



REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS  
NATIONAL CAPITAL REGION  
**NORTH MANILA DISTRICT ENGINEERING OFFICE**  
OFFICE OF THE DISTRICT ENGINEER  
Nagtahan, Sta. Mesa, Manila

C.Y. 2025 PROJECT  
DETAILED ENGINEERING DESIGN PLAN FOR  
**RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY**

SUBMITTED:

  
\_\_\_\_\_  
**ARLENE S. MENDOZA**  
OIC - CHIEF, PLANNING AND DESIGN SECTION

DATE:

RECOMMENDED:

  
\_\_\_\_\_  
**DENRYL CAESAR S. CORTUNA**  
ASSISTANT DISTRICT ENGINEER

DATE:

APPROVED:

  
\_\_\_\_\_  
**DENNIS E. SANDOVAL**  
DISTRICT ENGINEER

DATE:

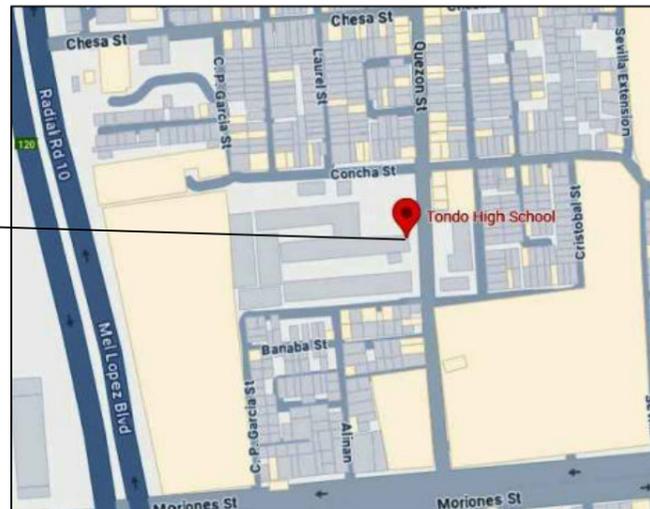
## BILL OF QUANTITIES

ITEM NO.	DESCRIPTION	ORIGINAL QTY.	UNIT
PART A	FACILITIES FOR THE ENGINEER	-	-
A 1.1.(3)	CONSTRUCTION FIELD OFFICE FOR THE ENGINEER	1.00	L.S.
PART B	OTHER GENERAL REQUIREMENTS	-	-
B.5(1)	PROJECT BILLBOARD/SIGN BOARD (DPWH BILLBOARD)	1.00	EA.
B.5(1)	PROJECT BILLBOARD/SIGN BOARD (COA BILLBOARD)	1.00	EA.
B.7(1)	OCCUPATIONAL SAFETY AND HEALTH	1.00	L.S.
B.9(1)	MOBILIZATION/DEMobilIZATION	1.00	L.S.
PART C	EARTHWORKS	-	-
801(1)	REMOVAL OF STRUCTURES AND OBSTRUCTION	1.00	L.S.
PART D	REINFORCED CONCRETE	-	-
903(1)	FORMWORKS AND FALSEWORKS	1.00	L.S.
PART E	FINISHINGS AND OTHER CIVIL WORKS	-	-
1027(1)	CEMENT PLASTER FINISH	2,648.00	SQ.M.
1032(1)a	PAINTING WORKS (MASONRY/CONCRETE)	2,6448.00	SQ.M.
1046(2)a2	CHB NON LOAD BEARING (INCLUDING REINFORCING STEEL) (150mm)	207.00	SQ.M.
1048(1)b	CARBON FIBER (2 LAYERS)	1,886.00	SQ.M.
1048(5)b	STRUCTURAL CONCRETE INJECTION AND CRACK REPAIR	1,645.50	L.M.

 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION NORTH MANILA DISTRICT ENGINEERING OFFICE OFFICE OF THE DISTRICT ENGINEER Nagtahan, Sta. Mesa, Manila</p>	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	BILL OF QUANTITIES	<p>MARC GERARD A. SARABIA ENGINEER</p> <p>ARWEN K. DIMAANO ENGINEER II</p>	<p>ARLENE S. MENDOZA OIC - CHIEF PLANNING AND DESIGN SECTION</p>	<p>DENRYL CAESAR S. CORTUNA ASSISTANT DISTRICT ENGINEER</p>	<p>DENNIS E. SANDOVAL DISTRICT ENGINEER</p>	<p>1 2</p>	<p>G - 1 2   16</p>



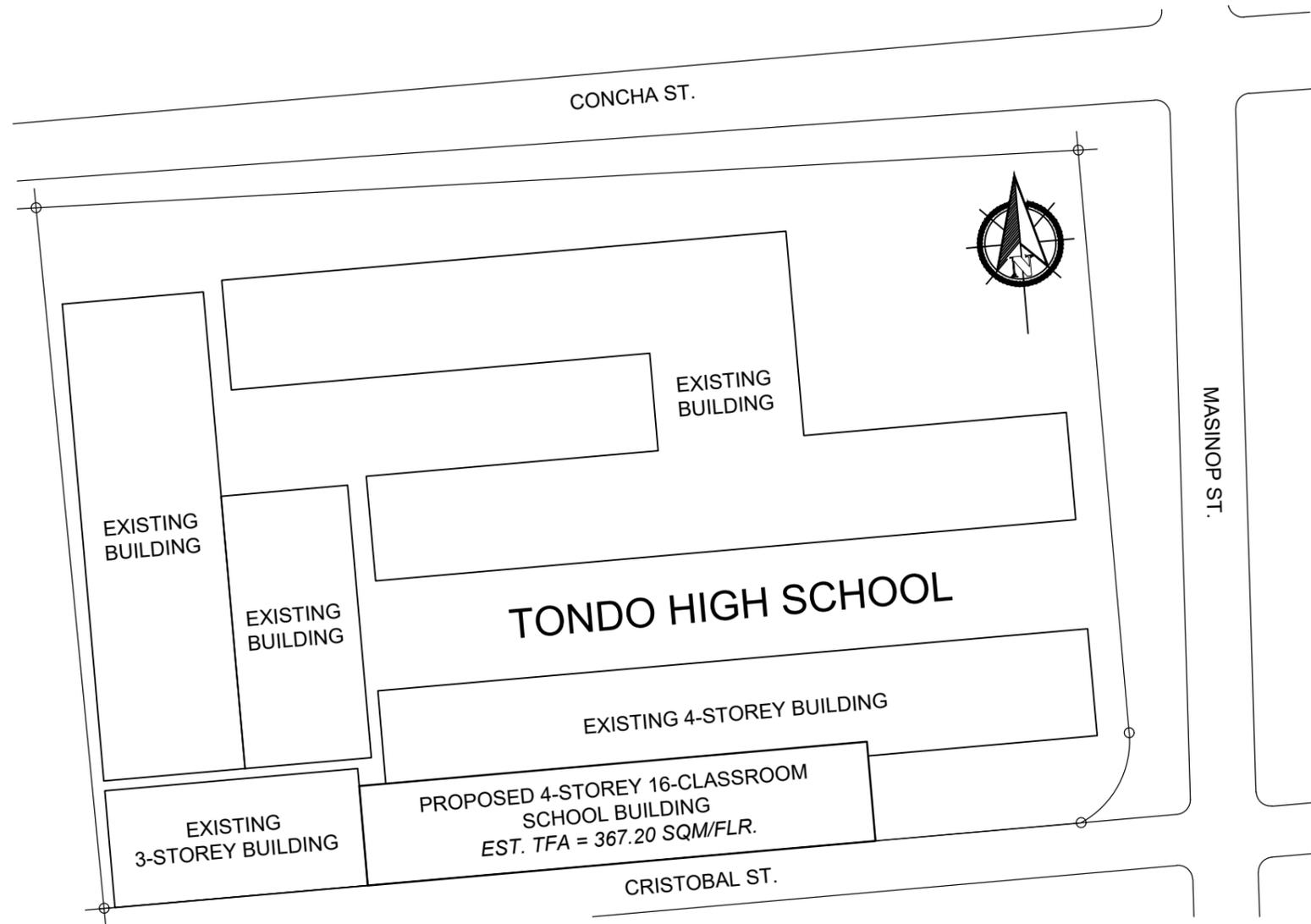
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A-1 SCALE NTS  
**PICTURE OF TONDO HIGH SCHOOL**



