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	DESIGNED: APPROVED:
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BASHIR UDDIN CONSTRUCTION COMPANY (P.L.C) GREEN VISION CONSTRUCTION COMPANY	DWG NO: <b>ARCH A-03</b> SCALE: AS SHOWN

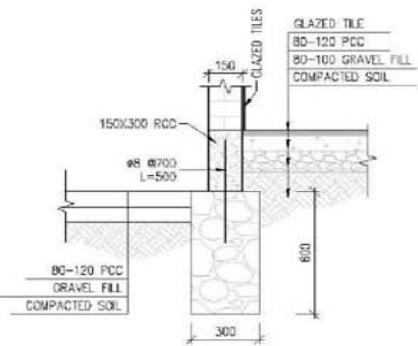


NAME & SIGNATURE:		DRAWN: YAKUBSHAH SHAHAB	
DESIGNED:		APPROVED:	
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1	1		
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<b>MLK COLLECTION POINT</b>			
LOCATION: LOSER PROVINCE			
<b>BASHIRUDDIN CONSTRUCTION COMPANY (P.L.C)</b>		<b>GREEN VISION CONSTRUCTION COMPANY</b>	
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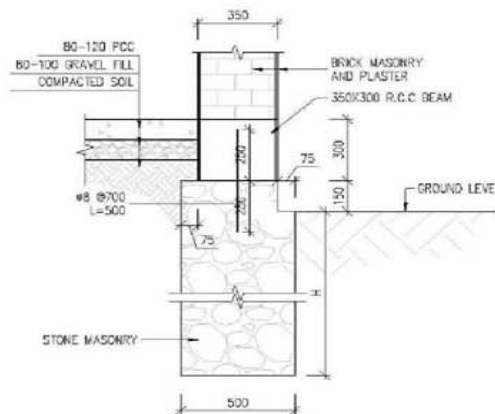


**1 SECTION A-A**  
A SCALE 1:75 M

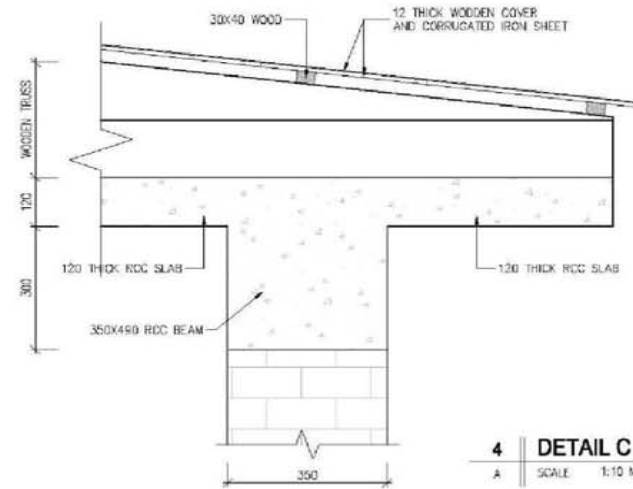
**NOTES:**  
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.  
 2. FOR DETAIL A REFER TO SHEET NO S-11.



**2 DETAIL A**  
A SCALE 1:20 M



**3 DETAIL B**  
A SCALE 1:20 M



**4 DETAIL C**  
A SCALE 1:10 M

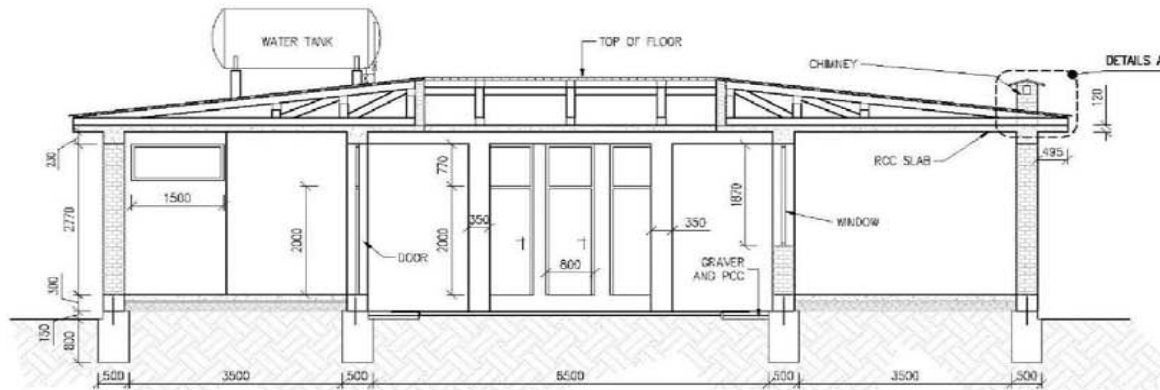
NAME & SIGNATURE:	
DRAWN: YOUSSEF SHAHAB	
DESIGNED:	
APPROVED:	

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REVISED ISSUE	DATE
REVISION	DATE

TITLE:	<b>MLK COLLECTION POINT</b>
LOCATION:	LOSER PROVINCE

<b>BASHIRUDDIN CONSTRUCTION COMPANY (P.L.C)</b>	<b>GREEN VISION CONSTRUCTION COMPANY</b>
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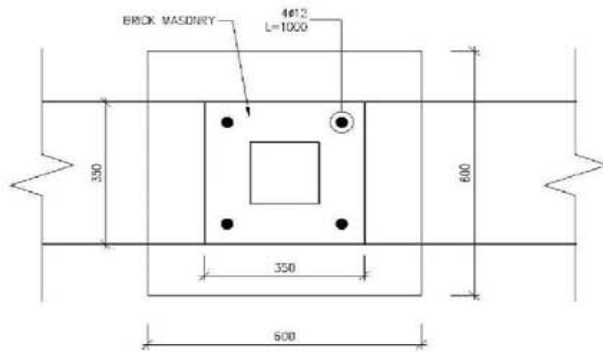


1 SECTION B-B

A SCALE 1:75 M

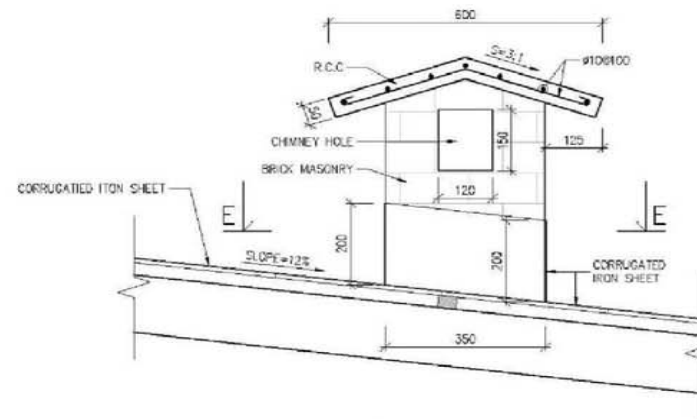
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2. FOR STRUCTURE DETAILS OF CHIMNEY REFER TO SHEET 07.



