



# Islamic Republic of Afghanistan

## Ministry of Rural Rehabilitation and Development

### Engineering Department



There are a total of 31 typical school designs, including boundary walls and latrines, have been developed by design engineers from the Ministry of Education (MOE) and the Ministry of Rural Rehabilitation and Development (MRRD), with technical support by the non-governmental organization Danish Assistance to Afghan Rehabilitation and Technical Training (DAARTT) appointed by the World Bank.

The designs have been made for 6, 8 and 10 classroom schools in combinations with different material for walls (stone, burnt brick, compressed, stabilized earth blocks (SCEB) and mud), different types of roof (I-beam (flat and vaulted), RCC, pre-cast RCC, truss roof (wooden and metal)), different degrees of reinforcement for resistance of seismic events, and with clear heights of 300cm (for relatively warm areas) or 275cm (for relatively cold areas, or disaster risk areas where more stability is required). In addition, designs for Latrine Blocks and Boundary walls have also been developed.

Type	S.No	Drawing Title	Prepared by	Date Prepared
General	G	Aprovel Cover Page	DAARTT	08.11.2018
	G0	General Notes DRR	Dr. Halim	22.07.2018
Architecture	G	Cover Sheet	Ziaurahman Zia	12.08.2018
	G	Drawing List	Ziaurahman Zia	12.08.2018
	G	General Notes	Ziaurahman Zia	12.08.2018
	A01	Ground Floor Plan	Ziaurahman Zia	12.08.2018
	A02	Furniture Plan	Ziaurahman Zia	12.08.2018
	A03	Pavement Plan	Ziaurahman Zia	12.08.2018
	A04	Front Elevation	Ziaurahman Zia	12.08.2018
	A05	Back Elevation	Ziaurahman Zia	12.08.2018
	A06	Side Elevation	Ziaurahman Zia	12.08.2018
	A07	Section A-A	Ziaurahman Zia	12.08.2018
	A08	Section B-B	Ziaurahman Zia	12.08.2018
	A09	Roof Plan	Ziaurahman Zia	12.08.2018
	A10	Plan & section with detail of 12 Rump hand railing	Ziaurahman Zia	12.08.2018
	A11	Plan & section & Elevation of Black Board	Ziaurahman Zia	12.08.2018
	A12	Details of Door	Ziaurahman Zia	12.08.2018
	A13	Details of windows	Ziaurahman Zia	12.08.2018
	A14	Details & section of Door & windows	Ziaurahman Zia	12.08.2018
	A15	Detail of Floor PCC Concrete	Ziaurahman Zia	12.08.2018
	A16	Detail of ( 5,6 )	Ziaurahman Zia	12.08.2018
	A17	Detail of ( 3,4 )	Ziaurahman Zia	12.08.2018
	A18	Detail of ( 1,2 )	Ziaurahman Zia	12.08.2018
	A19	Detail of ( 7,8,9,10 )	Ziaurahman Zia	12.08.2018
	A20	Details of 13 Flower pot	Ziaurahman Zia	12.08.2018
	A21	Detail of 14 Chimney Cup	Ziaurahman Zia	12.08.2018
Structure	01	Cover Sheet	Eng. Rahim	Jun-18
	02	General Notes	Eng. Rahim	Jun-18
	03	Foundation Plan	Eng. Rahim	Jun-18
	04	Foundation Details	Eng. Rahim	Jun-18
	05	Reinforcement Bars of ring Beams on stone masonry and R.B NO : 3	Eng. Rahim	Jun-18
	06	Structure walls	Eng. Rahim	Jun-18
	07	Shuttering plan for Roof Slab	Eng. Rahim	Jun-18
	08	Roof RCC Rings and Beams plan	Eng. Rahim	Jun-18
	09	Reinforcement bars of ring beams No:1-2	Eng. Rahim	Jun-18
	10	Reinforcement bars of ring beams No:4,5,6	Eng. Rahim	Jun-18
	11	Beams no: 1-2 : Detail	Eng. Rahim	Jun-18
	12	Beams no: 3-4 : Detail	Eng. Rahim	Jun-18
	13	Reinforcement bars plan for Roof slab	Eng. Rahim	Jun-18
	14	Reinforcement bars of ring beams No:7 and Parapet Details	Eng. Rahim	Jun-18
Electrical	E1	Specifications and Equipment's	Eng. Abdul Qader	07.08.2018
	E2	Power Plan	Eng. Abdul Qader	07.08.2018
	E3	Socket Plan	Eng. Abdul Qader	07.08.2018
	E4	Electric instrument Details	Eng. Abdul Qader	07.08.2018

The above drawings have to be read in conjunction with the Technical Specifications, Note on application of EQRA designs and the Categorization of EQRA provinces.  
The authorized signatories from the following ministries / organization have affixed their signatures on this note on ..... (insert date) as a token of their approval for the use of the above drawings for construction of schools and facilities planned under EQRA.

## 6 CLASSROOM

### BURNT BRICK WALL

### RCC ROOF H=2.75 M

Signed by Mr. Abdul Momin Razi.....  
who is duly authorized by the Minister of Education to sign on behalf of the Ministry of Education to certify that the above drawings meet the functional and space requirements of the Ministry of Education for schools and other supporting facilities.

SIGNATURE -1

Date: 13/11/2018

Signed by Mr. Eng. Shukur Ali.....  
who is duly authorized by the Minister of Rural Rehabilitation and Development (MRRD) to sign on behalf of the Ministry of Rural Rehabilitation and Development (MRRD) to certify that the above drawings meet the architectural, structural and electrical safety norms in Afghanistan.

SIGNATURE -1

Date: 13/11/2018

Signed by Mr. Eng. M. P. Agha.....  
who is duly authorized by the Danish Assistance to Afghan Rehabilitation and Technical Training (Daartt) to sign on their behalf to certify that the above drawings have been prepared under their guidance and can be adopted for construction.

SIGNATURE -1

Date: 13/11/2018

G

Aprovel  
cover sheet



## EARTHQUAKE ZONES

### LIST OF PACKAGES

#### 6- CLASSROOM PACKAGES

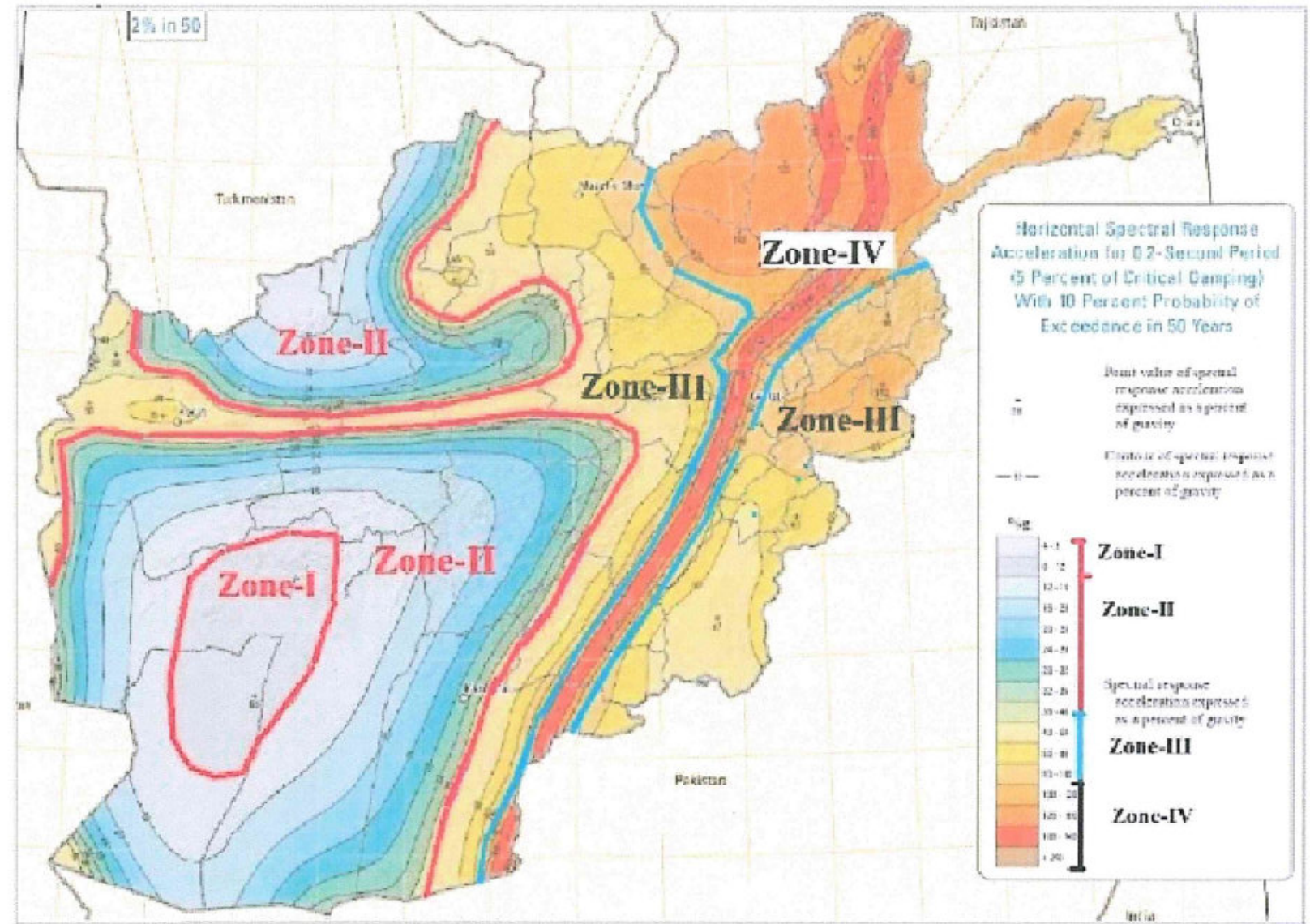
	ZONE-I	ZONE-II	ZONE-III	ZONE-IV
1- Burnt brick wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
2- Burnt brick wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
3- Burnt brick wall with vaulted roof H275cm	[√]	[√]	[√*]	[X]
4- Burnt brick wall with vaulted roof H300cm	[√]	[√]	[√*]	[X]
5- Burnt brick wall with PreCast roof H300cm	[√]	[√]	[√*]	[X]
6- Stone Masonry wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
7- Stone Masonry wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
8- Burnt Brick wall with RCC roof DRR	[√]	[√]	[√]	[√]
9- Mud wall with vaulted roof H300cm	[√]	[√]	[√*]	[X]
10- SCEB20 wall with vaulted roof H275cm	[√]	[X]	[X]	[X]
11- SCEB25 wall with vaulted roof H275cm	[√]	[√]	[X]	[X]

#### 8- CLASSROOM PACKAGES

	ZONE-I	ZONE-II	ZONE-III	ZONE-IV
1- Burnt brick wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
2- Burnt brick wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
3- Burnt brick wall with vaulted roof H275cm	[√]	[√]	[√*]	[X]
4- Burnt brick wall with vaulted roof H300cm	[√]	[√]	[√*]	[X]
5- Burnt brick wall with PreCast roof H300cm	[√]	[√]	[√*]	[X]
6- Stone Masonry wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
7- Stone Masonry wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
8- Burnt Brick wall with RCC roof DRR	[√]	[√]	[√]	[√]
9- SCEB20 wall with vaulted roof H275cm	[√]	[X]	[X]	[X]
10- SCEB25 wall with vaulted roof H275cm	[√]	[√]	[X]	[X]

#### 10- CLASSROOM PACKAGES

	ZONE-I	ZONE-II	ZONE-III	ZONE-IV
1- Burnt brick wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
2- Burnt brick wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
3- Burnt brick wall with vaulted roof H275cm	[√]	[√]	[√*]	[X]
4- Burnt brick wall with vaulted roof H300cm	[√]	[√]	[√*]	[X]
5- Burnt brick wall with PreCast roof H300cm	[√]	[√]	[√*]	[X]
6- Stone Masonry wall with RCC roof H275cm	[√]	[√]	[√*]	[X]
7- Stone Masonry wall with RCC roof H300cm	[√]	[√]	[√*]	[X]
8- Burnt Brick wall with RCC roof DRR	[√]	[√]	[√]	[√]
9- SCEB20 wall with vaulted roof H275cm	[√]	[X]	[X]	[X]
9- SCEB25 wall with vaulted roof H275cm	[√]	[√]	[X]	[X]







Islamic Republic of Afghanistan  
Ministry of Rural Rehabilitation and Development  
Engineering Department



**ARCHITECTURAL  
DRAWINGS**

**6 CLASS ROOM**

**BURNT BRICK WALL**  
**RCC ROOF H=2.75 M**



G  
00 COVER SHEET FOR 6 CLASS ROOM RCC SLAB  
SCALE: A3



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



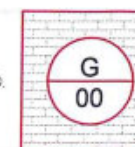
PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN ZIAURAHMAN ZIA  
PREPLANNED & CHECKED BY DAARTT  
TECH- APPROVED BY

Combined technical  
team MOE/MRRD/DAARTT  
SCALE AS SHOWN (A3)  
DATE 12/08/2018

PROJECT NAME 6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE Ground Floor Plan (cover sheet)


SHEET NO.





# 6 CLASS ROOM

Burnt Brick wall  
RCC Slab H=275

Support member	Ziaurahman Zia	
Design by	M.Rahim	
Check & Review by	DAARTT	
Approved by	MINISTRY OF EDUCATION	

## DRAWINGS LIST

### ARCHITECT LIST

SHEET NUMBER	SHEET NAME
01	DRAWINGS LIST FOR 6 CLASS ROOM PRECAST SLAB
02	SYMBOLS & GENERAL NOTE
A1	GROUND FLOOR PLAN
A2	FURNITURE FLOOR PLAN
A3	PAVEMENT PLAN
A4	FRONT ELEVATION
A5	BACK ELEVATION
A6	SIDE ELEVATION
A7	SECTIONS A-A
A8	SECTIONS B-B
A9	ROOF PLAN OF 6 CLASS ROOM PRECAST SLAB
A10	PLAN & SECTION WITH DETAILS OF 13 RUMP HAND RAILING
A11	PLAN & SECTION & ELEVATION OF BLACK BOARD
A12	DETAILS OF DOORS
A13	DETAILS OF WINDOWS
A14	DETAILS & SECTION OF DOORS & WINDOWS
A15	DETAILS 11 & SECTION OF FLOOR PCC CONCRETE
A16	DETAILS OF (5,6)
A17	DETAILS OF (3,4)
A18	DETAILS OF (1,2)
A19	DETAILS OF (7,8,9,10)
A20	DETAIL OF 13 FLOWERS POT
A21	DETAIL OF 14 CHIMNEY CUP





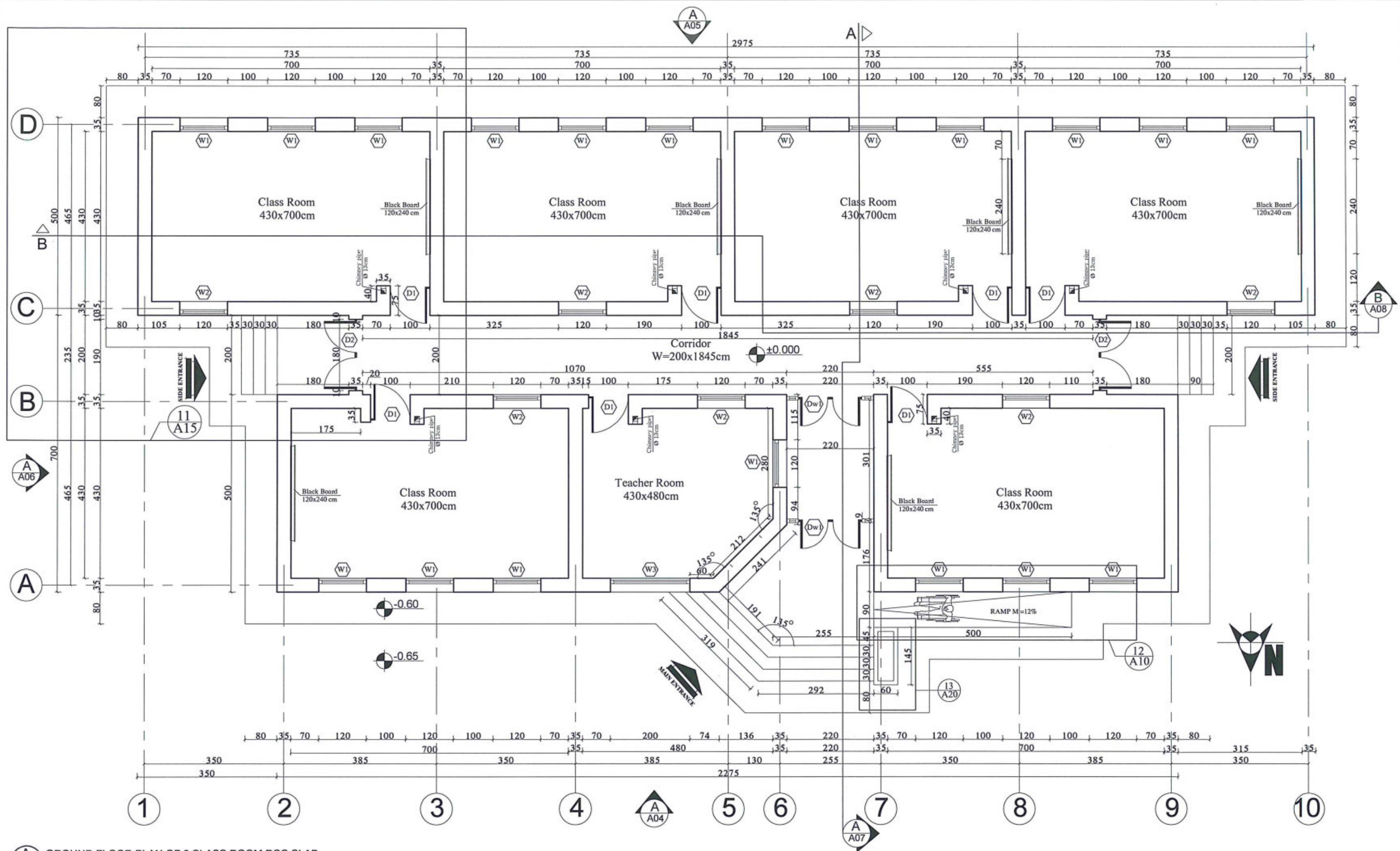
## General Notes for architecture designs of Schools for EQRA program

- The designs of 6, 8 and 10 classroom schools which are to be built under EQRA program was basically prototype designs with due consideration given to economy, safety, with the use local materials.
- The designs are made with due consideration of the norms and standards used by the ministry of education of Afghanistan.
- These designs are intended to be mainly built by the local communities and therefore they have been made very simple and easy to be built.
- These designs must undergo a site adaptation process after the site selection is complete for them. So a proper site plan with the help of the relevant manuals and the guidelines made for the site selection and design shall be prepared before the construction starts at site.
- These designs shall be used based on the verified site conditions and the assignment table for the types of design prepared based on the categorization of the 17 provinces.
- If any difficulties are arising in the process of construction, it has to be brought to the notice of the design engineers before bringing any changes to the designs or the use of materials.
- All dimensions are given in millimeters unless otherwise specified.
- All doors and windows are to be built in accordance with the details given in the drawings.
- The dimensions of doors and windows are given as finished dimensions, the builders shall consider an appropriate opening size when doing the brickworks.
- While construction the builders shall not scale the drawings and shall refer to the given dimensions

## GENERAL SYMBOLS

	Polystyrene	عایق حرارت
	Stone Elevation	سنگ در نما
	Exposed concrete	نمای کائوچری
	Direction of window	مسیر باز شدن کلکین
	Chimney pipe	دود کش بخاری
	Level in plan	ارتفاع در پلان
	Stone fired	قطع دیوار سنگی
	Elevation	عنصر نماها
	Section	قطع
	RCC Concrete	کائوچریست سیخ دار
	Center line	خط محوری
	Building entrance	ادخال تعمیر
	Direction of stair	مسیر زینه
	Ramp hand railing	کتاره
	Compacted soil	خاک تپک شده
	Gravel	سنگ دریایی
	Mortar	شفته کائوچریست
	PCC Concrete	کائوچریست بدون سیخ
	Finished level	سطح تمام شده
	Moisture insulation	عایق رطوبت
	Window mark	علامت کلکین
	Door mark	علامت دروازه
	Orientation	سمت یابی
	White Glass	شیشه در مقطع
	White Glass	درخت در نما





**A** GROUND FLOOR PLAN OF 6 CLASS ROOM RCC SLAB  
**01** SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
PREPLANNED &  
CHECKED BY  
TECH- APPROVED BY

ZIAURAHMAN ZIA  
DAARTT



Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT  
AS SHOWN (A3)  
12/08/2018

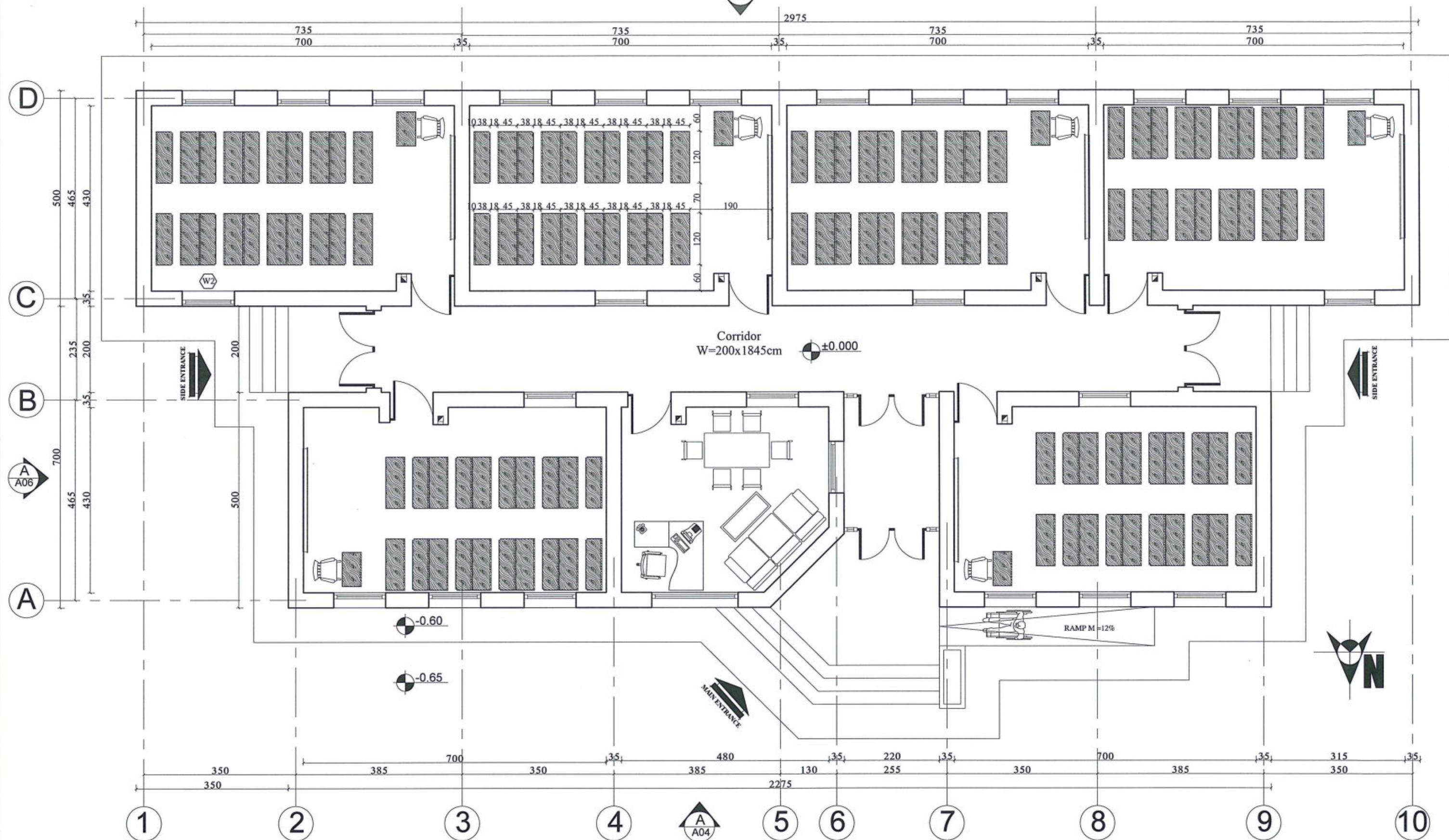
PROJECT NAME  
DRAWING TITLE

6 Classroom Burnt Brick RCC Slab H-275  
Ground Floor Plan

SHEET NO.

**A01**  
**21**





A  
02 FURNITURE PLAN OF 6 CLASS ROOM RCC SLAB  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

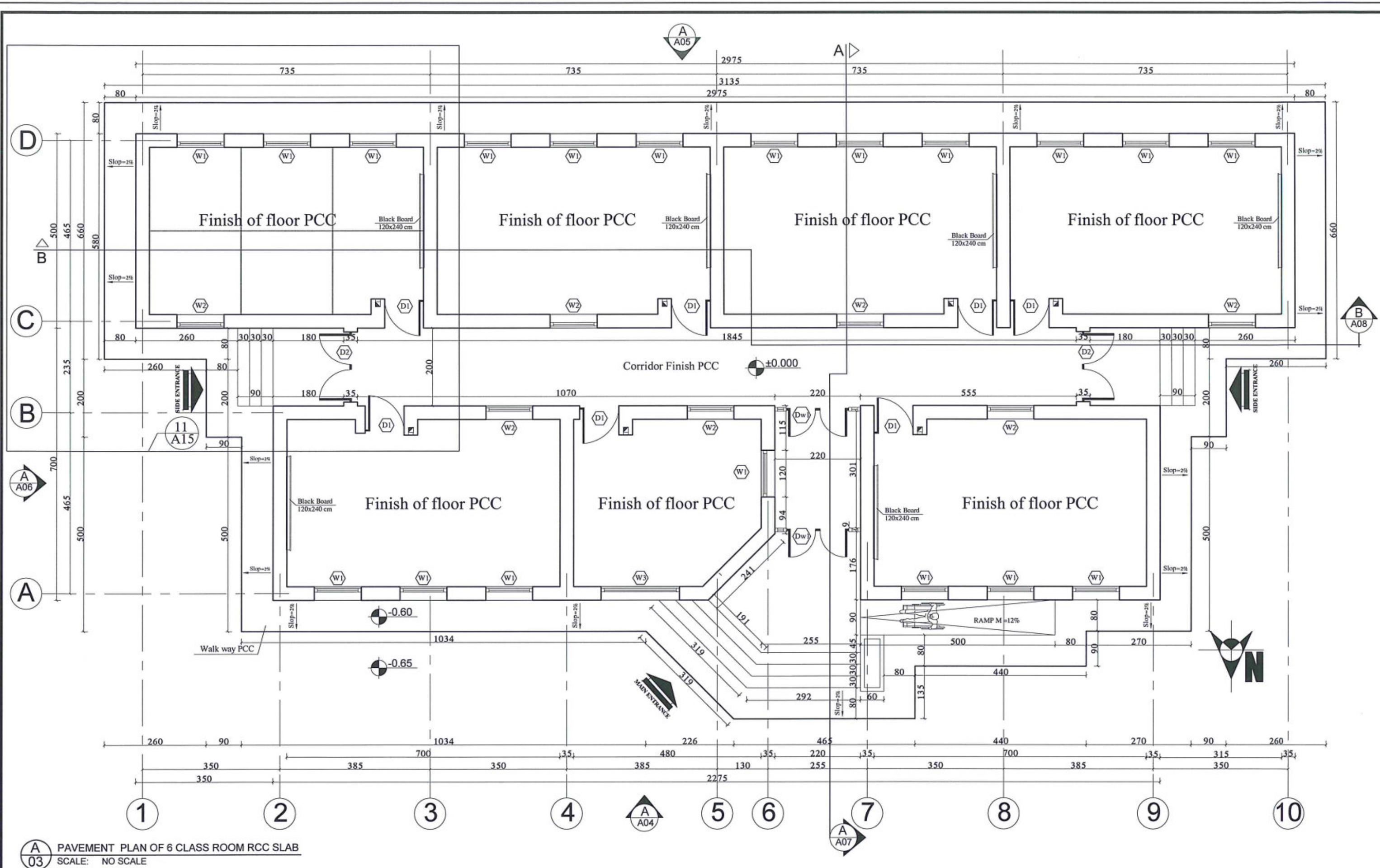
ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

Combined technical  
team  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Furniture Plan

SHEET NO.  
A02  
21





**A**  
**03** PAVEMENT PLAN OF 6 CLASS ROOM RCC SLAB  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

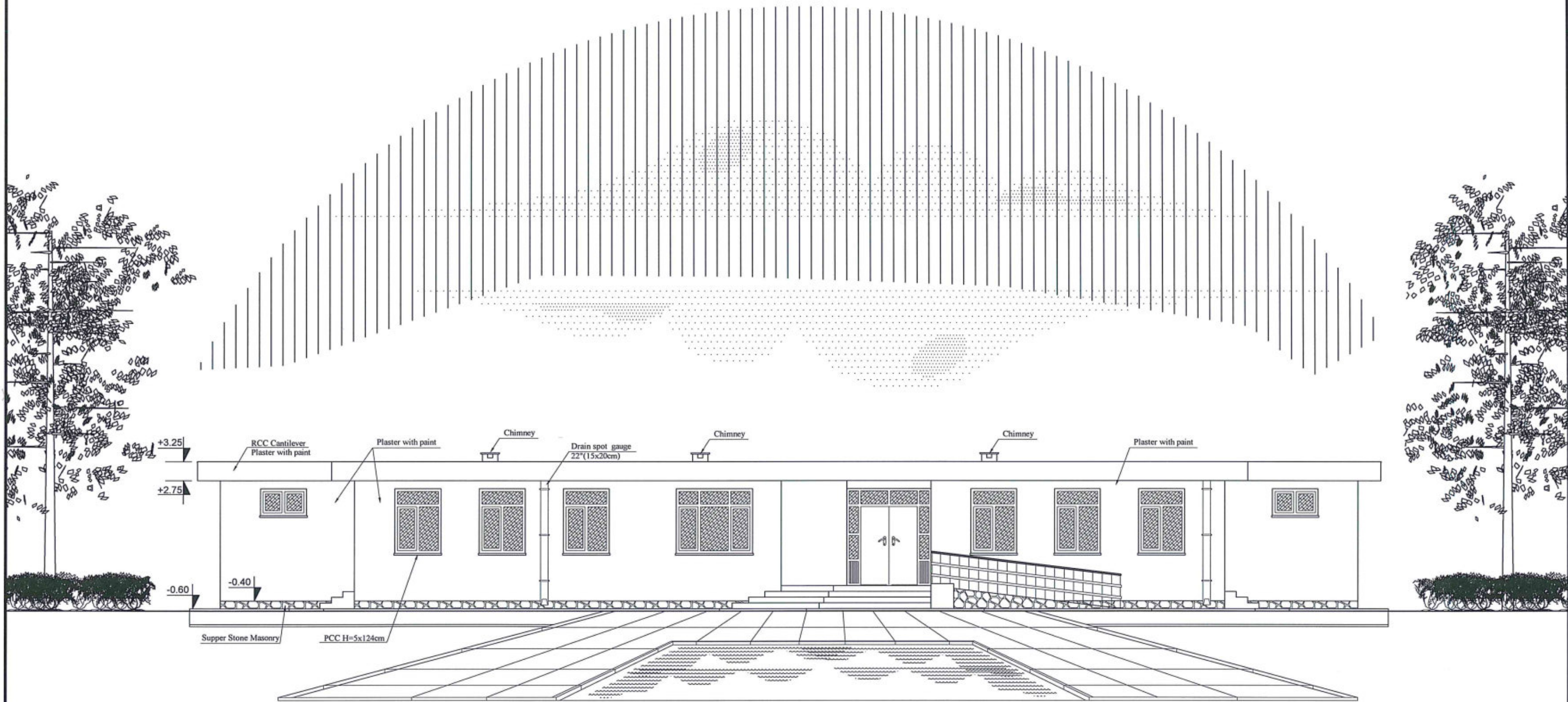
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MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Pavement Plan

SHEET NO.

