



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

STRUCTURAL INVESTIGATION CALCULATIONS AND STRUCTURAL RETROFITTING DESIGNS

FOR THE CONSULTING SERVICES FOR THE SHORT TERM

EXPERT FOR STRUCTURAL INSPECTION, INVESTIGATION

AND CERTIFICATION OF STRUCTURAL STABILITY

OF THE DEPARTMENT OF HEALTH BUILDING NO. 19

SAN LAZARO COMPOUND, STA. CRUZ, MANILA

Project No. : **1821 / 17 / 006**

Client : **DEPARTMENT OF HEALTH**
San Lazaro Compound, Rizal Ave.,
Sta. Cruz, Manila

Prepared By : **GILBERT B. MAGBUTAY**
Civil / Structural Engineer
Reg. No. 55251
PICE Structural Eng'g Specialist No. 75
PTR No. 2321899

Issued on January 4, 2017

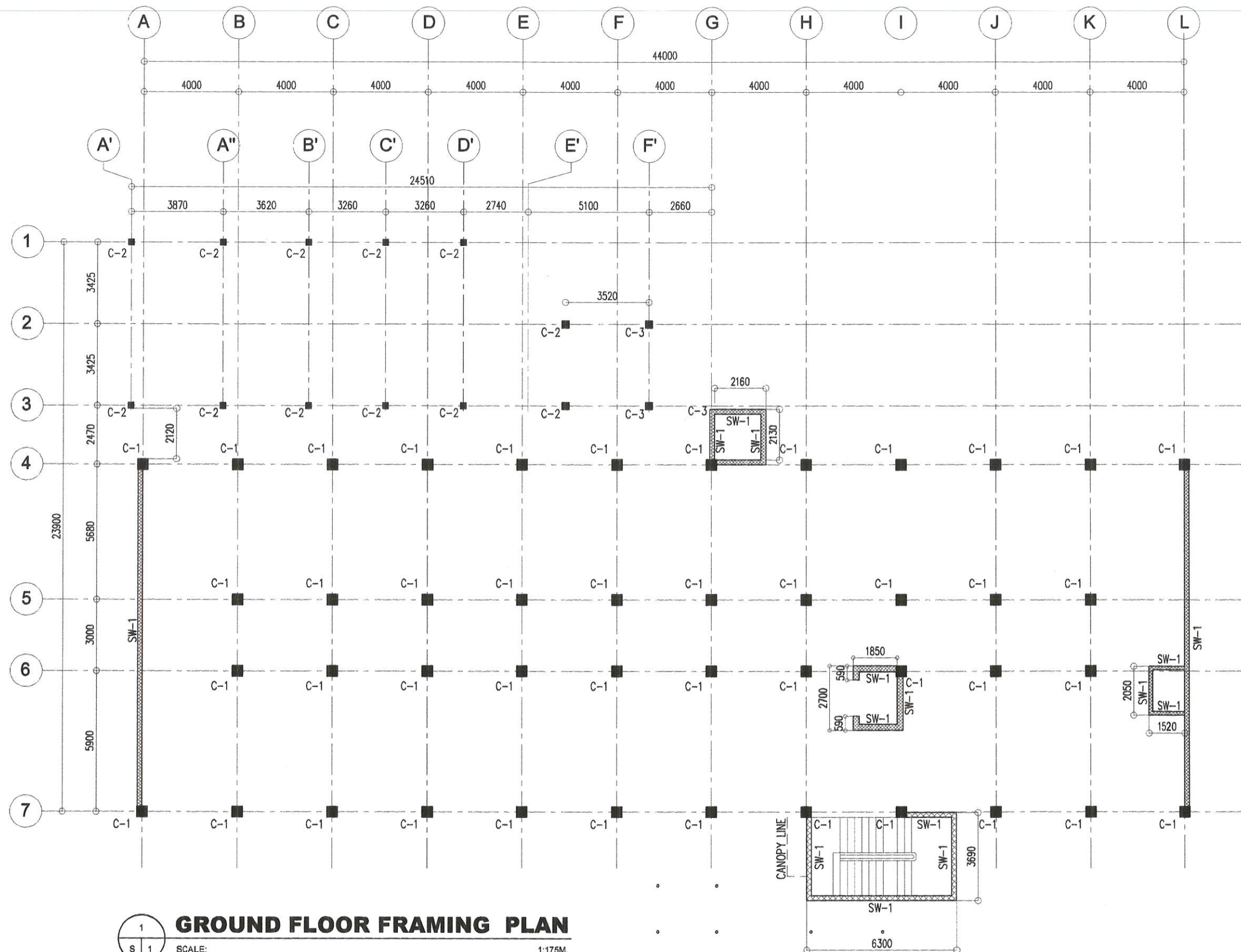
Issued at Pasig City



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

AS-BUILT DRAWINGS



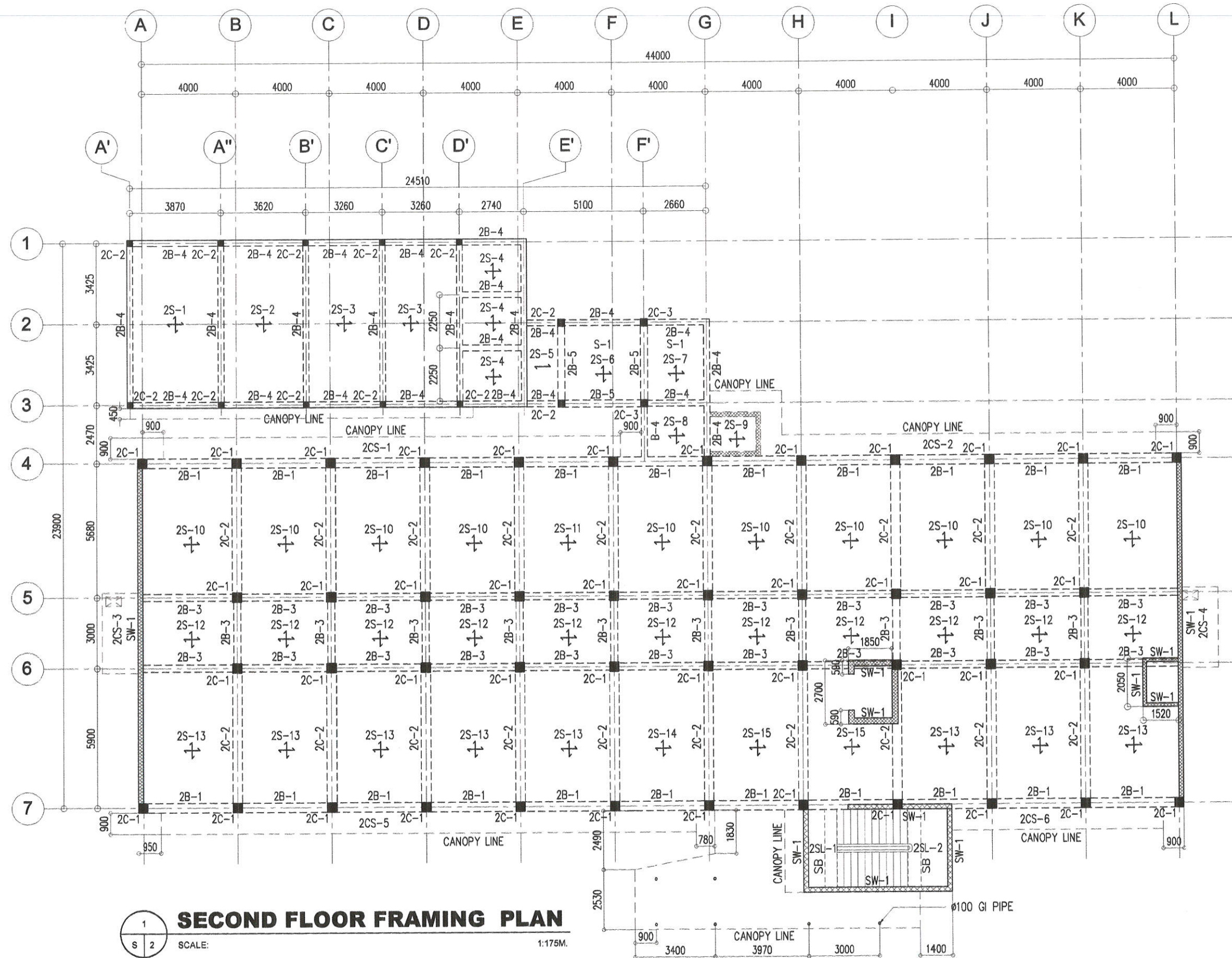
MAY 02 2017



GIBMA Engineering Services
Design - Construction - Project Management - Surveys

93 Kalkasan Street Karangalan Village Phase 2A, Dala Paz, Pasig City 1811
Tel. No.: 882 7114 Fax No.: 882 8487 Cellphone No.: 0920 9228441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:	PROJECT TITLE:	OWNER:	DATE:	REVISION:	DESIGNED BY:	JBMN	SHEET CONTENTS:	DRAWING NO.:
GILBERT B. MAGBUTAY	STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	DEPARTMENT OF HEALTH			CADD BY:	BJC	AS-BUILT	S - 1
REQ. NO.: 065261 PTR. NO.: 2321899					DATE:		GROUND FLOOR FRAMING PLAN	SHEET NO.:
DATE: AUG. 1, 1989 ISSUED ON: JAN. 4, 2017	LOCATION: SAN LAZARO COMPOUND, STA. CRUZ, MANILA	ADDRESS: SAN LAZARO COMPOUND, STA. CRUZ, MANILA			CHECKED BY:	GBM		1 / 25
TIN: 108-459-011 ISSUED AT: PASIG CITY					APPROVED BY:			
					DATE:			



SECOND FLOOR FRAMING PLAN

SCALE: 1:175M.

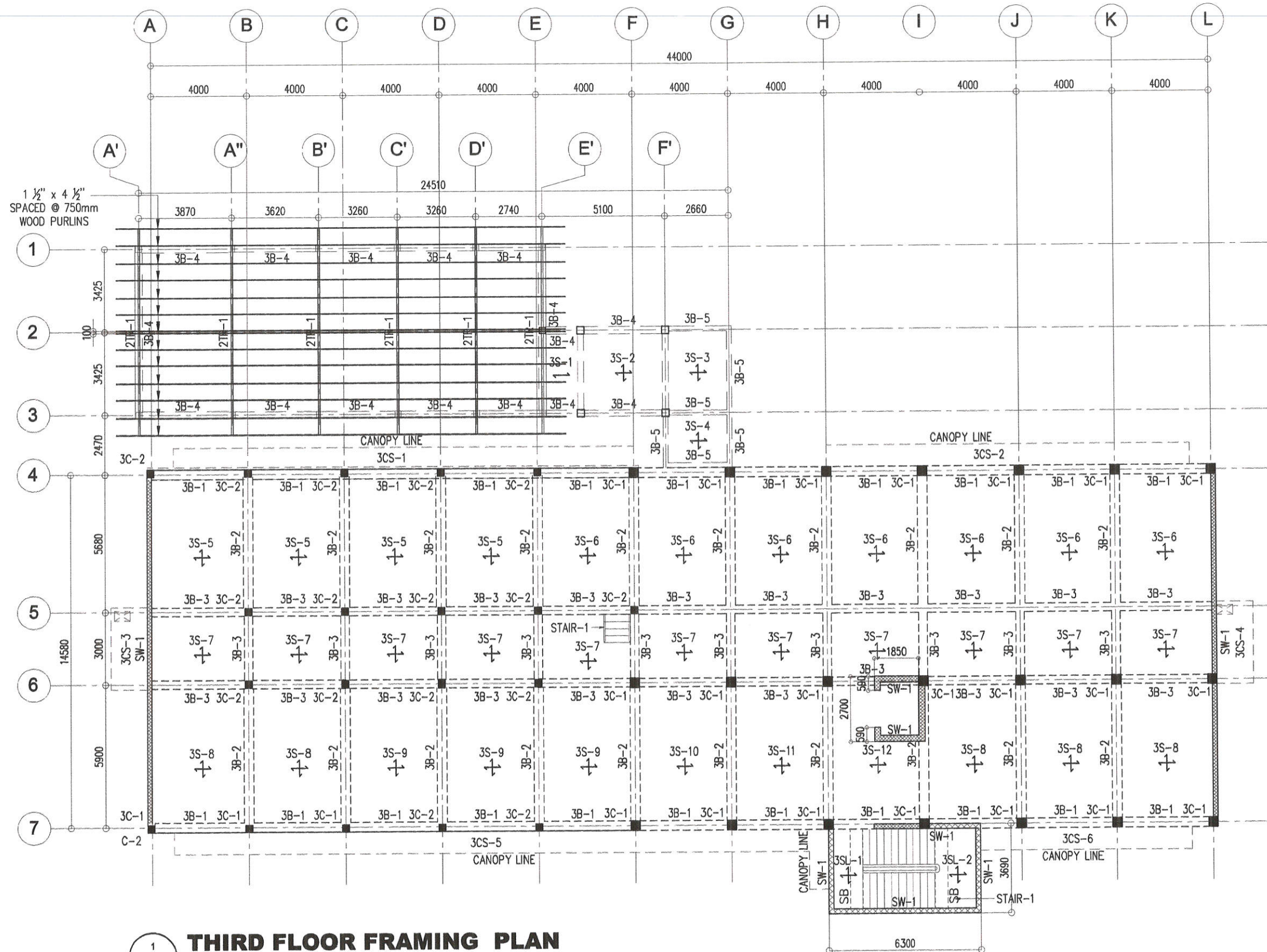
MAY 02 2017



GIBMA Engineering Services
Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dala Paz, Pasig City 1611
Tel. No.: 682 7114 Fax. No.: 682 6487 Cellphone No.: 0920 9228441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:	PROJECT TITLE:	OWNER:	DATE:	REVISION:	DESIGNED BY:	JBN	SHEET CONTENTS:	DRAWING NO.:
GILBERT MAGBUTAY	STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	DEPARTMENT OF HEALTH			CADD BY:	BJC	AS-BUILT	S - 2
REG. NO.: 056251 PTR NO.: 2321869					DATE:		SECOND FLOOR FRAMING PLAN	SHEET NO.:
DATE: AUG. 1, 1989 ISSUED ON: JAN. 4, 2017	LOCATION:	ADDRESS:			CHECKED BY:	GBM		2 / 25
TIN: 108-459-611 ISSUED AT: PASIG CITY	SAN LAZARO COMPOUND, STA. CRUZ, MANILA	SAN LAZARO COMPOUND, STA. CRUZ, MANILA			APPROVED BY:			
					DATE:			

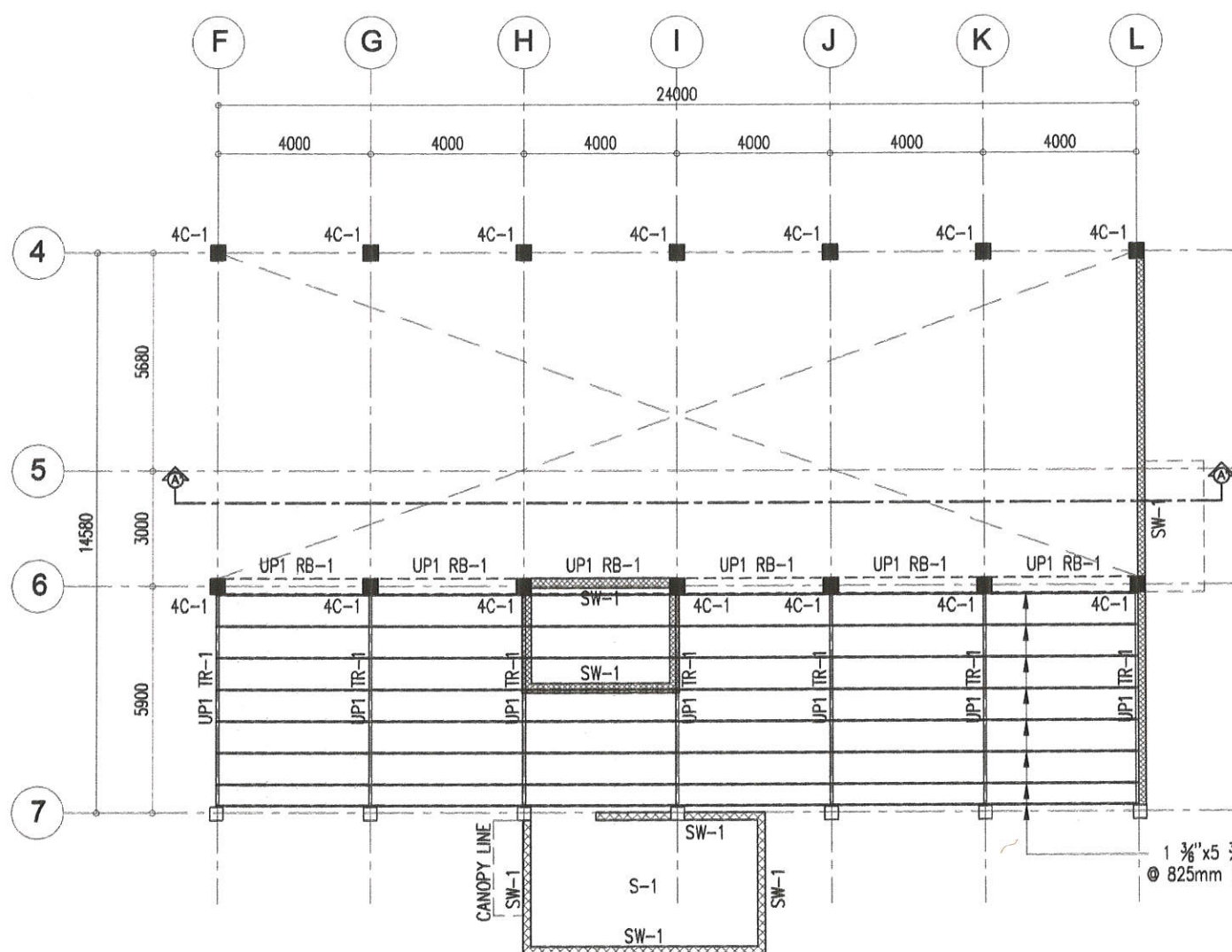


MAY 02 2017

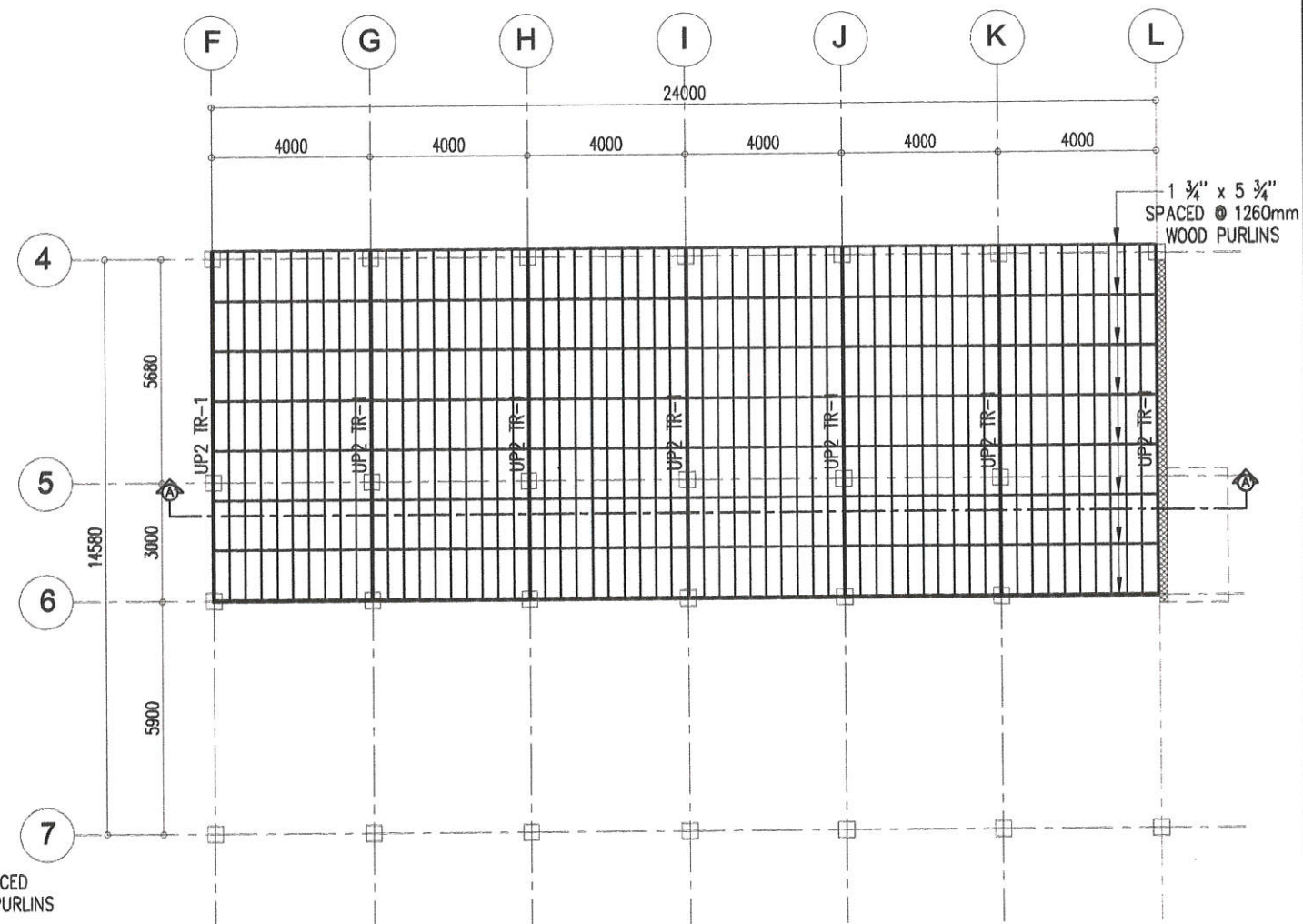


GIBMA Engineering Services
 Design - Construction - Project Management - Surveys
 93 Kalikasan Street Karangalan Village Phase 2A, Dala Paz, Pasig City 1811
 Tel. No.: 682 7114 Fax. No.: 682 6467 Cellphone No.: 0920 9228441
 URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER :	PROJECT TITLE :	OWNER :	DATE :	REVISION :	DESIGNED BY :	JBN	SHEET CONTENTS :	DRAWING NO. :
GILBERT S. MAGBUTAY	STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	DEPARTMENT OF HEALTH			CADD BY :	BJC	AS-BUILT	S - 3
REG. NO. : 058251 PTR NO. : 2321899					DATE :		THIRD FLOOR FRAMING PLAN	SHEET NO. :
DATE : AUG. 1, 1999 ISSUED ON : JAN. 4, 2017	LOCATION :	ADDRESS :			CHECKED BY :	GBM		3 / 25
TIN : 108-459-611 ISSUED AT : PASIG CITY	SAN LAZARO COMPOUND, STA. CRUZ, MANILA	SAN LAZARO COMPOUND, STA. CRUZ, MANILA			APPROVED BY :			
					DATE :			



ELEV. +14855.00
UPPER ROOF-1 FRAMING PLAN
 SCALE: 1:175 M.



ELEV. +17250.00
UPPER ROOF-2 FRAMING PLAN
 SCALE: 1:175 M.

MAY 02 2017



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dela Paz, Pasig City 1611
 Tel. No.: 682 7114 Fax. No.: 682 8487 Cellphone No.: 0920 8228441
 URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:	
REG. NO.: 050251	PTR NO.: 2321899
DATE: AUG. 1, 1999	ISSUED ON: JAN. 4, 2017
TIN: 108-489-611	ISSUED AT: PASIG CITY

PROJECT TITLE:	
STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	
LOCATION:	SAN LAZARO COMPOUND, STA. CRUZ, MANILA

OWNER:	
DEPARTMENT OF HEALTH	
ADDRESS:	SAN LAZARO COMPOUND, STA. CRUZ, MANILA

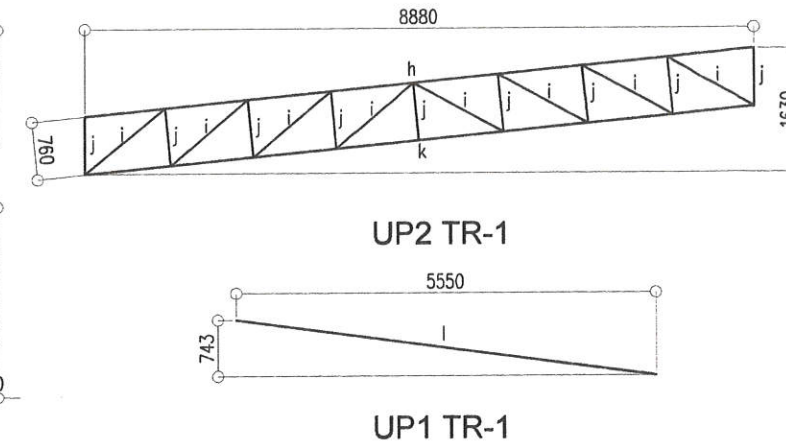
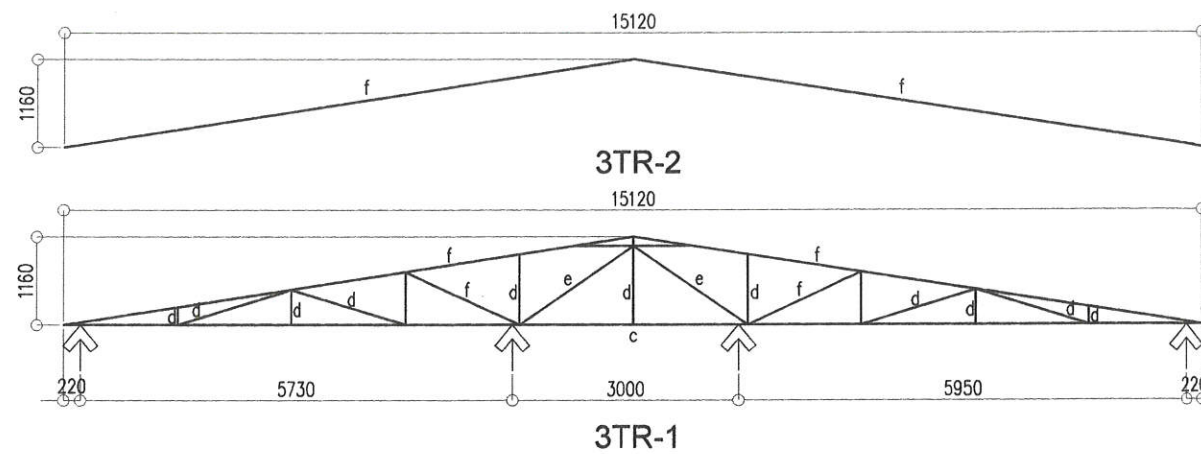
DATE:	REVISION:	DESIGNED BY:	JBN
		CADD BY:	BJC
		DATE:	
		CHECKED BY:	GBM
		APPROVED BY:	
		DATE:	

SHEET CONTENTS:
AS-BUILT
FOURTH FLOOR FRAMING PLAN
FOURTH FLOOR ROOF FRAMING PLAN

DRAWING NO.:
S - 5
SHEET NO.:
5 / 25

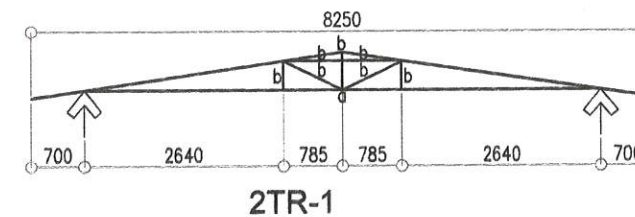
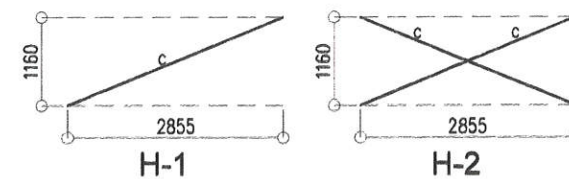
2 2017

NO. NO.:
S - 6
NO.:
5 / 25



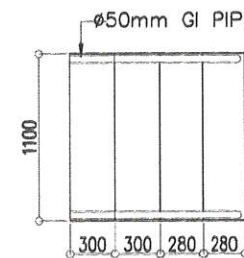
SCHEDULE OF TRUSS MEMBERS

a	= 1 1/2" x 5 1/2"
b	= 1" x 5 3/4"
c	= 1 3/4" x 4 3/4"
d	= 1 3/4" x 2 3/4"
e	= 1 3/4" x 3 3/4"
f	= 1 3/4" x 5 1/2"
g	= 1 3/4" x 3 1/4"
h	= 2 1/2" x 8"
i	= 2 3/4" x 3 3/4"
j	= 2" x 5"
k	= 2" x 6"
l	= 3 3/4" x 11"

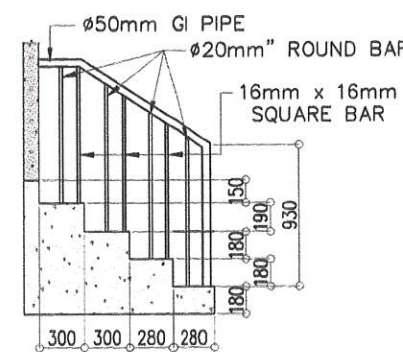


TRUSS DIAGRAMS

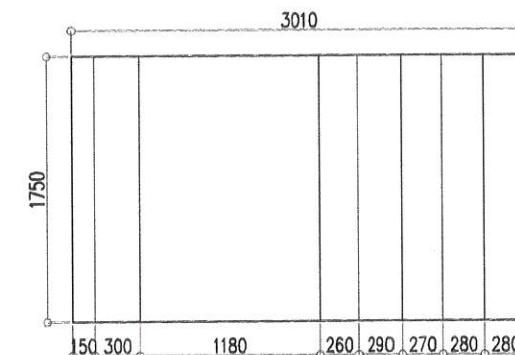
SCALE: 1:100 M.



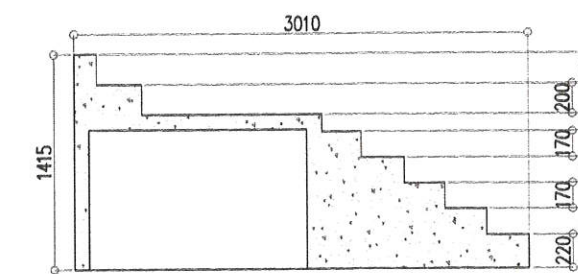
PLAN



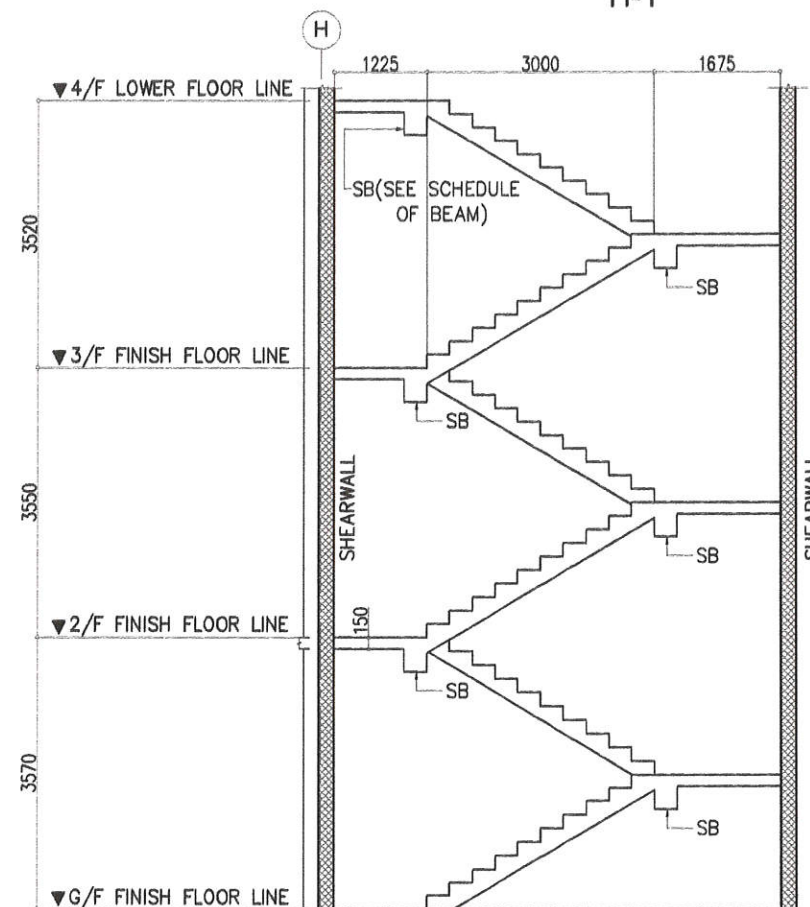
SECTION



PLAN



SECTION



MAIN STAIR

SCALE: 1:100 M.

STAIR - 1

SCALE: 1:50M.

STAIR - 2

SCALE: 1:50M.



GIBMA Engineering Services
Design - Construction - Project Management - Surveys

93 Kalayaan Street, Karangalan Village Phase 2A, Dela Paz, Pasig City 1811
Tel. No.: 882 7114 Fax. No.: 882 6487 Cellphone No.: 0920 9228441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER :

GILBERT B. MAGBITAY

REG. NO.: 069251 PTR NO.: 2321889

DATE: AUG. 1, 1989 ISSUED ON: JAN. 4, 2017

TIN: 108-459-011 ISSUED AT: PASIG CITY

PROJECT TITLE :

STRUCTURAL INSPECTION,
INVESTIGATION AND CERTIFICATION OF
STRUCTURAL STABILITY OF DOH
BUILDING NO.19

LOCATION :

SAN LAZARO COMPOUND, STA. CRUZ, MANILA

OWNER :

DEPARTMENT OF HEALTH

ADDRESS :

SAN LAZARO COMPOUND, STA. CRUZ, MANILA

DATE :

REVISION :

DESIGNED BY :

CADD BY :

DATE :

CHECKED BY :

APPROVED BY :

DATE :

DESIGNED BY :

CADD BY :

DATE :

CHECKED BY :

APPROVED BY :

DATE :

DATE :

DATE :

DESIGNED BY :

CADD BY :

DATE :

CHECKED BY :

APPROVED BY :

DATE :

DATE :

DATE :

DESIGNED BY :

CADD BY :

DATE :

CHECKED BY :

APPROVED BY :

DATE :

DATE :

DATE :

SHEET CONTENTS :

AS-BUILT

TRUSS DIAGRAMS

MAIN STAIR

STAIR - 1

STAIR - 2

DATE :

DATE :

DRAWING NO. :

S - 7

SHEET NO. :

7 / 25

DATE :

DATE :

DATE :

DATE :

MAY 02 2017

SCHEDULE OF SLABS

LOCATION	DESIGNATION	TYPE	THICKNESS (mm)	SPACING OF TOP REBARS (Ø 10)				SPACING OF BOTTOM REBARS (Ø 10)	
				NORTH	SOUTH	EAST	WEST	NORTH-SOUTH	EAST-WEST
SECOND FLOOR	2S - 1	2 - WAY	150	100	100	150	150	100	150
	2S - 2	2 - WAY	150	100	100	150	150	100	150
	2S - 3	2 - WAY	150	100	100	150	150	100	150
	2S - 4	2 - WAY	150	100	100	150	150	100	150
	2S - 5	1 - WAY	150	100	100	150	150	100	150
	2S - 6	2 - WAY	150	100	100	150	150	100	150
	2S - 7	2 - WAY	150	100	100	150	150	100	150
	2S - 8	2 - WAY	150	100	100	150	150	100	150
	2S - 9	2 - WAY	150	100	100	150	150	100	150
	2S - 10	2 - WAY	150	100	100	150	150	100	150
	2S - 11	2 - WAY	150	100	100	150	150	100	150
	2S - 12	2 - WAY	150	100	100	150	150	100	150
	2S - 13	2 - WAY	150	100	100	150	150	100	150
	2S - 14	2 - WAY	150	100	100	150	150	100	150
	2S - 15	2 - WAY	150	100	100	150	150	100	150
	2CS - 1	1 - WAY	100	100	100	150	150	100	150
	2CS - 2	1 - WAY	100	100	100	150	150	100	150
	2CS - 3	1 - WAY	100	100	100	150	150	100	150
	2CS - 4	1 - WAY	100	100	100	150	150	100	150
	2CS - 5	1 - WAY	100	100	100	150	150	100	150
	2CS - 6	1 - WAY	100	100	100	150	150	100	150
	2SL - 1	1 - WAY	150	100	100	150	150	100	150
	2SL - 2	2 - WAY	150	100	100	150	150	100	150
THIRD FLOOR	3S - 1	1 - WAY	150	100	100	150	150	100	150
	3S - 2	2 - WAY	150	100	100	150	150	100	150
	3S - 3	2 - WAY	150	100	100	150	150	100	150
	3S - 4	2 - WAY	150	100	100	150	150	100	150
	3S - 5	2 - WAY	150	100	100	150	150	100	150
	3S - 6	2 - WAY	150	100	100	150	150	100	150
	3S - 7	2 - WAY	150	100	100	150	150	100	150
	3S - 8	2 - WAY	150	100	100	150	150	100	150
	3S - 9	2 - WAY	150	100	100	150	150	100	150
	3S - 10	2 - WAY	150	100	100	150	150	100	150
	3S - 11	2 - WAY	150	100	100	150	150	100	150
	3S - 12	2 - WAY	150	100	100	150	150	100	150
	3CS - 1	1 - WAY	100	100	100	150	150	100	150
	3CS - 2	1 - WAY	100	100	100	150	150	100	150
	3CS - 3	1 - WAY	100	100	100	150	150	100	150
	3CS - 4	1 - WAY	100	100	100	150	150	100	150
	3CS - 5	1 - WAY	100	100	100	150	150	100	150
	3CS - 6	1 - WAY	100	100	100	150	150	100	150
	3SL - 1	1 - WAY	150	100	100	150	150	100	150
	3SL - 2	2 - WAY	150	100	100	150	150	100	150
FOURTH FLOOR	4S - 1	2 - WAY	150	100	100	150	150	100	150
	4S - 2	2 - WAY	150	100	100	150	150	100	150
	4S - 3	2 - WAY	150	100	100	150	150	100	150
	4S - 4	2 - WAY	150	100	100	150	150	100	150
	4S - 5	2 - WAY	150	100	100	150	150	100	150

NOTES: USE Ø10 @350MM DEFORMED STEEL BARS FOR TEMPERATURE REINFORCEMENT FOR ALL SLABS

SCHEDULE OF BEAMS

BEAM MARKING	SECTION (B x H)	BEAM TYPE	LEFT END REBARS		MIDSPAN REBARS		RIGHT END REBARS		SIDE BARS	SPACING OF Ø10 STIRRUPS TO CENTER
			TOP	BOTTOM	TOP	BOTTOM	TOP	BOTTOM		
2B-1	400 x 700	CONTINUOUS	3-Ø20	2-Ø20	3-Ø20	3-Ø20	3-Ø20	2-Ø20	8-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
2B-2	400 x 500	CONTINUOUS	3-Ø20	2-Ø20	3-Ø20	3-Ø20	3-Ø20	2-Ø20	6-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
2B-3	300 x 500	CONTINUOUS	3-Ø20	2-Ø20	3-Ø20	3-Ø20	3-Ø20	2-Ø20	4-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
2B-4	250 x 350	CONTINUOUS	2-Ø20	2-Ø20	2-Ø20	3-Ø20	2-Ø20	2-Ø20	2-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
2B-5	300 x 450	CONTINUOUS	2-Ø20	2-Ø20	2-Ø20	3-Ø20	2-Ø20	2-Ø20	2-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
3B-1	400 x 750	CONTINUOUS	3-Ø20	2-Ø20	3-Ø20	3-Ø20	3-Ø20	2-Ø20	8-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
3B-2	400 x 400	CONTINUOUS	3-Ø20	2-Ø20	3-Ø20	3-Ø20	3-Ø20	2-Ø20	6-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
3B-3	350 x 400	CONTINUOUS	4-Ø20	4-Ø20	4-Ø20	4-Ø20	4-Ø20	4-Ø20	2-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
3B-4	300 x 450	CONTINUOUS	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	4-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
3B-5	200 x 350	CONTINUOUS	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	1 @ 50, @ 100, REST @ 100 O.C.
4B-1	300 x 750	CONTINUOUS	3-Ø16	2-Ø16	3-Ø16	3-Ø16	3-Ø16	2-Ø16	8-Ø16	1 @ 50, @ 100, REST @ 100 O.C.
4B-2	400 x 950	CONTINUOUS	4-Ø16	4-Ø16	4-Ø16	4-Ø16	4-Ø16	4-Ø16	6-Ø16	1 @ 50, @ 100, REST @ 100 O.C.
4B-3	400 x 650	CONTINUOUS	3-Ø16	2-Ø16	3-Ø16	3-Ø16	3-Ø16	2-Ø16	6-Ø16	1 @ 50, @ 100, REST @ 100 O.C.
4B-4	400 x 400	CONTINUOUS	3-Ø16	2-Ø16	3-Ø16	3-Ø16	3-Ø16	2-Ø16	6-Ø16	1 @ 50, @ 100, REST @ 100 O.C.
UP1 RB-1	400 x 450	CONTINUOUS	3-Ø16	2-Ø16	3-Ø16	3-Ø16	3-Ø16	2-Ø16	4-Ø16	1 @ 50, @ 100, REST @ 100 O.C.
SB	300 x 450	CONTINUOUS	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	2-Ø20	4-Ø20	1 @ 50, @ 100, REST @ 100 O.C.

SCHEDULE OF WALL

WALL MARK	THICKNESS (mm)	BAR LOCATION	BAR DIA.	SPACING (mm)	REMARKS
SW-1	200	VERTICAL	Ø-12	150	SHEAR WALL
		HORIZONTAL	Ø-12	200	

SCHEDULE OF COLUMNS

COLUMN MARKING	LEVEL	SECTION (B X H)	MAIN VERT. REBARS	Ø10 LATERAL TIES
C - 1	GROUND - SECOND FLOOR	450 x 450	16-Ø20	1 SET @ 100 O.C.
C - 2	GROUND - SECOND FLOOR	250 x 250	8-Ø12	1 SET @ 100 O.C.
C - 3	GROUND - SECOND FLOOR	300 x 300	8-Ø12	1 SET @ 100 O.C.
2C - 1	SECOND FLOOR - THIRD FLOOR	400 x 400	8-Ø20	1 SET @ 100 O.C.
2C - 2	SECOND FLOOR - THIRD FLOOR	250 x 250	8-Ø12	1 SET @ 100 O.C.
2C - 3	SECOND FLOOR - THIRD FLOOR	300 x 300	8-Ø12	1 SET @ 100 O.C.
3C - 1	THIRD FLOOR - FOURTH FLOOR	400 x 400	8-Ø20	1 SET @ 100 O.C.
3C - 2	THIRD FLOOR - FOURTH FLOOR	300 x 300	6-Ø20	1 SET @ 100 O.C.
4C - 1	FOURTH FLOOR - ROOF BEAM	400 x 400	8-Ø20	1 SET @ 100 O.C.

MAY 02 2017



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dala Paz, Pasig City 1611
Tel. No.: 882 7114 Fax. No.: 882 8487 Cellphone No.: 0920 9228441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:

(Signature)
GILBERT B. MAGBITAY

REG. NO.: 065251 PTR NO.: 2321899

DATE: AUG. 1, 1989 ISSUED ON: JAN. 4, 2017

TIN: 108-459-611 ISSUED AT: PASIG CITY

PROJECT TITLE:

STRUCTURAL INSPECTION,
INVESTIGATION AND CERTIFICATION OF
STRUCTURAL STABILITY OF DOH
BUILDING NO.19

LOCATION:

SAN LAZARO COMPOUND, STA. CRUZ, MANILA

OWNER:

DEPARTMENT OF HEALTH

ADDRESS:

SAN LAZARO COMPOUND, STA. CRUZ, MANILA

DATE:

REVISION:

DESIGNED BY:

JBN

DESIGNED BY:

CADD BY: BJC

DATE:

GBM

SHEET CONTENTS:

AS-BUILT
SCHEDULE OF BEAMS
SCHEDULE OF SLABS
SCHEDULE OF WALLS
SCHEDULE OF COLUMNS

APPROVED BY:

DATE:

DRAWING NO.:

S - 8

SHEET NO.:

8 / 25



GIBMA Engineering Services

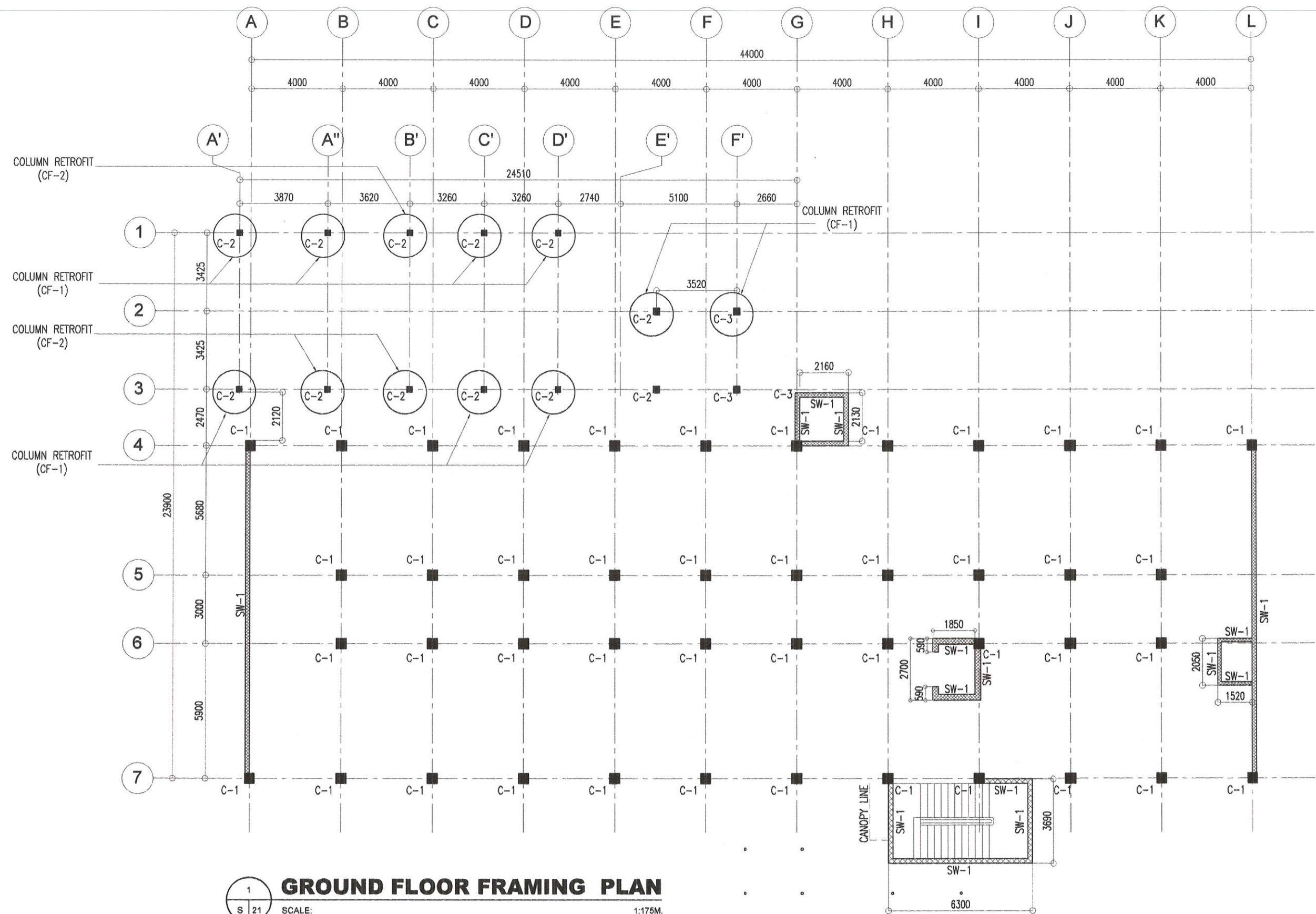
Design - Construction - Project Management - Surveys

Retrofitting Drawings

93 Kalikasan Street Karangalan Village Phase 2A, Brgy. dela Paz, Pasig City, Philippines 1611

Tel. Nos.: (+632) 682 7114 , (+632) 736 1229 Fax No.: (+632) 682 8467 Mobile No. +63920 9226441 , +63922 8966350

URL: www.gibma.com E-mail: gibma2003@yahoo.com



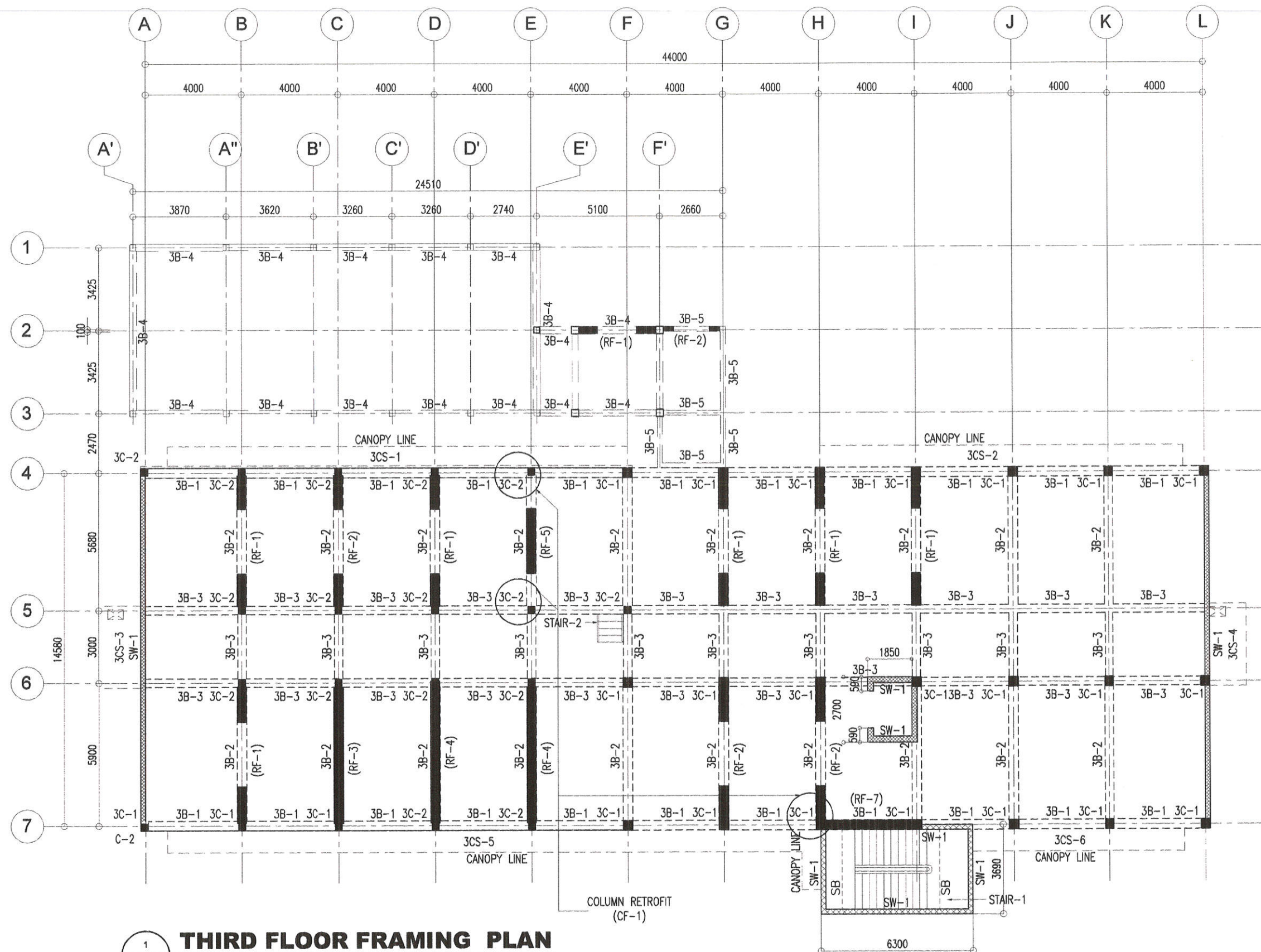
MAY 02 2017



GIBMA Engineering Services
Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dela Paz, Pasig City 1611
Tel. No.: 682 7114 Fax. No.: 652 8467 Cellphone No.: 0920 9226441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:	PROJECT TITLE:	OWNER:	DATE:	REVISION:	DESIGNED BY:	JBN	SHEET CONTENTS:	DRAWING NO.:
GILBERT B. MAGNUTAY	STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	DEPARTMENT OF HEALTH			CADD BY:	BJC	RETROFITTING	S - 21
REG. NO.: 055251 PTR. NO.: 2321899					DATE:		GROUND FLOOR FRAMING PLAN	SHEET NO.:
DATE: AUG. 1, 1999 ISSUED ON: JAN. 4, 2017	LOCATION:	ADDRESS:			CHECKED BY:	GBM		21 / 25
TIN: 106-459-911 ISSUED AT: PASIG CITY	SAN LAZARO COMPOUND, STA. CRUZ, MANILA	SAN LAZARO COMPOUND, STA. CRUZ, MANILA			APPROVED BY:			
					DATE:			



THIRD FLOOR FRAMING PLAN

SCALE: 1:175 M.

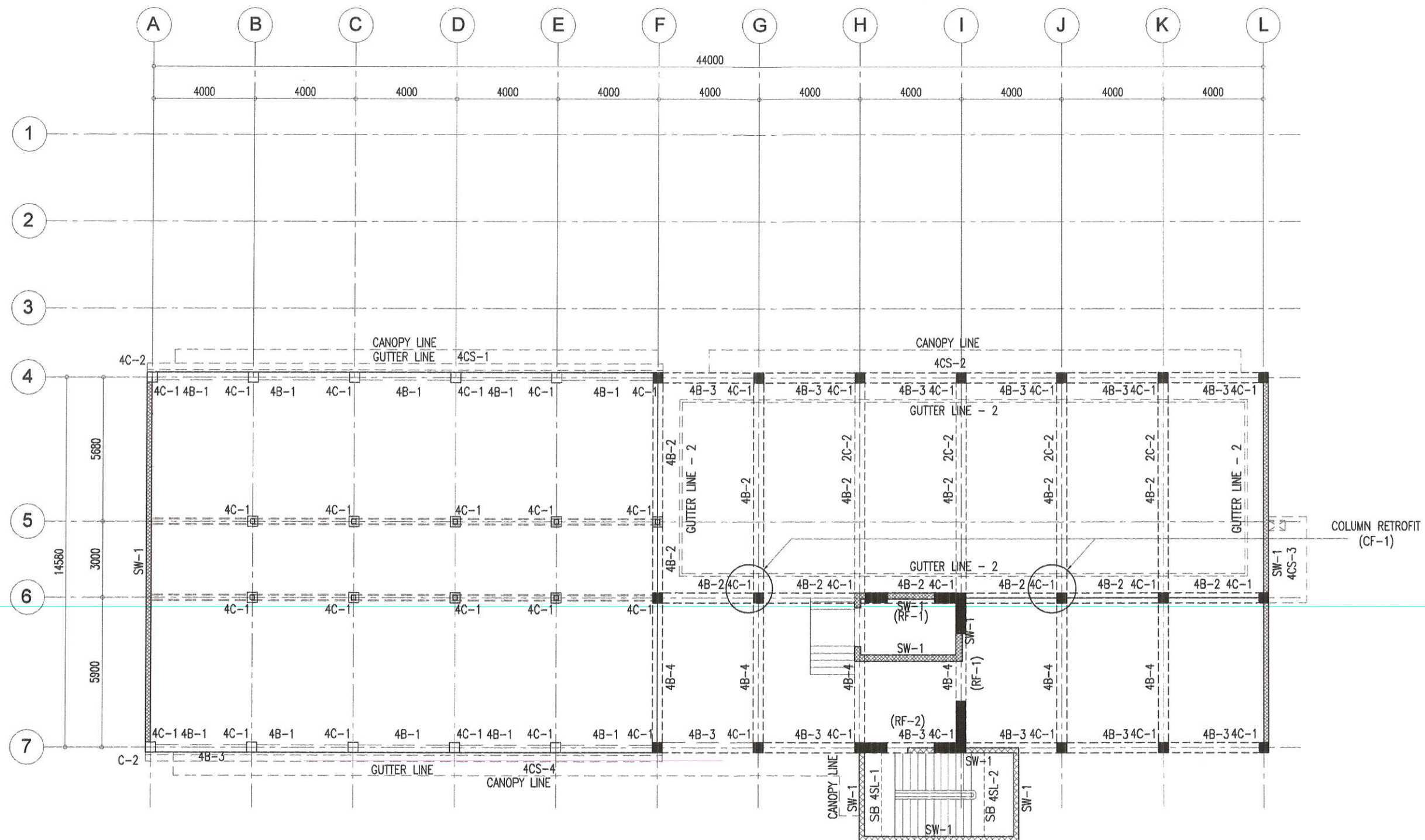
MAY 02 2017



GIBMA Engineering Services
Design - Construction - Project Management- Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dela Paz, Pasig City 1611
Tel. No.: 682 7114 Fax. No.: 682 8467 Telephone No.: 0920 9226441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER: GILBERT B. MAGBITAY	PROJECT TITLE: STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	OWNER: DEPARTMENT OF HEALTH	DATE:	REVISION:	DESIGNED BY: CADD BY: DATE: CHECKED BY: APPROVED BY: DATE:	JBNB BJC GBM	SHEET CONTENTS: RETROFITTING THIRD FLOOR FRAMING PLAN	DRAWING NO.: S - 23 SHEET NO.: 23 / 25
REG. NO.: 055251 PTR NO.: 2321899	DATE: AUG. 1, 1999 ISSUED ON: JAN. 4, 2017	LOCATION: SAN LAZARO COMPOUND, STA. CRUZ, MANILA	ADDRESS: SAN LAZARO COMPOUND, STA. CRUZ, MANILA					
TIN: 106-459-911	ISSUED AT: PASIG CITY							



FOURTH FLOOR / LOWER ROOF FRAMING PLAN

SCALE:

1:175 M.