3 SECTION E - E

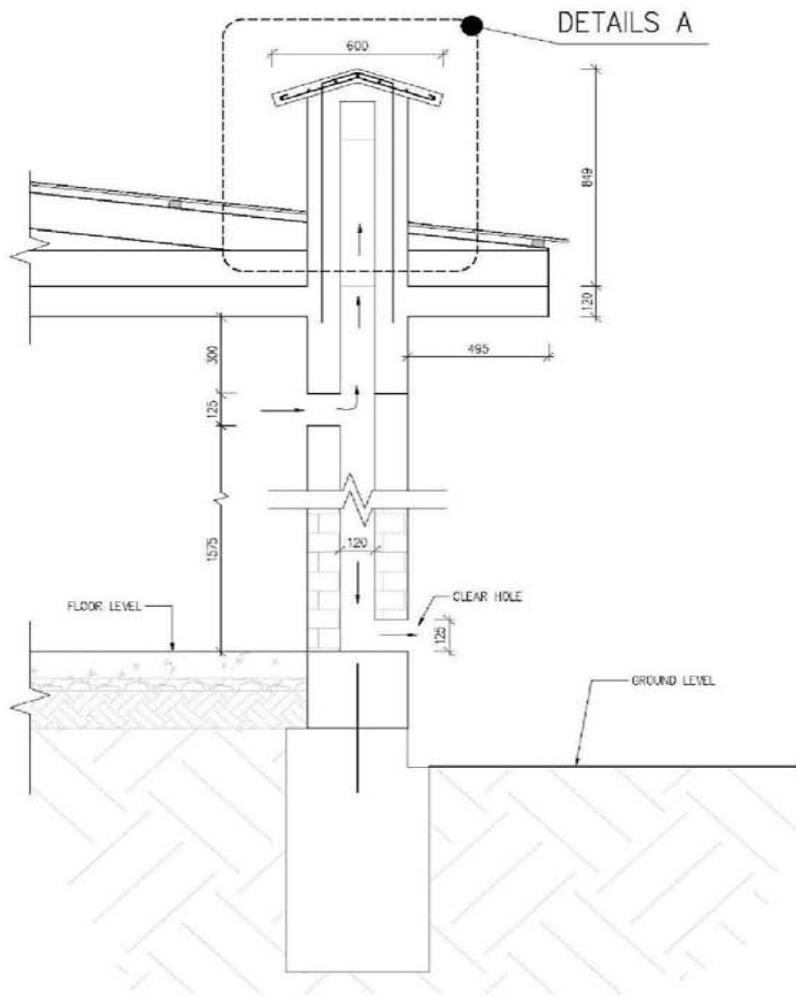
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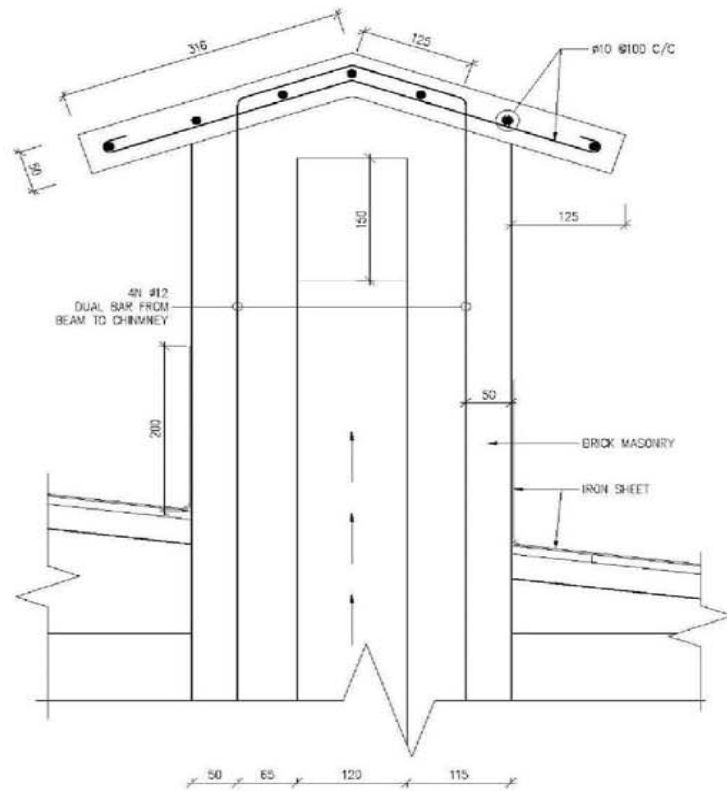
2 DETAIL A

A SCALE 1:10 M

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DESIGNED:		APPROVED:	
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FIRST ISSUE		AUG 08	
REVISION & DATE			
<b>MILK COLLECTION POINT</b>			
LOCATION: UDER PROVINCE			
BASHIR UDDIN CONSTRUCTION COMPANY (P.L.C.C)		GREEN VISION CONSTRUCTION COMPANY	
			