**A**  
**03**  
**21**





**A**  
**04** FRONT ELEVATION OF 6 CLASS ROOM RCC SLAB  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

*[Signature]*

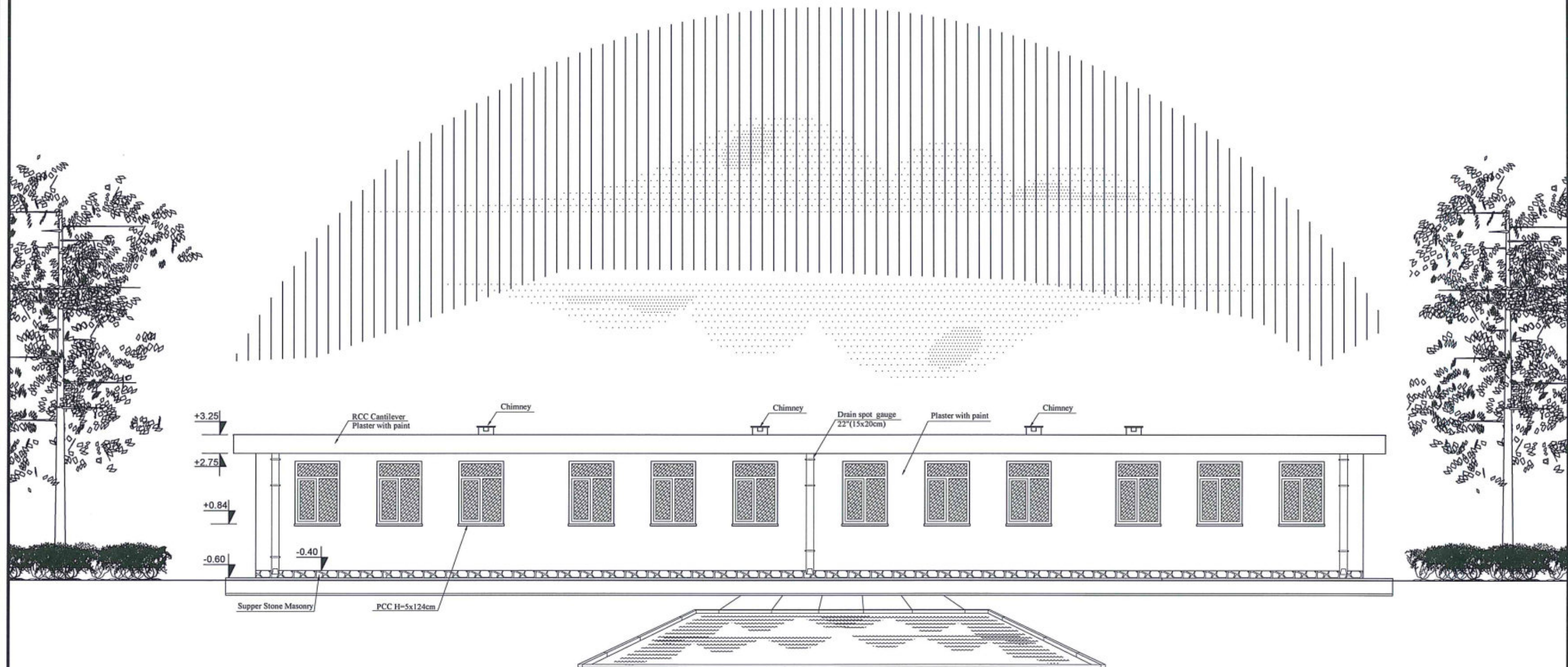
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MOE/MRRD/DAARTT  
SCALE  
AS SHOWN ( A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Front Elevation

SHEET NO.

**A04**  
**21**





A  
05 BACK ELEVATION OF 6 CLASS ROOM RCC SLAB  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

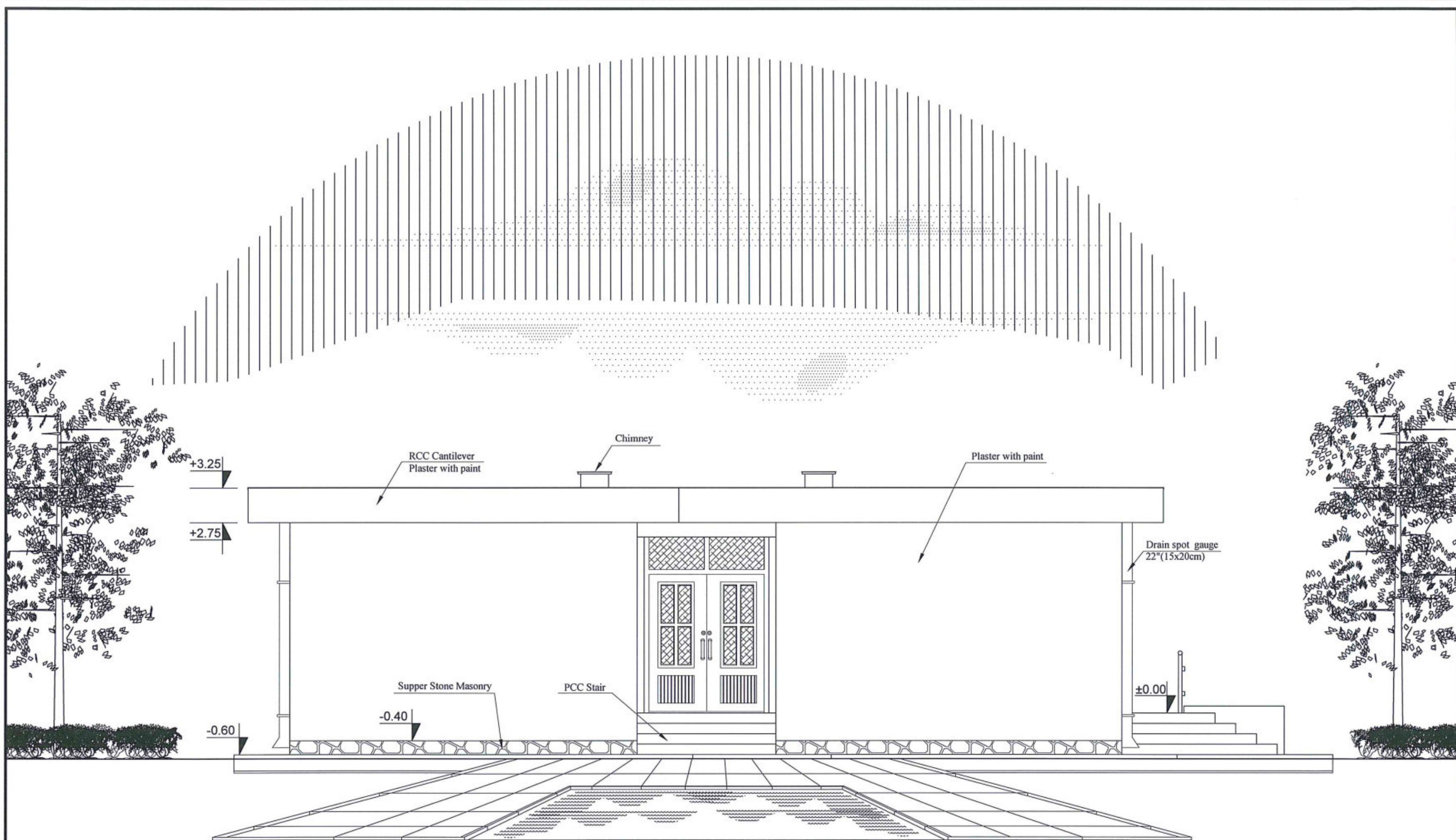
ARCHITECT/DESIGN	ZIAURAHMAN ZIA	Combined technical team	MOE/MRRD/DAARTT
PREPLANNED & CHECKED BY	DAARTT	SCALE	AS SHOWN (A3)
TECH- APPROVED BY		DATE	12/08/2018

PROJECT NAME	6 Classroom Burnt Brick RCC Slab H-275
DRAWING TITLE	Back Elevation

SHEET NO.

A05  
21





Side Elevation

A SIDE ELEVATION OF 6 CLASS ROOM RCC SLAB  
06 SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
PREPLANNED &  
CHECKED BY  
TECH- APPROVED BY

ZIAURAHMAN ZIA  
DAARTT

*[Signature]*

Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT  
AS SHOWN ( A3)  
12/08/2018

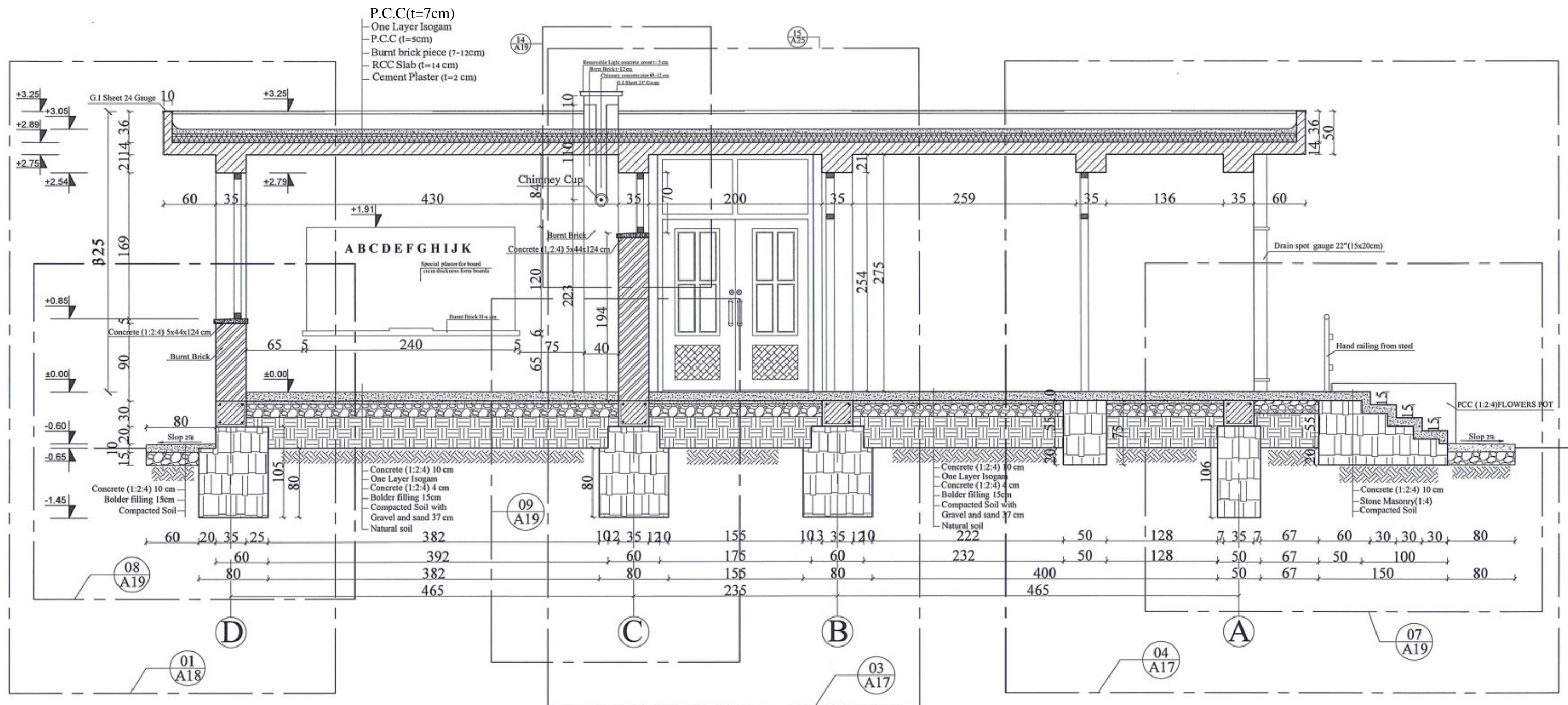
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6 Classroom Burnt Brick RCC Slab H-275  
Side Elevation

SHEET NO.

A06  
21





**A** SECTION A-A OF 6 CLASS ROOM RCC SLAB  
**07** SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH. APPROVED BY

Combined technical  
team  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Section A-A

SHEET NO.

**A** 07  
21

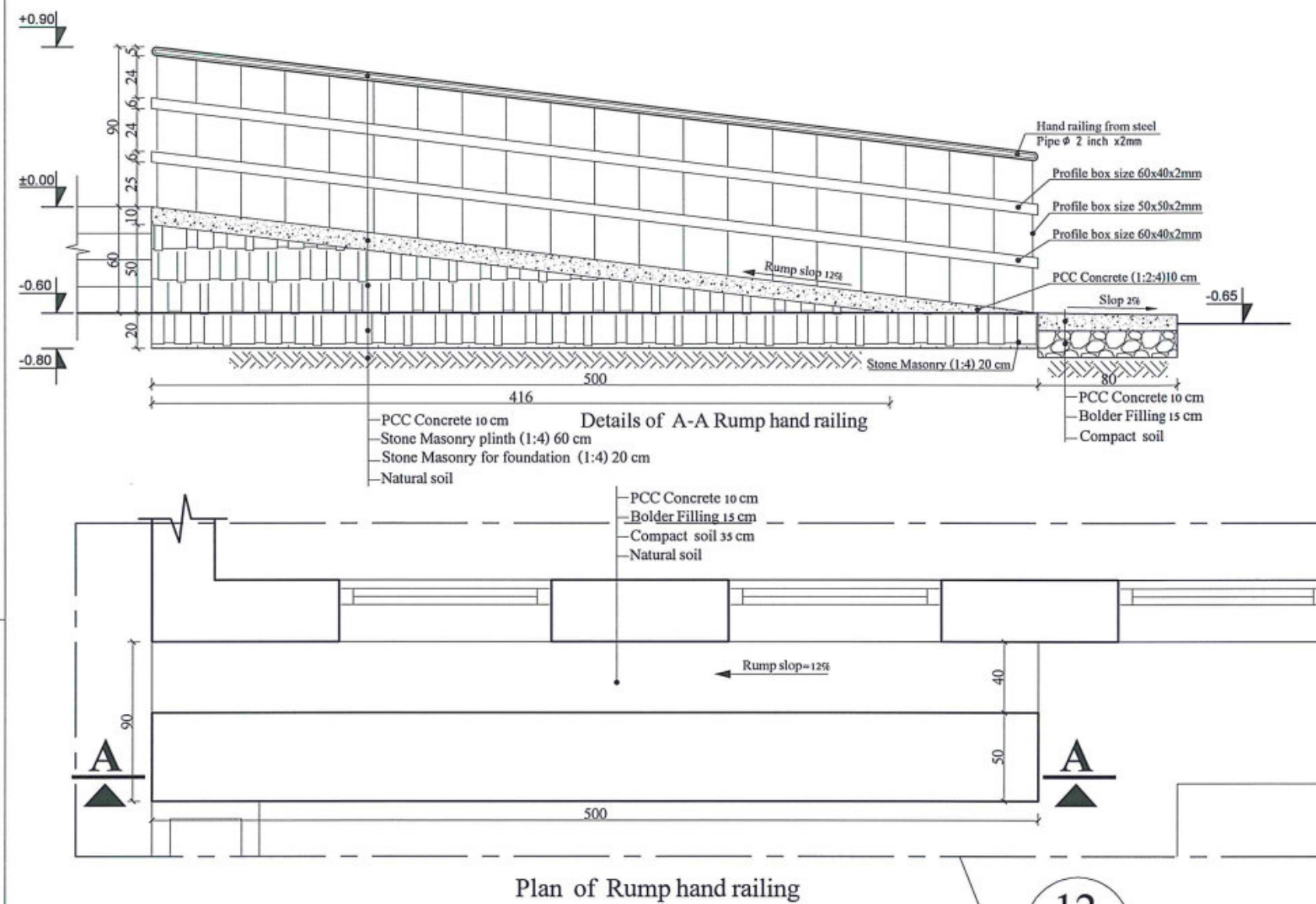
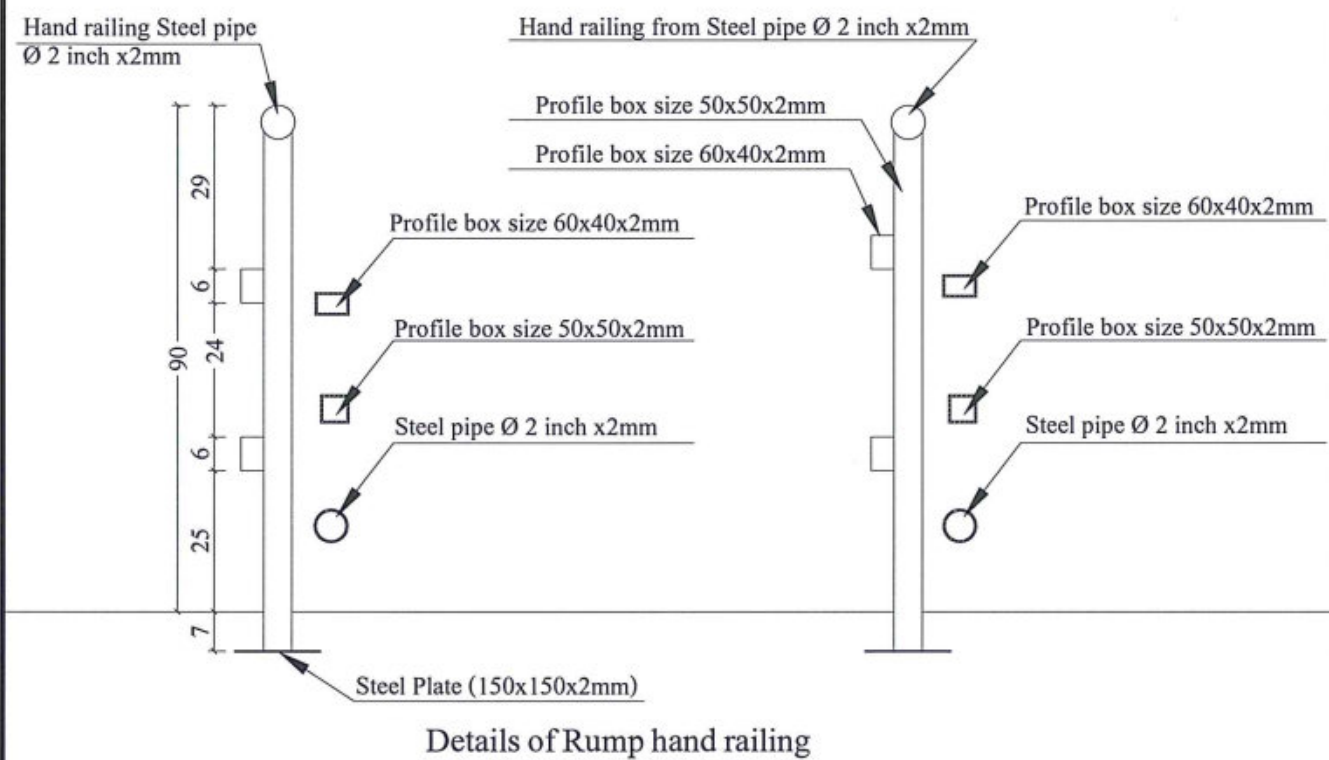












12  
A01

A  
10 PLAN & SECTION WITH DETAILS OF 12 RUMP HAND RAILING  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

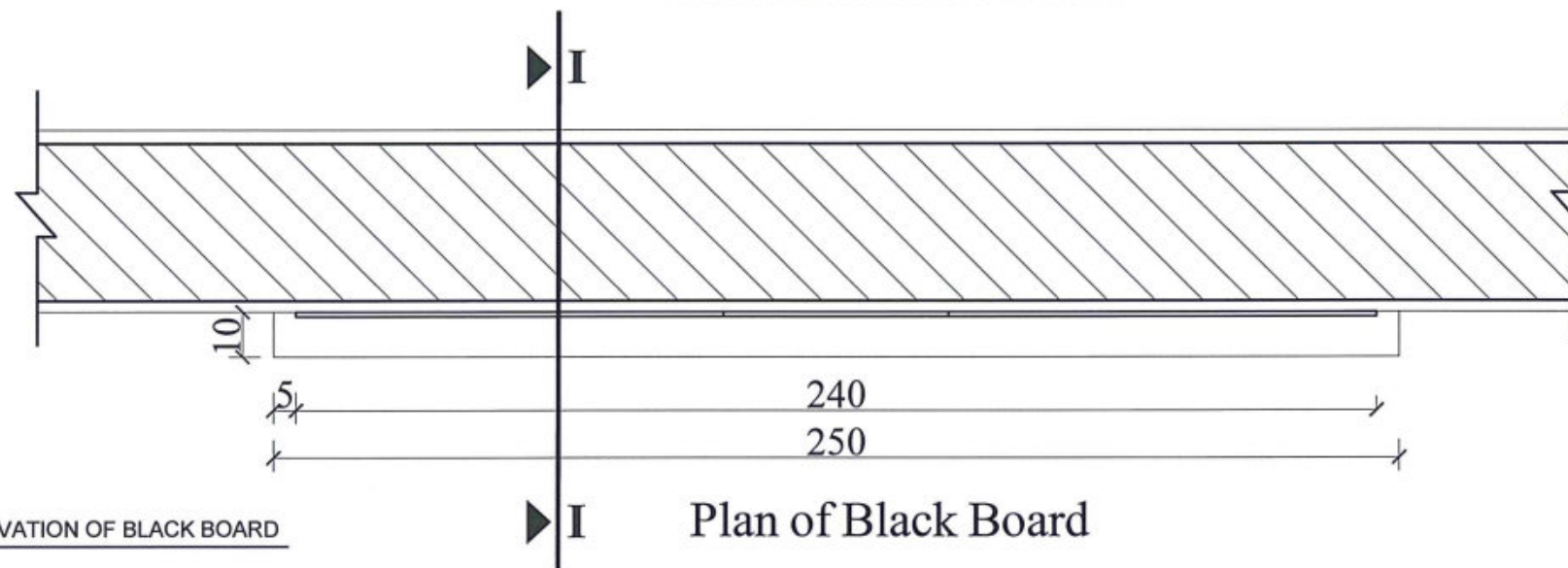
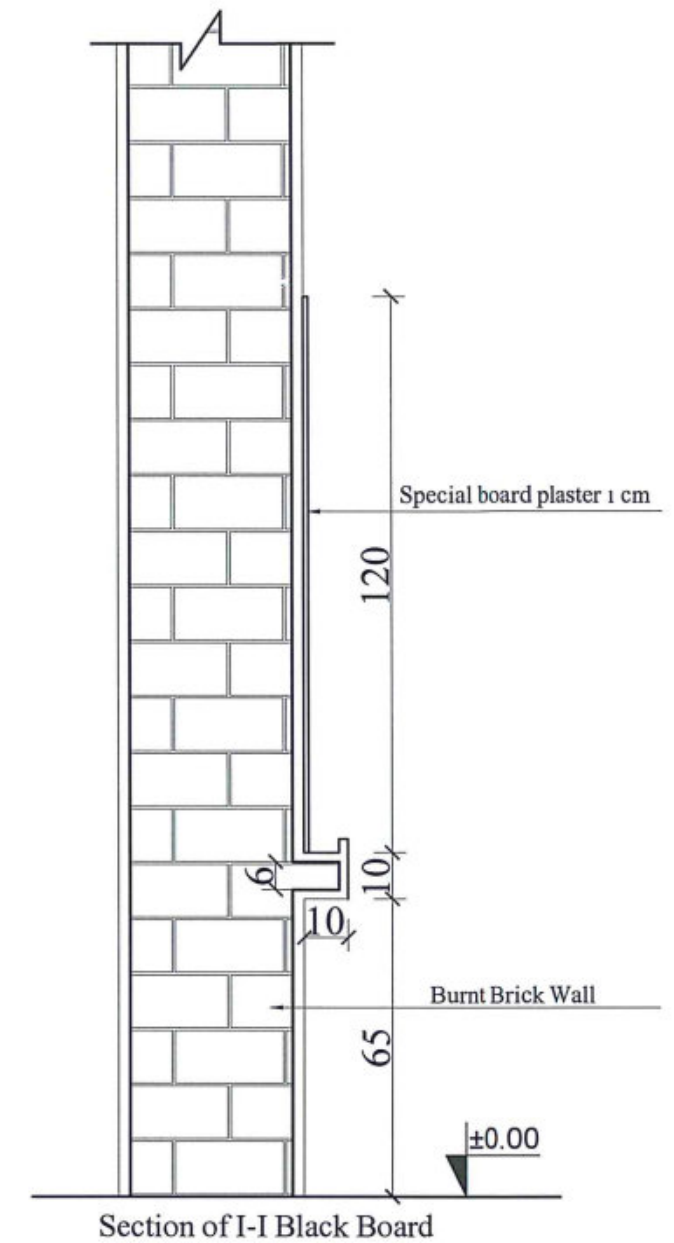
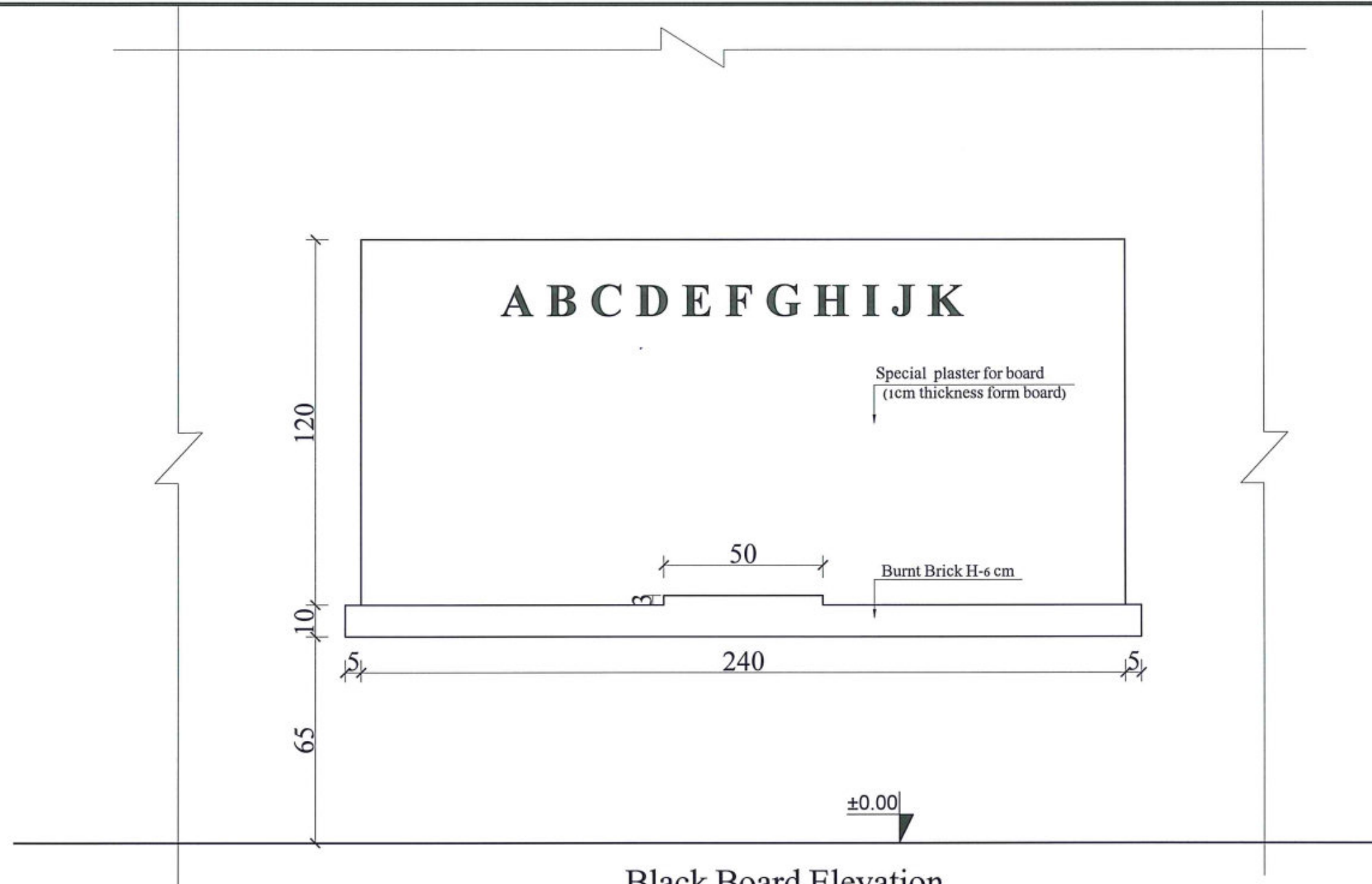
Combined technical  
team  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN ( A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Plan & Section with Details of 12 Rump Hand railing

SHEET NO.