THIS SITE

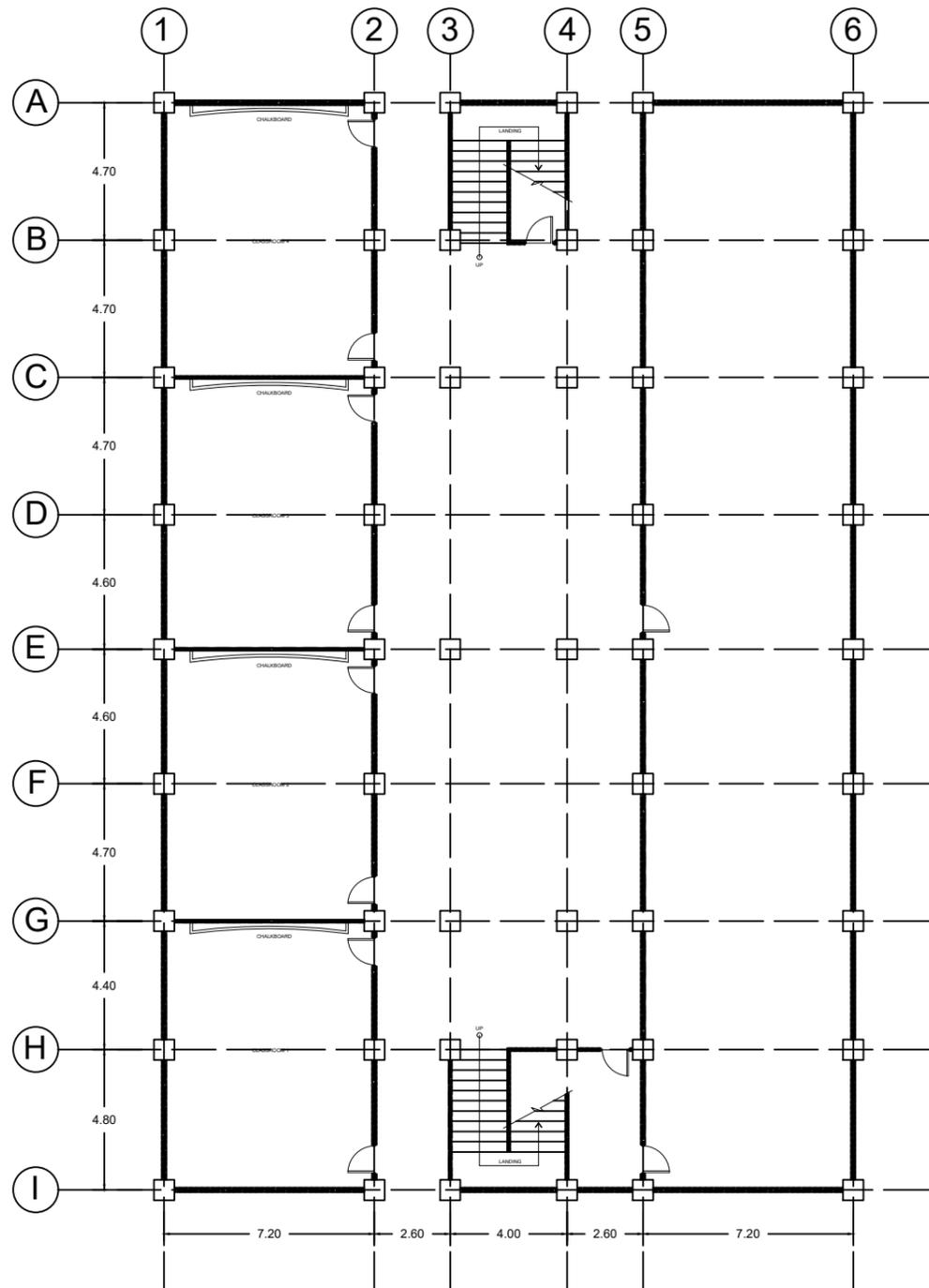
2  
A-1 SCALE NTS  
**VICINITY MAP**

REPUBLIC OF THE PHILIPPINES OFFICE OF THE CITY/MUNICIPAL ENGINEER/BUILDING OFFICIAL	
TABLE OF CONTENTS	
GENERAL	DISTRICT / CITY / MUNICIPALITY
ARCHITECTURAL	LAND USE & ZONING
(A-1) PICTURE OF BASKETBALL COURT VICINITY MAP TABLE OF CONTENTS	
(A-2) SITE DEVELOPMENT PLAN	
(A-3) GROUND FLOOR PLAN SECOND FLOOR PLAN	LINE AND GRADE
(A-4) THIRD FLOOR PLAN	
STRUCTURAL	ARCHITECTURAL
(S-1) GROUND FLOOR FRAMING PLAN SECOND FLOOR FRAMING PLAN	
(S-2) THIRD FLOOR FRAMING PLAN	
(S-3) BEAM FRP RETRO DET. PLAN VIEW RC BEAM FRP RETRO DET. BEAM FRP SCHEDULE TYP. COLUMN FRP RETRO DET. ELEVATION FRP RETRO DET.	STRUCTURAL
ELECTRICAL	SANITARY
PLUMBING	ELECTRICAL
(C-2) PERT - CPM	
(C-3) PDM	MECHANICAL

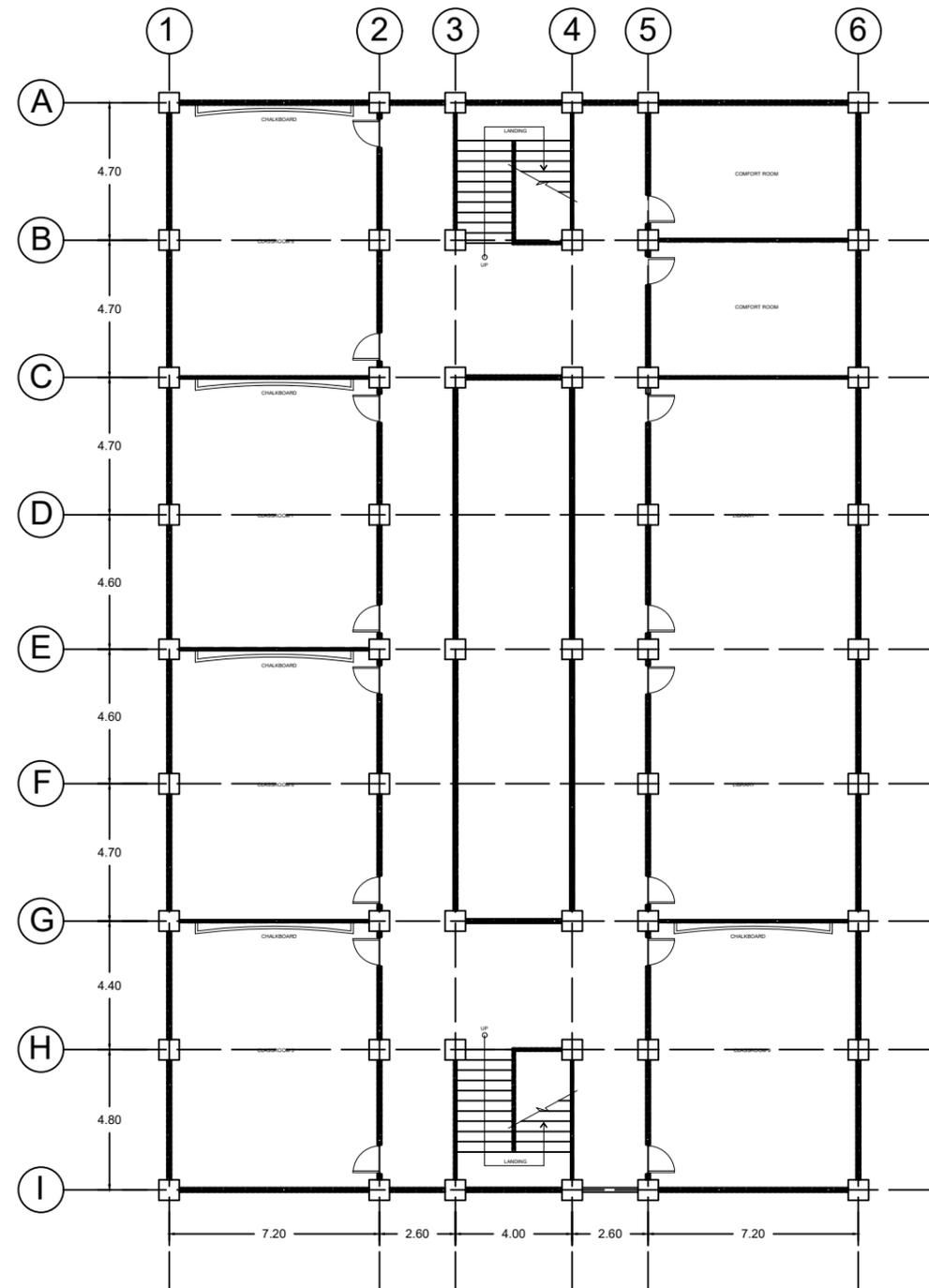


1 SITE DEVELOPMENT PLAN  
A-2 SCALE NTS.

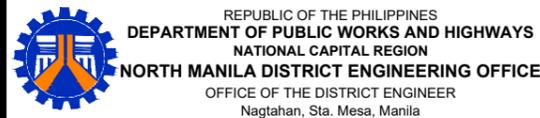
 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION NORTH MANILA DISTRICT ENGINEERING OFFICE OFFICE OF THE DISTRICT ENGINEER Nagtahan, Sta. Mesa, Manila</p>	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	SITE DEVELOPMENT PLAN	AR JON MARCOS ARCHITECT	ARLENE S. MENDOZA DIC - CHIEF, PLANNING AND DESIGN SECTION	DENRYL CAESAR S. CORTUNA ASSISTANT DISTRICT ENGINEER	DENNIS E. SANDOVAL DISTRICT ENGINEER	1 2	A-2 04/16