MAY 02 2017

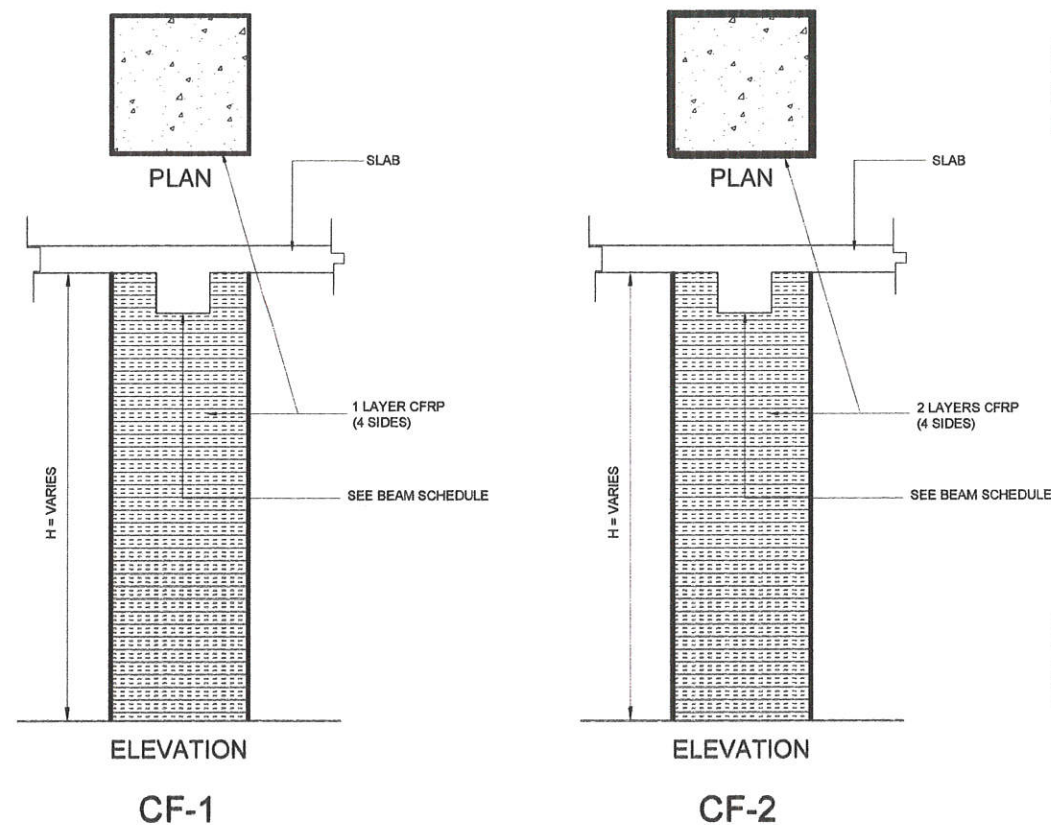


GIBMA Engineering Services

Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dela Paz, Pasig City 1611
Tel. No.: 862 7114 Fax. No.: 862 8467 Cellphone No.: 0920 9228441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

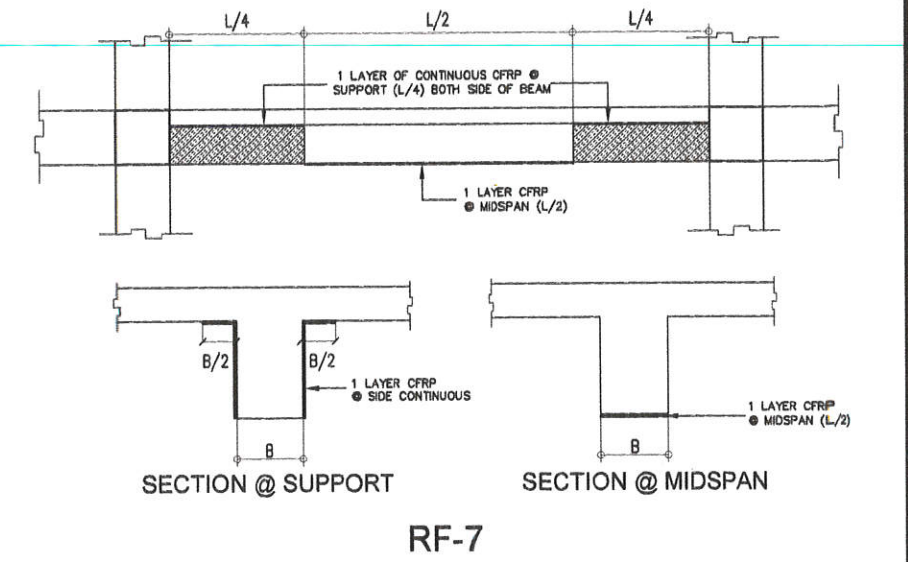
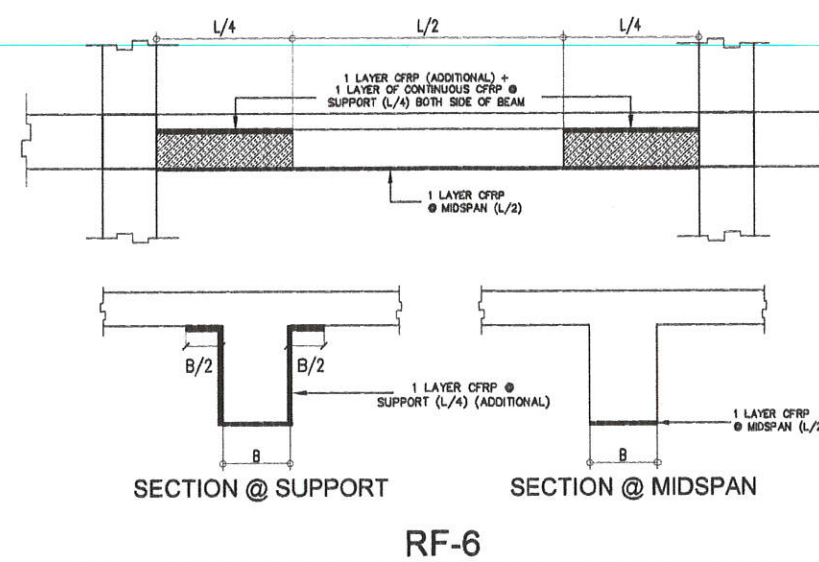
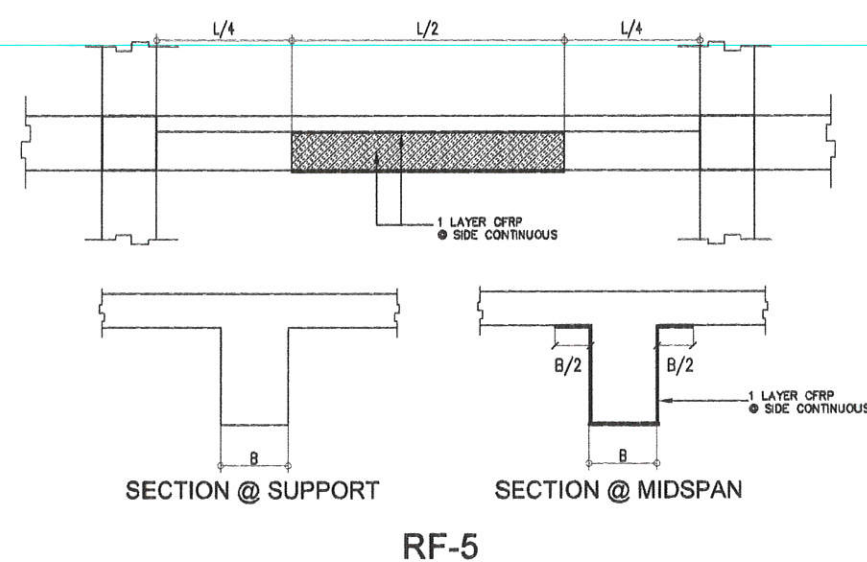
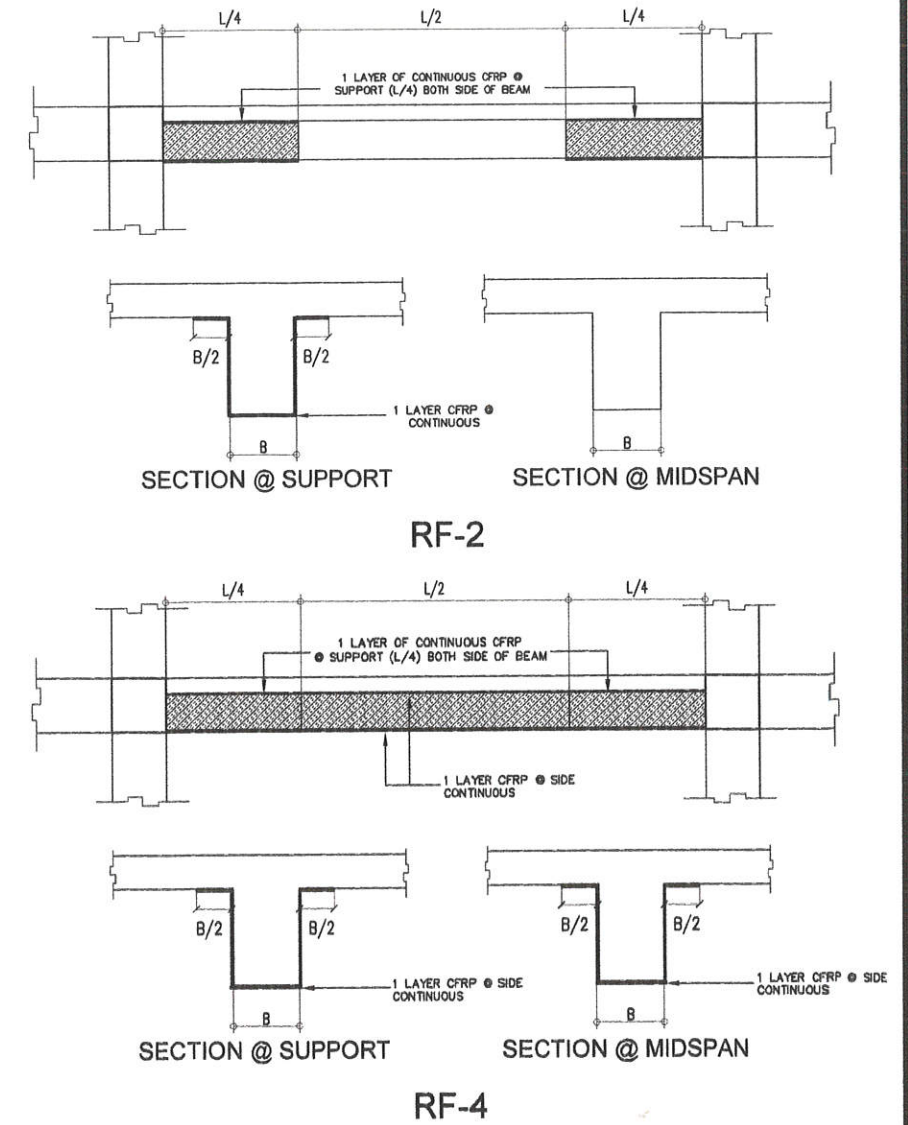
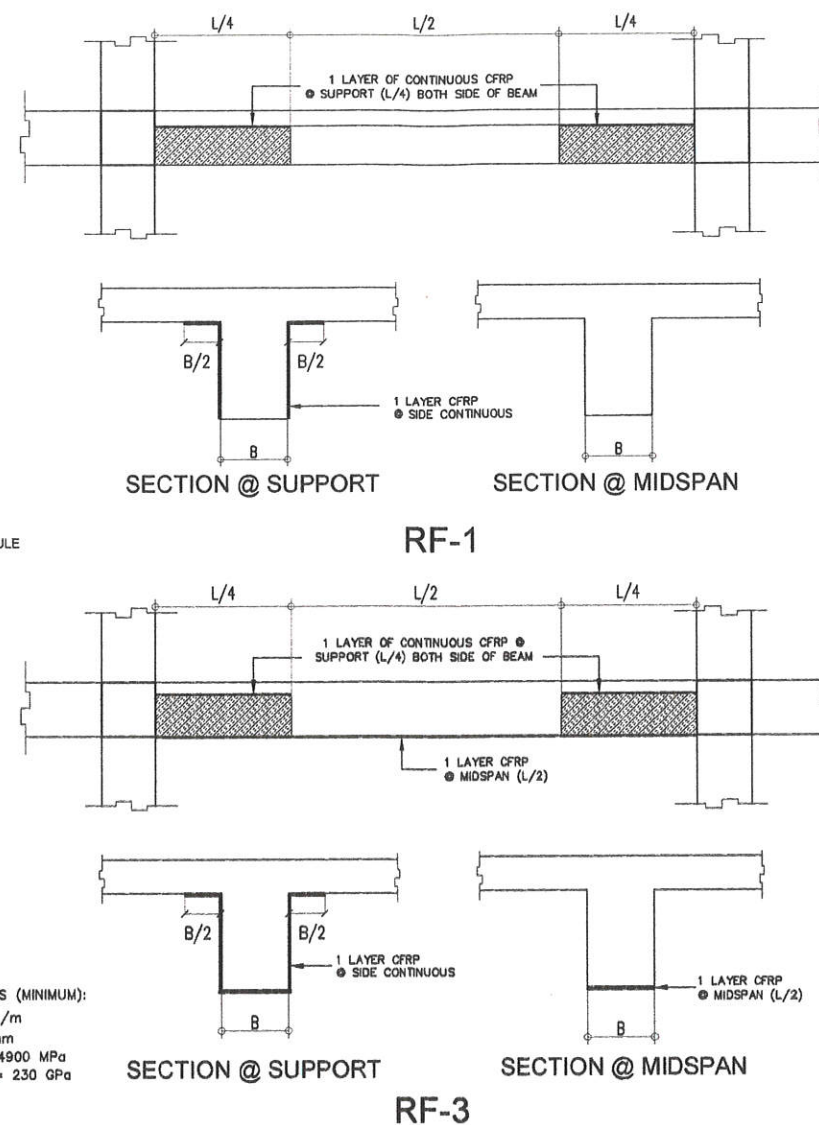
CIVIL / STRUCTURAL ENGINEER:	PROJECT TITLE:	OWNER:	DATE:	REVISION:	DESIGNED BY:	JBN	SHEET CONTENTS:	DRAWING NO.:
GILBERT B. MAGSAYAY	STRUCTURAL INSPECTION, INVESTIGATION AND CERTIFICATION OF STRUCTURAL STABILITY OF DOH BUILDING NO.19	DEPARTMENT OF HEALTH			CADD BY:	BJC	RETROFITTING	S - 24
REG. NO. 055251 PTR. NO. 2321699					DATE:		FOURTH FLOOR/ LOWER ROOF FRAMING PLAN	SHEET NO.:
DATE: AUG. 1, 1999 ISSUED ON: JAN. 4, 2017	LOCATION:	ADDRESS:			CHECKED BY:	GBM		24 / 25
TIN: 105-459-911 ISSUED AT: PASIG CITY	SAN LAZARO COMPOUND, STA. CRUZ, MANILA	SAN LAZARO COMPOUND, STA. CRUZ, MANILA			APPROVED BY:			
					DATE:			



COLUMN RETROFITTING DETAIL

1
S 25
SCALE: N.T.S.

NOTES:
CARBON FIBER PROPERTIES (MINIMUM):
1. AREA WEIGHT = 600 g/m
2. THICKNESS = 0.333 mm
3. TENSILE STRENGTH = 4900 MPa
4. TENSILE E-MODULUS = 230 GPa



BEAM RETROFITTING DETAILS

2
S 25
SCALE: N.T.S.

MAY 02 2017



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

93 Kalikasan Street Karangalan Village Phase 2A, Dela Paz, Pasig City 1611
Tel. No.: 682 7114 Fax. No.: 682 8467 Cellphone No.: 0920 9226441
URL: www.gibma.com E-mail: gibma2003@yahoo.com

CIVIL / STRUCTURAL ENGINEER:
GILBERT B. MAGBUTAY
REG. NO. 056251 PTR. NO.: 2321899
DATE: AUG. 1, 1999 ISSUED ON: JAN. 4, 2017
TIN: 106-459-911 ISSUED AT: PASIG CITY

PROJECT TITLE:
STRUCTURAL INSPECTION,
INVESTIGATION AND CERTIFICATION OF
STRUCTURAL STABILITY OF DOH
BUILDING NO.19
LOCATION:
SAN LAZARO COMPOUND, STA. CRUZ, MANILA

OWNER:
DEPARTMENT OF HEALTH
ADDRESS:
SAN LAZARO COMPOUND, STA. CRUZ, MANILA

DATE:
REVISION:

DESIGNED BY:
CADD BY:
DATE:
CHECKED BY:
APPROVED BY:
DATE:

JBNB
BJO
GBM

SHEET CONTENTS:
RETROFITTING
COLUMN RETROFITTING DETAILS
BEAM RETROFITTING DETAILS

DRAWING NO.:
S - 25
SHEET NO.:
25 / 25



GIBMA Engineering Services

Design - Construction - Project Management - Surveys

Theoretical Analysis and Investigation (STAAD Calculations)

DESIGN / INVESTIGATION CRITERIA

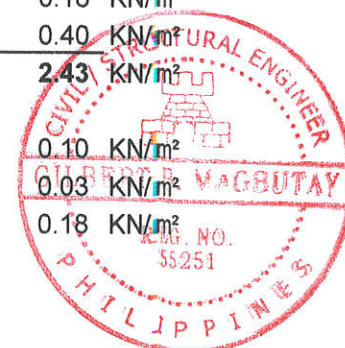
A APPLICABLE CODES / REFERENCES

- 1 National Structural Code of the Philippines (Volume 1 - Buildings, Towers and Other Vertical Structures)
NSCP C101-15, 7th Edition 2015
- 2 National Building Code of the Philippines, latest edition
- 3 ASEP Earthquake Design Manual (Volume 1 - Code Provisions for Lateral Forces)
M301-03, 1st Edition
- 4 ASEP Handbook on Computer- Aided Analysis and Design of RC Buildings
HD202-01, 1st Edition
- 5 ACI-318 2005, Building Code Requirements for Structural Concrete

B LOADINGS

1 Dead Loads

a	Structural Concrete	24.00 KN/m ³
b	Structural Steel	77.00 KN/m ³
c	150mm thk CHB exterior walls, both faces plastered	2.40 KN/m ²
d	100mm thk CHB interior/ partition walls, both faces plastered	1.76 KN/m ²
e	Pressure Loads at Second to Fourth Floor Offices and Corridors	
e.1	Ceramic Tiles on 25mm thk Mortar bed	1.10 KN/m ²
e.2	Ceiling - 10mm thk Gypsum Boards on Suspended Metal Furrings	0.18 KN/m ²
e.3	Utilities (MEP)	0.40 KN/m ²
		1.68 KN/m²
f	Pressure Loads at Second & Third Floor Offices with CHB Partition	
f.1	Ceramic Tiles on 25mm thk Mortar bed	1.10 KN/m ²
f.2	Ceiling - 10mm thk Gypsum Boards on Suspended Metal Furrings	0.18 KN/m ²
f.3	100 mm thick CHB Interior walls, both faces plastered	1.56 KN/m ²
f.4	Utilities (MEP)	0.40 KN/m ²
		3.24 KN/m²
g	Pressure Loads at Fourth Floor Offices with Drywall / Movable Partition	
g.1	Ceramic Tiles on 25mm thk Mortar bed	1.10 KN/m ²
g.2	Ceiling - 10mm thk Gypsum Boards on Suspended Metal Furrings	0.18 KN/m ²
g.3	Movable Partitions	1.00 KN/m ²
g.4	Utilities (MEP)	0.40 KN/m ²
		2.68 KN/m²
h	Pressure Loads at Second and Fourth Floor Toilet	
h.1	Ceramic Tiles on 25mm thk Mortar bed	1.10 KN/m ²
h.2	25mm thk Concrete Topping	0.60 KN/m ²
h.3	Cementitious Waterproofing	0.15 KN/m ²
h.4	Ceiling - 10mm thk Gypsum Boards on Suspended Metal Furrings	0.18 KN/m ²
h.5	Utilities (MEP)	0.40 KN/m ²
		2.43 KN/m²
i	Pressure Loads at Roof	
s.1	Roof Covering (Pre-painted Long Span Roofing / Corrugated Metal, Ga.26)	0.10 KN/m ²
s.2	10mm thk HDPE Foam Insulation with 2 sides Alum & Wire Mesh	0.03 KN/m ²
s.3	Ceiling - 10mm thk Gypsum Boards on Suspended Metal Furrings	0.18 KN/m ²



DESIGN / INVESTIGATION CRITERIA

s.4 Utilities (MEP)	0.24 KN/m ²
	0.55 KN/m²
2 Live Loads	
a Offices	2.40 KN/m ²
b Restroom	2.40 KN/m ²
c Laboratories	2.90 KN/m ²
d Library Reading Rooms	2.90 KN/m ²
e Storage Rooms	6.00 KN/m ²
f Corridors and Waiting Area above Ground Floor	3.80 KN/m ²
g Fire Exit	4.80 KN/m ²
h Roof Uniform Live Load	1.00 KN/m ²
h.1 Reduced Roof Live Load	0.75 KN/m ²
3 Wind Load - Applicable provisions for Zone 2 (V = 250 kph), Exposure C	
4 Seismic Load - Applicable provisions for Zone 4	
a Design Parameters	
a.1 Zone Factor, Z	0.40
a.2 Importance Factor, IV (Standard Occupancy Structures)	1.00
a.3 RWx (Special Reinforced Concrete Moment Frames)	8.50
a.4 RWz (Special Reinforced Concrete Shear Walls)	6.50
a.5 Soil Profile Type	Sc
a.6 Near Source Factor Na	1.00
a.7 Near Source Factor Nv	1.196
5 Load Combinations	
a For Analyses of Roof Purlins & Trusses (Allowable Stress Design Method)	
a.1 D + L	
a.2 D + 0.75 (L + W)	
b For Concrete SMRF (Ultimate Strength Design Method conforming to NSCP 2015)	
b.1 1.4 D	
b.2 1.2 DL + 1.6 FLL + 0.5 RLL	
b.3 1.2 DL + 1.6 RLL + 0.5 FLL	
b.4 1.2 DL + 1.0 EQX + 0.5 FLL	
b.5 1.2 DL + 1.0 EQZ + 0.5 FLL	
b.6 0.9 DL + 1.0 EQX	
b.7 0.9 DL + 1.0 EQZ	
b.8 0.9 DL - 1.0 EQX	
b.9 0.9 DL - 1.0 EQZ	

C MATERIAL PROPERTIES

- 1 Structural Concrete, min. 28 day compressive strength
 - a Foundations
 - b Columns, Suspended Beams and Suspended Slabs
 - c Slab-on-fill
- 2 Reinforcing Bars, yield strength
 - a For all sizes (Grade 33 - Intermediate Grade)

20.70 MPa

See Test Results

20.70 MPa

230.00 MPa



DESIGN / INVESTIGATION CRITERIA

3 Concrete Masonry Units (400 psi, Non- load Bearing)

19.60 KN/m³

D FOUNDATION

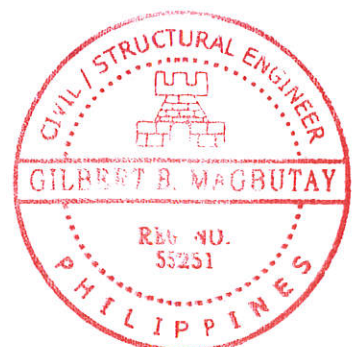
The Building was investigated assuming a very soft soil, probably with soil bearing capacity of less than 80KPa.

E ASSUMED SECTIONS

- | | | |
|---|--|------------------|
| 1 | Roof Purlins | See Excel Output |
| 2 | Truss/ Rafter Members | See STAAD Output |
| 3 | Second Floor Slabs | See Excel Output |
| 4 | Main & Secondary Second Floor & Roof Beams | See STAAD Output |
| 5 | Foundation to Roof Columns | See STAAD Output |

F SOFTWARES USED

- 1 Slab Design - Quality Computer System Inc.
- 2 STAAD Pro V8i- Research Engineers, Inc.
- 3 Microsoft Excel





Software licensed to

Job Title Structural Investigation of DoH Building No. 19

Client Department of Health

Job No

1821/17

Sheet No

1

Rev

0

Part

Ref

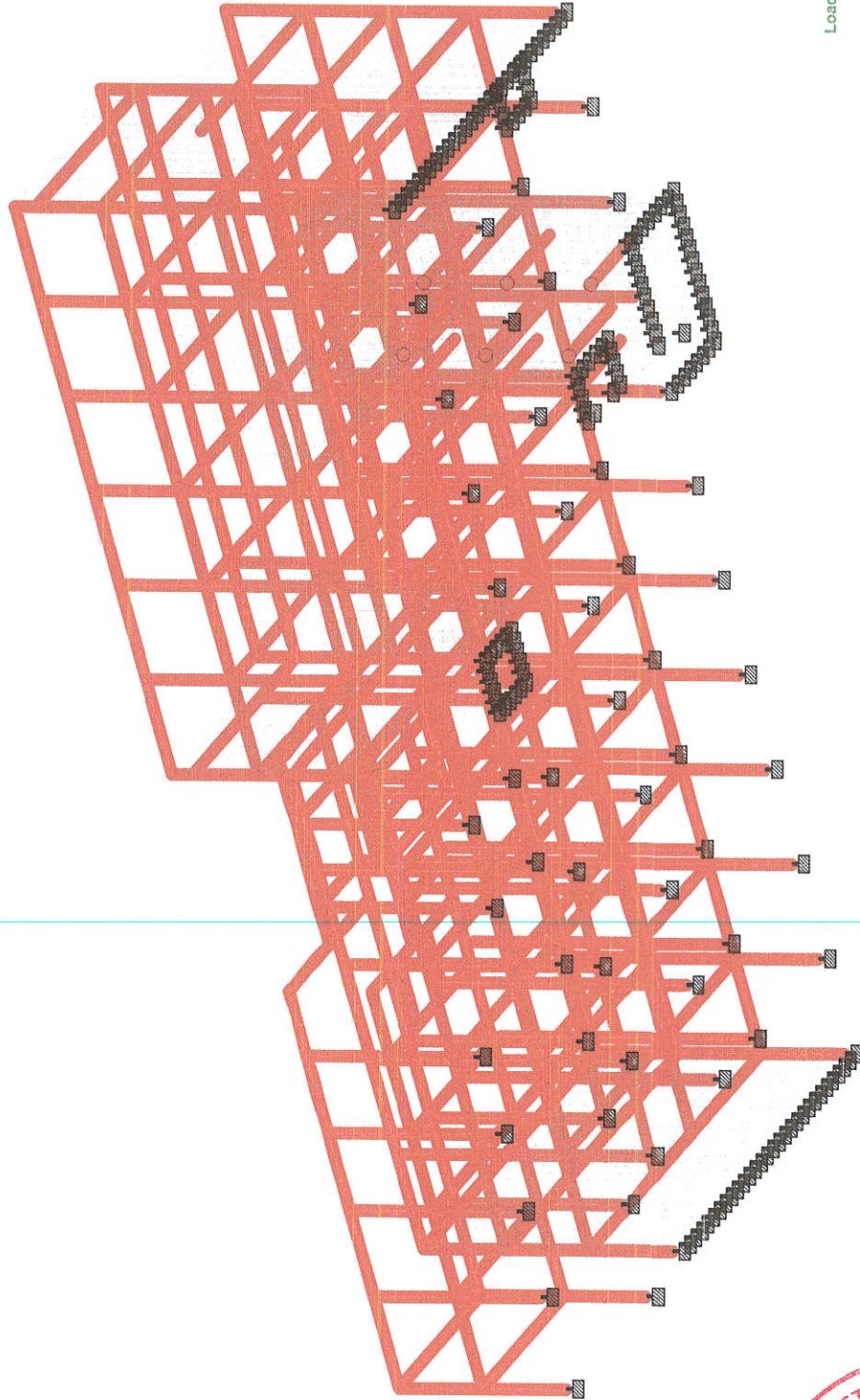
By JBNN

Date 23-Mar-17

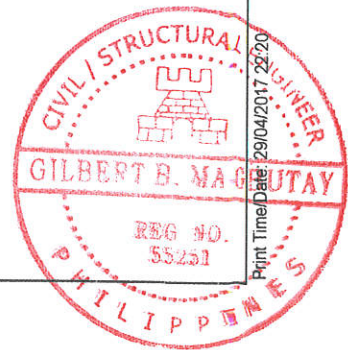
Chd GBM

File DoH Building No. 19.std

Date/Time 29-Apr-2017 22:05



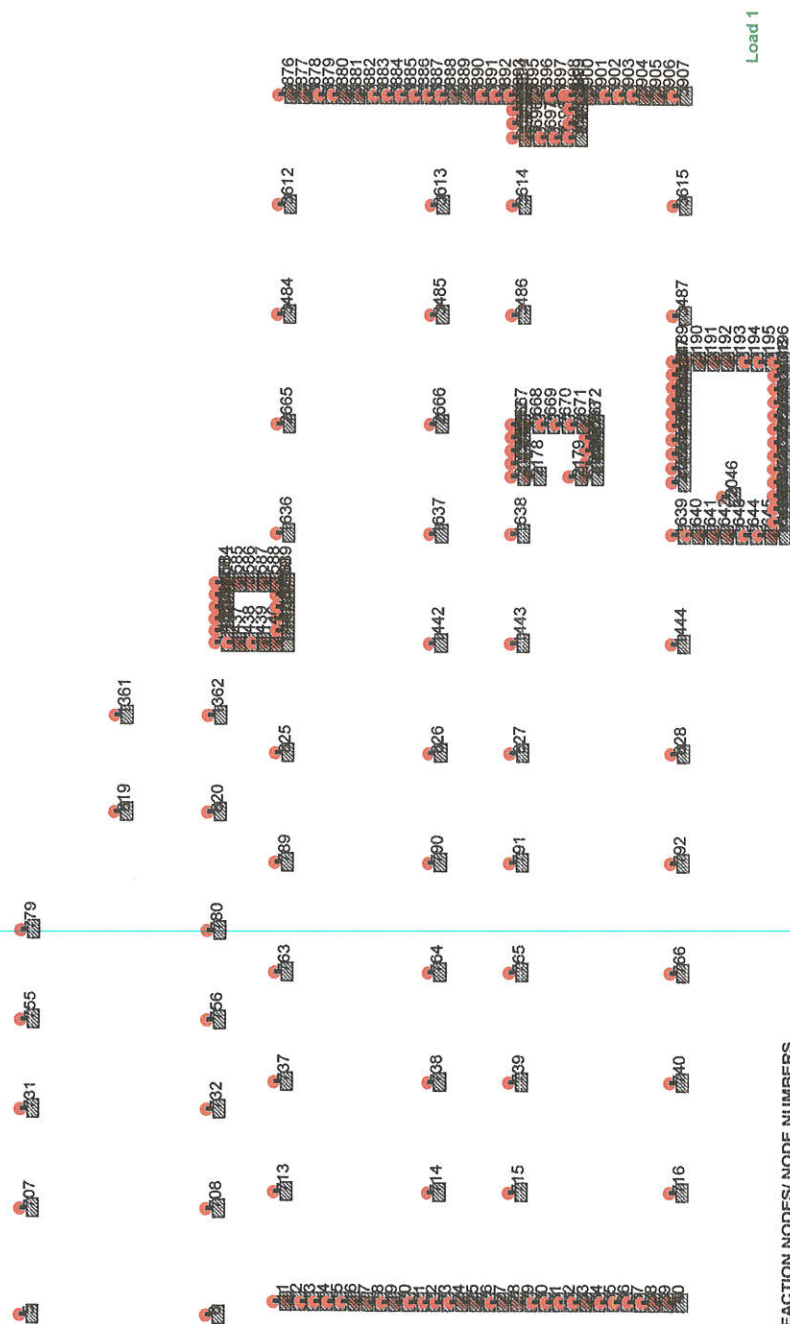
Y
X
Z





Job No	1821/17	Sheet No	1	Rev	0
Part					
Ref					
By	JBNN	Date	23-Mar-17	Chd	GBM
File	DoH Building No. 19 std			Date/Time	30-Apr-2017 06:

File DoH Building No. 19.std	Date/Time 30-Apr-2017 06:53
------------------------------	-----------------------------



SUPPORT REACTION NODES/ NODE NUMBERS




```

*****
*
*          STAAD.Pro V8i SELECTseries4
*          Version  20.07.09.21
*          Proprietary Program of
*          Bentley Systems, Inc.
*          Date=    APR 30, 2017
*          Time=    6:53:44
*
*          USER ID:
*****

```

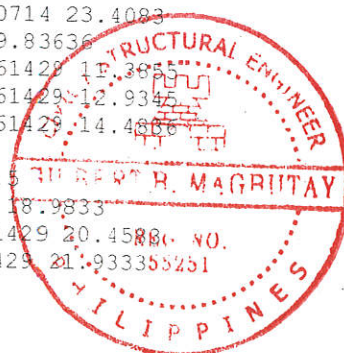
```

1. STAAD SPACE
INPUT FILE: DoH Building No. 19.STD
2. START JOB INFORMATION
3. ENGINEER DATE 23-MAR-17
4. JOB NAME STRUCTURAL INVESTIGATION OF DOH BUILDING NO. 19
5. JOB CLIENT DEPARTMENT OF HEALTH
6. JOB NO 1821/17
7. JOB REV 0
8. ENGINEER NAME JBNN
9. CHECKER NAME GBM
10. END JOB INFORMATION
11. INPUT WIDTH 79
12. UNIT METER KN
13. JOINT COORDINATES
14. 1 -1.214 3.6 15; 2 -1.214 3.6 18; 3 -1.214 7.15 15; 4 -1.214 7.15 18
15. 5 0 0.03 0; 6 0 0.03 6.85; 7 0 3.6 0; 8 0 3.6 6.85; 9 0 7.15 0; 10 0 7.15 6.85
16. 11 0.51 0.03 9.32; 12 0.51 0.03 9.82276; 13 0.51 0.03 10.3255
17. 14 0.51 0.03 10.8283; 15 0.51 0.03 11.331; 16 0.51 0.03 11.8338
18. 17 0.51 0.03 12.3366; 18 0.51 0.03 12.8393; 19 0.51 0.03 13.3421
19. 20 0.51 0.03 13.8448; 21 0.51 0.03 14.3476; 22 0.51 0.03 14.8503
20. 23 0.51 0.03 15.3531; 24 0.51 0.03 15.8559; 25 0.51 0.03 16.3586
21. 26 0.51 0.03 16.8614; 27 0.51 0.03 17.3641; 28 0.51 0.03 17.8669
22. 29 0.51 0.03 18.3697; 30 0.51 0.03 18.8724; 31 0.51 0.03 19.3752
23. 32 0.51 0.03 19.8779; 33 0.51 0.03 20.3807; 34 0.51 0.03 20.8834
24. 35 0.51 0.03 21.3862; 36 0.51 0.03 21.889; 37 0.51 0.03 22.3917
25. 38 0.51 0.03 22.8945; 39 0.51 0.03 23.3972; 40 0.51 0.03 23.9
26. 41 0.51 0.54 9.32; 42 0.51 0.54 9.82276; 43 0.51 0.54 10.3255
27. 44 0.51 0.54 10.8283; 45 0.51 0.54 11.331; 46 0.51 0.54 11.8338
28. 47 0.51 0.54 12.3366; 48 0.51 0.54 12.8393; 49 0.51 0.54 13.3421
29. 50 0.51 0.54 13.8448; 51 0.51 0.54 14.3476; 52 0.51 0.54 14.8503
30. 53 0.51 0.54 15.3531; 54 0.51 0.54 15.8559; 55 0.51 0.54 16.3586
31. 56 0.51 0.54 16.8614; 57 0.51 0.54 17.3641; 58 0.51 0.54 17.8669
32. 59 0.51 0.54 18.3697; 60 0.51 0.54 18.8724; 61 0.51 0.54 19.3752
33. 62 0.51 0.54 19.8779; 63 0.51 0.54 20.3807; 64 0.51 0.54 20.8834
34. 65 0.51 0.54 21.3862; 66 0.51 0.54 21.889; 67 0.51 0.54 22.3917
35. 68 0.51 0.54 22.8945; 69 0.51 0.54 23.3972; 70 0.51 0.54 23.9
36. 71 0.51 1.05 9.32; 72 0.51 1.05 9.82276; 73 0.51 1.05 10.3255
37. 74 0.51 1.05 10.8283; 75 0.51 1.05 11.331; 76 0.51 1.05 11.8338
38. 77 0.51 1.05 12.3366; 78 0.51 1.05 12.8393; 79 0.51 1.05 13.3421
39. 80 0.51 1.05 13.8448; 81 0.51 1.05 14.3476; 82 0.51 1.05 14.8503
40. 83 0.51 1.05 15.3531; 84 0.51 1.05 15.8559; 85 0.51 1.05 16.3586
41. 86 0.51 1.05 16.8614; 87 0.51 1.05 17.3641; 88 0.51 1.05 17.8669
42. 89 0.51 1.05 18.3697; 90 0.51 1.05 18.8724; 91 0.51 1.05 19.3752
43. 92 0.51 1.05 19.8779; 93 0.51 1.05 20.3807; 94 0.51 1.05 20.8834
44. 95 0.51 1.05 21.3862; 96 0.51 1.05 21.889; 97 0.51 1.05 22.3917
45. 98 0.51 1.05 22.8945; 99 0.51 1.05 23.3972; 100 0.51 1.05 23.9
46. 101 0.51 1.56 9.32; 102 0.51 1.56 9.82276; 103 0.51 1.56 10.3255
47. 104 0.51 1.56 10.8283; 105 0.51 1.56 11.331; 106 0.51 1.56 11.8338
48. 107 0.51 1.56 12.3366; 108 0.51 1.56 12.8393; 109 0.51 1.56 13.3421
49. 110 0.51 1.56 13.8448; 111 0.51 1.56 14.3476; 112 0.51 1.56 14.8503
50. 113 0.51 1.56 15.3531; 114 0.51 1.56 15.8559; 115 0.51 1.56 16.3586
51. 116 0.51 1.56 16.8614; 117 0.51 1.56 17.3641; 118 0.51 1.56 17.8669
52. 119 0.51 1.56 18.3697; 120 0.51 1.56 18.8724; 121 0.51 1.56 19.3752
53. 122 0.51 1.56 19.8779; 123 0.51 1.56 20.3807; 124 0.51 1.56 20.8834
54. 125 0.51 1.56 21.3862; 126 0.51 1.56 21.889; 127 0.51 1.56 22.3917
55. 128 0.51 1.56 22.8945; 129 0.51 1.56 23.3972; 130 0.51 1.56 23.9

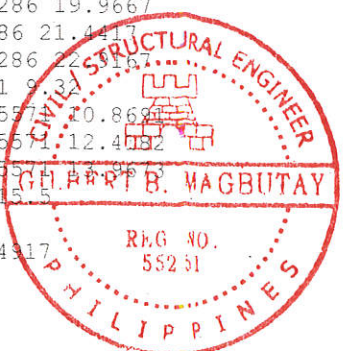
```



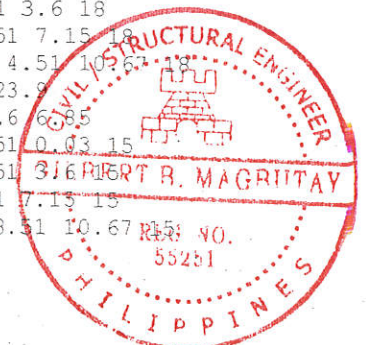
56. 131 0.51 2.07 9.32; 132 0.51 2.07 9.82276; 133 0.51 2.07 10.3255
 57. 134 0.51 2.07 10.8283; 135 0.51 2.07 11.331; 136 0.51 2.07 11.8338
 58. 137 0.51 2.07 12.3366; 138 0.51 2.07 12.8393; 139 0.51 2.07 13.3421
 59. 140 0.51 2.07 13.8448; 141 0.51 2.07 14.3476; 142 0.51 2.07 14.8503
 60. 143 0.51 2.07 15.3531; 144 0.51 2.07 15.8559; 145 0.51 2.07 16.3586
 61. 146 0.51 2.07 16.8614; 147 0.51 2.07 17.3641; 148 0.51 2.07 17.8669
 62. 149 0.51 2.07 18.3697; 150 0.51 2.07 18.8724; 151 0.51 2.07 19.3752
 63. 152 0.51 2.07 19.8779; 153 0.51 2.07 20.3807; 154 0.51 2.07 20.8834
 64. 155 0.51 2.07 21.3862; 156 0.51 2.07 21.889; 157 0.51 2.07 22.3917
 65. 158 0.51 2.07 22.8945; 159 0.51 2.07 23.3972; 160 0.51 2.07 23.9
 66. 161 0.51 2.58 9.32; 162 0.51 2.58 9.82276; 163 0.51 2.58 10.3255
 67. 164 0.51 2.58 10.8283; 165 0.51 2.58 11.331; 166 0.51 2.58 11.8338
 68. 167 0.51 2.58 12.3366; 168 0.51 2.58 12.8393; 169 0.51 2.58 13.3421
 69. 170 0.51 2.58 13.8448; 171 0.51 2.58 14.3476; 172 0.51 2.58 14.8503
 70. 173 0.51 2.58 15.3531; 174 0.51 2.58 15.8559; 175 0.51 2.58 16.3586
 71. 176 0.51 2.58 16.8614; 177 0.51 2.58 17.3641; 178 0.51 2.58 17.8669
 72. 179 0.51 2.58 18.3697; 180 0.51 2.58 18.8724; 181 0.51 2.58 19.3752
 73. 182 0.51 2.58 19.8779; 183 0.51 2.58 20.3807; 184 0.51 2.58 20.8834
 74. 185 0.51 2.58 21.3862; 186 0.51 2.58 21.889; 187 0.51 2.58 22.3917
 75. 188 0.51 2.58 22.8945; 189 0.51 2.58 23.3972; 190 0.51 2.58 23.9
 76. 191 0.51 3.09 9.32; 192 0.51 3.09 9.82276; 193 0.51 3.09 10.3255
 77. 194 0.51 3.09 10.8283; 195 0.51 3.09 11.331; 196 0.51 3.09 11.8338
 78. 197 0.51 3.09 12.3366; 198 0.51 3.09 12.8393; 199 0.51 3.09 13.3421
 79. 200 0.51 3.09 13.8448; 201 0.51 3.09 14.3476; 202 0.51 3.09 14.8503
 80. 203 0.51 3.09 15.3531; 204 0.51 3.09 15.8559; 205 0.51 3.09 16.3586
 81. 206 0.51 3.09 16.8614; 207 0.51 3.09 17.3641; 208 0.51 3.09 17.8669
 82. 209 0.51 3.09 18.3697; 210 0.51 3.09 18.8724; 211 0.51 3.09 19.3752
 83. 212 0.51 3.09 19.8779; 213 0.51 3.09 20.3807; 214 0.51 3.09 20.8834
 84. 215 0.51 3.09 21.3862; 216 0.51 3.09 21.889; 217 0.51 3.09 22.3917
 85. 218 0.51 3.09 22.8945; 219 0.51 3.09 23.3972; 220 0.51 3.09 23.9
 86. 221 0.51 3.6 9.32; 222 0.51 3.6 9.82276; 223 0.51 3.6 9.83636
 87. 224 0.51 3.6 10.3255; 225 0.51 3.6 10.3527; 226 0.51 3.6 10.8283
 88. 227 0.51 3.6 10.8691; 228 0.51 3.6 11.331; 229 0.51 3.6 11.3855
 89. 230 0.51 3.6 11.8338; 231 0.51 3.6 11.9018; 232 0.51 3.6 12.3366
 90. 233 0.51 3.6 12.4182; 234 0.51 3.6 12.8393; 235 0.51 3.6 12.9345
 91. 236 0.51 3.6 13.3421; 237 0.51 3.6 13.4509; 238 0.51 3.6 13.8448
 92. 239 0.51 3.6 13.9673; 240 0.51 3.6 14.3476; 241 0.51 3.6 14.4836
 93. 242 0.51 3.6 14.8503; 243 0.51 3.6 15; 244 0.51 3.6 15.3531; 245 0.51 3.6 15.5
 94. 246 0.51 3.6 15.8559; 247 0.51 3.6 16; 248 0.51 3.6 16.3586; 249 0.51 3.6 16.5
 95. 250 0.51 3.6 16.8614; 251 0.51 3.6 17; 252 0.51 3.6 17.3641; 253 0.51 3.6 17.5
 96. 254 0.51 3.6 17.8669; 255 0.51 3.6 18; 256 0.51 3.6 18.3697
 97. 257 0.51 3.6 18.4917; 258 0.51 3.6 18.8724; 259 0.51 3.6 18.9833
 98. 260 0.51 3.6 19.3752; 261 0.51 3.6 19.475; 262 0.51 3.6 19.8779
 99. 263 0.51 3.6 19.9667; 264 0.51 3.6 20.3807; 265 0.51 3.6 20.4583
 100. 266 0.51 3.6 20.8834; 267 0.51 3.6 20.95; 268 0.51 3.6 21.3862
 101. 269 0.51 3.6 21.4417; 270 0.51 3.6 21.889; 271 0.51 3.6 21.9333
 102. 272 0.51 3.6 22.3917; 273 0.51 3.6 22.425; 274 0.51 3.6 22.8945
 103. 275 0.51 3.6 22.9167; 276 0.51 3.6 23.3972; 277 0.51 3.6 23.4083
 104. 278 0.51 3.6 23.9; 279 0.51 4.10714 9.32; 280 0.51 4.10714 9.83636
 105. 281 0.51 4.10714 10.3527; 282 0.51 4.10714 10.3691; 283 0.51 4.10714 11.3855
 106. 284 0.51 4.10714 11.9018; 285 0.51 4.10714 12.4182; 286 0.51 4.10714 12.9345
 107. 287 0.51 4.10714 13.4509; 288 0.51 4.10714 13.9673; 289 0.51 4.10714 14.4836
 108. 290 0.51 4.10714 15; 291 0.51 4.10714 15.5; 292 0.51 4.10714 16
 109. 293 0.51 4.10714 16.5; 294 0.51 4.10714 17; 295 0.51 4.10714 17.5
 110. 296 0.51 4.10714 18; 297 0.51 4.10714 18.4917; 298 0.51 4.10714 18.9833
 111. 299 0.51 4.10714 19.475; 300 0.51 4.10714 19.9667; 301 0.51 4.10714 20.4583
 112. 302 0.51 4.10714 20.95; 303 0.51 4.10714 21.4417; 304 0.51 4.10714 21.9333
 113. 305 0.51 4.10714 22.425; 306 0.51 4.10714 22.9167; 307 0.51 4.10714 23.4083
 114. 308 0.51 4.10714 23.9; 309 0.51 4.61429 9.32; 310 0.51 4.61429 9.83636
 115. 311 0.51 4.61429 10.3527; 312 0.51 4.61429 10.3691; 313 0.51 4.61429 11.3855
 116. 314 0.51 4.61429 11.9018; 315 0.51 4.61429 12.4182; 316 0.51 4.61429 12.9345
 117. 317 0.51 4.61429 13.4509; 318 0.51 4.61429 13.9673; 319 0.51 4.61429 14.4836
 118. 320 0.51 4.61429 15; 321 0.51 4.61429 15.5; 322 0.51 4.61429 16
 119. 323 0.51 4.61429 16.5; 324 0.51 4.61429 17; 325 0.51 4.61429 17.5
 120. 326 0.51 4.61429 18; 327 0.51 4.61429 18.4917; 328 0.51 4.61429 18.9833
 121. 329 0.51 4.61429 19.475; 330 0.51 4.61429 19.9667; 331 0.51 4.61429 20.4583
 122. 332 0.51 4.61429 20.95; 333 0.51 4.61429 21.4417; 334 0.51 4.61429 21.9333



123. 335 0.51 4.61429 22.425; 336 0.51 4.61429 22.9167; 337 0.51 4.61429 23.4083
 124. 338 0.51 4.61429 23.9; 339 0.51 5.12143 9.32; 340 0.51 5.12143 9.83636
 125. 341 0.51 5.12143 10.3527; 342 0.51 5.12143 10.3691; 343 0.51 5.12143 11.3855
 126. 344 0.51 5.12143 11.9018; 345 0.51 5.12143 12.4182; 346 0.51 5.12143 12.9345
 127. 347 0.51 5.12143 13.4509; 348 0.51 5.12143 13.9673; 349 0.51 5.12143 14.4836
 128. 350 0.51 5.12143 15; 351 0.51 5.12143 15.5; 352 0.51 5.12143 16
 129. 353 0.51 5.12143 16.5; 354 0.51 5.12143 17; 355 0.51 5.12143 17.5
 130. 356 0.51 5.12143 18; 357 0.51 5.12143 18.4917; 358 0.51 5.12143 18.9833
 131. 359 0.51 5.12143 19.475; 360 0.51 5.12143 19.9667; 361 0.51 5.12143 20.4583
 132. 362 0.51 5.12143 20.95; 363 0.51 5.12143 21.4417; 364 0.51 5.12143 21.9333
 133. 365 0.51 5.12143 22.425; 366 0.51 5.12143 22.9167; 367 0.51 5.12143 23.4083
 134. 368 0.51 5.12143 23.9; 369 0.51 5.62857 9.32; 370 0.51 5.62857 9.83636
 135. 371 0.51 5.62857 10.3527; 372 0.51 5.62857 10.3691; 373 0.51 5.62857 11.3855
 136. 374 0.51 5.62857 11.9018; 375 0.51 5.62857 12.4182; 376 0.51 5.62857 12.9345
 137. 377 0.51 5.62857 13.4509; 378 0.51 5.62857 13.9673; 379 0.51 5.62857 14.4836
 138. 380 0.51 5.62857 15; 381 0.51 5.62857 15.5; 382 0.51 5.62857 16
 139. 383 0.51 5.62857 16.5; 384 0.51 5.62857 17; 385 0.51 5.62857 17.5
 140. 386 0.51 5.62857 18; 387 0.51 5.62857 18.4917; 388 0.51 5.62857 18.9833
 141. 389 0.51 5.62857 19.475; 390 0.51 5.62857 19.9667; 391 0.51 5.62857 20.4583
 142. 392 0.51 5.62857 20.95; 393 0.51 5.62857 21.4417; 394 0.51 5.62857 21.9333
 143. 395 0.51 5.62857 22.425; 396 0.51 5.62857 22.9167; 397 0.51 5.62857 23.4083
 144. 398 0.51 5.62857 23.9; 399 0.51 6.13571 9.32; 400 0.51 6.13571 9.83636
 145. 401 0.51 6.13571 10.3527; 402 0.51 6.13571 10.3691; 403 0.51 6.13571 11.3855
 146. 404 0.51 6.13571 11.9018; 405 0.51 6.13571 12.4182; 406 0.51 6.13571 12.9345
 147. 407 0.51 6.13571 13.4509; 408 0.51 6.13571 13.9673; 409 0.51 6.13571 14.4836
 148. 410 0.51 6.13571 15; 411 0.51 6.13571 15.5; 412 0.51 6.13571 16
 149. 413 0.51 6.13571 16.5; 414 0.51 6.13571 17; 415 0.51 6.13571 17.5
 150. 416 0.51 6.13571 18; 417 0.51 6.13571 18.4917; 418 0.51 6.13571 18.9833
 151. 419 0.51 6.13571 19.475; 420 0.51 6.13571 19.9667; 421 0.51 6.13571 20.4583
 152. 422 0.51 6.13571 20.95; 423 0.51 6.13571 21.4417; 424 0.51 6.13571 21.9333
 153. 425 0.51 6.13571 22.425; 426 0.51 6.13571 22.9167; 427 0.51 6.13571 23.4083
 154. 428 0.51 6.13571 23.9; 429 0.51 6.64286 9.32; 430 0.51 6.64286 9.83636
 155. 431 0.51 6.64286 10.3527; 432 0.51 6.64286 10.3691; 433 0.51 6.64286 11.3855
 156. 434 0.51 6.64286 11.9018; 435 0.51 6.64286 12.4182; 436 0.51 6.64286 12.9345
 157. 437 0.51 6.64286 13.4509; 438 0.51 6.64286 13.9673; 439 0.51 6.64286 14.4836
 158. 440 0.51 6.64286 15; 441 0.51 6.64286 15.5; 442 0.51 6.64286 16
 159. 443 0.51 6.64286 16.5; 444 0.51 6.64286 17; 445 0.51 6.64286 17.5
 160. 446 0.51 6.64286 18; 447 0.51 6.64286 18.4917; 448 0.51 6.64286 18.9833
 161. 449 0.51 6.64286 19.475; 450 0.51 6.64286 19.9667; 451 0.51 6.64286 20.4583
 162. 452 0.51 6.64286 20.95; 453 0.51 6.64286 21.4417; 454 0.51 6.64286 21.9333
 163. 455 0.51 6.64286 22.425; 456 0.51 6.64286 22.9167; 457 0.51 6.64286 23.4083
 164. 458 0.51 6.64286 23.9; 459 0.51 7.15 9.32; 460 0.51 7.15 9.83636
 165. 461 0.51 7.15 10.3527; 462 0.51 7.15 10.3691; 463 0.51 7.15 11.3855
 166. 464 0.51 7.15 11.9018; 465 0.51 7.15 12.4182; 466 0.51 7.15 12.9345
 167. 467 0.51 7.15 13.4509; 468 0.51 7.15 13.9673; 469 0.51 7.15 14.4836
 168. 470 0.51 7.15 15; 471 0.51 7.15 15.5; 472 0.51 7.15 16; 473 0.51 7.15 16.5
 169. 474 0.51 7.15 17; 475 0.51 7.15 17.5; 476 0.51 7.15 18; 477 0.51 7.15 18.4917
 170. 478 0.51 7.15 18.9833; 479 0.51 7.15 19.475; 480 0.51 7.15 19.9667
 171. 481 0.51 7.15 20.4583; 482 0.51 7.15 20.95; 483 0.51 7.15 21.4417
 172. 484 0.51 7.15 21.9333; 485 0.51 7.15 22.425; 486 0.51 7.15 22.9167
 173. 487 0.51 7.15 23.4083; 488 0.51 7.15 23.9; 489 0.51 7.65286 9.32
 174. 490 0.51 7.65286 9.83636; 491 0.51 7.65286 10.3527; 492 0.51 7.65286 10.3691
 175. 493 0.51 7.65286 11.3855; 494 0.51 7.65286 11.9018; 495 0.51 7.65286 12.4182
 176. 496 0.51 7.65286 12.9345; 497 0.51 7.65286 13.4509; 498 0.51 7.65286 13.9673
 177. 499 0.51 7.65286 14.4836; 500 0.51 7.65286 15; 501 0.51 7.65286 15.5
 178. 502 0.51 7.65286 16; 503 0.51 7.65286 16.5; 504 0.51 7.65286 17
 179. 505 0.51 7.65286 17.5; 506 0.51 7.65286 18; 507 0.51 7.65286 18.4917
 180. 508 0.51 7.65286 18.9833; 509 0.51 7.65286 19.475; 510 0.51 7.65286 19.9667
 181. 511 0.51 7.65286 20.4583; 512 0.51 7.65286 20.95; 513 0.51 7.65286 21.4417
 182. 514 0.51 7.65286 21.9333; 515 0.51 7.65286 22.425; 516 0.51 7.65286 22.9167
 183. 517 0.51 7.65286 23.4083; 518 0.51 7.65286 23.9; 519 0.51 8.15571 9.32
 184. 520 0.51 8.15571 9.83636; 521 0.51 8.15571 10.3527; 522 0.51 8.15571 10.3691
 185. 523 0.51 8.15571 11.3855; 524 0.51 8.15571 11.9018; 525 0.51 8.15571 12.4182
 186. 526 0.51 8.15571 12.9345; 527 0.51 8.15571 13.4509; 528 0.51 8.15571 13.9673
 187. 529 0.51 8.15571 14.4836; 530 0.51 8.15571 15; 531 0.51 8.15571 15.5
 188. 532 0.51 8.15571 16; 533 0.51 8.15571 16.5; 534 0.51 8.15571 17
 189. 535 0.51 8.15571 17.5; 536 0.51 8.15571 18; 537 0.51 8.15571 18.4917



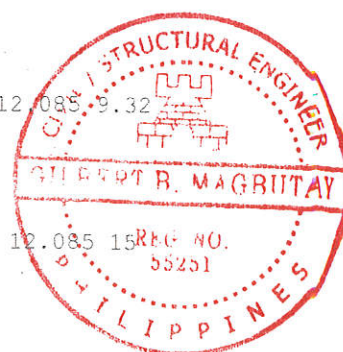
190. 538 0.51 8.15571 13.9833; 539 0.51 8.15571 19.475; 540 0.51 8.15571 19.9667
 191. 541 0.51 8.15571 20.4583; 542 0.51 8.15571 20.95; 543 0.51 8.15571 21.4417
 192. 544 0.51 8.15571 21.9333; 545 0.51 8.15571 22.425; 546 0.51 8.15571 22.9167
 193. 547 0.51 8.15571 23.4083; 548 0.51 8.15571 23.9; 549 0.51 8.65857 9.32
 194. 550 0.51 8.65857 9.83636; 551 0.51 8.65857 10.3527; 552 0.51 8.65857 10.8691
 195. 553 0.51 8.65857 11.3855; 554 0.51 8.65857 11.9018; 555 0.51 8.65857 12.4182
 196. 556 0.51 8.65857 12.9345; 557 0.51 8.65857 13.4509; 558 0.51 8.65857 13.9673
 197. 559 0.51 8.65857 14.4836; 560 0.51 8.65857 15; 561 0.51 8.65857 15.5
 198. 562 0.51 8.65857 16; 563 0.51 8.65857 16.5; 564 0.51 8.65857 17
 199. 565 0.51 8.65857 17.5; 566 0.51 8.65857 18; 567 0.51 8.65857 18.4917
 200. 568 0.51 8.65857 18.9833; 569 0.51 8.65857 19.475; 570 0.51 8.65857 19.9667
 201. 571 0.51 8.65857 20.4583; 572 0.51 8.65857 20.95; 573 0.51 8.65857 21.4417
 202. 574 0.51 8.65857 21.9333; 575 0.51 8.65857 22.425; 576 0.51 8.65857 22.9167
 203. 577 0.51 8.65857 23.4083; 578 0.51 8.65857 23.9; 579 0.51 9.16143 9.32
 204. 580 0.51 9.16143 9.83636; 581 0.51 9.16143 10.3527; 582 0.51 9.16143 10.8691
 205. 583 0.51 9.16143 11.3855; 584 0.51 9.16143 11.9018; 585 0.51 9.16143 12.4182
 206. 586 0.51 9.16143 12.9345; 587 0.51 9.16143 13.4509; 588 0.51 9.16143 13.9673
 207. 589 0.51 9.16143 14.4836; 590 0.51 9.16143 15; 591 0.51 9.16143 15.5
 208. 592 0.51 9.16143 16; 593 0.51 9.16143 16.5; 594 0.51 9.16143 17
 209. 595 0.51 9.16143 17.5; 596 0.51 9.16143 18; 597 0.51 9.16143 18.4917
 210. 598 0.51 9.16143 18.9833; 599 0.51 9.16143 19.475; 600 0.51 9.16143 19.9667
 211. 601 0.51 9.16143 20.4583; 602 0.51 9.16143 20.95; 603 0.51 9.16143 21.4417
 212. 604 0.51 9.16143 21.9333; 605 0.51 9.16143 22.425; 606 0.51 9.16143 22.9167
 213. 607 0.51 9.16143 23.4083; 608 0.51 9.16143 23.9; 609 0.51 9.66429 9.32
 214. 610 0.51 9.66429 9.83636; 611 0.51 9.66429 10.3527; 612 0.51 9.66429 10.8691
 215. 613 0.51 9.66429 11.3855; 614 0.51 9.66429 11.9018; 615 0.51 9.66429 12.4182
 216. 616 0.51 9.66429 12.9345; 617 0.51 9.66429 13.4509; 618 0.51 9.66429 13.9673
 217. 619 0.51 9.66429 14.4836; 620 0.51 9.66429 15; 621 0.51 9.66429 15.5
 218. 622 0.51 9.66429 16; 623 0.51 9.66429 16.5; 624 0.51 9.66429 17
 219. 625 0.51 9.66429 17.5; 626 0.51 9.66429 18; 627 0.51 9.66429 18.4917
 220. 628 0.51 9.66429 18.9833; 629 0.51 9.66429 19.475; 630 0.51 9.66429 19.9667
 221. 631 0.51 9.66429 20.4583; 632 0.51 9.66429 20.95; 633 0.51 9.66429 21.4417
 222. 634 0.51 9.66429 21.9333; 635 0.51 9.66429 22.425; 636 0.51 9.66429 22.9167
 223. 637 0.51 9.66429 23.4083; 638 0.51 9.66429 23.9; 639 0.51 10.1671 9.32
 224. 640 0.51 10.1671 9.83636; 641 0.51 10.1671 10.3527; 642 0.51 10.1671 10.8691
 225. 643 0.51 10.1671 11.3855; 644 0.51 10.1671 11.9018; 645 0.51 10.1671 12.4182
 226. 646 0.51 10.1671 12.9345; 647 0.51 10.1671 13.4509; 648 0.51 10.1671 13.9673
 227. 649 0.51 10.1671 14.4836; 650 0.51 10.1671 15; 651 0.51 10.1671 15.5
 228. 652 0.51 10.1671 16; 653 0.51 10.1671 16.5; 654 0.51 10.1671 17
 229. 655 0.51 10.1671 17.5; 656 0.51 10.1671 18; 657 0.51 10.1671 18.4917
 230. 658 0.51 10.1671 18.9833; 659 0.51 10.1671 19.475; 660 0.51 10.1671 19.9667
 231. 661 0.51 10.1671 20.4583; 662 0.51 10.1671 20.95; 663 0.51 10.1671 21.4417
 232. 664 0.51 10.1671 21.9333; 665 0.51 10.1671 22.425; 666 0.51 10.1671 22.9167
 233. 667 0.51 10.1671 23.4083; 668 0.51 10.1671 23.9; 669 0.51 10.67 9.32
 234. 670 0.51 10.67 9.83636; 671 0.51 10.67 10.3527; 672 0.51 10.67 10.8691
 235. 673 0.51 10.67 11.3855; 674 0.51 10.67 11.9018; 675 0.51 10.67 12.4182
 236. 676 0.51 10.67 12.9345; 677 0.51 10.67 13.4509; 678 0.51 10.67 13.9673
 237. 679 0.51 10.67 14.4836; 680 0.51 10.67 15; 681 0.51 10.67 15.5
 238. 682 0.51 10.67 16; 683 0.51 10.67 16.5; 684 0.51 10.67 17; 685 0.51 10.67 17.5
 239. 686 0.51 10.67 18; 687 0.51 10.67 18.4917; 688 0.51 10.67 18.9833
 240. 689 0.51 10.67 19.475; 690 0.51 10.67 19.9667; 691 0.51 10.67 20.4583
 241. 692 0.51 10.67 20.95; 693 0.51 10.67 21.4417; 694 0.51 10.67 21.9333
 242. 695 0.51 10.67 22.425; 696 0.51 10.67 22.9167; 697 0.51 10.67 23.4083
 243. 698 0.51 10.67 23.9; 699 1.41 3.6 9.32; 700 1.41 3.6 23.9; 701 1.41 7.15 9.32
 244. 702 1.41 7.15 23.9; 703 1.41 10.67 9.32; 704 1.41 10.67 23.9
 245. 705 3.36714 10.67 9.32; 706 3.36714 10.67 23.9; 707 3.87 0.03 0
 246. 708 3.87 0.03 6.85; 709 3.87 3.6 0; 710 3.87 3.6 6.85; 711 3.87 7.15 0
 247. 712 3.87 7.15 6.85; 713 4.51 0.03 9.32; 714 4.51 0.03 15; 715 4.51 0.03 18
 248. 716 4.51 0.03 23.9; 717 4.51 3.6 9.32; 718 4.51 3.6 15; 719 4.51 3.6 18
 249. 720 4.51 3.6 23.9; 721 4.51 7.15 9.32; 722 4.51 7.15 15; 723 4.51 7.15 18
 250. 724 4.51 7.15 23.9; 725 4.51 10.67 9.32; 726 4.51 10.67 15; 727 4.51 10.67 18
 251. 728 4.51 10.67 23.9; 729 6.22429 10.67 9.32; 730 6.22429 10.67 23.9
 252. 731 7.49 0.03 0; 732 7.49 0.03 6.85; 733 7.49 3.6 0; 734 7.49 3.6 6.85
 253. 735 7.49 7.15 0; 736 7.49 7.15 6.85; 737 8.51 0.03 9.32; 738 8.51 0.03 15
 254. 739 8.51 0.03 18; 740 8.51 0.03 23.9; 741 8.51 3.6 9.32; 742 8.51 3.6 15
 255. 743 8.51 3.6 18; 744 8.51 3.6 23.9; 745 8.51 7.15 9.32; 746 8.51 7.15 15
 256. 747 8.51 7.15 18; 748 8.51 7.15 23.9; 749 8.51 10.67 9.32; 750 8.51 10.67 15



