


# STRUCTURE DRAWING

FOR ZONE-4

## DRAWING LIST OF STRUCTURE

DWG No.	DRAWING NAME	SCALE
S-01	DRAWING LIST	NTS
S-02	BAR ARRANGEMENT STANDARD	NTS
S-03	FOUNDATION PLAN AND COLUMN PLAN	1 : 200
S-04	GROUND FLOOR GIRDER AND SLAB PLAN, ROOF FLOOR GIRDER PLAN	1 : 200
S-05	FRAMING ELEVATION LINE X1-19 AND LINE Y1	1 : 200
S-06	FRAMING ELEVATION LINE Y2 AND Y3	1 : 200
S-07	COLUMN LIST AND GIRDER LIST	1 : 25

**FOR ZONE-4**

PROJECT NAME		TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	MINISTRY OF NATIONAL EDUCATION	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY DRAWING LIST	NTS					S-01

1. Processing and Assembly
  - 1-1 Reinforcing bars with dangerous bends, cracks, splits or other defects may not be used under any circumstances.
  - 1-2 The diameter for deformed reinforcing bar shall be conform to Table-2
  - 1-3 Reinforcing splines shall be lap joint, and the lap length shall be conform to Table-3
  - 1-4 Reinforcing bars shall be cut by de-compression zone
  - 1-4 The place of the lap joint shall be in compression zone
  - 1-4 Reinforcing bars shall be cut by de-compression zone
  - 1-5 Gas cutting is permitted where unavoidable. If approved by the Engineer
  - 1-5 Spot welding and arc strike is not permitted for reinforcing bars.
  - 1-6 Install hooks at each end of reinforcing bars
    - (1) The main reinforcing bars located at the four corners of a column at lap joint, and at the top of column at the highest story
    - (2) Hoops, stirrup and yoke bar

Type of structural elements	Minimum thickness of cover concrete for reinforcing bars	
	With finishing	Minimum thickness of cover concrete
Slab and walls	No finishing	20mm
Elements not in contact with soil	No finishing	30mm
	With finishing	40mm
Column	No finishing	40mm
Beam	No finishing	40mm
Elements contact with soil	Column, beam, floor, slab, wall	50mm
	Foundation, retaining wall	70mm

3. Minimum clearance between the reinforcing bars  
 Clearance shall be more than 25mm and 1.25 times the maximum size of coarse aggregate and 1.5 times of largest outside diameter of reinforcing bar