10  
21





A  
11

PLAN & SECTION & ELEVATION OF BLACK BOARD  
SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

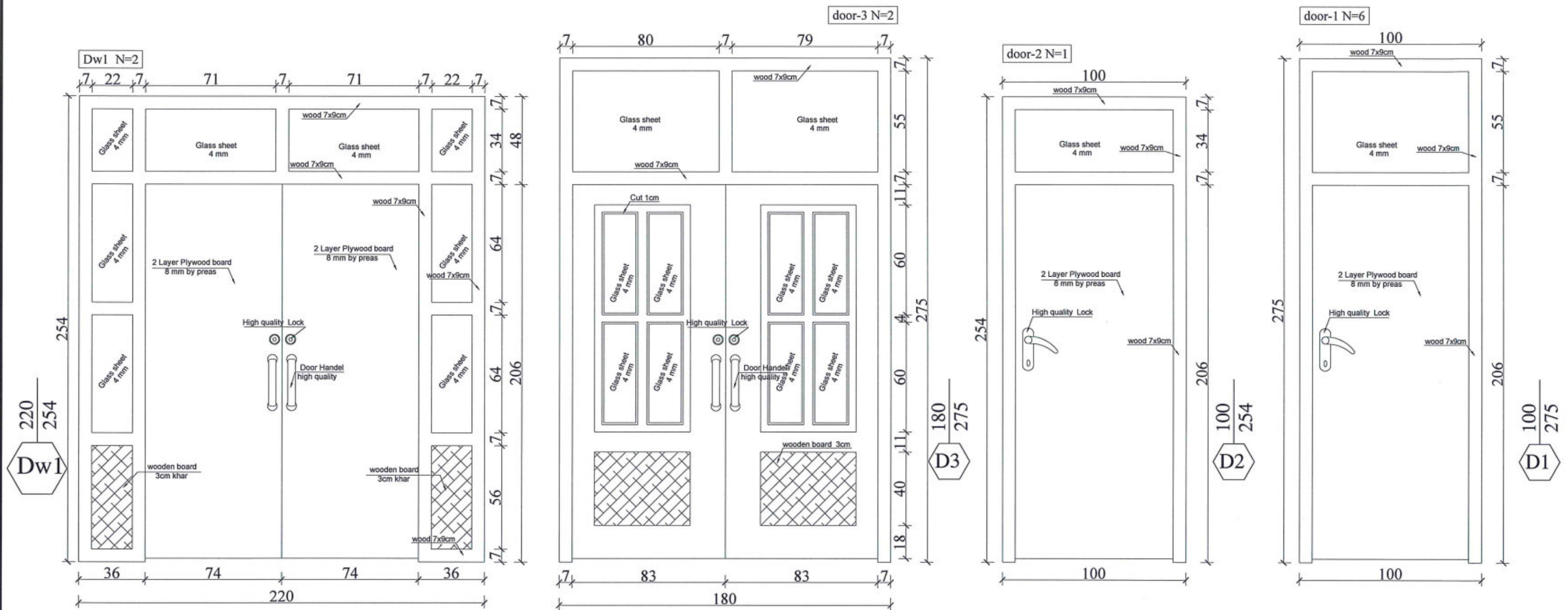
ARCHITECT/DESIGN	ZIAURAHMAN ZIA	Combined technical team	MOE/MRRD/DAARTT
PREPLANNED & CHECKED BY	DAARTT	SCALE	AS SHOWN (A3)
TECH- APPROVED BY		DATE	12/08/2018

PROJECT NAME	6 Classroom Burnt Brick RCC Slab H-275
DRAWING TITLE	Plan & Section & Elevation of Black Board

SHEET NO.

A11  
21





**A** DETAILS OF DOORS  
 SCALE: NO SCALE



MINISTRY OF EDUCATION DEPARTMENT  
 OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
 AFGHANISTAN

ARCHITECT/DESIGN  
 ZIAURAHMAN ZIA  
 PREPLANNED &  
 CHECKED BY  
 DAARTT  
 TECH- APPROVED BY

Combined technical  
 team  
 MOE/MRRD/DAARTT  
 SCALE  
 AS SHOWN ( A3)  
 DATE  
 12/08/2018

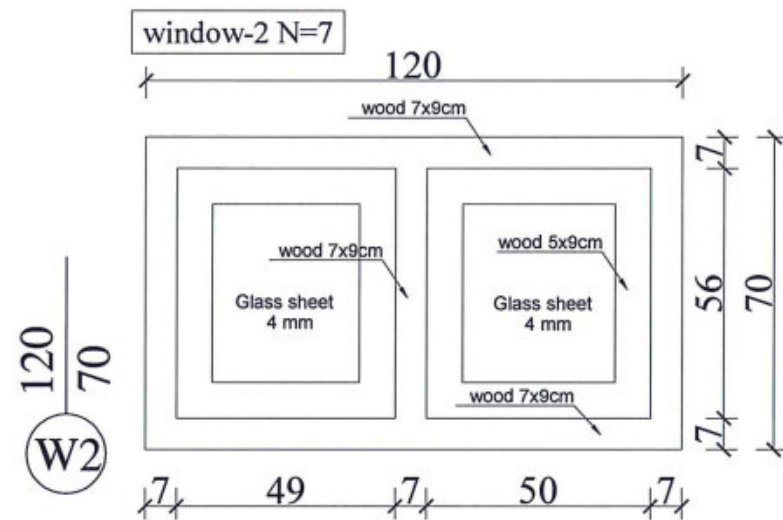
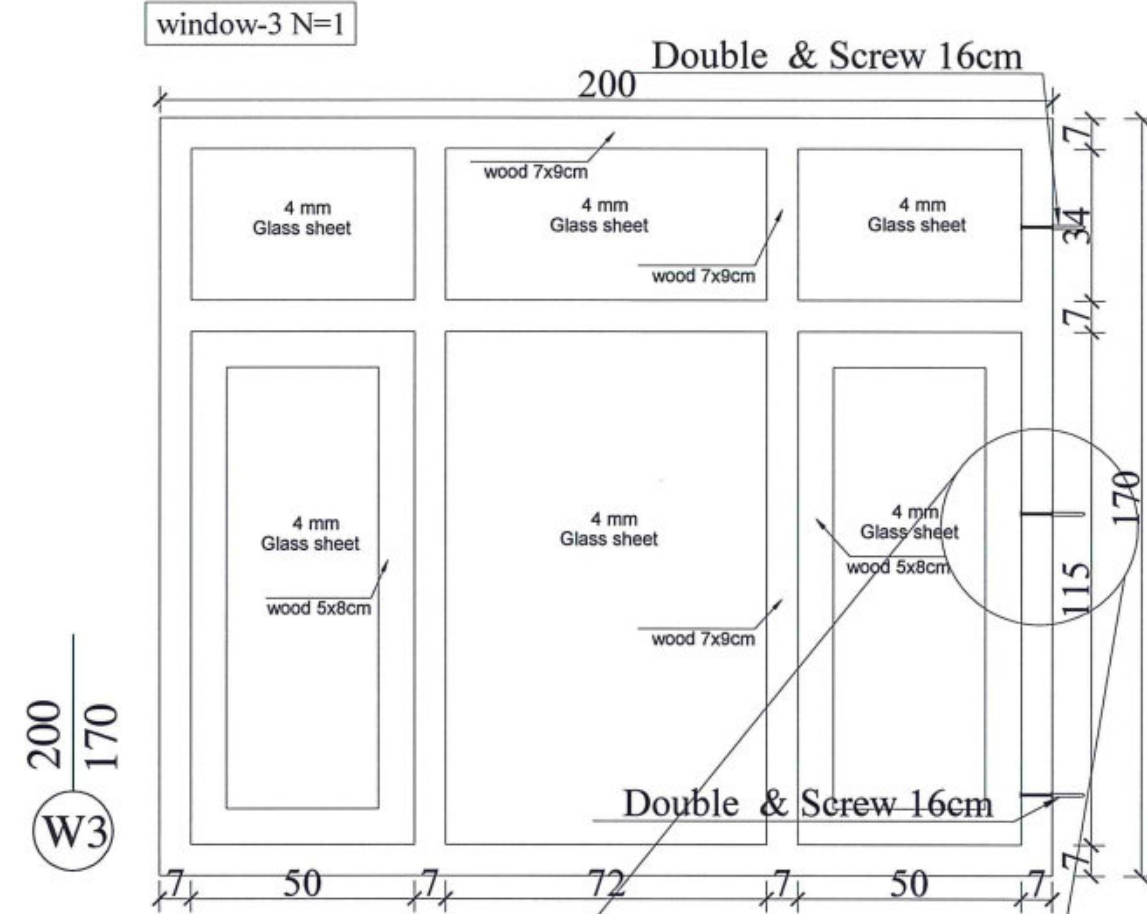
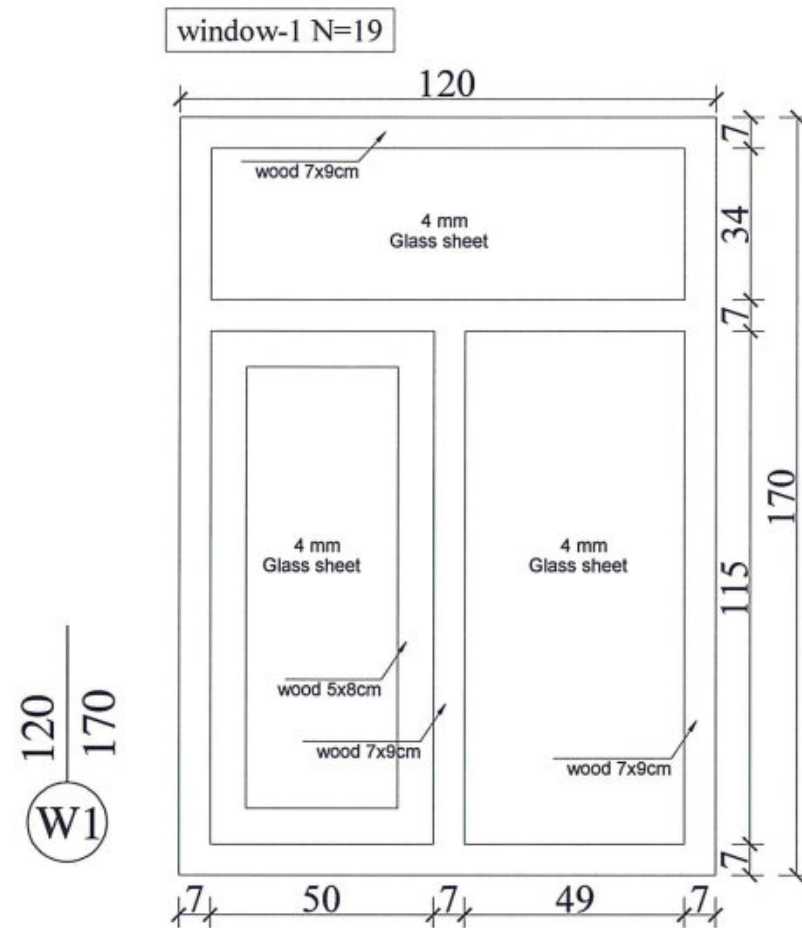
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 6 Classroom Burnt Brick RCC Slab H-275  
 DRAWING TITLE  
 Details of Doors

SHEET NO.

12  
 21

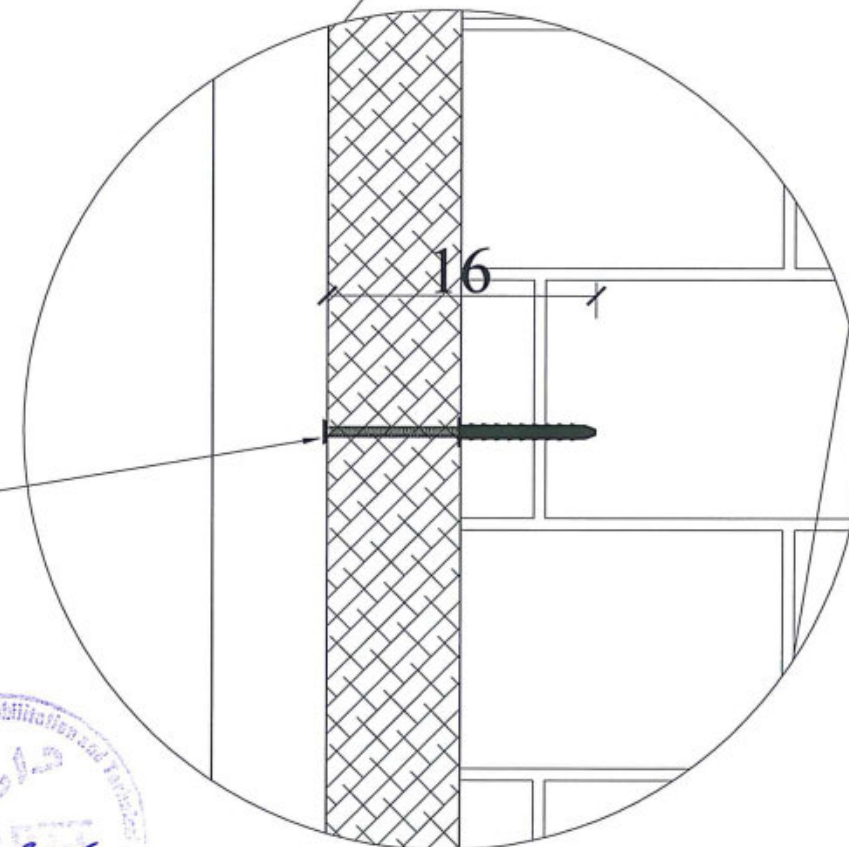
12  
 21





## Detail of Window

Double & Screw  
Ø10mmL= 16cm



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

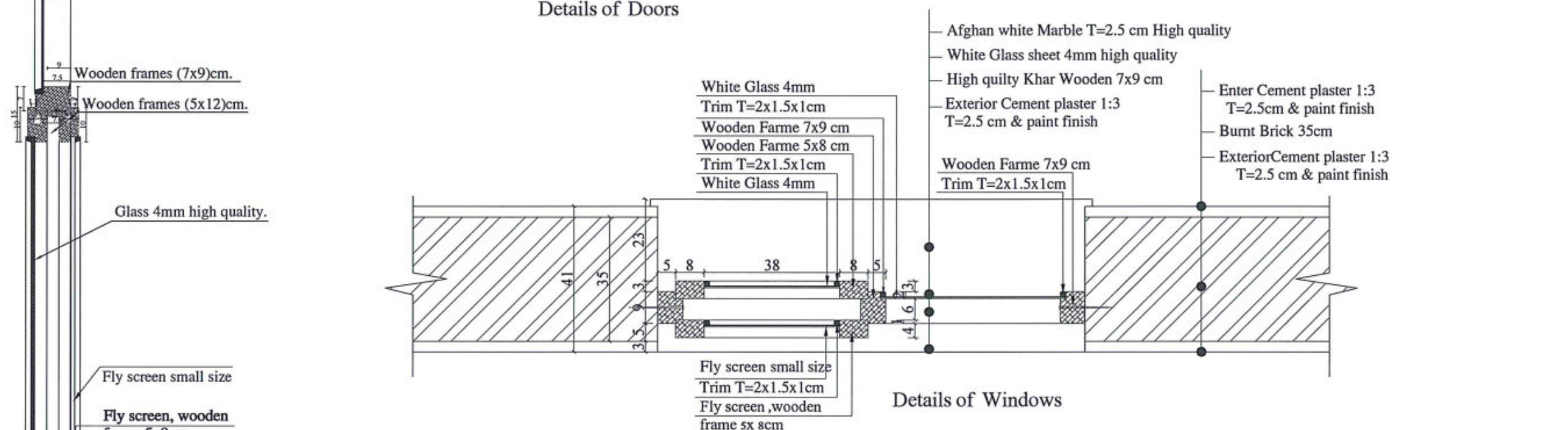
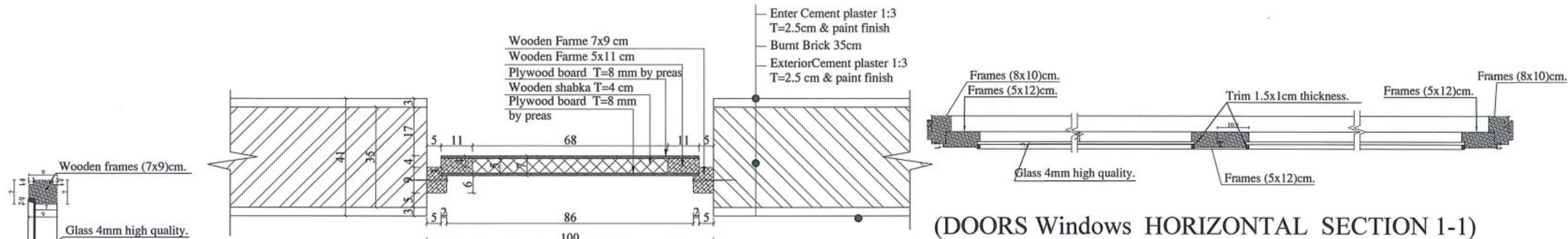
COMBINED  
TECHNICAL TEAM  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN ( A3)  
DATE  
2018-05-29

PROJECT NAME  
6 CLASSROOM BURNT BRICK WALL WITH RCC  
SLAB, H=2.89  
DRAWING TITLE  
DETAILS OF WINDOWS

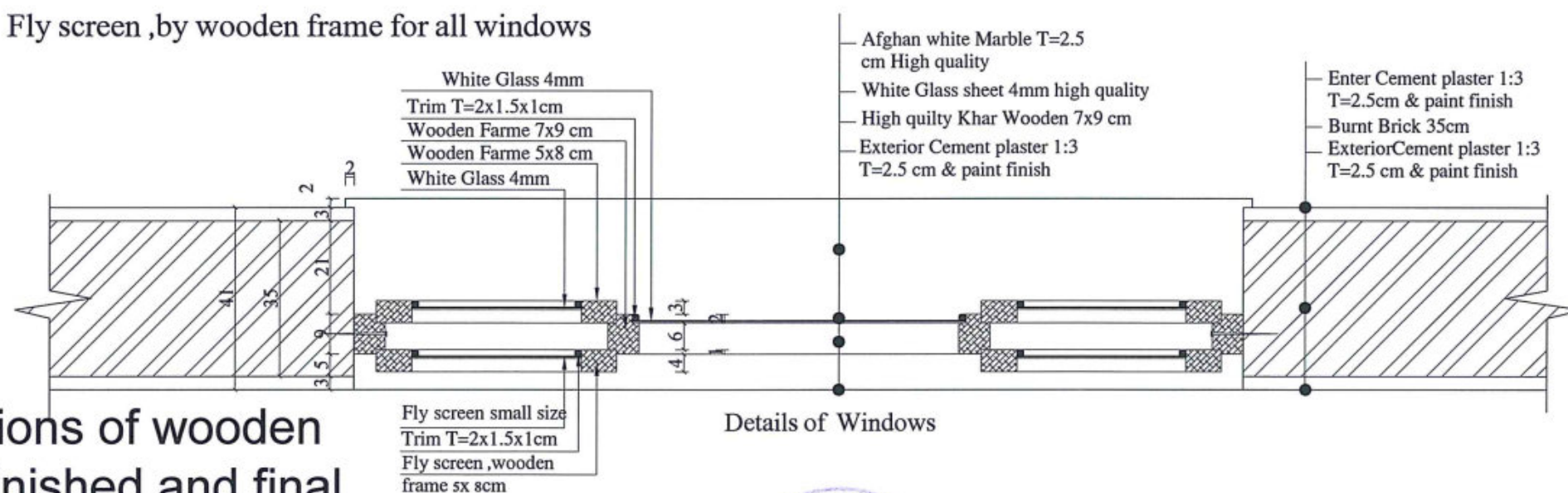
SHEET NO.

A13  
19





Fly screen ,by wooden frame for all windows



**Note:** The dimensions of wooden members are as finished and final dimensions.



MINISTRY OF EDUCATION DEPARTMENT  
OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY



COMBINED  
TECHNICAL TEAM  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN ( A3)  
DATE  
2018-05-29

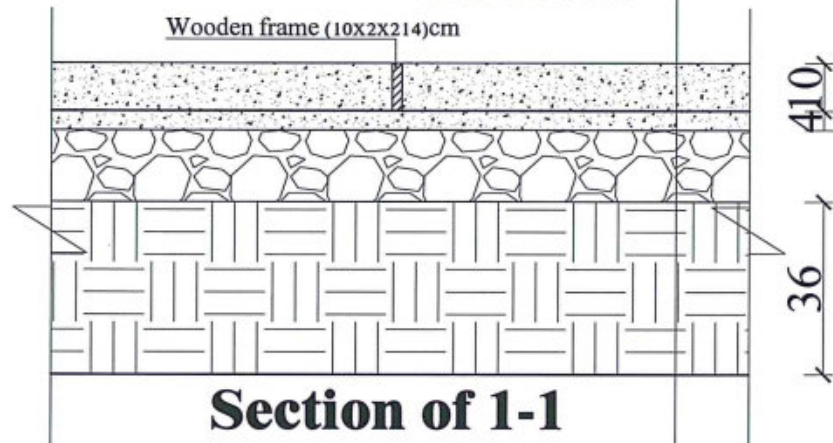
PROJECT NAME  
6 CLASSROOM BURNT BRICK WALL WITH RCC  
SLAB, H=2.89  
DRAWING TITLE  
SECTIONS OF WINDOWS & DOORS

SHEET NO.

A14  
19



Concrete (1:2:4) 10 cm  
One Layer Isogam  
Concrete (1:2:4) 4 cm  
Bolder filling 15cm  
Compacted Soil with Gravel  
and sand 37cm  
Natural soil