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SCALE: AS SHOWN			



**1 | CHIMNEY DETAIL**  
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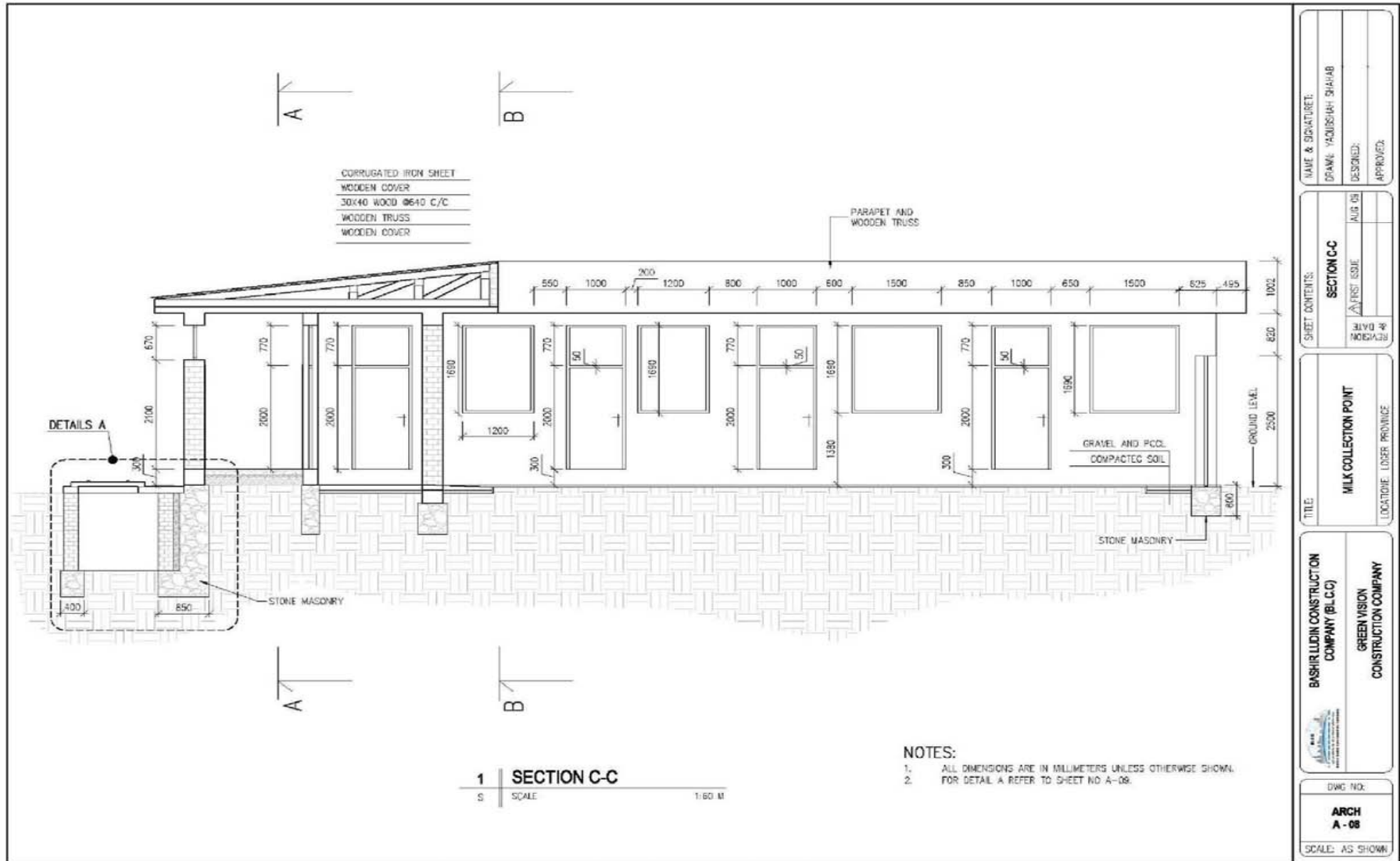


**2 | DETAIL A**  
S | SCALE 1:5 M

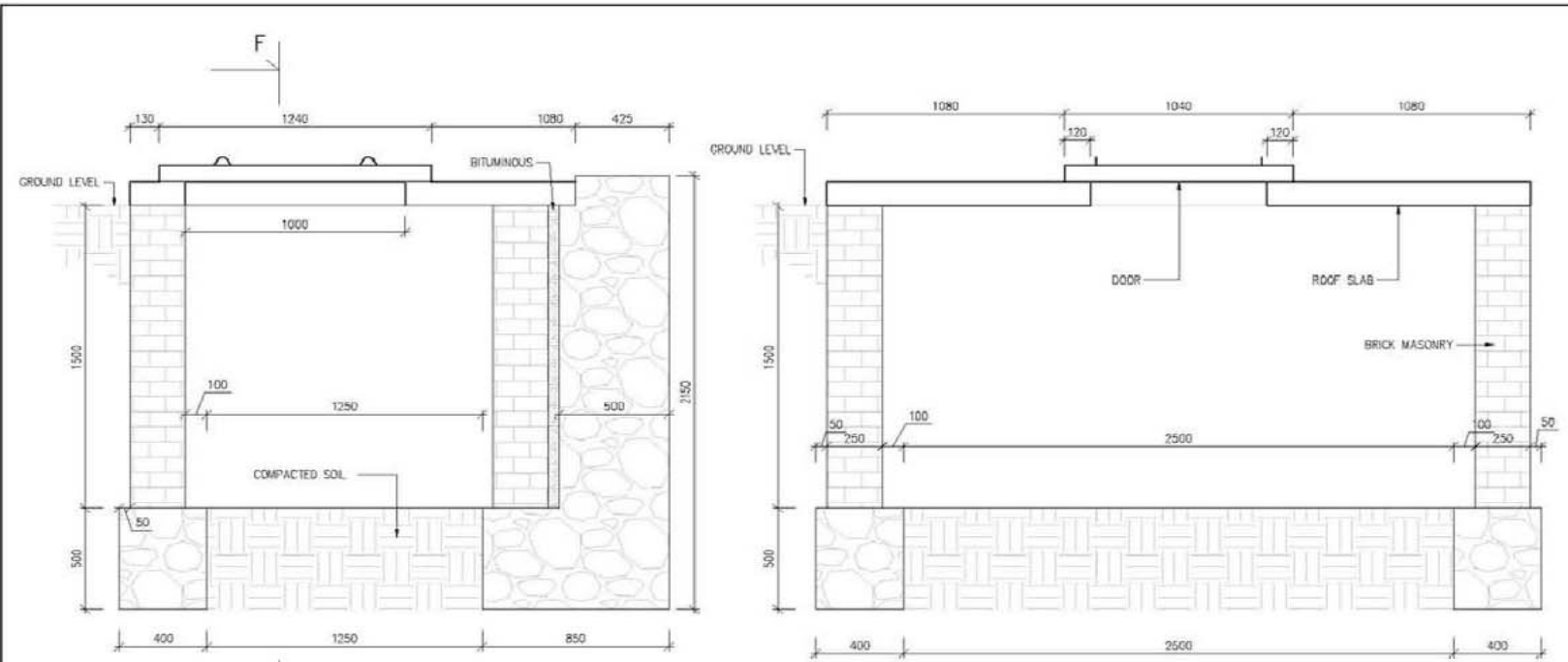
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REVISION & DATE	DATE
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LOCATION: LOSER PROVINCE	
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GREEN VISION CONSTRUCTION COMPANY	
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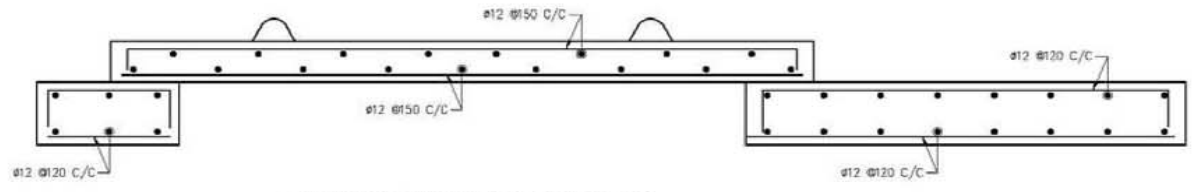