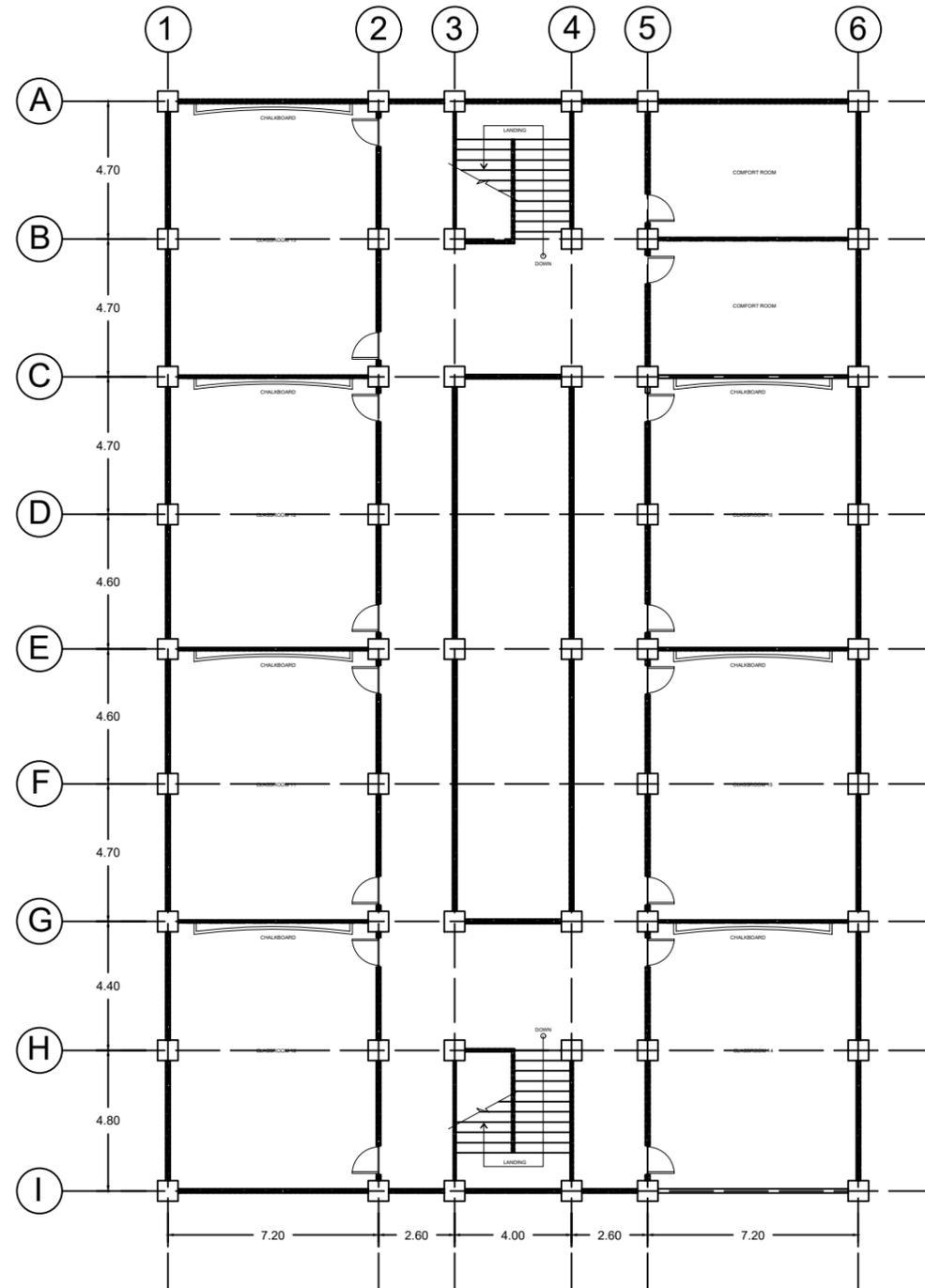
BUILDING 1  
**1**  
**A-3** SCALE NTS.  
**GROUND FLOOR PLAN**



BUILDING 1  
**1**  
**A-3** SCALE NTS.  
**SECOND FLOOR PLAN**



PROJECT NAME / LOCATION <b>RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY</b>	SHEET CONTENTS GROUND FRAMING PLAN SECOND FRAMING PLAN	PREPARED BY: <i>Archieve</i> DR. J. EMAR S. ... ARCHITECT II	REVIEWED / SUBMITTED BY: <i>Arlene S. Mendoza</i> <b>ARLENE S. MENDOZA</b> OIC - CHIEF PLANNING AND DESIGN SECTION	RECOMMENDING APPROVAL: <i>Denryl Caesar S. Cortuna</i> <b>DENRYL CAESAR S. CORTUNA</b> ASSISTANT DISTRICT ENGINEER	APPROVED: <i>Dennis E. Sandoval</i> <b>DENNIS E. SANDOVAL</b> DISTRICT ENGINEER	SET NO. 1 2	SHEET NO. A-3 05/16
		CHECKED BY: <i>Flanchessa Ada S. Usmanil</i> <b>FLANCHESCA ADA S. USMANIL</b> ARCHITECT II	APPROVED:	APPROVED:	APPROVED:	APPROVED:	

