



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

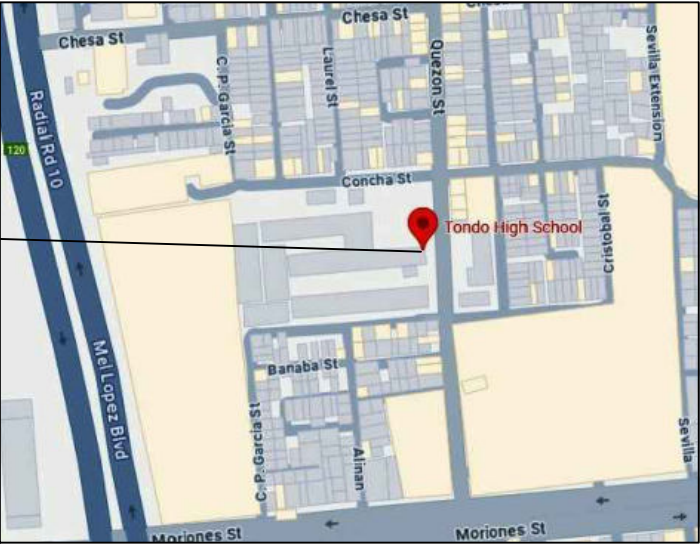
ITEM NO.	DESCRIPTION	ORIGINAL QTY.	UNIT
PART A	FACILITIES FOR THE ENGINEER	-	-
A 1.1.(3)	CONSTRUCTION FIELD OFFICE FOR THE ENGINEER	1.00	L.S.
PART B	OTHER GENERAL REQUIREMENTS	-	-
B.5(1)	PROJECT BILLBOARD/SIGN BOARD (DPWH BILLBOARD)	1.00	EA.
B.5(1)	PROJECT BILLBOARD/SIGN BOARD (COA BILLBOARD)	1.00	EA.
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.

 <div>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</div>	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	<div>MARC GERARD A. SARABIA ENGINEER</div> <div> MARVIN K. DIMAANO ENGINEER II</div>	<div> ARLENE S. MENDOZA OIC - CHIEF PLANNING AND DESIGN SECTION</div>	<div> DENRYL CAESAR S. CORTUNA ASSISTANT DISTRICT ENGINEER</div>	<div> DENNIS E. SANDOVAL DISTRICT ENGINEER</div>	<div>1 2</div>	<div>G - 1 2 16</div>



1
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 LAND USE & ZONING
ARCHITECTURAL	
(A-1) PICTURE OF BASKETBALL COURT VICINITY MAP TABLE OF CONTENTS (A-2) SITE DEVELOPMENT PLAN (A-3) GROUND FLOOR PLAN SECOND FLOOR PLAN (A-4) THIRD FLOOR PLAN	
STRUCTURAL	LINE AND GRADE
(S-1) GROUND FLOOR FRAMING PLAN SECOND FLOOR FRAMING PLAN (S-2) THIRD FLOOR FRAMING PLAN	ARCHITECTURAL
(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



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NATIONAL CAPITAL REGION
NORTH MANILA DISTRICT ENGINEERING OFFICE
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Nagtahan, Sta. Mesa, Manila

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

SHEET CONTENTS
PICTURE OF BASKETBALL COURT
VICINITY MAP
TABLE OF CONTENTS

PREPARED BY:

CHECKED BY:

DR. JUEMAR S. MANUEL
ARCHITECT II
FINCHESCA ADA S. USMANIL
ARCHITECT II

REVIEWED / SUBMITTED BY:

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

RECOMMENDING APPROVAL:

DENRYL CAESAR S. CORTUNA
ASSISTANT DISTRICT ENGINEER

APPROVED:

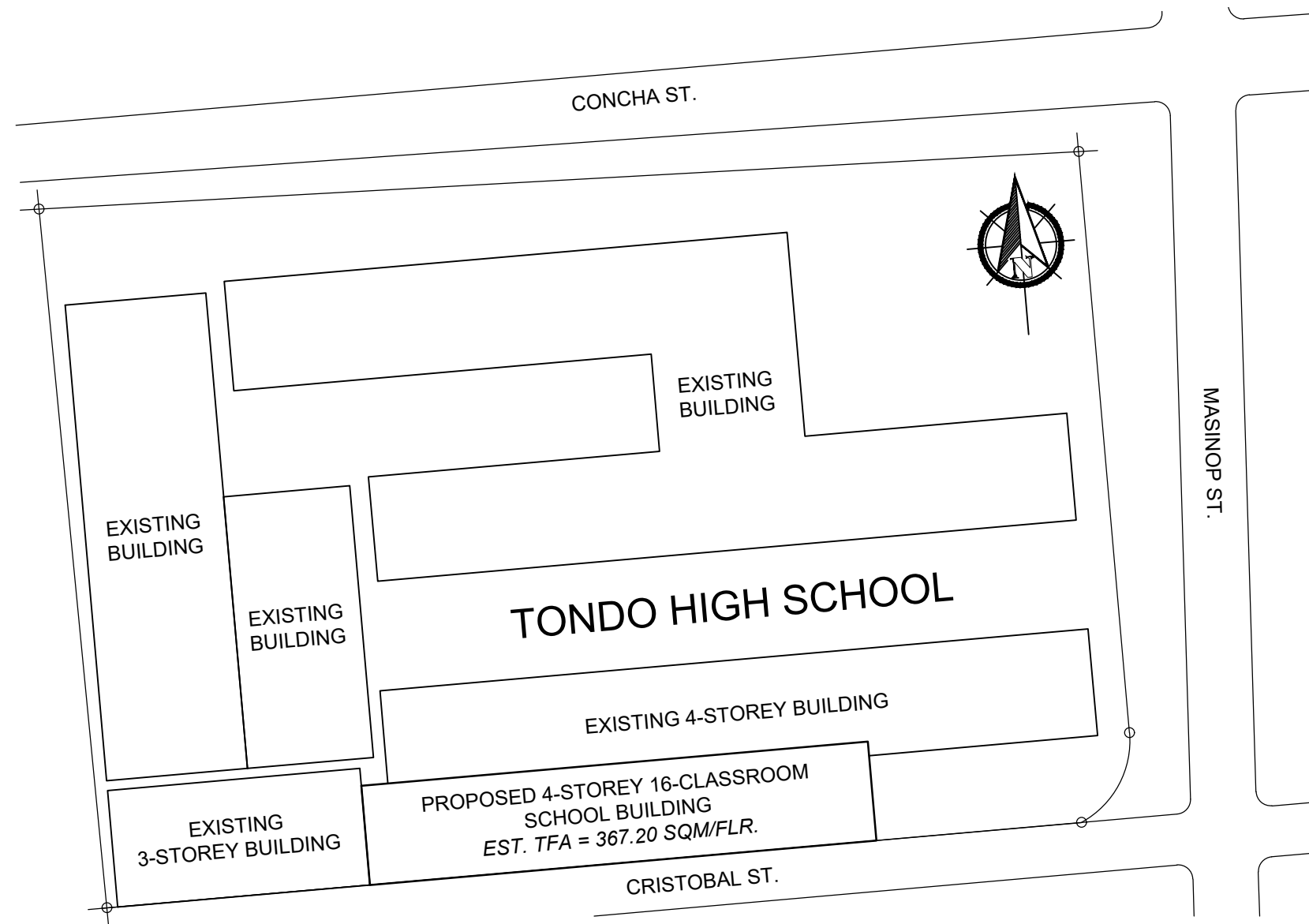
JENNIS E. SANDOVAL
DISTRICT ENGINEER

SET NO.