**1** | **DETAIL A**  
A | SCALE 1:20 M

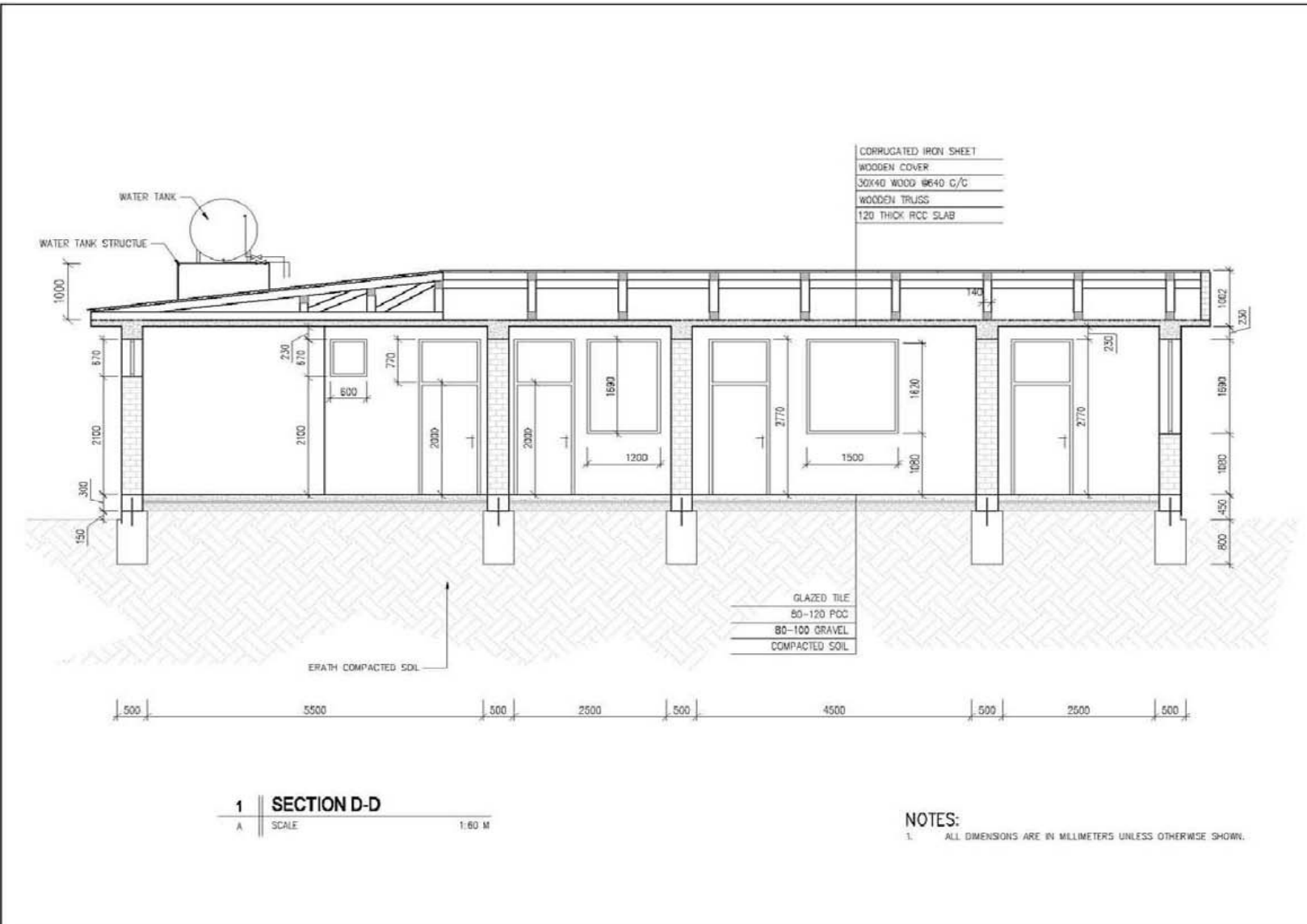
**2** | **SECTION F-F**  
A | SCALE 1:20 M



**2** | **SEPTIC SLAB REINFORCEMENT**  
5 | SCALE 1:8 M

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SHEET CONTENTS: <b>SEPTIC TANK</b> 1. FIRST ISSUE	NAME & SIGNATURE: DRAWN: YAKUBSABAH SHAHAB
	DESIGNED: APPROVED:
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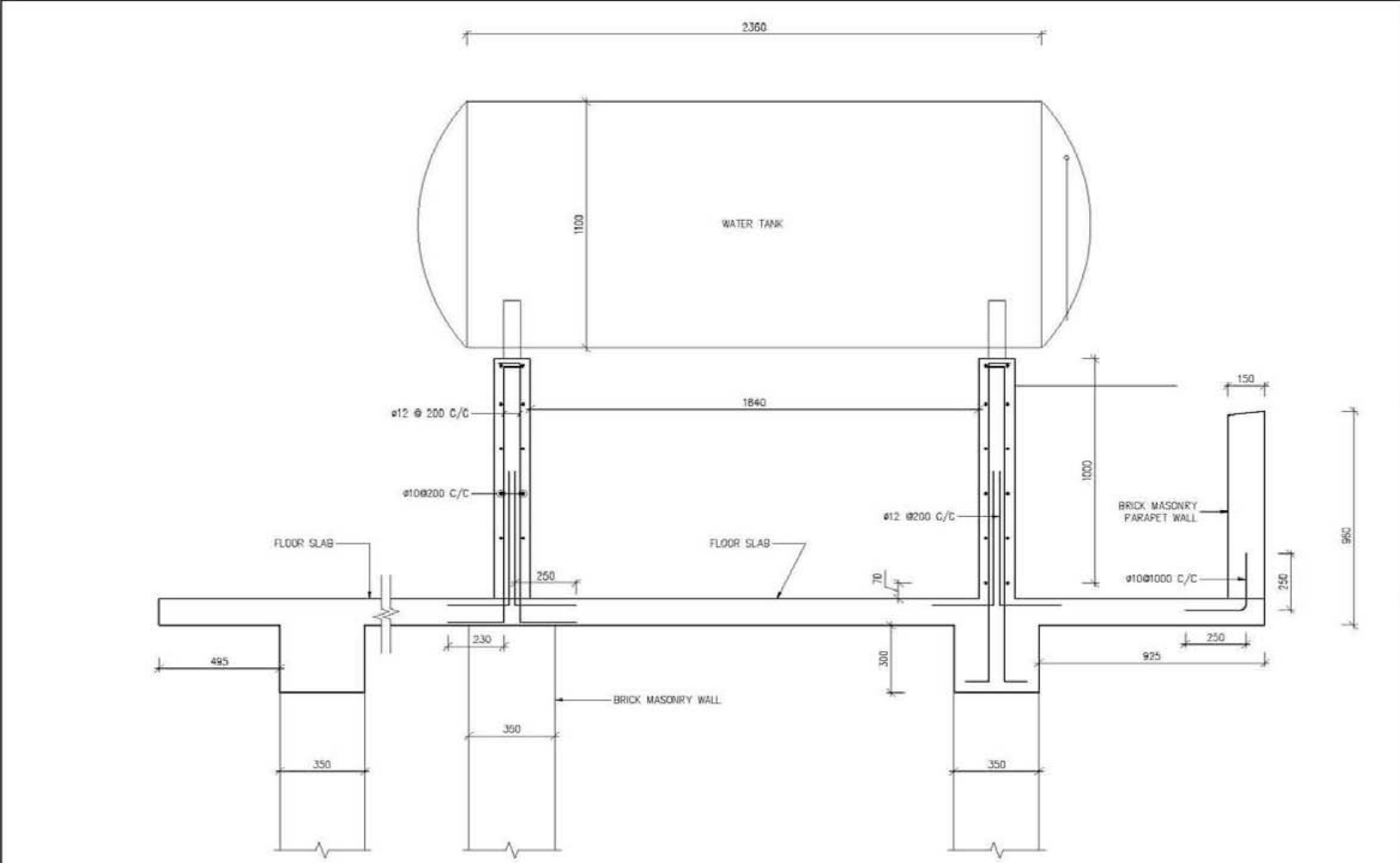
CORRUGATED IRON SHEET  
 WOODEN COVER  
 30X40 WOOD @640 C/C  
 WOODEN TRUSS  
 120 THICK RCC SLAB