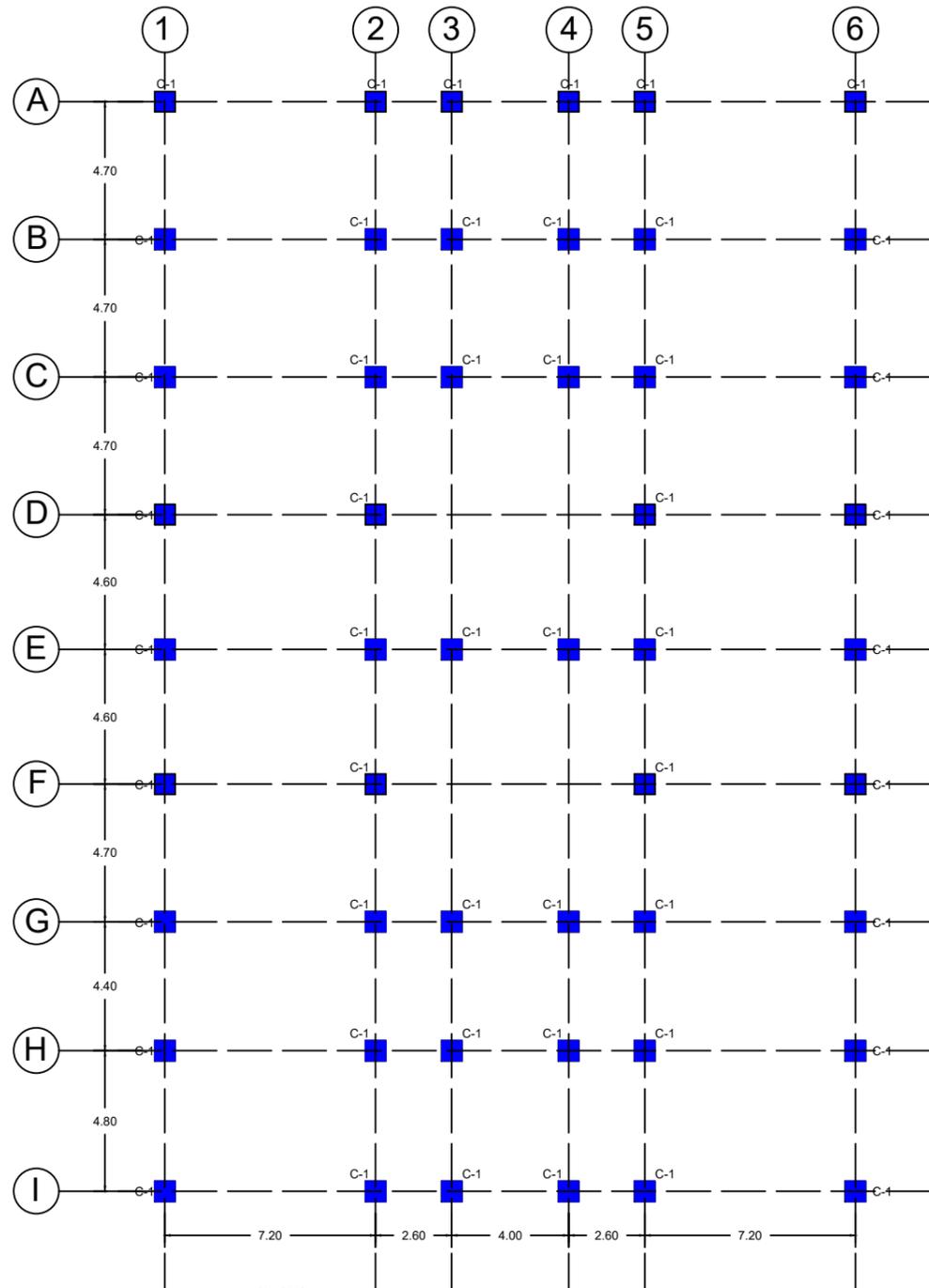


1 BUILDING 1  
**THIRD FLOOR PLAN**  
A-4 SCALE NTS.

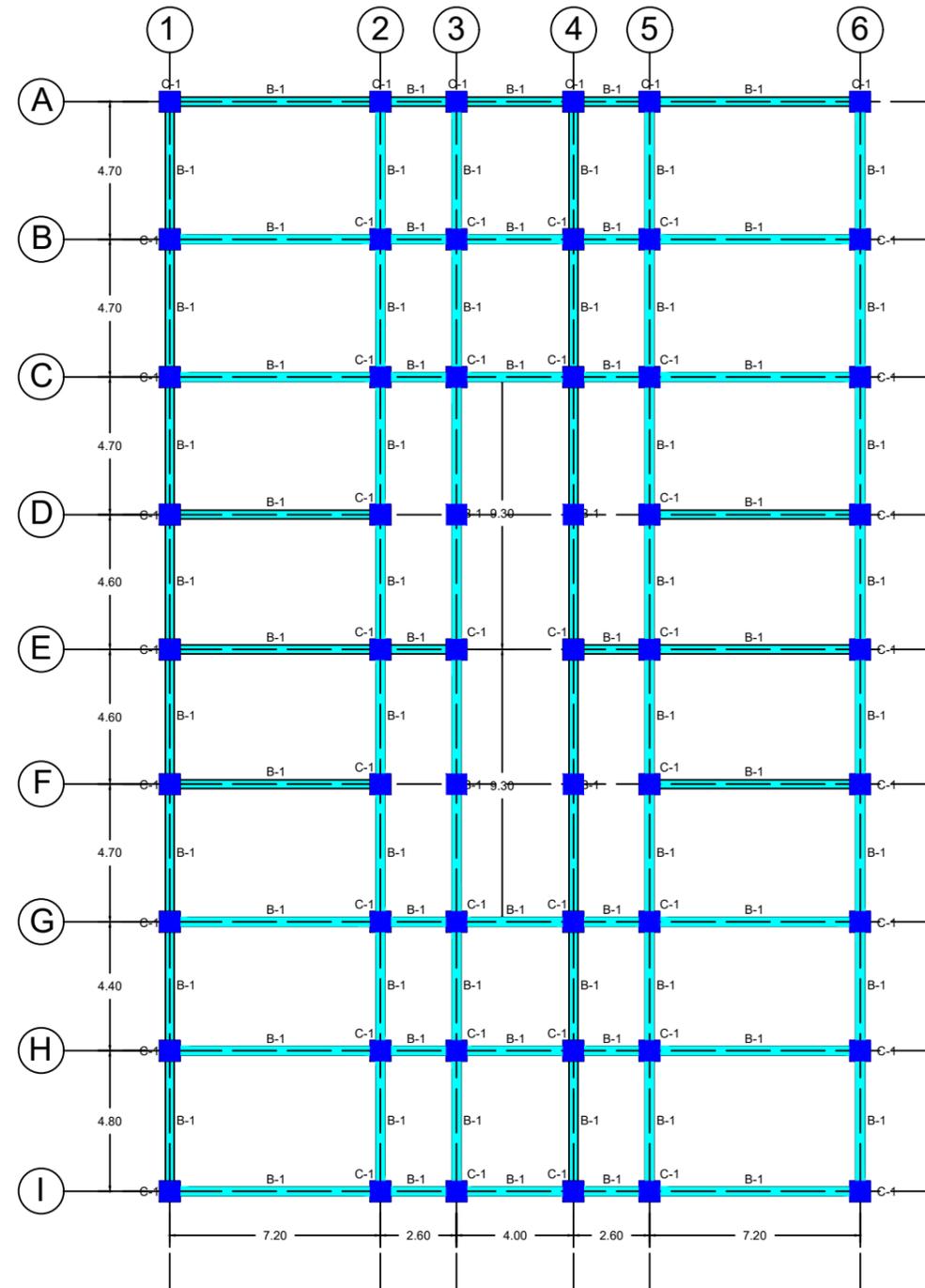
 <p style="font-size: small;">       REPUBLIC OF THE PHILIPPINES        DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS        NATIONAL CAPITAL REGION  <b>NORTH MANILA DISTRICT ENGINEERING OFFICE</b>        OFFICE OF THE DISTRICT ENGINEER        Nagtahan, Sta. Mesa, Manila     </p>	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	THIRD FLOOR PLAN	 J. JEMAR S. PATUBO, UAP <small>ARCHITECT II</small>	 ARLENE S. MENDOZA <small>OIC - CHIEF, PLANNING AND DESIGN SECTION</small>	 DENRYL CAESAR S. CORTUNA <small>ASSISTANT DISTRICT ENGINEER</small>	 DENNIS E. SANDOVAL <small>DISTRICT ENGINEER</small>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">1</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2</span>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">A - 4</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">06   16</span>

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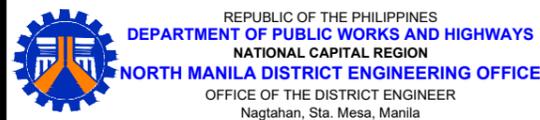
- COLUMN TO BE RETROFITTED
- BEAM TO BE RETROFITTED



BUILDING 1  
**1**  
**S-1** SCALE NTS.  
**GROUND FLOOR FRAMING PLAN**



BUILDING 1  
**1**  
**S-1** SCALE NTS.  
**SECOND FLOOR FRAMING PLAN**



REPUBLIC OF THE PHILIPPINES  
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 NATIONAL CAPITAL REGION  
**NORTH MANILA DISTRICT ENGINEERING OFFICE**  
 OFFICE OF THE DISTRICT ENGINEER  
 Nagtahan, Sta. Mesa, Manila

PROJECT NAME / LOCATION  
**RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY**

SHEET CONTENTS  
 GROUND FLOOR FRAMING PLAN  
 SECOND FLOOR FRAMING PLAN

PREPARED BY:  
**MARC GERARD A. SARABIA**  
 ENGINEER II

CHECKED BY:  
**DARWIN K. DIMAANO**  
 ENGINEER II

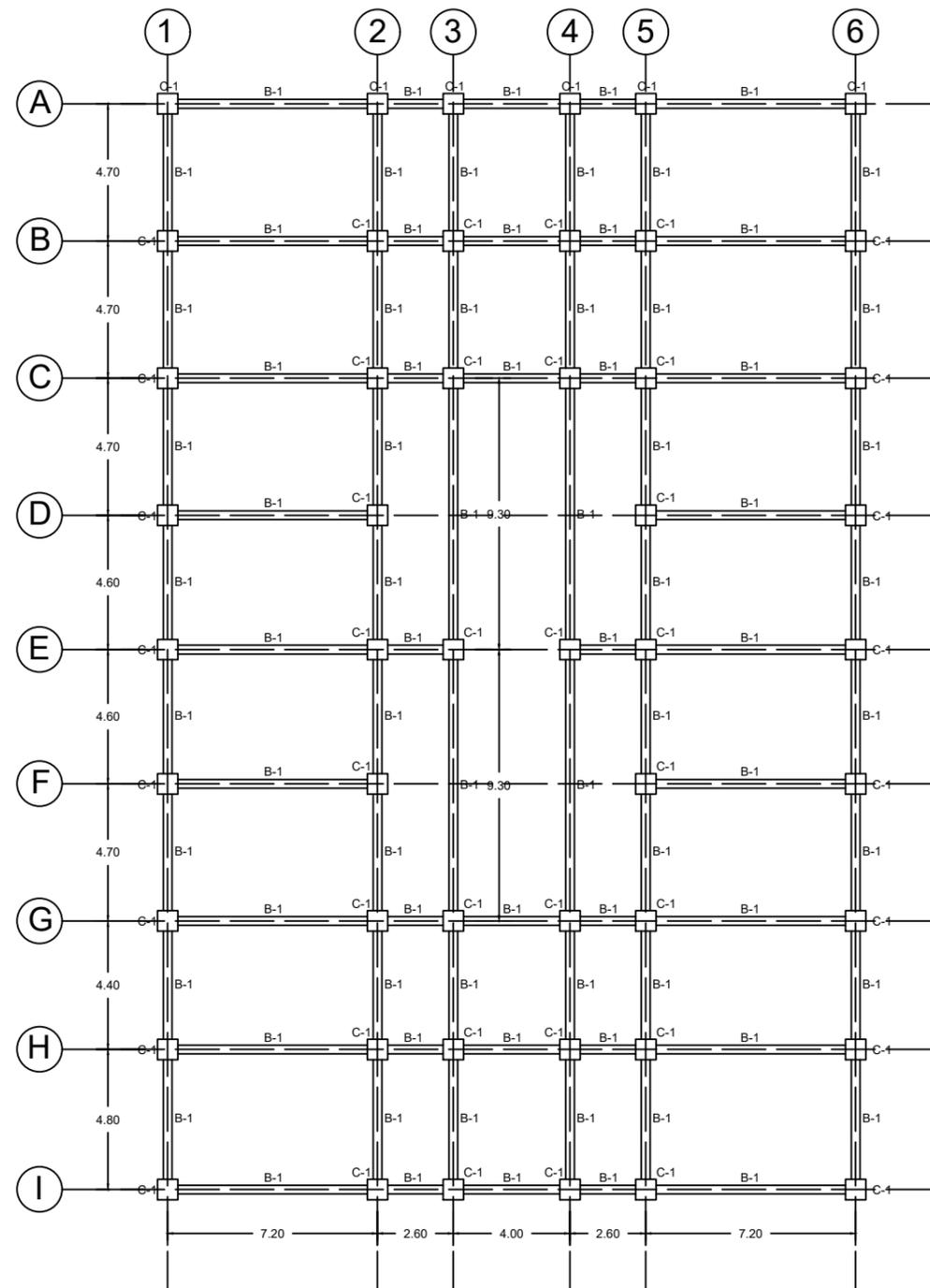
REVIEWED / SUBMITTED BY:  
**ARLENE S. MENDOZA**  
 OIC - CHIEF, PLANNING AND DESIGN SECTION