1
2

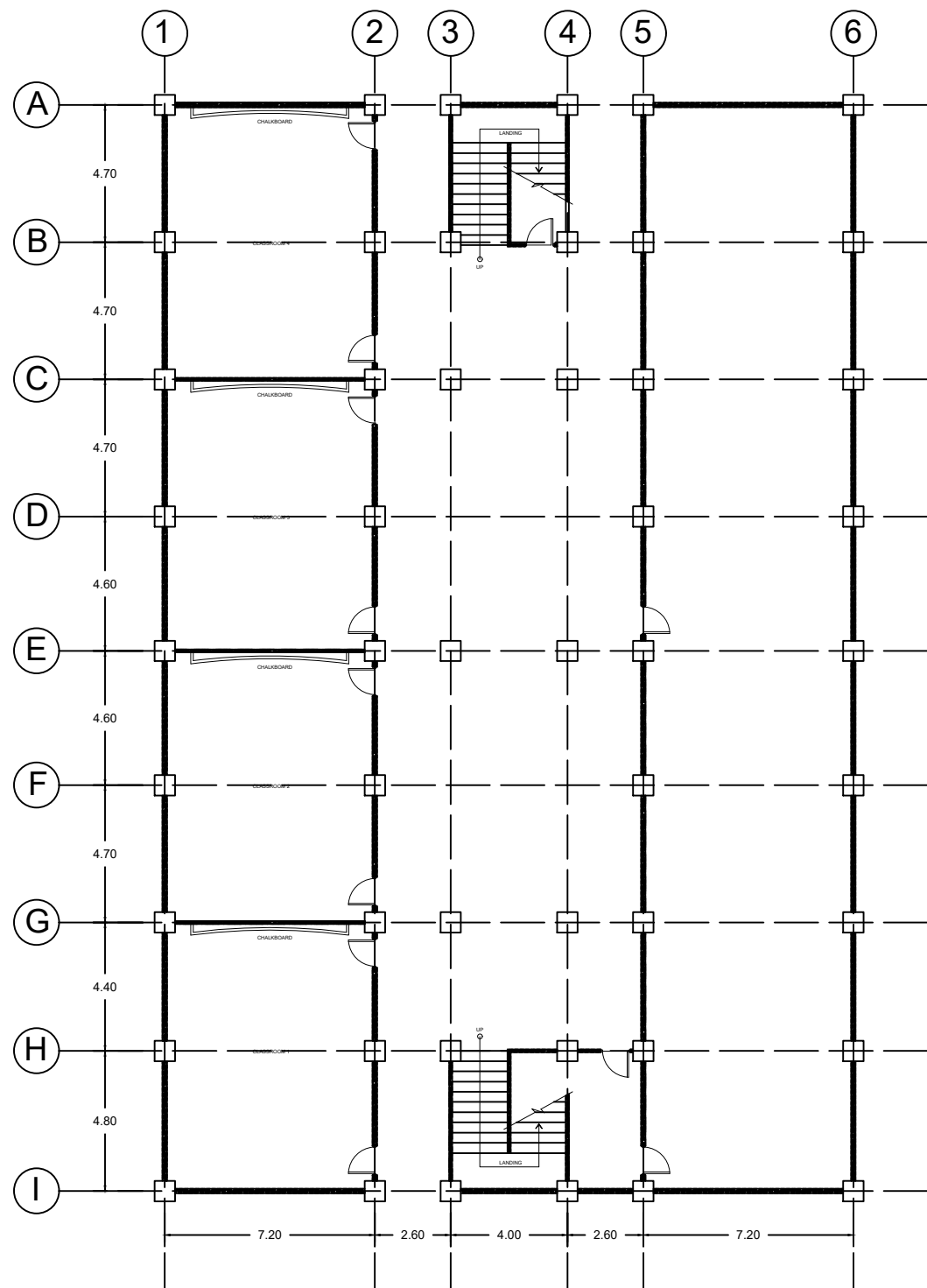
SHEET NO.

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03/16

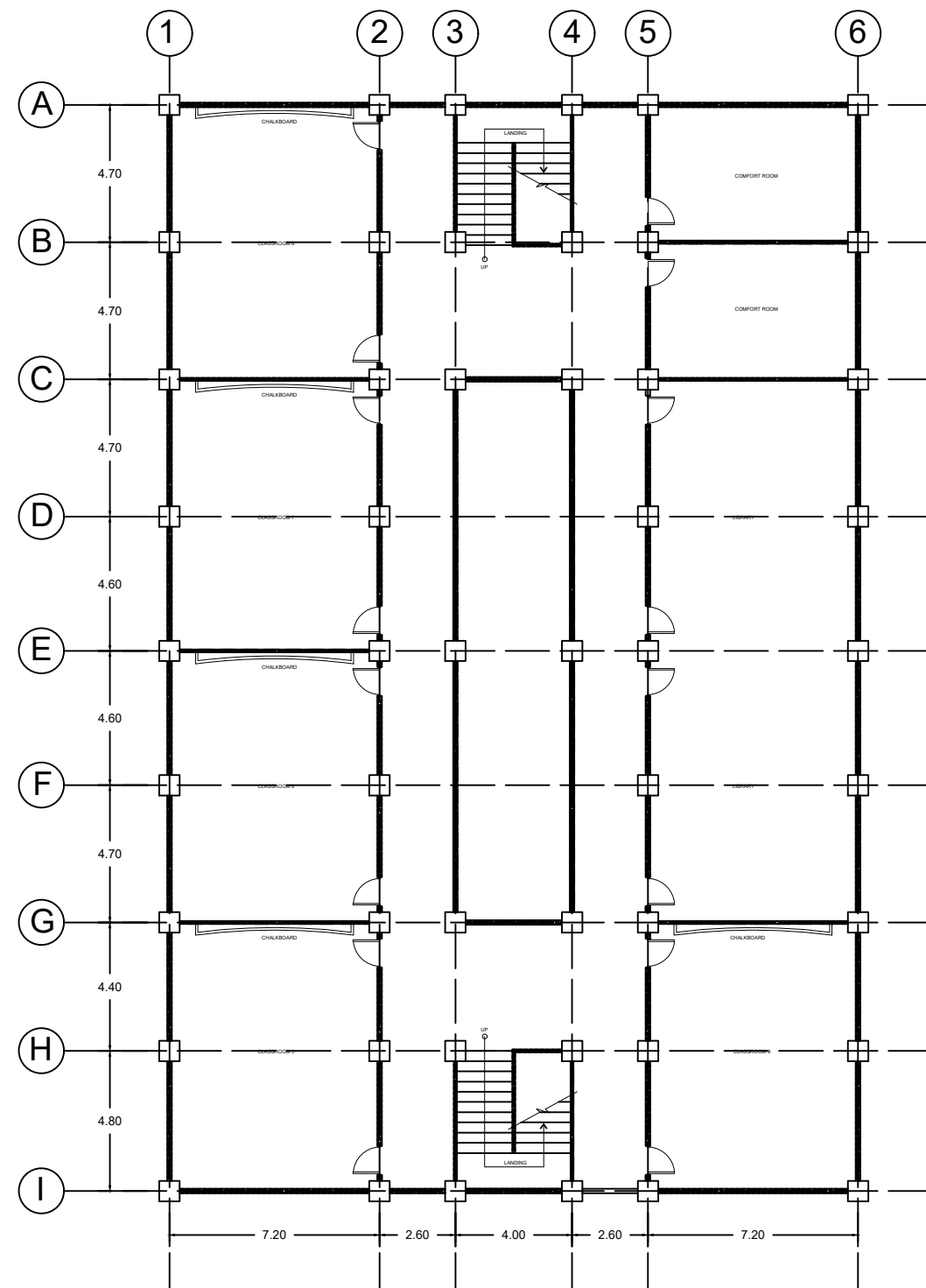


1
A-2 SITE DEVELOPMENT PLAN
SCALE NTS.

 <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>ARJON MARCOS ARCHITECT II</p> <p>FRANCISCO S. E. MANIL 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>1 2</p>	<p>A - 2 04/16</p>