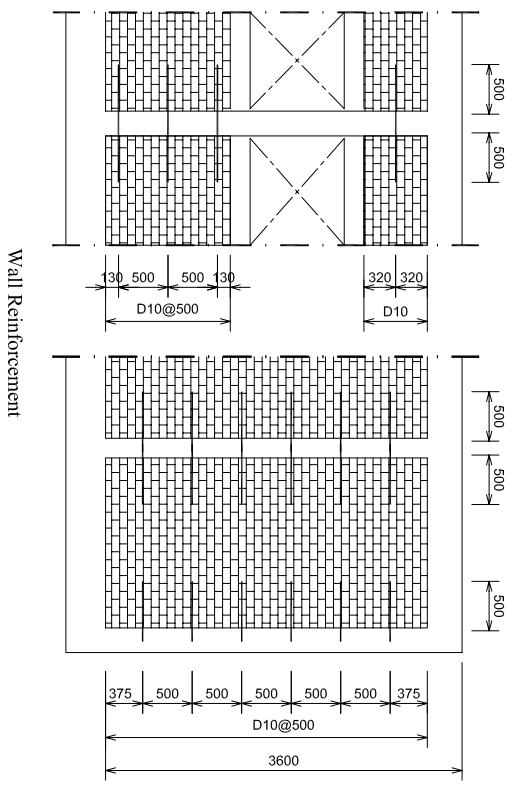


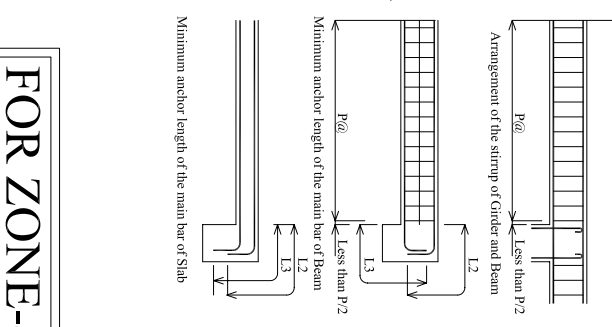
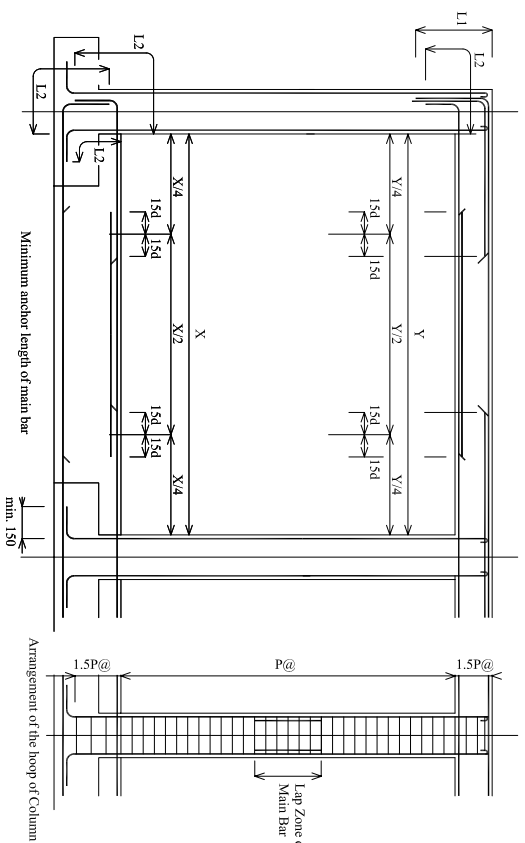
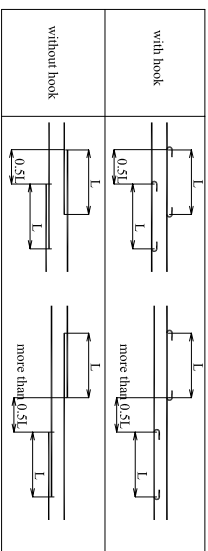
Table-2 Minimum diameter for bending of reinforcing bars

Bending Shape	Under femur Dia.	19 to 38mmDia.	Previous location
180° 	More than 3d	More than 4d	Main bars for column and beam etc.
135° 	More than 3d	More than 4d	Stirrup,loop,spiral bar
90° 	More than 3d	More than 4d	Stirrup,loop,spiral bar
Less than 90° 	More than 4d	More than 6d	Stirrup,loop,spiral bar

Table-3 Minimum lap length and Anchor length

Concrete Design strength	without hook			with hook		
	L1	L2	L3	L1	L2	L3
Over Fc28=21N/mm2 but under Fc28=27N/mm2	40d	35d	Small Beam 25d	10d and over 150mm	30d	25d
					25d	15d
					15d	15d

Table-4 Location of neighboring joints



**FOR ZONE-4**

PROJECT NAME

PROTOTYPE ELEMENTARY SCHOOL BUILDINGS



MINISTRY OF NATIONAL EDUCATION

TITLE

QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY BAR ARRANGEMENT STANDARD

SCALE

NTS

DATE

DESIGNED

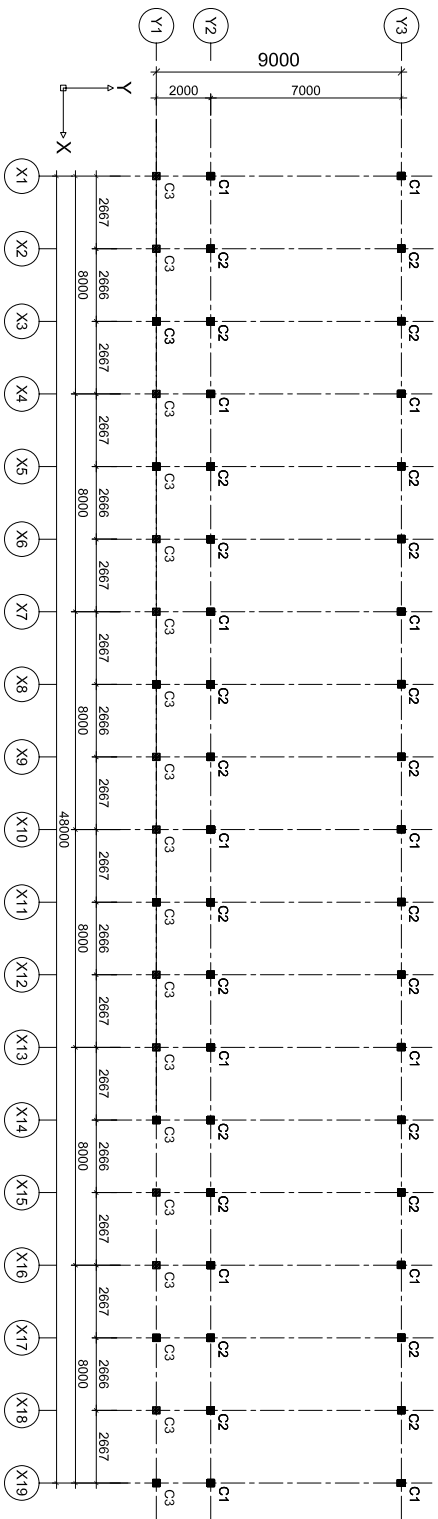
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APPROVED

DWG No.