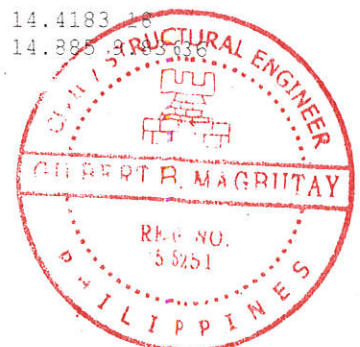
257. 751 8.51 10.67 18; 752 8.51 10.67 23.9; 753 9.08143 10.67 9.32
 258. 754 9.08143 10.67 23.9; 755 10.75 0.03 0; 756 10.75 0.03 6.85; 757 10.75 3.6 0
 259. 758 10.75 3.6 6.85; 759 10.75 7.15 0; 760 10.75 7.15 6.85
 260. 761 11.9386 10.67 9.32; 762 11.9386 10.67 23.9; 763 12.51 0.03 9.32
 261. 764 12.51 0.03 15; 765 12.51 0.03 18; 766 12.51 0.03 23.9; 767 12.51 3.6 9.32
 262. 768 12.51 3.6 15; 769 12.51 3.6 18; 770 12.51 3.6 23.9; 771 12.51 7.15 9.32
 263. 772 12.51 7.15 15; 773 12.51 7.15 18; 774 12.51 7.15 23.9
 264. 775 12.51 10.67 9.32; 776 12.51 10.67 15; 777 12.51 10.67 18
 265. 778 12.51 10.67 23.9; 779 14.01 0.03 0; 780 14.01 0.03 6.85; 781 14.01 3.6 0
 266. 782 14.01 3.6 2.28333; 783 14.01 3.6 4.56667; 784 14.01 3.6 6.85
 267. 785 14.01 7.15 0; 786 14.01 7.15 6.85; 787 14.7957 10.67 9.32
 268. 788 14.7957 10.67 23.9; 789 16.51 0.03 9.32; 790 16.51 0.03 15
 269. 791 16.51 0.03 18; 792 16.51 0.03 23.9; 793 16.51 3.6 9.32; 794 16.51 3.6 15
 270. 795 16.51 3.6 18; 796 16.51 3.6 23.9; 797 16.51 7.15 9.32; 798 16.51 7.15 15
 271. 799 16.51 7.15 18; 800 16.51 7.15 23.9; 801 16.51 8.03 9.32; 802 16.51 8.03 15
 272. 803 16.51 10.67 9.32; 804 16.51 10.67 15; 805 16.51 10.67 18
 273. 806 16.51 10.67 23.9; 807 16.75 3.6 0; 808 16.75 3.6 2.28333
 274. 809 16.75 3.6 3.425; 810 16.75 3.6 4.56667; 811 16.75 3.6 6.85
 275. 812 16.75 7.15 0; 813 16.75 7.15 2.28333; 814 16.75 7.15 3.425
 276. 815 16.75 7.15 4.56667; 816 16.75 7.15 6.85; 817 17.6529 10.67 9.32
 277. 818 17.6529 10.67 23.9; 819 18.33 0.03 3.425; 820 18.33 0.03 6.85
 278. 821 18.33 3.6 3.425; 822 18.33 3.6 6.85; 823 18.33 7.15 3.425
 279. 824 18.33 7.15 6.85; 825 20.51 0.03 9.32; 826 20.51 0.03 15; 827 20.51 0.03 18
 280. 828 20.51 0.03 23.9; 829 20.51 3.6 9.32; 830 20.51 3.6 15; 831 20.51 3.6 18
 281. 832 20.51 3.6 23.9; 833 20.51 7.15 9.32; 834 20.51 7.15 9.83636
 282. 835 20.51 7.15 10.22; 836 20.51 7.15 10.3527; 837 20.51 7.15 10.8691
 283. 838 20.51 7.15 11.3855; 839 20.51 7.15 11.9018; 840 20.51 7.15 12.4182
 284. 841 20.51 7.15 12.9345; 842 20.51 7.15 13.4509; 843 20.51 7.15 13.9673
 285. 844 20.51 7.15 14.4836; 845 20.51 7.15 15; 846 20.51 7.15 18
 286. 847 20.51 7.15 18.4917; 848 20.51 7.15 18.9833; 849 20.51 7.15 19.475
 287. 850 20.51 7.15 19.9667; 851 20.51 7.15 20.4583; 852 20.51 7.15 20.95
 288. 853 20.51 7.15 21.4417; 854 20.51 7.15 21.9333; 855 20.51 7.15 22.425
 289. 856 20.51 7.15 22.9167; 857 20.51 7.15 23.4083; 858 20.51 7.15 23.9
 290. 859 20.51 7.65286 9.32; 860 20.51 7.65286 9.83636; 861 20.51 7.65286 10.3527
 291. 862 20.51 7.65286 10.8691; 863 20.51 7.65286 11.3855
 292. 864 20.51 7.65286 11.9018; 865 20.51 7.65286 12.4182
 293. 866 20.51 7.65286 12.9345; 867 20.51 7.65286 13.4509
 294. 868 20.51 7.65286 13.9673; 869 20.51 7.65286 14.4836; 870 20.51 7.65286 15
 295. 871 20.51 7.65286 18; 872 20.51 7.65286 18.4917; 873 20.51 7.65286 18.9833
 296. 874 20.51 7.65286 19.475; 875 20.51 7.65286 19.9667; 876 20.51 7.65286 20.4583
 297. 877 20.51 7.65286 20.95; 878 20.51 7.65286 21.4417; 879 20.51 7.65286 21.9333
 298. 880 20.51 7.65286 22.425; 881 20.51 7.65286 22.9167; 882 20.51 7.65286 23.4083
 299. 883 20.51 7.65286 23.9; 884 20.51 8.03 9.32; 885 20.51 8.03 15
 300. 886 20.51 8.15571 9.32; 887 20.51 8.15571 9.83636; 888 20.51 8.15571 10.3527
 301. 889 20.51 8.15571 10.8691; 890 20.51 8.15571 11.3855
 302. 891 20.51 8.15571 11.9018; 892 20.51 8.15571 12.4182
 303. 893 20.51 8.15571 12.9345; 894 20.51 8.15571 13.4509
 304. 895 20.51 8.15571 13.9673; 896 20.51 8.15571 14.4836; 897 20.51 8.15571 15
 305. 898 20.51 8.15571 18; 899 20.51 8.15571 18.4917; 900 20.51 8.15571 18.9833
 306. 901 20.51 8.15571 19.475; 902 20.51 8.15571 19.9667; 903 20.51 8.15571 20.4583
 307. 904 20.51 8.15571 20.95; 905 20.51 8.15571 21.4417; 906 20.51 8.15571 21.9333
 308. 907 20.51 8.15571 22.425; 908 20.51 8.15571 22.9167; 909 20.51 8.15571 23.4083
 309. 910 20.51 8.15571 23.9; 911 20.51 8.65857 9.32; 912 20.51 8.65857 9.83636
 310. 913 20.51 8.65857 10.3527; 914 20.51 8.65857 10.8691
 311. 915 20.51 8.65857 11.3855; 916 20.51 8.65857 11.9018
 312. 917 20.51 8.65857 12.4182; 918 20.51 8.65857 12.9345
 313. 919 20.51 8.65857 13.4509; 920 20.51 8.65857 13.9673
 314. 921 20.51 8.65857 14.4836; 922 20.51 8.65857 15; 923 20.51 8.65857 18
 315. 924 20.51 8.65857 18.4917; 925 20.51 8.65857 18.9833; 926 20.51 8.65857 19.475
 316. 927 20.51 8.65857 19.9667; 928 20.51 8.65857 20.4583; 929 20.51 8.65857 20.95
 317. 930 20.51 8.65857 21.4417; 931 20.51 8.65857 21.9333; 932 20.51 8.65857 22.425
 318. 933 20.51 8.65857 22.9167; 934 20.51 8.65857 23.4083; 935 20.51 8.65857 23.9
 319. 936 20.51 9.16143 9.32; 937 20.51 9.16143 9.83636; 938 20.51 9.16143 10.3527
 320. 939 20.51 9.16143 10.8691; 940 20.51 9.16143 11.3855
 321. 941 20.51 9.16143 11.9018; 942 20.51 9.16143 12.4182
 322. 943 20.51 9.16143 12.9345; 944 20.51 9.16143 13.4509
 323. 945 20.51 9.16143 13.9673; 946 20.51 9.16143 14.4836; 947 20.51 9.16143 15



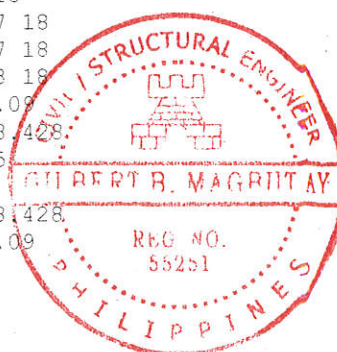
324. 948 20.51 9.16143 18; 949 20.51 9.16143 18.4917; 950 20.51 9.16143 18.9833
 325. 951 20.51 9.16143 19.475; 952 20.51 9.16143 19.9667; 953 20.51 9.16143 20.4583
 326. 954 20.51 9.16143 20.95; 955 20.51 9.16143 21.4417; 956 20.51 9.16143 21.9333
 327. 957 20.51 9.16143 22.425; 958 20.51 9.16143 22.9167; 959 20.51 9.16143 23.4083
 328. 960 20.51 9.16143 23.9; 961 20.51 9.66429 9.32; 962 20.51 9.66429 9.83636
 329. 963 20.51 9.66429 10.3527; 964 20.51 9.66429 10.8691
 330. 965 20.51 9.66429 11.3855; 966 20.51 9.66429 11.9018
 331. 967 20.51 9.66429 12.4182; 968 20.51 9.66429 12.9345
 332. 969 20.51 9.66429 13.4509; 970 20.51 9.66429 13.9673
 333. 971 20.51 9.66429 14.4836; 972 20.51 9.66429 15; 973 20.51 9.66429 18
 334. 974 20.51 9.66429 18.4917; 975 20.51 9.66429 18.9833; 976 20.51 9.66429 19.475
 335. 977 20.51 9.66429 19.9667; 978 20.51 9.66429 20.4583; 979 20.51 9.66429 20.95
 336. 980 20.51 9.66429 21.4417; 981 20.51 9.66429 21.9333; 982 20.51 9.66429 22.425
 337. 983 20.51 9.66429 22.9167; 984 20.51 9.66429 23.4083; 985 20.51 9.66429 23.9
 338. 986 20.51 10.1671 9.32; 987 20.51 10.1671 9.83636; 988 20.51 10.1671 10.3527
 339. 989 20.51 10.1671 10.8691; 990 20.51 10.1671 11.3855
 340. 991 20.51 10.1671 11.9018; 992 20.51 10.1671 12.4182
 341. 993 20.51 10.1671 12.9345; 994 20.51 10.1671 13.4509
 342. 995 20.51 10.1671 13.9673; 996 20.51 10.1671 14.4836; 997 20.51 10.1671 15
 343. 998 20.51 10.1671 18; 999 20.51 10.1671 18.4917; 1000 20.51 10.1671 18.9833
 344. 1001 20.51 10.1671 19.475; 1002 20.51 10.1671 19.9667
 345. 1003 20.51 10.1671 20.4583; 1004 20.51 10.1671 20.95
 346. 1005 20.51 10.1671 21.4417; 1006 20.51 10.1671 21.9333
 347. 1007 20.51 10.1671 22.425; 1008 20.51 10.1671 22.9167
 348. 1009 20.51 10.1671 23.4083; 1010 20.51 10.1671 23.9; 1011 20.51 10.67 9.32
 349. 1012 20.51 10.67 9.83636; 1013 20.51 10.67 10.22; 1014 20.51 10.67 10.3527
 350. 1015 20.51 10.67 10.8691; 1016 20.51 10.67 11.3855; 1017 20.51 10.67 11.9018
 351. 1018 20.51 10.67 12.4182; 1019 20.51 10.67 12.9345; 1020 20.51 10.67 13.4509
 352. 1021 20.51 10.67 13.9673; 1022 20.51 10.67 14.4836; 1023 20.51 10.67 15
 353. 1024 20.51 10.67 15.5; 1025 20.51 10.67 16; 1026 20.51 10.67 16.5
 354. 1027 20.51 10.67 17; 1028 20.51 10.67 17.5; 1029 20.51 10.67 18
 355. 1030 20.51 10.67 18.4917; 1031 20.51 10.67 18.9833; 1032 20.51 10.67 19.475
 356. 1033 20.51 10.67 19.9667; 1034 20.51 10.67 20.4583; 1035 20.51 10.67 20.95
 357. 1036 20.51 10.67 21.4417; 1037 20.51 10.67 21.9333; 1038 20.51 10.67 22.425
 358. 1039 20.51 10.67 22.9167; 1040 20.51 10.67 23.4083; 1041 20.51 10.67 23.9
 359. 1042 20.51 11.1417 9.32; 1043 20.51 11.1417 9.83636
 360. 1044 20.51 11.1417 10.3527; 1045 20.51 11.1417 10.8691
 361. 1046 20.51 11.1417 11.3855; 1047 20.51 11.1417 11.9018
 362. 1048 20.51 11.1417 12.4182; 1049 20.51 11.1417 12.9345
 363. 1050 20.51 11.1417 13.4509; 1051 20.51 11.1417 13.9673
 364. 1052 20.51 11.1417 14.4836; 1053 20.51 11.1417 15; 1054 20.51 11.1417 15.5
 365. 1055 20.51 11.1417 16; 1056 20.51 11.1417 16.5; 1057 20.51 11.1417 17
 366. 1058 20.51 11.1417 17.5; 1059 20.51 11.1417 18; 1060 20.51 11.1657 18
 367. 1061 20.51 11.1657 18.4917; 1062 20.51 11.1657 18.9833
 368. 1063 20.51 11.1657 19.475; 1064 20.51 11.1657 19.9667
 369. 1065 20.51 11.1657 20.4583; 1066 20.51 11.1657 20.95
 370. 1067 20.51 11.1657 21.4417; 1068 20.51 11.1657 21.9333
 371. 1069 20.51 11.1657 22.425; 1070 20.51 11.1657 22.9167
 372. 1071 20.51 11.1657 23.4083; 1072 20.51 11.1657 23.9; 1073 20.51 11.6133 9.32
 373. 1074 20.51 11.6133 9.83636; 1075 20.51 11.6133 10.3527
 374. 1076 20.51 11.6133 10.8691; 1077 20.51 11.6133 11.3855
 375. 1078 20.51 11.6133 11.9018; 1079 20.51 11.6133 12.4182
 376. 1080 20.51 11.6133 12.9345; 1081 20.51 11.6133 13.4509
 377. 1082 20.51 11.6133 13.9673; 1083 20.51 11.6133 14.4836; 1084 20.51 11.6133 15
 378. 1085 20.51 11.6133 15.5; 1086 20.51 11.6133 16; 1087 20.51 11.6133 16.5
 379. 1088 20.51 11.6133 17; 1089 20.51 11.6133 17.5; 1090 20.51 11.6133 18
 380. 1091 20.51 11.6614 18; 1092 20.51 11.6614 18.4917; 1093 20.51 11.6614 18.9833
 381. 1094 20.51 11.6614 19.475; 1095 20.51 11.6614 19.9667
 382. 1096 20.51 11.6614 20.4583; 1097 20.51 11.6614 20.95
 383. 1098 20.51 11.6614 21.4417; 1099 20.51 11.6614 21.9333
 384. 1100 20.51 11.6614 22.425; 1101 20.51 11.6614 22.9167
 385. 1102 20.51 11.6614 23.4083; 1103 20.51 11.6614 23.9; 1104 20.51 12.085 9.32
 386. 1105 20.51 12.085 9.83636; 1106 20.51 12.085 10.3527
 387. 1107 20.51 12.085 10.8691; 1108 20.51 12.085 11.3855
 388. 1109 20.51 12.085 11.9018; 1110 20.51 12.085 12.4182
 389. 1111 20.51 12.085 12.9345; 1112 20.51 12.085 13.4509
 390. 1113 20.51 12.085 13.9673; 1114 20.51 12.085 14.4836; 1115 20.51 12.085 15



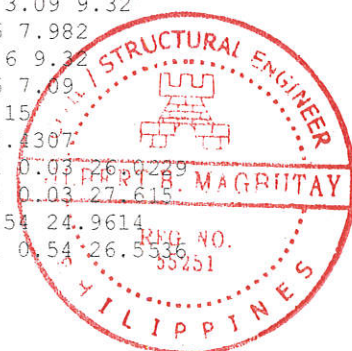
391. 1116 20.51 12.085 15.5; 1117 20.51 12.085 16; 1118 20.51 12.085 16.5
 392. 1119 20.51 12.085 17; 1120 20.51 12.085 17.5; 1121 20.51 12.085 18
 393. 1122 20.51 12.1571 18; 1123 20.51 12.1571 18.4917; 1124 20.51 12.1571 18.9833
 394. 1125 20.51 12.1571 19.475; 1126 20.51 12.1571 19.9667
 395. 1127 20.51 12.1571 20.4583; 1128 20.51 12.1571 20.95
 396. 1129 20.51 12.1571 21.4417; 1130 20.51 12.1571 21.9333
 397. 1131 20.51 12.1571 22.425; 1132 20.51 12.1571 22.9167
 398. 1133 20.51 12.1571 23.4083; 1134 20.51 12.1571 23.9; 1135 20.51 12.5517 9.32
 399. 1136 20.51 12.5517 9.83636; 1137 20.51 12.5517 10.3527
 400. 1138 20.51 12.5517 10.8691; 1139 20.51 12.5517 11.3855
 401. 1140 20.51 12.5517 11.9018; 1141 20.51 12.5517 12.4182
 402. 1142 20.51 12.5517 12.9345; 1143 20.51 12.5517 13.4509
 403. 1144 20.51 12.5517 13.9673; 1145 20.51 12.5517 14.4836; 1146 20.51 12.5517 15
 404. 1147 20.51 12.5517 18; 1148 20.51 12.6529 18; 1149 20.51 12.6529 18.4917
 405. 1150 20.51 12.6529 18.9833; 1151 20.51 12.6529 19.475
 406. 1152 20.51 12.6529 19.9667; 1153 20.51 12.6529 20.4583
 407. 1154 20.51 12.6529 20.95; 1155 20.51 12.6529 21.4417
 408. 1156 20.51 12.6529 21.9333; 1157 20.51 12.6529 22.425
 409. 1158 20.51 12.6529 22.9167; 1159 20.51 12.6529 23.4083
 410. 1160 20.51 12.6529 23.9; 1161 20.51 13.0183 9.32; 1162 20.51 13.0183 9.83636
 411. 1163 20.51 13.0183 10.3527; 1164 20.51 13.0183 10.8691
 412. 1165 20.51 13.0183 11.3855; 1166 20.51 13.0183 11.9018
 413. 1167 20.51 13.0183 12.4182; 1168 20.51 13.0183 12.9345
 414. 1169 20.51 13.0183 13.4509; 1170 20.51 13.0183 13.9673
 415. 1171 20.51 13.0183 14.4836; 1172 20.51 13.0183 15; 1173 20.51 13.0183 18
 416. 1174 20.51 13.1486 18; 1175 20.51 13.1486 18.4917; 1176 20.51 13.1486 18.9833
 417. 1177 20.51 13.1486 19.475; 1178 20.51 13.1486 19.9667
 418. 1179 20.51 13.1486 20.4583; 1180 20.51 13.1486 20.95
 419. 1181 20.51 13.1486 21.4417; 1182 20.51 13.1486 21.9333
 420. 1183 20.51 13.1486 22.425; 1184 20.51 13.1486 22.9167
 421. 1185 20.51 13.1486 23.4083; 1186 20.51 13.1486 23.9; 1187 20.51 13.485 9.32
 422. 1188 20.51 13.485 9.83636; 1189 20.51 13.485 10.3527
 423. 1190 20.51 13.485 10.8691; 1191 20.51 13.485 11.3855
 424. 1192 20.51 13.485 11.9018; 1193 20.51 13.485 12.4182
 425. 1194 20.51 13.485 12.9345; 1195 20.51 13.485 13.4509
 426. 1196 20.51 13.485 13.9673; 1197 20.51 13.485 14.4836; 1198 20.51 13.485 15
 427. 1199 20.51 13.485 18; 1200 20.51 13.6443 18; 1201 20.51 13.6443 18.4917
 428. 1202 20.51 13.6443 18.9833; 1203 20.51 13.6443 19.475
 429. 1204 20.51 13.6443 19.9667; 1205 20.51 13.6443 20.4583
 430. 1206 20.51 13.6443 20.95; 1207 20.51 13.6443 21.4417
 431. 1208 20.51 13.6443 21.9333; 1209 20.51 13.6443 22.425
 432. 1210 20.51 13.6443 22.9167; 1211 20.51 13.6443 23.4083
 433. 1212 20.51 13.6443 23.9; 1213 20.51 13.9517 9.32; 1214 20.51 13.9517 9.83636
 434. 1215 20.51 13.9517 10.3527; 1216 20.51 13.9517 10.8691
 435. 1217 20.51 13.9517 11.3855; 1218 20.51 13.9517 11.9018
 436. 1219 20.51 13.9517 12.4182; 1220 20.51 13.9517 12.9345
 437. 1221 20.51 13.9517 13.4509; 1222 20.51 13.9517 13.9673
 438. 1223 20.51 13.9517 14.4836; 1224 20.51 13.9517 15; 1225 20.51 13.9517 18
 439. 1226 20.51 14.14 18; 1227 20.51 14.14 18.4917; 1228 20.51 14.14 18.9833
 440. 1229 20.51 14.14 19.475; 1230 20.51 14.14 19.9667; 1231 20.51 14.14 20.4583
 441. 1232 20.51 14.14 20.95; 1233 20.51 14.14 21.4417; 1234 20.51 14.14 21.9333
 442. 1235 20.51 14.14 22.425; 1236 20.51 14.14 22.9167; 1237 20.51 14.14 23.4083
 443. 1238 20.51 14.14 23.9; 1239 20.51 14.4183 9.32; 1240 20.51 14.4183 9.83636
 444. 1241 20.51 14.4183 10.3527; 1242 20.51 14.4183 10.8691
 445. 1243 20.51 14.4183 11.3855; 1244 20.51 14.4183 11.9018
 446. 1245 20.51 14.4183 12.4182; 1246 20.51 14.4183 12.9345
 447. 1247 20.51 14.4183 13.4509; 1248 20.51 14.4183 13.9673
 448. 1249 20.51 14.4183 14.4836; 1250 20.51 14.4183 15; 1251 20.51 14.4183 18
 449. 1252 20.51 14.885 9.32; 1253 20.51 14.885 9.83059; 1254 20.51 14.885 10.3527
 450. 1255 20.51 14.885 10.8691; 1256 20.51 14.885 11.3855
 451. 1257 20.51 14.885 11.9018; 1258 20.51 14.885 12.4182
 452. 1259 20.51 14.885 12.9345; 1260 20.51 14.885 13.4509
 453. 1261 20.51 14.885 13.9673; 1262 20.51 14.885 14.4836
 454. 1263 20.51 14.885 15; 1264 20.51 14.885 18
 455. 1265 20.51 14.885 18.4917; 1266 20.51 14.885 18.9833
 456. 1267 20.51 14.885 19.475; 1268 20.51 14.885 19.9667
 457. 1269 20.51 14.885 20.4583; 1270 20.51 14.885 20.95



453. 1271 20.51 14.885 14.4259; 1272 20.51 14.885 14.4836
 459. 1273 20.51 14.885 14.9365; 1274 20.51 14.885 15; 1275 20.51 14.885 15.4471
 460. 1276 20.51 14.885 15.9576; 1277 20.51 14.885 16.4682
 461. 1278 20.51 14.885 16.9788; 1279 20.51 14.885 17.4894; 1280 20.51 14.885 18
 462. 1281 20.51 15.185 9.32; 1282 20.51 15.1993 9.83059; 1283 20.51 15.2136 10.3412
 463. 1284 20.51 15.2279 10.8518; 1285 20.51 15.2423 11.3624
 464. 1286 20.51 15.2566 11.8729; 1287 20.51 15.2709 12.3835
 465. 1288 20.51 15.2852 12.8941; 1289 20.51 15.2995 13.4047
 466. 1290 20.51 15.3138 13.9153; 1291 20.51 15.3281 14.4259
 467. 1292 20.51 15.3425 14.9365; 1293 20.51 15.3568 15.4471
 468. 1294 20.51 15.3711 15.9576; 1295 20.51 15.3854 16.4682
 469. 1296 20.51 15.3997 16.9788; 1297 20.51 15.414 17.4894; 1298 20.51 15.4283 18
 470. 1299 20.51 15.485 9.32; 1300 20.51 15.5136 9.83059; 1301 20.51 15.5423 10.3412
 471. 1302 20.51 15.5709 10.8518; 1303 20.51 15.5995 11.3624
 472. 1304 20.51 15.6281 11.8729; 1305 20.51 15.6568 12.3835
 473. 1306 20.51 15.6854 12.8941; 1307 20.51 15.714 13.4047
 474. 1308 20.51 15.7426 13.9153; 1309 20.51 15.7713 14.4259; 1310 20.51 15.785 9.32
 475. 1311 20.51 15.7999 14.9365; 1312 20.51 15.8279 9.83059
 476. 1313 20.51 15.8285 15.4471; 1314 20.51 15.8572 15.9576
 477. 1315 20.51 15.8709 10.3412; 1316 20.51 15.8858 16.4682
 478. 1317 20.51 15.9138 10.8518; 1318 20.51 15.9144 16.9788
 479. 1319 20.51 15.943 17.4894; 1320 20.51 15.9568 11.3624; 1321 20.51 15.9717 18
 480. 1322 20.51 15.9997 11.8729; 1323 20.51 16.0426 12.3835
 481. 1324 20.51 16.0856 12.8941; 1325 20.51 16.1285 13.4047
 482. 1326 20.51 16.1715 13.9153; 1327 20.51 16.2144 14.4259
 483. 1328 20.51 16.2574 14.9365; 1329 20.51 16.3003 15.4471
 484. 1330 20.51 16.3432 15.9576; 1331 20.51 16.3862 16.4682
 485. 1332 20.51 16.4291 16.9788; 1333 20.51 16.4721 17.4894; 1334 20.51 16.515 18
 486. 1335 21.01 10.67 18; 1336 21.01 11.1417 18; 1337 21.01 11.6133 18
 487. 1338 21.01 12.085 18; 1339 21.01 12.5517 18; 1340 21.01 13.0183 18
 488. 1341 21.01 13.485 18; 1342 21.01 13.9517 18; 1343 21.01 14.4183 18
 489. 1344 21.01 14.885 18; 1345 21.01 15.4283 18; 1346 21.01 15.9717 18
 490. 1347 21.01 16.515 18; 1348 21.51 10.67 18; 1349 21.51 11.1417 18
 491. 1350 21.51 11.6133 18; 1351 21.51 12.085 18; 1352 21.51 12.5517 18
 492. 1353 21.51 13.0183 18; 1354 21.51 13.485 18; 1355 21.51 13.9517 18
 493. 1356 21.51 14.4183 18; 1357 21.51 14.885 18; 1358 21.51 15.4283 18
 494. 1359 21.51 15.9717 18; 1360 21.51 16.515 18; 1361 21.85 0.03 3.425
 495. 1362 21.85 0.03 6.95; 1363 21.85 3.6 3.425; 1364 21.85 3.6 6.85
 496. 1365 21.85 3.6 8.995; 1366 21.85 3.6 9.32; 1367 21.85 7.15 3.425
 497. 1368 21.85 7.15 6.85; 1369 21.85 7.15 9.02; 1370 21.85 7.15 9.32
 498. 1371 22.01 10.67 18; 1372 22.01 11.1417 18; 1373 22.01 11.6133 18
 499. 1374 22.01 12.085 18; 1375 22.01 12.5517 18; 1376 22.01 13.0183 18
 500. 1377 22.01 13.485 18; 1378 22.01 13.9517 18; 1379 22.01 14.4183 18
 501. 1380 22.01 14.885 18; 1381 22.01 15.4283 18; 1382 22.01 15.9717 18
 502. 1383 22.01 16.515 18; 1384 22.51 10.67 18; 1385 22.51 11.1417 18
 503. 1386 22.51 11.6133 18; 1387 22.51 12.085 18; 1388 22.51 12.5517 18
 504. 1389 22.51 13.0183 18; 1390 22.51 13.485 18; 1391 22.51 13.9517 18
 505. 1392 22.51 14.4183 18; 1393 22.51 14.885 18; 1394 22.51 15.4283 18
 506. 1395 22.51 15.9717 18; 1396 22.51 16.515 18; 1397 23.01 10.67 18
 507. 1398 23.01 11.1417 18; 1399 23.01 11.6133 18; 1400 23.01 12.085 18
 508. 1401 23.01 12.5517 18; 1402 23.01 13.0183 18; 1403 23.01 13.485 18
 509. 1404 23.01 13.9517 18; 1405 23.01 14.4183 18; 1406 23.01 14.885 18
 510. 1407 23.01 15.4283 18; 1408 23.01 15.9717 18; 1409 23.01 16.515 18
 511. 1410 23.51 10.67 18; 1411 23.51 11.1417 18; 1412 23.51 11.6133 18
 512. 1413 23.51 12.085 18; 1414 23.51 12.5517 18; 1415 23.51 13.0183 18
 513. 1416 23.51 13.485 18; 1417 23.51 13.9517 18; 1418 23.51 14.4183 18
 514. 1419 23.51 14.885 18; 1420 23.51 15.4283 18; 1421 23.51 15.9717 18
 515. 1422 23.51 16.515 18; 1423 24.01 10.67 18; 1424 24.01 11.1417 18
 516. 1425 24.01 11.6133 18; 1426 24.01 12.085 18; 1427 24.01 12.5517 18
 517. 1428 24.01 13.0183 18; 1429 24.01 13.485 18; 1430 24.01 13.9517 18
 518. 1431 24.01 14.4183 18; 1432 24.01 14.885 18; 1433 24.01 15.4283 18
 519. 1434 24.01 15.9717 18; 1435 24.01 16.515 18; 1436 24.51 0.03 7.09
 520. 1437 24.51 0.03 7.536; 1438 24.51 0.03 7.982; 1439 24.51 0.03 8.428
 521. 1440 24.51 0.03 8.874; 1441 24.51 0.03 9.32; 1442 24.51 0.03 15.428
 522. 1443 24.51 0.03 18; 1444 24.51 0.03 23.9; 1445 24.51 0.54 7.09
 523. 1446 24.51 0.54 7.536; 1447 24.51 0.54 7.982; 1448 24.51 0.54 8.428
 524. 1449 24.51 0.54 8.874; 1450 24.51 0.54 9.32; 1451 24.51 1.05 7.09



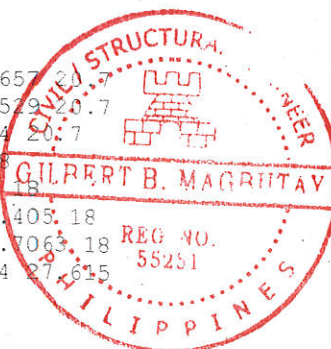
525. 1452 24.51 1.05 7.536; 1453 24.51 1.05 7.982; 1454 24.51 1.05 8.428
 526. 1455 24.51 1.05 8.874; 1456 24.51 1.05 9.32; 1457 24.51 1.56 7.09
 527. 1458 24.51 1.56 7.536; 1459 24.51 1.56 7.982; 1460 24.51 1.56 8.428
 528. 1461 24.51 1.56 8.874; 1462 24.51 1.56 9.32; 1463 24.51 2.07 7.09
 529. 1464 24.51 2.07 7.536; 1465 24.51 2.07 7.982; 1466 24.51 2.07 8.428
 530. 1467 24.51 2.07 8.874; 1468 24.51 2.07 9.32; 1469 24.51 2.58 7.09
 531. 1470 24.51 2.58 7.536; 1471 24.51 2.58 7.982; 1472 24.51 2.58 8.428
 532. 1473 24.51 2.58 8.874; 1474 24.51 2.58 9.32; 1475 24.51 3.09 7.09
 533. 1476 24.51 3.09 7.536; 1477 24.51 3.09 7.982; 1478 24.51 3.09 8.428
 534. 1479 24.51 3.09 8.874; 1480 24.51 3.09 9.32; 1481 24.51 3.6 3.425
 535. 1482 24.51 3.6 6.19; 1483 24.51 3.6 6.85; 1484 24.51 3.6 7.09
 536. 1485 24.51 3.6 7.536; 1486 24.51 3.6 7.982; 1487 24.51 3.6 8.428
 537. 1488 24.51 3.6 8.874; 1489 24.51 3.6 8.995; 1490 24.51 3.6 9.32
 538. 1491 24.51 3.6 15; 1492 24.51 3.6 18; 1493 24.51 3.6 23.9
 539. 1494 24.51 7.15 3.425; 1495 24.51 7.15 6.85; 1496 24.51 7.15 9.02
 540. 1497 24.51 7.15 9.32; 1498 24.51 7.15 15; 1499 24.51 7.15 18
 541. 1500 24.51 7.15 23.9; 1501 24.51 10.67 9.32; 1502 24.51 10.67 18
 542. 1503 24.51 10.67 23.9; 1504 24.51 11.1417 18; 1505 24.51 11.6133 18
 543. 1506 24.51 12.085 9.32; 1507 24.51 12.085 18; 1508 24.51 12.5517 18
 544. 1509 24.51 13.0183 18; 1510 24.51 13.485 18; 1511 24.51 13.9517 18
 545. 1512 24.51 14.14 18; 1513 24.51 14.14 23.9; 1514 24.51 14.4183 18
 546. 1515 24.51 14.885 18; 1516 24.51 15.4283 18; 1517 24.51 15.785 9.32
 547. 1518 24.51 15.9717 18; 1519 24.51 16.515 18; 1520 24.947 0.03 7.09
 548. 1521 24.947 0.03 9.32; 1522 24.947 0.54 7.09; 1523 24.947 0.54 9.32
 549. 1524 24.947 1.05 7.09; 1525 24.947 1.05 9.32; 1526 24.947 1.56 7.09
 550. 1527 24.947 1.56 9.32; 1528 24.947 2.07 7.09; 1529 24.947 2.07 9.32
 551. 1530 24.947 2.58 7.09; 1531 24.947 2.58 9.32; 1532 24.947 3.09 7.09
 552. 1533 24.947 3.09 9.32; 1534 24.947 3.6 7.09; 1535 24.947 3.6 9.32
 553. 1536 25.384 0.03 7.09; 1537 25.384 0.03 9.32; 1538 25.384 0.54 7.09
 554. 1539 25.384 0.54 9.32; 1540 25.384 1.05 7.09; 1541 25.384 1.05 9.32
 555. 1542 25.384 1.56 7.09; 1543 25.384 1.56 9.32; 1544 25.384 2.07 7.09
 556. 1545 25.384 2.07 9.32; 1546 25.384 2.58 7.09; 1547 25.384 2.58 9.32
 557. 1548 25.384 3.09 7.09; 1549 25.384 3.09 9.32; 1550 25.384 3.6 7.09
 558. 1551 25.384 3.6 9.32; 1552 25.821 0.03 7.09; 1553 25.821 0.03 9.32
 559. 1554 25.821 0.54 7.09; 1555 25.821 0.54 9.32; 1556 25.821 1.05 7.09
 560. 1557 25.821 1.05 9.32; 1558 25.821 1.56 7.09; 1559 25.821 1.56 9.32
 561. 1560 25.821 2.07 7.09; 1561 25.821 2.07 9.32; 1562 25.821 2.58 7.09
 562. 1563 25.821 2.58 9.32; 1564 25.821 3.09 7.09; 1565 25.821 3.09 9.32
 563. 1566 25.821 3.6 7.09; 1567 25.821 3.6 9.32; 1568 26.258 0.03 7.09
 564. 1569 26.258 0.03 9.32; 1570 26.258 0.54 7.09; 1571 26.258 0.54 9.32
 565. 1572 26.258 1.05 7.09; 1573 26.258 1.05 9.32; 1574 26.258 1.56 7.09
 566. 1575 26.258 1.56 9.32; 1576 26.258 2.07 7.09; 1577 26.258 2.07 9.32
 567. 1578 26.258 2.58 7.09; 1579 26.258 2.58 9.32; 1580 26.258 3.09 7.09
 568. 1581 26.258 3.09 9.32; 1582 26.258 3.6 7.09; 1583 26.258 3.6 9.32
 569. 1584 26.695 0.03 7.09; 1585 26.695 0.03 7.536; 1586 26.695 0.03 7.982
 570. 1587 26.695 0.03 8.428; 1588 26.695 0.03 8.874; 1589 26.695 0.03 9.32
 571. 1590 26.695 0.54 7.09; 1591 26.695 0.54 7.536; 1592 26.695 0.54 7.982
 572. 1593 26.695 0.54 8.428; 1594 26.695 0.54 8.874; 1595 26.695 0.54 9.32
 573. 1596 26.695 1.05 7.09; 1597 26.695 1.05 7.536; 1598 26.695 1.05 7.982
 574. 1599 26.695 1.05 8.428; 1600 26.695 1.05 8.874; 1601 26.695 1.05 9.32
 575. 1602 26.695 1.56 7.09; 1603 26.695 1.56 7.536; 1604 26.695 1.56 7.982
 576. 1605 26.695 1.56 8.428; 1606 26.695 1.56 8.874; 1607 26.695 1.56 9.32
 577. 1608 26.695 2.07 7.09; 1609 26.695 2.07 7.536; 1610 26.695 2.07 7.982
 578. 1611 26.695 2.07 8.428; 1612 26.695 2.07 8.874; 1613 26.695 2.07 9.32
 579. 1614 26.695 2.58 7.09; 1615 26.695 2.58 7.536; 1616 26.695 2.58 7.982
 580. 1617 26.695 2.58 8.428; 1618 26.695 2.58 8.874; 1619 26.695 2.58 9.32
 581. 1620 26.695 3.09 7.09; 1621 26.695 3.09 7.536; 1622 26.695 3.09 7.982
 582. 1623 26.695 3.09 8.428; 1624 26.695 3.09 8.874; 1625 26.695 3.09 9.32
 583. 1626 26.695 3.6 7.09; 1627 26.695 3.6 7.536; 1628 26.695 3.6 7.982
 584. 1629 26.695 3.6 8.428; 1630 26.695 3.6 8.874; 1631 26.695 3.6 9.32
 585. 1632 26.695 7.15 9.32; 1633 27.595 3.6 6.19; 1634 27.595 3.6 7.09
 586. 1635 27.595 3.6 9.32; 1636 28.51 0.03 9.32; 1637 28.51 0.03 15
 587. 1638 28.51 0.03 18; 1639 28.51 0.03 23.9; 1640 28.51 0.03 24.4307
 588. 1641 28.51 0.03 24.9614; 1642 28.51 0.03 25.4921; 1643 28.51 0.03 26.0229
 589. 1644 28.51 0.03 26.5536; 1645 28.51 0.03 27.0843; 1646 28.51 0.03 27.615
 590. 1647 28.51 0.54 23.9; 1648 28.51 0.54 24.4307; 1649 28.51 0.54 24.9614
 591. 1650 28.51 0.54 25.4921; 1651 28.51 0.54 26.0229; 1652 28.51 0.54 26.5536



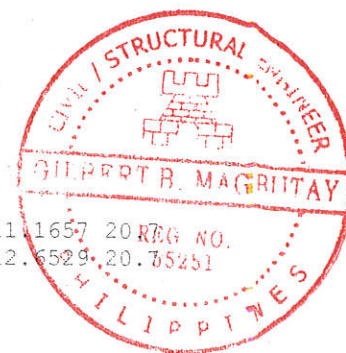
592. 1653 28.51 0.54 27.0843; 1654 28.51 0.54 27.615; 1655 28.51 1.05 23.9
 593. 1656 28.51 1.05 24.4307; 1657 28.51 1.05 24.9614; 1658 28.51 1.05 25.4921
 594. 1659 28.51 1.05 26.0229; 1660 28.51 1.05 26.5536; 1661 28.51 1.05 27.0843
 595. 1662 28.51 1.05 27.615; 1663 28.51 1.56 23.9; 1664 28.51 1.56 24.4307
 596. 1665 28.51 1.56 24.9614; 1666 28.51 1.56 25.4921; 1667 28.51 1.56 26.0229
 597. 1668 28.51 1.56 26.5536; 1669 28.51 1.56 27.0843; 1670 28.51 1.56 27.615
 598. 1671 28.51 2.07 23.9; 1672 28.51 2.07 24.4307; 1673 28.51 2.07 24.9614
 599. 1674 28.51 2.07 25.4921; 1675 28.51 2.07 26.0229; 1676 28.51 2.07 26.5536
 600. 1677 28.51 2.07 27.0843; 1678 28.51 2.07 27.615; 1679 28.51 2.58 23.9
 601. 1680 28.51 2.58 24.4307; 1681 28.51 2.58 24.9614; 1682 28.51 2.58 25.4921
 602. 1683 28.51 2.58 26.0229; 1684 28.51 2.58 26.5536; 1685 28.51 2.58 27.0843
 603. 1686 28.51 2.58 27.615; 1687 28.51 3.09 23.9; 1688 28.51 3.09 24.4307
 604. 1689 28.51 3.09 24.9614; 1690 28.51 3.09 25.4921; 1691 28.51 3.09 26.0229
 605. 1692 28.51 3.09 26.5536; 1693 28.51 3.09 27.0843; 1694 28.51 3.09 27.615
 606. 1695 28.51 3.6 9.32; 1696 28.51 3.6 15; 1697 28.51 3.6 18; 1698 28.51 3.6 23.9
 607. 1699 28.51 3.6 24.4307; 1700 28.51 3.6 24.9614; 1701 28.51 3.6 25
 608. 1702 28.51 3.6 25.4921; 1703 28.51 3.6 26.0229; 1704 28.51 3.6 26.5536
 609. 1705 28.51 3.6 26.595; 1706 28.51 3.6 27.0843; 1707 28.51 3.6 27.615
 610. 1708 28.51 4.10714 23.9; 1709 28.51 4.10714 24.4307
 611. 1710 28.51 4.10714 24.9614; 1711 28.51 4.10714 25.4921
 612. 1712 28.51 4.10714 26.0229; 1713 28.51 4.10714 26.5536
 613. 1714 28.51 4.10714 27.0843; 1715 28.51 4.10714 27.615; 1716 28.51 4.61429 23.9
 614. 1717 28.51 4.61429 24.4307; 1718 28.51 4.61429 24.9614
 615. 1719 28.51 4.61429 25.4921; 1720 28.51 4.61429 26.0229
 616. 1721 28.51 4.61429 26.5536; 1722 28.51 4.61429 27.0843
 617. 1723 28.51 4.61429 27.615; 1724 28.51 5.12143 23.9; 1725 28.51 5.12143 24.4307
 618. 1726 28.51 5.12143 24.9614; 1727 28.51 5.12143 25.4921
 619. 1728 28.51 5.12143 26.0229; 1729 28.51 5.12143 26.5536
 620. 1730 28.51 5.12143 27.0843; 1731 28.51 5.12143 27.615; 1732 28.51 5.62857 23.9
 621. 1733 28.51 5.62857 24.4307; 1734 28.51 5.62857 24.9614
 622. 1735 28.51 5.62857 25.4921; 1736 28.51 5.62857 26.0229
 623. 1737 28.51 5.62857 26.5536; 1738 28.51 5.62857 27.0843
 624. 1739 28.51 5.62857 27.615; 1740 28.51 6.13571 23.9; 1741 28.51 6.13571 24.4307
 625. 1742 28.51 6.13571 24.9614; 1743 28.51 6.13571 25.4921
 626. 1744 28.51 6.13571 26.0229; 1745 28.51 6.13571 26.5536
 627. 1746 28.51 6.13571 27.0843; 1747 28.51 6.13571 27.615; 1748 28.51 6.64286 23.9
 628. 1749 28.51 6.64286 24.4307; 1750 28.51 6.64286 24.9614
 629. 1751 28.51 6.64286 25.4921; 1752 28.51 6.64286 26.0229
 630. 1753 28.51 6.64286 26.5536; 1754 28.51 6.64286 27.0843
 631. 1755 28.51 6.64286 27.615; 1756 28.51 7.15 9.32; 1757 28.51 7.15 15
 632. 1758 28.51 7.15 18; 1759 28.51 7.15 23.9; 1760 28.51 7.15 24.4307
 633. 1761 28.51 7.15 24.9614; 1762 28.51 7.15 25; 1763 28.51 7.15 25.4921
 634. 1764 28.51 7.15 26.0229; 1765 28.51 7.15 26.5536; 1766 28.51 7.15 26.595
 635. 1767 28.51 7.15 27.0843; 1768 28.51 7.15 27.615; 1769 28.51 7.65286 23.9
 636. 1770 28.51 7.65286 24.4307; 1771 28.51 7.65286 24.9614
 637. 1772 28.51 7.65286 25.4921; 1773 28.51 7.65286 26.0229
 638. 1774 28.51 7.65286 26.5536; 1775 28.51 7.65286 27.0843
 639. 1776 28.51 7.65286 27.615; 1777 28.51 8.15571 23.9; 1778 28.51 8.15571 24.4307
 640. 1779 28.51 8.15571 24.9614; 1780 28.51 8.15571 25.4921
 641. 1781 28.51 8.15571 26.0229; 1782 28.51 8.15571 26.5536
 642. 1783 28.51 8.15571 27.0843; 1784 28.51 8.15571 27.615; 1785 28.51 8.65857 23.9
 643. 1786 28.51 8.65857 24.4307; 1787 28.51 8.65857 24.9614
 644. 1788 28.51 8.65857 25.4921; 1789 28.51 8.65857 26.0229
 645. 1790 28.51 8.65857 26.5536; 1791 28.51 8.65857 27.0843
 646. 1792 28.51 8.65857 27.615; 1793 28.51 9.16143 23.9; 1794 28.51 9.16143 24.4307
 647. 1795 28.51 9.16143 24.9614; 1796 28.51 9.16143 25.4921
 648. 1797 28.51 9.16143 26.0229; 1798 28.51 9.16143 26.5536
 649. 1799 28.51 9.16143 27.0843; 1800 28.51 9.16143 27.615; 1801 28.51 9.66429 23.9
 650. 1802 28.51 9.66429 24.4307; 1803 28.51 9.66429 24.9614
 651. 1804 28.51 9.66429 25.4921; 1805 28.51 9.66429 26.0229
 652. 1806 28.51 9.66429 26.5536; 1807 28.51 9.66429 27.0843
 653. 1808 28.51 9.66429 27.615; 1809 28.51 10.1671 23.9; 1810 28.51 10.1671 24.4307
 654. 1811 28.51 10.1671 24.9614; 1812 28.51 10.1671 25.4921
 655. 1813 28.51 10.1671 26.0229; 1814 28.51 10.1671 26.5536
 656. 1815 28.51 10.1671 27.0843; 1816 28.51 10.1671 27.615; 1817 28.51 10.67 9.32
 657. 1818 28.51 10.67 18; 1819 28.51 10.67 18.54; 1820 28.51 10.67 19.08
 658. 1821 28.51 10.67 19.62; 1822 28.51 10.67 20.11; 1823 28.51 10.67 20.18



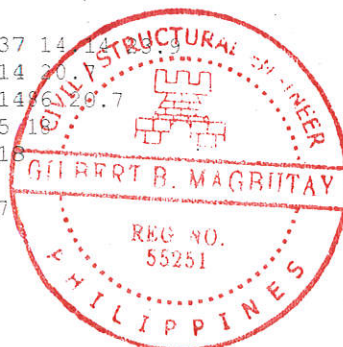
659. 1824 28.51 10.67 20.7; 1825 28.51 10.67 23.9; 1826 28.51 10.67 24.4307
 660. 1827 28.51 10.67 24.9614; 1828 28.51 10.67 25.4921; 1829 28.51 10.67 26.0229
 661. 1830 28.51 10.67 26.5536; 1831 28.51 10.67 26.595; 1832 28.51 10.67 27.0843
 662. 1833 28.51 10.67 27.615; 1834 28.51 11.1038 18; 1835 28.51 11.1657 18
 663. 1836 28.51 11.1657 18.54; 1837 28.51 11.1657 19.08; 1838 28.51 11.1657 19.62
 664. 1839 28.51 11.1657 20.16; 1840 28.51 11.1657 20.7; 1841 28.51 11.1657 23.9
 665. 1842 28.51 11.1657 24.4307; 1843 28.51 11.1657 24.9614
 666. 1844 28.51 11.1657 25.4921; 1845 28.51 11.1657 26.0229
 667. 1846 28.51 11.1657 26.5536; 1847 28.51 11.1657 27.0843
 668. 1848 28.51 11.1657 27.615; 1849 28.51 11.5375 18; 1850 28.51 11.6614 18
 669. 1851 28.51 11.6614 18.54; 1852 28.51 11.6614 19.08; 1853 28.51 11.6614 19.62
 670. 1854 28.51 11.6614 20.16; 1855 28.51 11.6614 20.7; 1856 28.51 11.6614 23.9
 671. 1857 28.51 11.6614 24.4307; 1858 28.51 11.6614 24.9614
 672. 1859 28.51 11.6614 25.4921; 1860 28.51 11.6614 26.0229
 673. 1861 28.51 11.6614 26.5536; 1862 28.51 11.6614 27.0843
 674. 1863 28.51 11.6614 27.615; 1864 28.51 11.9713 18; 1865 28.51 12.085 9.32
 675. 1866 28.51 12.085 18; 1867 28.51 12.1571 18; 1368 28.51 12.1571 18.54
 676. 1869 28.51 12.1571 19.08; 1870 28.51 12.1571 19.62; 1871 28.51 12.1571 20.16
 677. 1872 28.51 12.1571 20.7; 1873 28.51 12.1571 23.9; 1874 28.51 12.1571 24.4307
 678. 1875 28.51 12.1571 24.9614; 1876 28.51 12.1571 25.4921
 679. 1877 28.51 12.1571 26.0229; 1878 28.51 12.1571 26.5536
 680. 1879 28.51 12.1571 27.0843; 1880 28.51 12.1571 27.615; 1881 28.51 12.405 18
 681. 1882 28.51 12.6529 18; 1883 28.51 12.6529 18.54; 1884 28.51 12.6529 19.08
 682. 1885 28.51 12.6529 19.62; 1886 28.51 12.6529 20.16; 1887 28.51 12.6529 20.7
 683. 1888 28.51 12.6529 23.9; 1889 28.51 12.6529 24.4307
 684. 1890 28.51 12.6529 24.9614; 1891 28.51 12.6529 25.4921
 685. 1892 28.51 12.6529 26.0229; 1893 28.51 12.6529 26.5536
 686. 1894 28.51 12.6529 27.0843; 1895 28.51 12.6529 27.615; 1896 28.51 12.8387 18
 687. 1897 28.51 13.1486 18; 1898 28.51 13.1486 18.54; 1899 28.51 13.1486 19.08
 688. 1900 28.51 13.1486 19.62; 1901 28.51 13.1486 20.16; 1902 28.51 13.1486 20.7
 689. 1903 28.51 13.1486 23.9; 1904 28.51 13.1486 24.4307
 690. 1905 28.51 13.1486 24.9614; 1906 28.51 13.1486 25.4921
 691. 1907 28.51 13.1486 26.0229; 1908 28.51 13.1486 26.5536
 692. 1909 28.51 13.1486 27.0843; 1910 28.51 13.1486 27.615; 1911 28.51 13.2725 18
 693. 1912 28.51 13.6443 18; 1913 28.51 13.6443 18.54; 1914 28.51 13.6443 19.08
 694. 1915 28.51 13.6443 19.62; 1916 28.51 13.6443 20.16; 1917 28.51 13.6443 20.7
 695. 1918 28.51 13.6443 23.9; 1919 28.51 13.6443 24.4307
 696. 1920 28.51 13.6443 24.9614; 1921 28.51 13.6443 25.4921
 697. 1922 28.51 13.6443 26.0229; 1923 28.51 13.6443 26.5536
 698. 1924 28.51 13.6443 27.0843; 1925 28.51 13.6443 27.615; 1926 28.51 13.7063 18
 699. 1927 28.51 14.14 18; 1928 28.51 14.14 18.54; 1929 28.51 14.14 19.08
 700. 1930 28.51 14.14 19.62; 1931 28.51 14.14 20.16; 1932 28.51 14.14 20.7
 701. 1933 28.51 14.14 23.9; 1934 28.51 14.14 24.4307; 1935 28.51 14.14 24.9614
 702. 1936 28.51 14.14 25.4921; 1937 28.51 14.14 26.0229; 1938 28.51 14.14 26.5536
 703. 1939 28.51 14.14 27.0843; 1940 28.51 14.14 27.615; 1941 28.51 14.885 18
 704. 1942 28.51 15.4283 18; 1943 28.51 15.785 9.32; 1944 28.51 15.9717 18
 705. 1945 28.51 16.515 18; 1946 28.9965 0.03 27.615; 1947 28.9965 0.54 27.615
 706. 1948 28.9965 1.05 27.615; 1949 28.9965 1.56 27.615; 1950 28.9965 2.07 27.615
 707. 1951 28.9965 2.58 27.615; 1952 28.9965 3.09 27.615; 1953 28.9965 3.6 27.615
 708. 1954 28.9965 4.10714 27.615; 1955 28.9965 4.61429 27.615
 709. 1956 28.9965 5.12143 27.615; 1957 28.9965 5.62357 27.615
 710. 1958 28.9965 6.13571 27.615; 1959 28.9965 6.64286 27.615
 711. 1960 28.9965 7.15 27.615; 1961 28.9965 7.65286 27.615
 712. 1962 28.9965 8.15571 27.615; 1963 28.9965 8.65357 27.615
 713. 1964 28.9965 9.16143 27.615; 1965 28.9965 9.66429 27.615
 714. 1966 28.9965 10.1671 27.615; 1967 28.9965 10.67 27.615
 715. 1968 28.9965 11.1657 27.615; 1969 28.9965 11.6614 27.615
 716. 1970 28.9965 12.1571 27.615; 1971 28.9965 12.6529 27.615
 717. 1972 28.9965 13.1486 27.615; 1973 28.9965 13.6443 27.615
 718. 1974 28.9965 14.14 27.615; 1975 29.01 10.67 20.7; 1976 29.01 11.1657 20.7
 719. 1977 29.01 11.6614 20.7; 1978 29.01 12.1571 20.7; 1979 29.01 12.6529 20.7
 720. 1980 29.01 13.1486 20.7; 1981 29.01 13.6443 20.7; 1982 29.01 14.14 20.7
 721. 1983 29.01 14.885 18; 1984 29.01 15.4283 18; 1985 29.01 15.9717 18
 722. 1986 29.01 16.515 18; 1987 29.0814 10.67 18; 1988 29.0814 11.1038 18
 723. 1989 29.0814 11.5375 18; 1990 29.0814 11.9713 18; 1991 29.0814 12.405 18
 724. 1992 29.0814 12.8387 18; 1993 29.0814 13.2725 18; 1994 29.0814 13.7063 18
 725. 1995 29.0814 14.14 18; 1996 29.4831 0.03 27.615; 1997 29.4831 0.54 27.615



726. 1998 29.4831 1.05 27.615; 1999 29.4831 1.56 27.615; 2000 29.4831 2.07 27.615
 727. 2001 29.4831 2.58 27.615; 2002 29.4831 3.09 27.615; 2003 29.4831 3.6 27.615
 728. 2004 29.4831 4.10714 27.615; 2005 29.4831 4.61429 27.615
 729. 2006 29.4831 5.12143 27.615; 2007 29.4831 5.62357 27.615
 730. 2008 29.4831 6.13571 27.615; 2009 29.4831 6.64286 27.615
 731. 2010 29.4831 7.15 27.615; 2011 29.4831 7.65286 27.615
 732. 2012 29.4831 8.15571 27.615; 2013 29.4831 8.65357 27.615
 733. 2014 29.4831 9.16143 27.615; 2015 29.4831 9.66429 27.615
 734. 2016 29.4831 10.1671 27.615; 2017 29.4831 10.67 27.615
 735. 2018 29.4831 11.1657 27.615; 2019 29.4831 11.6614 27.615
 736. 2020 29.4831 12.1571 27.615; 2021 29.4831 12.6529 27.615
 737. 2022 29.4831 13.1436 27.615; 2023 29.4831 13.6443 27.615
 738. 2024 29.4831 14.14 27.615; 2025 29.51 10.67 20.7; 2026 29.51 11.1657 20.7
 739. 2027 29.51 11.6614 20.7; 2028 29.51 12.1571 20.7; 2029 29.51 12.6529 20.7
 740. 2030 29.51 13.1486 20.7; 2031 29.51 13.6443 20.7; 2032 29.51 14.14 20.7
 741. 2033 29.51 14.885 18; 2034 29.51 15.4283 18; 2035 29.51 15.9717 18
 742. 2036 29.51 16.515 18; 2037 29.6529 10.67 18; 2038 29.6529 11.1038 18
 743. 2039 29.6529 11.5375 18; 2040 29.6529 11.9713 18; 2041 29.6529 12.405 18
 744. 2042 29.6529 12.8387 18; 2043 29.6529 13.2725 18; 2044 29.6529 13.7063 18
 745. 2045 29.6529 14.14 18; 2046 29.91 0.03 25.76; 2047 29.91 0.03 27.615
 746. 2048 29.91 3.6 23.9; 2049 29.91 3.6 25.76; 2050 29.91 3.6 27.615
 747. 2051 29.91 7.15 23.9; 2052 29.91 7.15 25.76; 2053 29.91 7.15 27.615
 748. 2054 29.91 10.67 23.9; 2055 29.91 10.67 25.76; 2056 29.91 10.67 27.615
 749. 2057 29.9696 0.03 27.615; 2058 29.9696 0.54 27.615; 2059 29.9696 1.05 27.615
 750. 2060 29.9696 1.56 27.615; 2061 29.9696 2.07 27.615; 2062 29.9696 2.58 27.615
 751. 2063 29.9696 3.09 27.615; 2064 29.9696 3.6 27.615; 2065 29.9696 4.10714 27.615
 752. 2066 29.9696 4.61429 27.615; 2067 29.9696 5.12143 27.615
 753. 2068 29.9696 5.62857 27.615; 2069 29.9696 6.13571 27.615
 754. 2070 29.9696 6.64286 27.615; 2071 29.9696 7.15 27.615
 755. 2072 29.9696 7.65286 27.615; 2073 29.9696 8.15571 27.615
 756. 2074 29.9696 8.65857 27.615; 2075 29.9696 9.16143 27.615
 757. 2076 29.9696 9.66429 27.615; 2077 29.9696 10.1671 27.615
 758. 2078 29.9696 10.67 27.615; 2079 29.9696 11.1657 27.615
 759. 2080 29.9696 11.6614 27.615; 2081 29.9696 12.1571 27.615
 760. 2082 29.9696 12.6529 27.615; 2083 29.9696 13.1486 27.615
 761. 2084 29.9696 13.6443 27.615; 2085 29.9696 14.14 27.615; 2086 30.01 10.67 20.7
 762. 2087 30.01 11.1657 20.7; 2088 30.01 11.6614 20.7; 2089 30.01 12.1571 20.7
 763. 2090 30.01 12.6529 20.7; 2091 30.01 13.1486 20.7; 2092 30.01 13.6443 20.7
 764. 2093 30.01 14.14 20.7; 2094 30.01 14.885 18; 2095 30.01 15.4283 18
 765. 2096 30.01 15.9717 18; 2097 30.01 16.515 18; 2098 30.2243 10.67 18
 766. 2099 30.2243 11.1038 18; 2100 30.2243 11.5375 18; 2101 30.2243 11.9713 18
 767. 2102 30.2243 12.405 18; 2103 30.2243 12.8387 18; 2104 30.2243 13.2725 18
 768. 2105 30.2243 13.7063 18; 2106 30.2243 14.14 18; 2107 30.435 0.03 23.9
 769. 2108 30.435 0.54 23.9; 2109 30.435 1.05 23.9; 2110 30.435 1.56 23.9
 770. 2111 30.435 2.07 23.9; 2112 30.435 2.58 23.9; 2113 30.435 3.09 23.9
 771. 2114 30.435 3.6 23.9; 2115 30.435 4.10714 23.9; 2116 30.435 4.61429 23.9
 772. 2117 30.435 5.12143 23.9; 2118 30.435 5.62857 23.9; 2119 30.435 6.13571 23.9
 773. 2120 30.435 6.64286 23.9; 2121 30.435 7.15 23.9; 2122 30.435 7.65286 23.9
 774. 2123 30.435 8.15571 23.9; 2124 30.435 8.65857 23.9; 2125 30.435 9.16143 23.9
 775. 2126 30.435 9.66429 23.9; 2127 30.435 10.1671 23.9; 2128 30.435 10.67 23.9
 776. 2129 30.435 11.1657 23.9; 2130 30.435 11.6614 23.9; 2131 30.435 12.1571 23.9
 777. 2132 30.435 12.6529 23.9; 2133 30.435 13.1486 23.9; 2134 30.435 13.6443 23.9
 778. 2135 30.435 14.14 23.9; 2136 30.4562 0.03 27.615; 2137 30.4562 0.54 27.615
 779. 2138 30.4562 1.05 27.615; 2139 30.4562 1.56 27.615; 2140 30.4562 2.07 27.615
 780. 2141 30.4562 2.58 27.615; 2142 30.4562 3.09 27.615; 2143 30.4562 3.6 27.615
 781. 2144 30.4562 4.10714 27.615; 2145 30.4562 4.61429 27.615
 782. 2146 30.4562 5.12143 27.615; 2147 30.4562 5.62357 27.615
 783. 2148 30.4562 6.13571 27.615; 2149 30.4562 6.64286 27.615
 784. 2150 30.4562 7.15 27.615; 2151 30.4562 7.65286 27.615
 785. 2152 30.4562 8.15571 27.615; 2153 30.4562 8.65357 27.615
 786. 2154 30.4562 9.16143 27.615; 2155 30.4562 9.66429 27.615
 787. 2156 30.4562 10.1671 27.615; 2157 30.4562 10.67 27.615
 788. 2158 30.4562 11.1657 27.615; 2159 30.4562 11.6614 27.615
 789. 2160 30.4562 12.1571 27.615; 2161 30.4562 12.6529 27.615
 790. 2162 30.4562 13.1436 27.615; 2163 30.4562 13.6443 27.615
 791. 2164 30.4562 14.14 27.615; 2165 30.51 10.67 20.7; 2166 30.51 11.1657 20.7
 792. 2167 30.51 11.6614 20.7; 2168 30.51 12.1571 20.7; 2169 30.51 12.6529 20.7