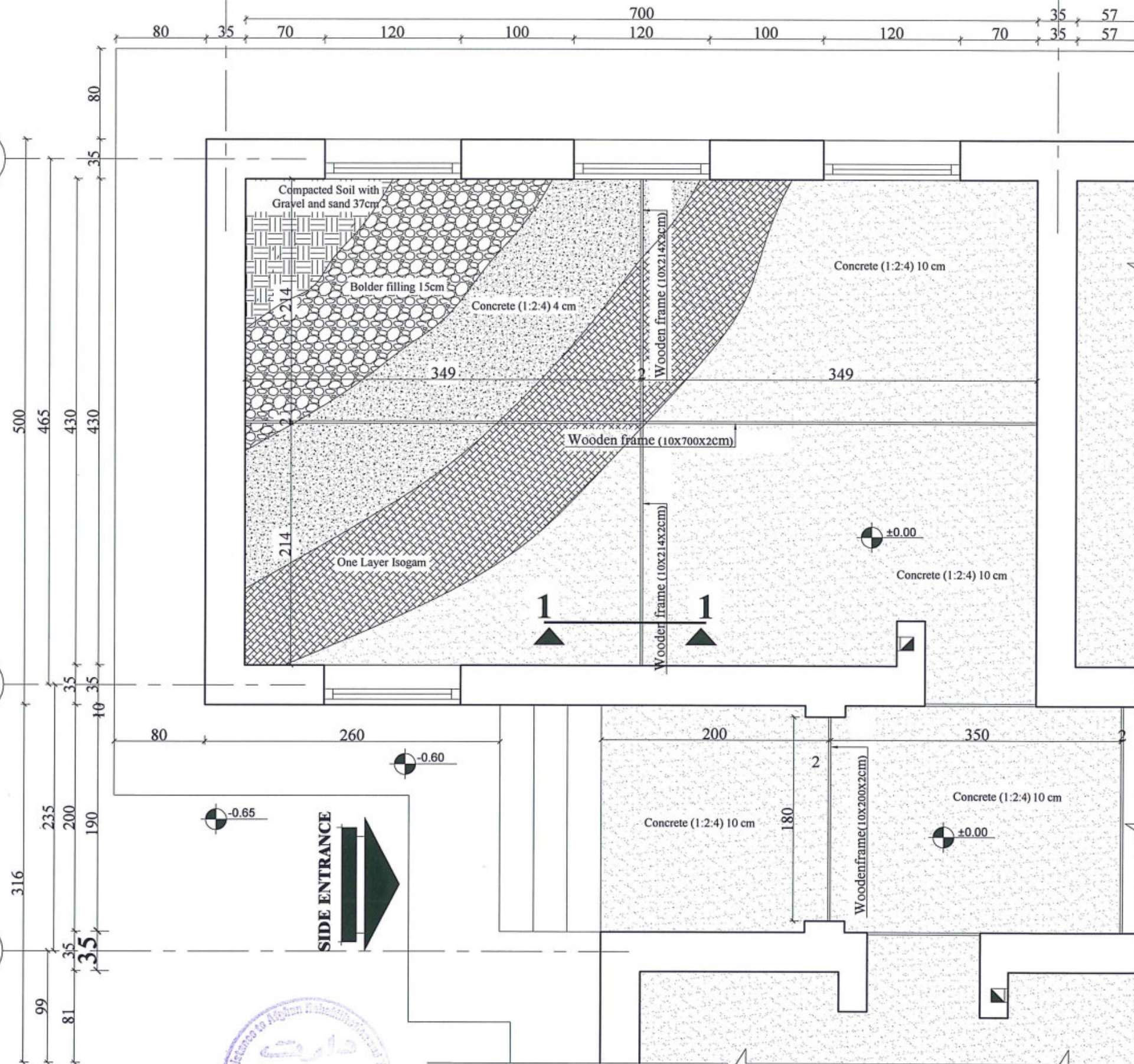


**Section of 1-1  
Floor PCC Concrete**

D

C

B



**Details of Floor PCC Concrete**



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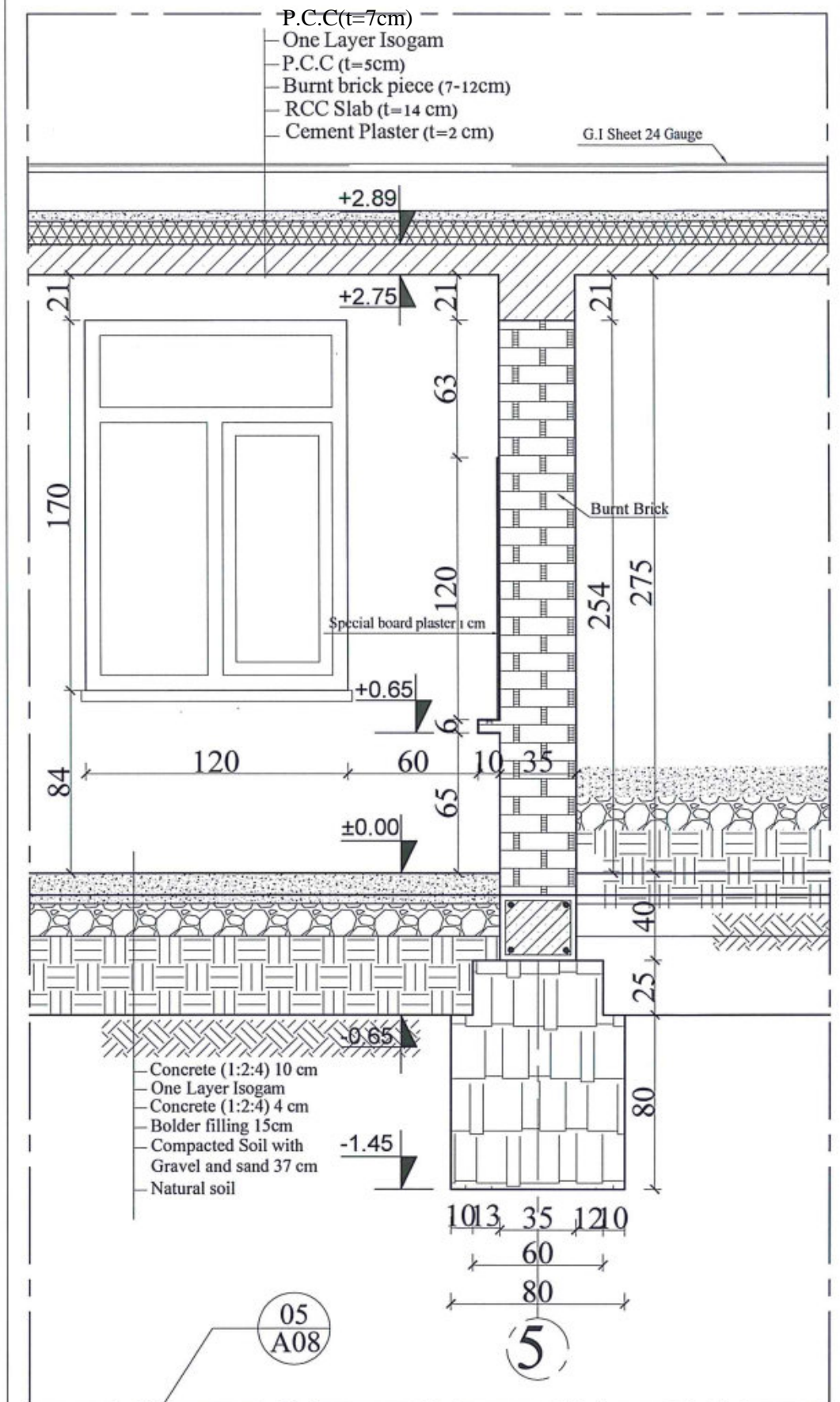
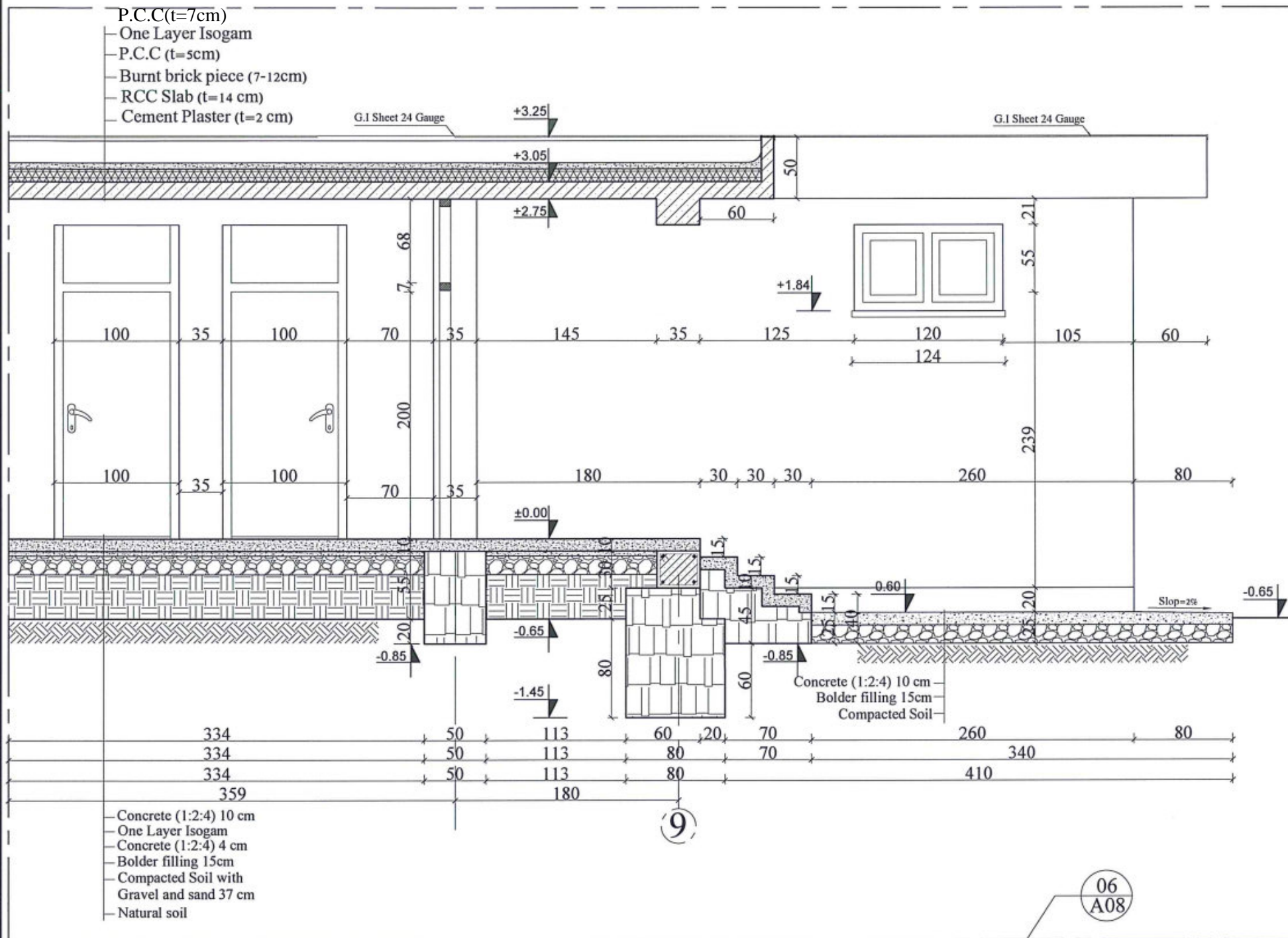
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TECHNICAL TEAM  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
2018-05-29

PROJECT NAME  
6 CLASSROOM BURNT BRICK WALL WITH RCC  
SLAB, H=2.89  
DRAWING TITLE  
DETAILS OF FOOR PCC

SHEET NO.

A15  
19





A  
 16  
 DETAILS OF (5,6)  
 SCALE: NO SCALE



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 AFGHANISTAN

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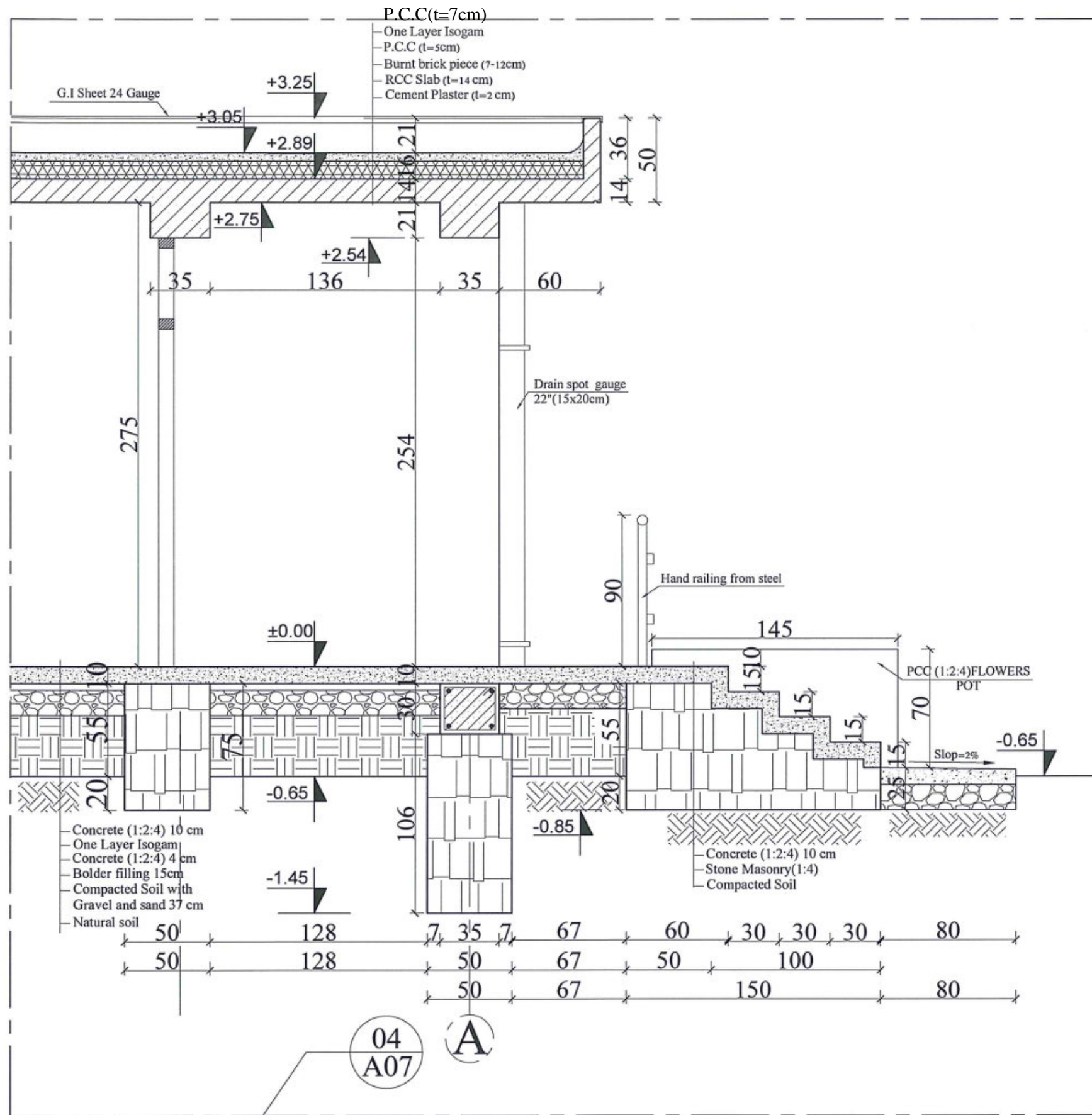
Combined technical  
 team  
 MOE/MRRD/DAARTT  
 SCALE  
 AS SHOWN (A3)  
 DATE  
 12/08/2018

PROJECT NAME  
 6 Classroom Burnt Brick RCC Slab H-275  
 DRAWING TITLE  
 Details of (5,6)

SHEET NO.

A16  
 21





A  
17  
DETAILS OF (3,4)  
SCALE: NO SCALE



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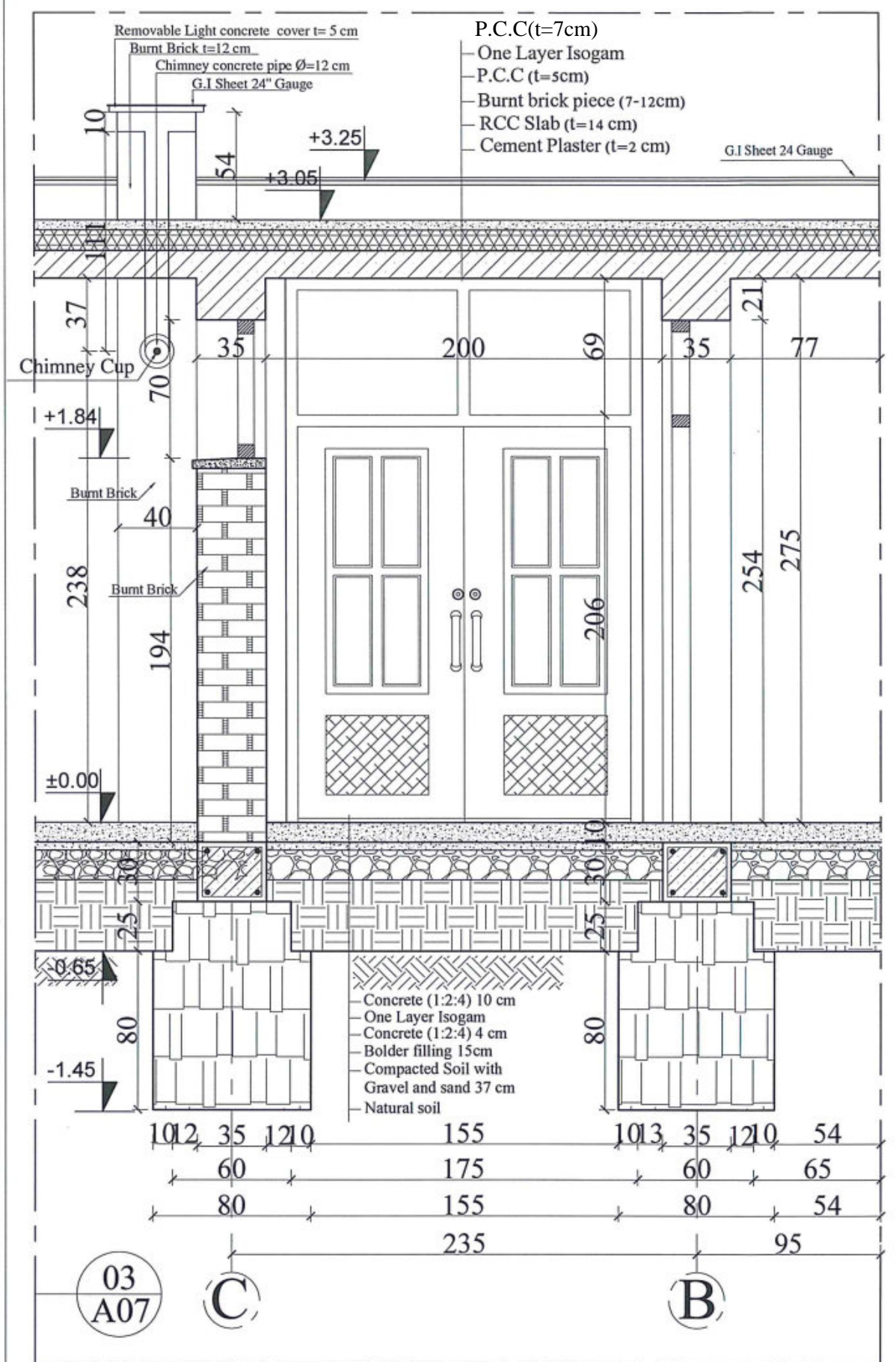
PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN  
ZIAURAHMAN ZIA  
PREPLANNED &  
CHECKED BY  
DAARTT  
TECH- APPROVED BY

Combined technical  
team  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Details of (3,4)

SHEET NO.  
A17  
21



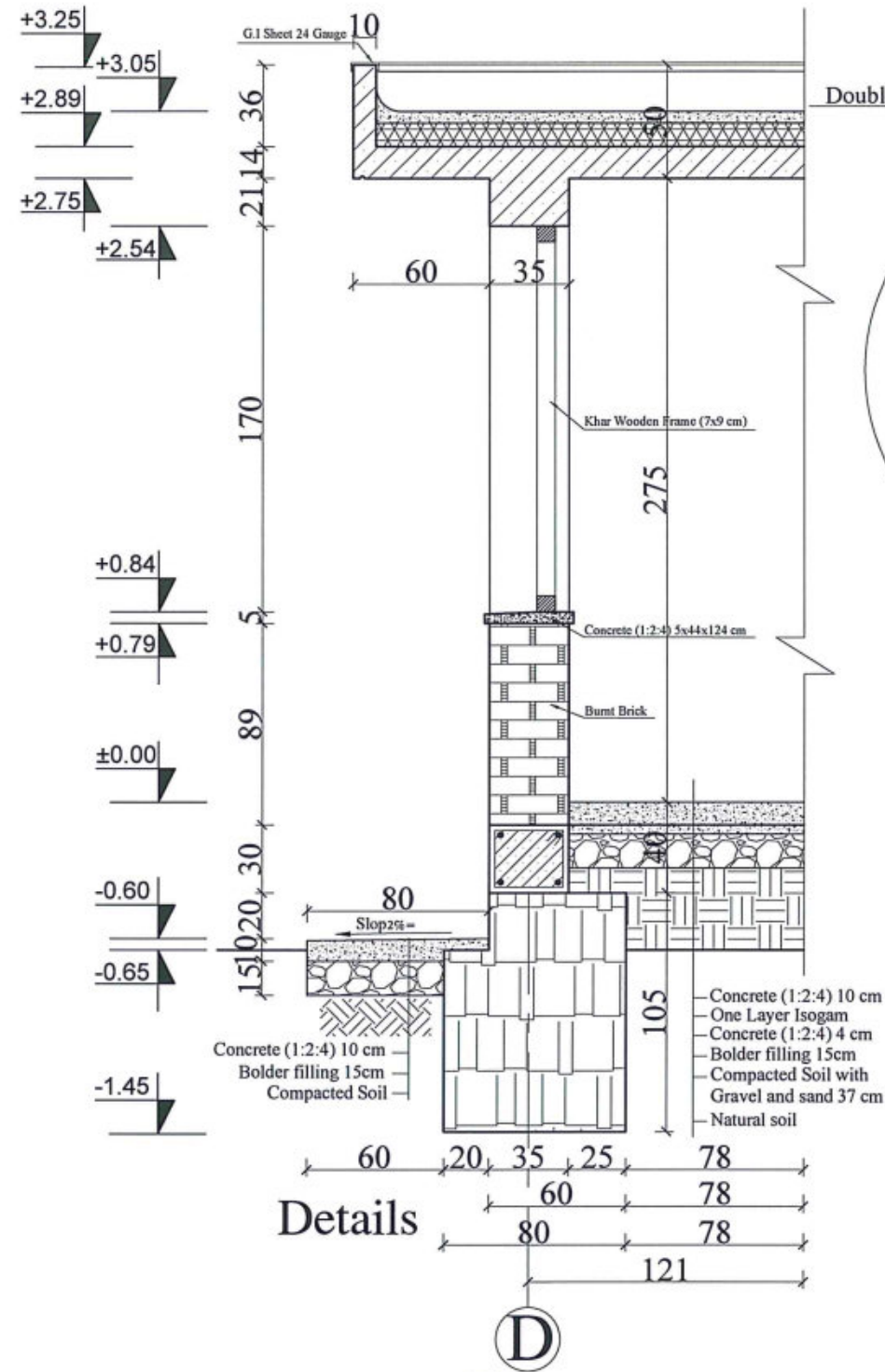
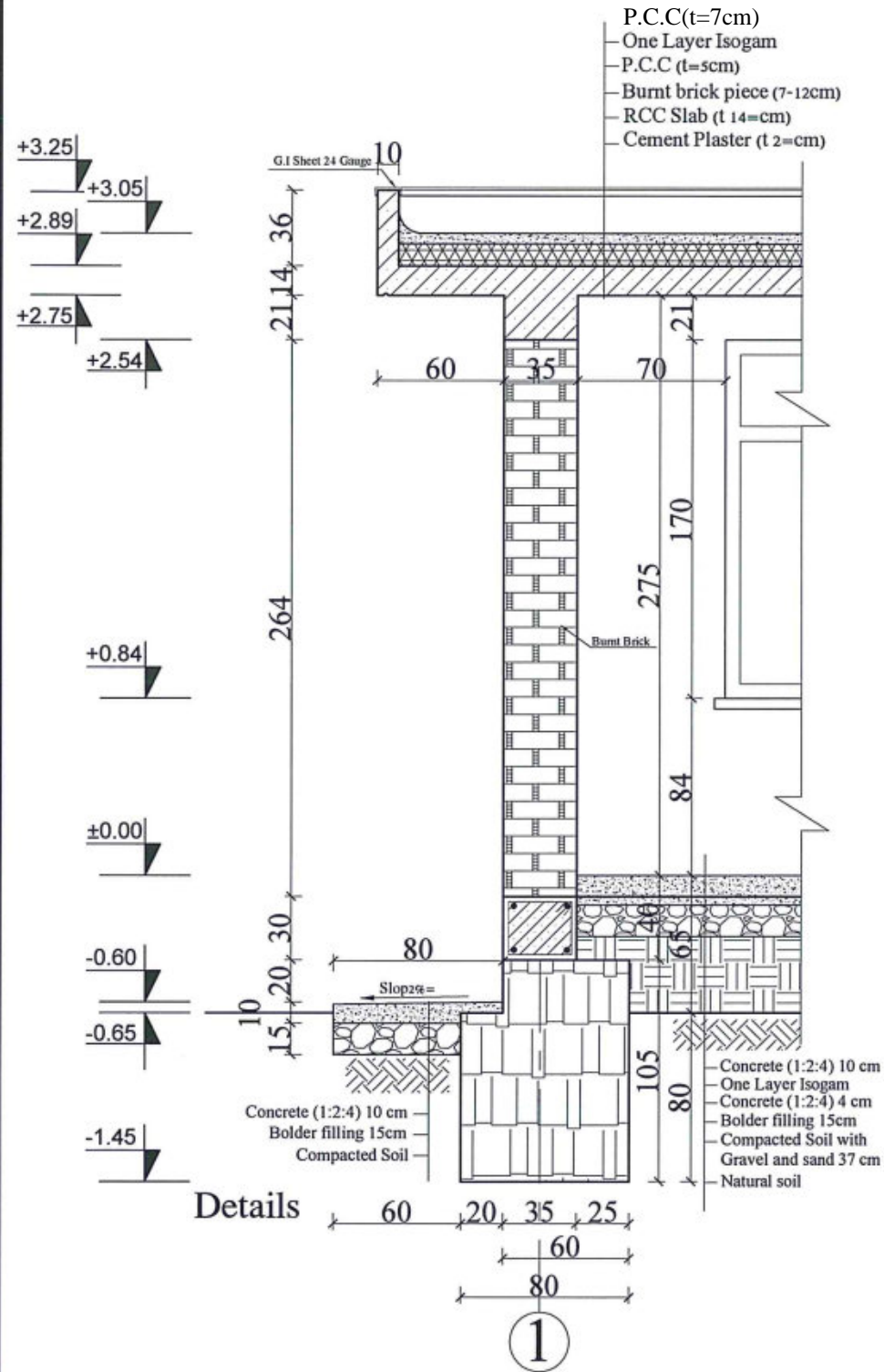
03  
A07

C

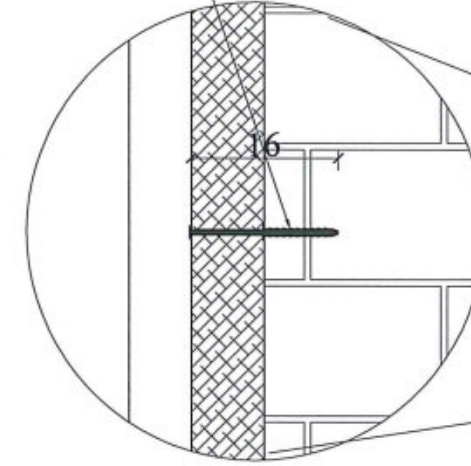
B

A17  
21





Double & Screw 16cm



Double & Screw 16cm

Double & Screw 16cm

120

Detail M



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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN	ZIAURAHMAN ZIA	COMBINED TECHNICAL TEAM	MOE/MRRD/DAARTT
PREPLANNED & CHECKED BY	DAARTT	SCALE	AS SHOWN (A3)
TECH-APPROVED BY		DATE	2018-05-29

PROJECT NAME

6 CLASSROOM BURNT BRICK WALL WITH RCC  
SLAB, H=2.89

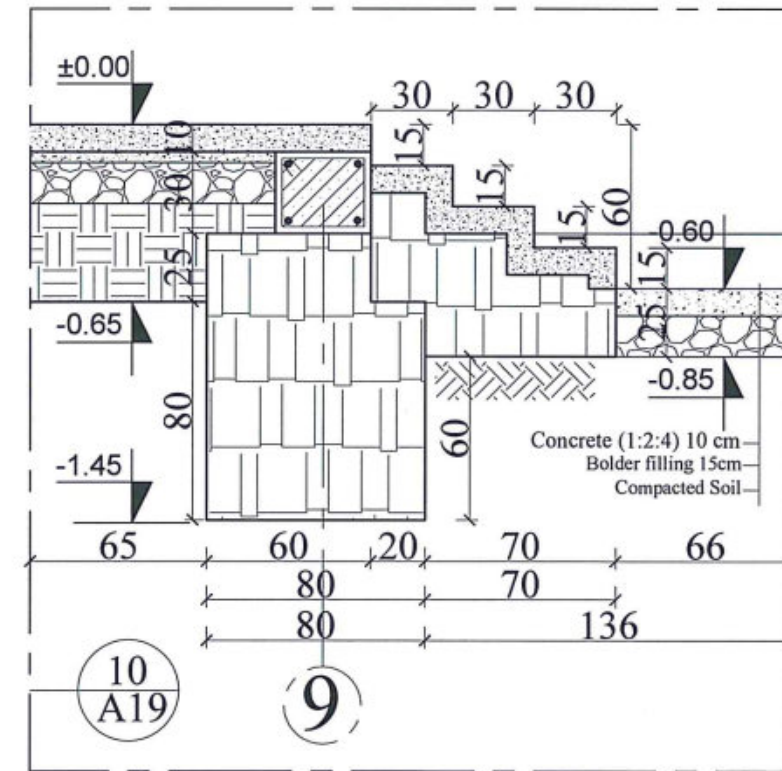
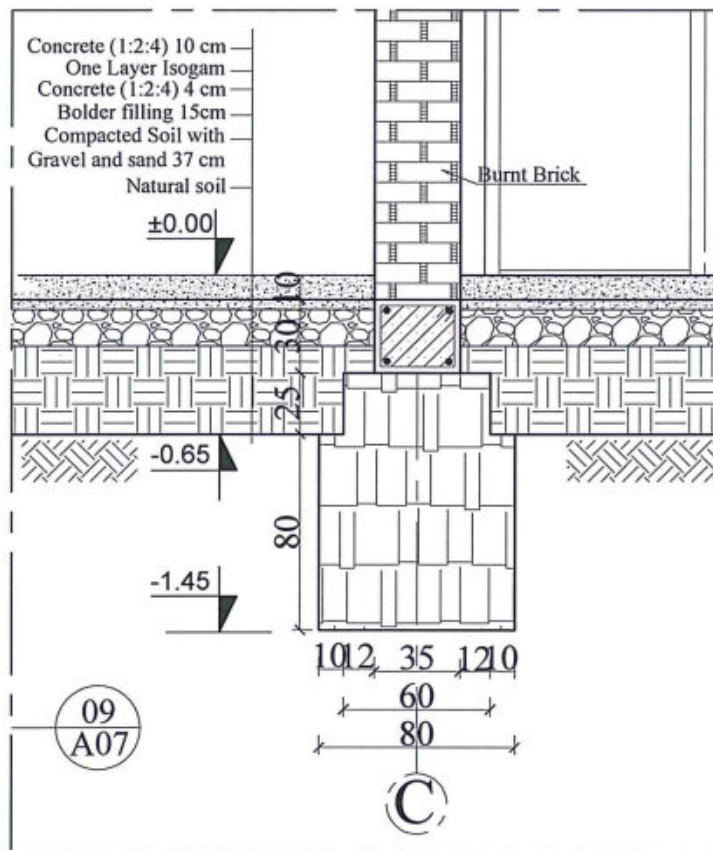
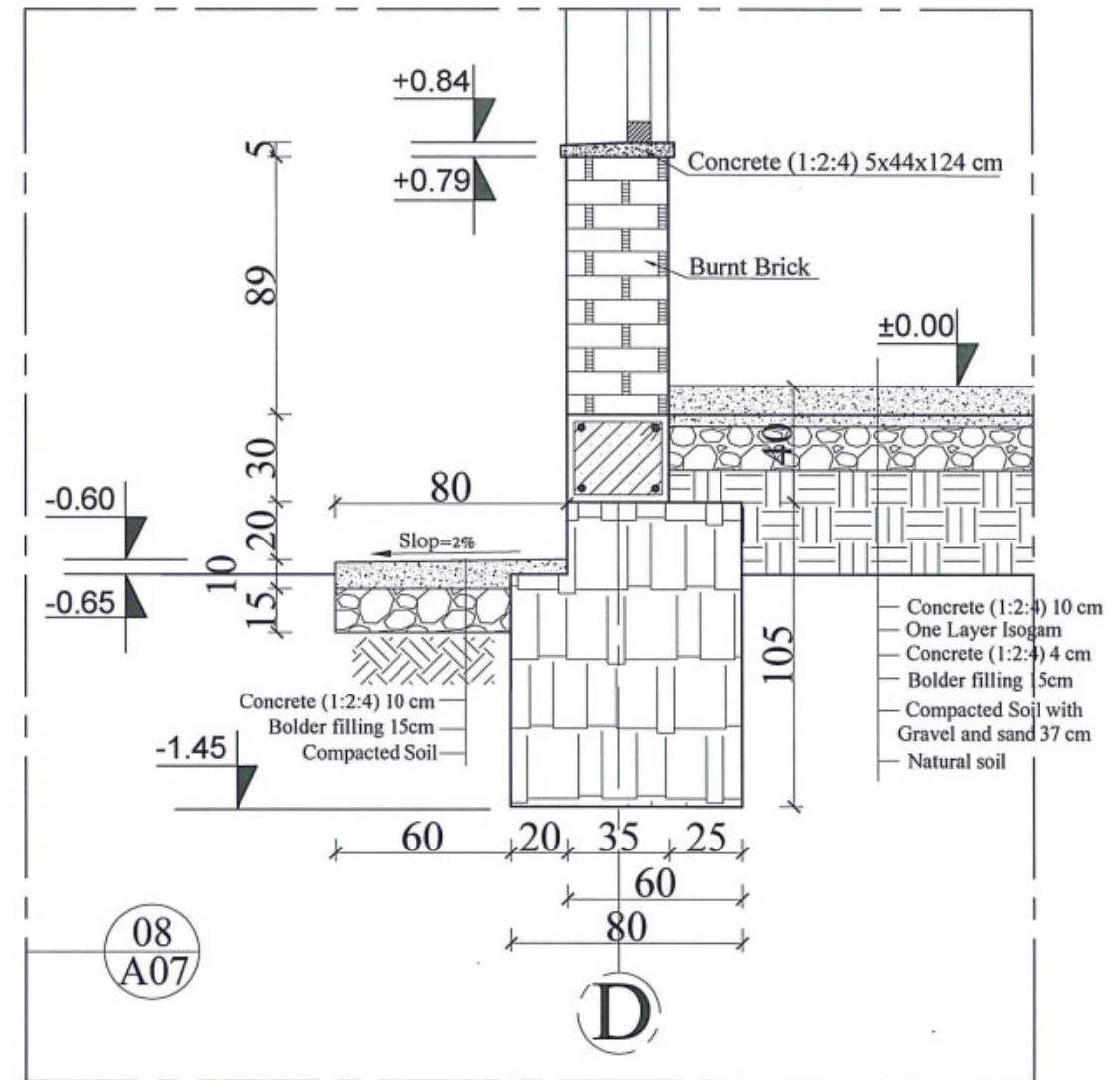
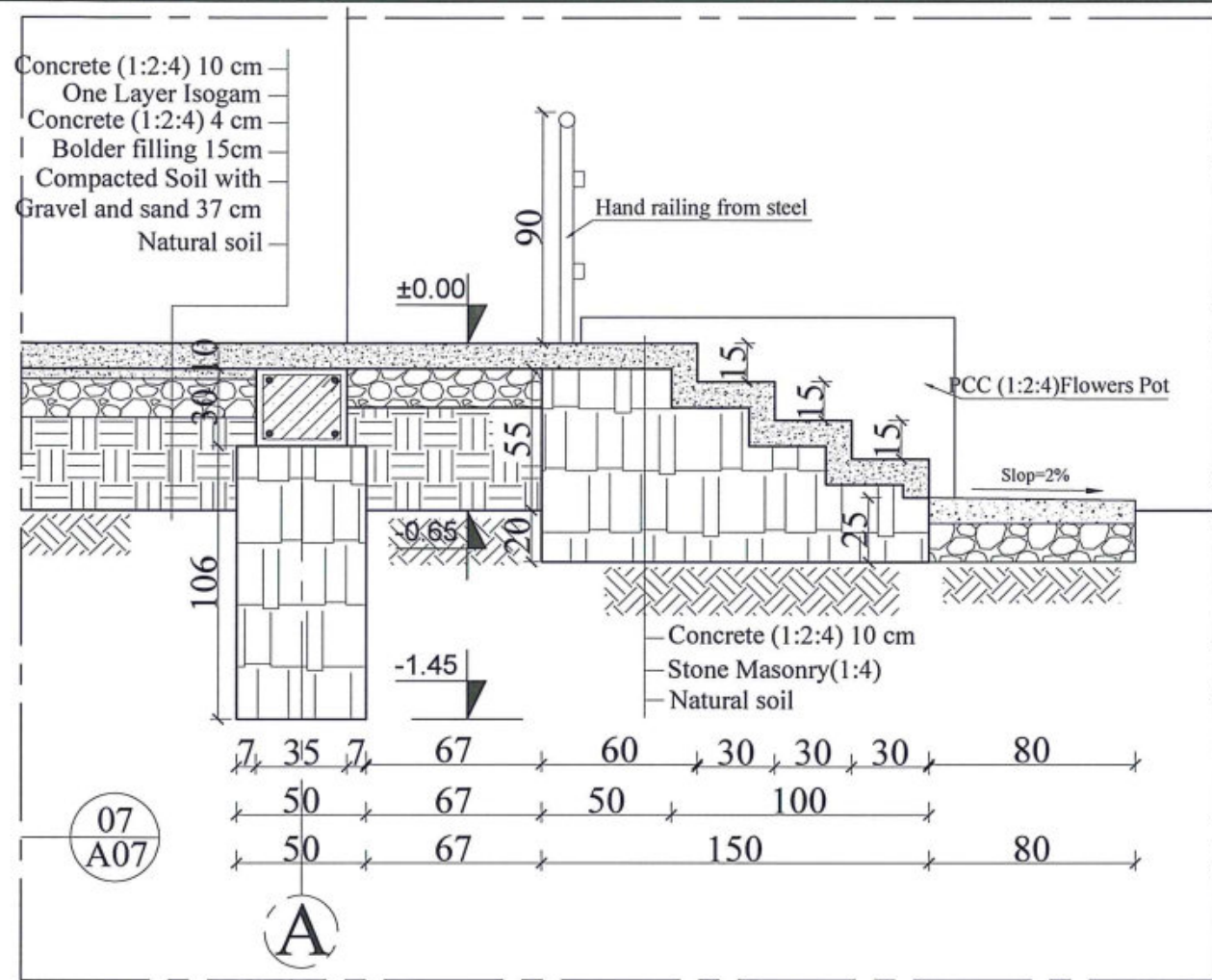
DRAWING TITLE