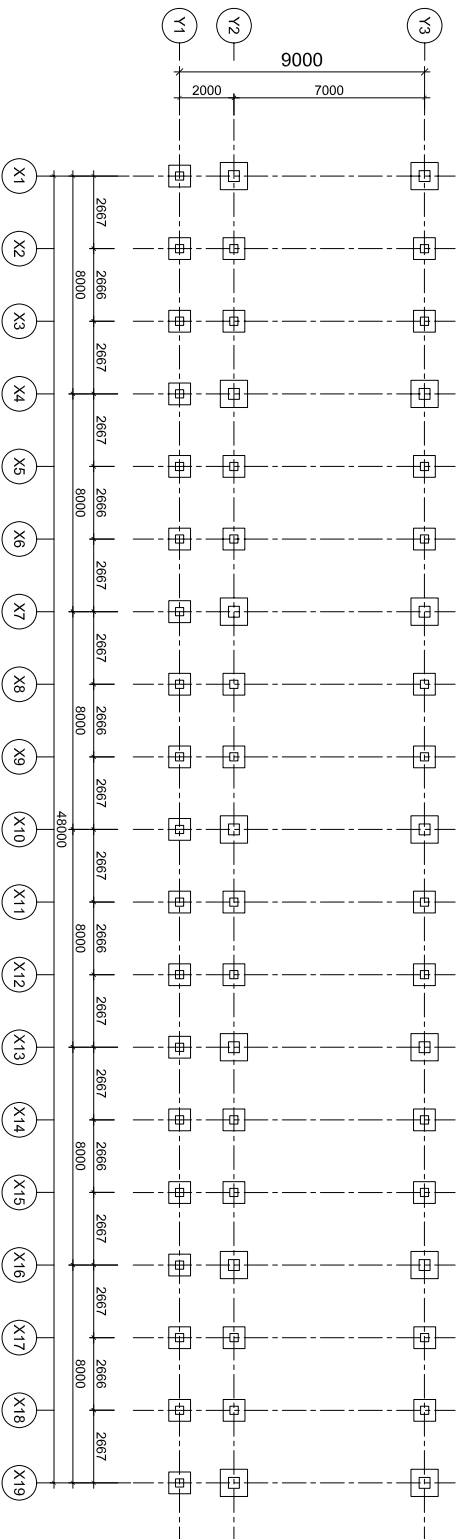
S-02

MEMBER LIST		
TYPE	DIMENTION	QUALITY
C1	250X250	K-225
C2	220X220	K-225
C3	220X220	K-225



○ COLUMN PLAN  
SCALE 1 : 200

FOUNDATION TYPE IS DETERMINED BY EACH SITE. FOUNDATION SHOULD BE BUILT ON REINFORCED CONCRETE



○ FOUNDATION PLAN  
SCALE 1:200

**FOR ZONE-4**

PROJECT NAME

PROTOTYPE ELEMENTARY SCHOOL BUILDINGS



MINISTRY OF NATIONAL EDUCATION

TITLE

QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY FOUNDATION PLAN AND COLUMN PLAN

SCALE

1 : 200

DATE

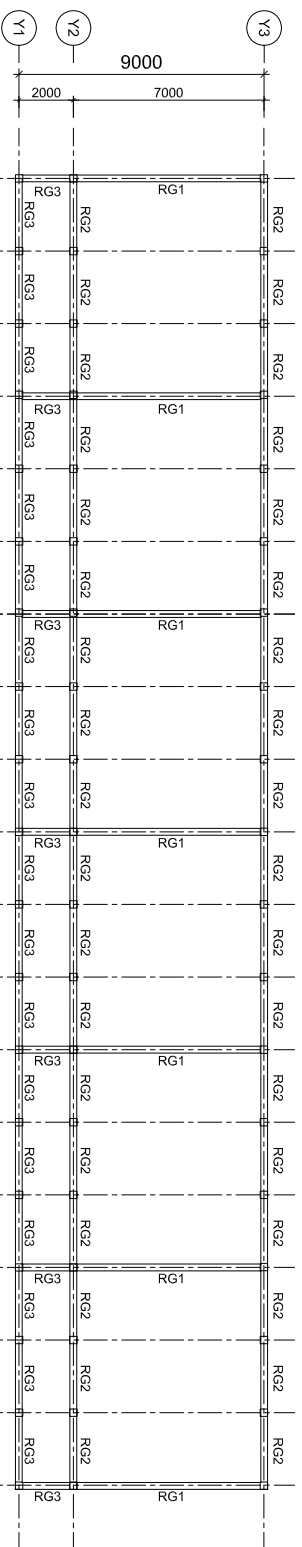
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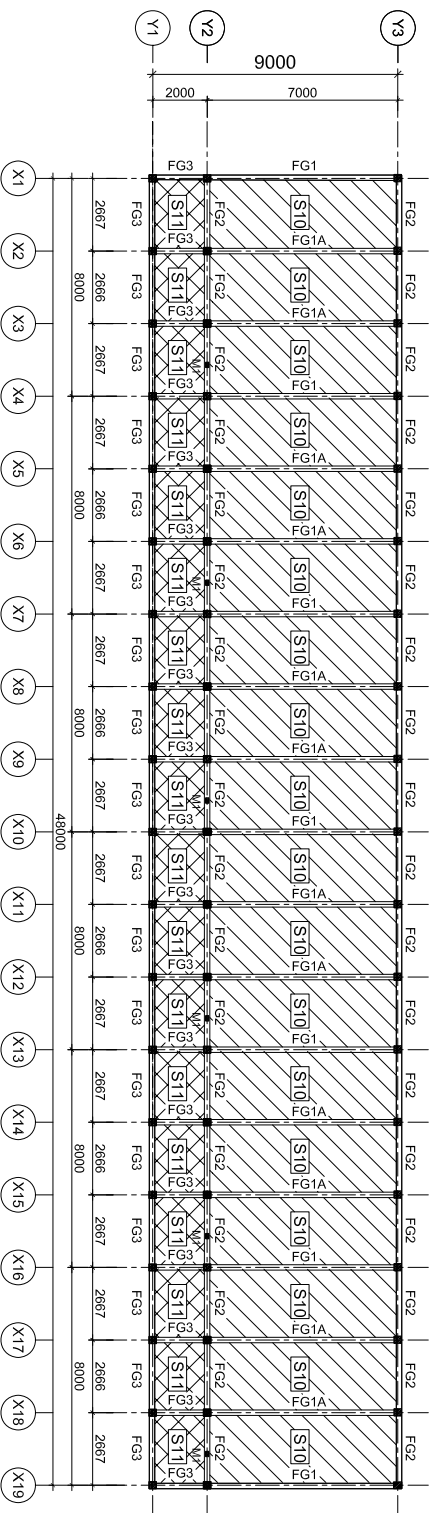
S-03