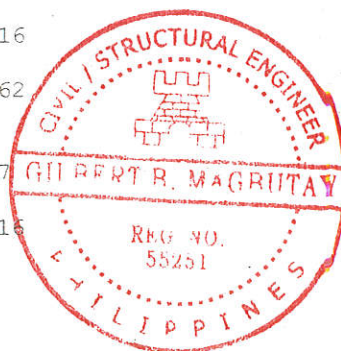
793. 2170 30.51 13.1486 20.7; 2171 30.51 13.6443 20.7; 2172 30.51 14.14 20.7
 794. 2173 30.51 14.885 18; 2174 30.51 15.4283 18; 2175 30.51 15.9717 18
 795. 2176 30.51 16.515 18; 2177 30.61 0.03 18; 2178 30.61 0.03 18.59
 796. 2179 30.61 0.03 20.11; 2180 30.61 0.03 20.7; 2181 30.61 0.54 18
 797. 2182 30.61 0.54 18.59; 2183 30.61 0.54 20.11; 2184 30.61 0.54 20.7
 798. 2185 30.61 1.05 18; 2186 30.61 1.05 18.59; 2187 30.61 1.05 20.11
 799. 2188 30.61 1.05 20.7; 2189 30.61 1.56 18; 2190 30.61 1.56 18.59
 800. 2191 30.61 1.56 20.11; 2192 30.61 1.56 20.7; 2193 30.61 2.07 18
 801. 2194 30.61 2.07 18.59; 2195 30.61 2.07 20.11; 2196 30.61 2.07 20.7
 802. 2197 30.61 2.58 18; 2198 30.61 2.58 18.59; 2199 30.61 2.58 20.11
 803. 2200 30.61 2.58 20.7; 2201 30.61 3.09 18; 2202 30.61 3.09 18.59
 804. 2203 30.61 3.09 20.11; 2204 30.61 3.09 20.7; 2205 30.61 3.6 18
 805. 2206 30.61 3.6 18.59; 2207 30.61 3.6 20.11; 2208 30.61 3.6 20.7
 806. 2209 30.61 4.10714 18; 2210 30.61 4.10714 18.59; 2211 30.61 4.10714 20.11
 807. 2212 30.61 4.10714 20.7; 2213 30.61 4.61429 18; 2214 30.61 4.61429 18.59
 808. 2215 30.61 4.61429 20.11; 2216 30.61 4.61429 20.7; 2217 30.61 5.12143 18
 809. 2218 30.61 5.12143 18.59; 2219 30.61 5.12143 20.11; 2220 30.61 5.12143 20.7
 810. 2221 30.61 5.62857 18; 2222 30.61 5.62857 18.59; 2223 30.61 5.62857 20.11
 811. 2224 30.61 5.62857 20.7; 2225 30.61 6.13571 18; 2226 30.61 6.13571 18.59
 812. 2227 30.61 6.13571 20.11; 2228 30.61 6.13571 20.7; 2229 30.61 6.64286 18
 813. 2230 30.61 6.64286 18.59; 2231 30.61 6.64286 20.11; 2232 30.61 6.64286 20.7
 814. 2233 30.61 7.15 18; 2234 30.61 7.15 18.59; 2235 30.61 7.15 20.11
 815. 2236 30.61 7.15 20.7; 2237 30.61 7.65286 18; 2238 30.61 7.65286 18.59
 816. 2239 30.61 7.65286 20.11; 2240 30.61 7.65286 20.7; 2241 30.61 8.15571 18
 817. 2242 30.61 8.15571 18.59; 2243 30.61 8.15571 20.11; 2244 30.61 8.15571 20.7
 818. 2245 30.61 8.65857 18; 2246 30.61 8.65857 18.59; 2247 30.61 8.65857 20.11
 819. 2248 30.61 8.65857 20.7; 2249 30.61 9.16143 18; 2250 30.61 9.16143 18.59
 820. 2251 30.61 9.16143 20.11; 2252 30.61 9.16143 20.7; 2253 30.61 9.66429 18
 821. 2254 30.61 9.66429 18.59; 2255 30.61 9.66429 20.11; 2256 30.61 9.66429 20.7
 822. 2257 30.61 10.1671 18; 2258 30.61 10.1671 18.59; 2259 30.61 10.1671 20.11
 823. 2260 30.61 10.1671 20.7; 2261 30.61 10.67 18; 2262 30.61 10.67 18.59
 824. 2263 30.61 10.67 20.11; 2264 30.61 10.67 20.7; 2265 30.61 12.085 18
 825. 2266 30.61 14.885 18; 2267 30.7957 10.67 18; 2268 30.7957 11.1038 18
 826. 2269 30.7957 11.5375 18; 2270 30.7957 11.9713 18; 2271 30.7957 12.405 18
 827. 2272 30.7957 12.8387 18; 2273 30.7957 13.2725 18; 2274 30.7957 13.7063 18
 828. 2275 30.7957 14.14 18; 2276 30.9427 0.03 27.615; 2277 30.9427 0.54 27.615
 829. 2278 30.9427 1.05 27.615; 2279 30.9427 1.56 27.615; 2280 30.9427 2.07 27.615
 830. 2281 30.9427 2.58 27.615; 2282 30.9427 3.09 27.615; 2283 30.9427 3.6 27.615
 831. 2284 30.9427 4.10714 27.615; 2285 30.9427 4.61429 27.615
 832. 2286 30.9427 5.12143 27.615; 2287 30.9427 5.62857 27.615
 833. 2288 30.9427 6.13571 27.615; 2289 30.9427 6.64286 27.615
 834. 2290 30.9427 7.15 27.615; 2291 30.9427 7.65286 27.615
 835. 2292 30.9427 8.15571 27.615; 2293 30.9427 8.65857 27.615
 836. 2294 30.9427 9.16143 27.615; 2295 30.9427 9.66429 27.615
 837. 2296 30.9427 10.1671 27.615; 2297 30.9427 10.67 27.615
 838. 2298 30.9427 11.1657 27.615; 2299 30.9427 11.6614 27.615
 839. 2300 30.9427 12.1571 27.615; 2301 30.9427 12.6529 27.615
 840. 2302 30.9427 13.1486 27.615; 2303 30.9427 13.6443 27.615
 841. 2304 30.9427 14.14 27.615; 2305 30.9537 0.03 23.9; 2306 30.9537 0.54 23.9
 842. 2307 30.9537 1.05 23.9; 2308 30.9537 1.56 23.9; 2309 30.9537 2.07 23.9
 843. 2310 30.9537 2.58 23.9; 2311 30.9537 3.09 23.9; 2312 30.9537 3.6 23.9
 844. 2313 30.9537 4.10714 23.9; 2314 30.9537 4.61429 23.9
 845. 2315 30.9537 5.12143 23.9; 2316 30.9537 5.62857 23.9
 846. 2317 30.9537 6.13571 23.9; 2318 30.9537 6.64286 23.9; 2319 30.9537 7.15 23.9
 847. 2320 30.9537 7.65286 23.9; 2321 30.9537 8.15571 23.9
 848. 2322 30.9537 8.65857 23.9; 2323 30.9537 9.16143 23.9
 849. 2324 30.9537 9.66429 23.9; 2325 30.9537 10.1671 23.9; 2326 30.9537 10.67 23.9
 850. 2327 30.9537 11.1657 23.9; 2328 30.9537 11.6614 23.9
 851. 2329 30.9537 12.1571 23.9; 2330 30.9537 12.6529 23.9
 852. 2331 30.9537 13.1486 23.9; 2332 30.9537 13.6443 23.9; 2333 30.9537 14.14 23.9
 853. 2334 31.01 10.67 20.7; 2335 31.01 11.1657 20.7; 2336 31.01 11.6614 20.7
 854. 2337 31.01 12.1571 20.7; 2338 31.01 12.6529 20.7; 2339 31.01 13.1486 20.7
 855. 2340 31.01 13.6443 20.7; 2341 31.01 14.14 20.7; 2342 31.01 14.885 18
 856. 2343 31.01 15.4283 18; 2344 31.01 15.9717 18; 2345 31.01 16.515 18
 857. 2346 31.085 0.03 18; 2347 31.085 0.03 20.7; 2348 31.085 0.54 18
 858. 2349 31.085 0.54 20.7; 2350 31.085 1.05 18; 2351 31.085 1.05 20.7
 859. 2352 31.085 1.56 18; 2353 31.085 1.56 20.7; 2354 31.085 2.07 18



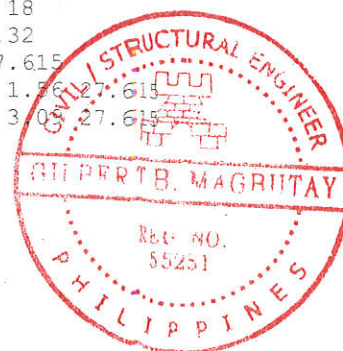
860. 2355 31.085 2.07 20.7; 2356 31.085 2.58 18; 2357 31.085 2.58 20.7
 861. 2358 31.085 3.09 18; 2359 31.085 3.09 20.7; 2360 31.085 3.6 18
 862. 2361 31.085 3.6 20.7; 2362 31.085 4.10714 18; 2363 31.085 4.10714 20.7
 863. 2364 31.085 4.61429 18; 2365 31.085 4.61429 20.7; 2366 31.085 5.12143 18
 864. 2367 31.085 5.12143 20.7; 2368 31.085 5.62857 18; 2369 31.085 5.62857 20.7
 865. 2370 31.085 6.13571 18; 2371 31.085 6.13571 20.7; 2372 31.085 6.64286 18
 866. 2373 31.085 6.64286 20.7; 2374 31.085 7.15 18; 2375 31.085 7.15 20.7
 867. 2376 31.085 7.65286 18; 2377 31.085 7.65286 20.7; 2378 31.085 8.15571 18
 868. 2379 31.085 8.15571 20.7; 2380 31.085 8.65857 18; 2381 31.085 8.65857 20.7
 869. 2382 31.085 9.16143 18; 2383 31.085 9.16143 20.7; 2384 31.085 9.66429 18
 870. 2385 31.085 9.66429 20.7; 2386 31.085 10.1671 18; 2387 31.085 10.1671 20.7
 871. 2388 31.085 10.67 18; 2389 31.085 10.67 20.7; 2390 31.3671 10.67 18
 872. 2391 31.3671 11.1038 18; 2392 31.3671 11.5375 18; 2393 31.3671 11.9713 18
 873. 2394 31.3671 12.403 18; 2395 31.3671 12.8387 18; 2396 31.3671 13.2725 18
 874. 2397 31.3671 13.7063 18; 2398 31.3671 14.14 18; 2399 31.4292 0.03 27.615
 875. 2400 31.4292 0.54 27.615; 2401 31.4292 1.05 27.615; 2402 31.4292 1.56 27.615
 876. 2403 31.4292 2.07 27.615; 2404 31.4292 2.58 27.615; 2405 31.4292 3.09 27.615
 877. 2406 31.4292 3.6 27.615; 2407 31.4292 4.10714 27.615
 878. 2408 31.4292 4.61429 27.615; 2409 31.4292 5.12143 27.615
 879. 2410 31.4292 5.62857 27.615; 2411 31.4292 6.13571 27.615
 880. 2412 31.4292 6.64286 27.615; 2413 31.4292 7.15 27.615
 881. 2414 31.4292 7.65286 27.615; 2415 31.4292 8.15571 27.615
 882. 2416 31.4292 8.65857 27.615; 2417 31.4292 9.16143 27.615
 883. 2418 31.4292 9.66429 27.615; 2419 31.4292 10.1671 27.615
 884. 2420 31.4292 10.67 27.615; 2421 31.4292 11.1657 27.615
 885. 2422 31.4292 11.6614 27.615; 2423 31.4292 12.1571 27.615
 886. 2424 31.4292 12.6529 27.615; 2425 31.4292 13.1486 27.615
 887. 2426 31.4292 13.6443 27.615; 2427 31.4292 14.14 27.615; 2428 31.4725 0.03 23.9
 888. 2429 31.4725 0.54 23.9; 2430 31.4725 1.05 23.9; 2431 31.4725 1.56 23.9
 889. 2432 31.4725 2.07 23.9; 2433 31.4725 2.58 23.9; 2434 31.4725 3.09 23.9
 890. 2435 31.4725 3.6 23.9; 2436 31.4725 4.10714 23.9; 2437 31.4725 4.61429 23.9
 891. 2438 31.4725 5.12143 23.9; 2439 31.4725 5.62857 23.9
 892. 2440 31.4725 6.13571 23.9; 2441 31.4725 6.64286 23.9; 2442 31.4725 7.15 23.9
 893. 2443 31.4725 7.65286 23.9; 2444 31.4725 8.15571 23.9
 894. 2445 31.4725 8.65857 23.9; 2446 31.4725 9.16143 23.9
 895. 2447 31.4725 9.66429 23.9; 2448 31.4725 10.1671 23.9; 2449 31.4725 10.67 23.9
 896. 2450 31.4725 11.1657 23.9; 2451 31.4725 11.6614 23.9
 897. 2452 31.4725 12.1571 23.9; 2453 31.4725 12.6529 23.9
 898. 2454 31.4725 13.1486 23.9; 2455 31.4725 13.6443 23.9; 2456 31.4725 14.14 23.9
 899. 2457 31.51 10.67 20.7; 2458 31.51 11.1657 20.7; 2459 31.51 11.6614 20.7
 900. 2460 31.51 12.1571 20.7; 2461 31.51 12.6529 20.7; 2462 31.51 13.1486 20.7
 901. 2463 31.51 13.6443 20.7; 2464 31.51 14.14 20.7; 2465 31.51 14.885 18
 902. 2466 31.51 15.4283 18; 2467 31.51 15.9717 18; 2468 31.51 16.515 18
 903. 2469 31.56 0.03 18; 2470 31.56 0.03 20.7; 2471 31.56 0.54 18
 904. 2472 31.56 0.54 20.7; 2473 31.56 1.05 18; 2474 31.56 1.05 20.7
 905. 2475 31.56 1.56 18; 2476 31.56 1.56 20.7; 2477 31.56 2.07 18
 906. 2478 31.56 2.07 20.7; 2479 31.56 2.58 18; 2480 31.56 2.58 20.7
 907. 2481 31.56 3.09 18; 2482 31.56 3.09 20.7; 2483 31.56 3.6 18
 908. 2484 31.56 3.6 20.7; 2485 31.56 4.10714 18; 2486 31.56 4.10714 20.7
 909. 2487 31.56 4.61429 18; 2488 31.56 4.61429 20.7; 2489 31.56 5.12143 18
 910. 2490 31.56 5.12143 20.7; 2491 31.56 5.62857 18; 2492 31.56 5.62857 20.7
 911. 2493 31.56 6.13571 18; 2494 31.56 6.13571 20.7; 2495 31.56 6.64286 18
 912. 2496 31.56 6.64286 20.7; 2497 31.56 7.15 18; 2498 31.56 7.15 20.7
 913. 2499 31.56 7.65286 18; 2500 31.56 7.65286 20.7; 2501 31.56 8.15571 18
 914. 2502 31.56 8.15571 20.7; 2503 31.56 8.65857 18; 2504 31.56 8.65857 20.7
 915. 2505 31.56 9.16143 18; 2506 31.56 9.16143 20.7; 2507 31.56 9.66429 18
 916. 2508 31.56 9.66429 20.7; 2509 31.56 10.1671 18; 2510 31.56 10.1671 20.7
 917. 2511 31.56 10.67 18; 2512 31.56 10.67 20.7; 2513 31.9158 0.03 27.615
 918. 2514 31.9158 0.54 27.615; 2515 31.9158 1.05 27.615; 2516 31.9158 1.56 27.615
 919. 2517 31.9158 2.07 27.615; 2518 31.9158 2.58 27.615; 2519 31.9158 3.09 27.615
 920. 2520 31.9158 3.6 27.615; 2521 31.9158 4.10714 27.615
 921. 2522 31.9158 4.61429 27.615; 2523 31.9158 5.12143 27.615
 922. 2524 31.9158 5.62857 27.615; 2525 31.9158 6.13571 27.615
 923. 2526 31.9158 6.64286 27.615; 2527 31.9158 7.15 27.615
 924. 2528 31.9158 7.65286 27.615; 2529 31.9158 8.15571 27.615
 925. 2530 31.9158 8.65857 27.615; 2531 31.9158 9.16143 27.615
 926. 2532 31.9158 9.66429 27.615; 2533 31.9158 10.1671 27.615



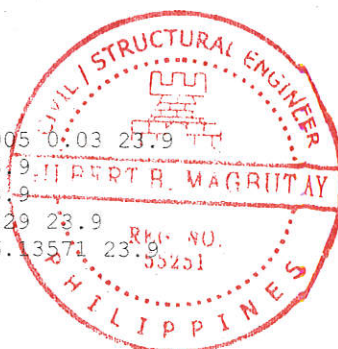
927. 2534 31.9158 10.67 27.615; 2535 31.9158 11.1657 27.615
 928. 2536 31.9158 11.6614 27.615; 2537 31.9158 12.1571 27.615
 929. 2538 31.9158 12.6529 27.615; 2539 31.9158 13.1486 27.615
 930. 2540 31.9158 13.6443 27.615; 2541 31.9158 14.14 27.615; 2542 31.9386 10.67 18
 931. 2543 31.9386 11.1038 18; 2544 31.9386 11.5375 18; 2545 31.9386 11.9713 18
 932. 2546 31.9386 12.405 18; 2547 31.9386 12.8387 18; 2548 31.9386 13.2725 18
 933. 2549 31.9386 13.7063 18; 2550 31.9386 14.14 18; 2551 31.9912 0.03 23.9
 934. 2552 31.9912 0.54 23.9; 2553 31.9912 1.05 23.9; 2554 31.9912 1.56 23.9
 935. 2555 31.9912 2.07 23.9; 2556 31.9912 2.58 23.9; 2557 31.9912 3.09 23.9
 936. 2558 31.9912 3.6 23.9; 2559 31.9912 4.10714 23.9; 2560 31.9912 4.61429 23.9
 937. 2561 31.9912 5.12143 23.9; 2562 31.9912 5.62857 23.9
 938. 2563 31.9912 6.13571 23.9; 2564 31.9912 6.64286 23.9; 2565 31.9912 7.15 23.9
 939. 2566 31.9912 7.65286 23.9; 2567 31.9912 8.15571 23.9
 940. 2568 31.9912 8.65857 23.9; 2569 31.9912 9.16143 23.9
 941. 2570 31.9912 9.66429 23.9; 2571 31.9912 10.1671 23.9; 2572 31.9912 10.67 23.9
 942. 2573 31.9912 11.1657 23.9; 2574 31.9912 11.6614 23.9
 943. 2575 31.9912 12.1571 23.9; 2576 31.9912 12.6529 23.9
 944. 2577 31.9912 13.1486 23.9; 2578 31.9912 13.6443 23.9; 2579 31.9912 14.14 23.9
 945. 2580 32.01 10.67 20.7; 2581 32.01 11.1657 20.7; 2582 32.01 11.6614 20.7
 946. 2583 32.01 12.1571 20.7; 2584 32.01 12.6529 20.7; 2585 32.01 13.1486 20.7
 947. 2586 32.01 13.6443 20.7; 2587 32.01 14.14 20.7; 2588 32.01 14.885 18
 948. 2589 32.01 15.4283 18; 2590 32.01 15.9717 18; 2591 32.01 16.515 18
 949. 2592 32.035 0.03 18; 2593 32.035 0.03 20.7; 2594 32.035 0.54 18
 950. 2595 32.035 0.54 20.7; 2596 32.035 1.05 18; 2597 32.035 1.05 20.7
 951. 2598 32.035 1.56 18; 2599 32.035 1.56 20.7; 2600 32.035 2.07 18
 952. 2601 32.035 2.07 20.7; 2602 32.035 2.58 18; 2603 32.035 2.58 20.7
 953. 2604 32.035 3.09 18; 2605 32.035 3.09 20.7; 2606 32.035 3.6 18
 954. 2607 32.035 3.6 20.7; 2608 32.035 4.10714 18; 2609 32.035 4.10714 20.7
 955. 2610 32.035 4.61429 18; 2611 32.035 4.61429 20.7; 2612 32.035 5.12143 18
 956. 2613 32.035 5.12143 20.7; 2614 32.035 5.62857 18; 2615 32.035 5.62857 20.7
 957. 2616 32.035 6.13571 18; 2617 32.035 6.13571 20.7; 2618 32.035 6.64286 18
 958. 2619 32.035 6.64286 20.7; 2620 32.035 7.15 18; 2621 32.035 7.15 20.7
 959. 2622 32.035 7.65286 18; 2623 32.035 7.65286 20.7; 2624 32.035 8.15571 18
 960. 2625 32.035 8.15571 20.7; 2626 32.035 8.65857 18; 2627 32.035 8.65857 20.7
 961. 2628 32.035 9.16143 18; 2629 32.035 9.16143 20.7; 2630 32.035 9.66429 18
 962. 2631 32.035 9.66429 20.7; 2632 32.035 10.1671 18; 2633 32.035 10.1671 20.7
 963. 2634 32.035 10.67 18; 2635 32.035 10.67 20.7; 2636 32.4023 0.03 27.615
 964. 2637 32.4023 0.54 27.615; 2638 32.4023 1.05 27.615; 2639 32.4023 1.56 27.615
 965. 2640 32.4023 2.07 27.615; 2641 32.4023 2.58 27.615; 2642 32.4023 3.09 27.615
 966. 2643 32.4023 3.6 27.615; 2644 32.4023 4.10714 27.615
 967. 2645 32.4023 4.61429 27.615; 2646 32.4023 5.12143 27.615
 968. 2647 32.4023 5.62857 27.615; 2648 32.4023 6.13571 27.615
 969. 2649 32.4023 6.64286 27.615; 2650 32.4023 7.15 27.615
 970. 2651 32.4023 7.65286 27.615; 2652 32.4023 8.15571 27.615
 971. 2653 32.4023 8.65857 27.615; 2654 32.4023 9.16143 27.615
 972. 2655 32.4023 9.66429 27.615; 2656 32.4023 10.1671 27.615
 973. 2657 32.4023 10.67 27.615; 2658 32.4023 11.1657 27.615
 974. 2659 32.4023 11.6614 27.615; 2660 32.4023 12.1571 27.615
 975. 2661 32.4023 12.6529 27.615; 2662 32.4023 13.1486 27.615
 976. 2663 32.4023 13.6443 27.615; 2664 32.4023 14.14 27.615; 2665 32.51 0.03 9.32
 977. 2666 32.51 0.03 15; 2667 32.51 0.03 18; 2668 32.51 0.03 18.54
 978. 2669 32.51 0.03 19.08; 2670 32.51 0.03 19.62; 2671 32.51 0.03 20.16
 979. 2672 32.51 0.03 20.7; 2673 32.51 0.03 23.9; 2674 32.51 0.54 18
 980. 2675 32.51 0.54 18.54; 2676 32.51 0.54 19.08; 2677 32.51 0.54 19.62
 981. 2678 32.51 0.54 20.16; 2679 32.51 0.54 20.7; 2680 32.51 0.54 23.9
 982. 2681 32.51 1.05 18; 2682 32.51 1.05 18.54; 2683 32.51 1.05 19.08
 983. 2684 32.51 1.05 19.62; 2685 32.51 1.05 20.16; 2686 32.51 1.05 20.7
 984. 2687 32.51 1.05 23.9; 2688 32.51 1.56 18; 2689 32.51 1.56 18.54
 985. 2690 32.51 1.56 19.08; 2691 32.51 1.56 19.62; 2692 32.51 1.56 20.16
 986. 2693 32.51 1.56 20.7; 2694 32.51 1.56 23.9; 2695 32.51 2.07 18
 987. 2696 32.51 2.07 18.54; 2697 32.51 2.07 19.08; 2698 32.51 2.07 19.62
 988. 2699 32.51 2.07 20.16; 2700 32.51 2.07 20.7; 2701 32.51 2.07 23.9
 989. 2702 32.51 2.58 18; 2703 32.51 2.58 18.54; 2704 32.51 2.58 19.08
 990. 2705 32.51 2.58 19.62; 2706 32.51 2.58 20.16; 2707 32.51 2.58 20.7
 991. 2708 32.51 2.58 23.9; 2709 32.51 3.09 18; 2710 32.51 3.09 18.54
 992. 2711 32.51 3.09 19.08; 2712 32.51 3.09 19.62; 2713 32.51 3.09 20.16
 993. 2714 32.51 3.09 20.7; 2715 32.51 3.09 23.9; 2716 32.51 3.6 9.32



994. 2717 32.51 3.6 15; 2718 32.51 3.6 18; 2719 32.51 3.6 18.54
 995. 2720 32.51 3.6 19.08; 2721 32.51 3.6 19.62; 2722 32.51 3.6 20.16
 996. 2723 32.51 3.6 20.7; 2724 32.51 3.6 23.9; 2725 32.51 4.10714 18
 997. 2726 32.51 4.10714 18.54; 2727 32.51 4.10714 19.08; 2728 32.51 4.10714 19.62
 998. 2729 32.51 4.10714 20.16; 2730 32.51 4.10714 20.7; 2731 32.51 4.10714 23.9
 999. 2732 32.51 4.61429 18; 2733 32.51 4.61429 18.54; 2734 32.51 4.61429 19.08
 1000. 2735 32.51 4.61429 19.62; 2736 32.51 4.61429 20.16; 2737 32.51 4.61429 20.7
 1001. 2738 32.51 4.61429 23.9; 2739 32.51 5.12143 18; 2740 32.51 5.12143 18.54
 1002. 2741 32.51 5.12143 19.08; 2742 32.51 5.12143 19.62; 2743 32.51 5.12143 20.16
 1003. 2744 32.51 5.12143 20.7; 2745 32.51 5.12143 23.9; 2746 32.51 5.62857 18
 1004. 2747 32.51 5.62857 18.54; 2748 32.51 5.62857 19.08; 2749 32.51 5.62857 19.62
 1005. 2750 32.51 5.62857 20.16; 2751 32.51 5.62857 20.7; 2752 32.51 5.62857 23.9
 1006. 2753 32.51 6.13571 18; 2754 32.51 6.13571 18.54; 2755 32.51 6.13571 19.08
 1007. 2756 32.51 6.13571 19.62; 2757 32.51 6.13571 20.16; 2758 32.51 6.13571 20.7
 1008. 2759 32.51 6.13571 23.9; 2760 32.51 6.64286 18; 2761 32.51 6.64286 18.54
 1009. 2762 32.51 6.64286 19.08; 2763 32.51 6.64286 19.62; 2764 32.51 6.64286 20.16
 1010. 2765 32.51 6.64286 20.7; 2766 32.51 6.64286 23.9; 2767 32.51 7.15 9.32
 1011. 2768 32.51 7.15 15; 2769 32.51 7.15 18; 2770 32.51 7.15 18.54
 1012. 2771 32.51 7.15 19.08; 2772 32.51 7.15 19.62; 2773 32.51 7.15 20.16
 1013. 2774 32.51 7.15 20.7; 2775 32.51 7.15 23.9; 2776 32.51 7.65286 18
 1014. 2777 32.51 7.65286 18.54; 2778 32.51 7.65286 19.08; 2779 32.51 7.65286 19.62
 1015. 2780 32.51 7.65286 20.16; 2781 32.51 7.65286 20.7; 2782 32.51 7.65286 23.9
 1016. 2783 32.51 8.15571 18; 2784 32.51 8.15571 18.54; 2785 32.51 8.15571 19.08
 1017. 2786 32.51 8.15571 19.62; 2787 32.51 8.15571 20.16; 2788 32.51 8.15571 20.7
 1018. 2789 32.51 8.15571 23.9; 2790 32.51 8.65857 18; 2791 32.51 8.65857 18.54
 1019. 2792 32.51 8.65857 19.08; 2793 32.51 8.65857 19.62; 2794 32.51 8.65857 20.16
 1020. 2795 32.51 8.65857 20.7; 2796 32.51 8.65857 23.9; 2797 32.51 9.16143 18
 1021. 2798 32.51 9.16143 18.54; 2799 32.51 9.16143 19.08; 2800 32.51 9.16143 19.62
 1022. 2801 32.51 9.16143 20.16; 2802 32.51 9.16143 20.7; 2803 32.51 9.16143 23.9
 1023. 2804 32.51 9.66429 18; 2805 32.51 9.66429 18.54; 2806 32.51 9.66429 19.08
 1024. 2807 32.51 9.66429 19.62; 2808 32.51 9.66429 20.16; 2809 32.51 9.66429 20.7
 1025. 2810 32.51 9.66429 23.9; 2811 32.51 10.1671 18; 2812 32.51 10.1671 18.54
 1026. 2813 32.51 10.1671 19.08; 2814 32.51 10.1671 19.62; 2815 32.51 10.1671 20.16
 1027. 2816 32.51 10.1671 20.7; 2817 32.51 10.1671 23.9; 2818 32.51 10.67 9.32
 1028. 2819 32.51 10.67 18; 2820 32.51 10.67 18.54; 2821 32.51 10.67 19.08
 1029. 2822 32.51 10.67 19.62; 2823 32.51 10.67 20.16; 2824 32.51 10.67 20.7
 1030. 2825 32.51 10.67 23.9; 2826 32.51 11.1038 18; 2827 32.51 11.1417 18
 1031. 2828 32.51 11.1657 18; 2829 32.51 11.1657 18.54; 2830 32.51 11.1657 19.08
 1032. 2831 32.51 11.1657 19.62; 2832 32.51 11.1657 20.16; 2833 32.51 11.1657 20.7
 1033. 2834 32.51 11.1657 23.9; 2835 32.51 11.5375 18; 2836 32.51 11.6133 18
 1034. 2837 32.51 11.6614 18; 2838 32.51 11.6614 18.54; 2839 32.51 11.6614 19.08
 1035. 2840 32.51 11.6614 19.62; 2841 32.51 11.6614 20.16; 2842 32.51 11.6614 20.7
 1036. 2843 32.51 11.6614 23.9; 2844 32.51 11.9713 18; 2845 32.51 12.085 9.32
 1037. 2846 32.51 12.085 18; 2847 32.51 12.1571 18; 2848 32.51 12.1571 18.54
 1038. 2849 32.51 12.1571 19.08; 2850 32.51 12.1571 19.62; 2851 32.51 12.1571 20.16
 1039. 2852 32.51 12.1571 20.7; 2853 32.51 12.1571 23.9; 2854 32.51 12.405 18
 1040. 2855 32.51 12.5517 18; 2856 32.51 12.6529 18; 2857 32.51 12.6529 18.54
 1041. 2858 32.51 12.6529 19.08; 2859 32.51 12.6529 19.62; 2860 32.51 12.6529 20.16
 1042. 2861 32.51 12.6529 20.7; 2862 32.51 12.6529 23.9; 2863 32.51 12.8387 18
 1043. 2864 32.51 13.0183 18; 2865 32.51 13.1486 18; 2866 32.51 13.1486 18.54
 1044. 2867 32.51 13.1486 19.08; 2868 32.51 13.1486 19.62; 2869 32.51 13.1486 20.16
 1045. 2870 32.51 13.1486 20.7; 2871 32.51 13.1486 23.9; 2872 32.51 13.2725 18
 1046. 2873 32.51 13.485 18; 2874 32.51 13.6443 18; 2875 32.51 13.6443 18.54
 1047. 2876 32.51 13.6443 19.08; 2877 32.51 13.6443 19.62; 2878 32.51 13.6443 20.16
 1048. 2879 32.51 13.6443 20.7; 2880 32.51 13.6443 23.9; 2881 32.51 13.7063 18
 1049. 2882 32.51 13.9517 18; 2883 32.51 14.14 18; 2884 32.51 14.14 18.54
 1050. 2885 32.51 14.14 19.08; 2886 32.51 14.14 19.62; 2887 32.51 14.14 20.16
 1051. 2888 32.51 14.14 20.7; 2889 32.51 14.14 23.9; 2890 32.51 14.4183 18
 1052. 2891 32.51 14.885 18; 2892 32.51 15.4283 18; 2893 32.51 15.785 9.32
 1053. 2894 32.51 15.9717 18; 2895 32.51 16.515 18; 2896 32.8888 0.03 27.615
 1054. 2897 32.8888 0.54 27.615; 2898 32.8888 1.05 27.615; 2899 32.8888 1.56 27.615
 1055. 2900 32.8888 2.07 27.615; 2901 32.8888 2.58 27.615; 2902 32.8888 3.09 27.615
 1056. 2903 32.8888 3.6 27.615; 2904 32.8888 4.10714 27.615
 1057. 2905 32.8888 4.61429 27.615; 2906 32.8888 5.12143 27.615
 1058. 2907 32.8888 5.62857 27.615; 2908 32.8888 6.13571 27.615
 1059. 2909 32.8888 6.64286 27.615; 2910 32.8888 7.15 27.615
 1060. 2911 32.8888 7.65286 27.615; 2912 32.8888 8.15571 27.615



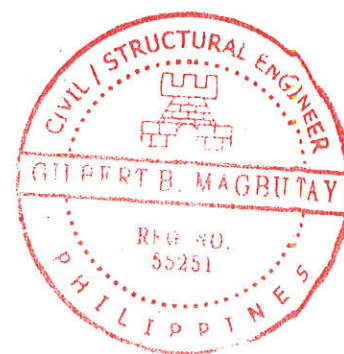
1061. 2913 32.8888 8.65857 27.615; 2914 32.8888 9.16143 27.615
 1062. 2915 32.8888 9.66429 27.615; 2916 32.8888 10.1671 27.615
 1063. 2917 32.8888 10.67 27.615; 2918 32.8888 11.1657 27.615
 1064. 2919 32.8888 11.6614 27.615; 2920 32.8888 12.1571 27.615
 1065. 2921 32.8888 12.6529 27.615; 2922 32.8888 13.1486 27.615
 1066. 2923 32.8888 13.6443 27.615; 2924 32.8888 14.14 27.615; 2925 32.96 1.79 23.9
 1067. 2926 32.96 1.79 25.76; 2927 32.96 1.79 27.615; 2928 32.96 5.375 23.9
 1068. 2929 32.96 5.375 25.76; 2930 32.96 5.375 27.615; 2931 32.96 8.91 23.9
 1069. 2932 32.96 8.91 25.76; 2933 32.96 8.91 27.615; 2934 32.975 0.03 23.9
 1070. 2935 32.975 0.54 23.9; 2936 32.975 1.05 23.9; 2937 32.975 1.56 23.9
 1071. 2938 32.975 2.07 23.9; 2939 32.975 2.58 23.9; 2940 32.975 3.09 23.9
 1072. 2941 32.975 3.6 23.9; 2942 32.975 4.10714 23.9; 2943 32.975 4.61429 23.9
 1073. 2944 32.975 5.12143 23.9; 2945 32.975 5.62857 23.9; 2946 32.975 6.13571 23.9
 1074. 2947 32.975 6.64286 23.9; 2948 32.975 7.15 23.9; 2949 32.975 7.65286 23.9
 1075. 2950 32.975 8.15571 23.9; 2951 32.975 8.65857 23.9; 2952 32.975 9.16143 23.9
 1076. 2953 32.975 9.66429 23.9; 2954 32.975 10.1671 23.9; 2955 32.975 10.67 23.9
 1077. 2956 32.975 11.1657 23.9; 2957 32.975 11.6614 23.9; 2958 32.975 12.1571 23.9
 1078. 2959 32.975 12.6529 23.9; 2960 32.975 13.1486 23.9; 2961 32.975 13.6443 23.9
 1079. 2962 32.975 14.14 23.9; 2963 33.01 10.67 18; 2964 33.01 11.1417 18
 1080. 2965 33.01 11.6133 18; 2966 33.01 12.085 18; 2967 33.01 12.5517 18
 1081. 2968 33.01 13.0183 18; 2969 33.01 13.485 18; 2970 33.01 13.9517 18
 1082. 2971 33.01 14.4183 18; 2972 33.01 14.885 18; 2973 33.01 15.4283 18
 1083. 2974 33.01 15.9717 18; 2975 33.01 16.515 18; 2976 33.3754 0.03 27.615
 1084. 2977 33.3754 0.54 27.615; 2978 33.3754 1.05 27.615; 2979 33.3754 1.56 27.615
 1085. 2980 33.3754 2.07 27.615; 2981 33.3754 2.58 27.615; 2982 33.3754 3.09 27.615
 1086. 2983 33.3754 3.6 27.615; 2984 33.3754 4.10714 27.615
 1087. 2985 33.3754 4.61429 27.615; 2986 33.3754 5.12143 27.615
 1088. 2987 33.3754 5.62857 27.615; 2988 33.3754 6.13571 27.615
 1089. 2989 33.3754 6.64286 27.615; 2990 33.3754 7.15 27.615
 1090. 2991 33.3754 7.65286 27.615; 2992 33.3754 8.15571 27.615
 1091. 2993 33.3754 8.65857 27.615; 2994 33.3754 9.16143 27.615
 1092. 2995 33.3754 9.66429 27.615; 2996 33.3754 10.1671 27.615
 1093. 2997 33.3754 10.67 27.615; 2998 33.3754 11.1657 27.615
 1094. 2999 33.3754 11.6614 27.615; 3000 33.3754 12.1571 27.615
 1095. 3001 33.3754 12.6529 27.615; 3002 33.3754 13.1486 27.615
 1096. 3003 33.3754 13.6443 27.615; 3004 33.3754 14.14 27.615; 3005 33.44 0.03 23.9
 1097. 3006 33.44 0.54 23.9; 3007 33.44 1.05 23.9; 3008 33.44 1.56 23.9
 1098. 3009 33.44 2.07 23.9; 3010 33.44 2.58 23.9; 3011 33.44 3.09 23.9
 1099. 3012 33.44 3.6 23.9; 3013 33.44 4.10714 23.9; 3014 33.44 4.61429 23.9
 1100. 3015 33.44 5.12143 23.9; 3016 33.44 5.62857 23.9; 3017 33.44 6.13571 23.9
 1101. 3018 33.44 6.64286 23.9; 3019 33.44 7.15 23.9; 3020 33.44 7.65286 23.9
 1102. 3021 33.44 8.15571 23.9; 3022 33.44 8.65857 23.9; 3023 33.44 9.16143 23.9
 1103. 3024 33.44 9.66429 23.9; 3025 33.44 10.1671 23.9; 3026 33.44 10.67 23.9
 1104. 3027 33.44 11.1657 23.9; 3028 33.44 11.6614 23.9; 3029 33.44 12.1571 23.9
 1105. 3030 33.44 12.6529 23.9; 3031 33.44 13.1486 23.9; 3032 33.44 13.6443 23.9
 1106. 3033 33.44 14.14 23.9; 3034 33.51 10.67 18; 3035 33.51 11.1417 18
 1107. 3036 33.51 11.6133 18; 3037 33.51 12.085 18; 3038 33.51 12.5517 18
 1108. 3039 33.51 13.0183 18; 3040 33.51 13.485 18; 3041 33.51 13.9517 18
 1109. 3042 33.51 14.4183 18; 3043 33.51 14.885 18; 3044 33.51 15.4283 18
 1110. 3045 33.51 15.9717 18; 3046 33.51 16.515 18; 3047 33.8619 0.03 27.615
 1111. 3048 33.8619 0.54 27.615; 3049 33.8619 1.05 27.615; 3050 33.8619 1.56 27.615
 1112. 3051 33.8619 2.07 27.615; 3052 33.8619 2.58 27.615; 3053 33.8619 3.09 27.615
 1113. 3054 33.8619 3.6 27.615; 3055 33.8619 4.10714 27.615
 1114. 3056 33.8619 4.61429 27.615; 3057 33.8619 5.12143 27.615
 1115. 3058 33.8619 5.62857 27.615; 3059 33.8619 6.13571 27.615
 1116. 3060 33.8619 6.64286 27.615; 3061 33.8619 7.15 27.615
 1117. 3062 33.8619 7.65286 27.615; 3063 33.8619 8.15571 27.615
 1118. 3064 33.8619 8.65857 27.615; 3065 33.8619 9.16143 27.615
 1119. 3066 33.8619 9.66429 27.615; 3067 33.8619 10.1671 27.615
 1120. 3068 33.8619 10.67 27.615; 3069 33.8619 11.1657 27.615
 1121. 3070 33.8619 11.6614 27.615; 3071 33.8619 12.1571 27.615
 1122. 3072 33.8619 12.6529 27.615; 3073 33.8619 13.1486 27.615
 1123. 3074 33.8619 13.6443 27.615; 3075 33.8619 14.14 27.615; 3076 33.905 0.03 23.9
 1124. 3077 33.905 0.54 23.9; 3078 33.905 1.05 23.9; 3079 33.905 1.56 23.9
 1125. 3080 33.905 2.07 23.9; 3081 33.905 2.58 23.9; 3082 33.905 3.09 23.9
 1126. 3083 33.905 3.6 23.9; 3084 33.905 4.10714 23.9; 3085 33.905 4.61429 23.9
 1127. 3086 33.905 5.12143 23.9; 3087 33.905 5.62857 23.9; 3088 33.905 6.13571 23.9



1128. 3089 33.905 6.64286 23.9; 3090 33.905 7.15 23.9; 3091 33.905 7.65286 23.9
 1129. 3092 33.905 8.15571 23.9; 3093 33.905 8.65857 23.9; 3094 33.905 9.16143 23.9
 1130. 3095 33.905 9.66429 23.9; 3096 33.905 10.1671 23.9; 3097 33.905 10.67 23.9
 1131. 3098 33.905 11.1657 23.9; 3099 33.905 11.6614 23.9; 3100 33.905 12.1571 23.9
 1132. 3101 33.905 12.6529 23.9; 3102 33.905 13.1486 23.9; 3103 33.905 13.6443 23.9
 1133. 3104 33.905 14.14 23.9; 3105 34.01 10.67 18; 3106 34.01 11.1417 18
 1134. 3107 34.01 11.6133 18; 3108 34.01 12.085 18; 3109 34.01 12.5517 18
 1135. 3110 34.01 13.0183 18; 3111 34.01 13.485 18; 3112 34.01 13.9517 18
 1136. 3113 34.01 14.4183 18; 3114 34.01 14.885 18; 3115 34.01 15.4283 18
 1137. 3116 34.01 15.9717 18; 3117 34.01 16.515 18; 3118 34.3485 0.03 27.615
 1138. 3119 34.3485 0.54 27.615; 3120 34.3485 1.05 27.615; 3121 34.3485 1.56 27.615
 1139. 3122 34.3485 2.07 27.615; 3123 34.3485 2.58 27.615; 3124 34.3485 3.09 27.615
 1140. 3125 34.3485 3.6 27.615; 3126 34.3485 4.10714 27.615
 1141. 3127 34.3485 4.61429 27.615; 3128 34.3485 5.12143 27.615
 1142. 3129 34.3485 5.62857 27.615; 3130 34.3485 6.13571 27.615
 1143. 3131 34.3485 6.64286 27.615; 3132 34.3485 7.15 27.615
 1144. 3133 34.3485 7.65286 27.615; 3134 34.3485 8.15571 27.615
 1145. 3135 34.3485 8.65857 27.615; 3136 34.3485 9.16143 27.615
 1146. 3137 34.3485 9.66429 27.615; 3138 34.3485 10.1671 27.615
 1147. 3139 34.3485 10.67 27.615; 3140 34.3485 11.1657 27.615
 1148. 3141 34.3485 11.6614 27.615; 3142 34.3485 12.1571 27.615
 1149. 3143 34.3485 12.6529 27.615; 3144 34.3485 13.1486 27.615
 1150. 3145 34.3485 13.6443 27.615; 3146 34.3485 14.14 27.615; 3147 34.37 0.03 23.9
 1151. 3148 34.37 0.54 23.9; 3149 34.37 1.05 23.9; 3150 34.37 1.56 23.9
 1152. 3151 34.37 2.07 23.9; 3152 34.37 2.58 23.9; 3153 34.37 3.09 23.9
 1153. 3154 34.37 3.6 23.9; 3155 34.37 4.10714 23.9; 3156 34.37 4.61429 23.9
 1154. 3157 34.37 5.12143 23.9; 3158 34.37 5.62857 23.9; 3159 34.37 6.13571 23.9
 1155. 3160 34.37 6.64286 23.9; 3161 34.37 7.15 23.9; 3162 34.37 7.65286 23.9
 1156. 3163 34.37 8.15571 23.9; 3164 34.37 8.65857 23.9; 3165 34.37 9.16143 23.9
 1157. 3166 34.37 9.66429 23.9; 3167 34.37 10.1671 23.9; 3168 34.37 10.67 23.9
 1158. 3169 34.37 11.1657 23.9; 3170 34.37 11.6614 23.9; 3171 34.37 12.1571 23.9
 1159. 3172 34.37 12.6529 23.9; 3173 34.37 13.1486 23.9; 3174 34.37 13.6443 23.9
 1160. 3175 34.37 14.14 23.9; 3176 34.51 10.67 18; 3177 34.51 11.1417 18
 1161. 3178 34.51 11.6133 18; 3179 34.51 12.085 18; 3180 34.51 12.5517 18
 1162. 3181 34.51 13.0183 18; 3182 34.51 13.485 18; 3183 34.51 13.9517 18
 1163. 3184 34.51 14.4183 18; 3185 34.51 14.885 18; 3186 34.51 15.4283 18
 1164. 3187 34.51 15.9717 18; 3188 34.51 16.515 18; 3189 34.835 0.03 23.9
 1165. 3190 34.835 0.03 24.4307; 3191 34.835 0.03 24.9614; 3192 34.835 0.03 25.4921
 1166. 3193 34.835 0.03 26.0229; 3194 34.835 0.03 26.5536; 3195 34.835 0.03 27.0843
 1167. 3196 34.835 0.03 27.615; 3197 34.835 0.54 23.9; 3198 34.835 0.54 24.4307
 1168. 3199 34.835 0.54 24.9614; 3200 34.835 0.54 25.4921; 3201 34.835 0.54 26.0229
 1169. 3202 34.835 0.54 26.5536; 3203 34.835 0.54 27.0843; 3204 34.835 0.54 27.615
 1170. 3205 34.835 1.05 23.9; 3206 34.835 1.05 24.4307; 3207 34.835 1.05 24.9614
 1171. 3208 34.835 1.05 25.4921; 3209 34.835 1.05 26.0229; 3210 34.835 1.05 26.5536
 1172. 3211 34.835 1.05 27.0843; 3212 34.835 1.05 27.615; 3213 34.835 1.56 23.9
 1173. 3214 34.835 1.56 24.4307; 3215 34.835 1.56 24.9614; 3216 34.835 1.56 25.4921
 1174. 3217 34.835 1.56 26.0229; 3218 34.835 1.56 26.5536; 3219 34.835 1.56 27.0843
 1175. 3220 34.835 1.56 27.615; 3221 34.835 1.79 23.9; 3222 34.835 1.79 27.615
 1176. 3223 34.835 2.07 23.9; 3224 34.835 2.07 24.4307; 3225 34.835 2.07 24.9614
 1177. 3226 34.835 2.07 25.4921; 3227 34.835 2.07 26.0229; 3228 34.835 2.07 26.5536
 1178. 3229 34.835 2.07 27.0843; 3230 34.835 2.07 27.615; 3231 34.835 2.58 23.9
 1179. 3232 34.835 2.58 24.4307; 3233 34.835 2.58 24.9614; 3234 34.835 2.58 25.4921
 1180. 3235 34.835 2.58 26.0229; 3236 34.835 2.58 26.5536; 3237 34.835 2.58 27.0843
 1181. 3238 34.835 2.58 27.615; 3239 34.835 3.09 23.9; 3240 34.835 3.09 24.4307
 1182. 3241 34.835 3.09 24.9614; 3242 34.835 3.09 25.4921; 3243 34.835 3.09 26.0229
 1183. 3244 34.835 3.09 26.5536; 3245 34.835 3.09 27.0843; 3246 34.835 3.09 27.615
 1184. 3247 34.835 3.6 23.9; 3248 34.835 3.6 24.4307; 3249 34.835 3.6 24.9614
 1185. 3250 34.835 3.6 25; 3251 34.835 3.6 25.4921; 3252 34.835 3.6 26.0229
 1186. 3253 34.835 3.6 26.5536; 3254 34.835 3.6 27.0843; 3255 34.835 3.6 27.615
 1187. 3256 34.835 4.10714 23.9; 3257 34.835 4.10714 24.4307
 1188. 3258 34.835 4.10714 24.9614; 3259 34.835 4.10714 25.4921
 1189. 3260 34.835 4.10714 26.0229; 3261 34.835 4.10714 26.5536
 1190. 3262 34.835 4.10714 27.0843; 3263 34.835 4.10714 27.615
 1191. 3264 34.835 4.61429 23.9; 3265 34.835 4.61429 24.4307
 1192. 3266 34.835 4.61429 24.9614; 3267 34.835 4.61429 25.4921
 1193. 3268 34.835 4.61429 26.0229; 3269 34.835 4.61429 26.5536
 1194. 3270 34.835 4.61429 27.0843; 3271 34.835 4.61429 27.615



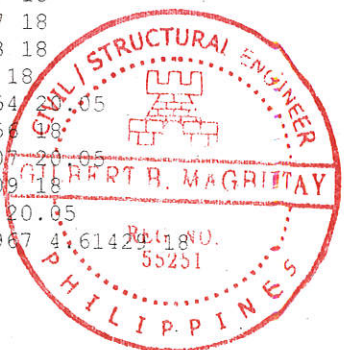
1195. 3272 34.835 5.12143 23.9; 3273 34.835 5.12143 24.4307
 1196. 3274 34.835 5.12143 24.9614; 3275 34.835 5.12143 25.4921
 1197. 3276 34.835 5.12143 26.0229; 3277 34.835 5.12143 26.5536
 1198. 3278 34.835 5.12143 27.0843; 3279 34.835 5.12143 27.615
 1199. 3280 34.835 5.375 23.9; 3281 34.835 5.375 27.615; 3282 34.835 5.62857 23.9
 1200. 3283 34.835 5.62857 24.4307; 3284 34.835 5.62857 24.9614
 1201. 3285 34.835 5.62857 25.4921; 3286 34.835 5.62857 26.0229
 1202. 3287 34.835 5.62857 26.5536; 3288 34.835 5.62857 27.0843
 1203. 3289 34.835 5.62857 27.615; 3290 34.835 6.13571 23.9
 1204. 3291 34.835 6.13571 24.4307; 3292 34.835 6.13571 24.9614
 1205. 3293 34.835 6.13571 25.4921; 3294 34.835 6.13571 26.0229
 1206. 3295 34.835 6.13571 26.5536; 3296 34.835 6.13571 27.0843
 1207. 3297 34.835 6.13571 27.615; 3298 34.835 6.64286 23.9
 1208. 3299 34.835 6.64286 24.4307; 3300 34.835 6.64286 24.9614
 1209. 3301 34.835 6.64286 25.4921; 3302 34.835 6.64286 26.0229
 1210. 3303 34.835 6.64286 26.5536; 3304 34.835 6.64286 27.0843
 1211. 3305 34.835 6.64286 27.615; 3306 34.835 7.15 23.9; 3307 34.835 7.15 24.4307
 1212. 3308 34.835 7.15 24.9614; 3309 34.835 7.15 25; 3310 34.835 7.15 25.4921
 1213. 3311 34.835 7.15 26.0229; 3312 34.835 7.15 26.5536; 3313 34.835 7.15 27.0843
 1214. 3314 34.835 7.15 27.615; 3315 34.835 7.65286 23.9; 3316 34.835 7.65286 24.4307
 1215. 3317 34.835 7.65286 24.9614; 3318 34.835 7.65286 25.4921
 1216. 3319 34.835 7.65286 26.0229; 3320 34.835 7.65286 26.5536
 1217. 3321 34.835 7.65286 27.0843; 3322 34.835 7.65286 27.615
 1218. 3323 34.835 8.15571 23.9; 3324 34.835 8.15571 24.4307
 1219. 3325 34.835 8.15571 24.9614; 3326 34.835 8.15571 25.4921
 1220. 3327 34.835 8.15571 26.0229; 3328 34.835 8.15571 26.5536
 1221. 3329 34.835 8.15571 27.0843; 3330 34.835 8.15571 27.615
 1222. 3331 34.835 8.65857 23.9; 3332 34.835 8.65857 24.4307
 1223. 3333 34.835 8.65857 24.9614; 3334 34.835 8.65857 25.4921
 1224. 3335 34.835 8.65857 26.0229; 3336 34.835 8.65857 26.5536
 1225. 3337 34.835 8.65857 27.0843; 3338 34.835 8.65857 27.615; 3339 34.835 8.91 23.9
 1226. 3340 34.835 8.91 27.615; 3341 34.835 9.16143 23.9; 3342 34.835 9.16143 24.4307
 1227. 3343 34.835 9.16143 24.9614; 3344 34.835 9.16143 25.4921
 1228. 3345 34.835 9.16143 26.0229; 3346 34.835 9.16143 26.5536
 1229. 3347 34.835 9.16143 27.0843; 3348 34.835 9.16143 27.615
 1230. 3349 34.835 9.66429 23.9; 3350 34.835 9.66429 24.4307
 1231. 3351 34.835 9.66429 24.9614; 3352 34.835 9.66429 25.4921
 1232. 3353 34.835 9.66429 26.0229; 3354 34.835 9.66429 26.5536
 1233. 3355 34.835 9.66429 27.0843; 3356 34.835 9.66429 27.615
 1234. 3357 34.835 10.1671 23.9; 3358 34.835 10.1671 24.4307
 1235. 3359 34.835 10.1671 24.9614; 3360 34.835 10.1671 25.4921
 1236. 3361 34.835 10.1671 26.0229; 3362 34.835 10.1671 26.5536
 1237. 3363 34.835 10.1671 27.0843; 3364 34.835 10.1671 27.615
 1238. 3365 34.835 10.67 23.9; 3366 34.835 10.67 24.4307; 3367 34.835 10.67 24.9614
 1239. 3368 34.835 10.67 25.4921; 3369 34.835 10.67 26.0229
 1240. 3370 34.835 10.67 26.5536; 3371 34.835 10.67 27.0843; 3372 34.835 10.67 27.615
 1241. 3373 34.835 11.1657 23.9; 3374 34.835 11.1657 24.4307
 1242. 3375 34.835 11.1657 24.9614; 3376 34.835 11.1657 25.4921
 1243. 3377 34.835 11.1657 26.0229; 3378 34.835 11.1657 26.5536
 1244. 3379 34.835 11.1657 27.0843; 3380 34.835 11.1657 27.615
 1245. 3381 34.835 11.6614 23.9; 3382 34.835 11.6614 24.4307
 1246. 3383 34.835 11.6614 24.9614; 3384 34.835 11.6614 25.4921
 1247. 3385 34.835 11.6614 26.0229; 3386 34.835 11.6614 26.5536
 1248. 3387 34.835 11.6614 27.0843; 3388 34.835 11.6614 27.615
 1249. 3389 34.835 12.1571 23.9; 3390 34.835 12.1571 24.4307
 1250. 3391 34.835 12.1571 24.9614; 3392 34.835 12.1571 25.4921
 1251. 3393 34.835 12.1571 26.0229; 3394 34.835 12.1571 26.5536
 1252. 3395 34.835 12.1571 27.0843; 3396 34.835 12.1571 27.615
 1253. 3397 34.835 12.6529 23.9; 3398 34.835 12.6529 24.4307
 1254. 3399 34.835 12.6529 24.9614; 3400 34.835 12.6529 25.4921
 1255. 3401 34.835 12.6529 26.0229; 3402 34.835 12.6529 26.5536
 1256. 3403 34.835 12.6529 27.0843; 3404 34.835 12.6529 27.615
 1257. 3405 34.835 13.1486 23.9; 3406 34.835 13.1486 24.4307
 1258. 3407 34.835 13.1486 24.9614; 3408 34.835 13.1486 25.4921
 1259. 3409 34.835 13.1486 26.0229; 3410 34.835 13.1486 26.5536
 1260. 3411 34.835 13.1486 27.0843; 3412 34.835 13.1486 27.615
 1261. 3413 34.835 13.6443 23.9; 3414 34.835 13.6443 24.4307



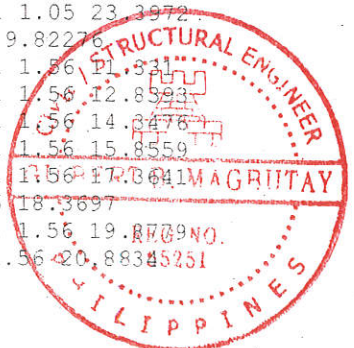
1262. 3415 34.835 13.6443 24.9614; 3416 34.835 13.6443 25.4921
 1263. 3417 34.835 13.6443 26.0229; 3418 34.835 13.6443 26.5536
 1264. 3419 34.835 13.6443 27.0843; 3420 34.835 13.6443 27.615
 1265. 3421 34.835 14.14 23.9; 3422 34.835 14.14 24.4307; 3423 34.835 14.14 24.9614
 1266. 3424 34.835 14.14 25.4921; 3425 34.835 14.14 26.0229
 1267. 3426 34.835 14.14 26.5536; 3427 34.835 14.14 27.0843; 3428 34.835 14.14 27.615
 1268. 3429 35.01 10.67 18; 3430 35.01 11.1417 18; 3431 35.01 11.6133 18
 1269. 3432 35.01 12.085 18; 3433 35.01 12.5517 18; 3434 35.01 13.0183 18
 1270. 3435 35.01 13.485 18; 3436 35.01 13.9517 18; 3437 35.01 14.4183 18
 1271. 3438 35.01 14.885 18; 3439 35.01 15.4283 18; 3440 35.01 15.9717 18
 1272. 3441 35.01 16.515 18; 3442 35.3933 10.67 23.9; 3443 35.3933 11.1657 23.9
 1273. 3444 35.3933 11.6614 23.9; 3445 35.3933 12.1571 23.9
 1274. 3446 35.3933 12.6529 23.9; 3447 35.3933 13.1436 23.9
 1275. 3448 35.3933 13.6443 23.9; 3449 35.3933 14.14 23.9; 3450 35.51 10.67 18
 1276. 3451 35.51 11.1417 18; 3452 35.51 11.6133 18; 3453 35.51 12.085 18
 1277. 3454 35.51 12.5517 18; 3455 35.51 13.0183 18; 3456 35.51 13.485 18
 1278. 3457 35.51 13.9517 18; 3458 35.51 14.4183 18; 3459 35.51 14.885 18
 1279. 3460 35.51 15.4283 18; 3461 35.51 15.9717 18; 3462 35.51 16.515 18
 1280. 3463 35.9517 10.67 23.9; 3464 35.9517 11.1657 23.9; 3465 35.9517 11.6614 23.9
 1281. 3466 35.9517 12.1571 23.9; 3467 35.9517 12.6529 23.9
 1282. 3468 35.9517 13.1486 23.9; 3469 35.9517 13.6443 23.9; 3470 35.9517 14.14 23.9
 1283. 3471 36.01 10.67 18; 3472 36.01 11.1417 18; 3473 36.01 11.6133 18
 1284. 3474 36.01 12.085 18; 3475 36.01 12.5517 18; 3476 36.01 13.0183 18
 1285. 3477 36.01 13.485 18; 3478 36.01 13.9517 18; 3479 36.01 14.4183 18
 1286. 3480 36.01 14.885 18; 3481 36.01 15.4283 18; 3482 36.01 15.9717 18
 1287. 3483 36.01 16.515 18; 3484 36.51 0.03 9.32; 3485 36.51 0.03 15
 1288. 3486 36.51 0.03 18; 3487 36.51 0.03 23.9; 3488 36.51 3.6 9.32
 1289. 3489 36.51 3.6 15; 3490 36.51 3.6 18; 3491 36.51 3.6 23.9
 1290. 3492 36.51 7.15 9.32; 3493 36.51 7.15 15; 3494 36.51 7.15 18
 1291. 3495 36.51 7.15 23.9; 3496 36.51 10.67 9.32; 3497 36.51 10.67 18
 1292. 3498 36.51 10.67 23.9; 3499 36.51 11.1417 18; 3500 36.51 11.1657 23.9
 1293. 3501 36.51 11.6133 18; 3502 36.51 11.6614 23.9; 3503 36.51 12.085 9.32
 1294. 3504 36.51 12.085 18; 3505 36.51 12.1571 23.9; 3506 36.51 12.5517 18
 1295. 3507 36.51 12.6529 23.9; 3508 36.51 13.0183 18; 3509 36.51 13.1486 23.9
 1296. 3510 36.51 13.485 18; 3511 36.51 13.6443 23.9; 3512 36.51 13.9517 18
 1297. 3513 36.51 14.14 18; 3514 36.51 14.14 23.9; 3515 36.51 14.4183 18
 1298. 3516 36.51 14.885 18; 3517 36.51 15.4283 18; 3518 36.51 15.785 9.32
 1299. 3519 36.51 15.9717 18; 3520 36.51 16.515 18; 3521 37.01 10.67 18
 1300. 3522 37.01 11.1417 18; 3523 37.01 11.6133 18; 3524 37.01 12.085 18
 1301. 3525 37.01 12.5517 18; 3526 37.01 13.0183 18; 3527 37.01 13.485 18
 1302. 3528 37.01 13.9517 18; 3529 37.01 14.4183 18; 3530 37.01 14.885 18
 1303. 3531 37.01 15.4283 18; 3532 37.01 15.9717 18; 3533 37.01 16.515 18
 1304. 3534 37.51 10.67 18; 3535 37.51 11.1417 18; 3536 37.51 11.6133 18
 1305. 3537 37.51 12.085 18; 3538 37.51 12.5517 18; 3539 37.51 13.0183 18
 1306. 3540 37.51 13.485 18; 3541 37.51 13.9517 18; 3542 37.51 14.4183 18
 1307. 3543 37.51 14.885 18; 3544 37.51 15.4283 18; 3545 37.51 15.9717 18
 1308. 3546 37.51 16.515 18; 3547 38.01 10.67 18; 3548 38.01 11.1417 18
 1309. 3549 38.01 11.6133 18; 3550 38.01 12.085 18; 3551 38.01 12.5517 18
 1310. 3552 38.01 13.0183 18; 3553 38.01 13.485 18; 3554 38.01 13.9517 18
 1311. 3555 38.01 14.4183 18; 3556 38.01 14.885 18; 3557 38.01 15.4283 18
 1312. 3558 38.01 15.9717 18; 3559 38.01 16.515 18; 3560 38.51 10.67 18
 1313. 3561 38.51 11.1417 18; 3562 38.51 11.6133 18; 3563 38.51 12.085 18
 1314. 3564 38.51 12.5517 18; 3565 38.51 13.0183 18; 3566 38.51 13.485 18
 1315. 3567 38.51 13.9517 18; 3568 38.51 14.4183 18; 3569 38.51 14.885 18
 1316. 3570 38.51 15.4283 18; 3571 38.51 15.9717 18; 3572 38.51 16.515 18
 1317. 3573 39.01 10.67 18; 3574 39.01 11.1417 18; 3575 39.01 11.6133 18
 1318. 3576 39.01 12.085 18; 3577 39.01 12.5517 18; 3578 39.01 13.0183 18
 1319. 3579 39.01 13.485 18; 3580 39.01 13.9517 18; 3581 39.01 14.4183 18
 1320. 3582 39.01 14.885 18; 3583 39.01 15.4283 18; 3584 39.01 15.9717 18
 1321. 3585 39.01 16.515 18; 3586 39.51 10.67 18; 3587 39.51 11.1417 18
 1322. 3588 39.51 11.6133 18; 3589 39.51 12.085 18; 3590 39.51 12.5517 18
 1323. 3591 39.51 13.0183 18; 3592 39.51 13.485 18; 3593 39.51 13.9517 18
 1324. 3594 39.51 14.4183 18; 3595 39.51 14.885 18; 3596 39.51 15.4283 18
 1325. 3597 39.51 15.9717 18; 3598 39.51 16.515 18; 3599 40.01 10.67 18
 1326. 3600 40.01 11.1417 18; 3601 40.01 11.6133 18; 3602 40.01 12.085 18
 1327. 3603 40.01 12.5517 18; 3604 40.01 13.0183 18; 3605 40.01 13.485 18
 1328. 3606 40.01 13.9517 18; 3607 40.01 14.4183 18; 3608 40.01 14.885 18