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



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



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

SHEET CONTENTS
GROUND FRAMING PLAN
SECOND FRAMING PLAN

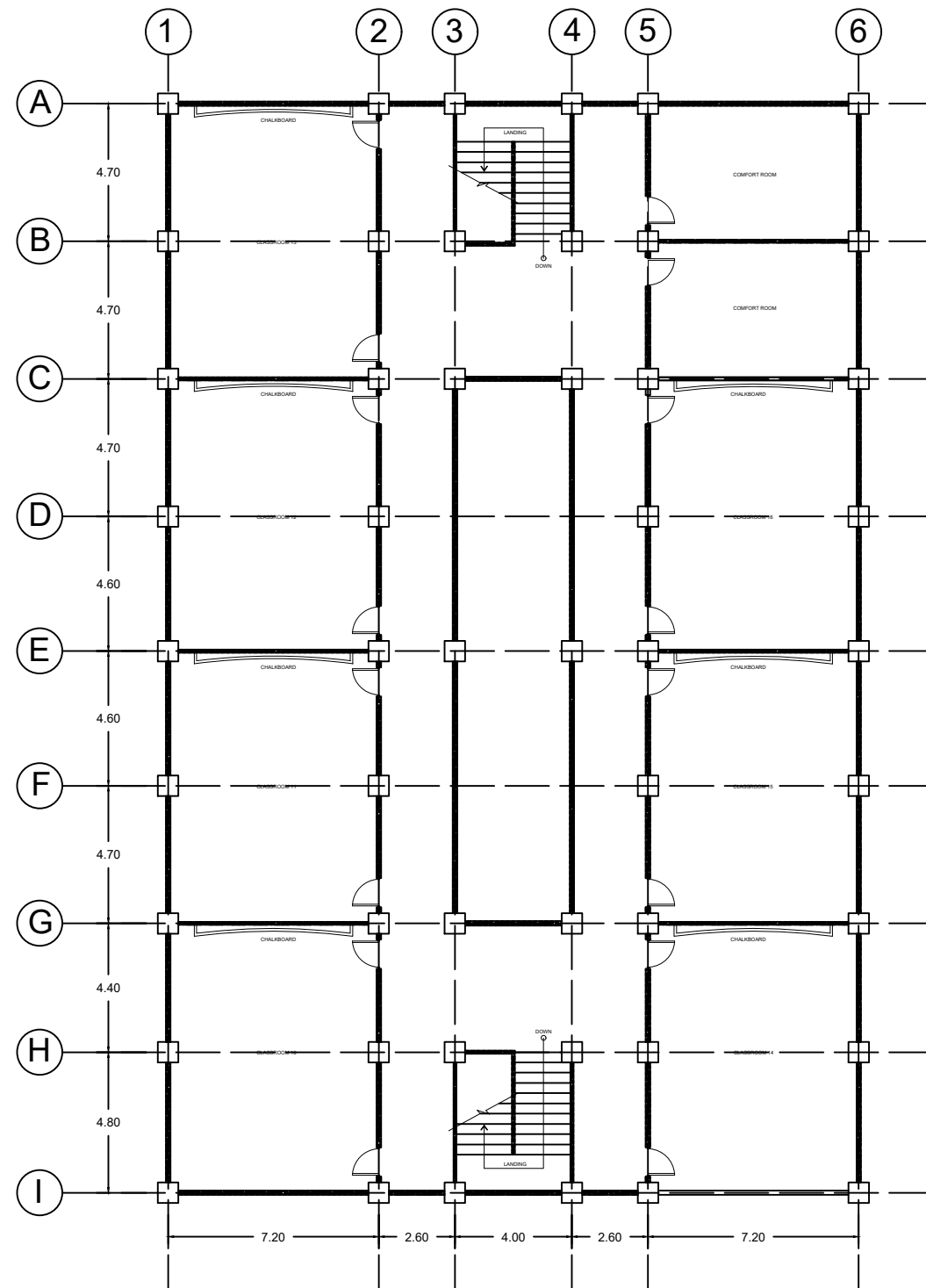
PREPARED BY:
DR. JOSE MAR S. LACOR
ARCHITECT II
CHECKED BY:
FRANCESCA ADA S. USMANIL
ARCHITECT II

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. A-3
05/16



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



REPUBLIC OF THE PHILIPPINES
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Nagtahan, Sta. Mesa, Manila

PROJECT NAME / LOCATION

RETROFITTING OF SCHOOL BUILDING AT
TONDO HIGH SCHOOL, MANILA CITY

SHEET CONTENTS

THIRD FLOOR PLAN

PREPARED BY:

CHECKED BY:

JOEMAR S. PATUBO, UAP
ARCHITECT II
FRANCHESCA ADA S. ESMANIL
ARCHITECT II

REVIEWED / SUBMITTED BY:

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

RECOMMENDING APPROVAL:

DENRYL CAESAR S. CORTUNA
ASSISTANT DISTRICT ENGINEER

APPROVED:

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DISTRICT ENGINEER

SET NO.