ROOF FLOOR GIRDER PLAN

SCALE 1:200

MEMBER LIST		
TYPE	DIMENTION	QUALITY
RG1	200X350	K-225
RG2	200X350	K-225
RG3	200X350	K-225



GROUND FLOOR GIRDER AND SLAB PLAN

SCALE 1:200

MEMBER LIST		
TYPE	DIMENTION	QUALITY
FG1	220X450	K-225
FG1A	200X400	K-225
FG2	200X400	K-225
FG3	200X400	K-225
M1	200X110	K-225

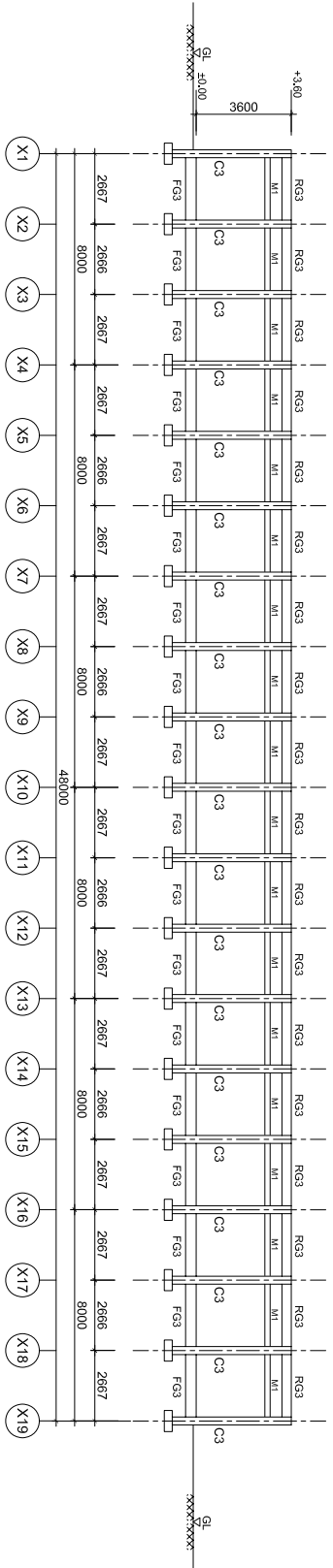
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TYPE	DIMENTION	QUALITY
S10	100	K-175
S11	100	K-175

**FOR ZONE-4**

PROJECT NAME		TITLE		SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS		QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY GROUND FLOOR GIRDER AND SLAB PLAN, ROOF FLOOR GIRDER PLAN		1:200					S-04



MINISTRY OF NATIONAL EDUCATION

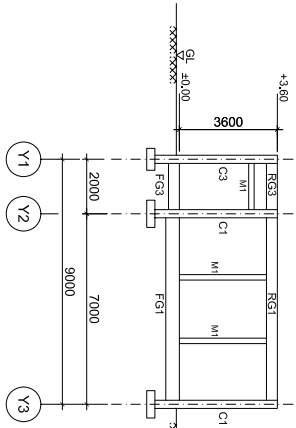


LINE Y1  
SCALE 1:200

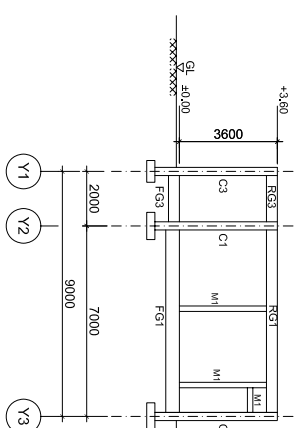
MEMBER LIST		
TYPE	DIMENTION	QUALITY
RG1	200X350	K-225
RG2	200X350	K-225
RG3	200X350	K-225