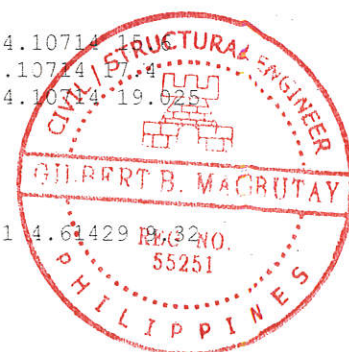
1329. 3609 40.01 15.4283 18; 3610 40.01 15.9717 18; 3611 40.01 16.515 18
 1330. 3612 40.51 0.03 9.32; 3613 40.51 0.03 15; 3614 40.51 0.03 18
 1331. 3615 40.51 0.03 23.9; 3616 40.51 3.6 9.32; 3617 40.51 3.6 15
 1332. 3618 40.51 3.6 18; 3619 40.51 3.6 23.9; 3620 40.51 7.15 9.32
 1333. 3621 40.51 7.15 15; 3622 40.51 7.15 18; 3623 40.51 7.15 23.9
 1334. 3624 40.51 10.67 9.32; 3625 40.51 10.67 18; 3626 40.51 10.67 23.9
 1335. 3627 40.51 11.1417 18; 3628 40.51 11.6133 18; 3629 40.51 12.085 9.32
 1336. 3630 40.51 12.085 18; 3631 40.51 12.5517 18; 3632 40.51 13.0183 18
 1337. 3633 40.51 13.485 18; 3634 40.51 13.9517 18; 3635 40.51 14.14 18
 1338. 3636 40.51 14.14 23.9; 3637 40.51 14.4183 18; 3638 40.51 14.885 18
 1339. 3639 40.51 15.4283 18; 3640 40.51 15.785 9.32; 3641 40.51 15.9717 18
 1340. 3642 40.51 16.515 18; 3643 41.01 10.67 18; 3644 41.01 11.1417 18
 1341. 3645 41.01 11.6133 18; 3646 41.01 12.085 18; 3647 41.01 12.5517 18
 1342. 3648 41.01 13.0183 18; 3649 41.01 13.485 18; 3650 41.01 13.9517 18
 1343. 3651 41.01 14.4183 18; 3652 41.01 14.885 18; 3653 41.01 15.4283 18
 1344. 3654 41.01 15.9717 18; 3655 41.01 16.515 18; 3656 41.51 10.67 18
 1345. 3657 41.51 11.1417 18; 3658 41.51 11.6133 18; 3659 41.51 12.085 18
 1346. 3660 41.51 12.5517 18; 3661 41.51 13.0183 18; 3662 41.51 13.485 18
 1347. 3663 41.51 13.9517 18; 3664 41.51 14.4183 18; 3665 41.51 14.885 18
 1348. 3666 41.51 15.4283 18; 3667 41.51 15.9717 18; 3668 41.51 16.515 18
 1349. 3669 42.01 10.67 18; 3670 42.01 11.1417 18; 3671 42.01 11.6133 18
 1350. 3672 42.01 12.085 18; 3673 42.01 12.5517 18; 3674 42.01 13.0183 18
 1351. 3675 42.01 13.485 18; 3676 42.01 13.9517 18; 3677 42.01 14.4183 18
 1352. 3678 42.01 14.885 18; 3679 42.01 15.4283 18; 3680 42.01 15.9717 18
 1353. 3681 42.01 16.515 18; 3682 42.51 10.67 18; 3683 42.51 11.1417 18
 1354. 3684 42.51 11.6133 18; 3685 42.51 12.085 18; 3686 42.51 12.5517 18
 1355. 3687 42.51 13.0183 18; 3688 42.51 13.485 18; 3689 42.51 13.9517 18
 1356. 3690 42.51 14.4183 18; 3691 42.51 14.885 18; 3692 42.51 15.4283 18
 1357. 3693 42.51 15.9717 18; 3694 42.51 16.515 18; 3695 42.99 0.03 18
 1358. 3696 42.99 0.03 18.5125; 3697 42.99 0.03 19.025; 3698 42.99 0.03 19.5375
 1359. 3699 42.99 0.03 20.05; 3700 42.99 0.54 18; 3701 42.99 0.54 18.5125
 1360. 3702 42.99 0.54 19.025; 3703 42.99 0.54 19.5375; 3704 42.99 0.54 20.05
 1361. 3705 42.99 1.05 18; 3706 42.99 1.05 18.5125; 3707 42.99 1.05 19.025
 1362. 3708 42.99 1.05 19.5375; 3709 42.99 1.05 20.05; 3710 42.99 1.56 18
 1363. 3711 42.99 1.56 18.5125; 3712 42.99 1.56 19.025; 3713 42.99 1.56 19.5375
 1364. 3714 42.99 1.56 20.05; 3715 42.99 2.07 18; 3716 42.99 2.07 18.5125
 1365. 3717 42.99 2.07 19.025; 3718 42.99 2.07 19.5375; 3719 42.99 2.07 20.05
 1366. 3720 42.99 2.58 18; 3721 42.99 2.58 18.5125; 3722 42.99 2.58 19.025
 1367. 3723 42.99 2.58 19.5375; 3724 42.99 2.58 20.05; 3725 42.99 3.09 18
 1368. 3726 42.99 3.09 18.5125; 3727 42.99 3.09 19.025; 3728 42.99 3.09 19.5375
 1369. 3729 42.99 3.09 20.05; 3730 42.99 3.6 18; 3731 42.99 3.6 18.5125
 1370. 3732 42.99 3.6 19.025; 3733 42.99 3.6 19.5375; 3734 42.99 3.6 20.05
 1371. 3735 42.99 4.10714 18; 3736 42.99 4.10714 18.5125; 3737 42.99 4.10714 19.025
 1372. 3738 42.99 4.10714 19.5375; 3739 42.99 4.10714 20.05; 3740 42.99 4.61429 18
 1373. 3741 42.99 4.61429 18.5125; 3742 42.99 4.61429 19.025
 1374. 3743 42.99 4.61429 19.5375; 3744 42.99 4.61429 20.05; 3745 42.99 5.12143 18
 1375. 3746 42.99 5.12143 18.5125; 3747 42.99 5.12143 19.025
 1376. 3748 42.99 5.12143 19.5375; 3749 42.99 5.12143 20.05; 3750 42.99 5.62857 18
 1377. 3751 42.99 5.62857 18.5125; 3752 42.99 5.62857 19.025
 1378. 3753 42.99 5.62857 19.5375; 3754 42.99 5.62857 20.05; 3755 42.99 6.13571 18
 1379. 3756 42.99 6.13571 18.5125; 3757 42.99 6.13571 19.025
 1380. 3758 42.99 6.13571 19.5375; 3759 42.99 6.13571 20.05; 3760 42.99 6.64286 18
 1381. 3761 42.99 6.64286 18.5125; 3762 42.99 6.64286 19.025
 1382. 3763 42.99 6.64286 19.5375; 3764 42.99 6.64286 20.05; 3765 42.99 7.15 18
 1383. 3766 42.99 7.15 18.5125; 3767 42.99 7.15 19.025; 3768 42.99 7.15 19.5375
 1384. 3769 42.99 7.15 20.05; 3770 43.01 10.67 18; 3771 43.01 11.1417 18
 1385. 3772 43.01 11.6133 18; 3773 43.01 12.085 18; 3774 43.01 12.5517 18
 1386. 3775 43.01 13.0183 18; 3776 43.01 13.485 18; 3777 43.01 13.9517 18
 1387. 3778 43.01 14.4183 18; 3779 43.01 14.885 18; 3780 43.01 15.4283 18
 1388. 3781 43.01 15.9717 18; 3782 43.01 16.515 18; 3783 43.4967 0.03 18
 1389. 3784 43.4967 0.03 20.05; 3785 43.4967 0.54 18; 3786 43.4967 0.54 20.05
 1390. 3787 43.4967 1.05 18; 3788 43.4967 1.05 20.05; 3789 43.4967 1.56 18
 1391. 3790 43.4967 1.56 20.05; 3791 43.4967 2.07 18; 3792 43.4967 2.07 20.05
 1392. 3793 43.4967 2.58 18; 3794 43.4967 2.58 20.05; 3795 43.4967 3.09 18
 1393. 3796 43.4967 3.09 20.05; 3797 43.4967 3.6 18; 3798 43.4967 3.6 20.05
 1394. 3799 43.4967 4.10714 18; 3800 43.4967 4.10714 20.05; 3801 43.4967 4.61429 18
 1395. 3802 43.4967 4.61429 20.05; 3803 43.4967 5.12143 18



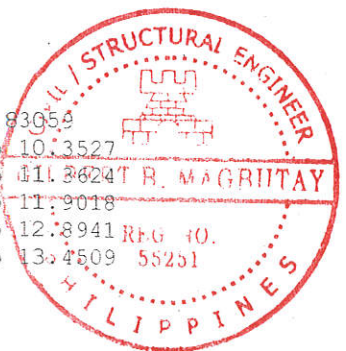
1396. 3804 43.4967 5.12143 20.05; 3805 43.4967 5.62357 18
 1397. 3806 43.4967 5.62857 20.05; 3807 43.4967 6.13571 18
 1399. 3808 43.4967 6.13571 20.05; 3809 43.4967 6.64286 18
 1399. 3810 43.4967 6.64236 20.05; 3811 43.4967 7.15 18; 3812 43.4967 7.15 20.05
 1400. 3813 43.51 10.67 13; 3814 43.51 11.1417 18; 3815 43.51 11.6133 18
 1401. 3816 43.51 12.085 18; 3817 43.51 12.5517 18; 3818 43.51 13.0183 18
 1402. 3819 43.51 13.485 18; 3820 43.51 13.9517 18; 3821 43.51 14.4183 18
 1403. 3822 43.51 14.885 18; 3823 43.51 15.4283 18; 3824 43.51 15.9717 18
 1404. 3825 43.51 16.515 18; 3826 43.61 3.6 9.32; 3827 43.61 3.6 23.9
 1405. 3828 43.61 3.6 25; 3829 43.61 7.15 9.32; 3830 43.61 7.15 23.9
 1406. 3831 43.61 7.15 25; 3832 43.61 12.085 9.32; 3833 44.0033 0.03 18
 1407. 3834 44.0033 0.03 20.05; 3835 44.0033 0.54 18; 3836 44.0033 0.54 20.05
 1408. 3837 44.0033 1.05 18; 3838 44.0033 1.05 20.05; 3839 44.0033 1.56 18
 1409. 3840 44.0033 1.56 20.05; 3841 44.0033 2.07 18; 3842 44.0033 2.07 20.05
 1410. 3843 44.0033 2.58 18; 3844 44.0033 2.58 20.05; 3845 44.0033 3.09 18
 1411. 3846 44.0033 3.09 20.05; 3847 44.0033 3.6 18; 3848 44.0033 3.6 20.05
 1412. 3849 44.0033 4.10714 18; 3850 44.0033 4.10714 20.05; 3851 44.0033 4.61429 18
 1413. 3852 44.0033 4.61429 20.05; 3853 44.0033 5.12143 18
 1414. 3854 44.0033 5.12143 20.05; 3855 44.0033 5.62357 18
 1415. 3856 44.0033 5.62857 20.05; 3857 44.0033 6.13571 18
 1416. 3858 44.0033 6.13571 20.05; 3859 44.0033 6.64286 18
 1417. 3860 44.0033 6.64286 20.05; 3861 44.0033 7.15 18; 3862 44.0033 7.15 20.05
 1418. 3863 44.01 10.67 13; 3864 44.01 11.1417 18; 3865 44.01 11.6133 18
 1419. 3866 44.01 12.085 18; 3867 44.01 12.5517 18; 3868 44.01 13.0183 18
 1420. 3869 44.01 13.485 18; 3870 44.01 13.9517 18; 3871 44.01 14.4183 18
 1421. 3872 44.01 14.885 18; 3873 44.01 15.4283 18; 3874 44.01 15.9717 18
 1422. 3875 44.01 16.515 18; 3876 44.51 0.03 9.32; 3877 44.51 0.03 9.82276
 1423. 3878 44.51 0.03 10.3255; 3879 44.51 0.03 10.8283; 3880 44.51 0.03 11.331
 1424. 3881 44.51 0.03 11.8338; 3882 44.51 0.03 12.3366; 3883 44.51 0.03 12.8393
 1425. 3884 44.51 0.03 13.3421; 3885 44.51 0.03 13.8448; 3886 44.51 0.03 14.3476
 1426. 3887 44.51 0.03 14.8503; 3888 44.51 0.03 15.3531; 3889 44.51 0.03 15.8559
 1427. 3890 44.51 0.03 16.3586; 3891 44.51 0.03 16.8614; 3892 44.51 0.03 17.3641
 1428. 3893 44.51 0.03 17.8669; 3894 44.51 0.03 18.3697; 3895 44.51 0.03 18.8724
 1429. 3896 44.51 0.03 19.3752; 3897 44.51 0.03 19.8779; 3898 44.51 0.03 20.3807
 1430. 3899 44.51 0.03 20.8834; 3900 44.51 0.03 21.3862; 3901 44.51 0.03 21.889
 1431. 3902 44.51 0.03 22.3917; 3903 44.51 0.03 22.8945; 3904 44.51 0.03 23.3972
 1432. 3905 44.51 0.03 23.8995; 3906 44.51 0.03 24.4023; 3907 44.51 0.03 24.9051
 1433. 3908 44.51 0.54 9.32; 3909 44.51 0.54 9.82276; 3910 44.51 0.54 10.3255
 1434. 3911 44.51 0.54 10.8283; 3912 44.51 0.54 11.331; 3913 44.51 0.54 11.8338
 1435. 3914 44.51 0.54 12.3366; 3915 44.51 0.54 12.8393; 3916 44.51 0.54 13.3421
 1436. 3917 44.51 0.54 13.8448; 3918 44.51 0.54 14.3476; 3919 44.51 0.54 14.8503
 1437. 3920 44.51 0.54 15.3531; 3921 44.51 0.54 15.8559; 3922 44.51 0.54 16.3586
 1438. 3923 44.51 0.54 16.8614; 3924 44.51 0.54 17.3641; 3925 44.51 0.54 17.8669
 1439. 3926 44.51 0.54 18.3697; 3927 44.51 0.54 18.8724; 3928 44.51 0.54 19.3752
 1440. 3929 44.51 0.54 19.8779; 3930 44.51 0.54 20.3807; 3931 44.51 0.54 20.8834
 1441. 3932 44.51 0.54 21.3862; 3933 44.51 0.54 21.889; 3934 44.51 0.54 22.3917
 1442. 3935 44.51 0.54 22.8945; 3936 44.51 0.54 23.3972; 3937 44.51 0.54 23.8995
 1443. 3938 44.51 0.54 24.4023; 3939 44.51 0.54 24.9051; 3940 44.51 0.54 25.4079
 1444. 3941 44.51 1.05 9.32276; 3942 44.51 1.05 10.3255; 3943 44.51 1.05 10.8283
 1445. 3944 44.51 1.05 11.331; 3945 44.51 1.05 11.8338; 3946 44.51 1.05 12.3366
 1446. 3947 44.51 1.05 12.8393; 3948 44.51 1.05 13.3421; 3949 44.51 1.05 13.8448
 1447. 3950 44.51 1.05 14.3476; 3951 44.51 1.05 14.8503; 3952 44.51 1.05 15.3531
 1448. 3953 44.51 1.05 15.8559; 3954 44.51 1.05 16.3586; 3955 44.51 1.05 16.8614
 1449. 3956 44.51 1.05 17.3641; 3957 44.51 1.05 17.8669; 3958 44.51 1.05 18.3697
 1450. 3959 44.51 1.05 18.8724; 3960 44.51 1.05 19.3752; 3961 44.51 1.05 19.8779
 1451. 3962 44.51 1.05 20.3807; 3963 44.51 1.05 20.8834; 3964 44.51 1.05 21.3862
 1452. 3965 44.51 1.05 21.889; 3966 44.51 1.05 22.3917; 3967 44.51 1.05 22.8945
 1453. 3968 44.51 1.05 23.3972; 3969 44.51 1.05 23.8995; 3970 44.51 1.05 24.4023
 1454. 3971 44.51 1.05 24.9051; 3972 44.51 1.56 9.32; 3973 44.51 1.56 9.82276
 1455. 3974 44.51 1.56 10.3255; 3975 44.51 1.56 10.8283; 3976 44.51 1.56 11.331
 1456. 3977 44.51 1.56 11.8338; 3978 44.51 1.56 12.3366; 3979 44.51 1.56 12.8393
 1457. 3980 44.51 1.56 13.3421; 3981 44.51 1.56 13.8448; 3982 44.51 1.56 14.3476
 1458. 3983 44.51 1.56 14.8503; 3984 44.51 1.56 15.3531; 3985 44.51 1.56 15.8559
 1459. 3986 44.51 1.56 16.3586; 3987 44.51 1.56 16.8614; 3988 44.51 1.56 17.3641
 1460. 3989 44.51 1.56 17.8669; 3990 44.51 1.56 18.3697; 3991 44.51 1.56 18.8724
 1461. 3992 44.51 1.56 19.3752; 3993 44.51 1.56 19.8779; 3994 44.51 1.56 20.3807
 1462. 3995 44.51 1.56 20.8834; 3996 44.51 1.56 21.3862; 3997 44.51 1.56 21.889



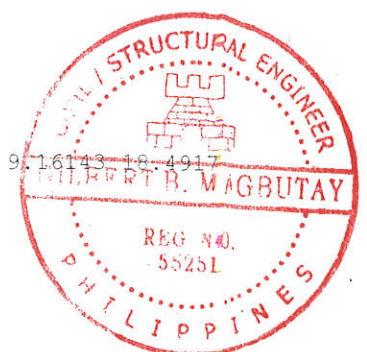
1463.. 3998 44.51 1.56 21.3862; 3999 44.51 1.56 21.889; 4000 44.51 1.56 22.3917
 1464. 4001 44.51 1.56 22.8945; 4002 44.51 1.56 23.3972; 4003 44.51 1.56 23.9
 1465. 4004 44.51 2.07 9.32; 4005 44.51 2.07 9.82276; 4006 44.51 2.07 10.3255
 1466. 4007 44.51 2.07 10.8283; 4008 44.51 2.07 11.331; 4009 44.51 2.07 11.8338
 1467. 4010 44.51 2.07 12.3366; 4011 44.51 2.07 12.8393; 4012 44.51 2.07 13.3421
 1468. 4013 44.51 2.07 13.8448; 4014 44.51 2.07 14.3476; 4015 44.51 2.07 14.8503
 1469. 4016 44.51 2.07 15.3531; 4017 44.51 2.07 15.8559; 4018 44.51 2.07 16.3586
 1470. 4019 44.51 2.07 16.8614; 4020 44.51 2.07 17.3641; 4021 44.51 2.07 17.8669
 1471. 4022 44.51 2.07 18; 4023 44.51 2.07 18.3697; 4024 44.51 2.07 18.3724
 1472. 4025 44.51 2.07 19.3752; 4026 44.51 2.07 19.8779; 4027 44.51 2.07 20.05
 1473. 4028 44.51 2.07 20.3807; 4029 44.51 2.07 20.8834; 4030 44.51 2.07 21.3862
 1474. 4031 44.51 2.07 21.889; 4032 44.51 2.07 22.3917; 4033 44.51 2.07 22.8945
 1475. 4034 44.51 2.07 23.3972; 4035 44.51 2.07 23.9; 4036 44.51 2.58 9.32
 1476. 4037 44.51 2.58 9.32276; 4038 44.51 2.58 10.3255; 4039 44.51 2.58 10.8283
 1477. 4040 44.51 2.58 11.331; 4041 44.51 2.58 11.8338; 4042 44.51 2.58 12.3366
 1478. 4043 44.51 2.58 12.8393; 4044 44.51 2.58 13.3421; 4045 44.51 2.58 13.8448
 1479. 4046 44.51 2.58 14.3476; 4047 44.51 2.58 14.8503; 4048 44.51 2.58 15.3531
 1480. 4049 44.51 2.58 15.8559; 4050 44.51 2.58 16.3586; 4051 44.51 2.58 16.8614
 1481. 4052 44.51 2.58 17.3641; 4053 44.51 2.58 17.8669; 4054 44.51 2.58 18
 1482. 4055 44.51 2.58 18.3697; 4056 44.51 2.58 18.8724; 4057 44.51 2.58 19.3752
 1483. 4058 44.51 2.58 19.8779; 4059 44.51 2.58 20.05; 4060 44.51 2.58 20.3807
 1484. 4061 44.51 2.58 20.8834; 4062 44.51 2.58 21.3862; 4063 44.51 2.58 21.889
 1485. 4064 44.51 2.58 22.3917; 4065 44.51 2.58 22.8945; 4066 44.51 2.58 23.3972
 1486. 4067 44.51 2.58 23.9; 4068 44.51 3.09 9.32; 4069 44.51 3.09 9.82276
 1487. 4070 44.51 3.09 10.3255; 4071 44.51 3.09 10.8283; 4072 44.51 3.09 11.331
 1488. 4073 44.51 3.09 11.8338; 4074 44.51 3.09 12.3366; 4075 44.51 3.09 12.8393
 1489. 4076 44.51 3.09 13.3421; 4077 44.51 3.09 13.8448; 4078 44.51 3.09 14.3476
 1490. 4079 44.51 3.09 14.8503; 4080 44.51 3.09 15.3531; 4081 44.51 3.09 15.8559
 1491. 4082 44.51 3.09 16.3586; 4083 44.51 3.09 16.8614; 4084 44.51 3.09 17.3641
 1492. 4085 44.51 3.09 17.8669; 4086 44.51 3.09 18; 4087 44.51 3.09 18.3697
 1493. 4088 44.51 3.09 18.8724; 4089 44.51 3.09 19.3752; 4090 44.51 3.09 19.8779
 1494. 4091 44.51 3.09 20.05; 4092 44.51 3.09 20.3807; 4093 44.51 3.09 20.8834
 1495. 4094 44.51 3.09 21.3862; 4095 44.51 3.09 21.889; 4096 44.51 3.09 22.3917
 1496. 4097 44.51 3.09 22.8945; 4098 44.51 3.09 23.3972; 4099 44.51 3.09 23.9
 1497. 4100 44.51 3.6 9.32; 4101 44.51 3.6 9.82276; 4102 44.51 3.6 9.83636
 1498. 4103 44.51 3.6 10.3255; 4104 44.51 3.6 10.3527; 4105 44.51 3.6 10.8283
 1499. 4106 44.51 3.6 10.8691; 4107 44.51 3.6 11.331; 4108 44.51 3.6 11.3855
 1500. 4109 44.51 3.6 11.8338; 4110 44.51 3.6 11.9018; 4111 44.51 3.6 12.3366
 1501. 4112 44.51 3.6 12.4182; 4113 44.51 3.6 12.8393; 4114 44.51 3.6 12.9345
 1502. 4115 44.51 3.6 13.3421; 4116 44.51 3.6 13.4509; 4117 44.51 3.6 13.8448
 1503. 4118 44.51 3.6 13.9673; 4119 44.51 3.6 14.3476; 4120 44.51 3.6 14.4836
 1504. 4121 44.51 3.6 14.8503; 4122 44.51 3.6 15; 4123 44.51 3.6 15.3531
 1505. 4124 44.51 3.6 15.6; 4125 44.51 3.6 15.8559; 4126 44.51 3.6 16.2
 1506. 4127 44.51 3.6 16.3586; 4128 44.51 3.6 16.8; 4129 44.51 3.6 16.8614
 1507. 4130 44.51 3.6 17.3641; 4131 44.51 3.6 17.4; 4132 44.51 3.6 17.8669
 1508. 4133 44.51 3.6 18; 4134 44.51 3.6 18.3697; 4135 44.51 3.6 18.5125
 1509. 4136 44.51 3.6 18.8724; 4137 44.51 3.6 19.025; 4138 44.51 3.6 19.3752
 1510. 4139 44.51 3.6 19.5375; 4140 44.51 3.6 19.8779; 4141 44.51 3.6 20.05
 1511. 4142 44.51 3.6 20.3807; 4143 44.51 3.6 20.5313; 4144 44.51 3.6 20.8834
 1512. 4145 44.51 3.6 21.0125; 4146 44.51 3.6 21.3862; 4147 44.51 3.6 21.4937
 1513. 4148 44.51 3.6 21.889; 4149 44.51 3.6 21.975; 4150 44.51 3.6 22.3917
 1514. 4151 44.51 3.6 22.4562; 4152 44.51 3.6 22.8945; 4153 44.51 3.6 22.9375
 1515. 4154 44.51 3.6 23.3972; 4155 44.51 3.6 23.4187; 4156 44.51 3.6 23.9
 1516. 4157 44.51 4.10714 9.32; 4158 44.51 4.10714 9.83636
 1517. 4159 44.51 4.10714 10.3527; 4160 44.51 4.10714 10.8691
 1518. 4161 44.51 4.10714 11.3855; 4162 44.51 4.10714 11.9018
 1519. 4163 44.51 4.10714 12.4182; 4164 44.51 4.10714 12.9345
 1520. 4165 44.51 4.10714 13.4509; 4166 44.51 4.10714 13.9673
 1521. 4167 44.51 4.10714 14.4836; 4168 44.51 4.10714 15; 4169 44.51 4.10714 15.3531
 1522. 4170 44.51 4.10714 16.2; 4171 44.51 4.10714 16.8; 4172 44.51 4.10714 17.3641
 1523. 4173 44.51 4.10714 18; 4174 44.51 4.10714 18.5125; 4175 44.51 4.10714 19.025
 1524. 4176 44.51 4.10714 19.5375; 4177 44.51 4.10714 20.05
 1525. 4178 44.51 4.10714 20.5313; 4179 44.51 4.10714 21.0125
 1526. 4180 44.51 4.10714 21.4937; 4181 44.51 4.10714 21.975
 1527. 4182 44.51 4.10714 22.4562; 4183 44.51 4.10714 22.9375
 1528. 4184 44.51 4.10714 23.4187; 4185 44.51 4.10714 23.9; 4186 44.51 4.61429 9.83636
 1529. 4187 44.51 4.61429 9.83636; 4188 44.51 4.61429 10.3527



1530. 4189 44.51 4.61429 10.8691; 4190 44.51 4.61429 11.3855
 1531. 4191 44.51 4.61429 11.9018; 4192 44.51 4.61429 12.4182
 1532. 4193 44.51 4.61429 12.9345; 4194 44.51 4.61429 13.4509
 1533. 4195 44.51 4.61429 13.9673; 4196 44.51 4.61429 14.4836; 4197 44.51 4.61429 15
 1534. 4198 44.51 4.61429 15.6; 4199 44.51 4.61429 16.2; 4200 44.51 4.61429 16.8
 1535. 4201 44.51 4.61429 17.4; 4202 44.51 4.61429 18; 4203 44.51 4.61429 18.5125
 1536. 4204 44.51 4.61429 19.025; 4205 44.51 4.61429 19.5375
 1537. 4206 44.51 4.61429 20.05; 4207 44.51 4.61429 20.5313
 1538. 4208 44.51 4.61429 21.0125; 4209 44.51 4.61429 21.4937
 1539. 4210 44.51 4.61429 21.975; 4211 44.51 4.61429 22.4562
 1540. 4212 44.51 4.61429 22.9375; 4213 44.51 4.61429 23.4187
 1541. 4214 44.51 4.61429 23.9; 4215 44.51 5.12143 9.32; 4216 44.51 5.12143 9.83636
 1542. 4217 44.51 5.12143 10.3527; 4218 44.51 5.12143 10.8691
 1543. 4219 44.51 5.12143 11.3855; 4220 44.51 5.12143 11.9018
 1544. 4221 44.51 5.12143 12.4182; 4222 44.51 5.12143 12.9345
 1545. 4223 44.51 5.12143 13.4509; 4224 44.51 5.12143 13.9673
 1546. 4225 44.51 5.12143 14.4836; 4226 44.51 5.12143 15; 4227 44.51 5.12143 15.6
 1547. 4228 44.51 5.12143 16.2; 4229 44.51 5.12143 16.8; 4230 44.51 5.12143 17.4
 1548. 4231 44.51 5.12143 18; 4232 44.51 5.12143 18.5125; 4233 44.51 5.12143 19.025
 1549. 4234 44.51 5.12143 19.5375; 4235 44.51 5.12143 20.05
 1550. 4236 44.51 5.12143 20.5313; 4237 44.51 5.12143 21.0125
 1551. 4238 44.51 5.12143 21.4937; 4239 44.51 5.12143 21.975
 1552. 4240 44.51 5.12143 22.4562; 4241 44.51 5.12143 22.9375
 1553. 4242 44.51 5.12143 23.4187; 4243 44.51 5.12143 23.9; 4244 44.51 5.62857 9.32
 1554. 4245 44.51 5.62857 9.83636; 4246 44.51 5.62857 10.3527
 1555. 4247 44.51 5.62857 10.8691; 4248 44.51 5.62857 11.3855
 1556. 4249 44.51 5.62857 11.9018; 4250 44.51 5.62857 12.4182
 1557. 4251 44.51 5.62857 12.9345; 4252 44.51 5.62857 13.4509
 1558. 4253 44.51 5.62857 13.9673; 4254 44.51 5.62857 14.4836; 4255 44.51 5.62857 15
 1559. 4256 44.51 5.62857 15.6; 4257 44.51 5.62857 16.2; 4258 44.51 5.62857 16.8
 1560. 4259 44.51 5.62857 17.4; 4260 44.51 5.62857 18; 4261 44.51 5.62857 18.5125
 1561. 4262 44.51 5.62857 19.025; 4263 44.51 5.62857 19.5375
 1562. 4264 44.51 5.62857 20.05; 4265 44.51 5.62857 20.5313
 1563. 4266 44.51 5.62857 21.0125; 4267 44.51 5.62857 21.4937
 1564. 4268 44.51 5.62857 21.975; 4269 44.51 5.62857 22.4562
 1565. 4270 44.51 5.62857 22.9375; 4271 44.51 5.62857 23.4187
 1566. 4272 44.51 5.62857 23.9; 4273 44.51 6.13571 9.32; 4274 44.51 6.13571 9.83636
 1567. 4275 44.51 6.13571 10.3527; 4276 44.51 6.13571 10.8691
 1568. 4277 44.51 6.13571 11.3855; 4278 44.51 6.13571 11.9018
 1569. 4279 44.51 6.13571 12.4182; 4280 44.51 6.13571 12.9345
 1570. 4281 44.51 6.13571 13.4509; 4282 44.51 6.13571 13.9673
 1571. 4283 44.51 6.13571 14.4836; 4284 44.51 6.13571 15; 4285 44.51 6.13571 15.6
 1572. 4286 44.51 6.13571 16.2; 4287 44.51 6.13571 16.8; 4288 44.51 6.13571 17.4
 1573. 4289 44.51 6.13571 18; 4290 44.51 6.13571 18.5125; 4291 44.51 6.13571 19.025
 1574. 4292 44.51 6.13571 19.5375; 4293 44.51 6.13571 20.05
 1575. 4294 44.51 6.13571 20.5313; 4295 44.51 6.13571 21.0125
 1576. 4296 44.51 6.13571 21.4937; 4297 44.51 6.13571 21.975
 1577. 4298 44.51 6.13571 22.4562; 4299 44.51 6.13571 22.9375
 1578. 4300 44.51 6.13571 23.4187; 4301 44.51 6.13571 23.9; 4302 44.51 6.64286 9.32
 1579. 4303 44.51 6.64286 9.83636; 4304 44.51 6.64286 10.3527
 1580. 4305 44.51 6.64286 10.8691; 4306 44.51 6.64286 11.3855
 1581. 4307 44.51 6.64286 11.9018; 4308 44.51 6.64286 12.4182
 1582. 4309 44.51 6.64286 12.9345; 4310 44.51 6.64286 13.4509
 1583. 4311 44.51 6.64286 13.9673; 4312 44.51 6.64286 14.4836; 4313 44.51 6.64286 15
 1584. 4314 44.51 6.64286 15.6; 4315 44.51 6.64286 16.2; 4316 44.51 6.64286 16.8
 1585. 4317 44.51 6.64286 17.4; 4318 44.51 6.64286 18; 4319 44.51 6.64286 18.5125
 1586. 4320 44.51 6.64286 19.025; 4321 44.51 6.64286 19.5375
 1587. 4322 44.51 6.64286 20.05; 4323 44.51 6.64286 20.5313
 1588. 4324 44.51 6.64286 21.0125; 4325 44.51 6.64286 21.4937
 1589. 4326 44.51 6.64286 21.975; 4327 44.51 6.64286 22.4562
 1590. 4328 44.51 6.64286 22.9375; 4329 44.51 6.64286 23.4187
 1591. 4330 44.51 6.64286 23.9; 4331 44.51 7.15 9.32; 4332 44.51 7.15 9.83636
 1592. 4333 44.51 7.15 9.83636; 4334 44.51 7.15 10.3527; 4335 44.51 7.15 10.8691
 1593. 4336 44.51 7.15 10.8691; 4337 44.51 7.15 11.3855; 4338 44.51 7.15 11.9018
 1594. 4339 44.51 7.15 11.9018; 4340 44.51 7.15 12.4182; 4341 44.51 7.15 12.9345
 1595. 4342 44.51 7.15 12.9345; 4343 44.51 7.15 13.4509; 4344 44.51 7.15 13.9673
 1596. 4345 44.51 7.15 13.9673; 4346 44.51 7.15 14.4836; 4347 44.51 7.15 15



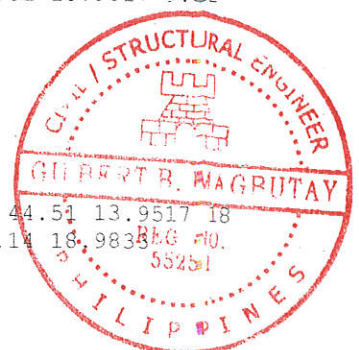
1597. 4348 44.51 7.15 13.9153; 4349 44.51 7.15 13.9673; 4350 44.51 7.15 14.4259
 1598. 4351 44.51 7.15 14.4836; 4352 44.51 7.15 14.9365; 4353 44.51 7.15 15
 1599. 4354 44.51 7.15 15.4471; 4355 44.51 7.15 15.6; 4356 44.51 7.15 15.9576
 1600. 4357 44.51 7.15 16.2; 4358 44.51 7.15 16.4682; 4359 44.51 7.15 16.8
 1601. 4360 44.51 7.15 16.9788; 4361 44.51 7.15 17.4; 4362 44.51 7.15 17.4894
 1602. 4363 44.51 7.15 18; 4364 44.51 7.15 18.4917; 4365 44.51 7.15 18.5125
 1603. 4366 44.51 7.15 18.9833; 4367 44.51 7.15 19.025; 4368 44.51 7.15 19.475
 1604. 4369 44.51 7.15 19.5375; 4370 44.51 7.15 19.9667; 4371 44.51 7.15 20.05
 1605. 4372 44.51 7.15 20.4583; 4373 44.51 7.15 20.5313; 4374 44.51 7.15 20.95
 1606. 4375 44.51 7.15 21.0125; 4376 44.51 7.15 21.4417; 4377 44.51 7.15 21.4937
 1607. 4378 44.51 7.15 21.9333; 4379 44.51 7.15 21.975; 4380 44.51 7.15 22.425
 1608. 4381 44.51 7.15 22.4562; 4382 44.51 7.15 22.9167; 4383 44.51 7.15 22.9375
 1609. 4384 44.51 7.15 23.4083; 4385 44.51 7.15 23.4187; 4386 44.51 7.15 23.9
 1610. 4387 44.51 7.65286 9.32; 4388 44.51 7.65286 9.83059
 1611. 4389 44.51 7.65286 10.3412; 4390 44.51 7.65286 10.8518
 1612. 4391 44.51 7.65286 11.3624; 4392 44.51 7.65286 11.8729
 1613. 4393 44.51 7.65286 12.3835; 4394 44.51 7.65286 12.8941
 1614. 4395 44.51 7.65286 13.4047; 4396 44.51 7.65286 13.9153
 1615. 4397 44.51 7.65286 14.4259; 4398 44.51 7.65286 14.9365
 1616. 4399 44.51 7.65286 15.4471; 4400 44.51 7.65286 15.9576
 1617. 4401 44.51 7.65286 16.4682; 4402 44.51 7.65286 16.9788
 1618. 4403 44.51 7.65286 17.4894; 4404 44.51 7.65286 18; 4405 44.51 7.65286 18.4917
 1619. 4406 44.51 7.65286 18.9833; 4407 44.51 7.65286 19.475
 1620. 4408 44.51 7.65286 19.9667; 4409 44.51 7.65286 20.4583
 1621. 4410 44.51 7.65286 20.95; 4411 44.51 7.65286 21.4417
 1622. 4412 44.51 7.65286 21.9333; 4413 44.51 7.65286 22.425
 1623. 4414 44.51 7.65286 22.9167; 4415 44.51 7.65286 23.4083
 1624. 4416 44.51 7.65286 23.9; 4417 44.51 8.15571 9.32; 4418 44.51 8.15571 9.83059
 1625. 4419 44.51 8.15571 10.3412; 4420 44.51 8.15571 10.8518
 1626. 4421 44.51 8.15571 11.3624; 4422 44.51 8.15571 11.8729
 1627. 4423 44.51 8.15571 12.3835; 4424 44.51 8.15571 12.8941
 1628. 4425 44.51 8.15571 13.4047; 4426 44.51 8.15571 13.9153
 1629. 4427 44.51 8.15571 14.4259; 4428 44.51 8.15571 14.9365
 1630. 4429 44.51 8.15571 15.4471; 4430 44.51 8.15571 15.9576
 1631. 4431 44.51 8.15571 16.4682; 4432 44.51 8.15571 16.9788
 1632. 4433 44.51 8.15571 17.4894; 4434 44.51 8.15571 18; 4435 44.51 8.15571 18.4917
 1633. 4436 44.51 8.15571 18.9833; 4437 44.51 8.15571 19.475
 1634. 4438 44.51 8.15571 19.9667; 4439 44.51 8.15571 20.4583
 1635. 4440 44.51 8.15571 20.95; 4441 44.51 8.15571 21.4417
 1636. 4442 44.51 8.15571 21.9333; 4443 44.51 8.15571 22.425
 1637. 4444 44.51 8.15571 22.9167; 4445 44.51 8.15571 23.4083
 1638. 4446 44.51 8.15571 23.9; 4447 44.51 8.65857 9.32; 4448 44.51 8.65857 9.83059
 1639. 4449 44.51 8.65857 10.3412; 4450 44.51 8.65857 10.8518
 1640. 4451 44.51 8.65857 11.3624; 4452 44.51 8.65857 11.8729
 1641. 4453 44.51 8.65857 12.3835; 4454 44.51 8.65857 12.8941
 1642. 4455 44.51 8.65857 13.4047; 4456 44.51 8.65857 13.9153
 1643. 4457 44.51 8.65857 14.4259; 4458 44.51 8.65857 14.9365
 1644. 4459 44.51 8.65857 15.4471; 4460 44.51 8.65857 15.9576
 1645. 4461 44.51 8.65857 16.4682; 4462 44.51 8.65857 16.9788
 1646. 4463 44.51 8.65857 17.4894; 4464 44.51 8.65857 18; 4465 44.51 8.65857 18.4917
 1647. 4466 44.51 8.65857 18.9833; 4467 44.51 8.65857 19.475
 1648. 4468 44.51 8.65857 19.9667; 4469 44.51 8.65857 20.4583
 1649. 4470 44.51 8.65857 20.95; 4471 44.51 8.65857 21.4417
 1650. 4472 44.51 8.65857 21.9333; 4473 44.51 8.65857 22.425
 1651. 4474 44.51 8.65857 22.9167; 4475 44.51 8.65857 23.4083
 1652. 4476 44.51 8.65857 23.9; 4477 44.51 9.16143 9.32; 4478 44.51 9.16143 9.83059
 1653. 4479 44.51 9.16143 10.3412; 4480 44.51 9.16143 10.8518
 1654. 4481 44.51 9.16143 11.3624; 4482 44.51 9.16143 11.8729
 1655. 4483 44.51 9.16143 12.3835; 4484 44.51 9.16143 12.8941
 1656. 4485 44.51 9.16143 13.4047; 4486 44.51 9.16143 13.9153
 1657. 4487 44.51 9.16143 14.4259; 4488 44.51 9.16143 14.9365
 1658. 4489 44.51 9.16143 15.4471; 4490 44.51 9.16143 15.9576
 1659. 4491 44.51 9.16143 16.4682; 4492 44.51 9.16143 16.9788
 1660. 4493 44.51 9.16143 17.4894; 4494 44.51 9.16143 18; 4495 44.51 9.16143 18.4917
 1661. 4496 44.51 9.16143 18.9833; 4497 44.51 9.16143 19.475
 1662. 4498 44.51 9.16143 19.9667; 4499 44.51 9.16143 20.4583
 1663. 4500 44.51 9.16143 20.95; 4501 44.51 9.16143 21.4417



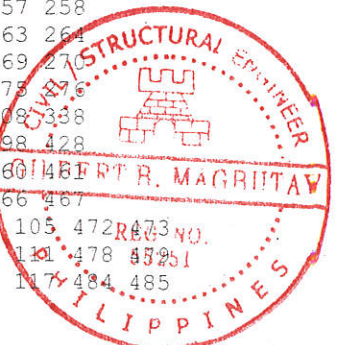
1664. 4502 44.51 9.16143 21.9333; 4503 44.51 9.16143 22.425
 1665. 4504 44.51 9.16143 22.9167; 4505 44.51 9.16143 23.4083
 1666. 4506 44.51 9.16143 23.9; 4507 44.51 9.66429 9.32; 4508 44.51 9.66429 9.83059
 1667. 4509 44.51 9.66429 10.3412; 4510 44.51 9.66429 10.8518
 1668. 4511 44.51 9.66429 11.3624; 4512 44.51 9.66429 11.8729
 1669. 4513 44.51 9.66429 12.3835; 4514 44.51 9.66429 12.8941
 1670. 4515 44.51 9.66429 13.4047; 4516 44.51 9.66429 13.9153
 1671. 4517 44.51 9.66429 14.4259; 4518 44.51 9.66429 14.9365
 1672. 4519 44.51 9.66429 15.4471; 4520 44.51 9.66429 15.9576
 1673. 4521 44.51 9.66429 16.4682; 4522 44.51 9.66429 16.9788
 1674. 4523 44.51 9.66429 17.4894; 4524 44.51 9.66429 18; 4525 44.51 9.66429 18.4917
 1675. 4526 44.51 9.66429 18.9833; 4527 44.51 9.66429 19.475
 1676. 4528 44.51 9.66429 19.9667; 4529 44.51 9.66429 20.4583
 1677. 4530 44.51 9.66429 20.95; 4531 44.51 9.66429 21.4417
 1678. 4532 44.51 9.66429 21.9333; 4533 44.51 9.66429 22.425
 1679. 4534 44.51 9.66429 22.9167; 4535 44.51 9.66429 23.4083
 1680. 4536 44.51 9.66429 23.9; 4537 44.51 10.1671 9.32; 4538 44.51 10.1671 9.83059
 1681. 4539 44.51 10.1671 10.3412; 4540 44.51 10.1671 10.8518
 1682. 4541 44.51 10.1671 11.3624; 4542 44.51 10.1671 11.8729
 1683. 4543 44.51 10.1671 12.3835; 4544 44.51 10.1671 12.8941
 1684. 4545 44.51 10.1671 13.4047; 4546 44.51 10.1671 13.9153
 1685. 4547 44.51 10.1671 14.4259; 4548 44.51 10.1671 14.9365
 1686. 4549 44.51 10.1671 15.4471; 4550 44.51 10.1671 15.9576
 1687. 4551 44.51 10.1671 16.4682; 4552 44.51 10.1671 16.9788
 1688. 4553 44.51 10.1671 17.4894; 4554 44.51 10.1671 18; 4555 44.51 10.1671 18.4917
 1689. 4556 44.51 10.1671 18.9833; 4557 44.51 10.1671 19.475
 1690. 4558 44.51 10.1671 19.9667; 4559 44.51 10.1671 20.4583
 1691. 4560 44.51 10.1671 20.95; 4561 44.51 10.1671 21.4417
 1692. 4562 44.51 10.1671 21.9333; 4563 44.51 10.1671 22.425
 1693. 4564 44.51 10.1671 22.9167; 4565 44.51 10.1671 23.4083
 1694. 4566 44.51 10.1671 23.9; 4567 44.51 10.67 9.32; 4568 44.51 10.67 9.83059
 1695. 4569 44.51 10.67 10.3412; 4570 44.51 10.67 10.8518; 4571 44.51 10.67 11.3624
 1696. 4572 44.51 10.67 11.8729; 4573 44.51 10.67 12.3835; 4574 44.51 10.67 12.8941
 1697. 4575 44.51 10.67 13.4047; 4576 44.51 10.67 13.9153; 4577 44.51 10.67 14.4259
 1698. 4578 44.51 10.67 14.9365; 4579 44.51 10.67 15; 4580 44.51 10.67 15.4471
 1699. 4581 44.51 10.67 15.9576; 4582 44.51 10.67 16.4682; 4583 44.51 10.67 16.9788
 1700. 4584 44.51 10.67 17.4894; 4585 44.51 10.67 18; 4586 44.51 10.67 18.4917
 1701. 4587 44.51 10.67 18.9833; 4588 44.51 10.67 19.475; 4589 44.51 10.67 19.9667
 1702. 4590 44.51 10.67 20.4583; 4591 44.51 10.67 20.95; 4592 44.51 10.67 21.4417
 1703. 4593 44.51 10.67 21.9333; 4594 44.51 10.67 22.425; 4595 44.51 10.67 22.9167
 1704. 4596 44.51 10.67 23.4083; 4597 44.51 10.67 23.9; 4598 44.51 11.1417 9.32
 1705. 4599 44.51 11.1417 9.83059; 4600 44.51 11.1417 10.3412
 1706. 4601 44.51 11.1417 10.8518; 4602 44.51 11.1417 11.3624
 1707. 4603 44.51 11.1417 11.8729; 4604 44.51 11.1417 12.3835
 1708. 4605 44.51 11.1417 12.8941; 4606 44.51 11.1417 13.4047
 1709. 4607 44.51 11.1417 13.9153; 4608 44.51 11.1417 14.4259
 1710. 4609 44.51 11.1417 14.9365; 4610 44.51 11.1417 15.4471
 1711. 4611 44.51 11.1417 15.9576; 4612 44.51 11.1417 16.4682
 1712. 4613 44.51 11.1417 16.9788; 4614 44.51 11.1417 17.4894; 4615 44.51 11.1417 18
 1713. 4616 44.51 11.1657 18; 4617 44.51 11.1657 18.4917; 4618 44.51 11.1657 18.9833
 1714. 4619 44.51 11.1657 19.475; 4620 44.51 11.1657 19.9667
 1715. 4621 44.51 11.1657 20.4583; 4622 44.51 11.1657 20.95
 1716. 4623 44.51 11.1657 21.4417; 4624 44.51 11.1657 21.9333
 1717. 4625 44.51 11.1657 22.425; 4626 44.51 11.1657 22.9167
 1718. 4627 44.51 11.1657 23.4083; 4628 44.51 11.1657 23.9; 4629 44.51 11.6133 9.32
 1719. 4630 44.51 11.6133 9.83059; 4631 44.51 11.6133 10.3412
 1720. 4632 44.51 11.6133 10.8518; 4633 44.51 11.6133 11.3624
 1721. 4634 44.51 11.6133 11.8729; 4635 44.51 11.6133 12.3835
 1722. 4636 44.51 11.6133 12.8941; 4637 44.51 11.6133 13.4047
 1723. 4638 44.51 11.6133 13.9153; 4639 44.51 11.6133 14.4259
 1724. 4640 44.51 11.6133 14.9365; 4641 44.51 11.6133 15.4471
 1725. 4642 44.51 11.6133 15.9576; 4643 44.51 11.6133 16.4682
 1726. 4644 44.51 11.6133 16.9788; 4645 44.51 11.6133 17.4894; 4646 44.51 11.6133 18
 1727. 4647 44.51 11.6614 18; 4648 44.51 11.6614 18.4917; 4649 44.51 11.6614 18.9833
 1728. 4650 44.51 11.6614 19.475; 4651 44.51 11.6614 19.9667
 1729. 4652 44.51 11.6614 20.4583; 4653 44.51 11.6614 20.95
 1730. 4654 44.51 11.6614 21.4417; 4655 44.51 11.6614 21.9333



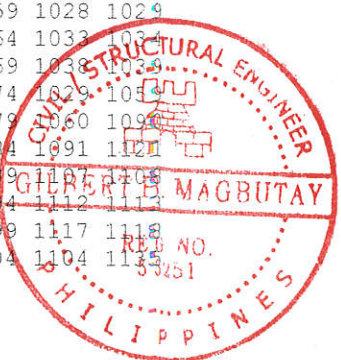
1731. 4656 44.51 11.6614 22.425; 4657 44.51 11.6614 22.9167
 1732. 4658 44.51 11.6614 23.4083; 4659 44.51 11.6614 23.9; 4660 44.51 12.085 9.32
 1733. 4661 44.51 12.085 9.83059; 4662 44.51 12.085 10.3412
 1734. 4663 44.51 12.085 10.8518; 4664 44.51 12.085 11.3624
 1735. 4665 44.51 12.085 11.8729; 4666 44.51 12.085 12.3835
 1736. 4667 44.51 12.085 12.8941; 4668 44.51 12.085 13.4047
 1737. 4669 44.51 12.085 13.9153; 4670 44.51 12.085 14.4259
 1738. 4671 44.51 12.085 14.9365; 4672 44.51 12.085 15.4471
 1739. 4673 44.51 12.085 15.9576; 4674 44.51 12.085 16.4682
 1740. 4675 44.51 12.085 16.9788; 4676 44.51 12.085 17.4894; 4677 44.51 12.085 18
 1741. 4678 44.51 12.1571 18; 4679 44.51 12.1571 18.4917; 4680 44.51 12.1571 18.9833
 1742. 4681 44.51 12.1571 19.475; 4682 44.51 12.1571 19.9667
 1743. 4683 44.51 12.1571 20.4583; 4684 44.51 12.1571 20.95
 1744. 4685 44.51 12.1571 21.4417; 4686 44.51 12.1571 21.9333
 1745. 4687 44.51 12.1571 22.425; 4688 44.51 12.1571 22.9167
 1746. 4689 44.51 12.1571 23.4083; 4690 44.51 12.1571 23.9; 4691 44.51 12.5517 9.32
 1747. 4692 44.51 12.5517 9.83059; 4693 44.51 12.5517 10.3412
 1748. 4694 44.51 12.5517 10.8518; 4695 44.51 12.5517 11.3624
 1749. 4696 44.51 12.5517 11.8729; 4697 44.51 12.5517 12.3835
 1750. 4698 44.51 12.5517 12.8941; 4699 44.51 12.5517 13.4047
 1751. 4700 44.51 12.5517 13.9153; 4701 44.51 12.5517 14.4259
 1752. 4702 44.51 12.5517 14.9365; 4703 44.51 12.5517 15.4471
 1753. 4704 44.51 12.5517 15.9576; 4705 44.51 12.5517 16.4682
 1754. 4706 44.51 12.5517 16.9788; 4707 44.51 12.5517 17.4894; 4708 44.51 12.5517 18
 1755. 4709 44.51 12.6529 18; 4710 44.51 12.6529 18.4917; 4711 44.51 12.6529 18.9833
 1756. 4712 44.51 12.6529 19.475; 4713 44.51 12.6529 19.9667
 1757. 4714 44.51 12.6529 20.4583; 4715 44.51 12.6529 20.95
 1758. 4716 44.51 12.6529 21.4417; 4717 44.51 12.6529 21.9333
 1759. 4718 44.51 12.6529 22.425; 4719 44.51 12.6529 22.9167
 1760. 4720 44.51 12.6529 23.4083; 4721 44.51 12.6529 23.9; 4722 44.51 13.0183 9.32
 1761. 4723 44.51 13.0183 9.83059; 4724 44.51 13.0183 10.3412
 1762. 4725 44.51 13.0183 10.8518; 4726 44.51 13.0183 11.3624
 1763. 4727 44.51 13.0183 11.8729; 4728 44.51 13.0183 12.3835
 1764. 4729 44.51 13.0183 12.8941; 4730 44.51 13.0183 13.4047
 1765. 4731 44.51 13.0183 13.9153; 4732 44.51 13.0183 14.4259
 1766. 4733 44.51 13.0183 14.9365; 4734 44.51 13.0183 15.4471
 1767. 4735 44.51 13.0183 15.9576; 4736 44.51 13.0183 16.4682
 1768. 4737 44.51 13.0183 16.9788; 4738 44.51 13.0183 17.4894; 4739 44.51 13.0183 18
 1769. 4740 44.51 13.1486 18; 4741 44.51 13.1486 18.4917; 4742 44.51 13.1486 18.9833
 1770. 4743 44.51 13.1486 19.475; 4744 44.51 13.1486 19.9667
 1771. 4745 44.51 13.1486 20.4583; 4746 44.51 13.1486 20.95
 1772. 4747 44.51 13.1486 21.4417; 4748 44.51 13.1486 21.9333
 1773. 4749 44.51 13.1486 22.425; 4750 44.51 13.1486 22.9167
 1774. 4751 44.51 13.1486 23.4083; 4752 44.51 13.1486 23.9; 4753 44.51 13.485 9.32
 1775. 4754 44.51 13.485 9.83059; 4755 44.51 13.485 10.3412
 1776. 4756 44.51 13.485 10.8518; 4757 44.51 13.485 11.3624
 1777. 4758 44.51 13.485 11.8729; 4759 44.51 13.485 12.3835
 1778. 4760 44.51 13.485 12.8941; 4761 44.51 13.485 13.4047
 1779. 4762 44.51 13.485 13.9153; 4763 44.51 13.485 14.4259
 1780. 4764 44.51 13.485 14.9365; 4765 44.51 13.485 15.4471
 1781. 4766 44.51 13.485 15.9576; 4767 44.51 13.485 16.4682
 1782. 4768 44.51 13.485 16.9788; 4769 44.51 13.485 17.4894; 4770 44.51 13.485 18
 1783. 4771 44.51 13.6443 18; 4772 44.51 13.6443 18.4917; 4773 44.51 13.6443 18.9833
 1784. 4774 44.51 13.6443 19.475; 4775 44.51 13.6443 19.9667
 1785. 4776 44.51 13.6443 20.4583; 4777 44.51 13.6443 20.95
 1786. 4778 44.51 13.6443 21.4417; 4779 44.51 13.6443 21.9333
 1787. 4780 44.51 13.6443 22.425; 4781 44.51 13.6443 22.9167
 1788. 4782 44.51 13.6443 23.4083; 4783 44.51 13.6443 23.9; 4784 44.51 13.9517 9.32
 1789. 4785 44.51 13.9517 9.83059; 4786 44.51 13.9517 10.3412
 1790. 4787 44.51 13.9517 10.8518; 4788 44.51 13.9517 11.3624
 1791. 4789 44.51 13.9517 11.8729; 4790 44.51 13.9517 12.3835
 1792. 4791 44.51 13.9517 12.8941; 4792 44.51 13.9517 13.4047
 1793. 4793 44.51 13.9517 13.9153; 4794 44.51 13.9517 14.4259
 1794. 4795 44.51 13.9517 14.9365; 4796 44.51 13.9517 15.4471
 1795. 4797 44.51 13.9517 15.9576; 4798 44.51 13.9517 16.4682
 1796. 4799 44.51 13.9517 16.9788; 4800 44.51 13.9517 17.4894; 4801 44.51 13.9517 18
 1797. 4802 44.51 14.14 18; 4803 44.51 14.14 18.4917; 4804 44.51 14.14 18.9833