DETAILS OF FOUNDATION (D,1)

SHEET NO.

A18  
19





A  
19

DETAILS OF (7,8,9,10)  
SCALE: NO SCALE



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SCALE  
AS SHOWN (A3)

DATE  
12/08/2018

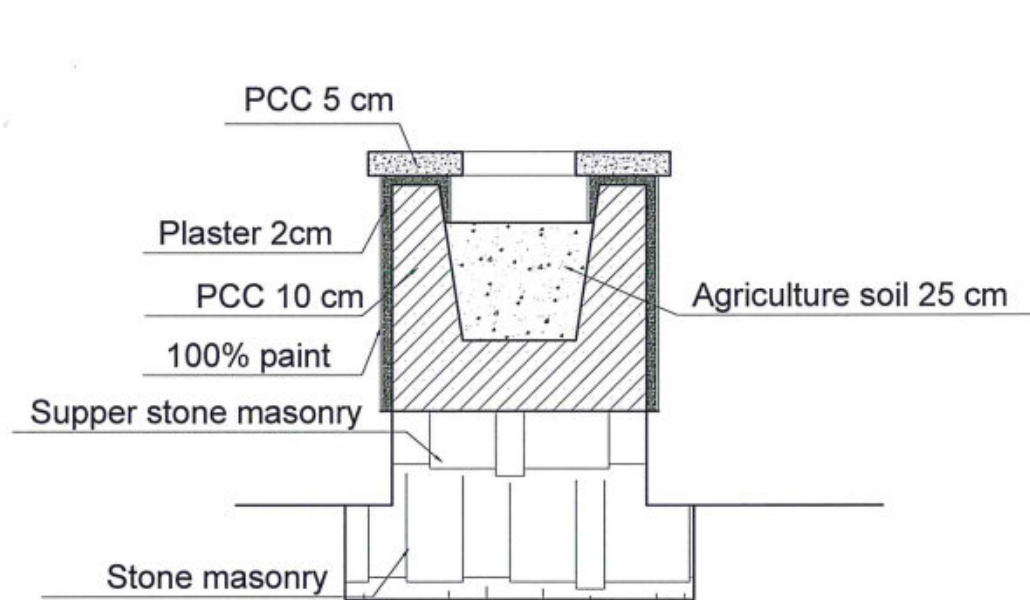
PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275

DRAWING TITLE  
Details of (7,8,9,10)

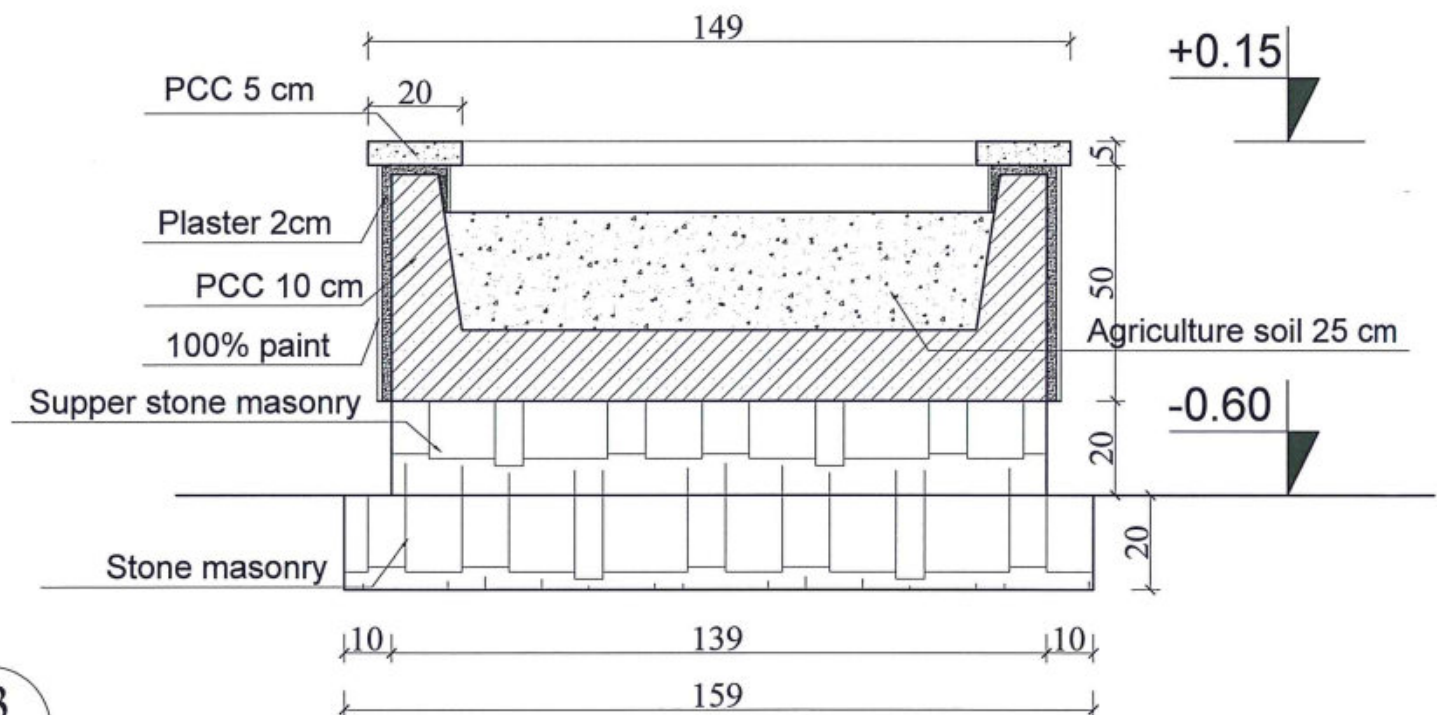
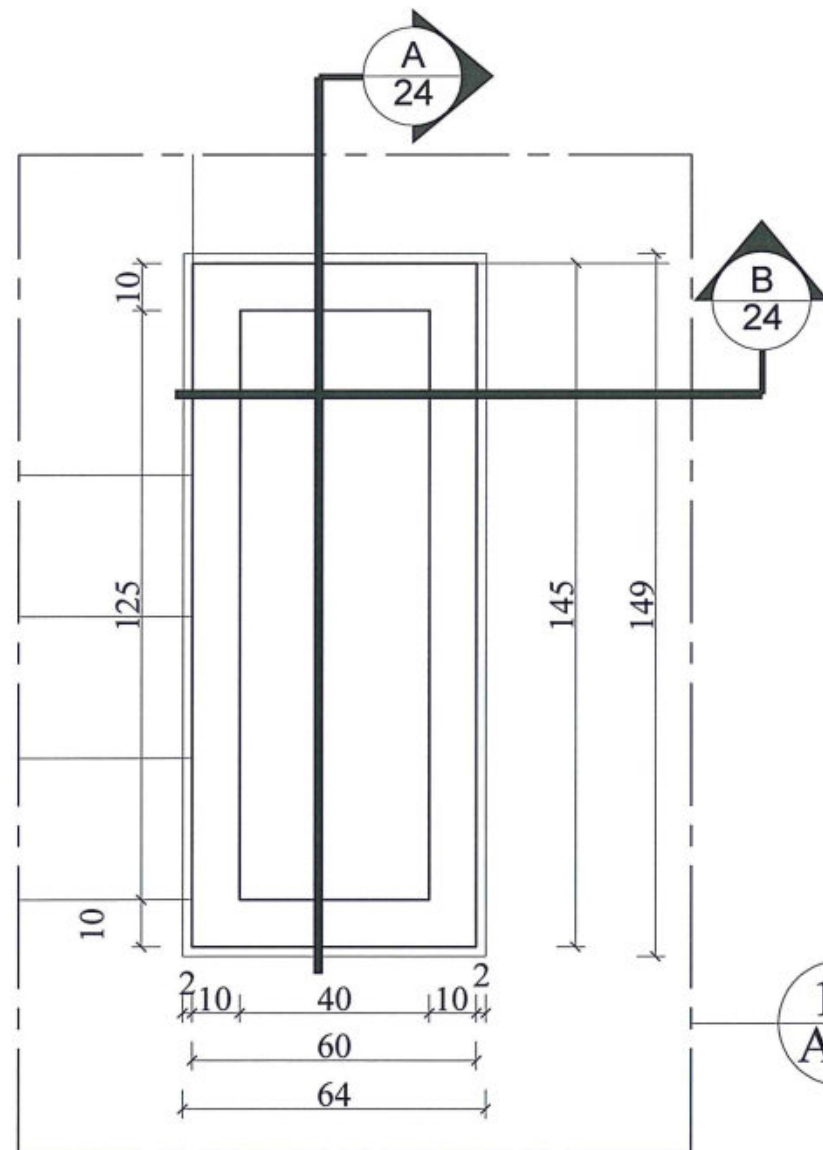
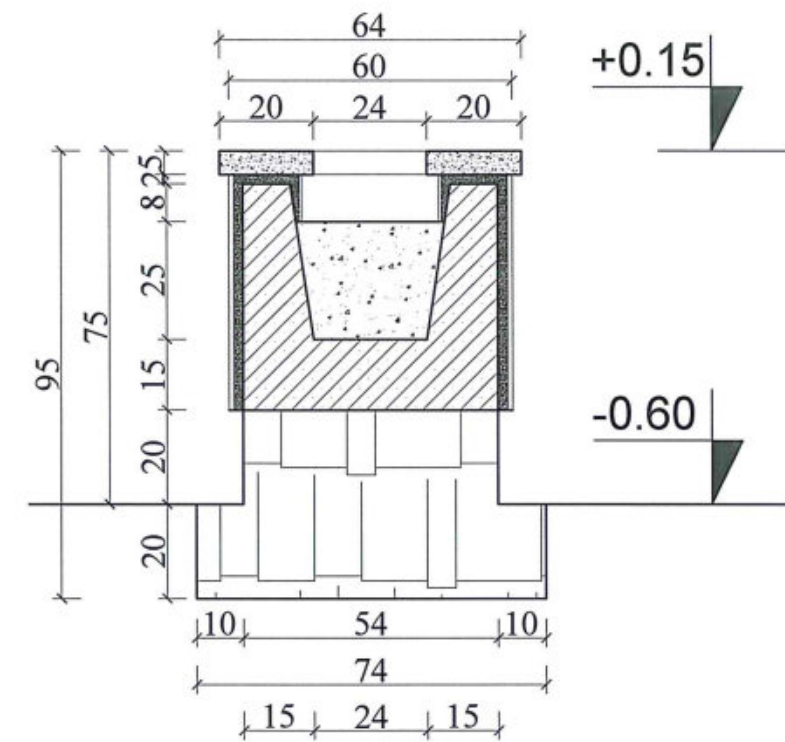
SHEET NO.

A19  
21





Sec.B-B



Sec.A-A

A  
20  
DETAILS OF 13 FLOWERS POT  
SCALE: NO SCALE



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PROTOTYPE SCHOOL DESIGN IN  
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team  
MOE/MRRD/DAARTT  
SCALE  
AS SHOWN (A3)  
DATE  
12/08/2018

PROJECT NAME  
6 Classroom Burnt Brick RCC Slab H-275  
DRAWING TITLE  
Details of 13 Flowers Pot

SHEET NO.

A20  
21







# Structural Drawings

6-Classrooms, one story school building with Brick Masonry load bearing walls Height= +2.89

Date: Jun-2018

Drawing Sheet list

No	Sheet Title	Sheet Number	Remarks
1	COVER SHEET	1	
2	GENERAL NOTES	2	
3	FOUNDATION PLAN	3	
4	FOUNDATION DETAILS	4	
5	REINFORCEMENT BARS OF RING BEAMS ON STONE MASONRY PLINTH AND RING BEAM NO: 3	5	
6	STRUCTURAL WALLS	6	
7	SHUTTERING PLAN FOR ROOF SLAB	7	
8	ROOF RCC RINGS AND BEAMS PLAN	8	
9	REINFORCEMENT BARS OF RING BEAMS NO:1-2	9	
10	REINFORCEMENT BARS OF RING BEAMS NO: 4-5-6	10	
11	BEAMS NO: 1-2	11	
12	BEAMS NO: 3-4 AND RING BEAM DETAILS	12	
13	REINFORCEMENT BARS PLAN FOR ROOF SLAB	13	
14	REINFORCEMENT BARS OF RING BEAM NO: 7 AND PARAPET DETAIL	14	

Logo and other informations



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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

STRUCTURAL/DESIGN  
PREPLANNED &  
CHECKED BY  
TECH- APPROVED BY

DAARTT

*[Signature]*

Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT  
AS SHOWN ( A3)  
JUN-2018

PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89  
COVER SHEET

SHEET NO.

01  
14



## تصویر

### عمومی:

- تمام مواد باید دارای جنسیت عالی و خوب باشد قبولی مواد مربوط انجنیر ساحه کارمیشاد و باید مطابقت به نقشه داشته باشد انجنیر ساحه کار مسوولیت تمام کارات را که تحت کنترل میباشند دارد
- در حصه تعدیل نقشه با انجنیر دیزاین کننده مشوره گردد
- پروسه کار پروژه از شروع تا ختم توسط انجنیر ساختمان مراقبت گردد
- در صورتیکه به کود ساختمانی افغانستان (ASC) و کودها و ستندرها ی مربوطه آن دسترسی باشد جهت معلومات و وضاحت بیشتر برای کانکریت به فصل پنجم و برای معموره به فصل هفتم و همچنان برای بارهای وارده به بخشهای 306-312 کود ساختمانی افغانستان مراجعه شود

### تهداب و کرسی:

- مقاومت خاک ( $1.5 \text{ gk/cm}^2$ ) برای دیزاین تهداب ها در نظر گرفته شده است
- پارچه سنگ معدن کوهی که در تهداب استفاده میشود مارک آن از 400 کمتر نباشد بطور عموم از 5 الی 40 کیلوگرام وزن داشته و دارای اشکال مختلف باشد؛ مقاوم سخت بادوام در مقابل حالات جوی مقاومت داشته قابلیت برداشت فشار و تحمل سایش راداشته باشد؛ متر اکم بوده در مقابل تیزابیت مقاومت داشته در ز خوردگی خرابی و نرمی نداشته وزن مخصوص سنگ از 2.5 کم نباشد و در 24 ساعت تحت آب بیش از 5% فیصد آب را جذب نکند قابلیت کار یاشکل گیری داشته در مقابل آتش زود متاثر نگردد و همچنان سنگ معدن کوهی باشد و سنگ روی دره که بی کیفیت باشد مورد استفاده قرار نگیرد؛ در نیش ها از سنگ های شکل داده شده دورویه کار گرفته شود؛ قوی ترین و بزرگترین سنگ ها باید در پایین قسمت روی زمین وزاویه ها و کنج ها کار گرفت؛ سنگ ها باید در مصالح خوابانیده شده و توسط چکش بالای آن کوبیده شود؛ سمت های بیرونی و داخلی کنج ها و تمام خلاها توسط مصالح پر کاری گردد؛ قسمت های پیش روی و عقب سنگ کاری همزمان کار گردد؛ از سنگ پارچه های خورد باید جهت جابجا نمودن سنگ های بزرگ کار گرفته شود؛ چهار جایت یا درز مایه نباید در یک قطار کار کردند از درز های طویل بین دو سنگ جلوگیری بعمل آید؛ در قسمت فوقانی دیوار از سنگ های کار گرفته شود کبه دیوار شکل هموار بدهند.
- مارک مخلوط مصالح 300 با تناسب (1:4) باشد نسبت مقدار آب و سمنت مراعات گردد و باید کوشش شود همان اندازه مصالحه تیار گردد که در ظرف نیم ساعت استعمال گردد و باید بطور دوامدار توسط بیلچه خوب تا و بالا گردد؛ مصالح سنگ کاری باید غلیظ باشد استعمال گردد هرگز در داخل سنگ کاری از مصالح ابگین کار نگیرید؛ مقدار حجم مصالحه در سنگکاری باید 35% الی 40 فیصد باشد سنگ ها خوب بافت داده شود و درز های سنگ ها باید خوب توسط مصالحه پر گردد؛ پروسه سنگکاری بعد از هر 60 سانتی متر لیول و یا آب تراز و گردد و بعداً قطار بعدی شروع گردد در قسمت اب زدن کانکریت و غیره امورات باید توجه جدی معطوف گردد تا مراحل تعاملات کیمیاوی سخت شدن کانکریت بخوبی تکمیل گردد سطح بالایی کانکریت بطور دایم حد اقل در محیط سرد 28 شبانه روز و در محیط گرم 14 شبانه روز مرطوب نگهداری گردد در تمام امور ساختمانی که از سمنت استفاده میشود برای مدت بیشتر از 14 یوم نظر به شرایط جوی و اقلیمی آب پاشی متداوم صورت گیرد تا عنصر مقاومت پروژه ی خود را حاصل نماید

### سیخ آهنکانکریت:

- سیخ های با مقاومت سنجشی ( $\text{Grade:40, Fy=2800kg/cm}^2$ ) درگزدمکها و؛ با مقاومت سنجشی ( $\text{Grade:60, Fy=4200kg/cm}^2$ ) در عناصر آهنکانکریتی محاسبه شده است. قشر محافظوی برای سیخ ها در پوشش از 1.5 سانتی متر و در گادرها از 2.5 سانتی متر کمتر نباشد
- سیخ های مورد استفاده باید عاری از زنگ زده گی باشد

### دیوارهای وزن بردار:

- ازینکه دیوارها در تمام پروژه وزن بردار میباشند بدین معنی اولاً تمام دیوارها اعمار و تکمیل گردد بعداً بالای آن قالببندی رینگ بیم و سلبها کار میشود که دیوارها وظیفه انتقال وزن تمام عناصر رابه تهداب دارند از خشت های درجه اول بامارک 140 باید استفاده گردد برای خشت کاری از مصالح سمنت وریگ مارک 300 یاتنا سب (1:4) استفاده شود و مقدار حجم مصالحه در خشت کاری باید 28% فیصد باشد. قبل از استفاده در بین اب برای 24 ساعت نگهداری گردد تا قابلیت جذب اب رابه اندازه کافی داشته باشد در صورتیکه از اثر جذب اب خشت ها شاریده گی پیدا کند قابل استعمال نمی باشد؛ فواصل بین خشت کاری دیوار باید 8 ملی متر باشد و این فاصله خشت ها که با مصالح پر میگردد نباید از یک سانتی متر اضافه گردد زیرا این کار مقاومت دیوار را کم میسازد؛ بعد از هر سه قطار خشت کاری دیوار باید ذریعه شاول چک گردد تا اطمینان حاصل گردد که دیوار درست کار شده. خشت کاری باید دارای بافت باهم باشد یعنی نصف خشت بالای یک خشت و نصف خشت بالای خشت دیگر از قطار پایینی قرار گیرد و این خشت ها باید خط عمود را ایجاد ننماید که این کار باید در کنج ها تطبیق گردد
- ریگ مورد ضرورت مصالحه باید عاری از خاک؛ گل و مواد عضوی باشد ریگ بقسم نخودی بوده 40 فیصد ان سایز یک الی سه ملی متر دارا باشد و به هیچ صورت فیصدی خاک از 5 فیصد تجاوز ننماید ریگ و سمنت باید باهم خوب مخلوط گردد و باز هم قابل یادآوری است که مصالحه باید اضافه تراز نیم ساعت بعد ازینکه اب بالای ان مخلوط گردد استفاده گردد در غیران فقط ریگ میگردد.
- پلستر دیوارهای داخلی و خارجی از مصالح سمنت وریگ با مارک M400 با تناسب (1:3) استفاده شود

### کانکریت:

- مارک کانکریت سیخدار در تمام عناصر انحنایی (M:200) با تناسب 1:1.5:3 میباشند
- آب های مورد استفاده برای مخلوط کانکریت پاک و تازه بوده شور و نمکی نباشد مقدار و اندازه اب مربوط به مارک مصالحه و کانکریت میباشند که برای مارک 200 -  $0.209 \text{ m}^3$  متر مکعب برای مارک 300 -  $0.251 \text{ m}^3$  تعین گردیده؛ آبدی برای تهیه نمودن رطوبت کافی و بوجود آوردن پروسه آبدی سمنت لازمی میباشند تا در آغاز کار ریخت سازی باید شروع گردد هر قدر آبدی وقت بیشتر را در برگیرد همان اندازه کیفیت کانکریت ازدیاد میابد از رویش های (اب پاشی نمودن؛ غرقه سازی؛ پوش کردن توسط خریطه های سمنت و پلاستیک اگر خطر شبنم موجود باشد در ان صورت آبدی کمتر صورت گرفته و توسط مواد عایق مانند خریطه های خالی سمنت و سبزه پوش گردد.
- سمنت مورد استفاده باید دارای مارک 400 تازه و پورتلند باشد
- قالب ها قبل از استفاده باید خوب چرب کاری شود
- ریگ و جغل قبل از استفاده باید شستشو گردد؛ باید ریگ دانه دار استفاده گردد هرگز ریگ میده دانه استفاده نگردد.
- در مخلوط کانکریت جغل کرش نوع دریایی با سورت های الی قطر 2.5 سانتی متر استفاده گردد و از جغل کرش نوع صخره ای یا کوهی استفاده نشود
- حین کانکریت ریزی و پیراتور استفاده گردد و باید توسط افراد مسلکی پروسه متر اکم سازی انجام شود
- قالب های عناصر انحنایی به هیچ وجه قبل از 18 روز دور نگردد
- مقدار مصالح که توسط دست مخلوط میگردد نباید از  $0.5 \text{ m}^3$  اضافه تر گردد و نباید روی خاک ها مخلوط گردد؛ برای کانکریت ریزی و مخلوط ان آزمایشین مکسر استفاده گردد.



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OF CONSTRUCTION



PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

STRUCTURAL/DESIGN  
PREPLANNED &  
CHECKED BY  
TECH- APPROVED BY

DAARTT

*Handwritten signature*

Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT  
AS SHOWN (A3)  
JUN-2018

PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HEIGHT=+2.89  
GENERAL NOTES

SHEET NO.