GLAZED TILE  
 80-120 PCC  
 80-100 GRAVEL  
 COMPACTED SOIL

**1** SECTION D-D  
 A SCALE 1:60 M

NOTES:  
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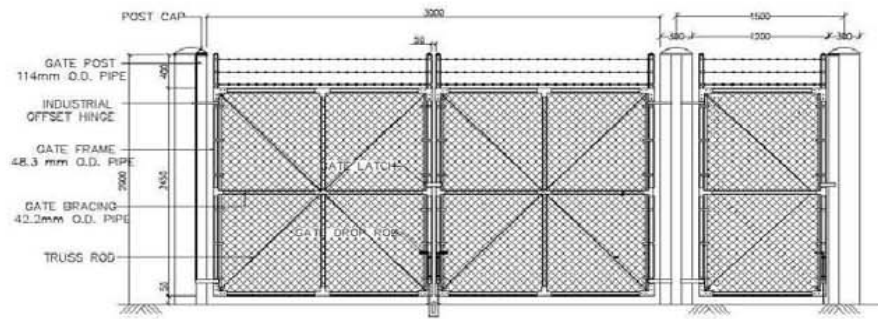
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DRAWN: YAKUBSAH SHAHAB	DESIGNED:
APPROVED:	
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NO. OF FIRST ISSUE	AUG 06
REV. DATE	REV. DATE
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MILK COLLECTION POINT	
LOCATION: LOBER PROVINCE	
BASHIR LUDIN CONSTRUCTION COMPANY (P.L.C.C)	
GREEN VISION CONSTRUCTION COMPANY	
DWG NO:	
ARCH A-10	
SCALE: AS SHOWN	



**1 WATER TANK AND PARAPET WALL STRUCTURE REINFORCEMENT**  
 S SCALE 1:16 M

**NOTES:**  
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

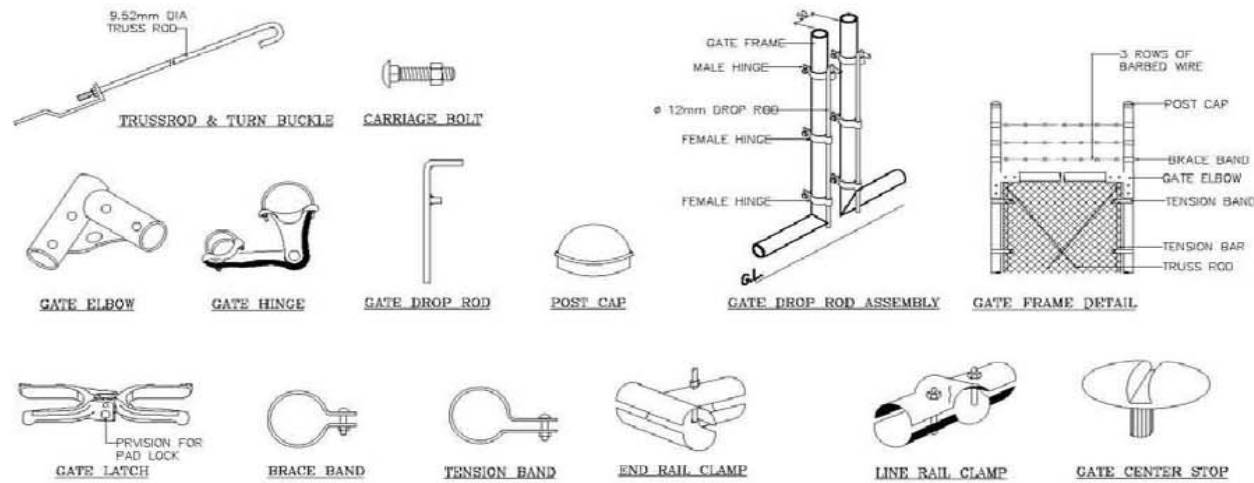
SHEET CONTENTS: <b>WATER TANK &amp; PARAPET WALL          STRUCTURE REINFORCEMENT</b>		NAME & SIGNATURE: DRAWN: YAKUBSAH SHAHAB DESIGNED: APPROVED:
REVISION # DATE	FIRST ISSUE JUL 08	
TITLE: <b>MILK COLLECTION POINT</b>		
BASHIR LUDIN CONSTRUCTION COMPANY (P.L.C.C)		LOCATION: LODER PROVINCE
GREEN VISION CONSTRUCTION COMPANY		
DWG NO: <b>ARCH          S - 11</b>		
SCALE: AS SHOWN		