RECOMMENDING APPROVAL:  
**DENRYL CAESAR S. CORTUNA**  
 ASSISTANT DISTRICT ENGINEER

APPROVED:  
**DENNIS E. SANDOVAL**  
 DISTRICT ENGINEER

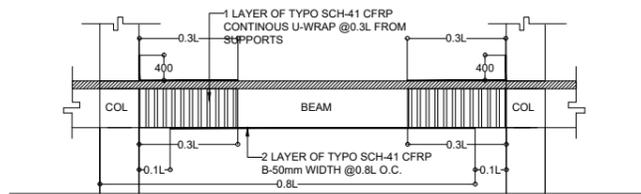
SET NO.  
 1  
 2

SHEET NO.  
 S - 1  
 07/16

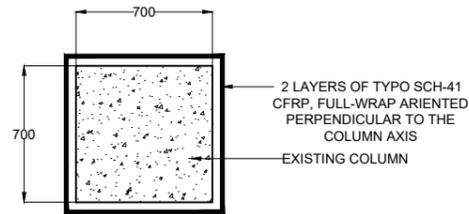


1 BUILDING 1  
**THIRD FLOOR FRAMING PLAN**  
 SCALE NTS.

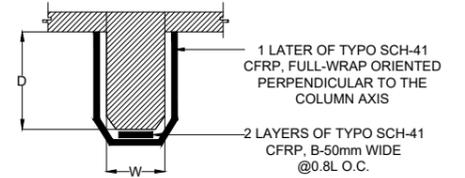
 <p style="font-size: 8px;">         REPUBLIC OF THE PHILIPPINES  <b>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</b>          NATIONAL CAPITAL REGION  <b>NORTH MANILA DISTRICT ENGINEERING OFFICE</b>          OFFICE OF THE DISTRICT ENGINEER          Nagtahan, Sta. Mesa, Manila       </p>	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	THIRD FLOOR FRAMING PLAN	MARC GERARD A. SARABIA <small>ENGINEER II</small>	ARLENE S. MENDOZA <small>OIC - CHIEF, PLANNING AND DESIGN SECTION</small>	DENRYL CAESAR S. CORTUNA <small>ASSISTANT DISTRICT ENGINEER</small>	JENNIS E. SANDOVAL <small>DISTRICT ENGINEER</small>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">1</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2</span>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">S - 2</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">08/16</span>



**1 BEAM FRP RETRO.DET.**  
SCALE 1:50



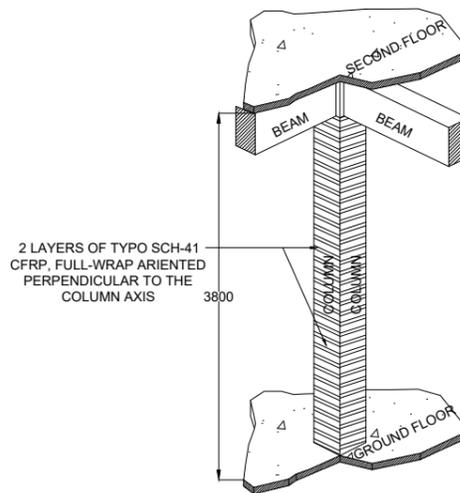
**2 PLAN VIEW**  
SCALE 1:20



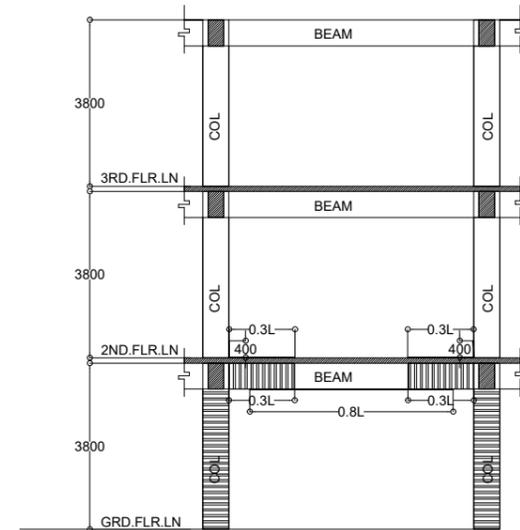
**3 RC BEAM FRP RETRO.DET.**  
SCALE 1:20

BEAM MARK	SIZE(mm)		FRP APPLICATION	
	WIDTH	DEPTH	FLEXURAL (BOTTOM FLEX)	SHEAR(U-WRAP)
B-1	300	860	2 LAYERS TYFO SCH-41 CARBON FIBER, B-50MM WIDTH @0.8L	1 LAYERS TYFO SCH-41 CARBON FIBER, CONTINUOUS U-WRAP @0.3L FROM SUPPORT