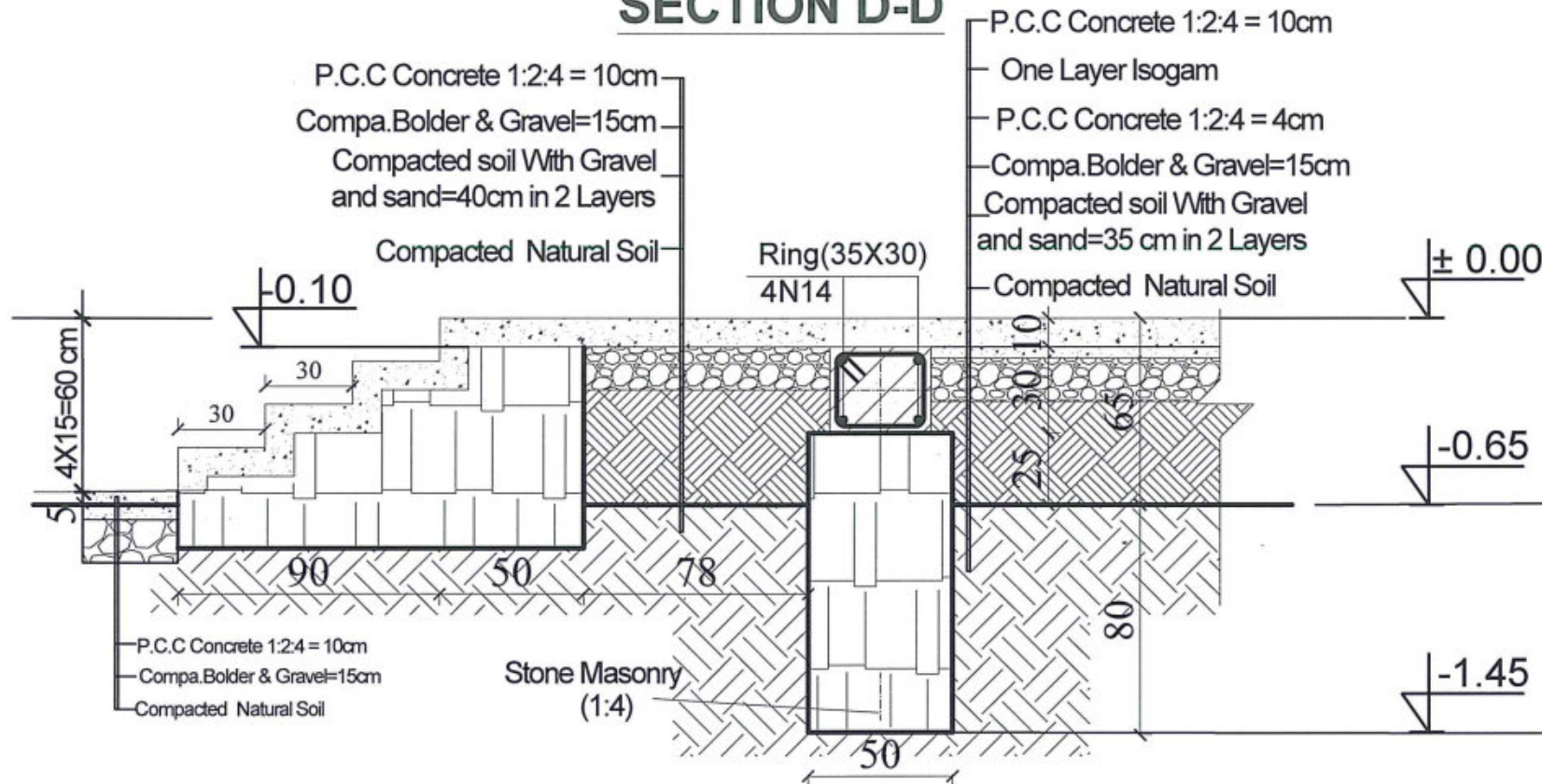
02  
14



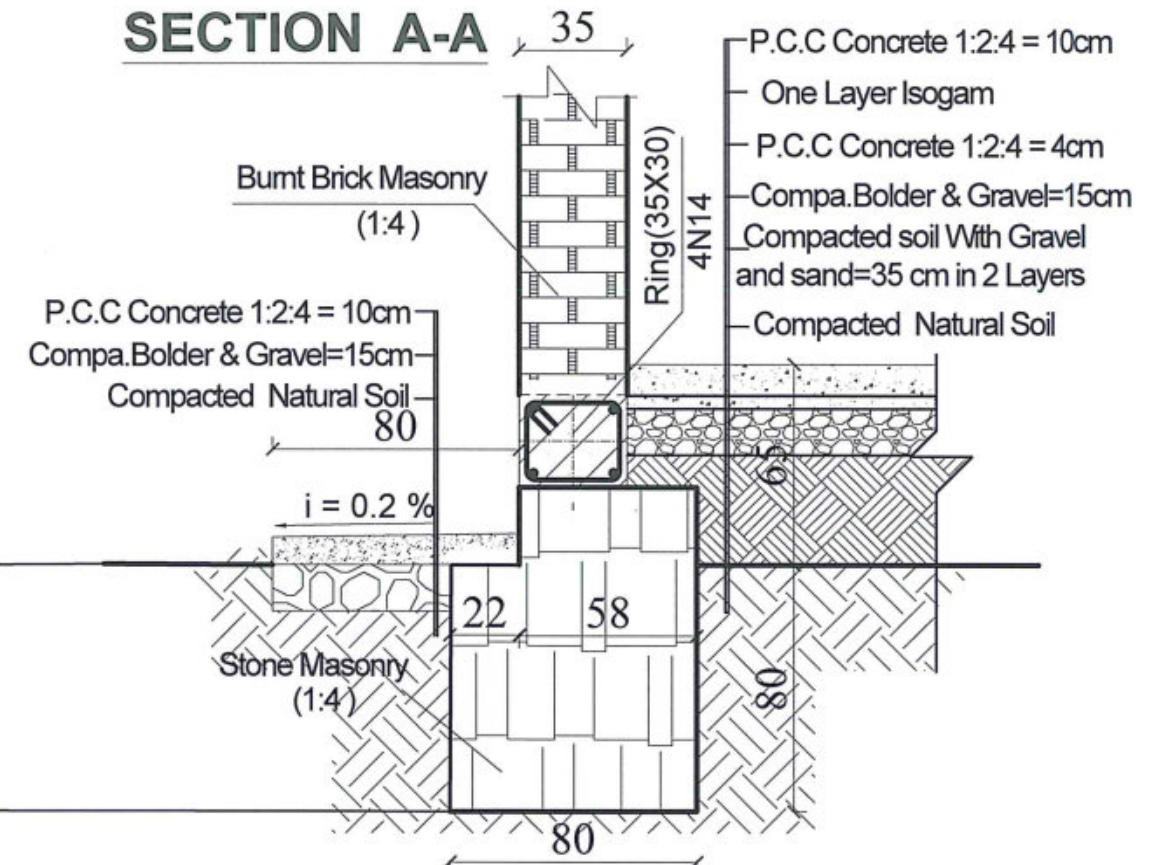




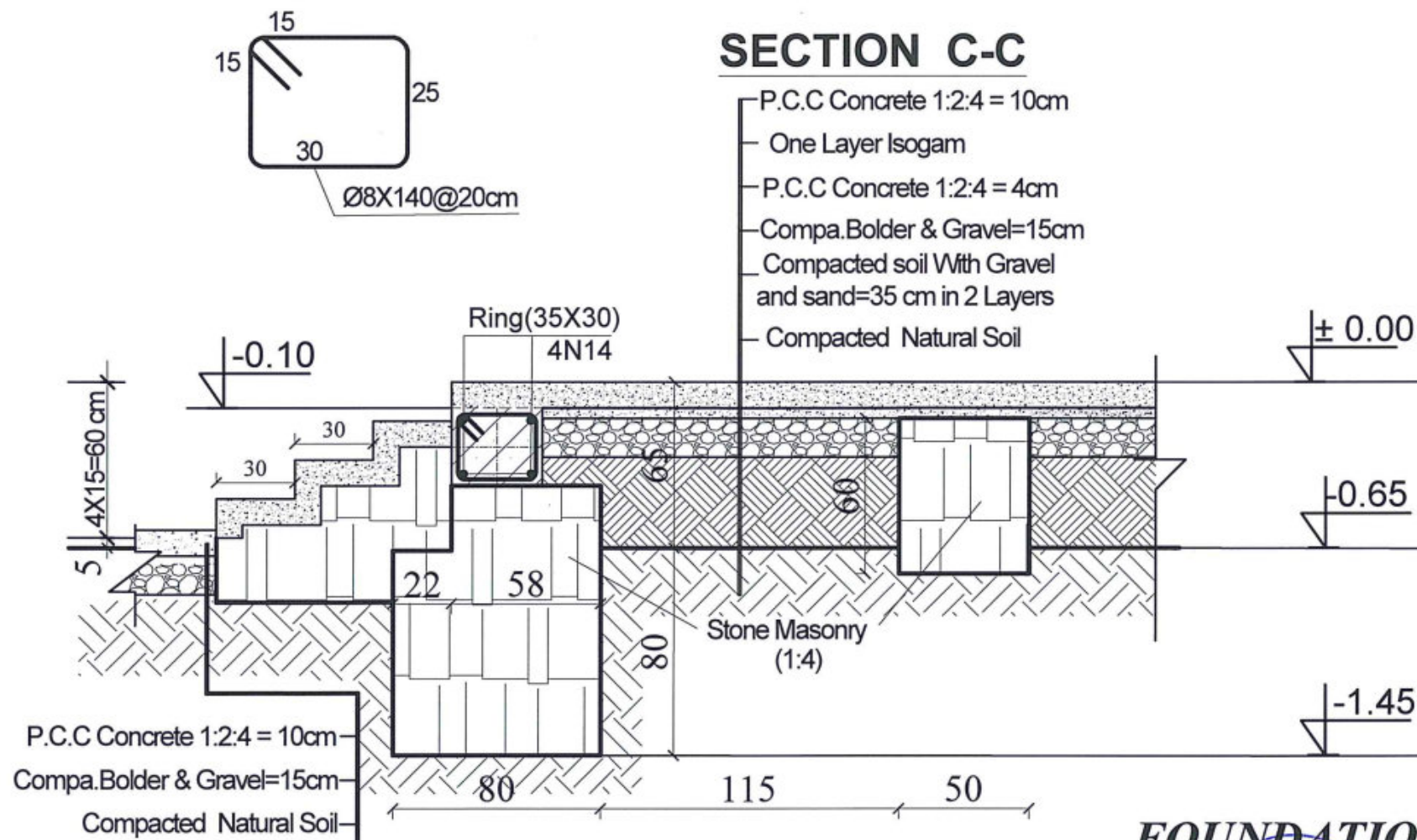
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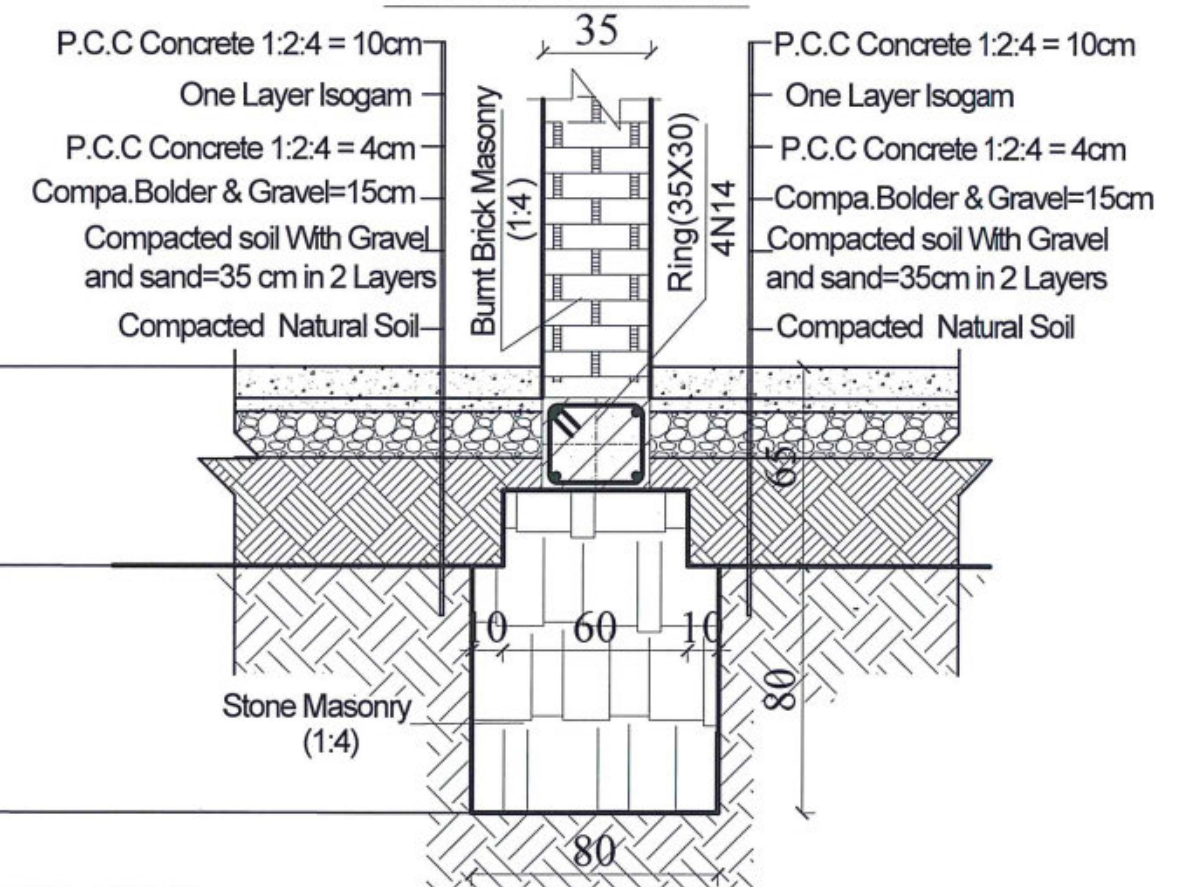
## SECTION A-A



## SECTION C-C



## SECTION B-B



## FOUNDATION DETAILS



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DATE

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JUN-2018

PROJECT NAME

DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89

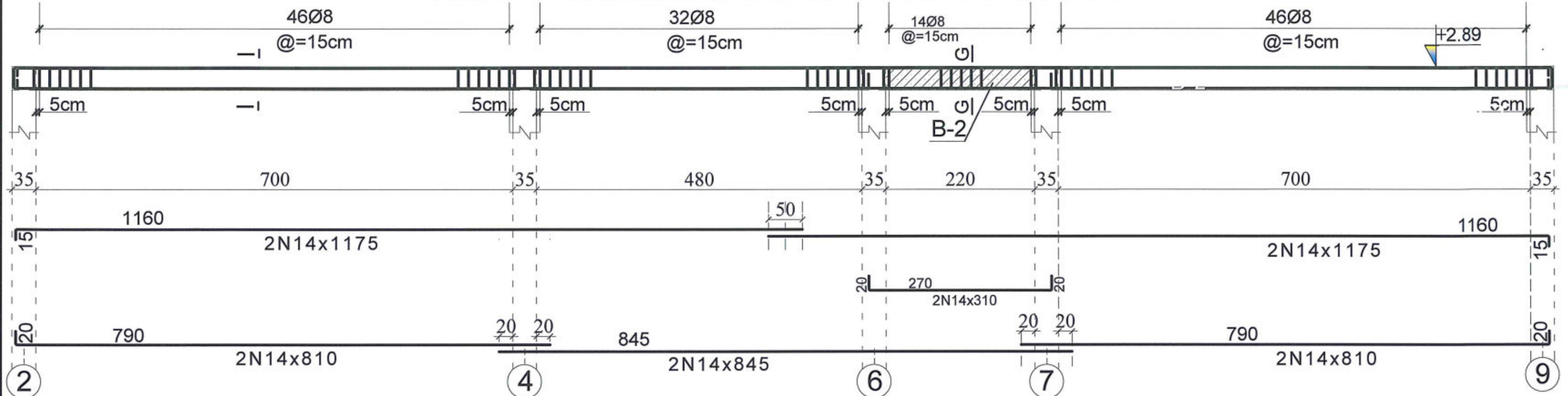
FOUNDATION DETAILS

SHEET NO.

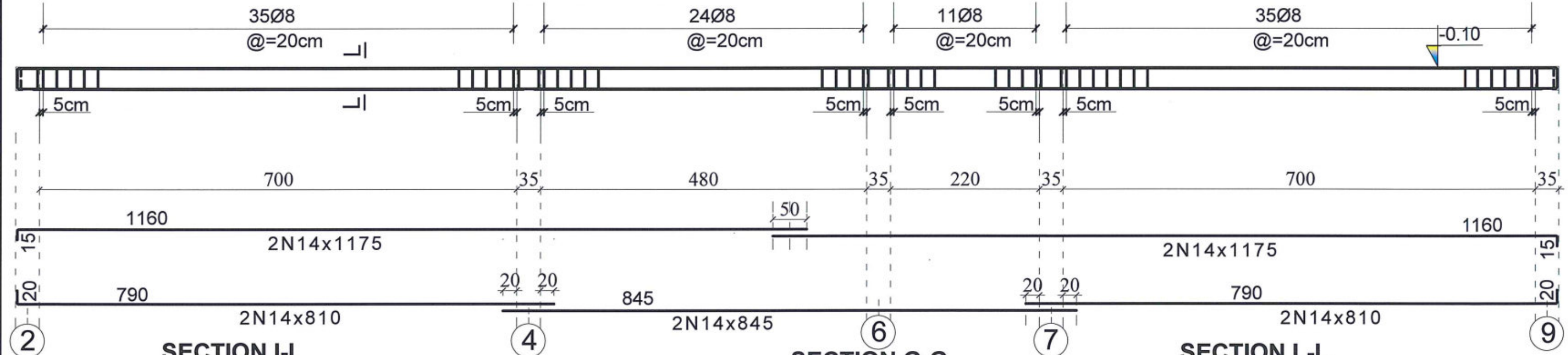
04  
14



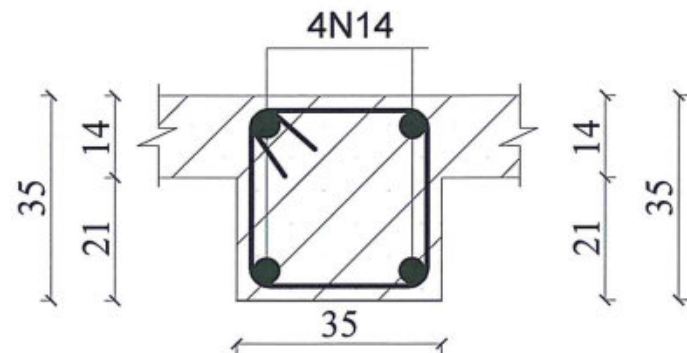
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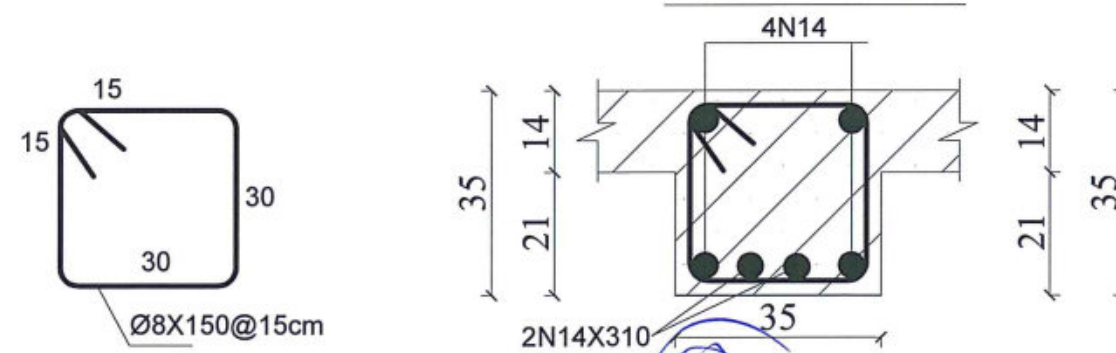
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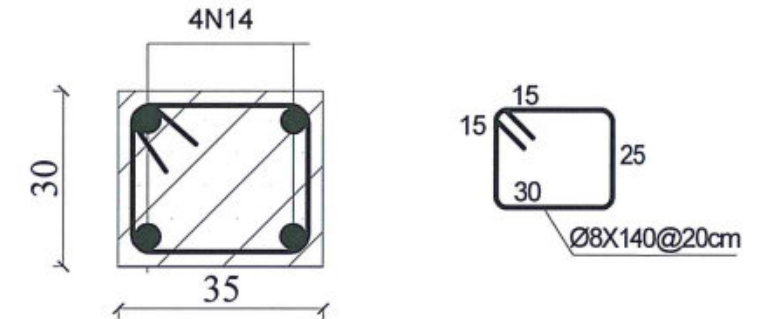
SECTION I-I



SECTION G-G



SECTION L-L



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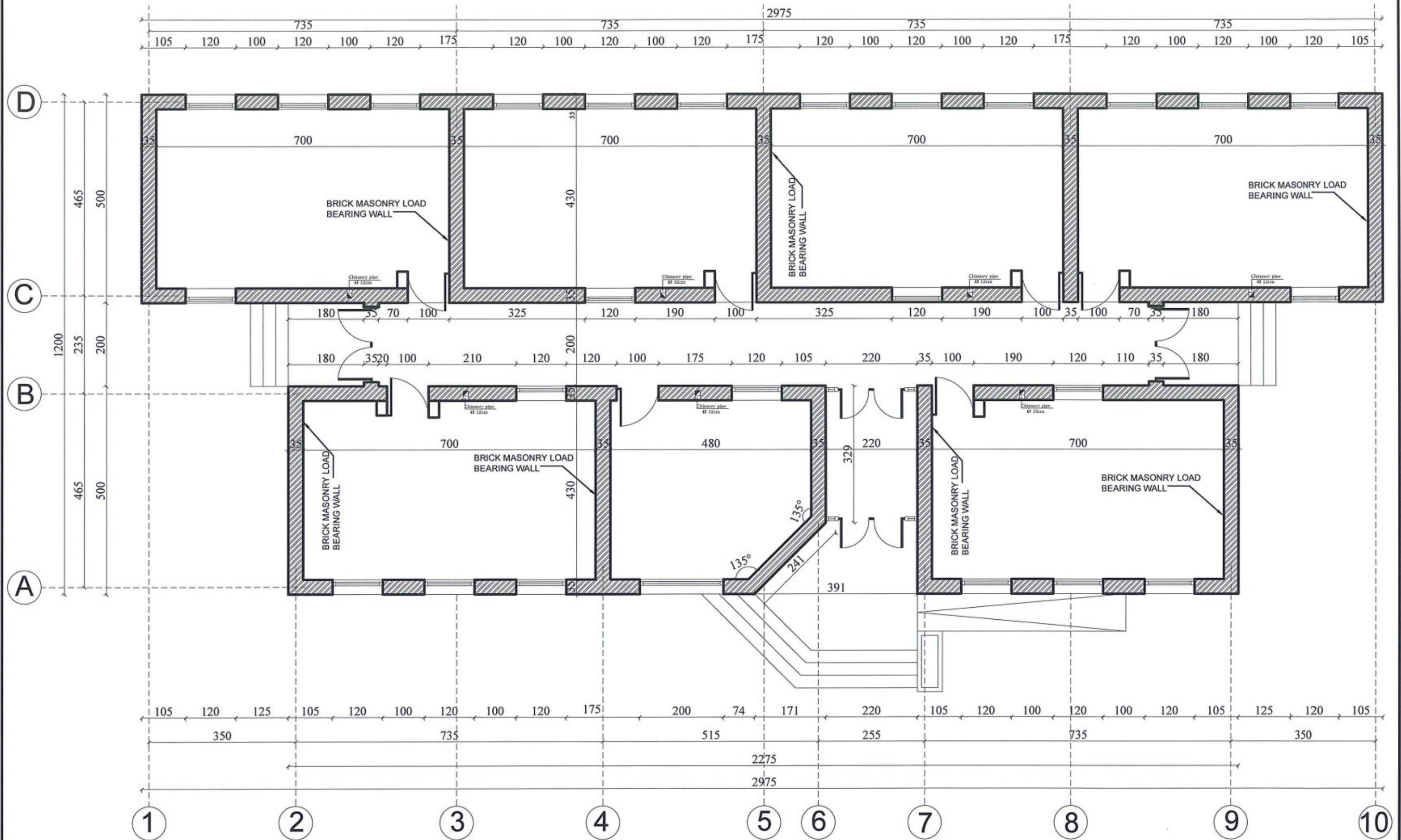
PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89  
REINFORCEMENT BARS OF RING BEAMS  
ON STONE MASONRY AND R.B NO:3

SHEET NO.

05  
14





## STRUCTURAL WALLS PLAN



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PROTOTYPE SCHOOL DESIGN IN  
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DATE

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JUN-2018

PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89  
STRUCTURAL WALLS

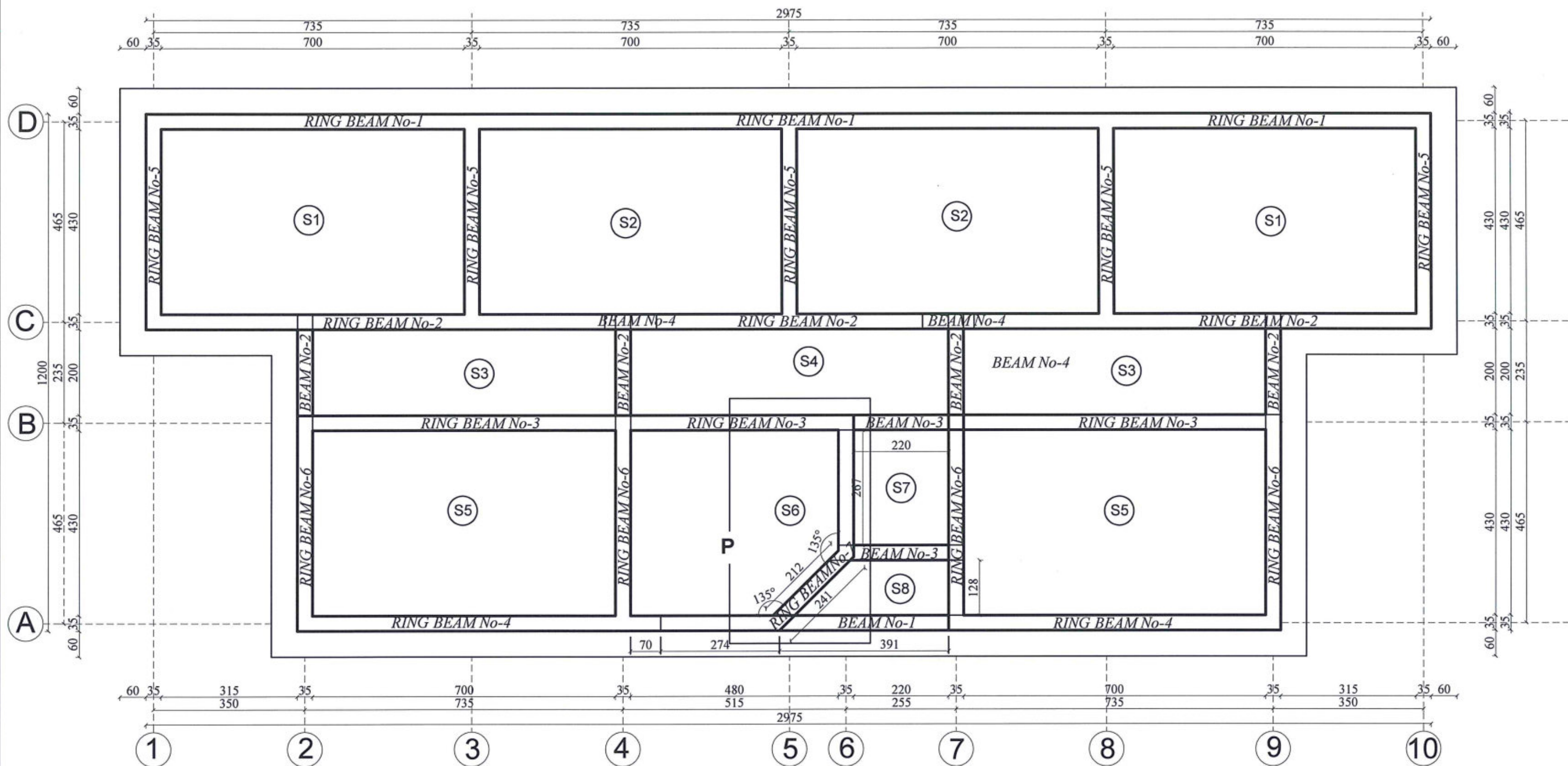
SHEET NO.

06  
14









ROOF RCC RINGS AND BEAMS PLAN



MINISTRY OF EDUCATION DEPARTMENT  
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SCALE  
DATE

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AS SHOWN (A3)  
JUN-2018

PROJECT NAME  
DRAWING TITLE

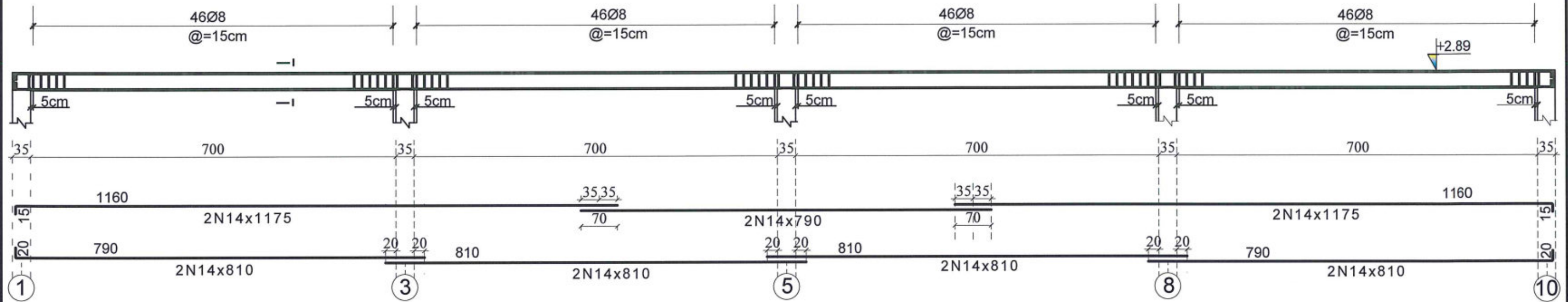
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ROOF RCC RINGS AND BEAMS PLAN

SHEET NO.