MEMBER LIST		
TYPE	DIMENTION	QUALITY
FG1	220X450	K-225
FG1A	200X400	K-225
FG2	200X400	K-225
FG3	200X400	K-225
M1	200X110	K-225

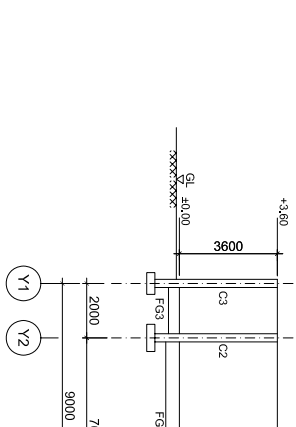
MEMBER LIST		
TYPE	DIMENTION	QUALITY
C1	250X250	K-225
C2	220X220	K-225
C3	220X220	K-225



LINE X1 AND X19  
SCALE 1:200



LINE X4, X7, X10, X13 AND X16  
SCALE 1:200



LINE X2, X3, X5, X6, X8, X9, X11, X12, X14, 15, X17 AND X18  
SCALE 1:200

**FOR ZONE-4**

PROJECT NAME

PROTOTYPE ELEMENTARY SCHOOL BUILDINGS



MINISTRY OF NATIONAL EDUCATION

TITLE

QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY FRAMING ELEVATION LINE X1-X19 AND LINE Y1

SCALE

1:200

DATE

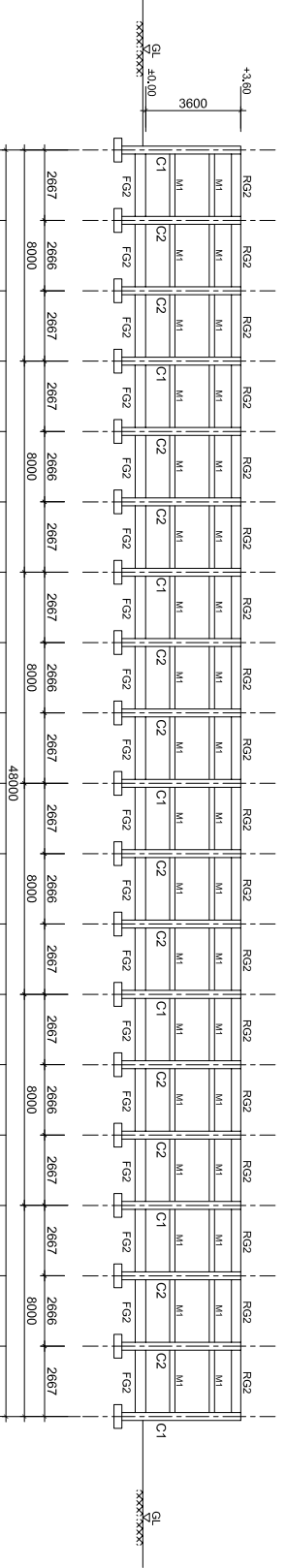
DESIGNED

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APPROVED

DWG No.