**4 BEAM FRP SCHEDULE**  
SCALE NTS.



**5 TYP. COLUMN FRP RETRO.DET.**  
SCALE NTS.

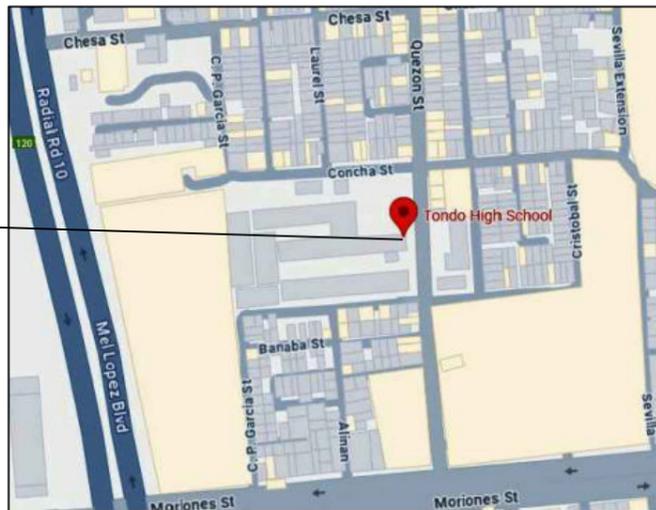


**6 ELEVATION FRP RETRO.DET.**  
SCALE 1:75



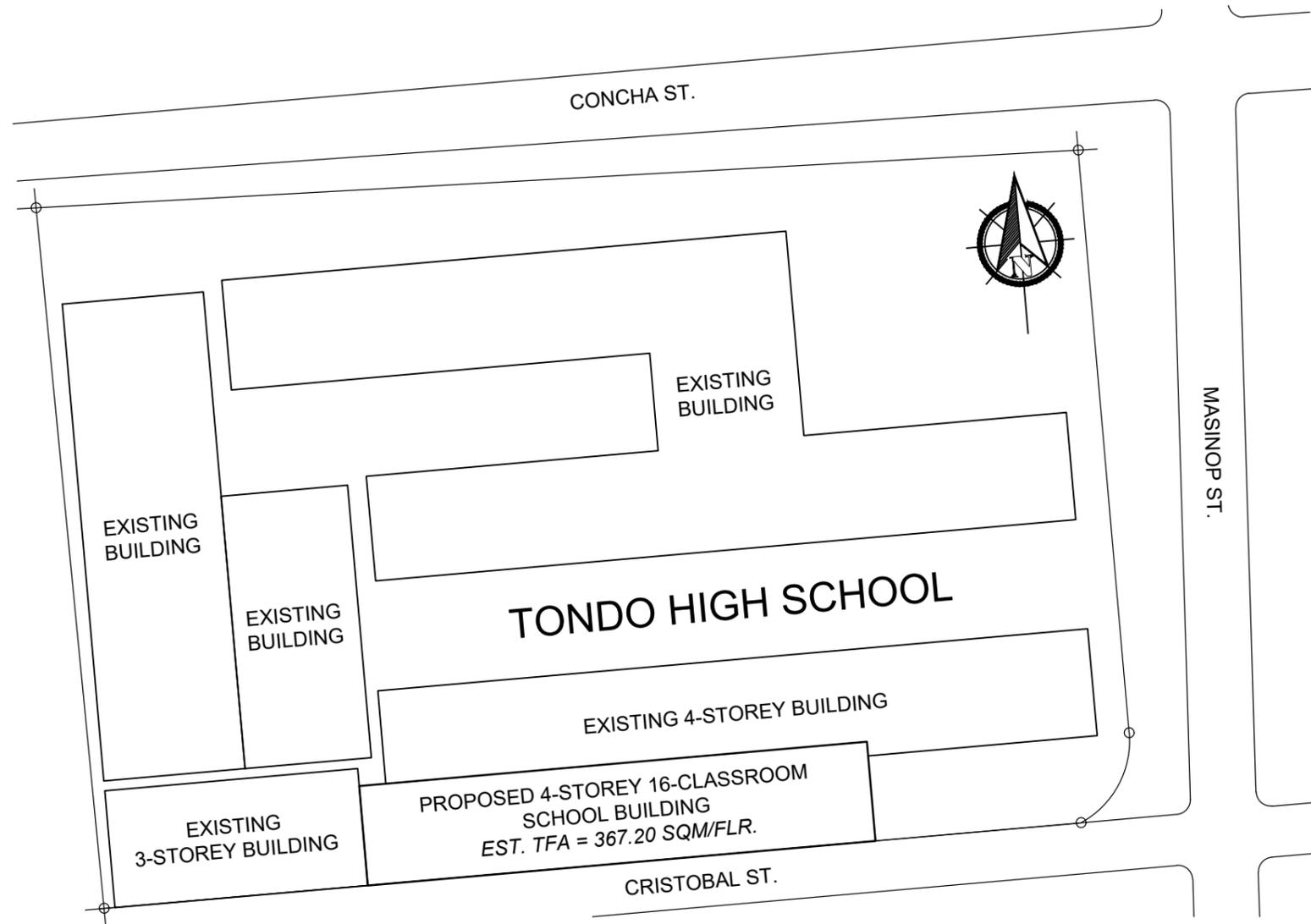
1  
A-1 SCALE NTS  
**PICTURE OF TONDO HIGH SCHOOL**

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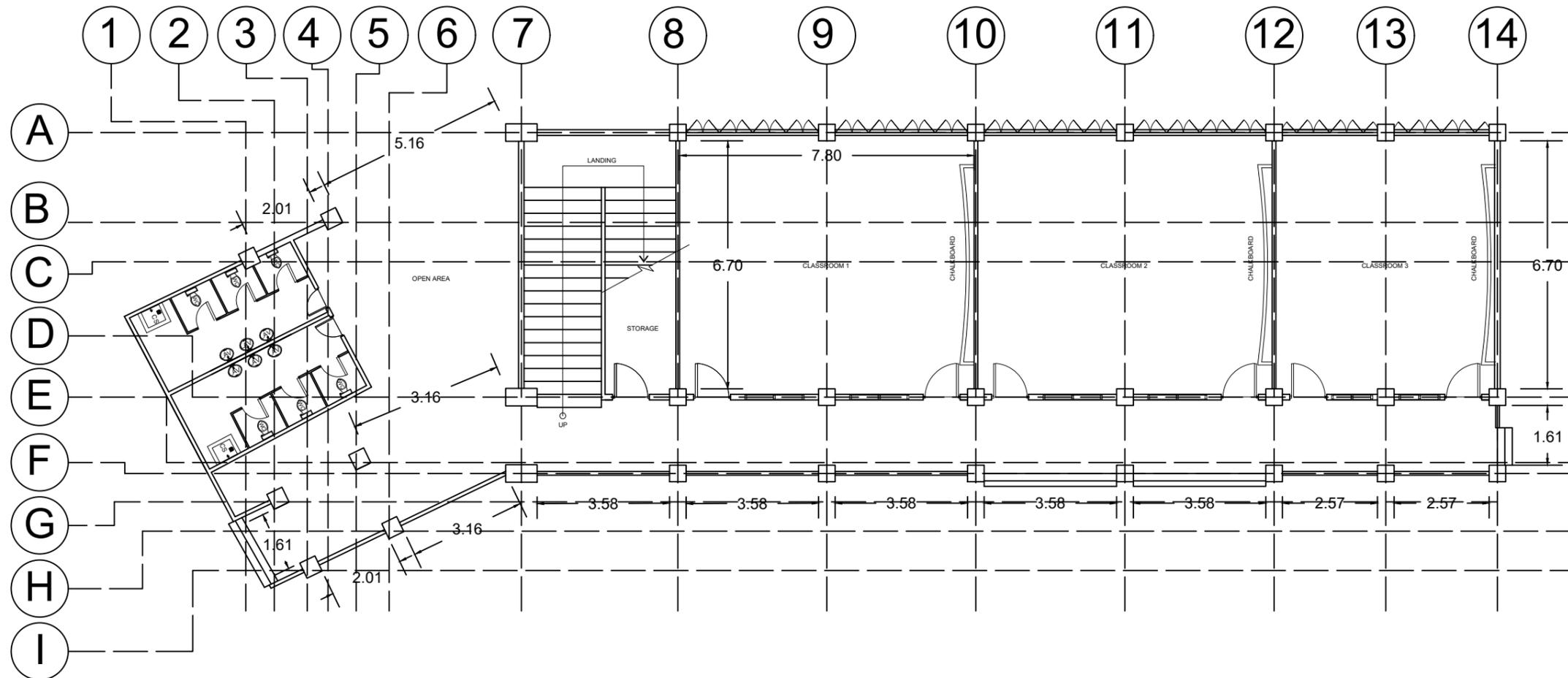
2  
A-1 SCALE NTS  
**VICINITY MAP**

REPUBLIC OF THE PHILIPPINES OFFICE OF THE CITY/MUNICIPAL ENGINEER/BUILDING OFFICIAL	
TABLE OF CONTENTS	
GENERAL	
G-1	BILL OF QUANTITIES
ARCHITECTURAL	
A-1	PICTURE OF BASKETBALL COURT VICINITY MAP TABLE OF CONTENTS
A-2	SITE DEVELOPMENT PLAN
A-3	GROUND FLOOR PLAN
A-4	SECOND FLOOR PLAN
STRUCTURAL	
S-1	GROUND FLOOR FRAMING PLAN
S-2	SECOND FLOOR FRAMING PLAN
S-3	BEAM FRP RETRO DET. PLAN VIEW RC BEAM FRP RETRO DET. BEAM FRP SCHEDULE TYP. COLUMN FRP RETRO DET. ELEVATION FRP RETRO DET.
ELECTRICAL	
PLUMBING	
C-1	
COVER PAGE	
DISTRICT / CITY / MUNICIPALITY	
LAND USE & ZONING	
LINE AND GRADE	
ARCHITECTURAL	
STRUCTURAL	
SANITARY	
ELECTRICAL	
MECHANICAL	

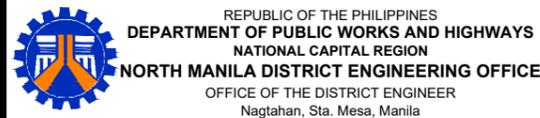


1 SITE DEVELOPMENT PLAN  
A-2 SCALE NTS.

 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION NORTH MANILA DISTRICT ENGINEERING OFFICE OFFICE OF THE DISTRICT ENGINEER Nagtahan, Sta. Mesa, Manila</p>	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	SITE DEVELOPMENT PLAN	<p>PREPARED BY: <i>JOYMAR S. FRANCISCO</i> ARCHITECT II</p> <p>CHECKED BY: <i>FRANCESCA ADA S. ESMANIL</i> ARCHITECT II</p>	<p>ARLENE S. MENDOZA OIC - CHIEF, PLANNING AND DESIGN SECTION</p>	<p>DENRYL CAESAR S. CORTUNA ASSISTANT DISTRICT ENGINEER</p>	<p>DENNIS E. SANDOVAL DISTRICT ENGINEER</p>	<p>2 2</p>	<p>A-2 11/16</p>