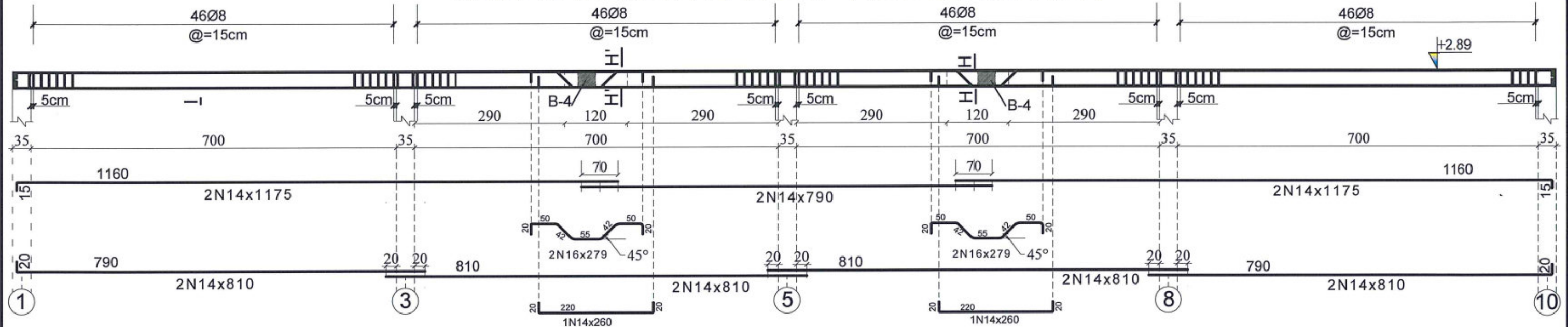
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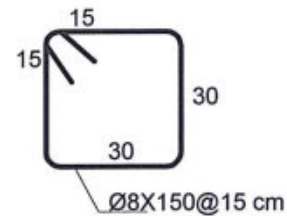
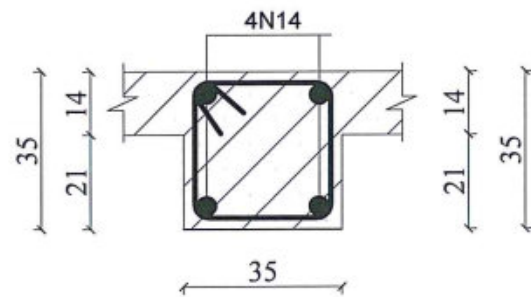
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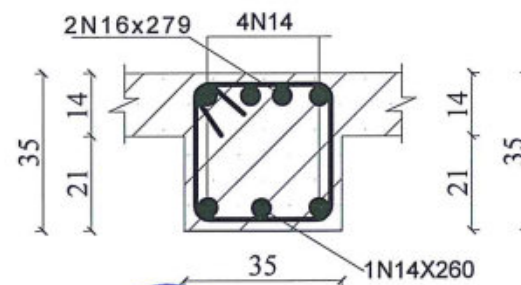
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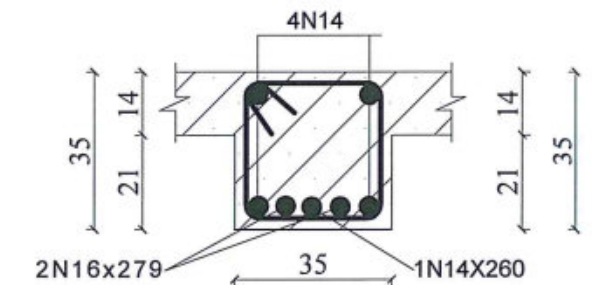
### SECTION I-I



### SECTION H'-H'



### SECTION H-H



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JUN-2018

PROJECT NAME

DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89

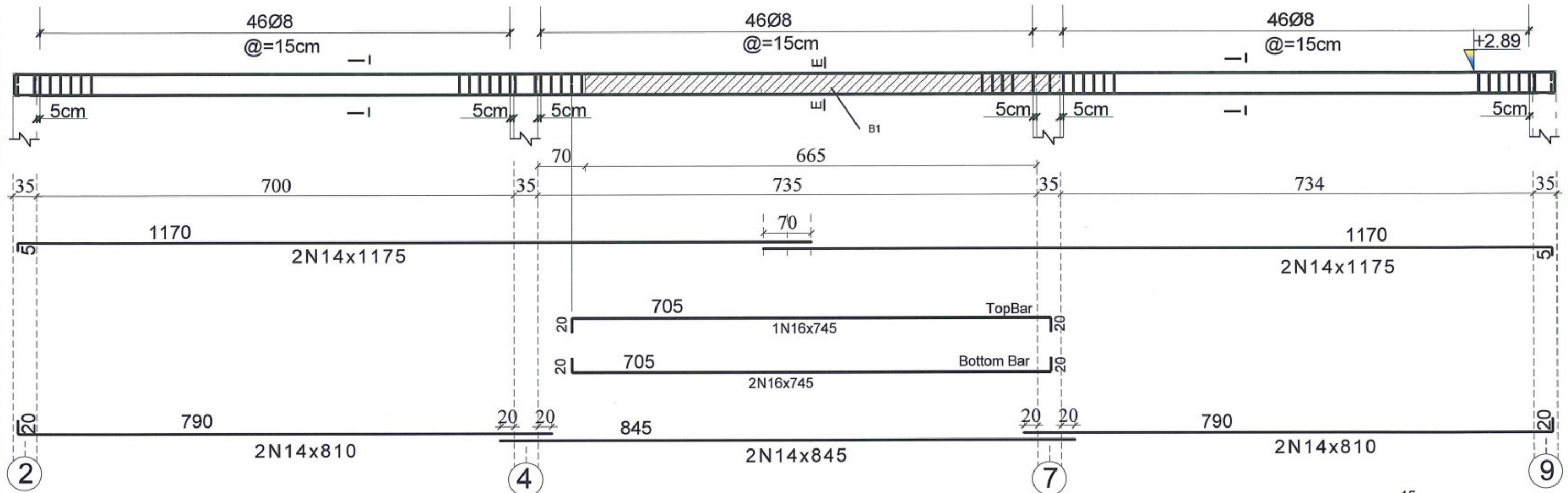
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SHEET NO.

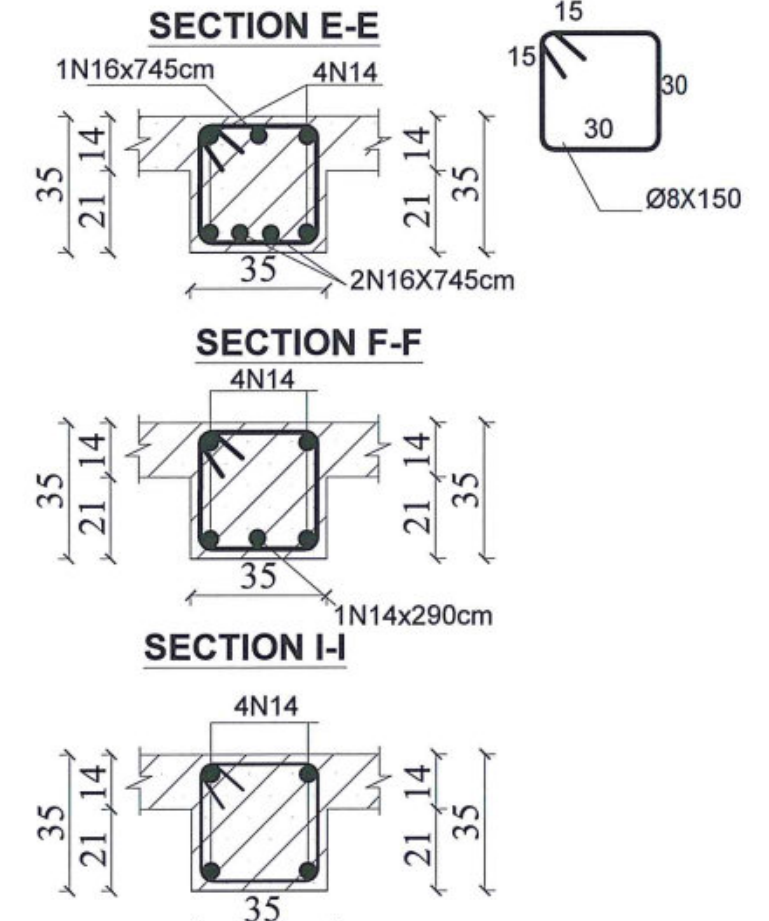
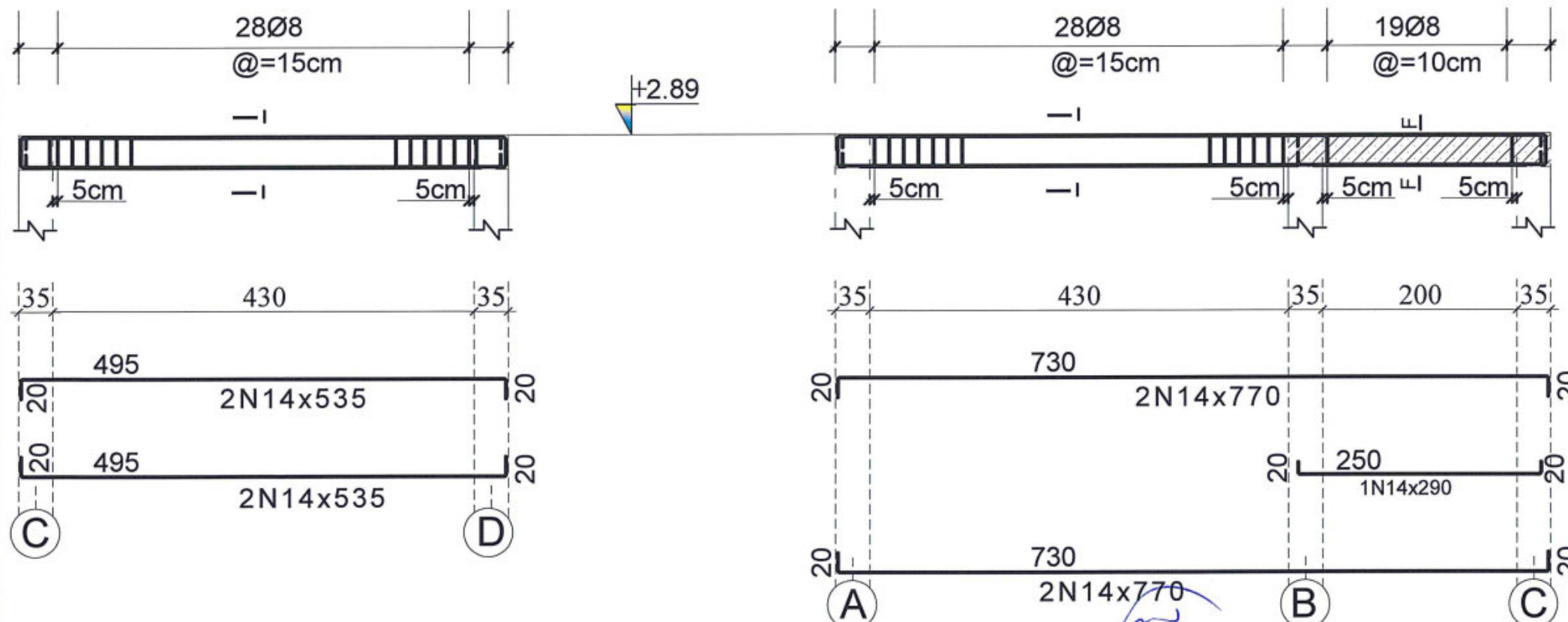
09  
14



## REINFORCEMENT BARS OF RING BEAMS No .4



## REINFORCEMENT BARS OF RING BEAMS No .5,6



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JUN-2018

PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
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REINFORCEMENT BARS OF RING BEAMS No 4,5,6

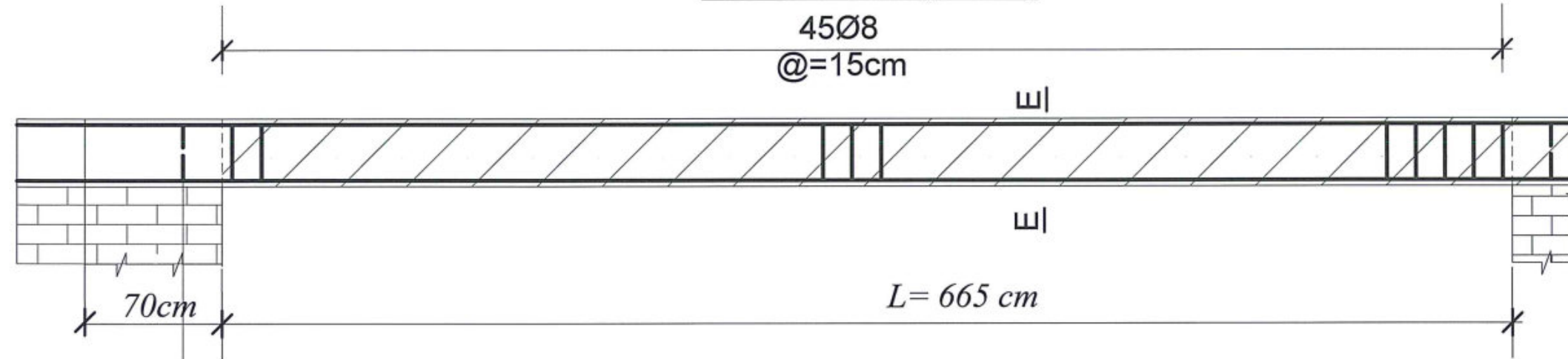
SHEET NO.

10  
14



### BEAM No1(1Nrs)

45Ø8  
@=15cm



2N14 (Ring steel bar)

705

TopBar

1N16x745

20

20

705

Bottom Bar

2N16x745

20

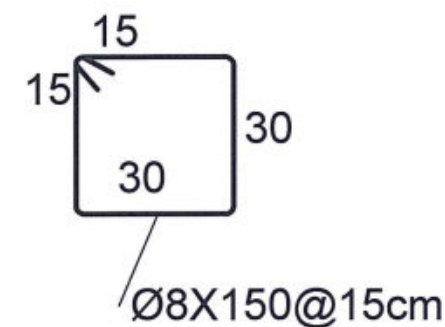
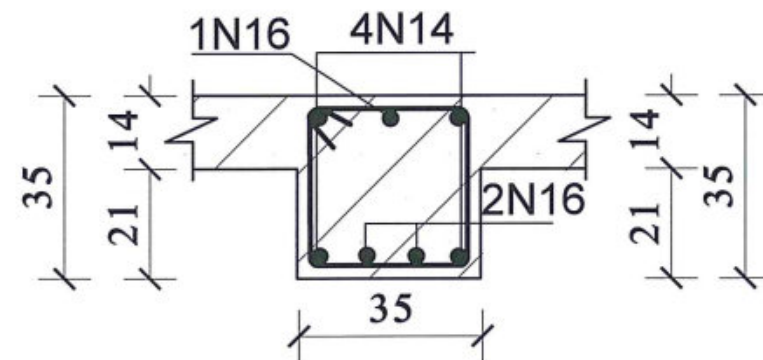
20

2N14 (Ring steel bar)

4

7

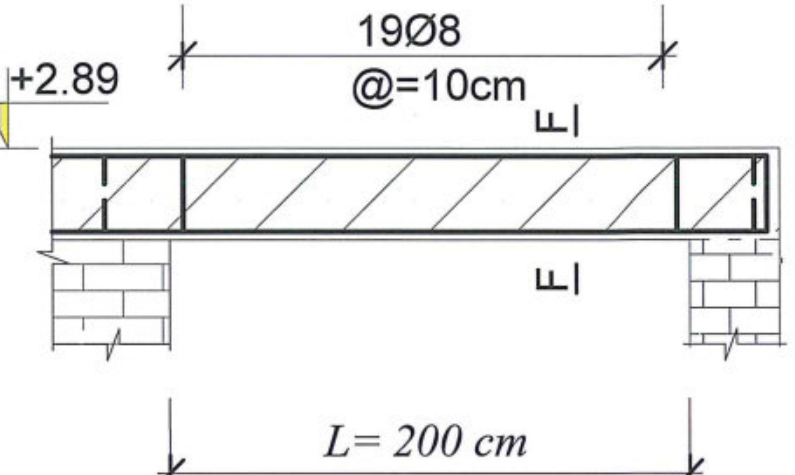
### SECTION E-E



### BEAM No2(4Nrs)

19Ø8  
@=10cm

+2.89



2N14 (Ring steel bar)

20

250

20

1N14x290

20

20

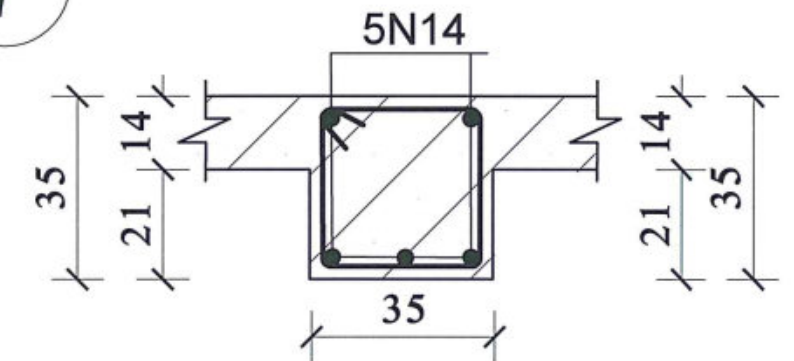
2N14 (Ring steel bar)

20

B

C

### SECTION F-F



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PROTOTYPE SCHOOL DESIGN IN  
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SCALE  
DATE

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PROJECT NAME  
DRAWING TITLE

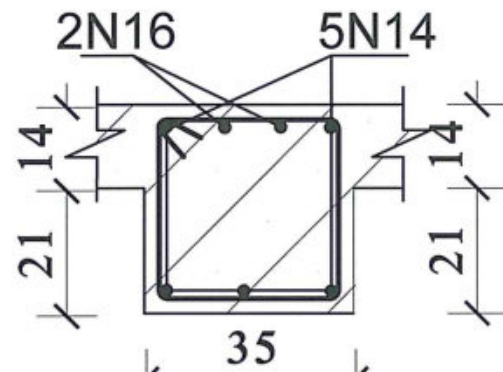
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HIGHT=+2.89  
BEAMS No 1-2 :DETAILS

SHEET NO.

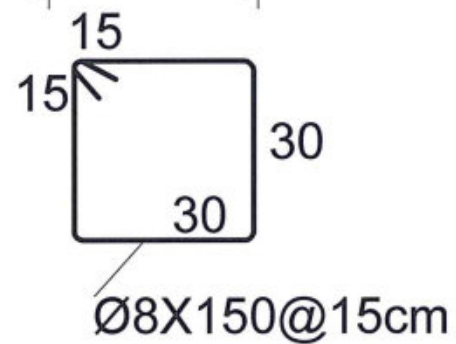
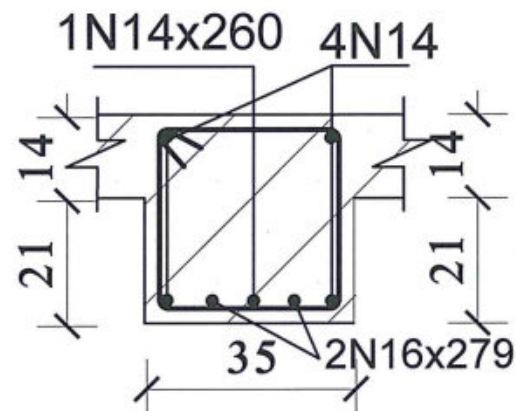
11  
14



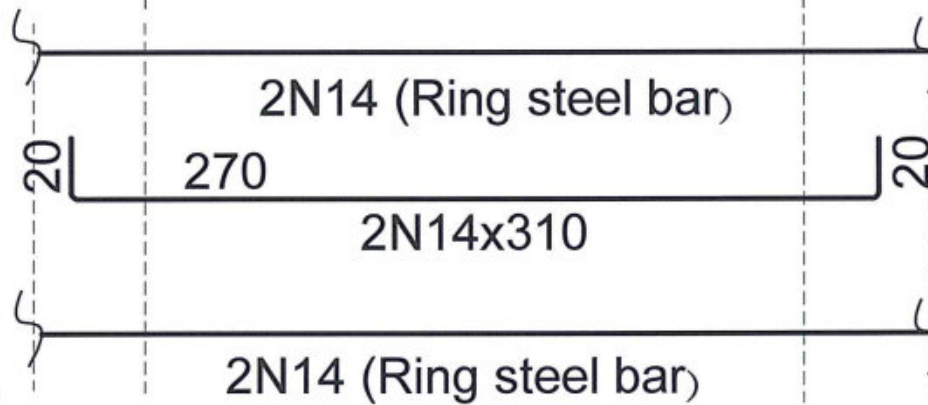
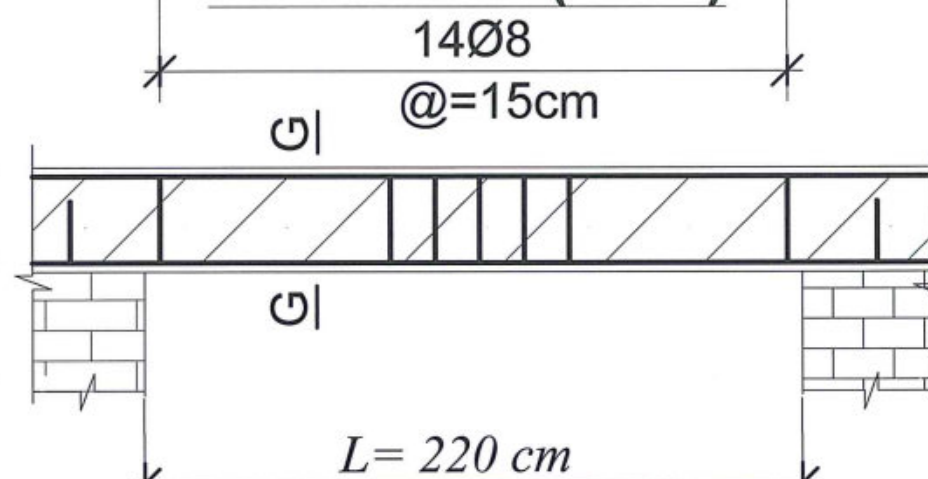
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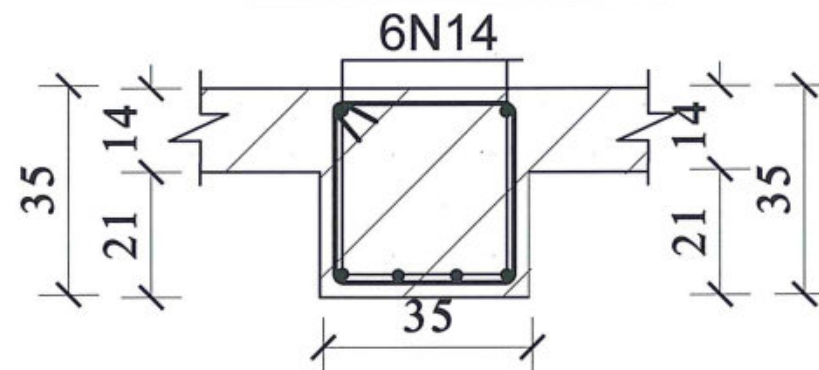
### SECTION H-H



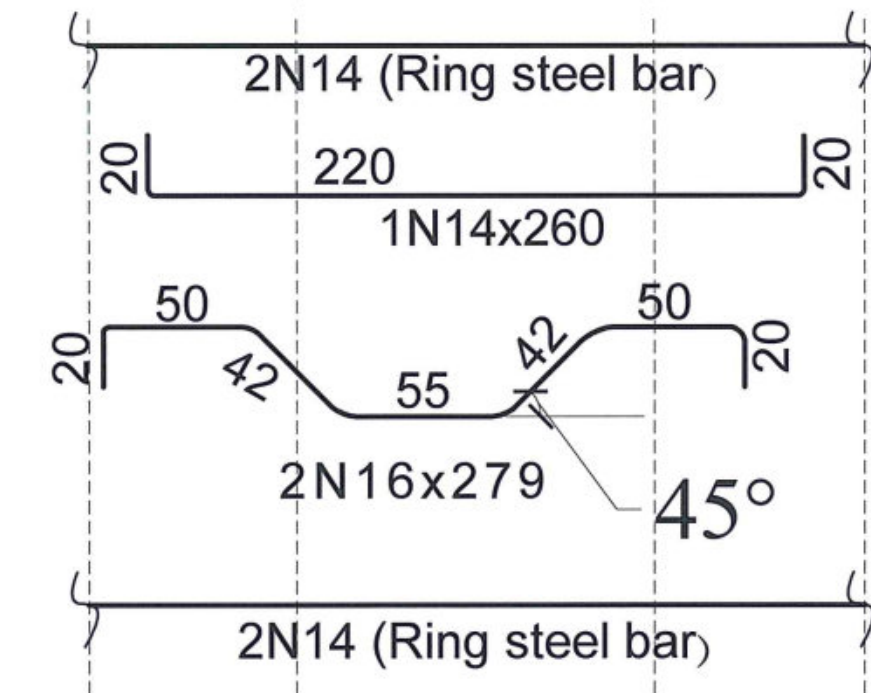
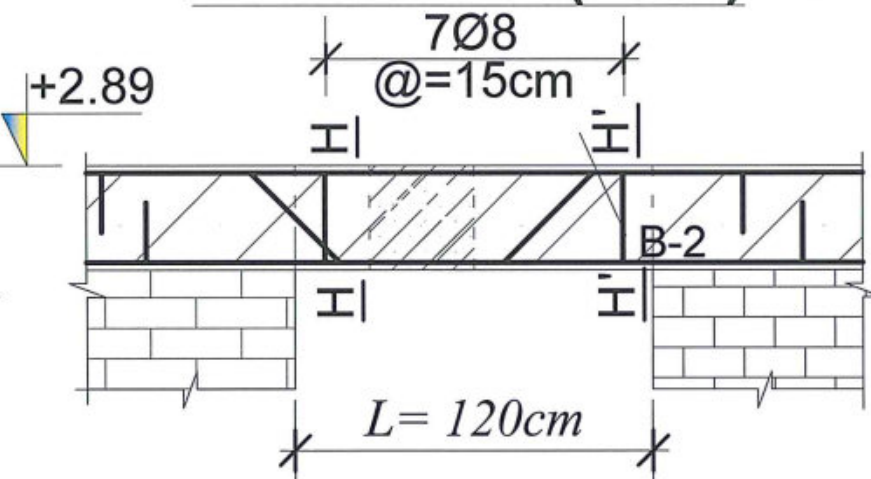
### BEAM No3(2Nrs)



### SECTION G-G



### BEAM No 4 (2Nrs)



### BEAMS DETAILS



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JUN-2018

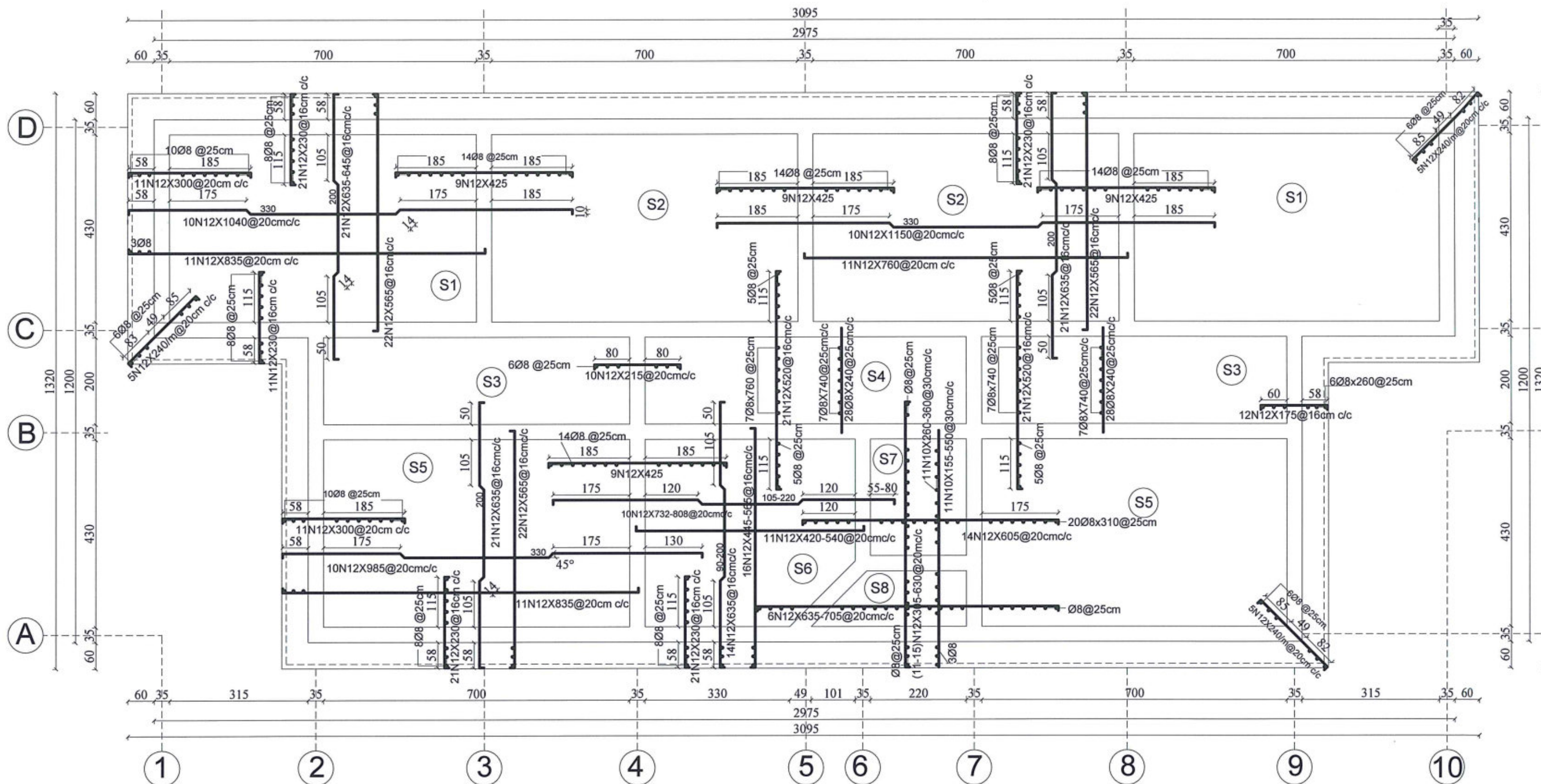
PROJECT NAME  
DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89  
BEAMS No 3-4 :DETAIL

SHEET NO.