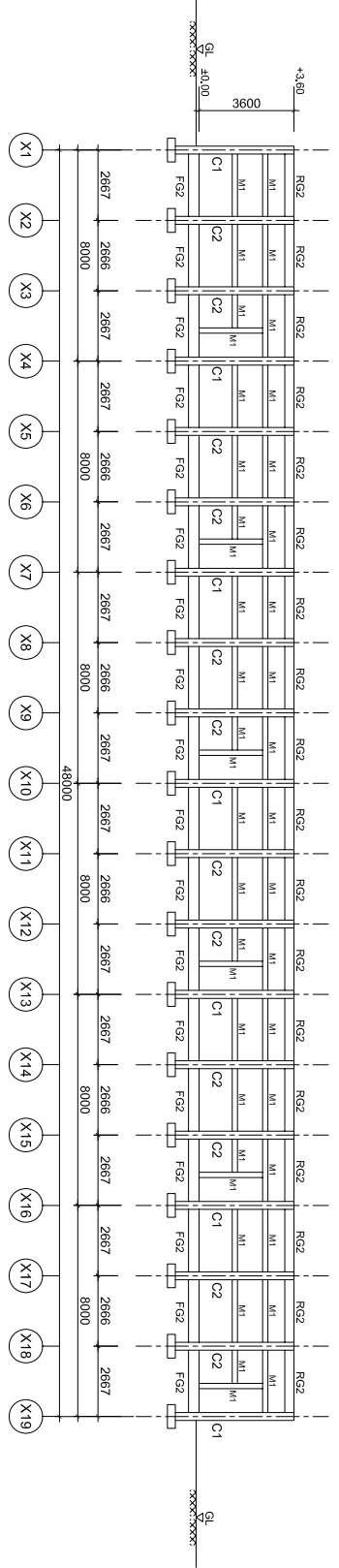
S-05



MEMBER LIST		
TYPE	DIMENTION	QUALITY
RG1	200X350	K-225
RG2	200X350	K-225
RG3	200X350	K-225

MEMBER LIST		
TYPE	DIMENTION	QUALITY
FG1	220X450	K-225
FG1A	200X400	K-225
FG2	200X400	K-225
FG3	200X400	K-225
M1	200X110	K-225

MEMBER LIST		
TYPE	DIMENTION	QUALITY
C1	280X250	K-225
C2	220X220	K-225
C3	220X220	K-225



LINE Y2  
SCALE 1:200

PROJECT NAME

PROTOTYPE ELEMENTARY SCHOOL BUILDINGS



MINISTRY OF NATIONAL EDUCATION

TITLE

QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY FRAMING ELEVATION LINE Y2 AND Y3

SCALE

1:200

DATE

DESIGNED

CHECKED

APPROVED

DWG No.

S-06

**FOR ZONE-4**

**LIST OF THE ROOF FLOOR GIRDER**

MARK	END	CENTER	END	CENTER	END	CENTER	
	RG1			RG2			RG3
POSITION	END	CENTER	END	CENTER	END	CENTER	
SECTION							
TOP BAR	2-D16	2-D16	2-D16	2-D16	2-D16	2-D16	
BOTTOM BAR	2-D16	2-D16	2-D16	2-D16	2-D16	2-D16	
STRIRUP	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	

**LIST OF THE GROUND FLOOR GIRDER**

MARK	END	CENTER	END	CENTER	END	CENTER		
	FG1			FG1A			FG2	FG3
POSITION	END	CENTER	END	CENTER	END	CENTER		
SECTION								
TOP BAR	3-D16	2-D16	2-D16	2-D16	2-D16	2-D16	2-D16	
BOTTOM BAR	2-D16	3-D16	2-D16	2-D16	2-D16	2-D16	2-D16	
STRIRUP	□-D10 - 150	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	

**LIST OF THE COLUMN (GROUND-ROOF)**

MARK	C1	C2	C3
POSITION	ALL SECTION	ALL SECTION	ALL SECTION
SECTION			
DIMENSION	250X250	220X220	220X220
MAIN BAR	4-D16	4-D13	4-D13
HOOP	□-D10 - 100	□-D10 - 100	□-D10 - 100

**LIST OF THE HEADER**

MARK	M1
POSITION	ALL SECTION
SECTION	
DIMENSION	200X110
MAIN BAR	2-D10
HOOP	□-D10 - 200

Note : Material  
 Concrete K-225  
 Main Rebar fy : 370 MPa  
 Confinement Rebar fy : 240 MPa

**FOR ZONE-4**


PROJECT NAME	PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	MINISTRY OF NATIONAL EDUCATION	TITLE	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY COLUMN LIST AND GIRDER LIST	SCALE	1 : 25	DATE	DESIGNED	CHECKED	APPROVED	DWG No.	S-07
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**DRAWING LIST OF COMPARISON OF MAJOR  
STRUCTURAL SECTIONS  
ONE-STOREY**

# DRAWING LIST OF COMPARISON OF MAJOR STRUCTURAL SECTIONS

DWG No.	DRAWING NAME	SCALE
CM-01	DRAWING LIST	NTS
CM-02	COLUMN LIST	1 : 25
CM-03	GROUND GIRDER LIST 1	1 : 25
CM-04	GROUND GIRDER LIST 2	1 : 25
CM-05	GROUND GIRDER LIST 3	1 : 25
CM-06	ROOF GIRDER LIST 1	1 : 25
CM-07	ROOF GIRDER LIST 2	1 : 25

PROJECT NAME		TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS		QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY DRAWING LIST	NTS					CM-01

PROTOTYPE ELEMENTARY SCHOOL BUILDINGS



MINISTRY OF NATIONAL EDUCATION

QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY DRAWING LIST

NTS

DATE

DESIGNED

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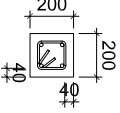
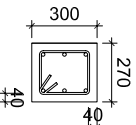
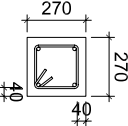
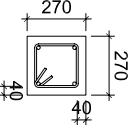
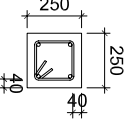
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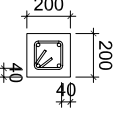
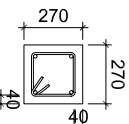
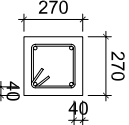
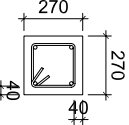
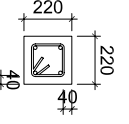
CM-01