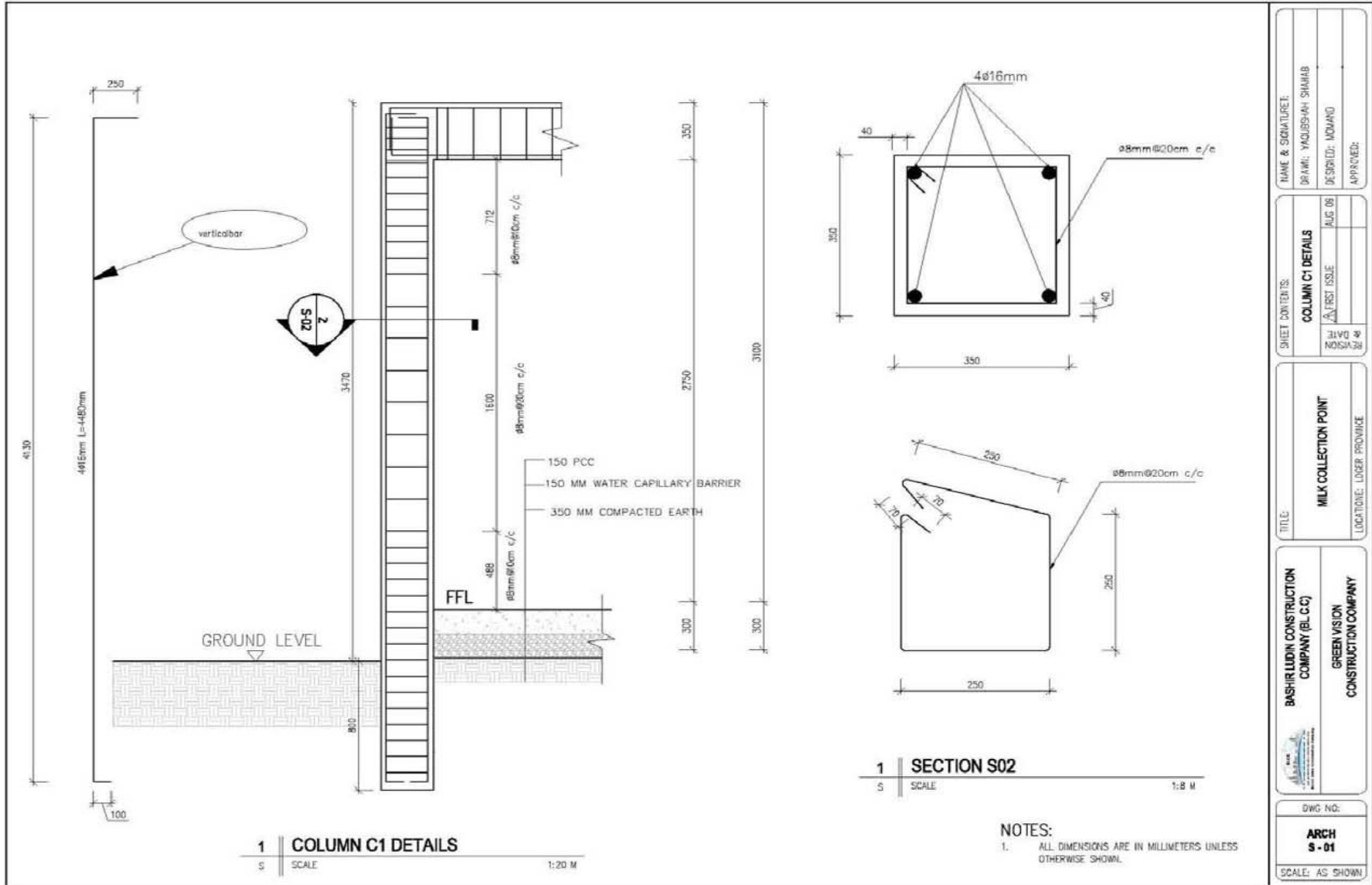
9.0M WIDE CHAIN LINK D/L GATE ELEVATION

NOTES	
GATE POST	114.3 mm O.D. x 6.02 mm WALL THK.
GATE FRAME	48.3 mm O.D. x 3.68 mm WALL THK.
GATE BRACING	42.2 mm O.D. x 3.56 mm WALL THK.
INFILL - FABRIC	3.0mm DIA GALVANISED WIRE
BARBED WIRE	STANDARD - GALVANISED
FITTINGS	GALVANISED

- 1) FABRIC - "CLICLUNK" GALVANISED CHAIN LINK FABRIC, 50 x 50mm DIAMOND MESH, 3.0mm DIA GALVANISED WIRE, FABRIC HEIGHT 2.45 M, BARBED SELVAGE.
- 2) FITTINGS :- GALVANISED.
- 3) PIPES :- ALL PIPES ARE GALVANISED, CONFORMS TO ASTM A 53, SCH - 40.
- 5) BARBED WIRE :- GALVANISED BARBED WIRE "TOWA" PATTERN, 2 PLY, 4 POINT STRAND WIRE  
2.5mm DIA BARBING WIRE 2.0mm DIA GALV., PACING BETWEEN BARBS 101 mm.



NAME & SIGNATURE: DRAWN: YAQUBSAH SHAHAB DESIGNED: APPROVED:	SHEET CONTENTS: <b>MAIN DOOR</b> 1st ISSUE AUG 08	REGION & DATE: TITLE: <b>MILK COLLECTION POINT</b> LOCATION: LODER PROVINCE
BASHIR LUDJIN CONSTRUCTION COMPANY (B.L.C.C) GREEN VISION CONSTRUCTION COMPANY		
DWG NO: <b>ARCH A - 012</b>		
SCALE: AS SHOWN		