12  
14





REINFORCEMENT BARS PLAN FOR ROOF SLAB



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AS SHOWN (A3)

DATE

JUN-2018

PROJECT NAME

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89

DRAWING TITLE

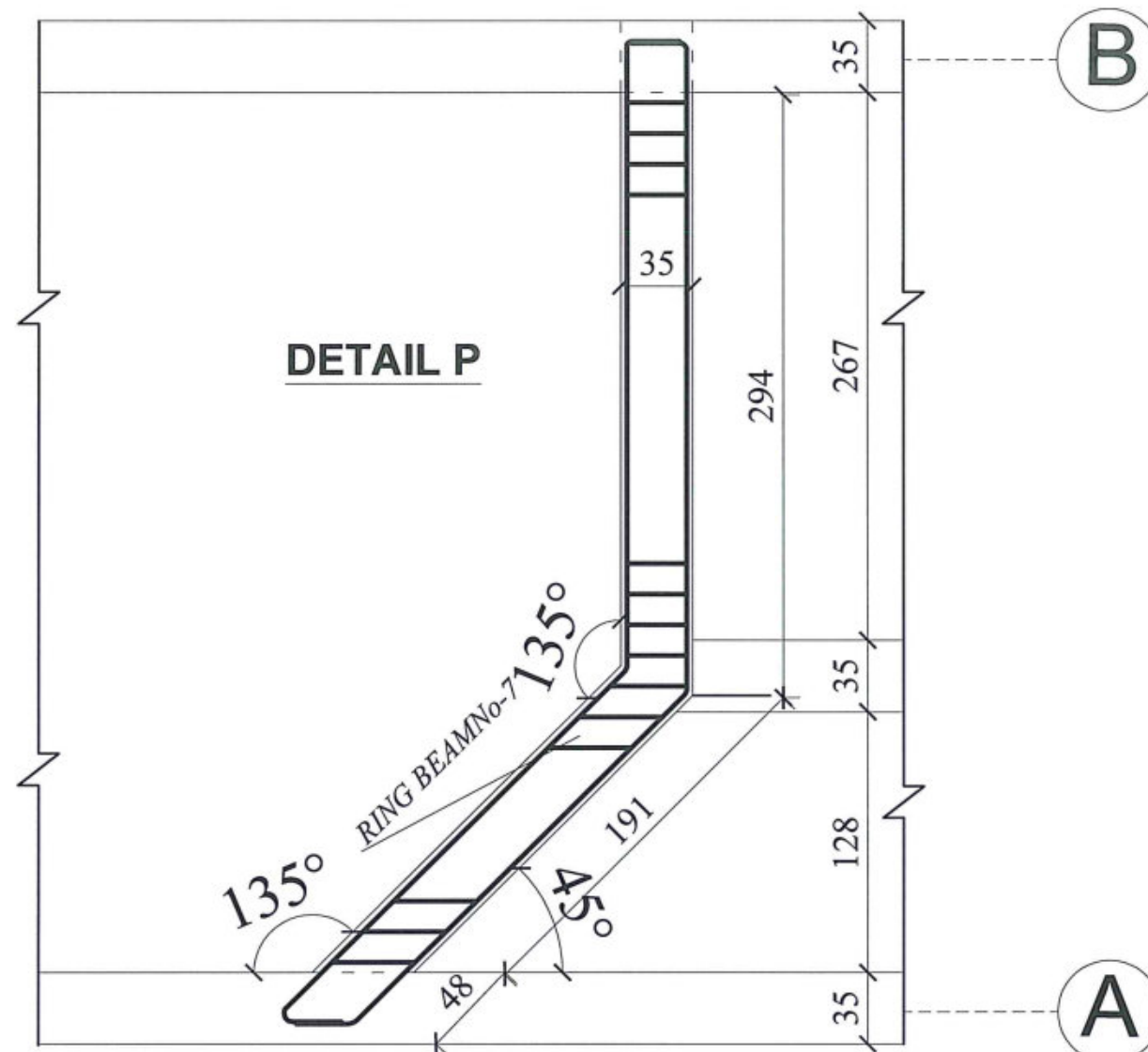
REINFORCEMENT BARS PLAN FOR ROOF SLAB

SHEET NO.

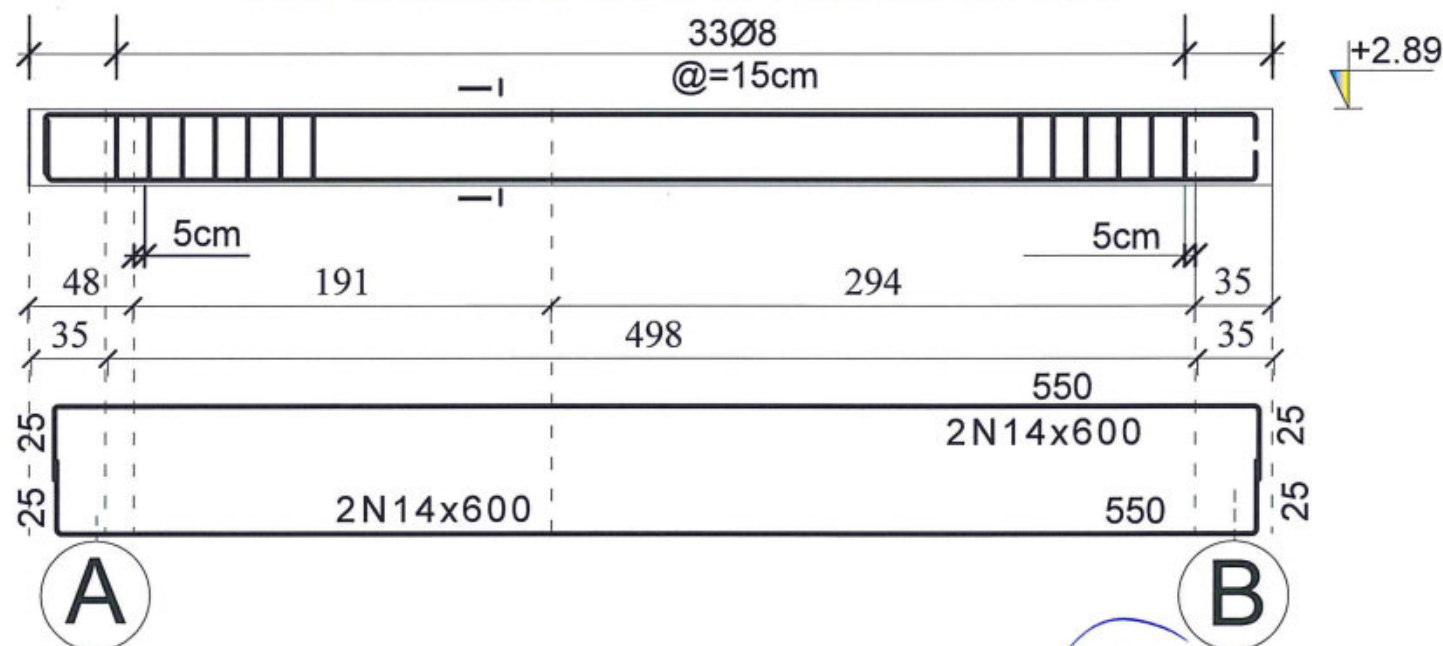
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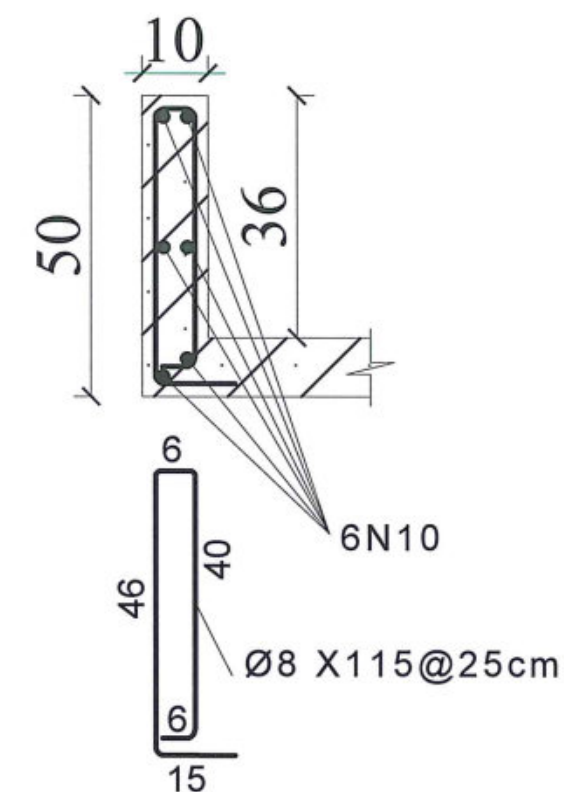




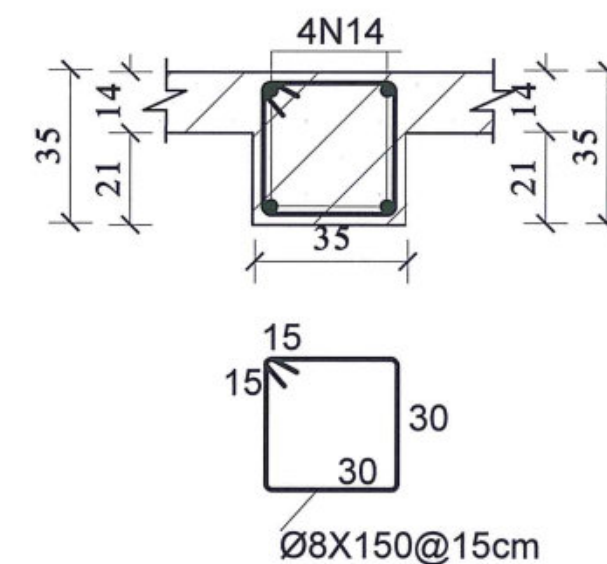
REINFORCEMENT BARS OF RING BEAMS No .7



SECTION M-M



SECTION I-I



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team

SCALE

DATE

MOE/MRRD/DAARTT

AS SHOWN ( A3)

JUN-2018

PROJECT NAME

DRAWING TITLE

SIX CLASSROOM BURNT BRICK-RCC SLAB SCHOOL  
HIGHT=+2.89






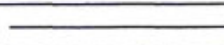

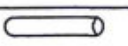
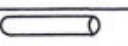
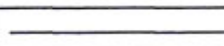


REINFORCEMENT BARS OF RING BEAM  
NO: 7 AND PARAPET DETAIL

SHEET NO.

14  
14



### SPECIFICATION OF ELECTRICAL EQUIPMENT FOR ONE FLOOR 6 CLASS

O	DESCRIPTION	SIGNS	UNIT	PIECES	REMARKS
	LED surface mounting fixture 18 X 18 X 4 cm 25W 220V 50hz		No	33	
2	Two pole switches 10 Amps under plaster good quality		No	6	
1	Single pole switches 10 Amps under plaster good quality.		No	6	
	Socket out let single phase 16 Amp under plaster .		No	25	
	PANEL BOARD or Distribution Box 30 x 45cm 22 gauge		No	1	
	WIRE (1 x 2.5) mm <sup>2</sup> for lighting.		M	560	
	WIRE (1 x 4)mm <sup>2</sup> for sockets.		M	450	
	PVC conduit 1" or 25mm		M	350	
	PVC conduit 3" or 75mm including fittings		M	30	
0	(Cu) Cable (3 x 25) mm <sup>2</sup> or (2 x 25)mm <sup>2</sup> + (1 x 25)mm <sup>2</sup>		M	30	
1	Grounding rod (Cu) 2.5 m length (Ø=16) mm diameter		Set	1	
2	Single device gnag (Boxes)		No	40	
3	MCB 63 Apms for distribution box Two port (Single Phase)		No	1	
4	Joint box .		No	15	
5	Circuit breaker 20 Amp for power receptacle		No	8	
6	Circuit breaker 10 Amp for lighting		No	8	

### NOTES

- 1-Sockets: Vico or equivalent, 400mm from the floor from door side 250mm .
- 2-Switches: Vico or equivalent 1200mm from the floor from the door side 250mm.
- 3-Joint boxes: 400mm from the roof in line with switches and sockets.
- 4-Conduit: PVC goal type semi-flexible.
- 5-All conduit must be in the plaster.
- 6-All bulbs,switches and sockets which are in moisture& out door must be water prove type.
- 7-Lighing circuit is extendable with 2.5mm<sup>2</sup> wire, single circuit.
- 8-Power circuit is extendable with 4mm<sup>2</sup> wire, single circuit.
- 9-Distribution box single phase wiring capacity of 36 circuit breakers 22 gauge.
- 10-Circuit Breakers: Vico or Equivalent
- 11-S1- Single Pole Switch
- 12-S2-Two Pole Switch
- 13-PB Penal Board.
- 14-CB Circuit Breaker.
- 15-All connection must have plastic joint.
- 16-R.C.B.O Residual Circuit Breaker Over Current.
- 17-Amp Amperes.
- 18-W Watt.
- 19-Hz Hertz.
- 20-Resistase of grounding should be not more then 25 Ohm per Nic code.
- 21-All wire in Penal board must have mark 1,2,3..Whaich show the Circuit numbers.
- 22-All wire in penal boards must be in plastic cover.

### SPECIFICATION OF ELECTRICAL EQUIPMENT



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OF CONSTRUCTION



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AFGHANISTAN

ARCHITECT/DESIGN  
PREPLANNED &  
CHECKED BY  
TECH- APPROVED BY

Ab.QADIR  
DAARTT

*Signature*

Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT  
AS SHOWN (A3)  
22/07/2018

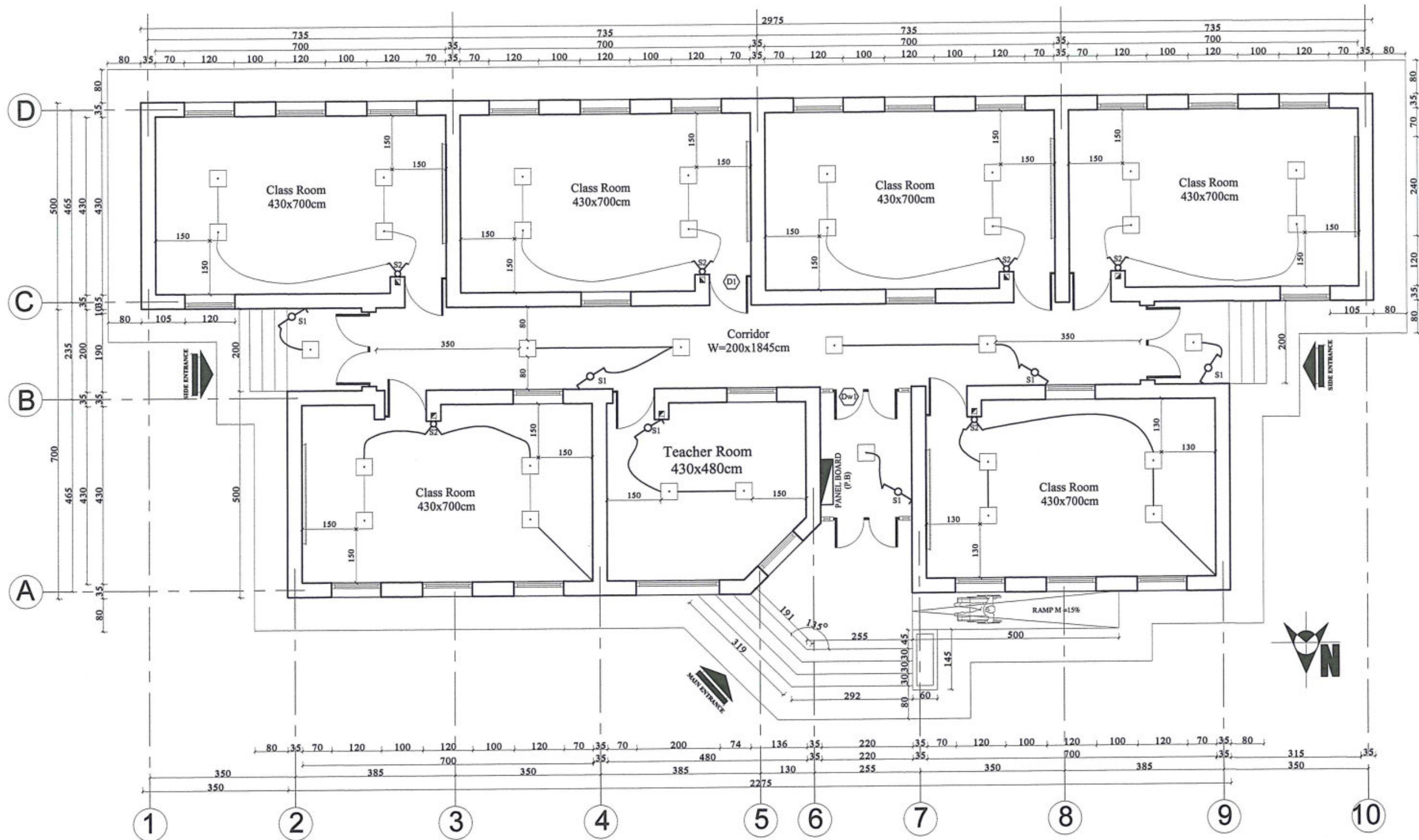
PROJECT NAME  
DRAWING TITLE

6 CLASSROOM SCHOOL BURNT BRICK WALL RCC ROOF H=2.75M  
SPECIFICATION AND EQUIPMENTS

SHEET NO.

E1  
4





GROUND FLOOR POWER PLAN



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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

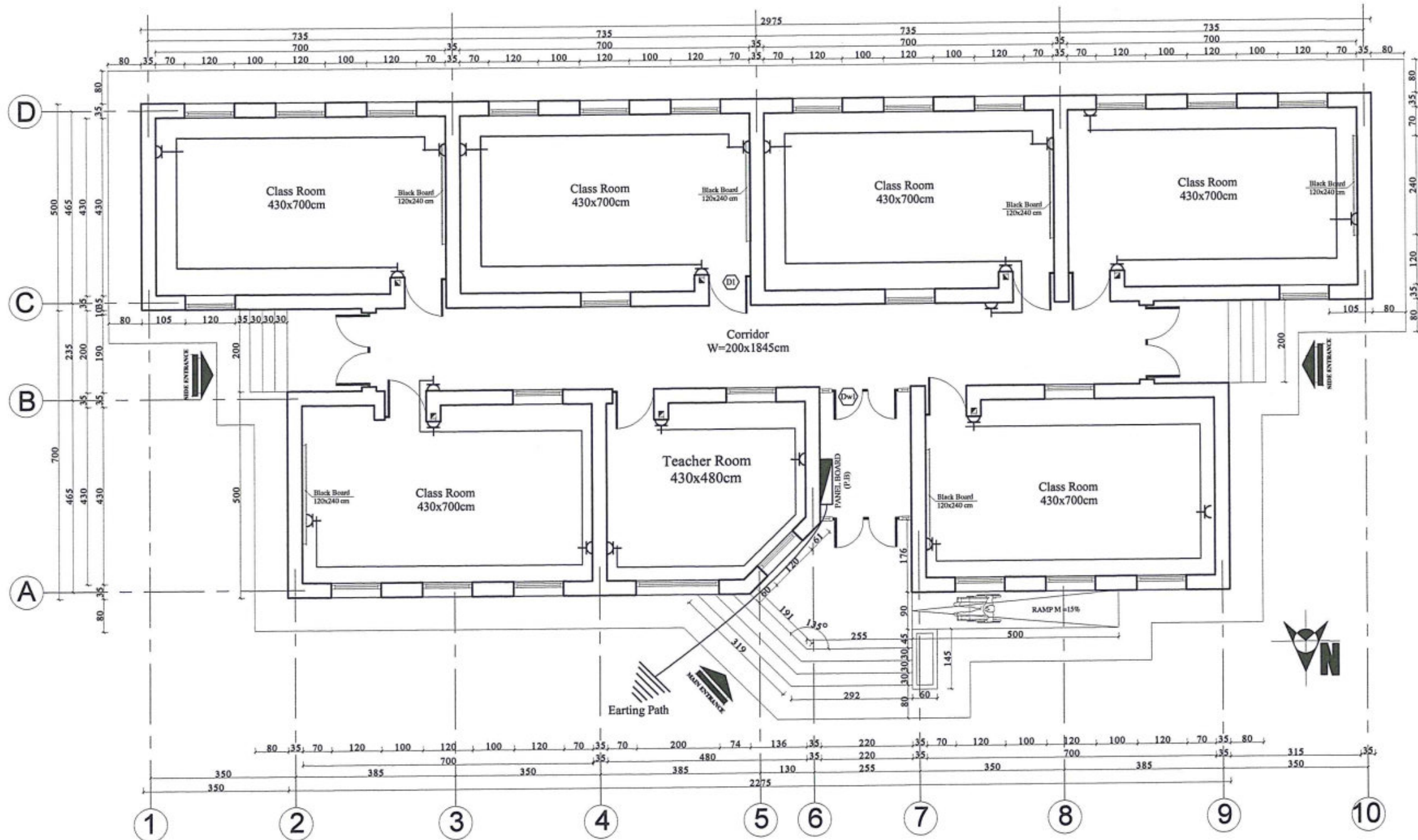
ARCHITECT/DESIGN	Ab.QADIR	Combined technical team	MOE/MRRD/DAARTT
PREPLANNED & CHECKED BY	DAARTT	SCALE	AS SHOWN (A3)
TECH-APPROVED BY		DATE	22/07/2018

PROJECT NAME	6 CLASSROOM SCHOOL BURNT BRICK WALL RCC ROOF H=2.75M
DRAWING TITLE	POWER PLAN

SHEET NO.

E2  
4





GROUND FLOOR SOCKET PLAN



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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

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Ab.QADIR

DAARTT

*[Signature]*

Combined technical  
team  
SCALE  
DATE

MOE/MRRD/DAARTT

AS SHOWN (A3)

22/07/2018

PROJECT NAME

6 CLASSROOM SCHOOL BURNT BRICK WALL RCC ROOF H=2.75M

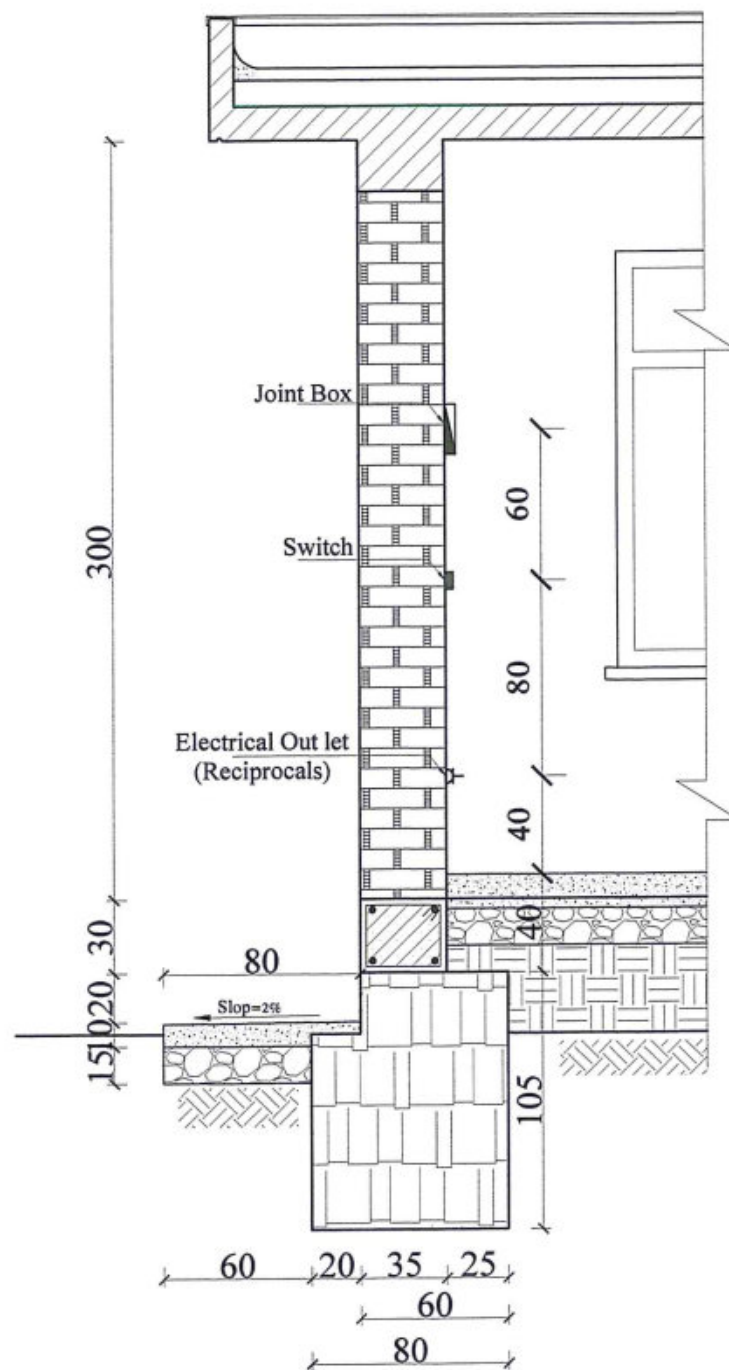
DRAWING TITLE

SOCKET PLAN

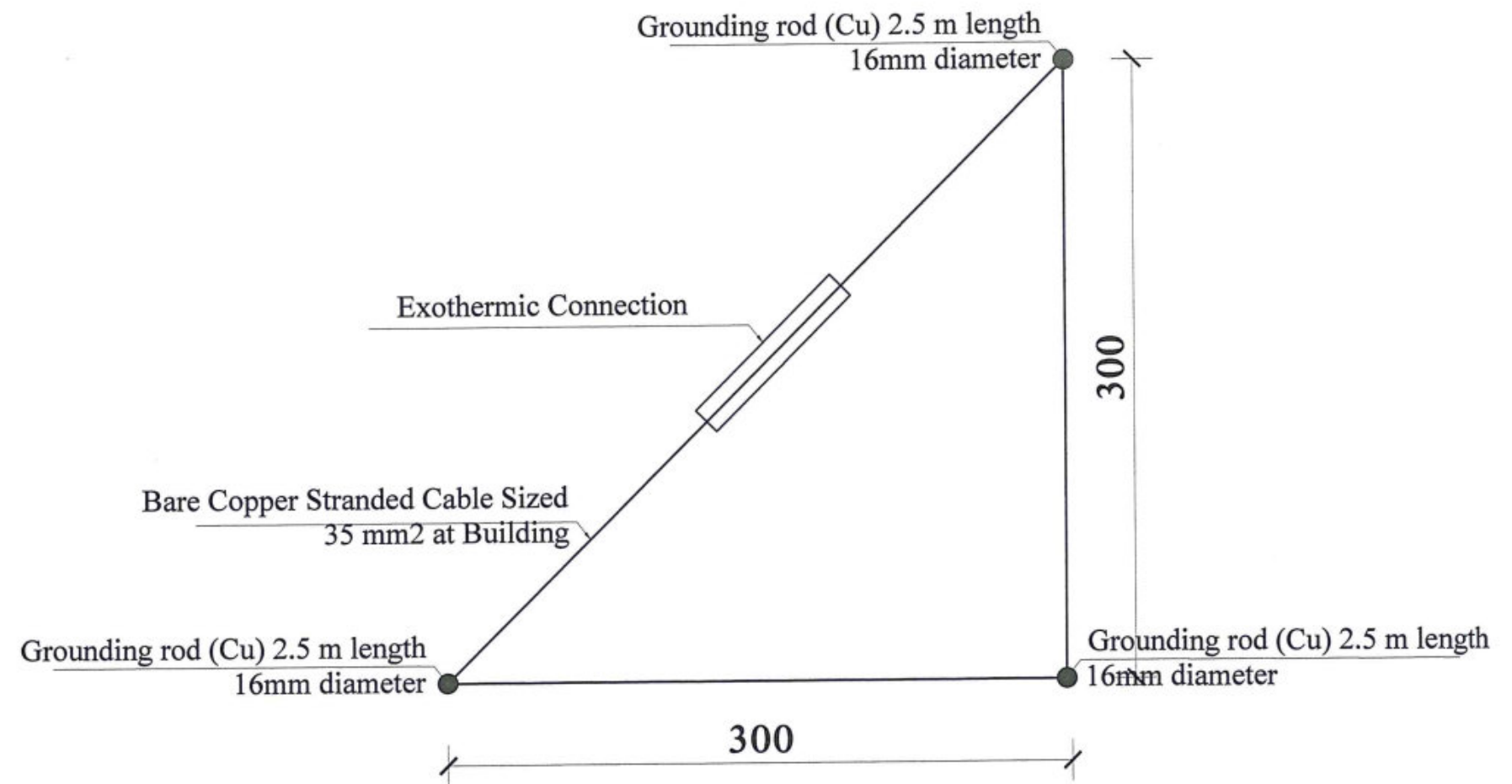
SHEET NO.

E3  
4





ELECTRICAL INSTRUMENT DETAIL



EARTHEN PATH



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PROTOTYPE SCHOOL DESIGN IN  
AFGHANISTAN

ARCHITECT/DESIGN	Ab.QADIR	Combined technical team	MOE/MRRD/DAARTT
PREPLANNED & CHECKED BY	DAARTT	SCALE	AS SHOWN (A3)
TECH. APPROVED BY		DATE	22/07/2018

PROJECT NAME 6 CLASSROOM SCHOOL BURNT BRICK WALL RCC ROOF H=2.75M

DRAWING TITLE ELECTRIC INSTRUMENT DETAIL

SHEET NO.

E4  
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