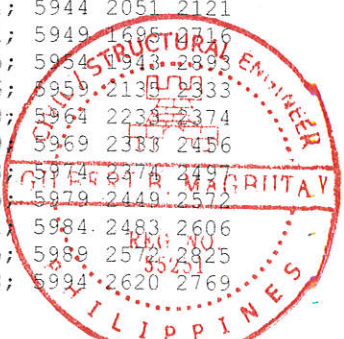
1798. 4805 44.51 14.14 19.475; 4806 44.51 14.14 19.9667; 4807 44.51 14.14 20.4583
 1799. 4808 44.51 14.14 20.95; 4809 44.51 14.14 21.4417; 4810 44.51 14.14 21.9333
 1800. 4811 44.51 14.14 22.425; 4812 44.51 14.14 22.9167; 4813 44.51 14.14 23.4083
 1801. 4814 44.51 14.14 23.9; 4815 44.51 14.4183 9.32; 4816 44.51 14.4183 9.83059
 1802. 4817 44.51 14.4183 10.3412; 4818 44.51 14.4183 10.8518
 1803. 4819 44.51 14.4183 11.3624; 4820 44.51 14.4183 11.8729
 1804. 4821 44.51 14.4183 12.3835; 4822 44.51 14.4183 12.8941
 1805. 4823 44.51 14.4183 13.4047; 4824 44.51 14.4183 13.9153
 1806. 4825 44.51 14.4183 14.4259; 4826 44.51 14.4183 14.9365
 1807. 4827 44.51 14.4183 15.4471; 4828 44.51 14.4183 15.9576
 1808. 4829 44.51 14.4183 16.4682; 4830 44.51 14.4183 16.9788
 1809. 4831 44.51 14.4183 17.4894; 4832 44.51 14.4183 18; 4833 44.51 14.885 9.32
 1810. 4834 44.51 14.885 9.83059; 4835 44.51 14.885 10.3412
 1811. 4836 44.51 14.885 10.8518; 4837 44.51 14.885 11.3624
 1812. 4838 44.51 14.885 11.8729; 4839 44.51 14.885 12.3835
 1813. 4840 44.51 14.885 12.8941; 4841 44.51 14.885 13.4047
 1814. 4842 44.51 14.885 13.9153; 4843 44.51 14.885 14.4259
 1815. 4844 44.51 14.885 14.9365; 4845 44.51 14.885 15; 4846 44.51 14.885 15.4471
 1816. 4847 44.51 14.885 15.9576; 4848 44.51 14.885 16.4682
 1817. 4849 44.51 14.885 16.9788; 4850 44.51 14.885 17.4894; 4851 44.51 14.885 18
 1818. 4852 44.51 15.185 9.32; 4853 44.51 15.1993 9.83059; 4854 44.51 15.2136 10.3412
 1819. 4855 44.51 15.2279 10.8518; 4856 44.51 15.2423 11.3624
 1820. 4857 44.51 15.2566 11.8729; 4858 44.51 15.2709 12.3835
 1821. 4859 44.51 15.2852 12.8941; 4860 44.51 15.2995 13.4047
 1822. 4861 44.51 15.3138 13.9153; 4862 44.51 15.3281 14.4259
 1823. 4863 44.51 15.3425 14.9365; 4864 44.51 15.3568 15.4471
 1824. 4865 44.51 15.3711 15.9576; 4866 44.51 15.3854 16.4682
 1825. 4867 44.51 15.3997 16.9788; 4868 44.51 15.414 17.4894; 4869 44.51 15.4283 18
 1826. 4870 44.51 15.485 9.32; 4871 44.51 15.5136 9.83059; 4872 44.51 15.5423 10.3412
 1827. 4873 44.51 15.5709 10.8518; 4874 44.51 15.5995 11.3624
 1828. 4875 44.51 15.6281 11.8729; 4876 44.51 15.6568 12.3835
 1829. 4877 44.51 15.6854 12.8941; 4878 44.51 15.714 13.4047
 1830. 4879 44.51 15.7426 13.9153; 4880 44.51 15.7713 14.4259; 4881 44.51 15.785 9.32
 1831. 4882 44.51 15.7999 14.9365; 4883 44.51 15.8279 9.83059
 1832. 4884 44.51 15.8285 15.4471; 4885 44.51 15.8572 15.9576
 1833. 4886 44.51 15.8709 10.3412; 4887 44.51 15.8853 16.4682
 1834. 4888 44.51 15.9138 10.8518; 4889 44.51 15.9144 16.9788
 1835. 4890 44.51 15.943 17.4894; 4891 44.51 15.9568 11.3624; 4892 44.51 15.9717 18
 1836. 4893 44.51 15.9997 11.8729; 4894 44.51 16.0426 12.3835
 1837. 4895 44.51 16.0856 12.8941; 4896 44.51 16.1285 13.4047
 1838. 4897 44.51 16.1715 13.9153; 4898 44.51 16.2144 14.4259
 1839. 4899 44.51 16.2574 14.9365; 4900 44.51 16.3003 15.4471
 1840. 4901 44.51 16.3432 15.9576; 4902 44.51 16.3862 16.4682
 1841. 4903 44.51 16.4291 16.9788; 4904 44.51 16.4721 17.4894; 4905 44.51 16.515 18
 1842. 4906 46.234 3.6 15; 4907 46.234 3.6 18; 4908 46.234 7.15 15
 1843. 4909 46.234 7.15 18; 4910 46.234 10.67 15; 4911 46.234 10.67 18
 1844. 4912 46.234 14.885 15; 4913 46.234 14.885 18
 1845. MEMBER INCIDENCES
 1846. 1 5 7; 2 6 8; 3 7 8; 4 7 9; 5 8 10; 6 9 10; 7 11 41; 8 40 70; 9 41 71
 1847. 10 70 100; 11 71 101; 12 100 130; 13 101 131; 14 130 160; 15 131 161
 1848. 16 160 190; 17 161 191; 18 190 220; 19 191 221; 20 220 278; 21 221 222
 1849. 22 222 223; 23 223 224; 24 224 225; 25 225 226; 26 226 227; 27 227 228
 1850. 28 228 229; 29 229 230; 30 230 231; 31 231 232; 32 232 233; 33 233 234
 1851. 34 234 235; 35 235 236; 36 236 237; 37 237 238; 38 238 239; 39 239 240
 1852. 40 240 241; 41 241 242; 42 242 243; 43 243 244; 44 244 245; 45 245 246
 1853. 46 246 247; 47 247 248; 48 248 249; 49 249 250; 50 250 251; 51 251 252
 1854. 52 252 253; 53 253 254; 54 254 255; 55 255 256; 56 256 257; 57 257 258
 1855. 58 258 259; 59 259 260; 60 260 261; 61 261 262; 62 262 263; 63 263 264
 1856. 64 264 265; 65 265 266; 66 266 267; 67 267 268; 68 268 269; 69 269 270
 1857. 70 270 271; 71 271 272; 72 272 273; 73 273 274; 74 274 275; 75 275 276
 1858. 76 276 277; 77 277 278; 78 278 279; 79 279 303; 80 279 309; 81 308 338
 1859. 82 309 339; 83 338 368; 84 339 369; 85 368 399; 86 369 399; 87 398 428
 1860. 88 399 429; 89 428 458; 90 429 459; 91 458 483; 92 459 460; 93 460 467
 1861. 94 461 462; 95 462 463; 96 463 464; 97 464 465; 98 465 466; 99 466 467
 1862. 100 467 468; 101 468 469; 102 469 470; 103 470 471; 104 471 472; 105 472 473
 1863. 106 473 474; 107 474 475; 108 475 476; 109 476 477; 110 477 478; 111 478 479
 1864. 112 479 480; 113 480 481; 114 481 482; 115 482 483; 116 483 484; 117 484 485



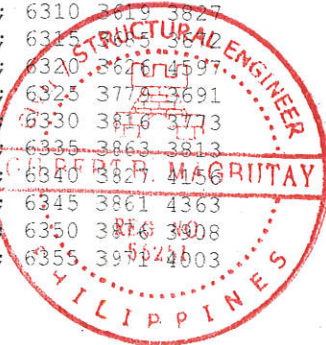
1865. 118 485 486; 119 486 487; 120 487 488; 121 459 489; 122 488 518; 123 489 519
 1866. 124 518 548; 125 519 549; 126 548 578; 127 549 579; 128 578 608; 129 579 609
 1867. 130 608 638; 131 609 639; 132 638 668; 133 639 669; 134 668 698; 135 669 670
 1868. 136 670 671; 137 671 672; 138 672 673; 139 673 674; 140 674 675; 141 675 676
 1869. 142 676 677; 143 677 678; 144 678 679; 145 679 680; 146 680 681; 147 681 682
 1870. 148 682 683; 149 683 684; 150 684 685; 151 685 686; 152 686 687; 153 687 688
 1871. 154 688 689; 155 689 690; 156 690 691; 157 691 692; 158 692 693; 159 693 694
 1872. 160 694 695; 161 695 696; 162 696 697; 163 697 698; 164 221 699; 165 278 700
 1873. 166 459 701; 167 488 702; 168 669 703; 169 693 704; 170 7 709; 171 8 710
 1874. 172 9 711; 173 10 712; 174 703 705; 175 704 706; 176 243 718; 177 255 719
 1875. 178 470 722; 179 476 723; 180 699 717; 181 700 720; 182 701 721; 183 702 724
 1876. 184 707 709; 185 708 710; 186 709 710; 187 709 711; 188 710 712; 189 705 725
 1877. 190 706 728; 191 713 717; 192 714 718; 193 715 719; 194 716 720; 195 717 718
 1878. 196 718 719; 197 719 720; 198 717 721; 199 718 722; 200 719 723; 201 720 724
 1879. 202 721 722; 203 722 723; 204 723 724; 205 721 725; 206 722 726; 207 723 727
 1880. 208 724 728; 209 725 729; 210 728 730; 211 709 733; 212 710 734; 213 711 735
 1881. 214 712 736; 215 717 741; 216 718 742; 217 719 743; 218 720 744; 219 721 745
 1882. 220 722 746; 221 723 747; 222 724 748; 223 729 749; 224 730 752; 225 731 733
 1883. 226 732 734; 227 733 734; 228 733 735; 229 734 736; 230 737 741; 231 738 742
 1884. 232 739 743; 233 740 744; 234 741 742; 235 742 743; 236 743 744; 237 741 745
 1885. 238 742 746; 239 743 747; 240 744 748; 241 745 746; 242 746 747; 243 747 748
 1886. 244 745 749; 245 746 750; 246 747 751; 247 748 752; 248 749 753; 249 752 754
 1887. 250 733 757; 251 734 758; 252 735 759; 253 736 760; 254 741 767; 255 742 768
 1888. 256 743 769; 257 744 770; 258 745 771; 259 746 772; 260 747 773; 261 748 774
 1889. 262 753 761; 263 754 762; 264 755 757; 265 756 758; 266 757 758; 267 757 759
 1890. 268 758 760; 269 761 775; 270 762 778; 271 757 781; 272 758 784; 273 759 785
 1891. 274 760 786; 275 763 767; 276 764 768; 277 765 769; 278 766 770; 279 767 768
 1892. 280 768 769; 281 769 770; 282 767 771; 283 768 772; 284 769 773; 285 770 774
 1893. 286 771 772; 287 772 773; 288 773 774; 289 771 775; 290 772 776; 291 773 777
 1894. 292 774 778; 293 775 787; 294 778 788; 295 779 781; 296 780 784; 297 781 782
 1895. 298 782 783; 299 783 784; 300 781 785; 301 784 786; 302 767 793; 303 768 794
 1896. 304 769 795; 305 770 796; 306 771 797; 307 772 798; 308 773 799; 309 774 800
 1897. 310 781 807; 311 782 808; 312 783 810; 313 784 811; 314 785 812; 315 786 816
 1898. 316 787 803; 317 788 806; 318 789 793; 319 790 794; 320 791 795; 321 792 796
 1899. 322 793 794; 323 794 795; 324 795 796; 325 793 797; 326 794 798; 327 795 799
 1900. 328 796 800; 329 797 798; 330 798 799; 331 799 800; 332 797 801; 333 798 802
 1901. 334 801 802; 335 799 805; 336 800 806; 337 801 803; 338 802 804; 339 807 808
 1902. 340 808 809; 341 809 810; 342 810 811; 343 812 813; 344 813 814; 345 814 815
 1903. 346 815 816; 347 803 817; 348 806 818; 349 809 821; 350 811 822; 351 814 823
 1904. 352 816 824; 353 819 821; 354 820 822; 355 821 822; 356 821 823; 357 822 824
 1905. 358 823 824; 359 793 829; 360 794 830; 361 795 831; 362 796 832; 363 797 833
 1906. 364 798 845; 365 799 846; 366 800 858; 367 801 884; 368 802 885; 369 817 1011
 1907. 370 818 1041; 371 821 1363; 372 822 1364; 373 823 1367; 374 824 1368
 1908. 375 825 829; 376 826 830; 377 827 831; 378 828 832; 379 829 830; 380 830 831
 1909. 381 831 832; 382 829 833; 383 830 845; 384 831 846; 385 832 858; 386 833 834
 1910. 387 834 835; 388 835 836; 389 836 837; 390 837 838; 391 838 839; 392 839 840
 1911. 393 840 841; 394 841 842; 395 842 843; 396 843 844; 397 844 845; 398 845 846
 1912. 399 846 847; 400 847 848; 401 848 849; 402 849 850; 403 850 851; 404 851 852
 1913. 405 852 853; 406 853 854; 407 854 855; 408 855 856; 409 856 857; 410 857 858
 1914. 411 833 859; 412 845 870; 413 846 871; 414 853 883; 415 859 884; 416 870 885
 1915. 417 871 898; 418 883 910; 419 884 885; 420 884 886; 421 885 897; 422 886 911
 1916. 423 897 922; 424 898 923; 425 910 935; 426 911 936; 427 922 947; 428 923 948
 1917. 429 935 960; 430 936 961; 431 947 972; 432 948 973; 433 960 985; 434 961 986
 1918. 435 972 997; 436 973 998; 437 985 1010; 438 936 1011; 439 997 1023
 1919. 440 998 1029; 441 1010 1041; 442 1011 1012; 443 1012 1013; 444 1013 1014
 1920. 445 1014 1015; 446 1015 1016; 447 1016 1017; 448 1017 1018; 449 1018 1019
 1921. 450 1019 1020; 451 1020 1021; 452 1021 1022; 453 1022 1023; 454 1023 1024
 1922. 455 1024 1025; 456 1025 1026; 457 1026 1027; 458 1027 1028; 459 1028 1029
 1923. 460 1029 1030; 461 1030 1031; 462 1031 1032; 463 1032 1033; 464 1033 1034
 1924. 465 1034 1035; 466 1035 1036; 467 1036 1037; 468 1037 1038; 469 1038 1039
 1925. 470 1039 1040; 471 1040 1041; 472 1011 1042; 473 1023 1053; 474 1029 1054
 1926. 475 1041 1072; 476 1059 1060; 477 1042 1073; 478 1053 1084; 479 1060 1090
 1927. 480 1072 1103; 481 1090 1091; 482 1073 1104; 483 1084 1115; 484 1091 1121
 1928. 485 1103 1134; 486 1104 1105; 487 1105 1106; 488 1106 1107; 489 1107 1108
 1929. 490 1108 1109; 491 1109 1110; 492 1110 1111; 493 1111 1112; 494 1112 1113
 1930. 495 1113 1114; 496 1114 1115; 497 1115 1116; 498 1116 1117; 499 1117 1118
 1931. 500 1118 1119; 501 1119 1120; 502 1120 1121; 503 1121 1122; 504 1104 1125



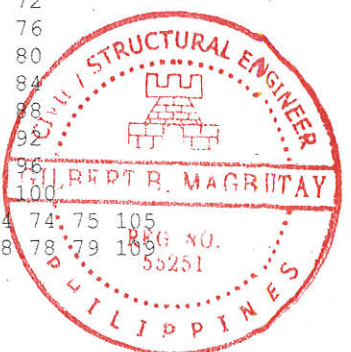
1932. 505 1115 1146; 506 1122 1147; 507 1134 1160; 508 1147 1148; 509 1135 1161
 1933. 510 1146 1172; 511 1148 1173; 512 1160 1186; 513 1173 1174; 514 1161 1187
 1934. 515 1172 1198; 516 1174 1199; 517 1186 1212; 518 1199 1200; 519 1187 1213
 1935. 520 1198 1224; 521 1200 1225; 522 1212 1238; 523 1225 1226; 524 1213 1239
 1936. 525 1224 1250; 526 1226 1251; 527 1239 1252; 528 1250 1274; 529 1251 1280
 1937. 530 1252 1253; 531 1253 1254; 532 1254 1255; 533 1255 1256; 534 1256 1257
 1938. 535 1257 1258; 536 1258 1259; 537 1259 1260; 538 1260 1261; 539 1261 1262
 1939. 540 1262 1263; 541 1263 1264; 542 1264 1265; 543 1265 1266; 544 1266 1267
 1940. 545 1267 1268; 546 1268 1269; 547 1269 1270; 548 1270 1271; 549 1271 1272
 1941. 550 1272 1273; 551 1273 1274; 552 1274 1275; 553 1275 1276; 554 1276 1277
 1942. 555 1277 1278; 556 1278 1279; 557 1279 1280; 558 1252 1281; 559 1280 1298
 1943. 560 1281 1299; 561 1299 1310; 562 1298 1321; 563 1321 1334; 564 1029 1335
 1944. 565 1121 1338; 566 1280 1344; 567 1334 1347; 568 829 1366; 569 833 1370
 1945. 570 1335 1348; 571 1338 1351; 572 1344 1357; 573 1347 1360; 574 1348 1371
 1946. 575 1351 1374; 576 1357 1380; 577 1360 1383; 578 1361 1363; 579 1362 1364
 1947. 580 1363 1364; 581 1364 1365; 584 1365 1366; 585 1363 1367; 586 1364 1368
 1948. 587 1367 1368; 588 1368 1369; 589 1369 1370; 590 1371 1384; 591 1374 1387
 1949. 592 1380 1393; 614 1383 1396; 615 830 1491; 616 831 1492; 624 832 1493
 1950. 625 845 1498; 626 846 1499; 635 858 1500; 640 1041 1503; 641 1104 1506
 1951. 642 1238 1513; 643 1310 1517; 644 1384 1397; 645 1387 1400; 646 1393 1406
 1952. 654 1396 1409; 656 1363 1481; 657 1364 1483; 662 1365 1489; 663 1366 1490
 1953. 664 1367 1494; 675 1368 1495; 677 1369 1496; 678 1370 1497; 679 1397 1410
 1954. 680 1400 1413; 681 1406 1419; 682 1409 1422; 683 1410 1423; 684 1413 1426
 1955. 693 1419 1432; 694 1422 1435; 696 1423 1502; 697 1426 1507; 698 1432 1515
 1956. 699 1435 1519; 700 1441 1450; 701 1450 1456; 702 1456 1462; 703 1462 1468
 1957. 704 1442 1491; 705 1443 1492; 706 1444 1493; 707 1468 1474; 708 1474 1480
 1958. 709 1480 1490; 710 1481 1482; 711 1482 1483; 712 1483 1484; 713 1484 1485
 1959. 714 1485 1486; 715 1486 1487; 716 1487 1488; 717 1488 1489; 718 1489 1490
 1960. 719 1490 1491; 720 1491 1492; 721 1492 1493; 722 1490 1497; 723 1491 1498
 1961. 724 1492 1499; 732 1493 1500; 734 1494 1495; 735 1496 1495; 736 1497 1496
 1962. 737 1497 1498; 738 1498 1499; 739 1499 1500; 740 1497 1501; 741 1499 1502
 1963. 742 1500 1503; 743 1502 1503; 751 1502 1504; 753 1501 1506; 754 1504 1505
 1964. 764 1505 1507; 766 1506 1507; 767 1507 1508; 768 1503 1513; 769 1508 1509
 1965. 770 1509 1510; 771 1510 1511; 772 1506 1517; 773 1511 1512; 774 1512 1514
 1966. 775 1514 1515; 776 1515 1516; 777 1516 1518; 778 1518 1519; 779 1490 1535
 1967. 780 1535 1551; 781 1551 1567; 782 1632 1497; 783 1567 1583; 784 1583 1631
 1968. 795 1491 1696; 797 1492 1697; 798 1493 1698; 802 1498 1757; 803 1499 1758
 1969. 1064 1500 1759; 1065 1502 1818; 1066 1503 1825; 1067 1506 1865; 1068 1507 1866
 1970. 1069 1513 1933; 1070 1515 1941; 1071 1517 1943; 1072 1519 1945; 1073 1631 1635
 1971. 1074 1632 1756; 1075 1635 1695; 1076 1639 1647; 1077 1647 1655; 1078 1655 1663
 1972. 5841 1636 1695; 5842 1637 1696; 5843 1638 1697; 5844 1663 1671; 5845 1671 1679
 1973. 5846 1679 1687; 5847 1687 1698; 5848 1695 1696; 5849 1696 1697; 5850 1697 1698
 1974. 5851 1698 1700; 5852 1700 1701; 5853 1701 1705; 5854 1705 1707; 5855 1698 1708
 1975. 5856 1708 1716; 5857 1716 1724; 5858 1695 1756; 5859 1696 1757; 5860 1697 1758
 1976. 5861 1724 1732; 5862 1732 1740; 5863 1740 1743; 5864 1748 1759; 5865 1756 1757
 1977. 5866 1757 1758; 5867 1758 1759; 5868 1759 1760; 5869 1760 1762; 5870 1762 1765
 1978. 5871 1765 1766; 5872 1766 1768; 5873 1759 1769; 5874 1769 1777; 5875 1777 1785
 1979. 5876 1756 1817; 5877 1758 1818; 5878 1785 1793; 5879 1793 1801; 5880 1801 1809
 1980. 5881 1809 1825; 5882 1818 1819; 5883 1819 1820; 5884 1820 1821; 5885 1821 1822
 1981. 5886 1822 1823; 5887 1823 1824; 5888 1824 1825; 5889 1825 1827; 5890 1827 1831
 1982. 5891 1831 1833; 5893 1825 1841; 5896 1817 1865; 5897 1841 1856; 5900 1856 1873
 1983. 5902 1865 1866; 5905 1873 1888; 5908 1888 1903; 5911 1903 1918; 5914 1918 1933
 1984. 5916 1865 1943; 5921 1941 1983; 5922 1945 1986; 5923 1818 1987; 5924 1698 2048
 1985. 5925 1759 2051; 5926 1825 2054; 5927 1983 2033; 5928 1986 2036; 5929 1987 2037
 1986. 5930 1933 2135; 5931 1697 2205; 5932 1758 2233; 5933 1866 2265; 5934 2033 2094
 1987. 5935 2036 2097; 5936 2048 2049; 5937 2049 2050; 5938 2051 2052; 5939 2052 2053
 1988. 5940 2054 2055; 5941 2055 2056; 5942 2037 2098; 5943 2048 2114; 5944 2051 2121
 1989. 5945 2054 2128; 5946 2094 2173; 5947 2097 2176; 5948 2098 2261; 5949 1696 2716
 1990. 5950 1696 2717; 5951 1756 2767; 5952 1757 2763; 5953 1865 2845; 5954 1943 2893
 1991. 5955 2173 2266; 5956 2114 2312; 5957 2121 2319; 5958 2128 2326; 5959 2136 2333
 1992. 5960 2261 2267; 5961 2176 2345; 5962 2266 2342; 5963 2205 2360; 5964 2233 2374
 1993. 5965 2267 2388; 5966 2312 2435; 5967 2319 2442; 5968 2326 2449; 5969 2333 2456
 1994. 5970 2388 2390; 5971 2342 2465; 5972 2345 2463; 5973 2360 2483; 5974 2449 2572
 1995. 5975 2390 2511; 5976 2265 2846; 5977 2435 2553; 5978 2442 2565; 5979 2449 2572
 1996. 5980 2456 2579; 5981 2511 2542; 5982 2465 2583; 5983 2468 2591; 5984 2483 2606
 1997. 5985 2497 2620; 5986 2542 2634; 5987 2558 2724; 5988 2565 2775; 5989 2572 2825
 1998. 5990 2579 2889; 5991 2588 2891; 5992 2591 2895; 5993 2606 2718; 5994 2620 2769



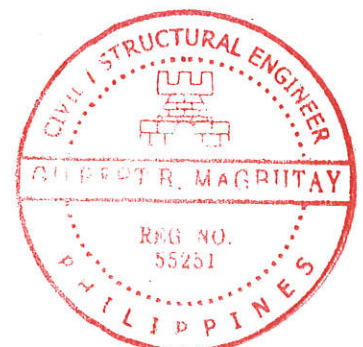
1999. 5995 2634 2813; 5996 2667 2674; 5997 2673 2680; 5998 2674 2681; 5999 2680 2687
 2000. 6000 2681 2688; 6001 2687 2694; 6002 2665 2716; 6003 2666 2717; 6004 2688 2695
 2001. 6005 2694 2701; 6006 2695 2702; 6007 2701 2708; 6008 2702 2709; 6009 2708 2715
 2002. 6010 2709 2713; 6011 2713 2724; 6012 2716 2717; 6013 2717 2718; 6014 2718 2719
 2003. 6015 2719 2720; 6016 2720 2721; 6017 2721 2722; 6018 2722 2723; 6019 2723 2724
 2004. 6020 2718 2725; 6021 2724 2731; 6022 2725 2732; 6023 2731 2738; 6024 2732 2739
 2005. 6025 2738 2745; 6026 2716 2767; 6027 2717 2768; 6028 2739 2746; 6029 2745 2752
 2006. 6030 2746 2753; 6031 2752 2759; 6032 2753 2760; 6033 2759 2766; 6034 2760 2769
 2007. 6035 2766 2773; 6036 2767 2768; 6037 2768 2769; 6038 2769 2770; 6039 2770 2771
 2008. 6040 2771 2772; 6041 2772 2773; 6042 2773 2774; 6043 2774 2775; 6044 2769 2776
 2009. 6045 2775 2782; 6046 2776 2783; 6047 2782 2789; 6048 2783 2790; 6049 2789 2796
 2010. 6050 2767 2818; 6051 2790 2797; 6052 2796 2803; 6053 2797 2804; 6054 2803 2810
 2011. 6055 2804 2811; 6056 2810 2817; 6057 2811 2819; 6058 2817 2825; 6059 2819 2820
 2012. 6060 2820 2821; 6061 2821 2822; 6062 2822 2823; 6063 2823 2824; 6064 2824 2825
 2013. 6066 2825 2834; 6070 2818 2845; 6071 2834 2843; 6075 2843 2853; 6077 2845 2846
 2014. 6080 2853 2862; 6084 2862 2871; 6089 2871 2880; 6093 2880 2889; 6094 2845 2893
 2015. 6101 2724 2941; 6102 2775 2948; 6103 2825 2955; 6104 2889 2962; 6105 2819 2963
 2016. 6106 2846 2966; 6107 2891 2972; 6108 2895 2975; 6109 2925 2926; 6110 2926 2927
 2017. 6111 2928 2929; 6112 2929 2930; 6113 2931 2932; 6114 2932 2933; 6115 2941 3012
 2018. 6116 2948 3019; 6117 2955 3026; 6118 2962 3033; 6119 2963 3034; 6120 2966 3037
 2019. 6121 2972 3043; 6122 2975 3046; 6123 3012 3083; 6124 3019 3090; 6125 3026 3097
 2020. 6126 3033 3104; 6127 3034 3105; 6128 3037 3108; 6129 3043 3114; 6130 3046 3117
 2021. 6131 3083 3154; 6132 3090 3161; 6133 3097 3168; 6134 3104 3175; 6135 3105 3176
 2022. 6136 3108 3179; 6137 3114 3185; 6138 3117 3188; 6139 2716 3488; 6140 2717 3489
 2023. 6141 2718 3490; 6142 2767 3492; 6143 2768 3493; 6144 2769 3494; 6145 2845 3503
 2024. 6146 2893 3518; 6147 3154 3247; 6148 3161 3306; 6149 3168 3365; 6150 3175 3421
 2025. 6151 3176 3429; 6152 3179 3432; 6153 3185 3438; 6154 3188 3441; 6155 3365 3442
 2026. 6156 3421 3449; 6157 3429 3450; 6158 3432 3453; 6159 3438 3459; 6160 3441 3462
 2027. 6161 3247 3491; 6162 3306 3495; 6163 3442 3463; 6164 3449 3470; 6165 3450 3471
 2028. 6166 3453 3474; 6167 3459 3480; 6168 3462 3483; 6169 3463 3498; 6170 3470 3514
 2029. 6171 3471 3497; 6172 3474 3504; 6173 3480 3516; 6174 3483 3520; 6175 3484 3488
 2030. 6176 3485 3489; 6177 3486 3490; 6178 3487 3491; 6179 3488 3489; 6180 3489 3490
 2031. 6181 3490 3491; 6182 3488 3492; 6183 3489 3493; 6184 3490 3494; 6185 3491 3495
 2032. 6186 3492 3493; 6187 3493 3494; 6188 3494 3495; 6189 3492 3496; 6190 3494 3497
 2033. 6191 3495 3498; 6192 3497 3498; 6193 3497 3499; 6194 3498 3500; 6195 3496 3503
 2034. 6196 3499 3501; 6197 3500 3502; 6198 3501 3504; 6199 3502 3505; 6200 3503 3504
 2035. 6201 3504 3506; 6202 3505 3507; 6203 3506 3508; 6204 3507 3509; 6205 3508 3510
 2036. 6206 3509 3511; 6207 3510 3512; 6208 3511 3514; 6209 3503 3518; 6210 3512 3513
 2037. 6211 3513 3515; 6212 3515 3516; 6213 3516 3517; 6214 3517 3519; 6215 3519 3520
 2038. 6216 3497 3521; 6217 3504 3524; 6218 3516 3530; 6219 3520 3533; 6220 3521 3534
 2039. 6221 3524 3537; 6222 3530 3543; 6223 3533 3546; 6224 3534 3547; 6225 3537 3550
 2040. 6226 3543 3556; 6227 3546 3559; 6228 3547 3560; 6229 3550 3563; 6230 3556 3569
 2041. 6231 3559 3572; 6232 3488 3616; 6233 3489 3617; 6234 3490 3618; 6235 3491 3619
 2042. 6236 3492 3620; 6237 3493 3621; 6238 3494 3622; 6239 3495 3623; 6240 3498 3626
 2043. 6241 3503 3629; 6242 3514 3636; 6243 3518 3640; 6244 3560 3573; 6245 3563 3576
 2044. 6246 3569 3582; 6247 3572 3585; 6248 3573 3586; 6249 3576 3589; 6250 3582 3595
 2045. 6251 3585 3598; 6252 3586 3599; 6253 3589 3602; 6254 3595 3608; 6255 3598 3611
 2046. 6256 3599 3625; 6257 3602 3630; 6258 3608 3638; 6259 3611 3642; 6260 3612 3616
 2047. 6261 3613 3617; 6262 3614 3618; 6263 3615 3619; 6264 3616 3617; 6265 3617 3618
 2048. 6266 3618 3619; 6267 3616 3620; 6268 3617 3621; 6269 3618 3622; 6270 3619 3623
 2049. 6271 3620 3621; 6272 3621 3622; 6273 3622 3623; 6274 3620 3624; 6275 3622 3625
 2050. 6276 3623 3626; 6277 3625 3626; 6278 3625 3627; 6279 3624 3629; 6280 3627 3628
 2051. 6281 3628 3630; 6282 3629 3630; 6283 3630 3631; 6284 3626 3636; 6285 3631 3632
 2052. 6286 3632 3633; 6287 3633 3634; 6288 3629 3640; 6289 3634 3635; 6290 3635 3637
 2053. 6291 3637 3638; 6292 3638 3639; 6293 3639 3641; 6294 3641 3642; 6295 3643 3625
 2054. 6296 3646 3630; 6297 3652 3638; 6298 3642 3655; 6299 3656 3643; 6300 3659 3646
 2055. 6301 3665 3652; 6302 3655 3668; 6303 3618 3730; 6304 3622 3765; 6305 3669 3656
 2056. 6306 3672 3659; 6307 3678 3665; 6308 3668 3681; 6309 3616 3826; 6310 3619 3827
 2057. 6311 3620 3829; 6312 3623 3830; 6313 3629 3832; 6314 3682 3669; 6315 3626 3827
 2058. 6316 3691 3678; 6317 3681 3694; 6318 3617 4122; 6319 3621 4353; 6320 3626 4197
 2059. 6321 3636 4814; 6322 3640 4881; 6323 3770 3682; 6324 3773 3685; 6325 3779 3691
 2060. 6326 3694 3782; 6327 3730 3797; 6328 3765 3811; 6329 3813 3770; 6330 3816 3773
 2061. 6331 3822 3779; 6332 3782 3825; 6333 3797 3847; 6334 3811 3861; 6335 3863 3813
 2062. 6336 3866 3816; 6337 3872 3822; 6338 3825 3875; 6339 3826 4100; 6340 3827 4156
 2063. 6341 3829 4331; 6342 3830 4386; 6343 3832 4660; 6344 3847 4133; 6345 3861 4363
 2064. 6346 4585 3863; 6347 4677 3866; 6348 4851 3872; 6349 3875 4905; 6350 3876 3808
 2065. 6351 3907 3939; 6352 3908 3940; 6353 3939 3971; 6354 3940 3972; 6355 3972 4003



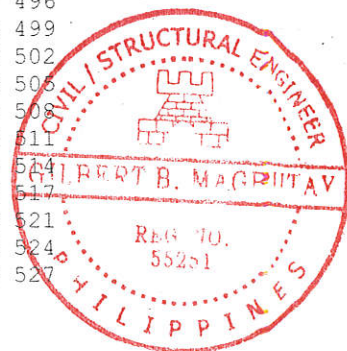
2066. 6356 3972 4004; 6357 4003 4035; 6358 4004 4036; 6359 4035 4067; 6360 4036 4068
 2067. 6361 4067 4099; 6362 4068 4100; 6363 4099 4156; 6364 4100 4101; 6365 4101 4102
 2068. 6366 4102 4103; 6367 4103 4104; 6368 4104 4105; 6369 4105 4106; 6370 4106 4107
 2069. 6371 4107 4108; 6372 4108 4109; 6373 4109 4110; 6374 4110 4111; 6375 4111 4112
 2070. 6376 4112 4113; 6377 4113 4114; 6378 4114 4115; 6379 4115 4116; 6380 4116 4117
 2071. 6381 4117 4118; 6382 4118 4119; 6383 4119 4120; 6384 4120 4121; 6385 4121 4122
 2072. 6386 4122 4123; 6387 4123 4124; 6388 4124 4125; 6389 4125 4126; 6390 4126 4127
 2073. 6391 4127 4128; 6392 4128 4129; 6393 4129 4130; 6394 4130 4131; 6395 4131 4132
 2074. 6396 4132 4133; 6397 4133 4134; 6398 4134 4135; 6399 4135 4136; 6400 4136 4137
 2075. 6401 4137 4138; 6402 4138 4139; 6403 4139 4140; 6404 4140 4141; 6405 4141 4142
 2076. 6406 4142 4143; 6407 4143 4144; 6408 4144 4145; 6409 4145 4146; 6410 4146 4147
 2077. 6411 4147 4148; 6412 4148 4149; 6413 4149 4150; 6414 4150 4151; 6415 4151 4152
 2078. 6416 4152 4153; 6417 4153 4154; 6418 4154 4155; 6419 4155 4156; 6420 4156 4157
 2079. 6421 4156 4157; 6422 4157 4158; 6423 4158 4159; 6424 4159 4160; 6425 4160 4161
 2080. 6426 4161 4162; 6427 4162 4163; 6428 4163 4164; 6429 4164 4165; 6430 4165 4166
 2081. 6431 4166 4167; 6432 4167 4168; 6433 4168 4169; 6434 4169 4170; 6435 4170 4171
 2082. 6436 4171 4172; 6437 4172 4173; 6438 4173 4174; 6439 4174 4175; 6440 4175 4176
 2083. 6441 4176 4177; 6442 4177 4178; 6443 4178 4179; 6444 4179 4180; 6445 4180 4181
 2084. 6446 4181 4182; 6447 4182 4183; 6448 4183 4184; 6449 4184 4185; 6450 4185 4186
 2085. 6451 4186 4187; 6452 4187 4188; 6453 4188 4189; 6454 4189 4190; 6455 4190 4191
 2086. 6456 4191 4192; 6457 4192 4193; 6458 4193 4194; 6459 4194 4195; 6460 4195 4196
 2087. 6461 4196 4197; 6462 4197 4198; 6463 4198 4199; 6464 4199 4200; 6465 4200 4201
 2088. 6466 4201 4202; 6467 4202 4203; 6468 4203 4204; 6469 4204 4205; 6470 4205 4206
 2089. 6471 4206 4207; 6472 4207 4208; 6473 4208 4209; 6474 4209 4210; 6475 4210 4211
 2090. 6476 4211 4212; 6477 4212 4213; 6478 4213 4214; 6479 4214 4215; 6480 4215 4216
 2091. 6481 4216 4217; 6482 4217 4218; 6483 4218 4219; 6484 4219 4220; 6485 4220 4221
 2092. 6486 4221 4222; 6487 4222 4223; 6488 4223 4224; 6489 4224 4225; 6490 4225 4226
 2093. 6491 4226 4227; 6492 4227 4228; 6493 4228 4229; 6494 4229 4230; 6495 4230 4231
 2094. 6496 4231 4232; 6497 4232 4233; 6498 4233 4234; 6499 4234 4235; 6500 4235 4236
 2095. 6501 4236 4237; 6502 4237 4238; 6503 4238 4239; 6504 4239 4240; 6505 4240 4241
 2096. 6506 4241 4242; 6507 4242 4243; 6508 4243 4244; 6509 4244 4245; 6510 4245 4246
 2097. 6511 4246 4247; 6512 4247 4248; 6513 4248 4249; 6514 4249 4250; 6515 4250 4251
 2098. 6516 4251 4252; 6517 4252 4253; 6518 4253 4254; 6519 4254 4255; 6520 4255 4256
 2099. 6521 4256 4257; 6522 4257 4258; 6523 4258 4259; 6524 4259 4260; 6525 4260 4261
 2100. 6526 4261 4262; 6527 4262 4263; 6528 4263 4264; 6529 4264 4265; 6530 4265 4266
 2101. 6531 4266 4267; 6532 4267 4268; 6533 4268 4269; 6534 4269 4270; 6535 4270 4271
 2102. 6536 4271 4272; 6537 4272 4273; 6538 4273 4274; 6539 4274 4275; 6540 4275 4276
 2103. 6541 4276 4277; 6542 4277 4278; 6543 4278 4279; 6544 4279 4280; 6545 4280 4281
 2104. 6546 4281 4282; 6547 4282 4283; 6548 4283 4284; 6549 4284 4285; 6550 4285 4286
 2105. 6551 4286 4287; 6552 4287 4288; 6553 4288 4289; 6554 4289 4290; 6555 4290 4291
 2106. 6556 4291 4292; 6557 4292 4293; 6558 4293 4294; 6559 4294 4295; 6560 4295 4296
 2107. 6561 4296 4297; 6562 4297 4298; 6563 4298 4299; 6564 4299 4300; 6565 4300 4301
 2108. 6566 4301 4302; 6567 4302 4303; 6568 4303 4304; 6569 4304 4305; 6570 4305 4306
 2109. 6571 4306 4307; 6572 4307 4308; 6573 4308 4309; 6574 4309 4310; 6575 4310 4311
 2110. 6576 4311 4312; 6577 4312 4313; 6578 4313 4314; 6579 4314 4315; 6580 4315 4316
 2111. 6581 4316 4317; 6582 4317 4318; 6583 4318 4319; 6584 4319 4320; 6585 4320 4321
 2112. 6586 4321 4322; 6587 4322 4323; 6588 4323 4324; 6589 4324 4325; 6590 4325 4326
 2113. 6591 4326 4327; 6592 4327 4328; 6593 4328 4329; 6594 4329 4330; 6595 4330 4331
 2114. 6596 4331 4332; 6597 4332 4333; 6598 4333 4334; 6599 4334 4335; 6600 4335 4336
 2115. ELEMENT INCIDENCES SHELL
 2116. 582 1 243 255 2; 593 3 470 476 4; 594 41 11 12 42; 594 42 12 13 43
 2117. 595 43 13 14 44; 596 44 14 15 45; 597 45 15 16 46; 598 46 16 17 47
 2118. 599 47 17 18 48; 600 48 18 19 49; 601 49 19 20 50; 602 50 20 21 51
 2119. 603 51 21 22 52; 604 52 22 23 53; 605 53 23 24 54; 606 54 24 25 55
 2120. 607 55 25 26 56; 608 56 26 27 57; 609 57 27 28 58; 610 58 28 29 59
 2121. 611 59 29 30 60; 612 60 30 31 61; 613 61 31 32 62; 614 62 32 33 63
 2122. 615 63 33 34 64; 616 64 34 35 65; 617 65 35 36 66; 618 66 36 37 67
 2123. 622 67 37 38 68; 623 68 38 39 69; 624 69 39 40 70; 625 70 40 41 71
 2124. 629 72 42 43 73; 630 73 43 44 74; 631 74 44 45 75; 632 75 45 46 76
 2125. 633 76 46 47 77; 634 77 47 48 78; 635 78 48 49 79; 636 79 49 50 80
 2126. 638 80 50 51 81; 639 81 51 52 82; 640 82 52 53 83; 641 83 53 54 84
 2127. 649 84 54 55 85; 650 85 55 56 86; 651 86 56 57 87; 652 87 57 58 88
 2128. 653 88 58 59 89; 654 89 59 60 90; 655 90 60 61 91; 656 91 61 62 92
 2129. 660 92 62 63 93; 661 93 63 64 94; 662 94 64 65 95; 663 95 65 66 96
 2130. 667 96 66 67 97; 668 97 67 68 98; 669 98 68 69 99; 670 99 69 70 100
 2131. 671 101 71 72 102; 672 102 72 73 103; 673 103 73 74 104; 674 104 74 75 105
 2132. 676 105 75 76 106; 677 106 76 77 107; 678 107 77 78 108; 679 108 78 79 109



2133. 688 109 79 80 110; 689 110 80 81 111; 690 111 81 82 112; 691 112 82 83 113
 2134. 692 113 83 84 114; 695 114 84 85 115; 725 115 85 86 116; 726 116 86 87 117
 2135. 727 117 87 88 118; 728 118 88 89 119; 729 119 89 90 120; 730 120 90 91 121
 2136. 731 121 91 92 122; 733 122 92 93 123; 744 123 93 94 124; 745 124 94 95 125
 2137. 746 125 95 96 126; 747 126 96 97 127; 748 127 97 98 128; 749 128 98 99 129
 2138. 750 129 99 100 130; 752 131 101 102 132; 755 132 102 103 133
 2139. 756 133 103 104 134; 757 134 104 105 135; 758 135 105 106 136
 2140. 759 136 106 107 137; 760 137 107 108 138; 761 138 108 109 139
 2141. 762 139 109 110 140; 763 140 110 111 141; 765 141 111 112 142
 2142. 785 142 112 113 143; 786 143 113 114 144; 787 144 114 115 145
 2143. 788 145 115 116 146; 789 146 116 117 147; 790 147 117 118 148
 2144. 791 148 118 119 149; 792 149 119 120 150; 793 150 120 121 151
 2145. 794 151 121 122 152; 796 152 122 123 153; 799 153 123 124 154
 2146. 800 154 124 125 155; 801 155 125 126 156; 804 156 126 127 157
 2147. 805 157 127 128 158; 806 158 128 129 159; 807 159 129 130 160
 2148. 808 161 131 132 162; 809 162 132 133 163; 810 163 133 134 164
 2149. 811 164 134 135 165; 812 165 135 136 166; 813 166 136 137 167
 2150. 814 167 137 138 168; 815 168 138 139 169; 816 169 139 140 170
 2151. 817 170 140 141 171; 818 171 141 142 172; 819 172 142 143 173
 2152. 820 173 143 144 174; 821 174 144 145 175; 822 175 145 146 176
 2153. 823 176 146 147 177; 824 177 147 148 178; 825 178 148 149 179
 2154. 826 179 149 150 180; 827 180 150 151 181; 828 181 151 152 182
 2155. 829 182 152 153 183; 830 183 153 154 184; 831 184 154 155 185
 2156. 832 185 155 156 186; 833 186 156 157 187; 834 187 157 158 188
 2157. 835 188 158 159 189; 836 189 159 160 190; 837 191 161 162 192
 2158. 838 192 162 163 193; 839 193 163 164 194; 840 194 164 165 195
 2159. 841 195 165 166 196; 842 196 166 167 197; 843 197 167 168 198
 2160. 844 198 168 169 199; 845 199 169 170 200; 846 200 170 171 201
 2161. 847 201 171 172 202; 848 202 172 173 203; 849 203 173 174 204
 2162. 850 204 174 175 205; 851 205 175 176 206; 852 206 176 177 207
 2163. 853 207 177 178 208; 854 208 178 179 209; 855 209 179 180 210
 2164. 856 210 180 181 211; 857 211 181 182 212; 858 212 182 183 213
 2165. 859 213 183 184 214; 860 214 184 185 215; 861 215 185 186 216
 2166. 862 216 186 187 217; 863 217 187 188 218; 864 218 188 189 219
 2167. 865 219 189 190 220; 866 221 191 192 222; 867 222 192 193 224
 2168. 868 224 193 194 226; 869 226 194 195 228; 870 228 195 196 230
 2169. 871 230 196 197 232; 872 232 197 198 234; 873 234 198 199 236
 2170. 874 236 199 200 238; 875 238 200 201 240; 876 240 201 202 242
 2171. 877 242 202 203 244; 878 244 203 204 246; 879 246 204 205 248
 2172. 880 248 205 206 250; 881 250 206 207 252; 882 252 207 208 254
 2173. 883 254 208 209 256; 884 256 209 210 258; 885 258 210 211 260
 2174. 886 260 211 212 262; 887 262 212 213 264; 888 264 213 214 266
 2175. 889 266 214 215 268; 890 268 215 216 270; 891 270 216 217 272
 2176. 892 272 217 218 274; 893 274 218 219 276; 894 276 219 220 278
 2177. 895 279 280 223 221; 896 280 281 225 223; 897 281 282 227 225
 2178. 898 282 283 229 227; 899 283 284 231 229; 900 284 285 233 231
 2179. 901 285 286 235 233; 902 286 287 237 235; 903 287 288 239 237
 2180. 904 288 289 241 239; 905 289 290 243 241; 906 290 291 245 243
 2181. 907 291 292 247 245; 908 292 293 249 247; 909 293 294 251 249
 2182. 910 294 295 253 251; 911 295 296 255 253; 912 296 297 257 255
 2183. 913 297 298 259 257; 914 298 299 261 259; 915 299 300 263 261
 2184. 916 300 301 265 263; 917 301 302 267 265; 918 302 303 269 267
 2185. 919 303 304 271 269; 920 304 305 273 271; 921 305 306 275 273
 2186. 922 306 307 277 275; 923 307 308 278 277; 924 309 310 280 279
 2187. 925 310 311 281 280; 926 311 312 282 281; 927 312 313 283 282
 2188. 928 313 314 284 283; 929 314 315 285 284; 930 315 316 286 285
 2189. 931 316 317 287 286; 932 317 318 288 287; 933 318 319 289 288
 2190. 934 319 320 290 289; 935 320 321 291 290; 936 321 322 292 291
 2191. 937 322 323 293 292; 938 323 324 294 293; 939 324 325 295 294
 2192. 940 325 326 296 295; 941 326 327 297 296; 942 327 328 298 297
 2193. 943 328 329 299 298; 944 329 330 300 299; 945 330 331 301 300
 2194. 946 331 332 302 301; 947 332 333 303 302; 948 333 334 304 303
 2195. 949 334 335 305 304; 950 335 336 306 305; 951 336 337 307 306
 2196. 952 337 338 308 307; 953 339 340 310 309; 954 340 341 311 310
 2197. 955 341 342 312 311; 956 342 343 313 312; 957 343 344 314 313
 2198. 958 344 345 315 314; 959 345 346 316 315; 960 346 347 317 316
 2199. 961 347 348 318 317; 962 348 349 319 318; 963 349 350 320 319



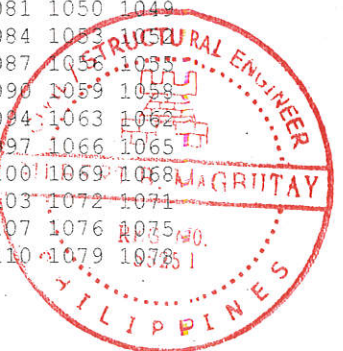
2200. 964 350 351 321 320; 965 351 352 322 321; 966 352 353 323 322
 2201. 967 353 354 324 323; 968 354 355 325 324; 969 355 356 326 325
 2202. 970 356 357 327 326; 971 357 358 328 327; 972 358 359 329 328
 2203. 973 359 360 320 329; 974 360 361 331 330; 975 361 362 332 331
 2204. 976 362 363 333 332; 977 363 364 334 333; 978 364 365 335 334
 2205. 979 365 366 336 335; 980 366 367 337 336; 981 367 368 338 337
 2206. 982 369 370 340 339; 983 370 371 341 340; 984 371 372 342 341
 2207. 985 372 373 343 342; 986 373 374 344 343; 987 374 375 345 344
 2208. 988 375 376 346 345; 989 376 377 347 346; 990 377 378 348 347
 2209. 991 378 379 349 348; 992 379 380 350 349; 993 380 381 351 350
 2210. 994 381 382 352 351; 995 382 383 353 352; 996 383 384 354 353
 2211. 997 384 385 355 354; 998 385 386 356 355; 999 386 387 357 356
 2212. 1000 387 388 358 357; 1001 388 389 359 358; 1002 389 390 360 359
 2213. 1003 390 391 361 360; 1004 391 392 362 361; 1005 392 393 363 362
 2214. 1006 393 394 364 363; 1007 394 395 365 364; 1008 395 396 366 365
 2215. 1009 396 397 367 366; 1010 397 398 368 367; 1011 399 400 370 369
 2216. 1012 400 401 371 370; 1013 401 402 372 371; 1014 402 403 373 372
 2217. 1015 403 404 374 373; 1016 404 405 375 374; 1017 405 406 376 375
 2218. 1018 406 407 377 376; 1019 407 408 378 377; 1020 408 409 379 378
 2219. 1021 409 410 380 379; 1022 410 411 381 380; 1023 411 412 382 381
 2220. 1024 412 413 383 382; 1025 413 414 384 383; 1026 414 415 385 384
 2221. 1027 415 416 386 385; 1028 416 417 387 386; 1029 417 418 388 387
 2222. 1030 418 419 389 388; 1031 419 420 390 389; 1032 420 421 391 390
 2223. 1033 421 422 392 391; 1034 422 423 393 392; 1035 423 424 394 393
 2224. 1036 424 425 395 394; 1037 425 426 396 395; 1038 426 427 397 396
 2225. 1039 427 428 398 397; 1040 429 430 400 399; 1041 430 431 401 400
 2226. 1042 431 432 402 401; 1043 432 433 403 402; 1044 433 434 404 403
 2227. 1045 434 435 405 404; 1046 435 436 406 405; 1047 436 437 407 406
 2228. 1048 437 438 408 407; 1049 438 439 409 408; 1050 439 440 410 409
 2229. 1051 440 441 411 410; 1052 441 442 412 411; 1053 442 443 413 412
 2230. 1054 443 444 414 413; 1055 444 445 415 414; 1056 445 446 416 415
 2231. 1057 446 447 417 416; 1058 447 448 418 417; 1059 448 449 419 418
 2232. 1060 449 450 420 419; 1061 450 451 421 420; 1062 451 452 422 421
 2233. 1063 452 453 423 422; 1079 453 454 424 423; 1080 454 455 425 424
 2234. 1081 455 456 426 425; 1082 456 457 427 426; 1083 457 458 428 427
 2235. 1084 459 460 430 429; 1085 460 461 431 430; 1086 461 462 432 431
 2236. 1087 462 463 433 432; 1088 463 464 434 433; 1089 464 465 435 434
 2237. 1090 465 466 436 435; 1091 466 467 437 436; 1092 467 468 438 437
 2238. 1093 468 469 439 438; 1094 469 470 440 439; 1095 470 471 441 440
 2239. 1096 471 472 442 441; 1097 472 473 443 442; 1098 473 474 444 443
 2240. 1099 474 475 445 444; 1100 475 476 446 445; 1101 476 477 447 446
 2241. 1102 477 478 448 447; 1103 478 479 449 448; 1104 479 480 450 449
 2242. 1105 480 481 451 450; 1106 481 482 452 451; 1107 482 483 453 452
 2243. 1108 483 484 454 453; 1109 484 485 455 454; 1110 485 486 456 455
 2244. 1111 486 487 457 456; 1112 487 488 458 457; 1113 489 490 460 459
 2245. 1114 490 491 461 460; 1115 491 492 462 461; 1116 492 493 463 462
 2246. 1117 493 494 464 463; 1118 494 495 465 464; 1119 495 496 466 465
 2247. 1120 496 497 467 466; 1121 497 498 468 467; 1122 498 499 469 468
 2248. 1123 499 500 470 469; 1124 500 501 471 470; 1125 501 502 472 471
 2249. 1126 502 503 473 472; 1127 503 504 474 473; 1128 504 505 475 474
 2250. 1129 505 506 476 475; 1130 506 507 477 476; 1131 507 508 478 477
 2251. 1132 508 509 479 478; 1133 509 510 480 479; 1134 510 511 481 480
 2252. 1135 511 512 482 481; 1136 512 513 483 482; 1137 513 514 484 483
 2253. 1138 514 515 485 484; 1139 515 516 486 485; 1140 516 517 487 486
 2254. 1141 517 518 488 487; 1142 519 520 490 489; 1143 520 521 491 490
 2255. 1144 521 522 492 491; 1145 522 523 493 492; 1146 523 524 494 493
 2256. 1147 524 525 495 494; 1148 525 526 496 495; 1149 526 527 497 496
 2257. 1150 527 528 498 497; 1151 528 529 499 498; 1152 529 530 500 499
 2258. 1153 530 531 501 500; 1154 531 532 502 501; 1155 532 533 503 502
 2259. 1156 533 534 504 503; 1157 534 535 505 504; 1158 535 536 506 505
 2260. 1159 536 537 507 506; 1160 537 538 508 507; 1161 538 539 509 508
 2261. 1162 539 540 510 509; 1163 540 541 511 510; 1164 541 542 512 511
 2262. 1165 542 543 513 512; 1166 543 544 514 513; 1167 544 545 515 514
 2263. 1168 545 546 516 515; 1169 546 547 517 516; 1170 547 548 518 517
 2264. 1171 549 550 520 519; 1172 550 551 521 520; 1173 551 552 522 521
 2265. 1174 552 553 523 522; 1175 553 554 524 523; 1176 554 555 525 524
 2266. 1177 555 556 526 525; 1178 556 557 527 526; 1179 557 558 528 527



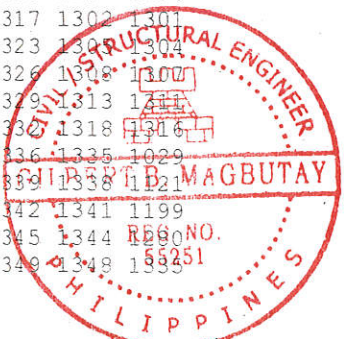
2267. 1180 558 559 529 528; 1181 559 560 530 529; 1182 560 561 531 530
 2263. 1183 561 562 532 531; 1184 562 563 533 532; 1185 563 564 534 533
 2269. 1186 564 565 535 534; 1187 565 566 536 535; 1188 566 567 537 536
 2270. 1189 567 568 538 537; 1190 568 569 539 538; 1191 569 570 540 539
 2271. 1192 570 571 541 540; 1193 571 572 542 541; 1194 572 573 543 542
 2272. 1195 573 574 544 543; 1196 574 575 545 544; 1197 575 576 546 545
 2273. 1198 576 577 547 546; 1199 577 578 548 547; 1200 579 580 550 549
 2274. 1201 580 581 551 550; 1202 581 582 552 551; 1203 582 583 553 552
 2275. 1204 583 584 554 553; 1205 584 585 555 554; 1206 585 586 556 555
 2276. 1207 586 587 557 556; 1208 587 588 558 557; 1209 588 589 559 558
 2277. 1210 589 590 560 559; 1211 590 591 561 560; 1212 591 592 562 561
 2273. 1213 592 593 563 562; 1214 593 594 564 563; 1215 594 595 565 564
 2279. 1216 595 596 566 565; 1217 596 597 567 566; 1218 597 598 568 567
 2280. 1219 598 599 569 568; 1220 599 600 570 569; 1221 600 601 571 570
 2281. 1222 601 602 572 571; 1223 602 603 573 572; 1224 603 604 574 573
 2282. 1225 604 605 575 574; 1226 605 606 576 575; 1227 606 607 577 576
 2283. 1228 607 608 578 577; 1229 609 610 580 579; 1230 610 611 581 580
 2284. 1231 611 612 582 581; 1232 612 613 583 582; 1233 613 614 584 583
 2285. 1234 614 615 585 584; 1235 615 616 586 585; 1236 616 617 587 586
 2286. 1237 617 618 588 587; 1238 618 619 589 588; 1239 619 620 590 589
 2287. 1240 620 621 591 590; 1241 621 622 592 591; 1242 622 623 593 592
 2288. 1243 623 624 594 593; 1244 624 625 595 594; 1245 625 626 596 595
 2289. 1246 626 627 597 596; 1247 627 628 598 597; 1248 628 629 599 598
 2290. 1249 629 630 600 599; 1250 630 631 601 600; 1251 631 632 602 601
 2291. 1252 632 633 603 602; 1253 633 634 604 603; 1254 634 635 605 604
 2292. 1255 635 636 606 605; 1256 636 637 607 606; 1257 637 638 608 607
 2293. 1258 639 640 610 609; 1259 640 641 611 610; 1260 641 642 612 611
 2294. 1261 642 643 613 612; 1262 643 644 614 613; 1263 644 645 615 614
 2295. 1264 645 646 616 615; 1265 646 647 617 616; 1266 647 648 618 617
 2296. 1267 648 649 619 618; 1268 649 650 620 619; 1269 650 651 621 620
 2297. 1270 651 652 622 621; 1271 652 653 623 622; 1272 653 654 624 623
 2298. 1273 654 655 625 624; 1274 655 656 626 625; 1275 656 657 627 626
 2299. 1276 657 658 628 627; 1277 658 659 629 628; 1278 659 660 630 629
 2300. 1279 660 661 631 630; 1280 661 662 632 631; 1281 662 663 633 632
 2301. 1282 663 664 634 633; 1283 664 665 635 634; 1284 665 666 636 635
 2302. 1285 666 667 637 636; 1286 667 668 638 637; 1287 669 670 640 639
 2303. 1288 670 671 641 640; 1289 671 672 642 641; 1290 672 673 643 642
 2304. 1291 673 674 644 643; 1292 674 675 645 644; 1293 675 676 646 645
 2305. 1294 676 677 647 646; 1295 677 678 648 647; 1296 678 679 649 648
 2306. 1297 679 680 650 649; 1298 680 681 651 650; 1299 681 682 652 651
 2307. 1300 682 683 653 652; 1301 683 684 654 653; 1302 684 685 655 654
 2308. 1303 685 686 656 655; 1304 686 687 657 656; 1305 687 688 658 657
 2309. 1306 688 689 659 658; 1307 689 690 660 659; 1308 690 691 661 660
 2310. 1309 691 692 662 661; 1310 692 693 663 662; 1311 693 694 664 663
 2311. 1312 694 695 665 664; 1313 695 696 666 665; 1314 696 697 667 666
 2312. 1315 697 698 668 667; 1316 7 709 710 8; 1317 221 717 718 243
 2313. 1318 243 718 719 255; 1319 255 719 720 278; 1320 459 721 722 470
 2314. 1321 470 722 723 476; 1322 476 723 724 488; 1323 709 733 734 710
 2315. 1324 717 741 742 718; 1325 718 742 743 719; 1326 719 743 744 720
 2316. 1327 721 745 746 722; 1328 722 746 747 723; 1329 723 747 748 724
 2317. 1330 733 757 758 734; 1331 741 767 768 742; 1332 742 768 769 743
 2318. 1333 743 769 770 744; 1334 745 771 772 746; 1335 746 772 773 747
 2319. 1336 747 773 774 748; 1337 757 781 784 758; 1338 767 793 794 768
 2320. 1339 768 794 795 769; 1340 769 795 796 770; 1341 771 797 798 772
 2321. 1342 772 798 799 773; 1343 773 799 800 774; 1344 781 807 808 782
 2322. 1345 782 808 810 793; 1346 783 810 811 784; 1347 809 821 822 811
 2323. 1348 814 823 824 816; 1349 793 829 830 794; 1350 794 830 831 795
 2324. 1351 795 831 832 796; 1352 798 845 846 799; 1353 799 846 858 800
 2325. 1354 801 884 885 802; 1355 821 1363 1364 822; 1356 823 1367 1368 824
 2326. 1357 859 860 834 833; 1358 860 861 836 834; 1359 861 862 837 836
 2327. 1360 862 863 838 837; 1361 863 864 839 838; 1362 864 865 840 839
 2328. 1363 865 866 841 840; 1364 866 867 842 841; 1365 867 868 843 842
 2329. 1366 868 869 844 843; 1367 869 870 845 844; 1368 871 872 847 849
 2330. 1369 872 873 848 847; 1370 873 874 849 848; 1371 874 875 850 849
 2331. 1372 875 876 851 850; 1373 876 877 852 851; 1374 877 878 853 852
 2332. 1375 878 879 854 853; 1376 879 880 855 854; 1377 880 881 856 855
 2333. 1378 881 882 857 856; 1379 882 883 858 857; 1380 886 887 860 859