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

C1

	NOT QUEKE-RESISTANCE SCHOOL BUILDING	QUAKE-RESISTANCE SCHOOL BUILDING			
		ZONE-1	ZONE-2	ZONE-3	ZONE-4
SECTION					
DIMENSION	200X200	270X300	270X270	270X270	250X250
MAIN BAR	4-D13	6-D16	4-D16	4-D16	4-D16
HOOP	□ -Ø9 -100 K-210	□ -D10 -100 K-250	□ -D10 -100 K-250	□ -D10 -100 K-225	□ -D10 -100 K-225
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa

C2, C3

	NOT QUEKE-RESISTANCE SCHOOL BUILDING	QUAKE-RESISTANCE SCHOOL BUILDING			
		ZONE-1	ZONE-2	ZONE-3	ZONE-4
SECTION					
DIMENSION	200X200	270X270	270X270	270X270	220X220
MAIN BAR	4-D13	4-D16	4-D16	4-D16	4-D13
HOOP	□ -Ø9 -100 K-210	□ -D10 -100 K-250	□ -D10 -100 K-250	□ -D10 -100 K-225	□ -D10 -100 K-225
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa

PROJECT NAME	TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY COLUMN LIST	1 : 25					CM-2
	MINISTRY OF NATIONAL EDUCATION						

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

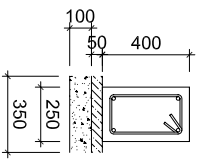
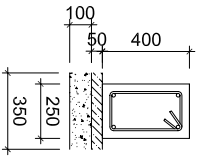
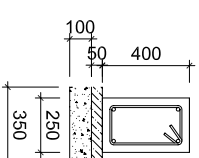
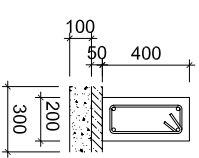
NOT QUAKE-RESISTANCE SCHOOL BUILDING		QUAKE-RESISTANCE SCHOOL BUILDING		
		ZONE-1	ZONE-2	ZONE-3
POSITION	ALL	END	CENTER	END
SECTION				
DIMENSION	150X200	250X450	250X450	250X450
TOP BAR	2-D13	3-D16	2-D16	3-D16
BOTTOM BAR	2-D13	2-D16	3-D16	2-D16
STIRRUP	□-Ø9-200	□-D10 - 150	□-D10 - 200	□-D10 - 150
CONCRETE	K-210	K-250	K-250	K-250
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 400 MPa

		QUAKE-RESISTANCE SCHOOL BUILDING		
		ZONE-3	ZONE-4	ZONE-4
POSITION	END	CENTER	END	CENTER
SECTION				
DIMENSION	250X450	250X450	220X450	220X450
TOP BAR	3-D16	2-D16	3-D16	2-D16
BOTTOM BAR	2-D16	3-D16	2-D16	3-D16
STIRRUP	□-D10 - 150	□-D10 - 200	□-D10 - 150	□-D10 - 200
CONCRETE	K-225	K-225	K-225	K-225
MAIN REBAR	Fy : 370 MPa	Fy : 370 MPa	Fy : 370 MPa	Fy : 370 MPa

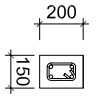
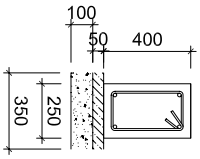
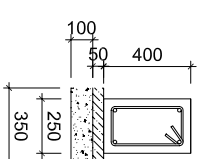
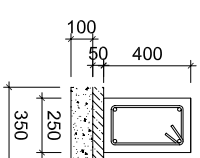
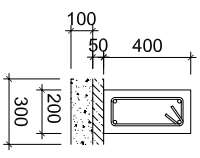
PROJECT NAME		TITLE		SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS		QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY GROUND GIRDER LIST 1		1 : 25					CM-3
 MINISTRY OF NATIONAL EDUCATION									

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

**FG1A**

	NOT QUEKE-RESISTANCE SCHOOL BUILDING	QUAKE-RESISTANCE SCHOOL BUILDING			
		ZONE-1	ZONE-2	ZONE-3	ZONE-4
POSITION	-	ALL	ALL	ALL	ALL
SECTION	NOTHING				
DIMENSION	250X400	250X400	250X400	250X400	200X400
TOP BAR	2-D16	2-D16	2-D16	2-D16	2-D16
BOTTOM BAR	2-D16	2-D16	2-D16	2-D16	2-D16
STIRRUP	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200
CONCRETE	K-250	K-250	K-225	K-225	K-225
MAIN REBAR	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa	Fy : 370 MPa


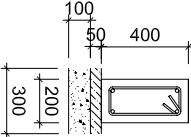
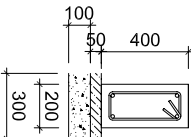
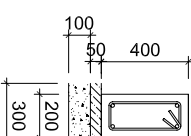
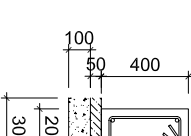
**FG2**