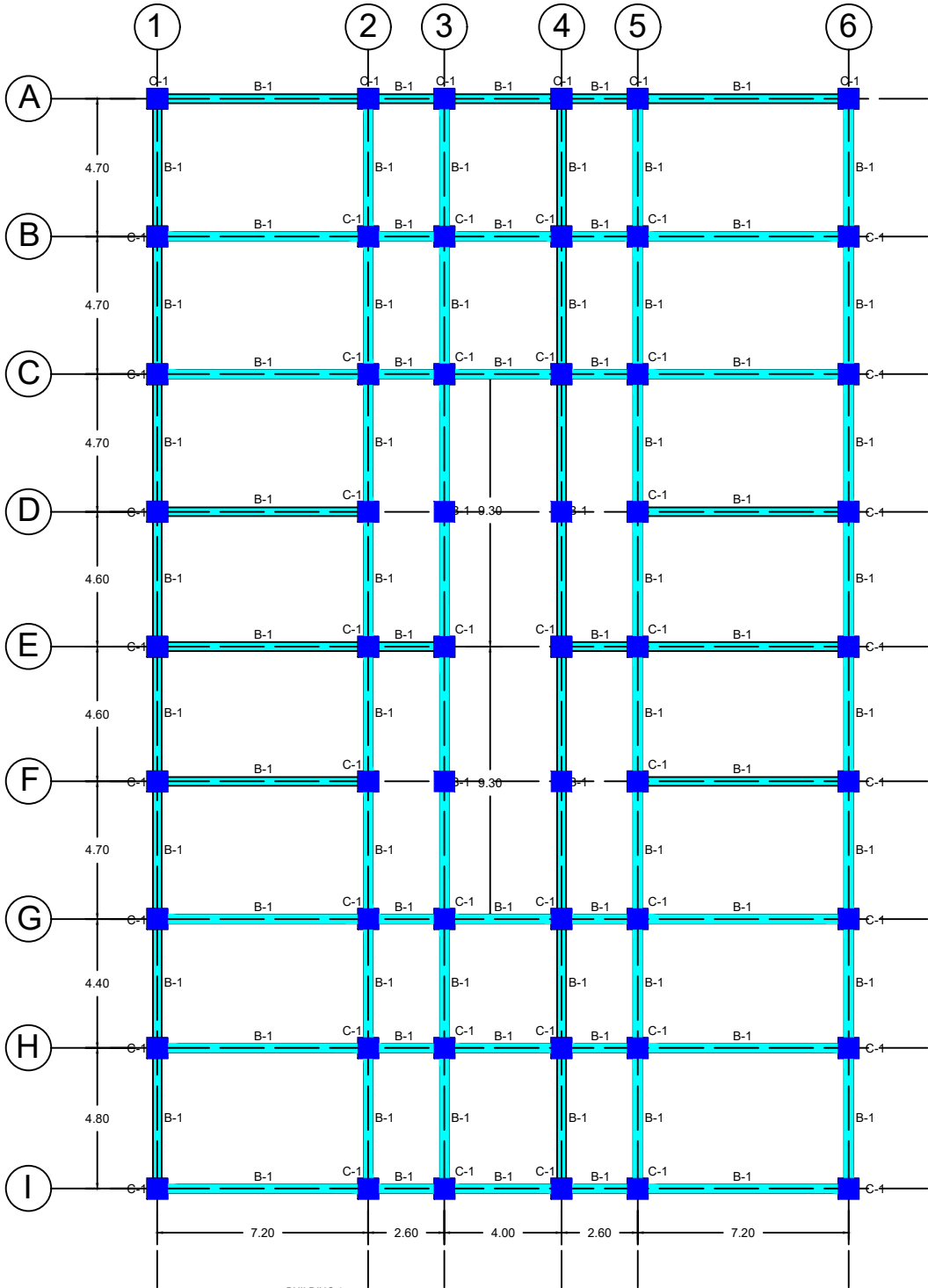
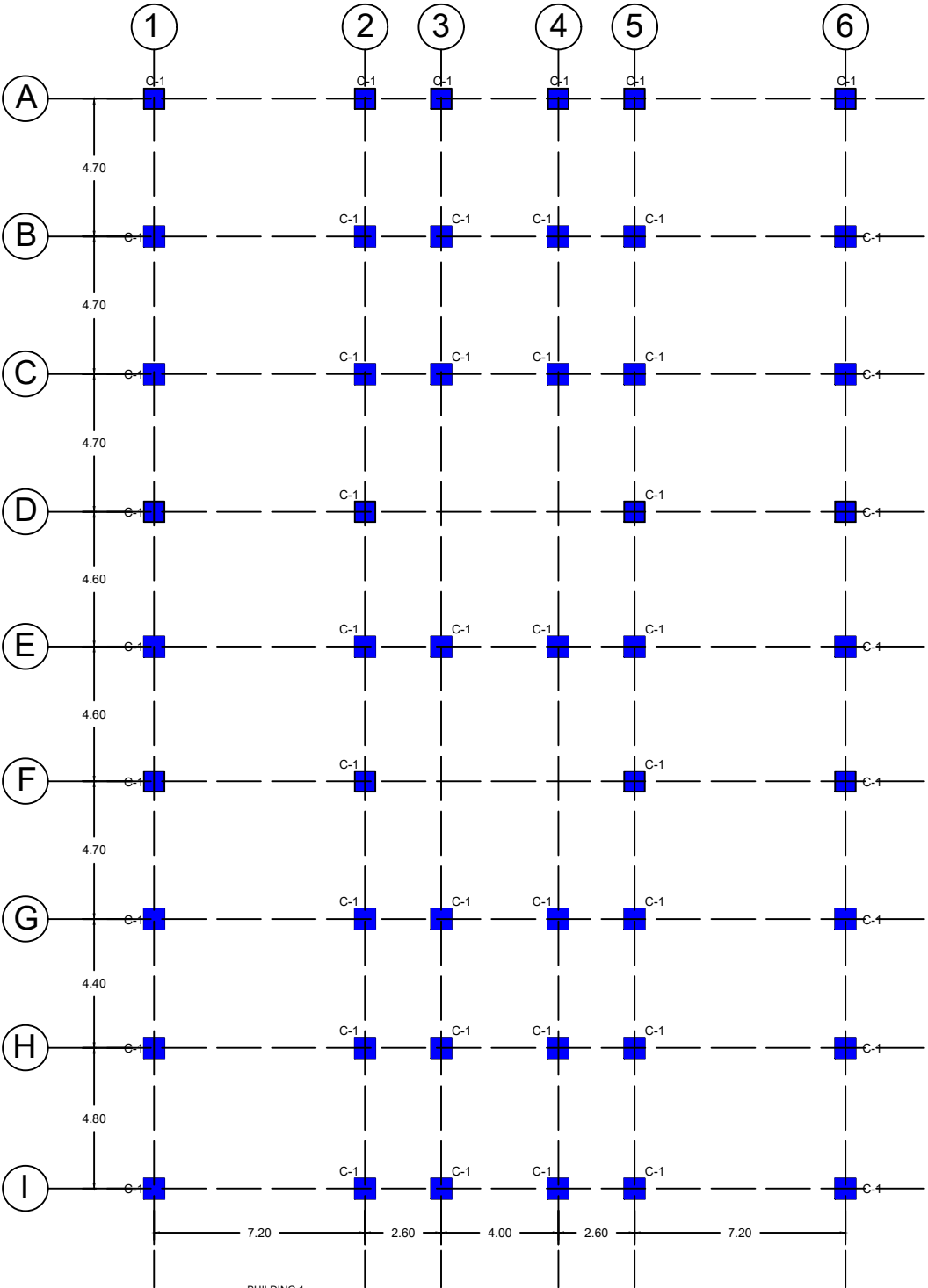
1
2

SHEET NO.

A - 4
06/16

LEGEND:

- COLUMN TO BE RETROFITTED
- BEAM TO BE RETROFITTED



REPUBLIC OF THE PHILIPPINES
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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:

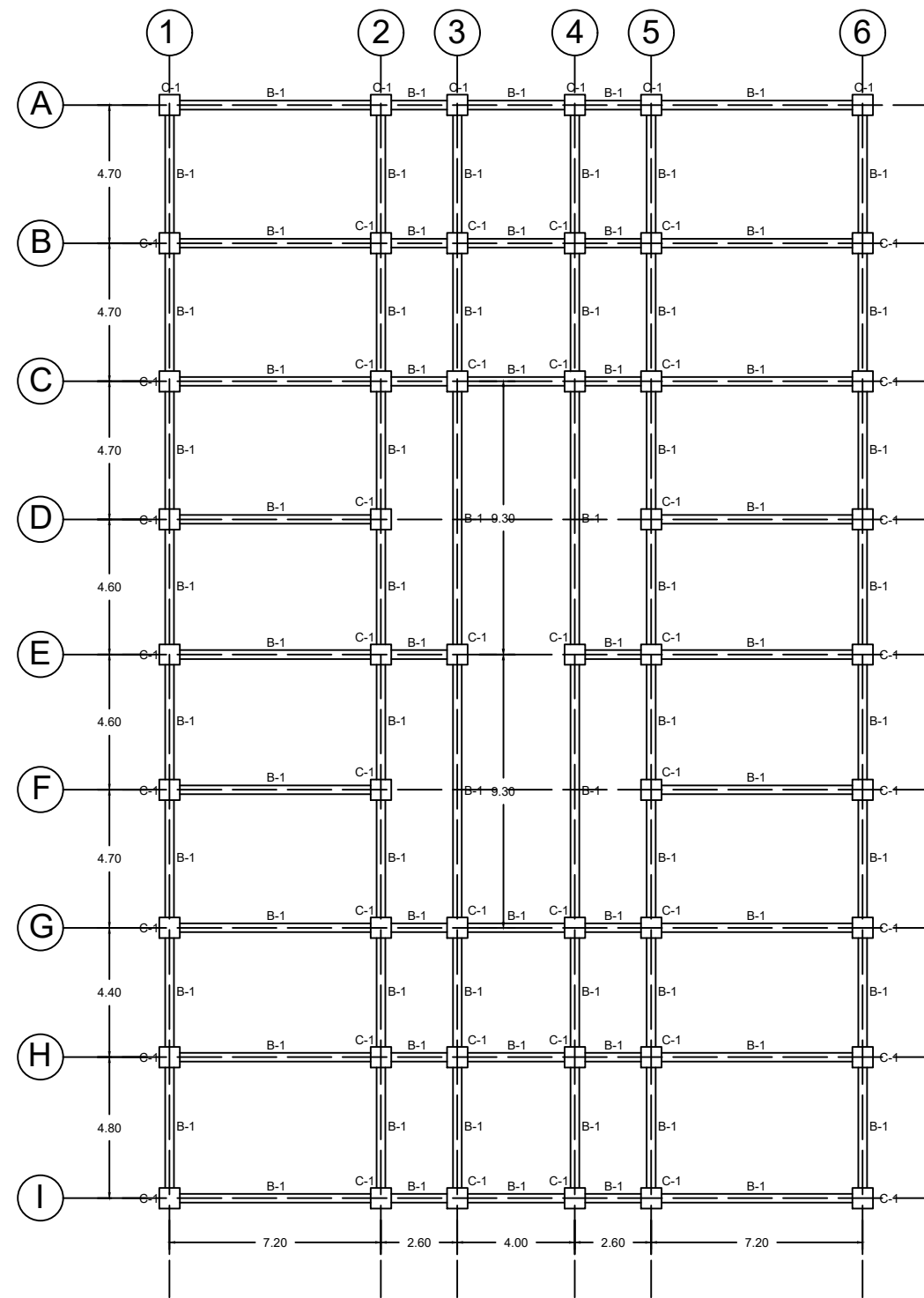
DENNIS E. SANDOVAL
DISTRICT ENGINEER

SET NO.