1 BUILDING 2  
**GROUND FLOOR PLAN**  
 A-3 SCALE NTS.



PROJECT NAME / LOCATION  
 RETROFITTING OF SCHOOL BUILDING AT  
 TONDO HIGH SCHOOL, MANILA CITY

SHEET CONTENTS  
 GROUND FLOOR PLAN

PREPARED BY:  
*Ar. Jemar S. ...*  
 ARCHITECT II

CHECKED BY:  
*Francesca Ada S. Emanoil*  
 ARCHITECT II

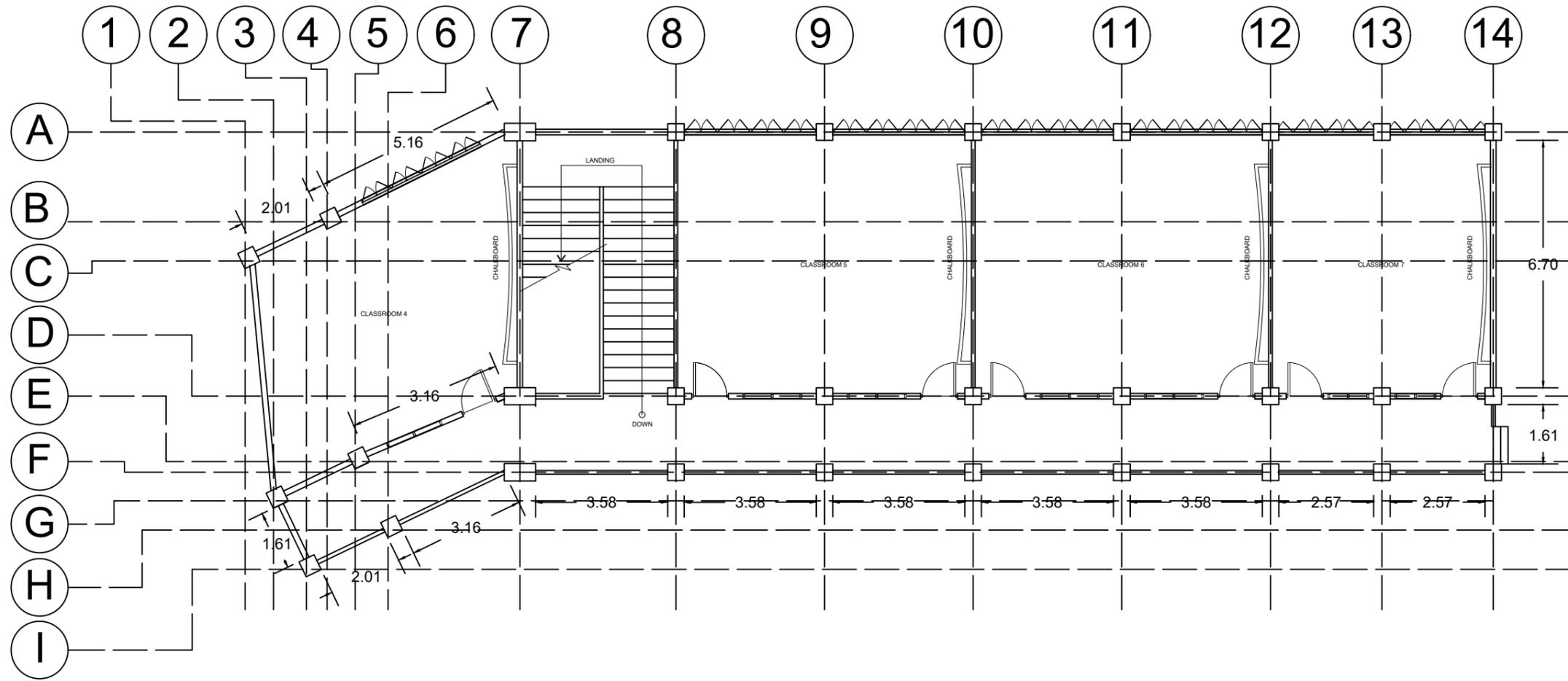
REVIEWED / SUBMITTED BY:  
*Arlene S. Mendoza*  
 ARLENE S. MENDOZA  
 OIC - CHIEF, PLANNING AND DESIGN SECTION

RECOMMENDING APPROVAL:  
*Denryl Caesar S. Cortuna*  
 DENRYL CAESAR S. CORTUNA  
 ASSISTANT DISTRICT ENGINEER

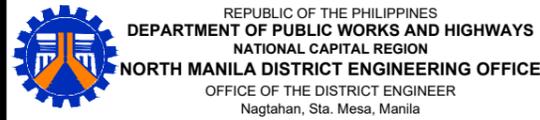
APPROVED:  
*Dennis E. Sandoval*  
 DENNIS E. SANDOVAL  
 DISTRICT ENGINEER

SET NO. SHEET NO.

2	A-3
2	12/16



1 BUILDING 2  
**SECOND FLOOR PLAN**  
A-4 SCALE NTS.



PROJECT NAME / LOCATION  
**RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY**

SHEET CONTENTS  
 SECOND FLOOR PLAN

PREPARED BY:  
*Francisca A. S. Manil*  
 ARCHITECT

CHECKED BY:  
**FRANCISCA A. S. MANIL**  
 ARCHITECT II

REVIEWED / SUBMITTED BY:  
*Arlene S. Mendoza*  
**ARLENE S. MENDOZA**  
 OIC - CHIEF, PLANNING AND DESIGN SECTION

RECOMMENDING APPROVAL:  
*Denryl Caesar S. Cortuna*  
**DENRYL CAESAR S. CORTUNA**  
 ASSISTANT DISTRICT ENGINEER

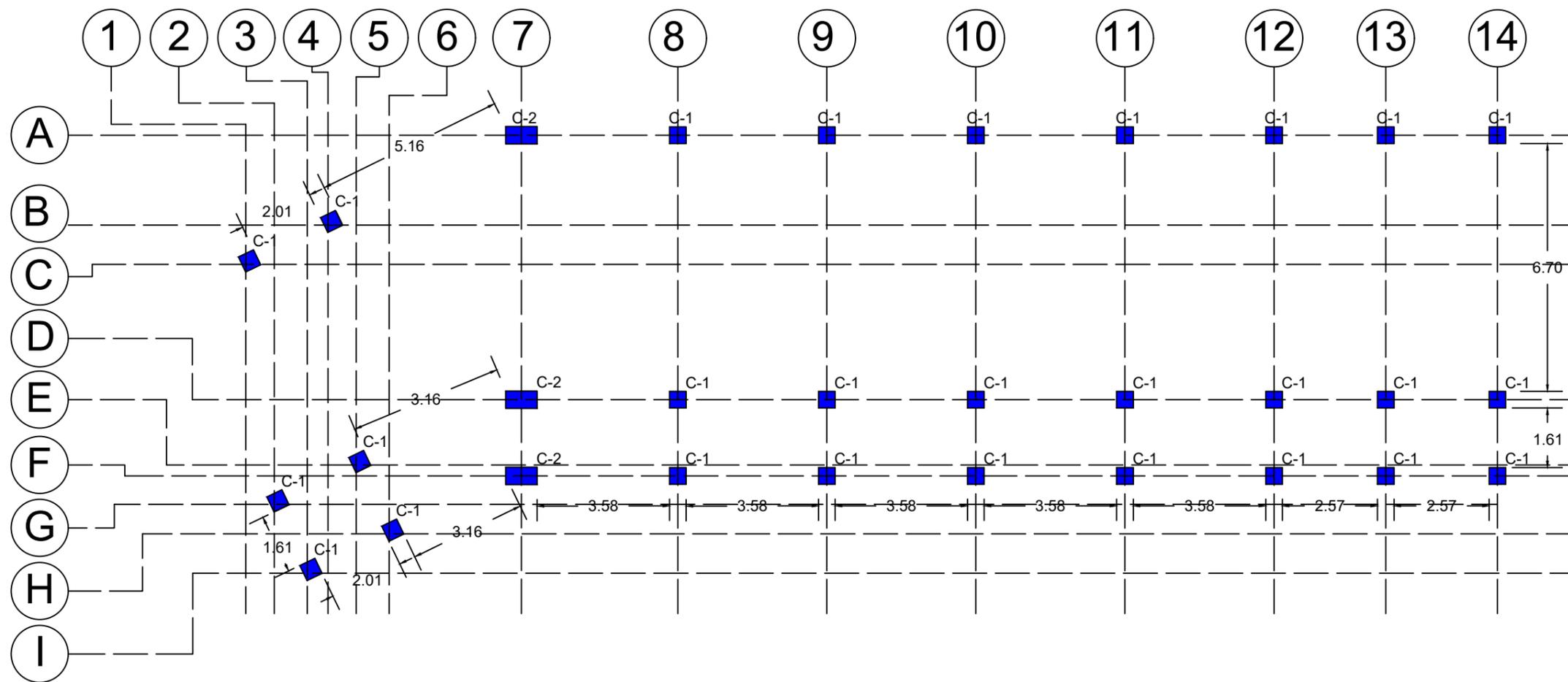
APPROVED:  
*Demas E. Sandoval*  
**DEMAS E. SANDOVAL**  
 DISTRICT ENGINEER