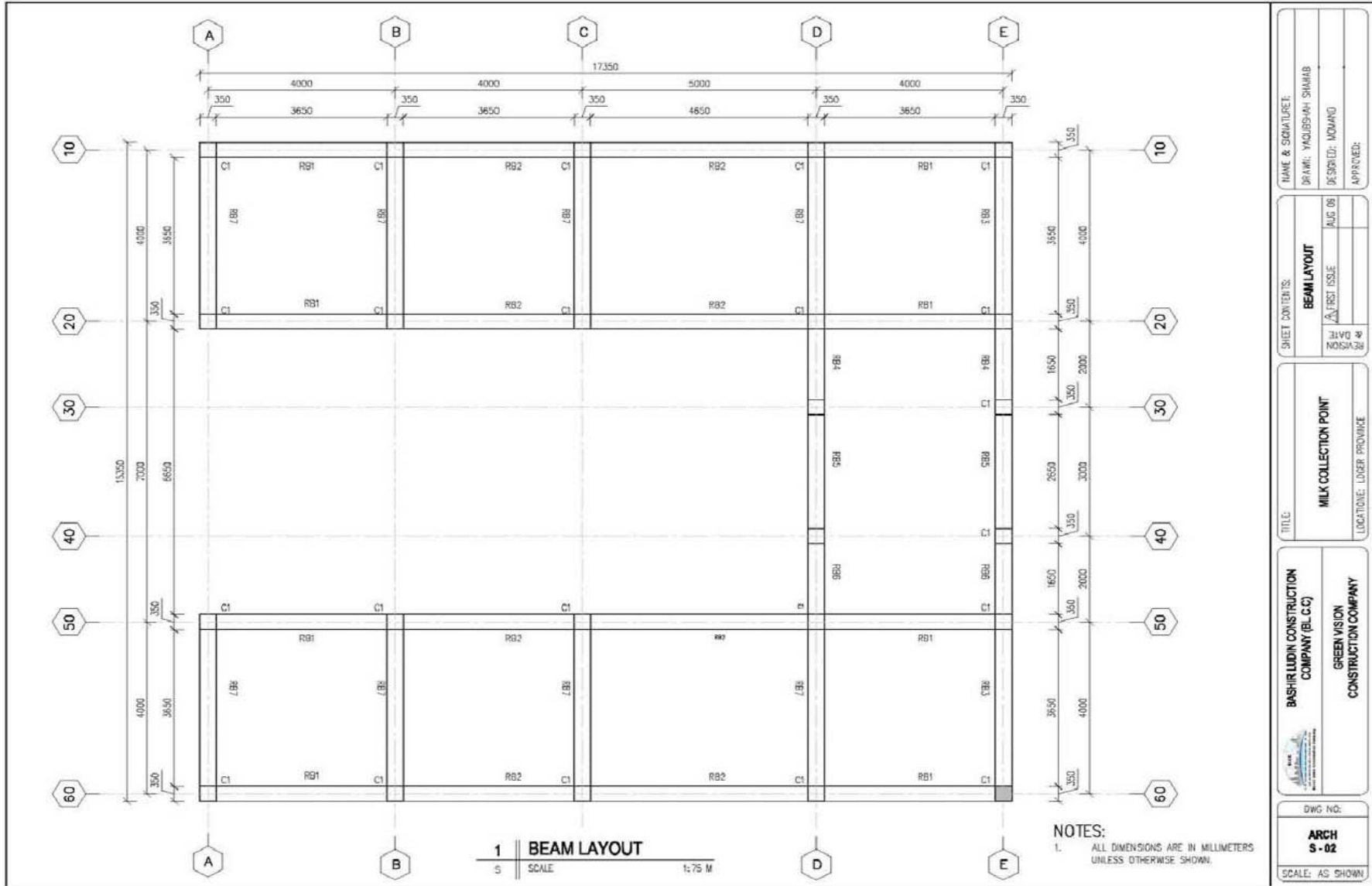
NAME & SIGNATURE:	
DRAWN: YACUBSAH SHAAB	DESIGNED: NOMANG
DATE: AUG 08	APPROVED:

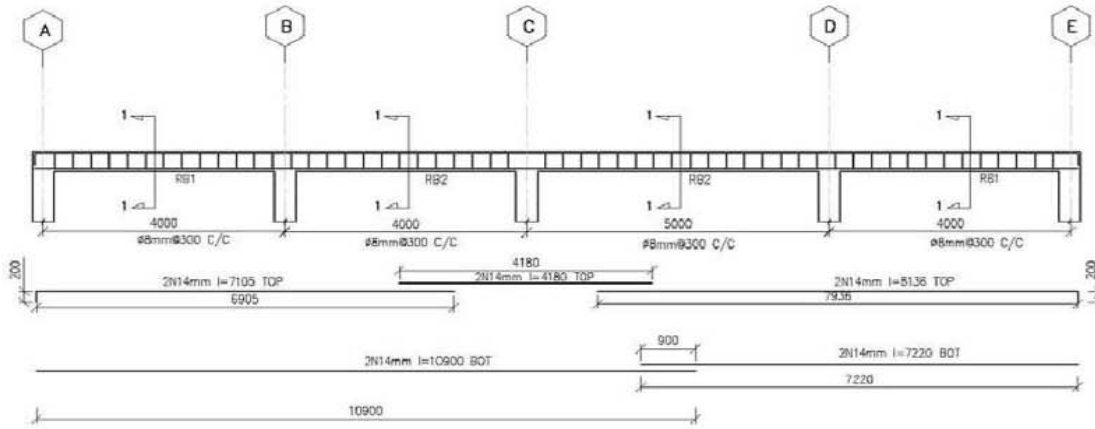
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COLUMN C1 DETAILS	
REVISION #	DATE
1	AUG 08

TITLE:	MILK COLLECTION POINT
LOCATION:	LOBER PROVINCE

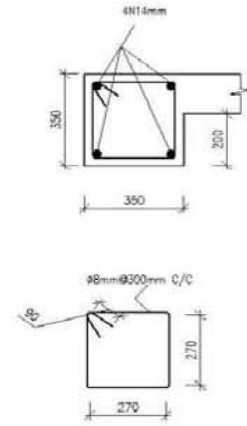
BASHIR LUDIN CONSTRUCTION COMPANY (B.L.C.C)	GREEN VISION CONSTRUCTION COMPANY
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DWG NO:	ARCH S-01
SCALE: AS SHOWN	

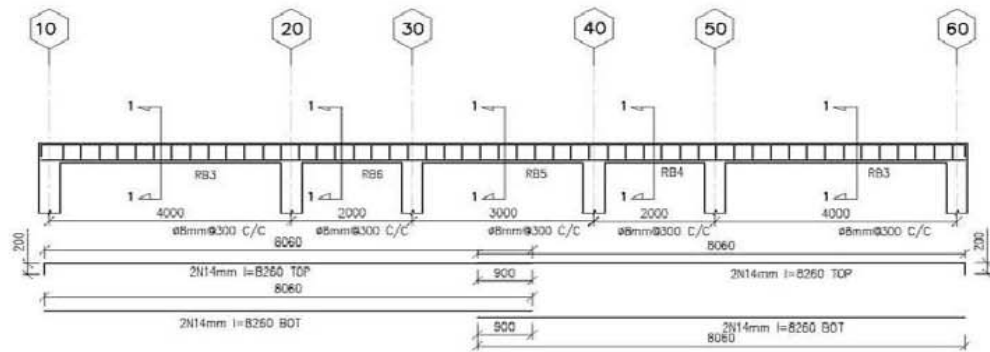




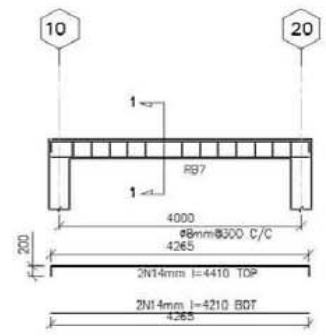
**1 | RB 1 & RB-2 DETAILS**  
SCALE 1:75 M