1
2

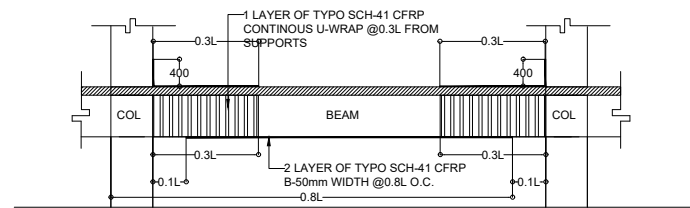
SHEET NO.

S - 1
07/16

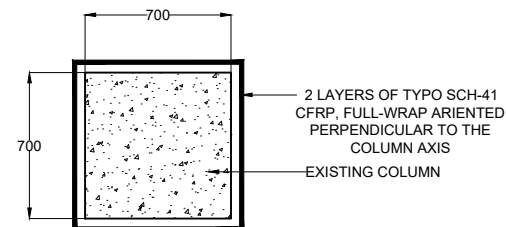


1
S-2
THIRD FLOOR FRAMING PLAN
SCALE NTS.

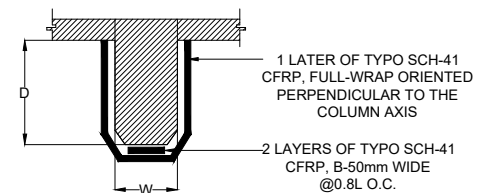
 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS NATIONAL CAPITAL REGION NORTH MANILA DISTRICT ENGINEERING OFFICE OFFICE OF THE DISTRICT ENGINEER Nagtahan, Sta. Mesa, Manila</p>	<p>PROJECT NAME / LOCATION</p> <p>RETROFITTING OF SCHOOL BUILDING AT TONDO HIGH SCHOOL, MANILA CITY</p>	<p>SHEET CONTENTS</p> <p>THIRD FLOOR FRAMING PLAN</p>	<p>PREPARED BY:</p> <p>CHECKED BY:</p>	<p>MARC GERARD A. SARABIA ENGINEER II</p> <p>DORWIN K. DIMAANO ENGINEER II</p>	<p>REVIEWED / SUBMITTED BY:</p> <p>ARLENE S. MENDOZA OIC - CHIEF, PLANNING AND DESIGN SECTION</p>	<p>RECOMMENDING APPROVAL:</p> <p>DENRYL CAESAR S. CORTUNA ASSISTANT DISTRICT ENGINEER</p>	<p>APPROVED:</p> <p>JENNIS E. SANDOVAL DISTRICT ENGINEER</p>	<p>SET NO.</p> <p>1 2</p>	<p>SHEET NO.</p> <p>S - 2 08/16</p>
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1 BEAM FRP RETRO.DET.
SCALE 1:50



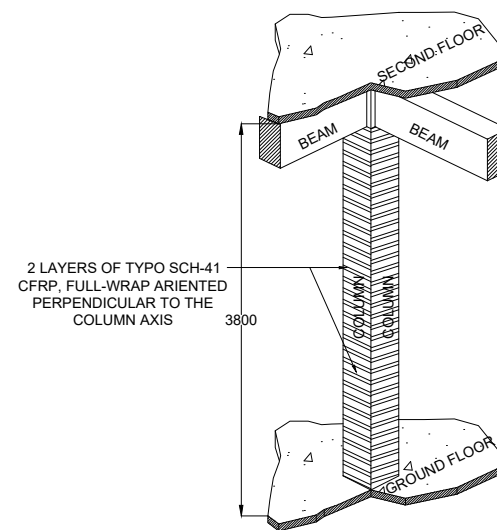
2 PLAN VIEW
SCALE 1:20



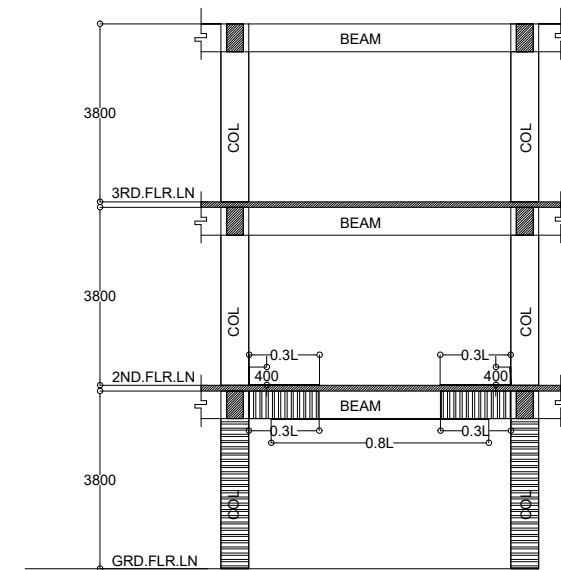
3 RC BEAM FRP RETRO.DET.
SCALE 1:20

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



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Nagtahan, Sta. Mesa, Manila

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

SHEET CONTENTS
BEAM FRP RETRO DET.
PLAN VIEW
RC BEAM FRP RETRO DET.
BEAM FRP SCHEDULE
TYP. COLUMN FRP RETRO DET.
ELEVATION FRP RETRO DET.

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:

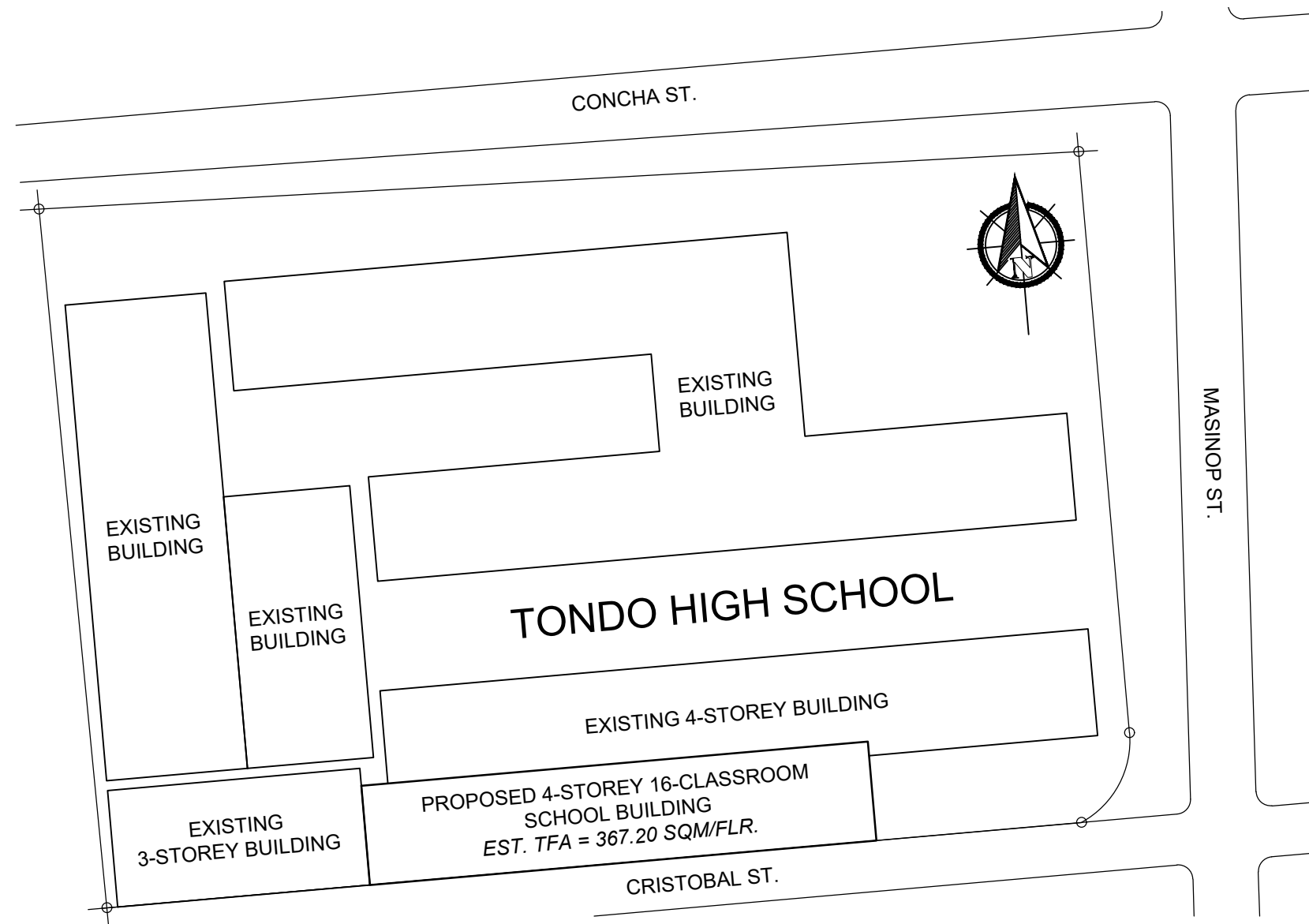
DENNIS E. SANDOVAL
DISTRICT ENGINEER

SET NO.


1
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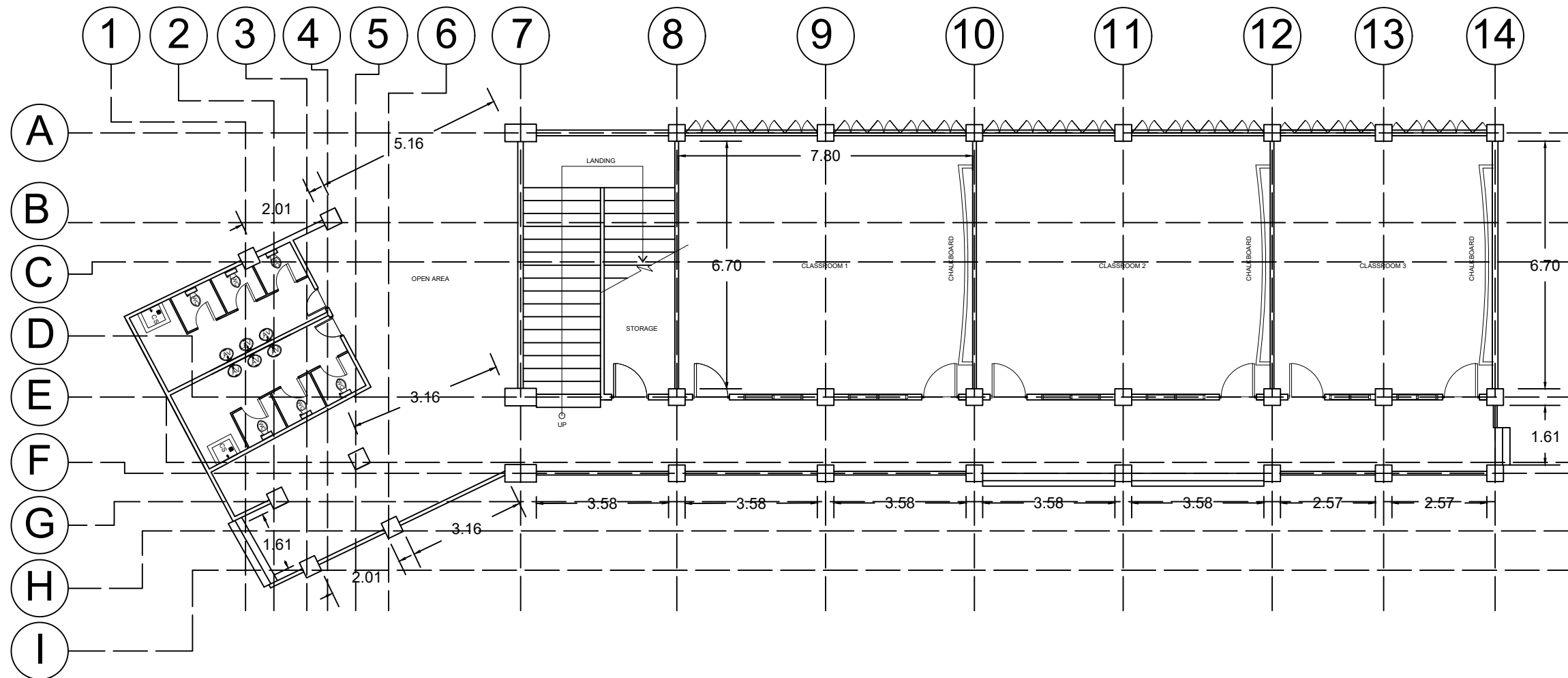
SHEET NO.

S - 3
09/16



1
A-2 SITE DEVELOPMENT PLAN
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: <u>JOYMAR S. FRANCISCO</u> ARCHITECT II</p> <p>CHECKED BY: <u>FRANCESCA ADA S. ESMANIL</u> ARCHITECT II</p>	<p>REVIEWED / SUBMITTED BY: <u>ARLENE S. MENDOZA</u> OIC - CHIEF, PLANNING AND DESIGN SECTION</p>	<p>RECOMMENDING APPROVAL: <u>DENRYL CAESAR S. CORTUNA</u> ASSISTANT DISTRICT ENGINEER</p>	<p>APPROVED: <u>DENNIS E. SANDOVAL</u> DISTRICT ENGINEER</p>	<p>2 2</p>	<p>A - 2 11 16</p>



1
A-3

BUILDING 2
GROUND FLOOR PLAN
SCALE NTS.