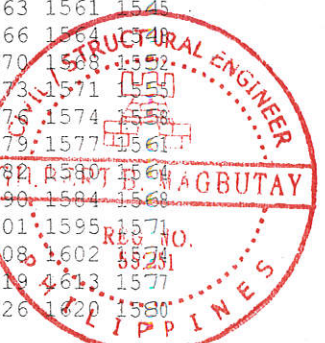
2334. 1381 887 888 861 860; 1382 888 889 862 861; 1383 889 890 863 862
 2335. 1384 890 891 864 863; 1385 891 892 865 864; 1386 892 893 866 865
 2336. 1387 893 894 867 866; 1388 894 895 868 867; 1389 895 896 869 868
 2337. 1390 896 897 870 869; 1391 898 899 872 871; 1392 899 900 873 872
 2338. 1393 900 901 874 873; 1394 901 902 875 874; 1395 902 903 876 875
 2339. 1396 903 904 877 876; 1397 904 905 878 877; 1398 905 906 879 878
 2340. 1399 906 907 880 879; 1400 907 908 881 880; 1401 908 909 882 881
 2341. 1402 909 910 883 882; 1403 911 912 887 886; 1404 912 913 888 887
 2342. 1405 913 914 889 888; 1406 914 915 890 889; 1407 915 916 891 890
 2343. 1408 916 917 892 891; 1409 917 918 893 892; 1410 918 919 894 893
 2344. 1411 919 920 895 894; 1412 920 921 896 895; 1413 921 922 897 896
 2345. 1414 923 924 899 898; 1415 924 925 900 899; 1416 925 926 901 900
 2346. 1417 926 927 902 901; 1418 927 928 903 902; 1419 928 929 904 903
 2347. 1420 929 930 905 904; 1421 930 931 906 905; 1422 931 932 907 906
 2348. 1423 932 933 908 907; 1424 933 934 909 908; 1425 934 935 910 909
 2349. 1426 936 937 912 911; 1427 937 938 913 912; 1428 938 939 914 913
 2350. 1429 939 940 915 914; 1430 940 941 916 915; 1431 941 942 917 916
 2351. 1432 942 943 918 917; 1433 943 944 919 918; 1434 944 945 920 919
 2352. 1435 945 946 921 920; 1436 946 947 922 921; 1437 948 949 924 923
 2353. 1438 949 950 925 924; 1439 950 951 926 925; 1440 951 952 927 926
 2354. 1441 952 953 928 927; 1442 953 954 929 928; 1443 954 955 930 929
 2355. 1444 955 956 931 930; 1445 956 957 932 931; 1446 957 958 933 932
 2356. 1447 958 959 934 933; 1448 959 960 935 934; 1449 961 962 937 936
 2357. 1450 962 963 938 937; 1451 963 964 939 938; 1452 964 965 940 939
 2358. 1453 965 966 941 940; 1454 966 967 942 941; 1455 967 968 943 942
 2359. 1456 968 969 944 943; 1457 969 970 945 944; 1458 970 971 946 945
 2360. 1459 971 972 947 946; 1460 973 974 949 948; 1461 974 975 950 949
 2361. 1462 975 976 951 950; 1463 976 977 952 951; 1464 977 978 953 952
 2362. 1465 978 979 954 953; 1466 979 980 955 954; 1467 980 981 956 955
 2363. 1468 981 982 957 956; 1469 982 983 958 957; 1470 983 984 959 958
 2364. 1471 984 985 960 959; 1472 986 987 962 961; 1473 987 988 963 962
 2365. 1474 988 989 964 963; 1475 989 990 965 964; 1476 990 991 966 965
 2366. 1477 991 992 967 966; 1478 992 993 968 967; 1479 993 994 969 968
 2367. 1480 994 995 970 969; 1481 995 996 971 970; 1482 996 997 972 971
 2368. 1483 998 999 974 973; 1484 999 1000 975 974; 1485 1000 1001 976 975
 2369. 1486 1001 1002 977 976; 1487 1002 1003 978 977; 1488 1003 1004 979 978
 2370. 1489 1004 1005 980 979; 1490 1005 1006 981 980; 1491 1006 1007 982 981
 2371. 1492 1007 1008 983 982; 1493 1008 1009 984 983; 1494 1009 1010 985 984
 2372. 1495 1011 1012 987 986; 1496 1012 1014 988 987; 1497 1014 1015 989 988
 2373. 1498 1015 1016 990 989; 1499 1016 1017 991 990; 1500 1017 1018 992 991
 2374. 1501 1018 1019 993 992; 1502 1019 1020 994 993; 1503 1020 1021 995 994
 2375. 1504 1021 1022 996 995; 1505 1022 1023 997 996; 1506 1029 1030 999 998
 2376. 1507 1030 1031 1000 999; 1508 1031 1032 1001 1000; 1509 1032 1033 1002 1001
 2377. 1510 1033 1034 1003 1002; 1511 1034 1035 1004 1003; 1512 1035 1036 1005 1004
 2378. 1513 1036 1037 1006 1005; 1514 1037 1038 1007 1006; 1515 1038 1039 1008 1007
 2379. 1516 1039 1040 1009 1008; 1517 1040 1041 1010 1009; 1518 1042 1043 1012 1011
 2380. 1519 1043 1044 1014 1012; 1520 1044 1045 1015 1014; 1521 1045 1046 1016 1015
 2381. 1522 1046 1047 1017 1016; 1523 1047 1048 1018 1017; 1524 1048 1049 1019 1018
 2382. 1525 1049 1050 1020 1019; 1526 1050 1051 1021 1020; 1527 1051 1052 1022 1021
 2383. 1528 1052 1053 1023 1022; 1529 1053 1054 1024 1023; 1530 1054 1055 1025 1024
 2384. 1531 1055 1056 1026 1025; 1532 1056 1057 1027 1026; 1533 1057 1058 1028 1027
 2385. 1534 1058 1059 1029 1028; 1535 1060 1061 1030 1029; 1536 1061 1062 1031 1030
 2386. 1537 1062 1063 1032 1031; 1538 1063 1064 1033 1032; 1539 1064 1065 1034 1033
 2387. 1540 1065 1066 1035 1034; 1541 1066 1067 1036 1035; 1542 1067 1068 1037 1036
 2388. 1543 1068 1069 1038 1037; 1544 1069 1070 1039 1038; 1545 1070 1071 1040 1039
 2389. 1546 1071 1072 1041 1040; 1547 1073 1074 1043 1042; 1548 1074 1075 1044 1043
 2390. 1549 1075 1076 1045 1044; 1550 1076 1077 1046 1045; 1551 1077 1078 1047 1046
 2391. 1552 1078 1079 1048 1047; 1553 1079 1080 1049 1048; 1554 1080 1081 1050 1049
 2392. 1555 1081 1082 1051 1050; 1556 1082 1083 1052 1051; 1557 1083 1084 1053 1052
 2393. 1558 1084 1085 1054 1053; 1559 1085 1086 1055 1054; 1560 1086 1087 1056 1055
 2394. 1561 1087 1088 1057 1056; 1562 1088 1089 1058 1057; 1563 1089 1090 1059 1058
 2395. 1564 1091 1092 1061 1060; 1565 1092 1093 1062 1061; 1566 1093 1094 1063 1062
 2396. 1567 1094 1095 1064 1063; 1568 1095 1096 1065 1064; 1569 1096 1097 1066 1065
 2397. 1570 1097 1098 1067 1066; 1571 1098 1099 1068 1067; 1572 1099 1100 1069 1068
 2398. 1573 1100 1101 1070 1069; 1574 1101 1102 1071 1070; 1575 1102 1103 1072 1071
 2399. 1576 1104 1105 1074 1073; 1577 1105 1106 1075 1074; 1578 1106 1107 1076 1075
 2400. 1579 1107 1108 1077 1076; 1580 1108 1109 1078 1077; 1581 1109 1110 1079 1078



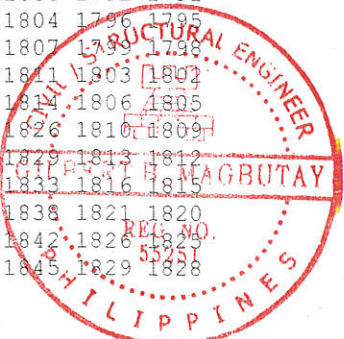
2401. 1582 1110 1111 1080 1079; 1583 1111 1112 1081 1080; 1584 1112 1113 1082 1081
 2402. 1585 1113 1114 1083 1082; 1586 1114 1115 1084 1083; 1587 1115 1116 1085 1084
 2403. 1588 1116 1117 1086 1085; 1589 1117 1118 1087 1086; 1590 1118 1119 1088 1087
 2404. 1591 1119 1120 1089 1088; 1592 1120 1121 1090 1089; 1593 1122 1123 1092 1091
 2405. 1594 1123 1124 1093 1092; 1595 1124 1125 1094 1093; 1596 1125 1126 1095 1094
 2406. 1597 1126 1127 1096 1095; 1598 1127 1128 1097 1096; 1599 1128 1129 1098 1097
 2407. 1600 1129 1130 1099 1098; 1601 1130 1131 1100 1099; 1602 1131 1132 1101 1100
 2408. 1603 1132 1133 1102 1101; 1604 1133 1134 1103 1102; 1605 1135 1136 1105 1104
 2409. 1606 1136 1137 1106 1105; 1607 1137 1138 1107 1106; 1608 1138 1139 1108 1107
 2410. 1609 1139 1140 1109 1108; 1610 1140 1141 1110 1109; 1611 1141 1142 1111 1110
 2411. 1612 1142 1143 1112 1111; 1613 1143 1144 1113 1112; 1614 1144 1145 1114 1113
 2412. 1615 1145 1146 1115 1114; 1616 1148 1149 1123 1122; 1617 1149 1150 1124 1123
 2413. 1618 1150 1151 1125 1124; 1619 1151 1152 1126 1125; 1620 1152 1153 1127 1126
 2414. 1621 1153 1154 1128 1127; 1622 1154 1155 1129 1128; 1623 1155 1156 1130 1129
 2415. 1624 1156 1157 1131 1130; 1625 1157 1158 1132 1131; 1626 1158 1159 1133 1132
 2416. 1627 1159 1160 1134 1133; 1628 1161 1162 1136 1135; 1629 1162 1163 1137 1136
 2417. 1630 1163 1164 1135 1134; 1631 1164 1165 1139 1138; 1632 1165 1166 1140 1139
 2418. 1633 1166 1167 1141 1140; 1634 1167 1168 1142 1141; 1635 1168 1169 1143 1142
 2419. 1636 1169 1170 1144 1143; 1637 1170 1171 1145 1144; 1638 1171 1172 1146 1145
 2420. 1639 1174 1175 1149 1148; 1640 1175 1176 1150 1149; 1641 1176 1177 1151 1150
 2421. 1642 1177 1178 1152 1151; 1643 1178 1179 1153 1152; 1644 1179 1180 1154 1153
 2422. 1645 1180 1181 1155 1154; 1646 1181 1182 1156 1155; 1647 1182 1183 1157 1156
 2423. 1648 1183 1184 1158 1157; 1649 1184 1185 1159 1158; 1650 1185 1186 1160 1159
 2424. 1651 1187 1188 1162 1161; 1652 1188 1189 1163 1162; 1653 1189 1190 1164 1163
 2425. 1654 1190 1191 1165 1164; 1655 1191 1192 1166 1165; 1656 1192 1193 1167 1166
 2426. 1657 1193 1194 1168 1167; 1658 1194 1195 1169 1168; 1659 1195 1196 1170 1169
 2427. 1660 1196 1197 1171 1170; 1661 1197 1198 1172 1171; 1662 1200 1201 1175 1174
 2428. 1663 1201 1202 1176 1175; 1664 1202 1203 1177 1176; 1665 1203 1204 1178 1177
 2429. 1666 1204 1205 1179 1178; 1667 1205 1206 1180 1179; 1668 1206 1207 1181 1180
 2430. 1669 1207 1208 1182 1181; 1670 1208 1209 1183 1182; 1671 1209 1210 1184 1183
 2431. 1672 1210 1211 1185 1184; 1673 1211 1212 1186 1185; 1674 1213 1214 1188 1187
 2432. 1675 1214 1215 1189 1188; 1676 1215 1216 1190 1189; 1677 1216 1217 1191 1190
 2433. 1678 1217 1218 1192 1191; 1679 1218 1219 1193 1192; 1680 1219 1220 1194 1193
 2434. 1681 1220 1221 1195 1194; 1682 1221 1222 1196 1195; 1683 1222 1223 1197 1196
 2435. 1684 1223 1224 1198 1197; 1685 1226 1227 1201 1200; 1686 1227 1228 1202 1201
 2436. 1687 1228 1229 1203 1202; 1688 1229 1230 1204 1203; 1689 1230 1231 1205 1204
 2437. 1690 1231 1232 1206 1205; 1691 1232 1233 1207 1206; 1692 1233 1234 1208 1207
 2438. 1693 1234 1235 1209 1208; 1694 1235 1236 1210 1209; 1695 1236 1237 1211 1210
 2439. 1696 1237 1238 1212 1211; 1697 1239 1240 1214 1213; 1698 1240 1241 1215 1214
 2440. 1699 1241 1242 1216 1215; 1700 1242 1243 1217 1216; 1701 1243 1244 1218 1217
 2441. 1702 1244 1245 1219 1218; 1703 1245 1246 1220 1219; 1704 1246 1247 1221 1220
 2442. 1705 1247 1248 1222 1221; 1706 1248 1249 1223 1222; 1707 1249 1250 1224 1223
 2443. 1708 1252 1254 1240 1239; 1709 1254 1256 1241 1240; 1710 1256 1258 1242 1241
 2444. 1711 1258 1260 1243 1242; 1712 1260 1262 1244 1243; 1713 1262 1264 1245 1244
 2445. 1714 1264 1266 1246 1245; 1715 1266 1268 1247 1246; 1716 1268 1270 1248 1247
 2446. 1717 1270 1272 1249 1248; 1718 1272 1274 1250 1249; 1719 1281 1282 1253 1252
 2447. 1720 1282 1283 1255 1253; 1721 1283 1284 1257 1255; 1722 1284 1285 1259 1257
 2448. 1723 1285 1286 1261 1259; 1724 1286 1287 1263 1261; 1725 1287 1288 1265 1263
 2449. 1726 1288 1289 1267 1265; 1727 1289 1290 1269 1267; 1728 1290 1291 1271 1269
 2450. 1729 1291 1292 1273 1271; 1730 1292 1293 1275 1273; 1731 1293 1294 1276 1275
 2451. 1732 1294 1295 1277 1276; 1733 1295 1296 1278 1277; 1734 1296 1297 1279 1278
 2452. 1735 1297 1298 1280 1279; 1736 1299 1300 1282 1281; 1737 1300 1301 1283 1282
 2453. 1738 1301 1302 1284 1283; 1739 1302 1303 1285 1284; 1740 1303 1304 1286 1285
 2454. 1741 1304 1305 1287 1286; 1742 1305 1306 1288 1287; 1743 1306 1307 1289 1288
 2455. 1744 1307 1308 1290 1289; 1745 1308 1309 1291 1290; 1746 1309 1311 1292 1291
 2456. 1747 1311 1313 1293 1292; 1748 1313 1314 1294 1293; 1749 1314 1316 1295 1294
 2457. 1750 1316 1318 1296 1295; 1751 1310 1312 1300 1299; 1752 1318 1319 1297 1296
 2458. 1753 1312 1315 1301 1300; 1754 1319 1321 1298 1297; 1755 1315 1317 1302 1301
 2459. 1756 1317 1320 1303 1302; 1757 1320 1322 1304 1303; 1758 1322 1323 1305 1304
 2460. 1759 1323 1324 1306 1305; 1760 1324 1325 1307 1306; 1761 1325 1326 1308 1307
 2461. 1762 1326 1327 1309 1308; 1763 1327 1328 1311 1309; 1764 1328 1329 1313 1311
 2462. 1765 1329 1330 1314 1313; 1766 1330 1331 1316 1314; 1767 1331 1332 1318 1316
 2463. 1768 1332 1333 1319 1318; 1769 1333 1334 1321 1319; 1770 1059 1336 1335 1029
 2464. 1771 1090 1337 1336 1059; 1772 1121 1338 1337 1090; 1773 1147 1339 1338 1121
 2465. 1774 1173 1340 1339 1147; 1775 1199 1341 1340 1173; 1776 1225 1342 1341 1199
 2466. 1777 1251 1343 1342 1225; 1778 1280 1344 1343 1251; 1779 1298 1345 1344 1298
 2467. 1780 1321 1346 1345 1298; 1781 1334 1347 1346 1321; 1782 1336 1349 1348 1336



2468. 1783 1337 1350 1349 1336; 1784 1338 1351 1350 1337; 1785 1339 1352 1351 1338
 2469. 1786 1340 1353 1352 1339; 1787 1341 1354 1353 1340; 1788 1342 1355 1354 1341
 2470. 1789 1343 1356 1355 1342; 1790 1344 1357 1356 1343; 1791 1345 1358 1357 1344
 2471. 1792 1346 1359 1353 1345; 1793 1347 1360 1359 1346; 1794 1349 1372 1371 1348
 2472. 1795 1350 1373 1372 1349; 1796 1351 1374 1373 1350; 1797 1352 1375 1374 1351
 2473. 1798 1353 1376 1375 1352; 1799 1354 1377 1376 1353; 1800 1355 1378 1377 1354
 2474. 1801 1356 1379 1373 1355; 1802 1357 1380 1379 1356; 1803 1358 1381 1380 1357
 2475. 1804 1359 1382 1381 1358; 1805 1360 1383 1382 1359; 1806 1372 1385 1384 1371
 2476. 1807 1373 1386 1385 1372; 1808 1374 1387 1386 1373; 1809 1375 1388 1387 1374
 2477. 1810 1376 1389 1383 1375; 1811 1377 1390 1389 1376; 1812 1378 1391 1390 1377
 2478. 1813 1379 1392 1391 1378; 1814 1380 1393 1392 1379; 1815 1381 1394 1393 1380
 2479. 1816 1382 1395 1394 1381; 1817 1383 1396 1395 1382; 1818 829 1490 1491 830
 2480. 1819 830 1491 1492 831; 1820 831 1492 1493 832; 1821 833 1497 1498 845
 2481. 1822 845 1498 1499 846; 1823 846 1499 1500 853; 1824 1029 1502 1503 1041
 2482. 1825 1104 1506 1507 1121; 1826 1385 1398 1397 1384; 1827 1386 1399 1398 1385
 2483. 1828 1387 1400 1399 1386; 1829 1388 1401 1400 1387; 1830 1389 1402 1401 1388
 2484. 1831 1390 1403 1402 1389; 1832 1391 1404 1403 1390; 1833 1392 1405 1404 1391
 2485. 1834 1393 1406 1405 1392; 1835 1394 1407 1406 1393; 1836 1395 1408 1407 1394
 2486. 1837 1396 1409 1408 1395; 1838 1363 1481 1483 1364; 1839 1364 1483 1490 1366
 2487. 1840 1367 1494 1495 1368; 1841 1368 1495 1497 1370; 1842 1398 1411 1410 1397
 2488. 1843 1399 1412 1411 1398; 1844 1400 1413 1412 1399; 1845 1401 1414 1413 1400
 2489. 1846 1402 1415 1414 1401; 1847 1403 1416 1415 1402; 1848 1404 1417 1416 1403
 2490. 1849 1405 1418 1417 1404; 1850 1406 1419 1418 1405; 1851 1407 1420 1419 1406
 2491. 1852 1408 1421 1420 1407; 1853 1409 1422 1421 1408; 1854 1411 1424 1423 1410
 2492. 1855 1412 1425 1424 1411; 1856 1413 1426 1425 1412; 1857 1414 1427 1426 1413
 2493. 1858 1415 1428 1427 1414; 1859 1416 1429 1428 1415; 1860 1417 1430 1429 1416
 2494. 1861 1418 1431 1430 1417; 1862 1419 1432 1431 1418; 1863 1420 1433 1432 1419
 2495. 1864 1421 1434 1433 1420; 1865 1422 1435 1434 1421; 1866 1424 1504 1502 1423
 2496. 1867 1425 1505 1504 1424; 1868 1426 1507 1505 1425; 1869 1427 1508 1507 1426
 2497. 1870 1428 1509 1508 1427; 1871 1429 1510 1509 1428; 1872 1430 1511 1510 1429
 2498. 1873 1431 1514 1511 1430; 1874 1432 1515 1514 1431; 1875 1433 1516 1515 1432
 2499. 1876 1434 1518 1516 1433; 1877 1435 1519 1518 1434; 1878 1445 1446 1437 1436
 2500. 1879 1446 1447 1438 1437; 1880 1447 1448 1439 1438; 1881 1448 1449 1440 1439
 2501. 1882 1449 1450 1441 1440; 1883 1451 1452 1446 1445; 1884 1452 1453 1447 1446
 2502. 1885 1453 1454 1443 1447; 1886 1454 1455 1449 1448; 1887 1455 1456 1450 1449
 2503. 1888 1457 1458 1452 1451; 1889 1458 1459 1453 1452; 1890 1459 1460 1454 1453
 2504. 1891 1460 1461 1455 1454; 1892 1461 1462 1456 1455; 1893 1463 1464 1458 1457
 2505. 1894 1464 1465 1459 1458; 1895 1465 1466 1460 1459; 1896 1466 1467 1461 1460
 2506. 1897 1467 1468 1462 1461; 1898 1469 1470 1464 1463; 1899 1470 1471 1465 1464
 2507. 1900 1471 1472 1466 1465; 1901 1472 1473 1467 1466; 1902 1473 1474 1468 1467
 2508. 1903 1475 1476 1470 1469; 1904 1476 1477 1471 1470; 1905 1477 1478 1472 1471
 2509. 1906 1478 1479 1473 1472; 1907 1479 1480 1474 1473; 1908 1484 1485 1476 1475
 2510. 1909 1485 1486 1477 1476; 1910 1486 1487 1478 1477; 1911 1487 1488 1479 1478
 2511. 1912 1488 1490 1480 1479; 1913 1445 1522 1520 1436; 1914 1450 1523 1521 1441
 2512. 1915 1451 1524 1522 1445; 1916 1456 1525 1523 1450; 1917 1457 1526 1524 1451
 2513. 1918 1462 1527 1525 1456; 1919 1463 1528 1526 1457; 1920 1468 1529 1527 1462
 2514. 1921 1469 1530 1528 1463; 1922 1474 1531 1529 1468; 1923 1475 1532 1530 1469
 2515. 1924 1480 1533 1531 1474; 1925 1484 1534 1532 1475; 1926 1490 1535 1533 1480
 2516. 1927 1522 1538 1536 1520; 1928 1523 1539 1537 1521; 1929 1524 1540 1538 1522
 2517. 1930 1525 1541 1539 1523; 1931 1526 1542 1540 1524; 1932 1527 1543 1541 1525
 2518. 1933 1528 1544 1542 1526; 1934 1529 1545 1543 1527; 1935 1530 1546 1544 1528
 2519. 1936 1531 1547 1545 1529; 1937 1532 1548 1546 1530; 1938 1533 1549 1547 1531
 2520. 1939 1534 1550 1548 1532; 1940 1535 1551 1549 1533; 1941 1538 1554 1552 1536
 2521. 1942 1539 1555 1553 1537; 1943 1540 1556 1554 1538; 1944 1541 1557 1555 1539
 2522. 1945 1542 1558 1556 1540; 1946 1543 1559 1557 1541; 1947 1544 1560 1558 1542
 2523. 1948 1545 1561 1559 1543; 1949 1546 1562 1560 1544; 1950 1547 1563 1561 1545
 2524. 1951 1548 1564 1562 1546; 1952 1549 1565 1563 1547; 1953 1550 1566 1564 1548
 2525. 1954 1551 1567 1565 1549; 1955 1484 1626 1631 1490; 1956 1554 1567 1552 1551
 2526. 1957 1555 1571 1569 1553; 1958 1556 1572 1570 1554; 1959 1557 1573 1555 1552
 2527. 1960 1558 1574 1572 1556; 1961 1559 1575 1573 1557; 1962 1560 1576 1558 1556
 2528. 1963 1561 1577 1575 1559; 1964 1562 1578 1576 1560; 1965 1563 1579 1561 1559
 2529. 1966 1564 1580 1578 1562; 1967 1565 1581 1579 1563; 1968 1566 1582 1580 1564
 2530. 1969 1567 1583 1581 1565; 1970 1482 1633 1634 1484; 1971 1570 1590 1584 1568
 2531. 1972 1571 1595 1589 1569; 1973 1572 1596 1590 1570; 1974 1573 1601 1595 1571
 2532. 1975 1574 1602 1596 1572; 1976 1575 1607 1601 1573; 1977 1576 1608 1602 1574
 2533. 1978 1577 1613 1607 1575; 1979 1578 1614 1608 1576; 1980 1579 1619 1613 1577
 2534. 1981 1580 1620 1614 1578; 1982 1581 1625 1619 1579; 1983 1582 1626 1620 1580



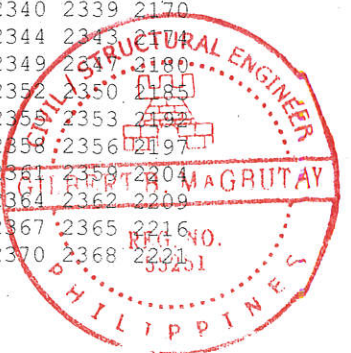
2535. 1984 1583 1631 1625 1581; 1985 1490 1695 1696 1491; 1986 1491 1696 1697 1492
 2536. 1987 1492 1697 1698 1493; 1988 1497 1756 1757 1498; 1989 1498 1757 1758 1499
 2537. 1990 1499 1758 1759 1500; 1991 1502 1818 1825 1503; 1992 1506 1865 1866 1507
 2538. 1993 1590 1591 1585 1584; 1994 1591 1592 1586 1585; 1995 1592 1593 1587 1586
 2539. 1996 1593 1594 1583 1587; 1997 1594 1595 1589 1588; 1998 1596 1597 1591 1590
 2540. 1999 1597 1598 1592 1591; 2000 1598 1599 1593 1592; 2001 1599 1600 1594 1593
 2541. 2002 1600 1601 1595 1594; 2003 1602 1603 1597 1596; 2004 1603 1604 1598 1597
 2542. 2005 1604 1605 1599 1598; 2006 1605 1606 1600 1599; 2007 1606 1607 1601 1600
 2543. 2008 1608 1609 1603 1602; 2009 1609 1610 1604 1603; 2010 1610 1611 1605 1604
 2544. 2011 1611 1612 1606 1605; 2012 1612 1613 1607 1606; 2013 1614 1615 1609 1608
 2545. 2014 1615 1616 1610 1609; 2015 1616 1617 1611 1610; 2016 1617 1618 1612 1611
 2546. 2017 1618 1619 1613 1612; 2018 1620 1621 1615 1614; 2019 1621 1622 1616 1615
 2547. 2020 1622 1623 1617 1616; 2021 1623 1624 1618 1617; 2022 1624 1625 1619 1618
 2548. 2023 1626 1627 1621 1620; 2024 1627 1628 1622 1621; 2025 1628 1629 1623 1622
 2549. 2026 1629 1630 1624 1623; 2027 1630 1631 1625 1624; 2028 1626 1634 1635 1631
 2550. 2029 1647 1648 1640 1639; 2030 1648 1649 1641 1640; 2031 1649 1650 1642 1641
 2551. 2032 1650 1651 1643 1642; 2033 1651 1652 1644 1643; 2034 1652 1653 1645 1644
 2552. 2035 1653 1654 1646 1645; 2036 1655 1656 1648 1647; 2037 1656 1657 1649 1648
 2553. 2038 1657 1658 1650 1649; 2039 1658 1659 1651 1650; 2040 1659 1660 1652 1651
 2554. 2041 1660 1661 1653 1652; 2042 1661 1662 1654 1653; 2043 1663 1664 1656 1655
 2555. 2044 1664 1665 1657 1656; 2045 1665 1666 1658 1657; 2046 1666 1667 1659 1658
 2556. 2047 1667 1668 1660 1659; 2048 1668 1669 1661 1660; 2049 1669 1670 1662 1661
 2557. 2050 1671 1672 1664 1663; 2051 1672 1673 1665 1664; 2052 1673 1674 1666 1665
 2558. 2053 1674 1675 1667 1666; 2054 1675 1676 1668 1667; 2055 1676 1677 1669 1668
 2559. 2056 1677 1678 1670 1669; 2057 1679 1680 1672 1671; 2058 1680 1681 1673 1672
 2560. 2059 1681 1682 1674 1673; 2060 1682 1683 1675 1674; 2061 1683 1684 1676 1675
 2561. 2062 1684 1685 1677 1676; 2063 1685 1686 1678 1677; 2064 1687 1688 1680 1679
 2562. 2065 1688 1689 1681 1680; 2066 1689 1690 1682 1681; 2067 1690 1691 1683 1682
 2563. 2068 1691 1692 1684 1683; 2069 1692 1693 1685 1684; 2070 1693 1694 1686 1685
 2564. 2071 1698 1699 1688 1687; 2072 1699 1700 1689 1688; 2073 1700 1702 1690 1689
 2565. 2074 1702 1703 1691 1690; 2075 1703 1704 1692 1691; 2076 1704 1706 1693 1692
 2566. 2077 1706 1707 1694 1693; 2078 1708 1709 1699 1698; 2079 1709 1710 1700 1699
 2567. 2080 1710 1711 1702 1700; 2081 1711 1712 1703 1702; 2082 1712 1713 1704 1703
 2568. 2083 1713 1714 1706 1704; 2084 1714 1715 1707 1706; 2085 1716 1717 1709 1708
 2569. 2086 1717 1718 1710 1709; 2087 1718 1719 1711 1710; 2088 1719 1720 1712 1711
 2570. 2089 1720 1721 1713 1712; 2090 1721 1722 1714 1713; 2091 1722 1723 1715 1714
 2571. 2092 1724 1725 1717 1716; 2093 1725 1726 1718 1717; 2094 1726 1727 1719 1718
 2572. 2095 1727 1728 1720 1719; 2096 1728 1729 1721 1720; 2097 1729 1730 1722 1721
 2573. 2098 1730 1731 1723 1722; 2099 1732 1733 1725 1724; 2100 1733 1734 1726 1725
 2574. 2101 1734 1735 1727 1726; 2102 1735 1736 1728 1727; 2103 1736 1737 1729 1728
 2575. 2104 1737 1738 1730 1729; 2105 1738 1739 1731 1730; 2106 1740 1741 1733 1732
 2576. 2107 1741 1742 1734 1733; 2108 1742 1743 1735 1734; 2109 1743 1744 1736 1735
 2577. 2110 1744 1745 1737 1736; 2111 1745 1746 1738 1737; 2112 1746 1747 1739 1738
 2578. 2113 1748 1749 1741 1740; 2114 1749 1750 1742 1741; 2115 1750 1751 1743 1742
 2579. 2116 1751 1752 1744 1743; 2117 1752 1753 1745 1744; 2118 1753 1754 1746 1745
 2580. 2119 1754 1755 1747 1746; 2120 1759 1760 1749 1748; 2121 1760 1761 1750 1749
 2581. 2122 1761 1763 1751 1750; 2123 1763 1764 1752 1751; 2124 1764 1765 1753 1752
 2582. 2125 1765 1767 1754 1753; 2126 1767 1768 1755 1754; 2127 1769 1770 1760 1759
 2583. 2128 1770 1771 1761 1760; 2129 1771 1772 1763 1761; 2130 1772 1773 1764 1763
 2584. 2131 1773 1774 1765 1764; 2132 1774 1775 1767 1765; 2133 1775 1776 1768 1767
 2585. 2134 1777 1778 1770 1769; 2135 1778 1779 1771 1770; 2136 1779 1780 1772 1771
 2586. 2137 1780 1781 1773 1772; 2138 1781 1782 1774 1773; 2139 1782 1783 1775 1774
 2587. 2140 1783 1784 1776 1775; 2141 1785 1786 1778 1777; 2142 1786 1787 1779 1778
 2588. 2143 1787 1788 1780 1779; 2144 1788 1789 1781 1780; 2145 1789 1790 1782 1781
 2589. 2146 1790 1791 1783 1782; 2147 1791 1792 1784 1783; 2148 1793 1794 1786 1785
 2590. 2149 1794 1795 1787 1786; 2150 1795 1796 1788 1787; 2151 1796 1797 1789 1788
 2591. 2152 1797 1798 1790 1789; 2153 1798 1799 1791 1790; 2154 1799 1800 1792 1791
 2592. 2155 1801 1802 1794 1793; 2156 1802 1803 1795 1794; 2157 1803 1804 1796 1795
 2593. 2158 1804 1805 1797 1796; 2159 1805 1806 1798 1797; 2160 1806 1807 1799 1798
 2594. 2161 1807 1808 1800 1799; 2162 1809 1810 1802 1801; 2163 1810 1811 1803 1802
 2595. 2164 1811 1812 1804 1803; 2165 1812 1813 1805 1804; 2166 1813 1814 1806 1805
 2596. 2167 1814 1815 1807 1806; 2168 1815 1816 1808 1807; 2169 1825 1826 1810 1809
 2597. 2170 1826 1827 1811 1810; 2171 1827 1828 1812 1811; 2172 1828 1829 1813 1812
 2598. 2173 1829 1830 1814 1813; 2174 1830 1832 1815 1814; 2175 1832 1833 1816 1815
 2599. 2176 1835 1836 1819 1818; 2177 1836 1837 1820 1819; 2178 1837 1838 1821 1820
 2600. 2179 1838 1839 1823 1821; 2180 1839 1840 1824 1823; 2181 1841 1842 1825 1824
 2601. 2182 1842 1843 1827 1826; 2183 1843 1844 1828 1827; 2184 1844 1845 1829 1828



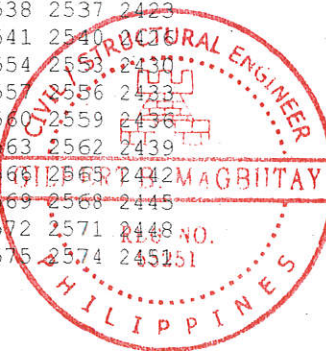
2602. 2185 1845 1846 1830 1829; 2186 1846 1847 1832 1830; 2187 1847 1848 1833 1832
 2603. 2189 1850 1851 1836 1835; 2189 1851 1852 1837 1836; 2190 1852 1853 1838 1837
 2604. 2191 1853 1854 1839 1838; 2192 1854 1855 1840 1839; 2193 1856 1857 1842 1841
 2605. 2194 1857 1858 1843 1842; 2195 1858 1859 1844 1843; 2196 1859 1860 1845 1844
 2606. 2197 1860 1861 1846 1845; 2198 1861 1862 1847 1846; 2199 1862 1863 1848 1847
 2607. 2200 1867 1868 1851 1850; 2201 1868 1869 1852 1851; 2202 1869 1870 1853 1852
 2608. 2203 1870 1871 1854 1853; 2204 1871 1872 1855 1854; 2205 1873 1874 1857 1856
 2609. 2206 1874 1875 1853 1857; 2207 1875 1876 1859 1858; 2208 1876 1877 1860 1859
 2610. 2209 1877 1878 1861 1860; 2210 1878 1879 1862 1861; 2211 1879 1880 1863 1862
 2611. 2212 1882 1883 1863 1867; 2213 1883 1884 1869 1868; 2214 1884 1885 1870 1869
 2612. 2215 1885 1886 1871 1870; 2216 1886 1887 1872 1871; 2217 1888 1889 1874 1873
 2613. 2218 1889 1890 1875 1874; 2219 1890 1891 1876 1875; 2220 1891 1892 1877 1876
 2614. 2221 1892 1893 1878 1877; 2222 1893 1894 1879 1878; 2223 1894 1895 1880 1879
 2615. 2224 1897 1898 1883 1882; 2225 1898 1899 1884 1883; 2226 1899 1900 1885 1884
 2616. 2227 1900 1901 1886 1885; 2228 1901 1902 1887 1886; 2229 1903 1904 1889 1888
 2617. 2230 1904 1905 1890 1889; 2231 1905 1906 1891 1890; 2232 1906 1907 1892 1891
 2618. 2233 1907 1908 1893 1892; 2234 1908 1909 1894 1893; 2235 1909 1910 1895 1894
 2619. 2236 1912 1913 1893 1897; 2237 1913 1914 1899 1898; 2238 1914 1915 1900 1899
 2620. 2239 1915 1916 1901 1900; 2240 1916 1917 1902 1901; 2241 1918 1919 1904 1903
 2621. 2242 1919 1920 1905 1904; 2243 1920 1921 1906 1905; 2244 1921 1922 1907 1906
 2622. 2245 1922 1923 1903 1907; 2246 1923 1924 1909 1908; 2247 1924 1925 1910 1909
 2623. 2248 1927 1928 1913 1912; 2249 1928 1929 1914 1913; 2250 1929 1930 1915 1914
 2624. 2251 1930 1931 1916 1915; 2252 1931 1932 1917 1916; 2253 1933 1934 1919 1918
 2625. 2254 1934 1935 1920 1919; 2255 1935 1936 1921 1920; 2256 1936 1937 1922 1921
 2626. 2257 1937 1938 1923 1922; 2258 1938 1939 1924 1923; 2259 1939 1940 1925 1924
 2627. 2260 1947 1948 1946 1946; 2261 1948 1949 1947 1948; 2262 1949 1950 1948 1948
 2628. 2263 1950 1951 1949 1949; 2264 1951 1952 1950 1950; 2265 1952 1953 1951 1951
 2629. 2266 1953 1954 1952 1952; 2267 1954 1955 1953 1953; 2268 1955 1956 1954 1954
 2630. 2269 1956 1957 1955 1955; 2270 1957 1958 1956 1956; 2271 1958 1959 1957 1957
 2631. 2272 1959 1960 1958 1958; 2273 1960 1961 1959 1959; 2274 1961 1962 1960 1960
 2632. 2275 1962 1963 1961 1961; 2276 1963 1964 1962 1962; 2277 1964 1965 1963 1963
 2633. 2278 1965 1966 1964 1964; 2279 1966 1967 1965 1965; 2280 1967 1968 1966 1966
 2634. 2281 1968 1969 1967 1967; 2282 1969 1970 1968 1968; 2283 1970 1971 1969 1969
 2635. 2284 1971 1972 1970 1970; 2285 1972 1973 1971 1971; 2286 1973 1974 1972 1972
 2636. 2287 1974 1975 1973 1973; 2288 1975 1976 1974 1974; 2289 1976 1977 1975 1975
 2637. 2290 1977 1978 1977 1977; 2291 1978 1979 1978 1978; 2292 1979 1980 1979 1979
 2638. 2293 1979 1980 1980 1980; 2294 1980 1981 1981 1981; 2295 1981 1982 1982 1982
 2639. 2296 1982 1983 1983 1983; 2297 1983 1984 1984 1984; 2298 1984 1985 1985 1985
 2640. 2299 1984 1985 1985 1985; 2300 1985 1986 1986 1986; 2301 1986 1987 1987 1987
 2641. 2302 1987 1988 1988 1988; 2303 1988 1989 1989 1989; 2304 1989 1990 1990 1990
 2642. 2305 1989 1990 1990 1990; 2306 1990 1991 1991 1991; 2307 1991 1992 1992 1992
 2643. 2308 1992 1993 1993 1993; 2309 1993 1994 1994 1994; 2310 1994 1995 1995 1995
 2644. 2311 1995 1996 1996 1996; 2312 1996 1997 1997 1997; 2313 1997 1998 1998 1998
 2645. 2314 1998 1999 1999 1999; 2315 1999 2000 2000 2000; 2316 2000 2001 2001 2001
 2646. 2317 2001 2002 2002 2002; 2318 2002 2003 2003 2003; 2319 2003 2004 2004 2004
 2647. 2320 2004 2005 2005 2005; 2321 2005 2006 2006 2006; 2322 2006 2007 2007 2007
 2648. 2323 2007 2008 2008 2008; 2324 2008 2009 2009 2009; 2325 2009 2010 2010 2010
 2649. 2326 2009 2010 2010 2010; 2327 2010 2011 2011 2011; 2328 2011 2012 2012 2012
 2650. 2329 2012 2013 2013 2013; 2330 2013 2014 2014 2014; 2331 2014 2015 2015 2015
 2651. 2332 2014 2015 2015 2015; 2333 2015 2016 2016 2016; 2334 2016 2017 2017 2017
 2652. 2335 2016 2017 2017 2017; 2336 2017 2018 2018 2018; 2337 2018 2019 2019 2019
 2653. 2338 2018 2019 2019 2019; 2339 2019 2020 2020 2020; 2340 2020 2021 2021 2021
 2654. 2341 2020 2021 2021 2021; 2342 2021 2022 2022 2022; 2343 2022 2023 2023 2023
 2655. 2344 2022 2023 2023 2023; 2345 2023 2024 2024 2024; 2346 2024 2025 2025 2025
 2656. 2347 2024 2025 2025 2025; 2348 2025 2026 2026 2026; 2349 2026 2027 2027 2027
 2657. 2350 2026 2027 2027 2027; 2351 2027 2028 2028 2028; 2352 2028 2029 2029 2029
 2658. 2353 2028 2029 2029 2029; 2354 2029 2030 2030 2030; 2355 2030 2031 2031 2031
 2659. 2356 2030 2031 2031 2031; 2357 2031 2032 2032 2032; 2358 2032 2033 2033 2033
 2660. 2359 2032 2033 2033 2033; 2360 2033 2034 2034 2034; 2361 2034 2035 2035 2035
 2661. 2362 2034 2035 2035 2035; 2363 2035 2036 2036 2036; 2364 2036 2037 2037 2037
 2662. 2365 2036 2037 2037 2037; 2366 2037 2038 2038 2038; 2367 2038 2039 2039 2039
 2663. 2368 2038 2039 2039 2039; 2369 2039 2040 2040 2040; 2370 2040 2041 2041 2041
 2664. 2371 2040 2041 2041 2041; 2372 2041 2042 2042 2042; 2373 2042 2043 2043 2043
 2665. 2374 2042 2043 2043 2043; 2375 2043 2044 2044 2044; 2376 2044 2045 2045 2045
 2666. 2377 2044 2045 2045 2045; 2378 2045 2046 2046 2046; 2379 2046 2047 2047 2047
 2667. 2380 2046 2047 2047 2047; 2381 2047 2048 2048 2048; 2382 2048 2049 2049 2049
 2668. 2383 2048 2049 2049 2049; 2384 2049 2050 2050 2050; 2385 2050 2051 2051 2051



2669. 2386 2029 2090 2089 2028; 2387 2030 2091 2090 2029; 2388 2031 2092 2091 2030
 2670. 2389 2032 2093 2092 2031; 2390 2034 2095 2094 2033; 2391 2035 2096 2095 2034
 2671. 2392 2036 2097 2096 2035; 2393 2037 2038 2099 2098; 2394 2038 2039 2100 2099
 2672. 2395 2039 2040 2101 2100; 2396 2040 2041 2102 2101; 2397 2041 2042 2103 2102
 2673. 2398 2042 2043 2104 2103; 2399 2043 2044 2105 2104; 2400 2044 2045 2106 2105
 2674. 2401 2058 2137 2136 2057; 2402 2059 2138 2137 2058; 2403 2060 2139 2138 2059
 2675. 2404 2061 2140 2139 2060; 2405 2062 2141 2140 2061; 2406 2063 2142 2141 2062
 2676. 2407 2064 2143 2142 2063; 2408 2065 2144 2143 2064; 2409 2066 2145 2144 2065
 2677. 2410 2067 2146 2145 2066; 2411 2068 2147 2146 2067; 2412 2069 2148 2147 2068
 2678. 2413 2070 2149 2148 2069; 2414 2071 2150 2149 2070; 2415 2072 2151 2150 2071
 2679. 2416 2073 2152 2151 2072; 2417 2074 2153 2152 2073; 2418 2075 2154 2153 2074
 2680. 2419 2076 2155 2154 2075; 2420 2077 2156 2155 2076; 2421 2078 2157 2156 2077
 2681. 2422 2079 2159 2157 2078; 2423 2080 2159 2158 2079; 2424 2081 2160 2159 2080
 2682. 2425 2082 2161 2160 2081; 2426 2083 2162 2161 2082; 2427 2084 2163 2162 2083
 2683. 2428 2085 2164 2163 2084; 2429 2087 2166 2165 2086; 2430 2088 2167 2166 2087
 2684. 2431 2089 2168 2167 2088; 2432 2090 2169 2168 2089; 2433 2091 2170 2169 2090
 2685. 2434 2092 2171 2170 2091; 2435 2093 2172 2171 2092; 2436 2095 2174 2173 2094
 2686. 2437 2096 2175 2174 2095; 2438 2097 2176 2175 2096; 2439 1695 2716 2717 1696
 2687. 2440 1696 2717 2718 1697; 2441 1697 2718 2724 1698; 2442 1756 2767 2768 1757
 2688. 2443 1757 2768 2769 1758; 2444 1758 2769 2775 1759; 2445 1818 2819 2825 1825
 2689. 2446 1865 2845 2846 1866; 2447 1927 2883 2888 1932; 2448 2098 2099 2268 2267
 2690. 2449 2099 2100 2269 2268; 2450 2100 2101 2270 2269; 2451 2101 2102 2271 2270
 2691. 2452 2102 2103 2272 2271; 2453 2103 2104 2273 2272; 2454 2104 2105 2274 2273
 2692. 2455 2105 2106 2275 2274; 2456 2181 2182 2178 2177; 2457 2183 2184 2180 2179
 2693. 2458 2185 2186 2182 2181; 2459 2187 2188 2184 2183; 2460 2189 2190 2186 2185
 2694. 2461 2191 2192 2188 2187; 2462 2193 2194 2190 2189; 2463 2195 2196 2192 2191
 2695. 2464 2197 2198 2194 2193; 2465 2199 2200 2196 2195; 2466 2201 2202 2198 2197
 2696. 2467 2203 2204 2200 2199; 2468 2205 2206 2202 2201; 2469 2207 2208 2204 2203
 2697. 2470 2209 2210 2206 2205; 2471 2211 2212 2208 2207; 2472 2213 2214 2210 2209
 2698. 2473 2215 2216 2212 2211; 2474 2217 2218 2214 2213; 2475 2219 2220 2216 2215
 2699. 2476 2221 2222 2218 2217; 2477 2223 2224 2220 2219; 2478 2225 2226 2222 2221
 2700. 2479 2227 2228 2224 2223; 2480 2229 2230 2226 2225; 2481 2231 2232 2228 2227
 2701. 2482 2233 2234 2230 2229; 2483 2235 2236 2232 2231; 2484 2237 2238 2234 2233
 2702. 2485 2239 2240 2236 2235; 2486 2241 2242 2238 2237; 2487 2243 2244 2240 2239
 2703. 2488 2245 2246 2242 2241; 2489 2247 2248 2244 2243; 2490 2249 2250 2246 2245
 2704. 2491 2251 2252 2248 2247; 2492 2253 2254 2250 2249; 2493 2255 2256 2252 2251
 2705. 2494 2257 2258 2254 2253; 2495 2259 2260 2256 2255; 2496 2261 2262 2258 2257
 2706. 2497 2263 2264 2260 2259; 2498 2108 2306 2305 2107; 2499 2109 2307 2306 2108
 2707. 2500 2110 2308 2307 2109; 2501 2111 2309 2308 2110; 2502 2112 2310 2309 2111
 2708. 2503 2113 2311 2310 2112; 2504 2114 2312 2311 2113; 2505 2115 2313 2312 2114
 2709. 2506 2116 2314 2313 2115; 2507 2117 2315 2314 2116; 2508 2118 2316 2315 2117
 2710. 2509 2119 2317 2316 2118; 2510 2120 2318 2317 2119; 2511 2121 2319 2318 2120
 2711. 2512 2122 2320 2319 2121; 2513 2123 2321 2320 2122; 2514 2124 2322 2321 2123
 2712. 2515 2125 2323 2322 2124; 2516 2126 2324 2323 2125; 2517 2127 2325 2324 2126
 2713. 2518 2128 2326 2325 2127; 2519 2129 2327 2326 2128; 2520 2130 2328 2327 2129
 2714. 2521 2131 2329 2328 2130; 2522 2132 2330 2329 2131; 2523 2133 2331 2330 2132
 2715. 2524 2134 2332 2331 2133; 2525 2135 2333 2332 2134; 2526 2137 2277 2276 2136
 2716. 2527 2138 2278 2277 2137; 2528 2139 2279 2278 2138; 2529 2140 2280 2279 2139
 2717. 2530 2141 2281 2280 2140; 2531 2142 2282 2281 2141; 2532 2143 2283 2282 2142
 2718. 2533 2144 2284 2283 2143; 2534 2145 2285 2284 2144; 2535 2146 2286 2285 2145
 2719. 2536 2147 2287 2286 2146; 2537 2148 2288 2287 2147; 2538 2149 2289 2288 2148
 2720. 2539 2150 2290 2289 2149; 2540 2151 2291 2290 2150; 2541 2152 2292 2291 2151
 2721. 2542 2153 2293 2292 2152; 2543 2154 2294 2293 2153; 2544 2155 2295 2294 2154
 2722. 2545 2156 2296 2295 2155; 2546 2157 2297 2296 2156; 2547 2158 2298 2297 2157
 2723. 2548 2159 2299 2298 2158; 2549 2160 2300 2299 2159; 2550 2161 2301 2300 2160
 2724. 2551 2162 2302 2301 2161; 2552 2163 2303 2302 2162; 2553 2164 2304 2303 2163
 2725. 2554 2166 2335 2334 2165; 2555 2167 2336 2335 2166; 2556 2168 2337 2336 2167
 2726. 2557 2169 2338 2337 2168; 2558 2170 2339 2338 2169; 2559 2171 2340 2339 2170
 2727. 2560 2172 2341 2340 2171; 2561 2174 2343 2342 2173; 2562 2175 2344 2343
 2728. 2563 2176 2345 2344 2175; 2564 2181 2348 2346 2177; 2565 2184 2349 2347 2180
 2729. 2566 2185 2350 2348 2181; 2567 2188 2351 2349 2184; 2568 2189 2352 2350 2185
 2730. 2569 2192 2353 2351 2188; 2570 2193 2354 2352 2189; 2571 2196 2355 2353 2192
 2731. 2572 2197 2356 2354 2193; 2573 2200 2357 2355 2196; 2574 2201 2358 2356 2197
 2732. 2575 2204 2359 2357 2200; 2576 2205 2360 2358 2201; 2577 2208 2361 2359 2204
 2733. 2578 2209 2362 2360 2205; 2579 2212 2363 2361 2208; 2580 2213 2364 2362 2209
 2734. 2581 2216 2365 2363 2212; 2582 2217 2366 2364 2213; 2583 2220 2367 2365 2216
 2735. 2584 2221 2368 2366 2217; 2585 2224 2369 2367 2220; 2586 2225 2370 2368 2221



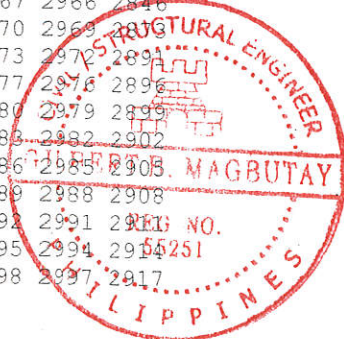
2736. 2587 2228 2371 2369 2224; 2588 2229 2372 2370 2225; 2589 2232 2373 2371 2228
 2737. 2590 2233 2374 2372 2229; 2591 2236 2375 2373 2232; 2592 2237 2376 2374 2233
 2738. 2593 2240 2377 2375 2236; 2594 2241 2378 2376 2237; 2595 2244 2379 2377 2240
 2739. 2596 2245 2380 2378 2241; 2597 2248 2381 2379 2244; 2598 2249 2382 2380 2245
 2740. 2599 2252 2381 2381 2248; 2600 2253 2384 2382 2249; 2601 2256 2385 2383 2252
 2741. 2602 2257 2386 2384 2253; 2603 2260 2387 2385 2256; 2604 2261 2388 2386 2257
 2742. 2605 2264 2389 2387 2260; 2606 2267 2268 2391 2390; 2607 2268 2269 2392 2391
 2743. 2608 2269 2270 2393 2392; 2609 2270 2271 2394 2393; 2610 2271 2272 2395 2394
 2744. 2611 2272 2273 2396 2395; 2612 2273 2274 2397 2396; 2613 2274 2275 2398 2397
 2745. 2614 2277 2400 2399 2276; 2615 2278 2401 2400 2277; 2616 2279 2402 2401 2278
 2746. 2617 2280 2403 2402 2279; 2618 2281 2404 2403 2280; 2619 2282 2405 2404 2281
 2747. 2620 2283 2406 2405 2282; 2621 2284 2407 2406 2283; 2622 2285 2408 2407 2284
 2748. 2623 2286 2409 2408 2285; 2624 2287 2410 2409 2286; 2625 2288 2411 2410 2287
 2749. 2626 2289 2412 2411 2288; 2627 2290 2413 2412 2289; 2628 2291 2414 2413 2290
 2750. 2629 2292 2415 2414 2291; 2630 2293 2416 2415 2292; 2631 2294 2417 2416 2293
 2751. 2632 2295 2418 2417 2294; 2633 2296 2419 2418 2295; 2634 2297 2420 2419 2296
 2752. 2635 2298 2421 2420 2297; 2636 2299 2422 2421 2298; 2637 2300 2423 2422 2299
 2753. 2638 2301 2424 2423 2300; 2639 2302 2425 2424 2301; 2640 2303 2426 2425 2302
 2754. 2641 2304 2427 2426 2303; 2642 2306 2429 2428 2305; 2643 2307 2430 2429 2306
 2755. 2644 2308 2431 2430 2307; 2645 2309 2432 2431 2308; 2646 2310 2433 2432 2309
 2756. 2647 2311 2434 2433 2310; 2648 2312 2435 2434 2311; 2649 2313 2436 2435 2312
 2757. 2650 2314 2437 2436 2313; 2651 2315 2438 2437 2314; 2652 2316 2439 2438 2315
 2758. 2653 2317 2440 2439 2316; 2654 2318 2441 2440 2317; 2655 2319 2442 2441 2318
 2759. 2656 2320 2443 2442 2319; 2657 2321 2444 2443 2320; 2658 2322 2445 2444 2321
 2760. 2659 2323 2446 2445 2322; 2660 2324 2447 2446 2323; 2661 2325 2448 2447 2324
 2761. 2662 2326 2449 2448 2325; 2663 2327 2450 2449 2326; 2664 2328 2451 2450 2327
 2762. 2665 2329 2452 2451 2328; 2666 2330 2453 2452 2329; 2667 2331 2454 2453 2330
 2763. 2668 2332 2455 2454 2331; 2669 2333 2456 2455 2332; 2670 2335 2458 2457 2334
 2764. 2671 2336 2459 2458 2335; 2672 2337 2460 2459 2336; 2673 2338 2461 2460 2337
 2765. 2674 2339 2462 2461 2338; 2675 2340 2463 2462 2339; 2676 2341 2464 2463 2340
 2766. 2677 2343 2466 2465 2342; 2678 2344 2467 2466 2343; 2679 2345 2468 2467 2344
 2767. 2680 2348 2471 2469 2346; 2681 2349 2472 2470 2347; 2682 2350 2473 2471 2348
 2768. 2683 2351 2474 2472 2349; 2684 2352 2475 2473 2350; 2685 2353 2476 2474 2351
 2769. 2686 2354 2477 2475 2352; 2687 2355 2478 2476 2353; 2688 2356 2479 2477 2354
 2770. 2689 2357 2480 2478 2355; 2690 2358 2481 2479 2356; 2691 2359 2482 2480 2357
 2771. 2692 2360 2483 2481 2358; 2693 2361 2484 2482 2359; 2694 2362 2485 2483 2360
 2772. 2695 2363 2486 2484 2361; 2696 2364 2487 2485 2362; 2697 2365 2488 2486 2363
 2773. 2698 2366 2489 2487 2364; 2699 2367 2490 2488 2365; 2700 2368 2491 2489 2366
 2774. 2701 2369 2492 2490 2367; 2702 2370 2493 2491 2368; 2703 2371 2494 2492 2369
 2775. 2704 2372 2495 2493 2370; 2705 2373 2496 2494 2371; 2706 2374 2497 2495 2372
 2776. 2707 2375 2498 2496 2373; 2708 2376 2499 2497 2374; 2709 2377 2500 2498 2375
 2777. 2710 2378 2501 2499 2376; 2711 2379 2502 2500 2377; 2712 2380 2503 2501 2378
 2778. 2713 2381 2504 2502 2379; 2714 2382 2505 2503 2380; 2715 2383 2506 2504 2381
 2779. 2716 2384 2507 2505 2382; 2717 2385 2508 2506 2383; 2718 2386 2509 2507 2384
 2780. 2719 2387 2510 2508 2385; 2720 2388 2511 2509 2386; 2721 2389 2512 2510 2387
 2781. 2722 2046 2926 2927 2047; 2723 2048 2925 2926 2049; 2724 2049 2929 2930 2050
 2782. 2725 2051 2928 2929 2052; 2726 2052 2932 2933 2053; 2727 2054 2931 2932 2055
 2783. 2728 2390 2391 2543 2542; 2729 2391 2392 2544 2543; 2730 2392 2393 2545 2544
 2784. 2731 2393 2394 2546 2545; 2732 2394 2395 2547 2546; 2733 2395 2396 2548 2547
 2785. 2734 2396 2397 2549 2548; 2735 2397 2398 2550 2549; 2736 2400 2514 2513 2399
 2786. 2737 2401 2515 2514 2400; 2738 2402 2516 2515 2401; 2739 2403 2517 2516 2402
 2787. 2740 2404 2518 2517 2403; 2741 2405 2519 2518 2404; 2742 2406 2520 2519 2405
 2788. 2743 2407 2521 2520 2406; 2744 2408 2522 2521 2407; 2745 2409 2523 2522 2408
 2789. 2746 2410 2524 2523 2409; 2747 2411 2525 2524 2410; 2748 2412 2526 2525 2411
 2790. 2749 2413 2527 2526 2412; 2750 2414 2528 2527 2413; 2751 2415 2529 2528 2414
 2791. 2752 2416 2530 2529 2415; 2753 2417 2531 2530 2416; 2754 2418 2532 2531 2417
 2792. 2755 2419 2533 2532 2418; 2756 2420 2534 2533 2419; 2757 2421 2535 2534 2420
 2793. 2758 2422 2536 2535 2421; 2759 2423 2537 2536 2422; 2760 2424 2538 2537 2423
 2794. 2761 2425 2539 2538 2424; 2762 2426 2540 2539 2425; 2763 2427 2541 2540 2426
 2795. 2764 2429 2552 2551 2428; 2765 2430 2553 2552 2429; 2766 2431 2554 2553 2430
 2796. 2767 2432 2555 2554 2431; 2768 2433 2556 2555 2432; 2769 2434 2557 2556 2433
 2797. 2770 2435 2558 2557 2434; 2771 2436 2559 2558 2435; 2772 2437 2560 2559 2436
 2798. 2773 2438 2561 2560 2437; 2774 2439 2562 2561 2438; 2775 2440 2563 2562 2439
 2799. 2776 2441 2564 2563 2440; 2777 2442 2565 2564 2441; 2778 2443 2566 2565 2442
 2800. 2779 2444 2567 2566 2443; 2780 2445 2568 2567 2444; 2781 2446 2569 2568 2445
 2801. 2782 2447 2570 2569 2446; 2783 2448 2571 2570 2447; 2784 2449 2572 2571 2448
 2802. 2785 2450 2573 2572 2449; 2786 2451 2574 2573 2450; 2787 2452 2575 2574 2451