**4 | SECTION 1-1**  
SCALE 1:15 M



**2 | RB-4 RB-5 & RB-6 DETAILS**  
SCALE 1:75 M

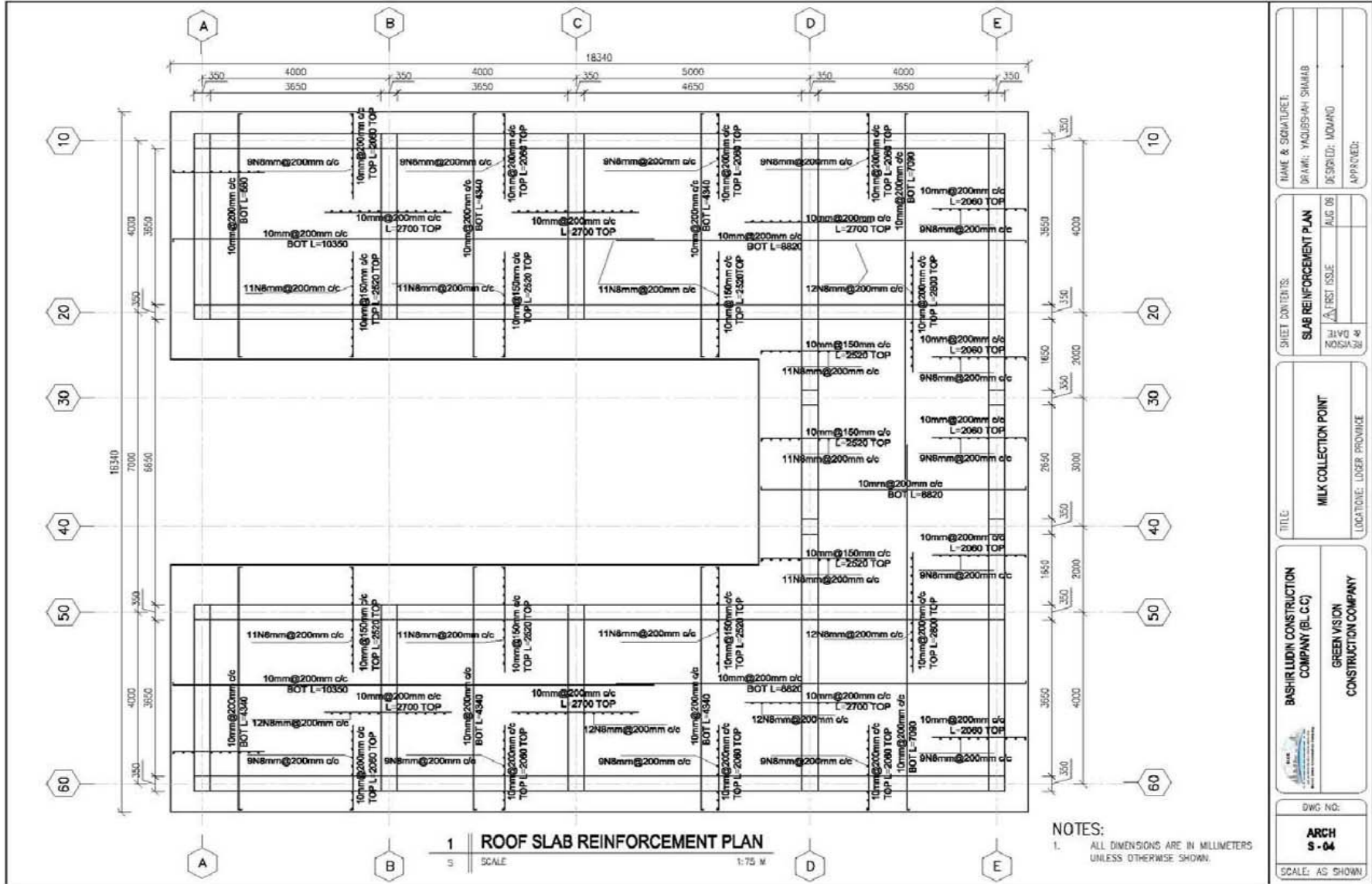


**3 | RB-2 DETAILS**  
SCALE 1:75 M

**NOTES:**  
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

NAME & SIGNATURE:		DRAWN: YACUBSAH SHAHAB	
DESIGNED: MOMANG		APPROVED:	
SHEET CONTENTS:		DATE: 05/05/2024	
BEAM REINFORCEMENT DETAILS		PROJECT ISSUE: AUC 05	
MILK COLLECTION POINT		LOCATION: LODER PROVINCE	
BASHIR LUDIN CONSTRUCTION COMPANY (B.L.C.C)		GREEN VISION CONSTRUCTION COMPANY	
DWG NO: ARCH S-03		SCALE: AS SHOWN	





SHEET CONTENTS: <b>SLAB REINFORCEMENT PLAN</b> NO. DATE 1/ FIRST ISSUE 2/	NAME & SIGNATURE: DRAWN: YAGUBSAH SHAHAB DESIGNED: NOMANG APPROVED:	TITLE: <b>MILK COLLECTION POINT</b> LOCATION: LIDER PROVINCE
BASHIR LUDIN CONSTRUCTION COMPANY (P.L.C.C) GREEN VISION CONSTRUCTION COMPANY		DWG NO: <b>ARCH S-04</b>
		SCALE: AS SHOWN



## **ABOUT THE CZECH PROVINCIAL RECONSTRUCTION TEAM**

The Czech Provincial Reconstruction Team (PRT) has been assisting Logar since March 2008 as part of NATO ISAF. It consists of ten civilian experts (Head of Civilian Team, Project Manager, Agricultural Advisor, three Civil Engineers, Veterinary Doctor, Security Projects Officer, Media Officer, and Finance Admin Officer – all from the Foreign Ministry of the Czech Republic) and 288 Czech Army soldiers.

The Czech PRT is working in conformity with Afghan and provincial core development documents (Afghan National Development Strategy, Provincial Development Program) and in close cooperation with district and provincial authorities. Outside of this, frequent consultations are being held with local communities, elders (shuras) and with development branches of ISAF members, especially the US Army.

The Czech PRT's development strategy is based on long term solutions, which are preferred over quick impact projects. The PRT emphasizes sustainability, Afghan participation, and transparency. Projects are always planned together with the provincial government and on the basis of needs assessments. Responsibility for and acceptance of reconstruction projects by the Afghans are among the expected results of this strategy.



## Milk Collection Centre Construction Guide

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Ministry of Foreign Affairs of the Czech Republic ([www.mzv.eu](http://www.mzv.eu))

Czech University of Life Sciences Prague ([www.czu.cz](http://www.czu.cz))



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