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Nagtahan, Sta. Mesa, Manila

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

SHEET CONTENTS
GROUND FLOOR PLAN

PREPARED BY:
AR. JCEMAR S. MANILA
ARCHITECT II

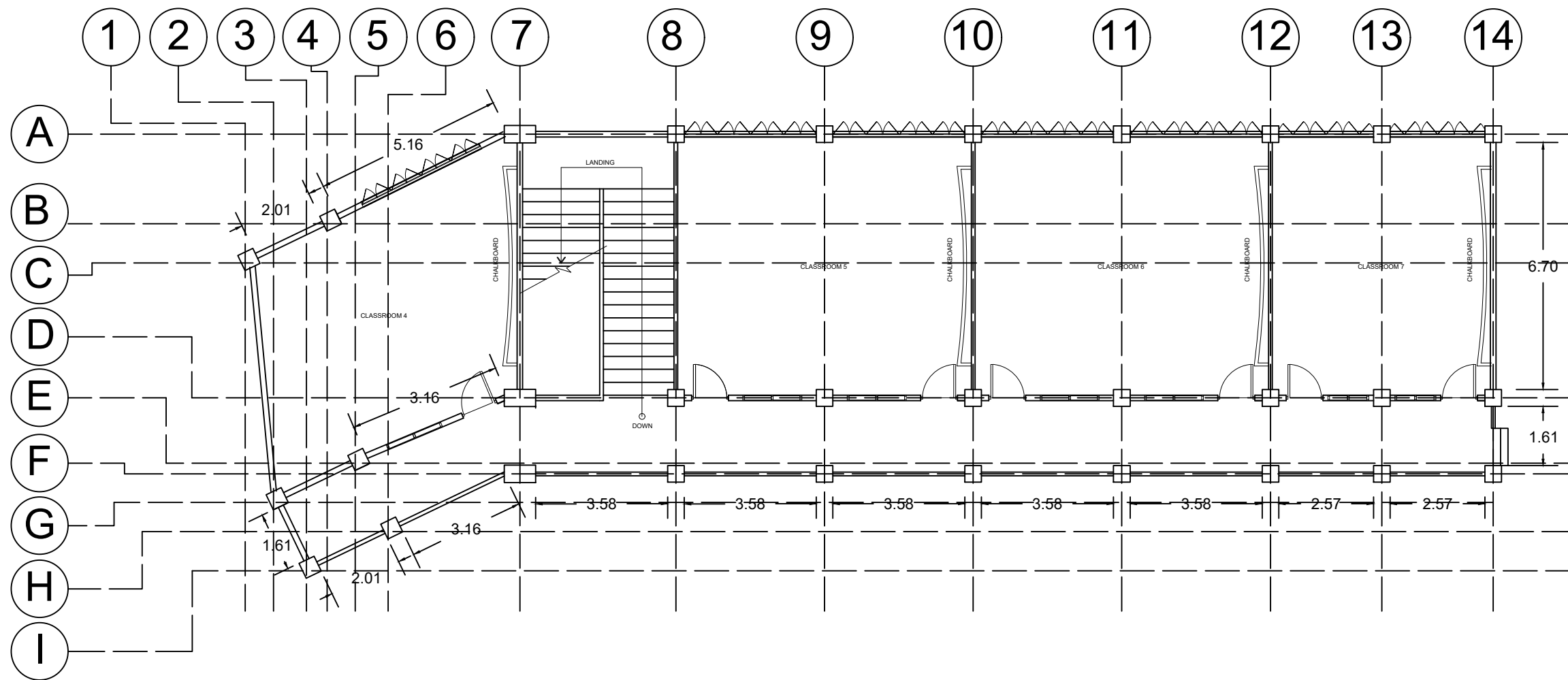
CHECKED BY:
FRANCESCA ADA S. ESMANIL
ARCHITECT II

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. 2
SHEET NO. A-3
12/16



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



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RETROFITTING OF SCHOOL BUILDING AT
TONDO HIGH SCHOOL, MANILA CITY

SHEET CONTENTS
SECOND FLOOR PLAN

PREPARED BY:

CHECKED BY:

FRANCISCA W. S. ESMANIL
ARCHITECT II

REVIEWED / SUBMITTED BY:

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

RECOMMENDING APPROVAL:

DENRYL CAESAR S. CORTUNA
ASSISTANT DISTRICT ENGINEER

APPROVED:

DEAN E. SANDOVAL
DISTRICT ENGINEER

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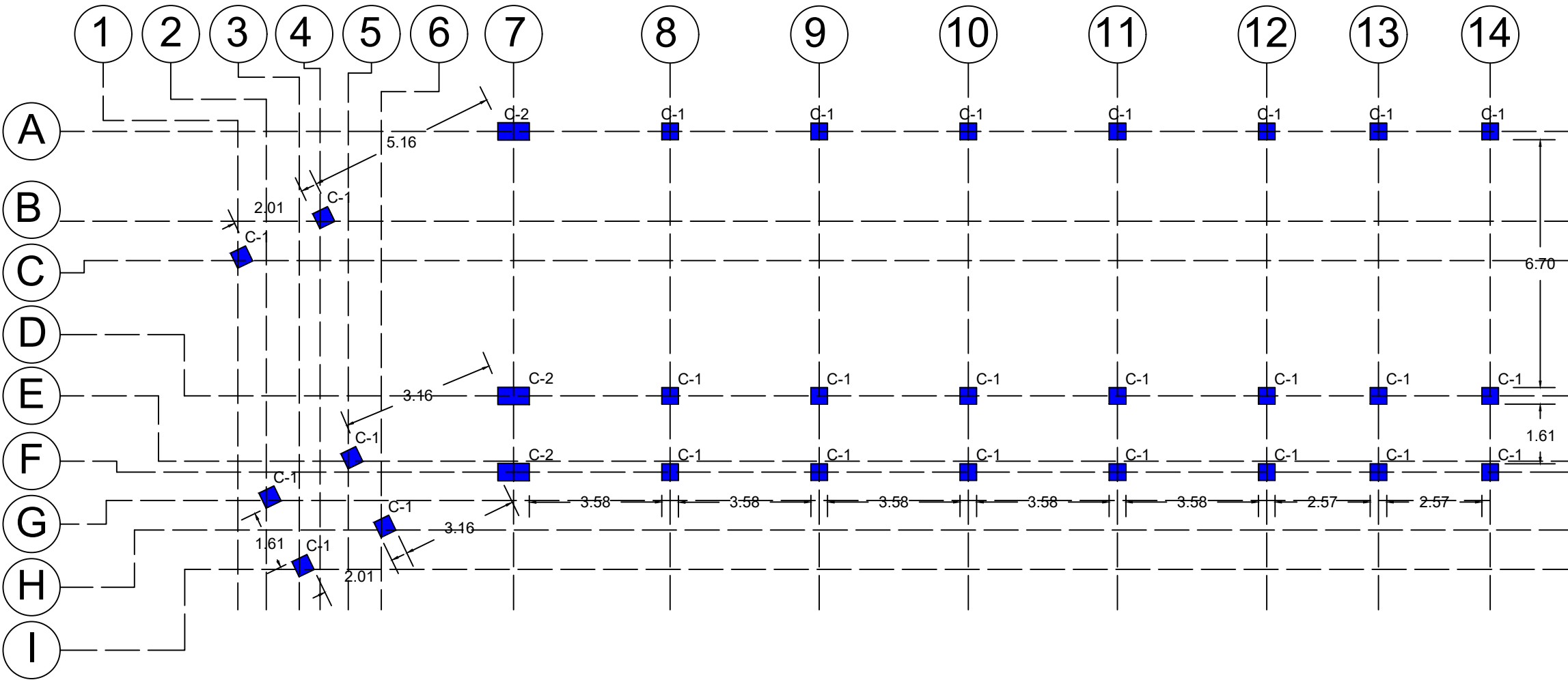
2
2

SHEET NO.

A - 4
13 | 16

LEGEND:

 - COLUMN TO BE RETROFITTED



1
S-1

BUILDING 2
SCALE
NTS.

GROUND FLOOR FRAMING PLAN



REPUBLIC OF THE PHILIPPINES
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PROJECT NAME / LOCATION

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TONDO HIGH SCHOOL, MANILA CITY

SHEET CONTENTS

GROUND FLOOR FRAMING PLAN

PREPARED BY:

MARC GERARD A. SARABIA
ENGINEER

CHECKED BY:

ARWIN K. DIMAANO
ENGINEER II

REVIEWED / SUBMITTED BY:

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

RECOMMENDING APPROVAL:

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ASSISTANT DISTRICT ENGINEER

APPROVED:

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DISTRICT ENGINEER

SET NO.