	NOT QUEKE-RESISTANCE SCHOOL BUILDING	QUAKE-RESISTANCE SCHOOL BUILDING			
		ZONE-1	ZONE-2	ZONE-3	ZONE-4
POSITION	ALL	ALL	ALL	ALL	ALL
SECTION					
DIMENSION	150X200	250X400	250X400	250X400	200X400
TOP BAR	2-D13	2-D16	2-D16	2-D16	2-D16
BOTTOM BAR	2-D13	2-D16	2-D16	2-D16	2-D16
STIRRUP	□-Ø9 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200
CONCRETE	K-210	K-250	K-250	K-225	K-225
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa

<b>PROJECT NAME</b>	<b>TITLE</b>	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY GROUND GIRDER LIST 2	1 : 25					CM-4
	MINISTRY OF NATIONAL EDUCATION						

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

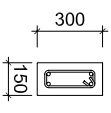
**FG3**

POSITION	NOT QUEKE-RESISTANCE SCHOOL BUILDING	QUAKE-RESISTANCE SCHOOL BUILDING			
	ALL	ZONE-1 ALL	ZONE-2 ALL	ZONE-3 ALL	ZONE-4 ALL
SECTION					
DIMENSION	150X200	200X400	200X400	200X400	200X400
TOP BAR	2-D13	2-D16	2-D16	2-D16	2-D16
BOTTOM BAR	2-D13	2-D16	2-D16	2-D16	2-D16
STIRRUP	□-Ø9 -200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200
CONCRETE	K-210	K-250	K-225	K-225	K-225
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa

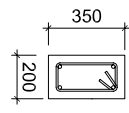
PROJECT NAME	TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY GROUND GIRDER LIST 3	1 : 25					CM-5
	MINISTRY OF NATIONAL EDUCATION						

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

RG1

SECTION	NOT QUEUE-RESISTANCE SCHOOL BUILDING		QUAKE-RESISTANCE SCHOOL BUILDING			
	POSITION	ALL	ZONE-1	ZONE-2	ZONE-3	ZONE-4
	DIMENSION	150X300	200X350	200X350	200X350	200X350
	TOP BAR	2-D13	2-D16	2-D16	2-D16	2-D16
	BOTTOM BAR	2-D13	2-D16	2-D16	2-D16	2-D16
	STIRRUP	□-Ø9-200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200
	CONCRETE	K-210	K-250	K-250	K-225	K-225
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa	

RG1A

SECTION	NOT QUEUE-RESISTANCE SCHOOL BUILDING		QUAKE-RESISTANCE SCHOOL BUILDING			
	POSITION	- <th style="width: 15%;">ZONE-1</th> <th style="width: 15%;">ZONE-2</th> <th style="width: 15%;">ZONE-3</th> <th style="width: 15%;">ZONE-4</th>	ZONE-1	ZONE-2	ZONE-3	ZONE-4
	DIMENSION	200X350	200X350	200X350	200X350	200X350
	TOP BAR	2-D16	2-D16	2-D16	2-D16	2-D16
	BOTTOM BAR	2-D16	2-D16	2-D16	2-D16	2-D16
	STIRRUP	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200
	CONCRETE	K-250	K-250	K-250	K-250	K-250
MAIN REBAR	Fy : 400 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 400 MPa	

PROJECT NAME	TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS	QUAKE-RESISTANCE SCHOOL BUILDING ONE-STORY ROOF GIRDER LIST 1	1 : 25					CM-6
	MINISTRY OF NATIONAL EDUCATION						

# COMPARISON OF MAJOR STRUCTURAL SECTIONS

**RG2, RG3**

SECTION	NOT QUEKE-RESISTANCE SCHOOL BUILDING		QUAKE-RESISTANCE SCHOOL BUILDING			
	POSITION	ALL	ZONE-1	ZONE-2	ZONE-3	ZONE-4
	ALL					
DIMENSION	150X300	200X350	200X350	200X350	200X350	
TOP BAR	2-D13	2-D16	2-D16	2-D16	2-D16	
BOTTOM BAR	2-D13	2-D16	2-D16	2-D16	2-D16	
STIRRUP	□-Ø9 -200	□-D10 - 200	□-D10 - 200	□-D10 - 200	□-D10 - 200	
CONCRETE	K-210	K-250	K-250	K-225	K-225	
MAIN REBAR	Fy : 300 MPa	Fy : 400 MPa	Fy : 400 MPa	Fy : 370 MPa	Fy : 370 MPa	

PROJECT NAME	MINISTRY OF NATIONAL EDUCATION	TITLE	SCALE	DATE	DESIGNED	CHECKED	APPROVED	DWG No.
PROTOTYPE ELEMENTARY SCHOOL BUILDINGS		QUAKE-RESISTANCE SCHOOL BUILDING ONE-STOREY ROOF GIRDER LIST 2	1 : 25					CM-7