SET NO.  
2  
2

SHEET NO.  
A - 4  
13 / 16

LEGEND:

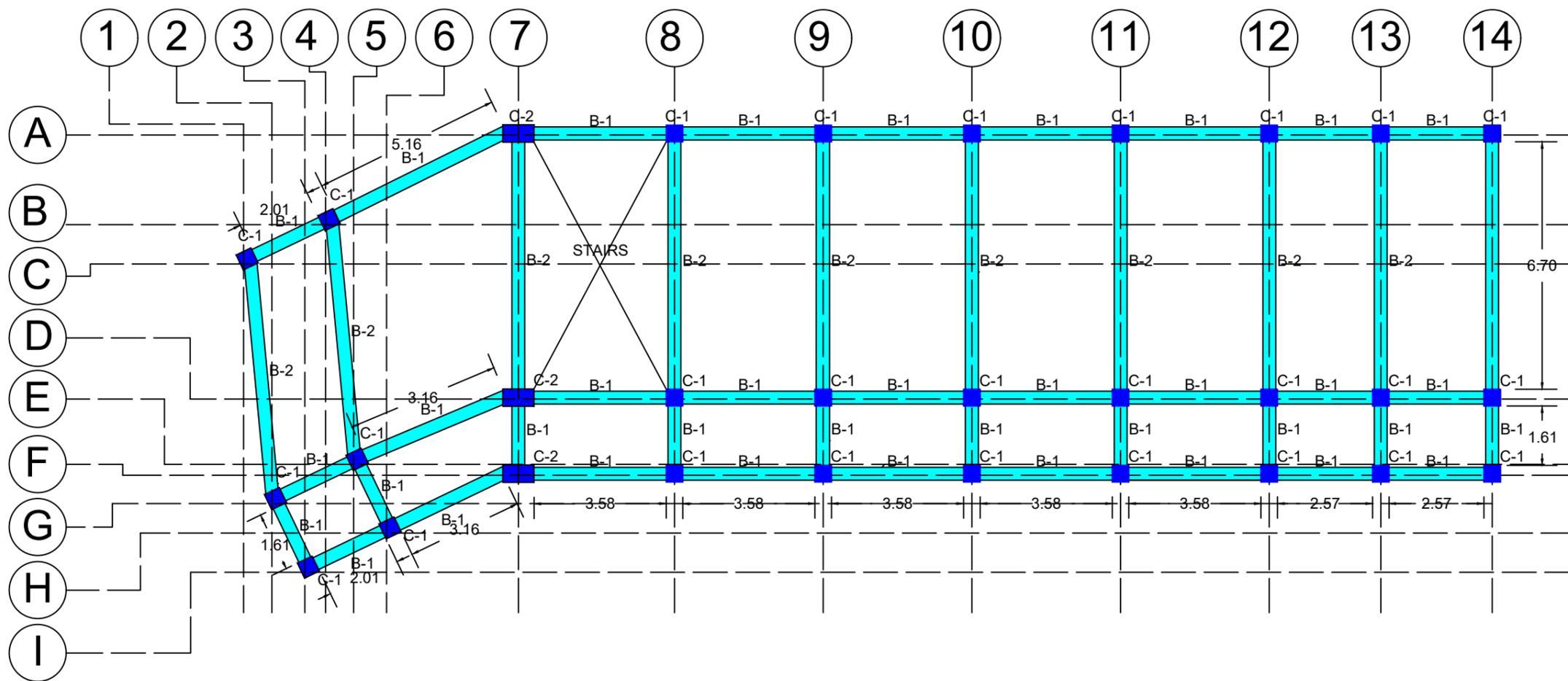
 - COLUMN TO BE RETROFITTED



1 BUILDING 2  
**GROUND FLOOR FRAMING PLAN**  
 SCALE NTS.

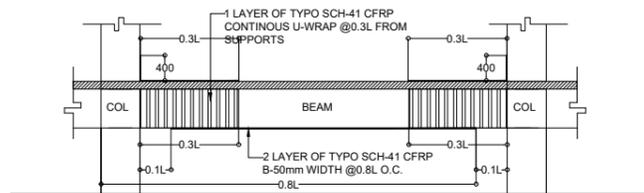
LEGEND:

- COLUMN TO BE RETROFITTED
- BEAM TO BE RETROFITTED

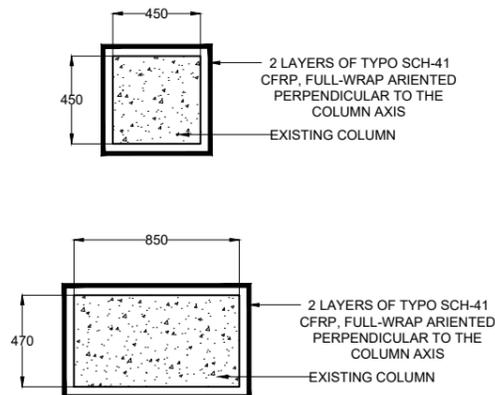


BUILDING 2  
1 **SECOND FLOOR FRAMING PLAN**  
 SCALE NTS.

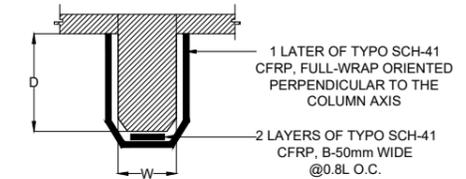
 REPUBLIC OF THE PHILIPPINES <b>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</b> NATIONAL CAPITAL REGION <b>NORTH MANILA DISTRICT ENGINEERING OFFICE</b> OFFICE OF THE DISTRICT ENGINEER Nagtahan, Sta. Mesa, Manila	PROJECT NAME / LOCATION	SHEET CONTENTS	PREPARED BY:	REVIEWED / SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SET NO.	SHEET NO.
	RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY	SECOND FLOOR FRAMING PLAN	MARC GERARD A. SARABIA <small>ENGINEER I</small>  DARWIN K. DIMAANO <small>ENGINEER II</small> 	ARLENE S. MENDOZA <small>OIC - CHIEF, PLANNING AND DESIGN SECTION</small> 	DENRYL CAESAR S. CORTUNA <small>ASSISTANT DISTRICT ENGINEER</small> 	DENNIS E. SANDOVAL <small>DISTRICT ENGINEER</small> 	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2</span>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">S - 2</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">15   16</span>



**1 BEAM FRP RETRO.DET.**  
SCALE 1:50



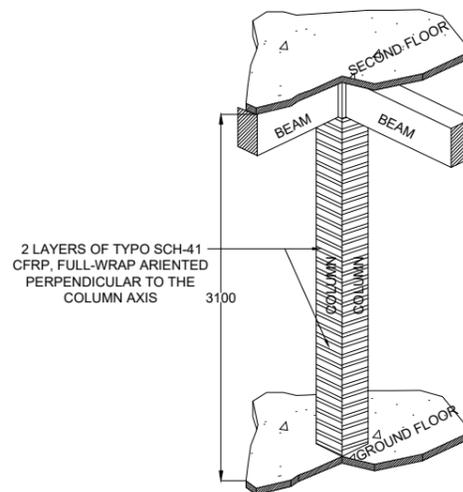
**2 PLAN VIEW**  
SCALE 1:20



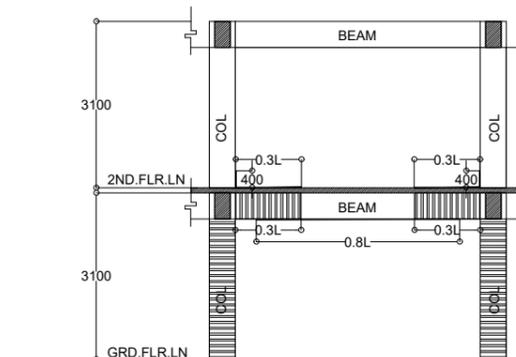
**3 RC BEAM FRP RETRO.DET.**  
SCALE 1:20

BEAM MARK	SIZE(mm)		FRP APPLICATION	
	WIDTH	DEPTH	FLEXURAL (BOTTOM FLEX)	SHEAR(U-WRAP)
B-1	350	500	2 LAYERS TYFO SCH-41 CARBON FIBER, B-50MM WIDTH @0.8L	1 LAYERS TYFO SCH-41 CARBON FIBER, CONTINUOUS U-WRAP @0.3L FROM SUPPORT

**4 BEAM FRP SCHEDULE**  
SCALE NTS.



**5 TYP. COLUMN FRP RETRO.DET.**  
SCALE NTS.



**6 ELEVATION FRP RETRO.DET.**  
SCALE 1:75