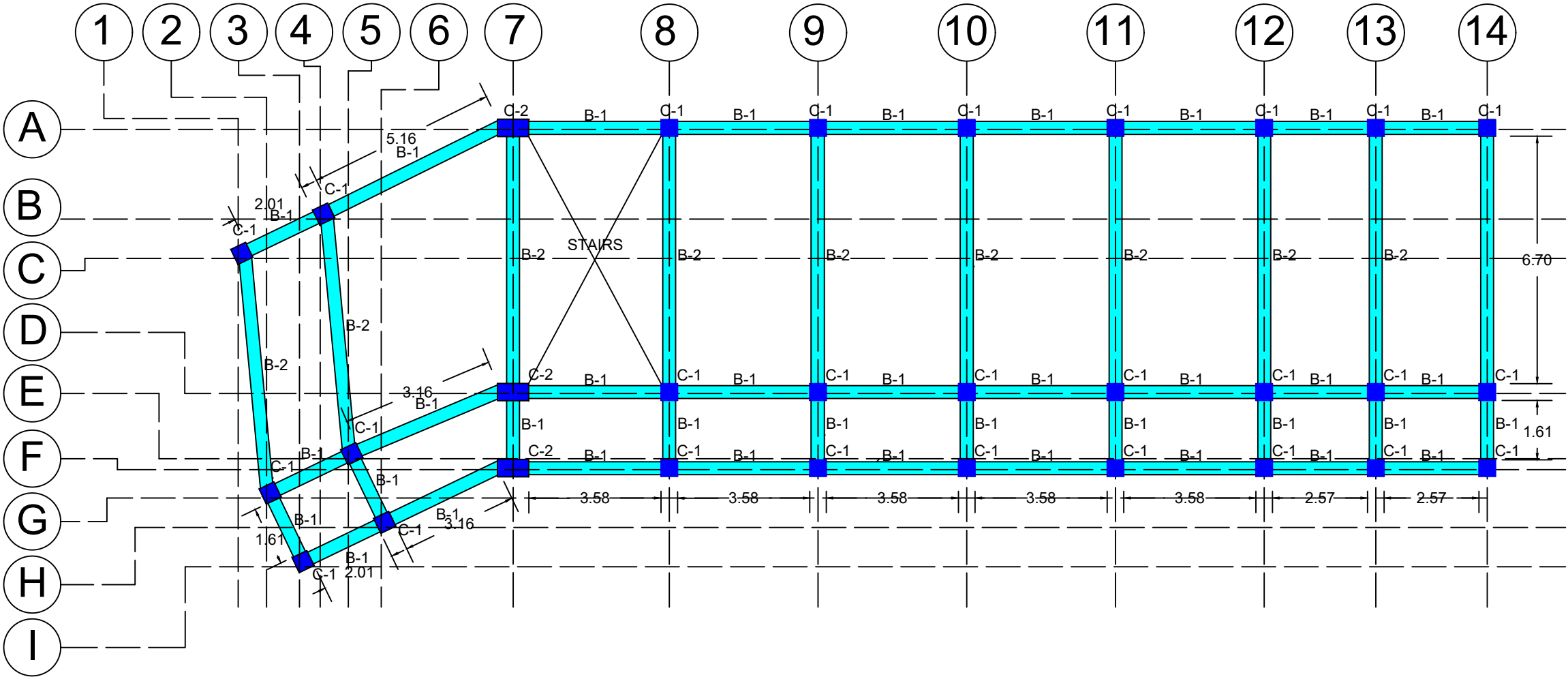
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SHEET NO.

S - 1
14 16

LEGEND:

- COLUMN TO BE RETROFITTED
- BEAM TO BE RETROFITTED



1
S-2

BUILDING 2
SECOND FLOOR FRAMING PLAN
SCALE NTS.



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

SHEET CONTENTS
SECOND FLOOR FRAMING PLAN

PREPARED BY:

MARC GERARD A. SARABIA
ENGINEER I

CHECKED BY:

DARWIN K. DIMAANO
ENGINEER II

REVIEWED / SUBMITTED BY:

ARLENE S. MENDOZA
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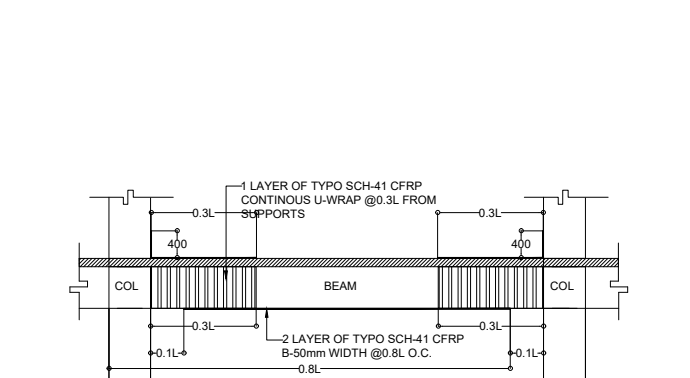
DENNIS E. SANDOVAL
DISTRICT ENGINEER

SET NO.

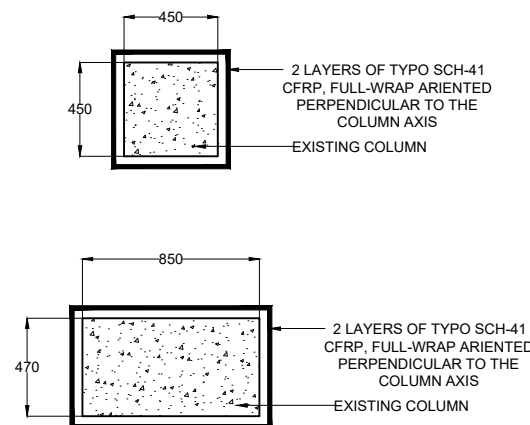
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SHEET NO.

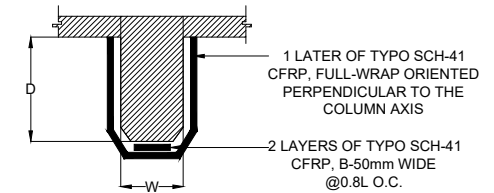
S - 2
15 | 16



1 BEAM FRP RETRO.DET.
SCALE 1:50



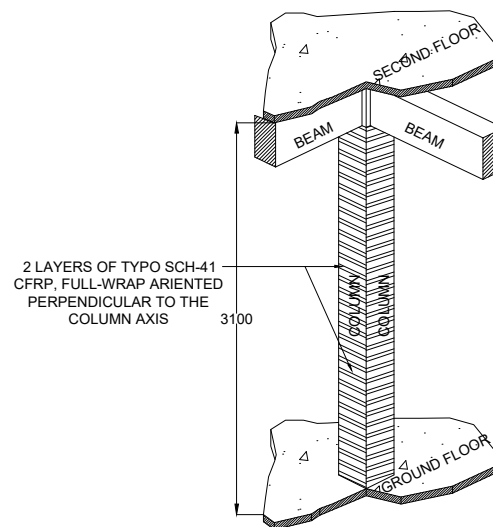
2 PLAN VIEW
SCALE 1:20



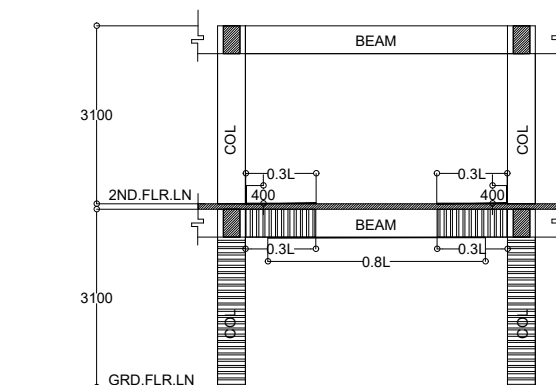
3 RC BEAM FRP RETRO.DET.
SCALE 1:20

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



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PROJECT NAME / LOCATION
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TONDO HIGH SCHOOL, MANILA CITY**

SHEET CONTENTS
BEAM FRP RETRO DET.
PLAN VIEW
RC BEAM FRP RETRO DET.
BEAM FRP SCHEDULE
TYP. COLUMN FRP RETRO DET.
ELEVATION FRP RETRO DET.

PREPARED BY:

MARC GERARD A. SARABIA
ENGINEER II

CHECKED BY:

MARK 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.

2
2

SHEET NO.

S - 3
16 | 16