2803. 2788 2453 2576 2575 2452; 2789 2454 2577 2576 2453; 2790 2455 2578 2577 2454
 2804. 2791 2456 2579 2578 2455; 2792 2458 2581 2580 2457; 2793 2459 2582 2581 2458
 2805. 2794 2460 2583 2582 2459; 2795 2461 2584 2583 2460; 2796 2462 2585 2584 2461
 2806. 2797 2463 2586 2585 2462; 2798 2464 2587 2586 2463; 2799 2466 2589 2588 2465
 2807. 2800 2467 2590 2589 2466; 2801 2468 2591 2590 2467; 2802 2471 2594 2592 2469
 2808. 2803 2472 2592 2593 2470; 2804 2473 2596 2594 2471; 2805 2474 2597 2595 2472
 2809. 2806 2475 2598 2596 2473; 2807. 2476 2599 2597 2474; 2808 2477 2600 2598 2475
 2810. 2809 2478 2601 2599 2476; 2810 2479 2602 2600 2477; 2811 2480 2603 2601 2478
 2811. 2812 2481 2604 2602 2479; 2813 2482 2605 2603 2480; 2814 2483 2606 2604 2481
 2812. 2815 2484 2607 2605 2482; 2816 2485 2608 2606 2483; 2817 2486 2609 2607 2484
 2813. 2818 2487 2610 2608 2485; 2819 2488 2611 2609 2486; 2820 2489 2612 2610 2487
 2814. 2821 2490 2613 2611 2488; 2822 2491 2614 2612 2489; 2823 2492 2615 2613 2490
 2815. 2824 2493 2616 2614 2491; 2825 2494 2617 2615 2492; 2826 2495 2618 2616 2493
 2816. 2827 2496 2619 2617 2494; 2828 2497 2620 2618 2495; 2829 2498 2621 2619 2496
 2817. 2830 2499 2622 2620 2497; 2831 2500 2623 2621 2498; 2832 2501 2624 2622 2499
 2818. 2833 2502 2625 2623 2500; 2834 2503 2626 2624 2501; 2835 2504 2627 2625 2502
 2819. 2836 2505 2628 2626 2503; 2837 2506 2629 2627 2504; 2838 2507 2630 2628 2505
 2820. 2839 2508 2631 2629 2506; 2840 2509 2632 2630 2507; 2841 2510 2633 2631 2508
 2821. 2842 2511 2634 2632 2509; 2843 2512 2635 2633 2510; 2844 2514 2637 2636 2513
 2822. 2845 2515 2638 2637 2514; 2846 2516 2639 2638 2515; 2847 2517 2640 2639 2516
 2823. 2848 2518 2641 2640 2517; 2849 2519 2642 2641 2518; 2850 2520 2643 2642 2519
 2824. 2851 2521 2644 2643 2520; 2852 2522 2645 2644 2521; 2853 2523 2646 2645 2522
 2825. 2854 2524 2647 2646 2523; 2855 2525 2648 2647 2524; 2856 2526 2649 2648 2525
 2826. 2857 2527 2650 2649 2526; 2858 2528 2651 2650 2527; 2859 2529 2652 2651 2528
 2827. 2860 2530 2653 2652 2529; 2861 2531 2654 2653 2530; 2862 2532 2655 2654 2531
 2828. 2863 2533 2656 2655 2532; 2864 2534 2657 2656 2533; 2865 2535 2658 2657 2534
 2829. 2866 2536 2659 2658 2535; 2867 2537 2660 2659 2536; 2868 2538 2661 2660 2537
 2830. 2869 2539 2662 2661 2538; 2870 2540 2663 2662 2539; 2871 2541 2664 2663 2540
 2831. 2872 2542 2543 2826 2819; 2873 2543 2544 2835 2826; 2874 2544 2545 2844 2835
 2832. 2875 2545 2546 2854 2844; 2876 2546 2547 2863 2854; 2877 2547 2548 2872 2863
 2833. 2878 2548 2549 2881 2872; 2879 2549 2550 2883 2881; 2880 2552 2680 2673 2551
 2834. 2881 2553 2687 2680 2552; 2882 2554 2694 2687 2553; 2883 2555 2701 2694 2554
 2835. 2884 2556 2708 2701 2555; 2885 2557 2715 2708 2556; 2886 2558 2724 2715 2557
 2836. 2887 2559 2731 2724 2558; 2888 2560 2738 2731 2559; 2889 2561 2745 2738 2560
 2837. 2890 2562 2752 2745 2561; 2891 2563 2759 2752 2562; 2892 2564 2766 2759 2563
 2838. 2893 2565 2775 2766 2564; 2894 2566 2782 2775 2565; 2895 2567 2789 2782 2566
 2839. 2896 2568 2796 2789 2567; 2897 2569 2803 2796 2568; 2898 2570 2810 2803 2569
 2840. 2899 2571 2817 2810 2570; 2900 2572 2825 2817 2571; 2901 2573 2834 2825 2572
 2841. 2902 2574 2843 2834 2573; 2903 2575 2853 2843 2574; 2904 2576 2862 2853 2575
 2842. 2905 2577 2871 2862 2576; 2906 2578 2880 2871 2577; 2907 2579 2889 2880 2578
 2843. 2908 2581 2833 2824 2580; 2909 2582 2842 2833 2581; 2910 2583 2852 2842 2582
 2844. 2911 2584 2861 2852 2583; 2912 2585 2870 2861 2584; 2913 2586 2879 2870 2585
 2845. 2914 2587 2888 2879 2586; 2915 2589 2892 2891 2588; 2916 2590 2894 2892 2589
 2846. 2917 2591 2895 2894 2590; 2918 2594 2674 2667 2592; 2919 2595 2679 2672 2593
 2847. 2920 2596 2681 2674 2594; 2921 2597 2686 2679 2595; 2922 2598 2688 2681 2596
 2848. 2923 2599 2693 2686 2597; 2924 2600 2695 2688 2598; 2925 2601 2700 2693 2599
 2849. 2926 2602 2702 2695 2600; 2927 2603 2707 2700 2601; 2928 2604 2709 2702 2602
 2850. 2929 2605 2714 2707 2603; 2930 2606 2718 2709 2604; 2931 2607 2723 2714 2605
 2851. 2932 2608 2725 2719 2606; 2933 2609 2730 2723 2607; 2934 2610 2732 2725 2608
 2852. 2935 2611 2737 2730 2609; 2936 2612 2739 2732 2610; 2937 2613 2744 2737 2611
 2853. 2938 2614 2746 2739 2612; 2939 2615 2751 2744 2613; 2940 2616 2753 2746 2614
 2854. 2941 2617 2758 2751 2615; 2942 2618 2760 2753 2616; 2943 2619 2765 2758 2617
 2855. 2944 2620 2769 2760 2618; 2945 2621 2774 2765 2619; 2946 2622 2776 2769 2620
 2856. 2947 2623 2781 2774 2621; 2948 2624 2783 2776 2622; 2949 2625 2788 2781 2623
 2857. 2950 2626 2790 2783 2624; 2951 2627 2795 2788 2625; 2952 2628 2797 2790 2626
 2858. 2953 2629 2802 2795 2627; 2954 2630 2804 2797 2628; 2955 2631 2809 2802 2629
 2859. 2956 2632 2811 2804 2630; 2957 2633 2816 2809 2631; 2958 2634 2819 2811 2632
 2860. 2959 2635 2824 2816 2633; 2960 2674 2675 2668 2667; 2961 2675 2676 2669 2668
 2861. 2962 2676 2677 2670 2669; 2963 2677 2678 2671 2670; 2964 2678 2679 2672 2671
 2862. 2965 2681 2682 2675 2674; 2966 2682 2683 2676 2675; 2967 2683 2684 2677 2678
 2863. 2968 2684 2685 2679 2677; 2969 2685 2686 2679 2678; 2970 2688 2689 2682 2681
 2864. 2971 2689 2690 2683 2682; 2972 2690 2691 2684 2683; 2973 2691 2692 2685 2684
 2865. 2974 2692 2693 2686 2685; 2975 2695 2696 2689 2688; 2976 2696 2697 2690 2689
 2866. 2977 2697 2698 2691 2690; 2978 2699 2699 2692 2691; 2979 2699 2700 2693 2692
 2867. 2980 2702 2703 2696 2695; 2981 2703 2704 2697 2696; 2982 2704 2705 2698 2697
 2868. 2983 2705 2706 2699 2698; 2984 2706 2707 2700 2699; 2985 2709 2710 2703 2702
 2869. 2986 2710 2711 2704 2703; 2987 2711 2712 2705 2704; 2988 2712 2713 2706 2705



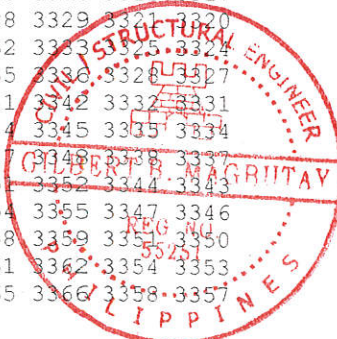
2870. 2989 2713 2714 2707 2706; 2990 2718 2719 2710 2709; 2991 2719 2720 2711 2710
 2871. 2992 2720 2721 2712 2711; 2993 2721 2722 2713 2712; 2994 2722 2723 2714 2713
 2872. 2995 2725 2726 2719 2718; 2996 2726 2727 2720 2719; 2997 2727 2728 2721 2720
 2873. 2998 2728 2729 2722 2721; 2999 2729 2730 2723 2722; 3000 2732 2733 2726 2725
 2874. 3001 2733 2734 2727 2726; 3002 2734 2735 2728 2727; 3003 2735 2736 2729 2728
 2875. 3004 2736 2737 2730 2729; 3005 2739 2740 2733 2732; 3006 2740 2741 2734 2733
 2876. 3007 2741 2742 2735 2734; 3008 2742 2743 2736 2735; 3009 2743 2744 2737 2736
 2877. 3010 2746 2747 2740 2739; 3011 2747 2748 2741 2740; 3012 2748 2749 2742 2741
 2878. 3013 2749 2750 2743 2742; 3014 2750 2751 2744 2743; 3015 2753 2754 2747 2746
 2879. 3016 2754 2755 2748 2747; 3017 2755 2756 2749 2748; 3018 2756 2757 2750 2749
 2880. 3019 2757 2758 2751 2750; 3020 2760 2761 2754 2753; 3021 2761 2762 2755 2754
 2881. 3022 2762 2763 2756 2755; 3023 2763 2764 2757 2756; 3024 2764 2765 2758 2757
 2882. 3025 2769 2770 2761 2760; 3026 2770 2771 2762 2761; 3027 2771 2772 2763 2762
 2883. 3028 2772 2773 2764 2763; 3029 2773 2774 2765 2764; 3030 2776 2777 2770 2769
 2884. 3031 2777 2778 2771 2770; 3032 2778 2779 2772 2771; 3033 2779 2780 2773 2772
 2885. 3034 2780 2781 2774 2773; 3035 2783 2784 2777 2776; 3036 2784 2785 2778 2777
 2886. 3037 2785 2786 2779 2778; 3038 2786 2787 2780 2779; 3039 2787 2788 2781 2780
 2887. 3040 2790 2791 2784 2783; 3041 2791 2792 2785 2784; 3042 2792 2793 2786 2785
 2888. 3043 2793 2794 2787 2786; 3044 2794 2795 2788 2787; 3045 2797 2798 2791 2790
 2889. 3046 2798 2799 2792 2791; 3047 2799 2800 2793 2792; 3048 2800 2801 2794 2793
 2890. 3049 2801 2802 2795 2794; 3050 2804 2805 2798 2797; 3051 2805 2806 2799 2798
 2891. 3052 2806 2807 2800 2799; 3053 2807 2808 2801 2800; 3054 2808 2809 2802 2801
 2892. 3055 2811 2812 2805 2804; 3056 2812 2813 2806 2805; 3057 2813 2814 2807 2806
 2893. 3058 2814 2815 2808 2807; 3059 2815 2816 2809 2808; 3060 2819 2820 2812 2811
 2894. 3061 2820 2821 2813 2812; 3062 2821 2822 2814 2813; 3063 2822 2823 2815 2814
 2895. 3064 2823 2824 2816 2815; 3065 2828 2829 2820 2819; 3066 2829 2830 2821 2820
 2896. 3067 2830 2831 2822 2821; 3068 2831 2832 2823 2822; 3069 2832 2833 2824 2823
 2897. 3070 2837 2838 2829 2828; 3071 2838 2839 2830 2829; 3072 2839 2840 2831 2830
 2898. 3073 2840 2841 2832 2831; 3074 2841 2842 2833 2832; 3075 2847 2848 2838 2837
 2899. 3076 2848 2849 2839 2838; 3077 2849 2850 2840 2839; 3078 2850 2851 2841 2840
 2900. 3079 2851 2852 2842 2841; 3080 2856 2857 2848 2847; 3081 2857 2858 2849 2848
 2901. 3082 2858 2859 2850 2849; 3083 2859 2860 2851 2850; 3084 2860 2861 2852 2851
 2902. 3085 2865 2866 2857 2856; 3086 2866 2867 2858 2857; 3087 2867 2868 2859 2858
 2903. 3088 2868 2869 2860 2859; 3089 2869 2870 2861 2860; 3090 2874 2875 2866 2865
 2904. 3091 2875 2876 2867 2866; 3092 2876 2877 2868 2867; 3093 2877 2878 2869 2868
 2905. 3094 2878 2879 2870 2869; 3095 2883 2884 2875 2874; 3096 2884 2885 2876 2875
 2906. 3097 2885 2886 2877 2876; 3098 2886 2887 2878 2877; 3099 2887 2888 2879 2878
 2907. 3100 2637 2897 2896 2636; 3101 2638 2898 2897 2637; 3102 2639 2899 2898 2638
 2908. 3103 2640 2900 2899 2639; 3104 2641 2901 2900 2640; 3105 2642 2902 2901 2641
 2909. 3106 2643 2903 2902 2642; 3107 2644 2904 2903 2643; 3108 2645 2905 2904 2644
 2910. 3109 2646 2906 2905 2645; 3110 2647 2907 2906 2646; 3111 2648 2908 2907 2647
 2911. 3112 2649 2909 2908 2648; 3113 2650 2910 2909 2649; 3114 2651 2911 2910 2650
 2912. 3115 2652 2912 2911 2651; 3116 2653 2913 2912 2652; 3117 2654 2914 2913 2653
 2913. 3118 2655 2915 2914 2654; 3119 2656 2916 2915 2655; 3120 2657 2917 2916 2656
 2914. 3121 2658 2918 2917 2657; 3122 2659 2919 2918 2658; 3123 2660 2920 2919 2659
 2915. 3124 2661 2921 2920 2660; 3125 2662 2922 2921 2661; 3126 2663 2923 2922 2662
 2916. 3127 2664 2924 2923 2663; 3128 2680 2935 2934 2673; 3129 2687 2936 2935 2680
 2917. 3130 2694 2937 2936 2687; 3131 2701 2938 2937 2694; 3132 2708 2939 2938 2701
 2918. 3133 2715 2940 2939 2708; 3134 2724 2941 2940 2715; 3135 2731 2942 2941 2724
 2919. 3136 2738 2943 2942 2731; 3137 2745 2944 2943 2738; 3138 2752 2945 2944 2745
 2920. 3139 2759 2946 2945 2752; 3140 2766 2947 2946 2759; 3141 2775 2948 2947 2766
 2921. 3142 2782 2949 2948 2775; 3143 2789 2950 2949 2782; 3144 2796 2951 2950 2789
 2922. 3145 2803 2952 2951 2796; 3146 2810 2953 2952 2803; 3147 2817 2954 2953 2810
 2923. 3148 2825 2955 2954 2817; 3149 2834 2956 2955 2825; 3150 2843 2957 2956 2834
 2924. 3151 2853 2958 2957 2843; 3152 2862 2959 2958 2853; 3153 2871 2960 2959 2862
 2925. 3154 2880 2961 2960 2871; 3155 2889 2962 2961 2880; 3156 2827 2964 2963 2819
 2926. 3157 2836 2965 2964 2827; 3158 2846 2966 2965 2836; 3159 2855 2967 2966 2846
 2927. 3160 2864 2968 2967 2855; 3161 2873 2969 2968 2864; 3162 2882 2970 2969 2873
 2928. 3163 2890 2971 2970 2882; 3164 2891 2972 2971 2890; 3165 2892 2973 2972 2891
 2929. 3166 2894 2974 2973 2892; 3167 2895 2975 2974 2894; 3168 2897 2977 2976 2896
 2930. 3169 2898 2978 2977 2897; 3170 2899 2979 2978 2898; 3171 2900 2980 2979 2899
 2931. 3172 2901 2981 2980 2900; 3173 2902 2982 2981 2901; 3174 2903 2983 2982 2902
 2932. 3175 2904 2984 2983 2903; 3176 2905 2985 2984 2904; 3177 2906 2986 2985 2905
 2933. 3178 2907 2987 2986 2906; 3179 2908 2988 2987 2907; 3180 2909 2989 2988 2908
 2934. 3181 2910 2990 2989 2909; 3182 2911 2991 2990 2910; 3183 2912 2992 2991 2911
 2935. 3184 2913 2993 2992 2912; 3185 2914 2994 2993 2913; 3186 2915 2995 2994 2914
 2936. 3187 2916 2996 2995 2915; 3188 2917 2997 2996 2916; 3189 2918 2998 2997 2917



2937. 3190 2919 2999 2993 2918; 3191 2920 3000 2999 2919; 3192 2921 3001 3000 2920
 2938. 3193 2922 3002 3001 2921; 3194 2923 3003 3002 2922; 3195 2924 3004 3003 2923
 2939. 3196 2935 3006 3005 2934; 3197 2936 3007 3006 2935; 3198 2937 3008 3007 2936
 2940. 3199 2938 3009 3008 2937; 3200 2939 3010 3009 2938; 3201 2940 3011 3010 2939
 2941. 3202 2941 3012 3011 2940; 3203 2942 3013 3012 2941; 3204 2943 3014 3013 2942
 2942. 3205 2944 3015 3014 2943; 3206 2945 3016 3015 2944; 3207 2946 3017 3016 2945
 2943. 3208 2947 3018 3017 2946; 3209 2948 3019 3018 2947; 3210 2949 3020 3019 2948
 2944. 3211 2950 3021 3020 2949; 3212 2951 3022 3021 2950; 3213 2952 3023 3022 2951
 2945. 3214 2953 3024 3023 2952; 3215 2954 3025 3024 2953; 3216 2955 3026 3025 2954
 2946. 3217 2956 3027 3026 2955; 3218 2957 3028 3027 2956; 3219 2958 3029 3028 2957
 2947. 3220 2959 3030 3029 2958; 3221 2960 3031 3030 2959; 3222 2961 3032 3031 2960
 2948. 3223 2962 3033 3032 2961; 3224 2964 3035 3034 2963; 3225 2965 3036 3035 2964
 2949. 3226 2966 3037 3036 2965; 3227 2967 3038 3037 2966; 3228 2968 3039 3038 2967
 2950. 3229 2969 3040 3039 2968; 3230 2970 3041 3040 2969; 3231 2971 3042 3041 2970
 2951. 3232 2972 3043 3042 2971; 3233 2973 3044 3043 2972; 3234 2974 3045 3044 2973
 2952. 3235 2975 3046 3045 2974; 3236 2977 3048 3047 2976; 3237 2978 3049 3048 2977
 2953. 3238 2979 3050 3049 2978; 3239 2980 3051 3050 2979; 3240 2981 3052 3051 2980
 2954. 3241 2982 3053 3052 2981; 3242 2983 3054 3053 2982; 3243 2984 3055 3054 2983
 2955. 3244 2985 3056 3055 2984; 3245 2986 3057 3056 2985; 3246 2987 3058 3057 2986
 2956. 3247 2988 3059 3058 2987; 3248 2989 3060 3059 2988; 3249 2990 3061 3060 2989
 2957. 3250 2991 3062 3061 2990; 3251 2992 3063 3062 2991; 3252 2993 3064 3063 2992
 2958. 3253 2994 3065 3064 2993; 3254 2995 3066 3065 2994; 3255 2996 3067 3066 2995
 2959. 3256 2997 3068 3067 2996; 3257 2998 3069 3068 2997; 3258 2999 3070 3069 2998
 2960. 3259 3000 3071 3070 2999; 3260 3001 3072 3071 3000; 3261 3002 3073 3072 3001
 2961. 3262 3003 3074 3073 3002; 3263 3004 3075 3074 3003; 3264 3006 3077 3076 3005
 2962. 3265 3007 3078 3077 3006; 3266 3008 3079 3078 3007; 3267 3009 3080 3079 3008
 2963. 3268 3010 3081 3080 3009; 3269 3011 3082 3081 3010; 3270 3012 3083 3082 3011
 2964. 3271 3013 3084 3083 3012; 3272 3014 3085 3084 3013; 3273 3015 3086 3085 3014
 2965. 3274 3016 3087 3086 3015; 3275 3017 3088 3087 3016; 3276 3018 3089 3088 3017
 2966. 3277 3019 3090 3089 3018; 3278 3020 3091 3090 3019; 3279 3021 3092 3091 3020
 2967. 3280 3022 3093 3092 3021; 3281 3023 3094 3093 3022; 3282 3024 3095 3094 3023
 2968. 3283 3025 3096 3095 3024; 3284 3026 3097 3096 3025; 3285 3027 3098 3097 3026
 2969. 3286 3028 3099 3098 3027; 3287 3029 3100 3099 3028; 3288 3030 3101 3100 3029
 2970. 3289 3031 3102 3101 3030; 3290 3032 3103 3102 3031; 3291 3033 3104 3103 3032
 2971. 3292 3035 3106 3105 3034; 3293 3036 3107 3106 3035; 3294 3037 3108 3107 3036
 2972. 3295 3038 3109 3108 3037; 3296 3039 3110 3109 3038; 3297 3040 3111 3110 3039
 2973. 3298 3041 3112 3111 3040; 3299 3042 3113 3112 3041; 3300 3043 3114 3113 3042
 2974. 3301 3044 3115 3114 3043; 3302 3045 3116 3115 3044; 3303 3046 3117 3116 3045
 2975. 3304 2925 3221 3222 2927; 3305 2928 3280 3281 2930; 3306 2931 3339 3340 2933
 2976. 3307 3048 3119 3118 3047; 3308 3049 3120 3119 3048; 3309 3050 3121 3120 3049
 2977. 3310 3051 3122 3121 3050; 3311 3052 3123 3122 3051; 3312 3053 3124 3123 3052
 2978. 3313 3054 3125 3124 3053; 3314 3055 3126 3125 3054; 3315 3056 3127 3126 3055
 2979. 3316 3057 3128 3127 3056; 3317 3058 3129 3128 3057; 3318 3059 3130 3129 3058
 2980. 3319 3060 3131 3130 3059; 3320 3061 3132 3131 3060; 3321 3062 3133 3132 3061
 2981. 3322 3063 3134 3133 3062; 3323 3064 3135 3134 3063; 3324 3065 3136 3135 3064
 2982. 3325 3066 3137 3136 3065; 3326 3067 3138 3137 3066; 3327 3068 3139 3138 3067
 2983. 3328 3069 3140 3139 3068; 3329 3070 3141 3140 3069; 3330 3071 3142 3141 3070
 2984. 3331 3072 3143 3142 3071; 3332 3073 3144 3143 3072; 3333 3074 3145 3144 3073
 2985. 3334 3075 3146 3145 3074; 3335 3077 3148 3147 3076; 3336 3078 3149 3148 3077
 2986. 3337 3079 3150 3149 3078; 3338 3080 3151 3150 3079; 3339 3081 3152 3151 3080
 2987. 3340 3082 3153 3152 3081; 3341 3083 3154 3153 3082; 3342 3084 3155 3154 3083
 2988. 3343 3085 3156 3155 3084; 3344 3086 3157 3156 3085; 3345 3087 3158 3157 3086
 2989. 3346 3088 3159 3158 3087; 3347 3089 3160 3159 3088; 3348 3090 3161 3160 3089
 2990. 3349 3091 3162 3161 3090; 3350 3092 3163 3162 3091; 3351 3093 3164 3163 3092
 2991. 3352 3094 3165 3164 3093; 3353 3095 3166 3165 3094; 3354 3096 3167 3166 3095
 2992. 3355 3097 3168 3167 3096; 3356 3098 3169 3168 3097; 3357 3099 3170 3169 3098
 2993. 3358 3100 3171 3170 3099; 3359 3101 3172 3171 3100; 3360 3102 3173 3172 3101
 2994. 3361 3103 3174 3173 3102; 3362 3104 3175 3174 3103; 3363 3106 3177 3176 3105
 2995. 3364 3107 3178 3177 3106; 3365 3108 3179 3178 3107; 3366 3109 3180 3179 3108
 2996. 3367 3110 3181 3180 3109; 3368 3111 3182 3181 3110; 3369 3112 3183 3182 3111
 2997. 3370 3113 3184 3183 3112; 3371 3114 3185 3184 3113; 3372 3115 3186 3185 3114
 2998. 3373 3116 3187 3186 3115; 3374 3117 3188 3187 3116; 3375 2716 3488 3489 2717
 2999. 3376 2717 3489 3490 2718; 3377 2718 3490 3491 2724; 3378 2767 3492 3493 2768
 3000. 3379 2768 3493 3494 2769; 3380 2769 3494 3495 2775; 3381 2819 3497 3498 2825
 3001. 3382 2845 3503 3504 2846; 3383 3119 3204 3196 3118; 3384 3120 3212 3123 3238 3230 3122
 3002. 3385 3121 3220 3212 3120; 3386 3122 3230 3220 3121; 3387 3123 3238 3230 3122
 3003. 3388 3124 3246 3238 3123; 3389 3125 3255 3246 3124; 3390 3126 3263 3255 3125



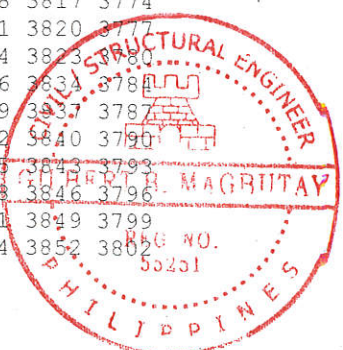
3004. 3391 3127 3271 3263 3126; 3392 3128 3279 3271 3127; 3393 3129 3289 3279 3128
 3005. 3394 3130 3297 3289 3129; 3395 3131 3305 3297 3130; 3396 3132 3314 3305 3131
 3006. 3397 3133 3322 3314 3132; 3398 3134 3330 3322 3133; 3399 3135 3338 3330 3134
 3007. 3400 3136 3348 3338 3135; 3401 3137 3356 3348 3136; 3402 3138 3364 3356 3137
 3008. 3403 3139 3372 3364 3138; 3404 3140 3380 3372 3139; 3405 3141 3388 3380 3140
 3009. 3406 3142 3396 3388 3141; 3407 3143 3404 3396 3142; 3408 3144 3412 3404 3143
 3010. 3409 3145 3420 3412 3144; 3410 3146 3428 3420 3145; 3411 3148 3197 3189 3147
 3011. 3412 3149 3205 3197 3148; 3413 3150 3213 3205 3149; 3414 3151 3223 3213 3150
 3012. 3415 3152 3231 3223 3151; 3416 3153 3239 3231 3152; 3417 3154 3247 3239 3153
 3013. 3418 3155 3256 3247 3154; 3419 3156 3264 3256 3155; 3420 3157 3272 3264 3156
 3014. 3421 3158 3282 3272 3157; 3422 3159 3290 3282 3158; 3423 3160 3298 3290 3159
 3015. 3424 3161 3306 3299 3160; 3425 3162 3315 3306 3161; 3426 3163 3323 3315 3162
 3016. 3427 3164 3331 3323 3163; 3428 3165 3341 3331 3164; 3429 3166 3349 3341 3165
 3017. 3430 3167 3357 3349 3166; 3431 3168 3365 3357 3167; 3432 3169 3373 3365 3168
 3018. 3433 3170 3381 3373 3169; 3434 3171 3389 3381 3170; 3435 3172 3397 3389 3171
 3019. 3436 3173 3405 3397 3172; 3437 3174 3413 3405 3173; 3438 3175 3421 3413 3174
 3020. 3439 3177 3430 3429 3176; 3440 3178 3431 3430 3177; 3441 3179 3432 3431 3178
 3021. 3442 3180 3433 3432 3179; 3443 3181 3434 3433 3180; 3444 3182 3435 3434 3181
 3022. 3445 3183 3436 3435 3182; 3446 3184 3437 3436 3183; 3447 3185 3438 3437 3184
 3023. 3448 3186 3439 3438 3185; 3449 3187 3440 3439 3186; 3450 3188 3441 3440 3187
 3024. 3451 3197 3198 3190 3189; 3452 3198 3199 3191 3190; 3453 3199 3200 3192 3191
 3025. 3454 3200 3201 3193 3192; 3455 3201 3202 3194 3193; 3456 3202 3203 3195 3194
 3026. 3457 3203 3204 3196 3195; 3458 3205 3206 3198 3197; 3459 3206 3207 3199 3198
 3027. 3460 3207 3208 3200 3199; 3461 3208 3209 3201 3200; 3462 3209 3210 3202 3201
 3028. 3463 3210 3211 3203 3202; 3464 3211 3212 3204 3203; 3465 3213 3214 3206 3205
 3029. 3466 3214 3215 3207 3206; 3467 3215 3216 3208 3207; 3468 3216 3217 3209 3208
 3030. 3469 3217 3218 3210 3209; 3470 3218 3219 3211 3210; 3471 3219 3220 3212 3211
 3031. 3472 3223 3224 3214 3213; 3473 3224 3225 3215 3214; 3474 3225 3226 3216 3215
 3032. 3475 3226 3227 3217 3216; 3476 3227 3228 3218 3217; 3477 3228 3229 3219 3218
 3033. 3478 3229 3230 3220 3219; 3479 3231 3232 3224 3223; 3480 3232 3233 3225 3224
 3034. 3481 3233 3234 3226 3225; 3482 3234 3235 3227 3226; 3483 3235 3236 3228 3227
 3035. 3484 3236 3237 3229 3228; 3485 3237 3238 3230 3229; 3486 3239 3240 3232 3231
 3036. 3487 3240 3241 3233 3232; 3488 3241 3242 3234 3233; 3489 3242 3243 3235 3234
 3037. 3490 3243 3244 3236 3235; 3491 3244 3245 3237 3236; 3492 3245 3246 3238 3237
 3038. 3493 3247 3248 3240 3239; 3494 3248 3249 3241 3240; 3495 3249 3251 3242 3241
 3039. 3496 3251 3252 3243 3242; 3497 3252 3253 3244 3243; 3498 3253 3254 3245 3244
 3040. 3499 3254 3255 3246 3245; 3500 3256 3257 3248 3247; 3501 3257 3258 3249 3248
 3041. 3502 3258 3259 3251 3249; 3503 3259 3260 3252 3251; 3504 3260 3261 3253 3252
 3042. 3505 3261 3262 3254 3253; 3506 3262 3263 3255 3254; 3507 3264 3265 3257 3256
 3043. 3508 3265 3266 3258 3257; 3509 3266 3267 3259 3258; 3510 3267 3268 3260 3259
 3044. 3511 3268 3269 3261 3260; 3512 3269 3270 3262 3261; 3513 3270 3271 3263 3262
 3045. 3514 3272 3273 3265 3264; 3515 3273 3274 3266 3265; 3516 3274 3275 3267 3266
 3046. 3517 3275 3276 3268 3267; 3518 3276 3277 3269 3268; 3519 3277 3278 3270 3269
 3047. 3520 3278 3279 3271 3270; 3521 3282 3283 3273 3272; 3522 3283 3284 3274 3273
 3048. 3523 3284 3285 3275 3274; 3524 3285 3286 3276 3275; 3525 3286 3287 3277 3276
 3049. 3526 3287 3288 3278 3277; 3527 3288 3289 3279 3278; 3528 3290 3291 3283 3282
 3050. 3529 3291 3292 3284 3283; 3530 3292 3293 3285 3284; 3531 3293 3294 3286 3285
 3051. 3532 3294 3295 3287 3286; 3533 3295 3296 3288 3287; 3534 3296 3297 3289 3288
 3052. 3535 3298 3299 3291 3290; 3536 3299 3300 3292 3291; 3537 3300 3301 3293 3292
 3053. 3538 3301 3302 3294 3293; 3539 3302 3303 3295 3294; 3540 3303 3304 3296 3295
 3054. 3541 3304 3305 3297 3296; 3542 3306 3307 3299 3298; 3543 3307 3308 3300 3299
 3055. 3544 3308 3310 3301 3300; 3545 3310 3311 3302 3301; 3546 3311 3312 3303 3302
 3056. 3547 3312 3313 3304 3303; 3548 3313 3314 3305 3304; 3549 3315 3316 3307 3306
 3057. 3550 3316 3317 3308 3307; 3551 3317 3318 3310 3308; 3552 3318 3319 3311 3310
 3058. 3553 3319 3320 3312 3311; 3554 3320 3321 3313 3312; 3555 3321 3322 3314 3313
 3059. 3556 3323 3324 3316 3315; 3557 3324 3325 3317 3316; 3558 3325 3326 3318 3317
 3060. 3559 3326 3327 3319 3318; 3560 3327 3328 3320 3319; 3561 3328 3329 3321 3320
 3061. 3562 3329 3330 3322 3321; 3563 3331 3332 3324 3323; 3564 3332 3333 3325 3324
 3062. 3565 3333 3334 3326 3325; 3566 3334 3335 3327 3326; 3567 3335 3336 3328 3327
 3063. 3568 3336 3337 3329 3328; 3569 3337 3338 3330 3329; 3570 3341 3342 3332 3331
 3064. 3571 3342 3343 3333 3332; 3572 3343 3344 3334 3333; 3573 3344 3345 3335 3334
 3065. 3574 3345 3346 3336 3335; 3575 3346 3347 3337 3336; 3576 3347 3348 3338 3337
 3066. 3577 3349 3350 3342 3341; 3578 3350 3351 3343 3342; 3579 3351 3352 3344 3343
 3067. 3580 3352 3353 3345 3344; 3581 3353 3354 3346 3345; 3582 3354 3355 3347 3346
 3068. 3583 3355 3356 3348 3347; 3584 3357 3358 3350 3349; 3585 3358 3359 3350 3350
 3069. 3586 3359 3360 3352 3351; 3587 3360 3361 3353 3352; 3588 3361 3362 3354 3353
 3070. 3589 3362 3363 3355 3354; 3590 3363 3364 3356 3355; 3591 3365 3366 3358 3357



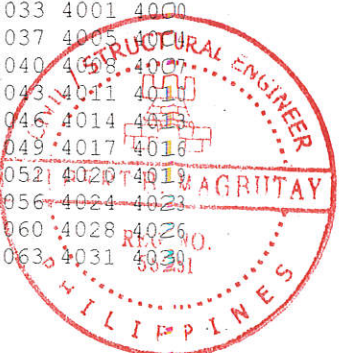
3071. 3592 3366 3367 3359 3358; 3593 3367 3368 3360 3359; 3594 3368 3369 3361 3360
 3072. 3595 3369 3370 3362 3361; 3596 3370 3371 3363 3362; 3597 3371 3372 3364 3363
 3073. 3598 3373 3374 3365 3365; 3599 3374 3375 3366 3366; 3600 3375 3376 3368 3367
 3074. 3601 3376 3377 3363 3368; 3602 3377 3378 3370 3369; 3603 3378 3379 3371 3370
 3075. 3604 3379 3380 3372 3371; 3605 3381 3382 3374 3373; 3606 3382 3383 3375 3374
 3076. 3607 3383 3384 3376 3375; 3608 3384 3385 3377 3376; 3609 3385 3386 3378 3377
 3077. 3610 3386 3387 3379 3378; 3611 3387 3388 3380 3379; 3612 3389 3390 3382 3381
 3078. 3613 3390 3391 3383 3382; 3614 3391 3392 3384 3383; 3615 3392 3393 3385 3384
 3079. 3616 3393 3394 3386 3385; 3617 3394 3395 3387 3386; 3618 3395 3396 3388 3387
 3080. 3619 3397 3398 3390 3389; 3620 3398 3399 3391 3390; 3621 3399 3400 3392 3391
 3081. 3622 3400 3401 3393 3392; 3623 3401 3402 3394 3393; 3624 3402 3403 3395 3394
 3082. 3625 3403 3404 3396 3395; 3626 3405 3406 3398 3397; 3627 3406 3407 3399 3398
 3083. 3628 3407 3408 3400 3399; 3629 3408 3409 3401 3400; 3630 3409 3410 3402 3401
 3084. 3631 3410 3411 3403 3402; 3632 3411 3412 3404 3403; 3633 3413 3414 3406 3405
 3085. 3634 3414 3415 3407 3406; 3635 3415 3416 3408 3407; 3636 3416 3417 3409 3408
 3086. 3637 3417 3418 3410 3409; 3638 3418 3419 3411 3410; 3639 3419 3420 3412 3411
 3087. 3640 3421 3422 3414 3413; 3641 3422 3423 3415 3414; 3642 3423 3424 3416 3415
 3088. 3643 3424 3425 3417 3416; 3644 3425 3426 3418 3417; 3645 3426 3427 3419 3418
 3089. 3646 3427 3428 3420 3419; 3647 3373 3443 3442 3365; 3648 3381 3444 3443 3373
 3090. 3649 3389 3445 3444 3381; 3650 3397 3446 3445 3389; 3651 3405 3447 3446 3397
 3091. 3652 3413 3448 3447 3405; 3653 3421 3449 3448 3413; 3654 3430 3451 3450 3429
 3092. 3655 3431 3452 3451 3430; 3656 3432 3453 3452 3431; 3657 3433 3454 3453 3432
 3093. 3658 3434 3455 3454 3433; 3659 3435 3456 3455 3434; 3660 3436 3457 3456 3435
 3094. 3661 3437 3458 3457 3436; 3662 3438 3459 3458 3437; 3663 3439 3460 3459 3438
 3095. 3664 3440 3461 3460 3439; 3665 3441 3462 3461 3440; 3666 3443 3464 3463 3442
 3096. 3667 3444 3465 3464 3443; 3668 3445 3466 3465 3444; 3669 3446 3467 3466 3445
 3097. 3670 3447 3468 3467 3446; 3671 3448 3469 3468 3447; 3672 3449 3470 3469 3448
 3098. 3673 3451 3472 3471 3450; 3674 3452 3473 3472 3451; 3675 3453 3474 3473 3452
 3099. 3676 3454 3475 3474 3453; 3677 3455 3476 3475 3454; 3678 3456 3477 3476 3455
 3100. 3679 3457 3478 3477 3456; 3680 3458 3479 3478 3457; 3681 3459 3480 3479 3458
 3101. 3682 3460 3481 3480 3459; 3683 3461 3482 3481 3460; 3684 3462 3483 3482 3461
 3102. 3685 3464 3500 3498 3463; 3686 3465 3502 3500 3464; 3687 3466 3505 3502 3465
 3103. 3688 3467 3507 3505 3466; 3689 3468 3509 3507 3467; 3690 3469 3511 3509 3468
 3104. 3691 3470 3514 3511 3469; 3692 3472 3499 3497 3471; 3693 3473 3501 3499 3472
 3105. 3694 3474 3504 3501 3473; 3695 3475 3506 3504 3474; 3696 3476 3508 3506 3475
 3106. 3697 3477 3510 3508 3476; 3698 3478 3512 3510 3477; 3699 3479 3515 3512 3478
 3107. 3700 3480 3516 3515 3479; 3701 3481 3517 3516 3480; 3702 3482 3519 3517 3481
 3108. 3703 3483 3520 3519 3482; 3704 3499 3522 3521 3497; 3705 3501 3523 3522 3499
 3109. 3706 3504 3524 3523 3501; 3707 3506 3525 3524 3504; 3708 3508 3526 3525 3506
 3110. 3709 3510 3527 3526 3508; 3710 3512 3528 3527 3510; 3711 3515 3529 3528 3512
 3111. 3712 3516 3530 3529 3515; 3713 3517 3531 3530 3516; 3714 3519 3532 3531 3517
 3112. 3715 3520 3533 3532 3519; 3716 3522 3535 3534 3521; 3717 3523 3536 3535 3522
 3113. 3718 3524 3537 3536 3523; 3719 3525 3538 3537 3524; 3720 3526 3539 3538 3525
 3114. 3721 3527 3540 3539 3526; 3722 3528 3541 3540 3527; 3723 3529 3542 3541 3528
 3115. 3724 3530 3543 3542 3529; 3725 3531 3544 3543 3530; 3726 3532 3545 3544 3531
 3116. 3727 3533 3546 3545 3532; 3728 3535 3548 3547 3534; 3729 3536 3549 3548 3535
 3117. 3730 3537 3550 3549 3536; 3731 3538 3551 3550 3537; 3732 3539 3552 3551 3538
 3118. 3733 3540 3553 3552 3539; 3734 3541 3554 3553 3540; 3735 3542 3555 3554 3541
 3119. 3736 3543 3556 3555 3542; 3737 3544 3557 3556 3543; 3738 3545 3558 3557 3544
 3120. 3739 3546 3559 3558 3545; 3740 3548 3561 3560 3547; 3741 3549 3562 3561 3548
 3121. 3742 3550 3563 3562 3549; 3743 3551 3564 3563 3550; 3744 3552 3565 3564 3551
 3122. 3745 3553 3566 3565 3552; 3746 3554 3567 3566 3553; 3747 3555 3568 3567 3554
 3123. 3748 3556 3569 3568 3555; 3749 3557 3570 3569 3556; 3750 3558 3571 3570 3557
 3124. 3751 3559 3572 3571 3558; 3752 3488 3616 3617 3489; 3753 3489 3617 3618 3490
 3125. 3754 3490 3618 3619 3491; 3755 3492 3620 3621 3493; 3756 3493 3621 3622 3494
 3126. 3757 3494 3622 3623 3495; 3758 3497 3625 3626 3498; 3759 3503 3629 3630 3504
 3127. 3760 3561 3574 3573 3560; 3761 3562 3575 3574 3561; 3762 3563 3576 3575 3562
 3128. 3763 3564 3577 3576 3563; 3764 3565 3578 3577 3564; 3765 3566 3579 3578 3565
 3129. 3766 3567 3580 3579 3566; 3767 3568 3581 3580 3567; 3768 3569 3582 3581 3568
 3130. 3769 3570 3583 3582 3569; 3770 3571 3584 3583 3570; 3771 3572 3585 3584 3571
 3131. 3772 3247 3827 3823 3250; 3773 3306 3830 3831 3309; 3774 3574 3587 3586 3575
 3132. 3775 3575 3588 3587 3574; 3776 3576 3589 3588 3575; 3777 3577 3590 3589 3576
 3133. 3778 3578 3591 3590 3577; 3779 3579 3592 3591 3578; 3780 3580 3593 3592 3579
 3134. 3781 3581 3594 3593 3580; 3782 3582 3595 3594 3581; 3783 3583 3596 3595 3582
 3135. 3784 3584 3597 3596 3583; 3785 3585 3598 3597 3584; 3786 3587 3599 3598 3585
 3136. 3787 3588 3601 3600 3587; 3788 3589 3602 3601 3588; 3789 3590 3603 3602 3589
 3137. 3790 3591 3604 3603 3590; 3791 3592 3605 3604 3591; 3792 3593 3606 3605 3592



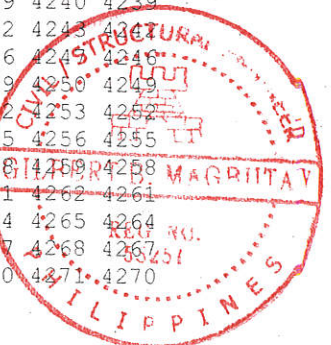
3138. 3793 3594 3607 3606 3593; 3794 3595 3608 3607 3594; 3795 3596 3609 3608 3595
 3139. 3796 3597 3610 3609 3596; 3797 3598 3611 3610 3597; 3798 3600 3627 3625 3599
 3140. 3799 3601 3628 3627 3600; 3800 3602 3630 3628 3601; 3801 3603 3631 3630 3602
 3141. 3802 3604 3632 3631 3603; 3803 3605 3633 3632 3604; 3804 3606 3634 3633 3605
 3142. 3805 3607 3637 3634 3606; 3806 3608 3638 3637 3607; 3807 3609 3639 3638 3608
 3143. 3808 3610 3641 3639 3609; 3809 3611 3642 3641 3610; 3810 3627 3644 3643 3625
 3144. 3811 3628 3645 3644 3627; 3812 3630 3646 3645 3628; 3813 3631 3647 3646 3630
 3145. 3814 3632 3648 3647 3631; 3815 3633 3649 3648 3632; 3816 3634 3650 3649 3633
 3146. 3817 3637 3651 3650 3634; 3818 3638 3652 3651 3637; 3819 3639 3653 3652 3638
 3147. 3820 3641 3654 3653 3639; 3821 3642 3655 3654 3641; 3822 3644 3657 3656 3643
 3148. 3823 3645 3658 3657 3644; 3824 3646 3659 3658 3645; 3825 3647 3660 3659 3646
 3149. 3826 3648 3661 3660 3647; 3827 3649 3662 3661 3648; 3828 3650 3663 3662 3649
 3150. 3829 3651 3664 3663 3650; 3830 3652 3665 3664 3651; 3831 3653 3666 3665 3652
 3151. 3832 3654 3667 3666 3653; 3833 3655 3668 3667 3654; 3834 3657 3670 3669 3656
 3152. 3835 3658 3671 3670 3657; 3836 3659 3672 3671 3658; 3837 3660 3673 3672 3659
 3153. 3838 3661 3674 3673 3660; 3839 3662 3675 3674 3661; 3840 3663 3676 3675 3662
 3154. 3841 3664 3677 3676 3663; 3842 3665 3678 3677 3664; 3843 3666 3679 3678 3665
 3155. 3844 3667 3680 3679 3666; 3845 3668 3681 3680 3667; 3846 3670 3683 3682 3669
 3156. 3847 3671 3684 3683 3670; 3848 3672 3685 3684 3671; 3849 3673 3686 3685 3672
 3157. 3850 3674 3687 3686 3673; 3851 3675 3688 3687 3674; 3852 3676 3689 3688 3675
 3158. 3853 3677 3690 3689 3676; 3854 3678 3691 3690 3677; 3855 3679 3692 3691 3678
 3159. 3856 3680 3693 3692 3679; 3857 3681 3694 3693 3680; 3858 3616 4100 4122 3617
 3160. 3859 3617 4122 4133 3618; 3860 3618 4133 4156 3619; 3861 3620 4331 4353 3621
 3161. 3862 3621 4353 4363 3622; 3863 3622 4363 4386 3623; 3864 3625 4585 4597 3626
 3162. 3865 3629 4660 4677 3630; 3866 3683 3771 3770 3682; 3867 3684 3772 3771 3683
 3163. 3868 3685 3773 3772 3684; 3869 3686 3774 3773 3685; 3870 3687 3775 3774 3686
 3164. 3871 3688 3776 3775 3687; 3872 3689 3777 3776 3688; 3873 3690 3778 3777 3689
 3165. 3874 3691 3779 3778 3690; 3875 3692 3780 3779 3691; 3876 3693 3781 3780 3692
 3166. 3877 3694 3782 3781 3693; 3878 3700 3701 3696 3695; 3879 3701 3702 3697 3696
 3167. 3880 3702 3703 3698 3697; 3881 3703 3704 3699 3698; 3882 3705 3706 3701 3700
 3168. 3883 3706 3707 3702 3701; 3884 3707 3708 3703 3702; 3885 3708 3709 3704 3703
 3169. 3886 3710 3711 3706 3705; 3887 3711 3712 3707 3706; 3888 3712 3713 3708 3707
 3170. 3889 3713 3714 3709 3708; 3890 3715 3716 3711 3710; 3891 3716 3717 3712 3711
 3171. 3892 3717 3718 3713 3712; 3893 3718 3719 3714 3713; 3894 3720 3721 3716 3715
 3172. 3895 3721 3722 3717 3716; 3896 3722 3723 3718 3717; 3897 3723 3724 3719 3718
 3173. 3898 3725 3726 3721 3720; 3899 3726 3727 3722 3721; 3900 3727 3728 3723 3722
 3174. 3901 3728 3729 3724 3723; 3902 3730 3731 3726 3725; 3903 3731 3732 3727 3726
 3175. 3904 3732 3733 3728 3727; 3905 3733 3734 3729 3728; 3906 3735 3736 3731 3730
 3176. 3907 3736 3737 3732 3731; 3908 3737 3738 3733 3732; 3909 3738 3739 3734 3733
 3177. 3910 3740 3741 3736 3735; 3911 3741 3742 3737 3736; 3912 3742 3743 3738 3737
 3178. 3913 3743 3744 3739 3738; 3914 3745 3746 3741 3740; 3915 3746 3747 3742 3741
 3179. 3916 3747 3748 3743 3742; 3917 3748 3749 3744 3743; 3918 3750 3751 3746 3745
 3180. 3919 3751 3752 3747 3746; 3920 3752 3753 3748 3747; 3921 3753 3754 3749 3748
 3181. 3922 3755 3756 3751 3750; 3923 3756 3757 3752 3751; 3924 3757 3758 3753 3752
 3182. 3925 3758 3759 3754 3753; 3926 3760 3761 3756 3755; 3927 3761 3762 3757 3756
 3183. 3928 3762 3763 3759 3757; 3929 3763 3764 3759 3758; 3930 3765 3766 3761 3760
 3184. 3931 3766 3767 3762 3761; 3932 3767 3768 3763 3762; 3933 3768 3769 3764 3763
 3185. 3934 3700 3785 3783 3695; 3935 3704 3786 3784 3699; 3936 3705 3787 3785 3700
 3186. 3937 3709 3788 3786 3704; 3938 3710 3789 3787 3705; 3939 3714 3790 3788 3709
 3187. 3940 3715 3791 3789 3710; 3941 3719 3792 3790 3714; 3942 3720 3793 3791 3715
 3188. 3943 3724 3794 3792 3719; 3944 3725 3795 3793 3720; 3945 3729 3796 3794 3724
 3189. 3946 3730 3797 3795 3725; 3947 3734 3798 3796 3729; 3948 3735 3799 3797 3730
 3190. 3949 3739 3800 3798 3734; 3950 3740 3801 3799 3735; 3951 3744 3802 3800 3739
 3191. 3952 3745 3803 3801 3740; 3953 3749 3804 3802 3744; 3954 3750 3805 3803 3745
 3192. 3955 3754 3806 3804 3749; 3956 3755 3807 3805 3750; 3957 3759 3808 3806 3754
 3193. 3958 3760 3809 3807 3755; 3959 3764 3810 3808 3759; 3960 3765 3811 3809 3760
 3194. 3961 3769 3812 3810 3764; 3962 3771 3814 3813 3770; 3963 3772 3815 3814 3771
 3195. 3964 3773 3816 3815 3772; 3965 3774 3817 3816 3773; 3966 3775 3818 3817 3774
 3196. 3967 3776 3819 3818 3775; 3968 3777 3820 3819 3776; 3969 3778 3821 3820 3777
 3197. 3970 3779 3822 3821 3778; 3971 3780 3823 3822 3779; 3972 3781 3824 3823 3780
 3198. 3973 3782 3825 3824 3781; 3974 3785 3835 3833 3783; 3975 3786 3836 3834 3784
 3199. 3976 3787 3837 3835 3785; 3977 3788 3838 3836 3786; 3978 3789 3839 3837 3787
 3200. 3979 3790 3840 3838 3788; 3980 3791 3841 3839 3789; 3981 3792 3842 3840 3790
 3201. 3982 3793 3843 3841 3791; 3983 3794 3844 3842 3792; 3984 3795 3845 3843 3793
 3202. 3985 3796 3846 3844 3794; 3986 3797 3847 3845 3795; 3987 3798 3848 3846 3796
 3203. 3988 3799 3849 3847 3797; 3989 3800 3850 3848 3798; 3990 3801 3851 3849 3799
 3204. 3991 3802 3852 3850 3800; 3992 3803 3853 3851 3801; 3993 3804 3854 3852 3802



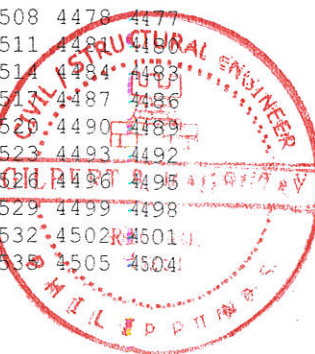
3205. 3994 3805 3853 3853 3803; 3995 3806 3856 3854 3804; 3996 3807 3857 3855 3805
 3206. 3997 3808 3858 3856 3806; 3998 3809 3859 3857 3807; 3999 3810 3860 3858 3808
 3207. 4000 3811 3861 3859 3809; 4001 3812 3862 3860 3810; 4002 3814 3864 3863 3813
 3208. 4003 3815 3865 3864 3814; 4004 3816 3866 3865 3815; 4005 3817 3867 3866 3816
 3209. 4006 3818 3868 3867 3817; 4007 3819 3869 3868 3818; 4008 3820 3870 3869 3819
 3210. 4009 3821 3871 3870 3820; 4010 3822 3872 3871 3821; 4011 3823 3873 3872 3822
 3211. 4012 3824 3874 3873 3823; 4013 3825 3875 3874 3824; 4014 3835 3926 3894 3833
 3212. 4015 3836 3931 3899 3834; 4016 3837 3958 3926 3835; 4017 3838 3963 3931 3836
 3213. 4018 3839 3990 3958 3837; 4019 3840 3995 3963 3838; 4020 3841 4022 3990 3839
 3214. 4021 3842 4027 3995 3840; 4022 3843 4054 4022 3841; 4023 3844 4059 4027 3842
 3215. 4024 3845 4086 4054 3843; 4025 3846 4091 4059 3844; 4026 3847 4133 4086 3845
 3216. 4027 3848 4141 4091 3846; 4028 3849 4173 4133 3847; 4029 3850 4177 4141 3848
 3217. 4030 3851 4202 4173 3849; 4031 3852 4206 4177 3850; 4032 3853 4231 4202 3851
 3218. 4033 3854 4235 4206 3852; 4034 3855 4260 4231 3853; 4035 3856 4264 4235 3854
 3219. 4036 3857 4289 4260 3855; 4037 3858 4293 4264 3856; 4038 3859 4318 4289 3857
 3220. 4039 3860 4322 4293 3858; 4040 3861 4363 4318 3859; 4041 3862 4371 4322 3860
 3221. 4042 3864 4615 4585 3863; 4043 3865 4646 4615 3864; 4044 3866 4677 4646 3865
 3222. 4045 3867 4708 4677 3866; 4046 3868 4739 4708 3867; 4047 3869 4770 4739 3868
 3223. 4048 3870 4801 4770 3869; 4049 3871 4832 4801 3870; 4050 3872 4851 4832 3871
 3224. 4051 3873 4869 4851 3872; 4052 3874 4892 4869 3873; 4053 3875 4905 4892 3874
 3225. 4054 3908 3909 3877 3876; 4055 3909 3910 3878 3877; 4056 3910 3911 3879 3878
 3226. 4057 3911 3912 3880 3879; 4058 3912 3913 3881 3880; 4059 3913 3914 3882 3881
 3227. 4060 3914 3915 3883 3882; 4061 3915 3916 3884 3883; 4062 3916 3917 3885 3884
 3228. 4063 3917 3918 3886 3885; 4064 3918 3919 3887 3886; 4065 3919 3920 3888 3887
 3229. 4066 3920 3921 3889 3888; 4067 3921 3922 3890 3889; 4068 3922 3923 3891 3890
 3230. 4069 3923 3924 3892 3891; 4070 3924 3925 3893 3892; 4071 3925 3927 3895 3893
 3231. 4072 3927 3928 3896 3895; 4073 3928 3929 3897 3896; 4074 3929 3930 3898 3897
 3232. 4075 3930 3932 3900 3898; 4076 3932 3933 3901 3900; 4077 3933 3934 3902 3901
 3233. 4078 3934 3935 3903 3902; 4079 3935 3936 3904 3903; 4080 3936 3937 3905 3904
 3234. 4081 3937 3938 3906 3905; 4082 3938 3939 3907 3906; 4083 3940 3941 3909 3908
 3235. 4084 3941 3942 3910 3909; 4085 3942 3943 3911 3910; 4086 3943 3944 3912 3911
 3236. 4087 3944 3945 3913 3912; 4088 3945 3946 3914 3913; 4089 3946 3947 3915 3914
 3237. 4090 3947 3948 3916 3915; 4091 3948 3949 3917 3916; 4092 3949 3950 3918 3917
 3238. 4093 3950 3951 3919 3918; 4094 3951 3952 3920 3919; 4095 3952 3953 3921 3920
 3239. 4096 3953 3954 3922 3921; 4097 3954 3955 3923 3922; 4098 3955 3956 3924 3923
 3240. 4099 3956 3957 3925 3924; 4100 3957 3959 3927 3925; 4101 3959 3960 3928 3927
 3241. 4102 3960 3961 3929 3928; 4103 3961 3962 3930 3929; 4104 3962 3964 3932 3930
 3242. 4105 3964 3965 3933 3932; 4106 3965 3966 3934 3933; 4107 3966 3967 3935 3934
 3243. 4108 3967 3968 3936 3935; 4109 3968 3969 3937 3936; 4110 3969 3970 3938 3937
 3244. 4111 3970 3971 3939 3938; 4112 3972 3973 3941 3940; 4113 3973 3974 3942 3941
 3245. 4114 3974 3975 3943 3942; 4115 3975 3976 3944 3943; 4116 3976 3977 3945 3944
 3246. 4117 3977 3978 3946 3945; 4118 3978 3979 3947 3946; 4119 3979 3980 3948 3947
 3247. 4120 3980 3981 3949 3948; 4121 3981 3982 3950 3949; 4122 3982 3983 3951 3950
 3248. 4123 3983 3984 3952 3951; 4124 3984 3985 3953 3952; 4125 3985 3986 3954 3953
 3249. 4126 3986 3987 3955 3954; 4127 3987 3988 3956 3955; 4128 3988 3989 3957 3956
 3250. 4129 3989 3991 3959 3957; 4130 3991 3992 3960 3959; 4131 3992 3993 3961 3960
 3251. 4132 3993 3994 3962 3961; 4133 3994 3996 3964 3962; 4134 3996 3997 3965 3964
 3252. 4135 3997 3998 3966 3965; 4136 3998 3999 3967 3966; 4137 3999 4000 3968 3967
 3253. 4138 4000 4001 3969 3968; 4139 4001 4002 3970 3969; 4140 4002 4003 3971 3970
 3254. 4141 4004 4005 3973 3972; 4142 4005 4006 3974 3973; 4143 4006 4007 3975 3974
 3255. 4144 4007 4008 3976 3975; 4145 4008 4009 3977 3976; 4146 4009 4010 3978 3977
 3256. 4147 4010 4011 3979 3978; 4148 4011 4012 3980 3979; 4149 4012 4013 3981 3980
 3257. 4150 4013 4014 3982 3981; 4151 4014 4015 3983 3982; 4152 4015 4016 3984 3983
 3258. 4153 4016 4017 3985 3984; 4154 4017 4018 3986 3985; 4155 4018 4019 3987 3986
 3259. 4156 4019 4020 3988 3987; 4157 4020 4021 3989 3988; 4158 4021 4023 3991 3989
 3260. 4159 4023 4024 3992 3991; 4160 4024 4025 3993 3992; 4161 4025 4026 3994 3993
 3261. 4162 4026 4028 3996 3994; 4163 4028 4029 3997 3996; 4164 4029 4030 3998 3997
 3262. 4165 4030 4031 3999 3998; 4166 4031 4032 4000 3999; 4167 4032 4033 4001 4000
 3263. 4168 4033 4034 4002 4001; 4169 4034 4035 4003 4002; 4170 4036 4037 4004 4003
 3264. 4171 4037 4038 4006 4005; 4172 4038 4039 4007 4006; 4173 4039 4040 4008 4007
 3265. 4174 4040 4041 4009 4008; 4175 4041 4042 4010 4009; 4176 4042 4043 4011 4010
 3266. 4177 4043 4044 4012 4011; 4178 4044 4045 4013 4012; 4179 4045 4046 4014 4013
 3267. 4180 4046 4047 4015 4014; 4181 4047 4048 4016 4015; 4182 4048 4049 4017 4016
 3268. 4183 4049 4050 4018 4017; 4184 4050 4051 4019 4018; 4185 4051 4052 4020 4019
 3269. 4186 4052 4053 4021 4020; 4187 4053 4055 4023 4021; 4188 4055 4056 4024 4023
 3270. 4189 4056 4057 4025 4024; 4190 4057 4058 4026 4025; 4191 4058 4060 4028 4026
 3271. 4192 4060 4061 4029 4028; 4193 4061 4062 4030 4029; 4194 4062 4063 4031 4030



3272. 4195 4063 4064 4032 4031; 4196 4064 4065 4033 4032; 4197 4065 4066 4034 4033
3273. 4198 4066 4067 4035 4034; 4199 4068 4069 4037 4036; 4200 4069 4070 4038 4037
3274. 4201 4070 4071 4039 4038; 4202 4071 4072 4040 4039; 4203 4072 4073 4041 4040
3275. 4204 4073 4074 4042 4041; 4205 4074 4075 4043 4042; 4206 4075 4076 4044 4043
3276. 4207 4076 4077 4045 4044; 4208 4077 4078 4046 4045; 4209 4078 4079 4047 4046
3277. 4210 4079 4080 4048 4047; 4211 4080 4081 4049 4048; 4212 4081 4082 4050 4049
3278. 4213 4082 4083 4051 4050; 4214 4083 4084 4052 4051; 4215 4084 4085 4053 4052
3279. 4216 4085 4087 4055 4053; 4217 4087 4088 4056 4055; 4218 4088 4089 4057 4056
3280. 4219 4089 4090 4058 4057; 4220 4090 4092 4060 4058; 4221 4092 4093 4061 4060
3281. 4222 4093 4094 4062 4061; 4223 4094 4095 4063 4062; 4224 4095 4096 4064 4063
3282. 4225 4096 4097 4065 4064; 4226 4097 4098 4066 4065; 4227 4098 4099 4067 4066
3283. 4228 4100 4101 4069 4068; 4229 4101 4103 4070 4069; 4230 4103 4105 4071 4070
3284. 4231 4105 4107 4072 4071; 4232 4107 4109 4073 4072; 4233 4109 4111 4074 4073
3285. 4234 4111 4113 4075 4074; 4235 4113 4115 4076 4075; 4236 4115 4117 4077 4076
3286. 4237 4117 4119 4078 4077; 4238 4119 4121 4079 4078; 4239 4121 4123 4080 4079
3287. 4240 4123 4125 4081 4080; 4241 4125 4127 4082 4081; 4242 4127 4129 4083 4082
3288. 4243 4129 4130 4084 4083; 4244 4130 4132 4085 4084; 4245 4132 4134 4087 4085
3289. 4246 4134 4136 4088 4087; 4247 4136 4138 4089 4088; 4248 4138 4140 4090 4089
3290. 4249 4140 4142 4092 4090; 4250 4142 4144 4093 4092; 4251 4144 4146 4094 4093
3291. 4252 4146 4148 4095 4094; 4253 4148 4150 4096 4095; 4254 4150 4152 4097 4096
3292. 4255 4152 4154 4098 4097; 4256 4154 4156 4099 4098; 4257 4157 4158 4102 4100
3293. 4258 4158 4159 4104 4102; 4259 4159 4160 4106 4104; 4260 4160 4161 4108 4106
3294. 4261 4161 4162 4110 4108; 4262 4162 4163 4112 4110; 4263 4163 4164 4114 4112
3295. 4264 4164 4165 4116 4114; 4265 4165 4166 4118 4116; 4266 4166 4167 4120 4118
3296. 4267 4167 4168 4122 4120; 4268 4168 4169 4124 4122; 4269 4169 4170 4126 4124
3297. 4270 4170 4171 4128 4126; 4271 4171 4172 4131 4128; 4272 4172 4173 4133 4131
3298. 4273 4173 4174 4135 4133; 4274 4174 4175 4137 4135; 4275 4175 4176 4139 4137
3299. 4276 4176 4177 4141 4139; 4277 4177 4178 4143 4141; 4278 4178 4179 4145 4143
3300. 4279 4179 4180 4147 4145; 4280 4180 4181 4149 4147; 4281 4181 4182 4151 4149
3301. 4282 4182 4183 4153 4151; 4283 4183 4184 4155 4153; 4284 4184 4185 4156 4155
3302. 4285 4186 4187 4158 4157; 4286 4187 4188 4159 4158; 4287 4188 4189 4160 4159
3303. 4288 4189 4190 4161 4160; 4289 4190 4191 4162 4161; 4290 4191 4192 4163 4162
3304. 4291 4192 4193 4164 4163; 4292 4193 4194 4165 4164; 4293 4194 4195 4166 4165
3305. 4294 4195 4196 4167 4166; 4295 4196 4197 4168 4167; 4296 4197 4198 4169 4168
3306. 4297 4198 4199 4170 4169; 4298 4199 4200 4171 4170; 4299 4200 4201 4172 4171
3307. 4300 4201 4202 4173 4172; 4301 4202 4203 4174 4173; 4302 4203 4204 4175 4174
3308. 4303 4204 4205 4176 4175; 4304 4205 4206 4177 4176; 4305 4206 4207 4178 4177
3309. 4306 4207 4208 4179 4178; 4307 4208 4209 4180 4179; 4308 4209 4210 4181 4180
3310. 4309 4210 4211 4182 4181; 4310 4211 4212 4183 4182; 4311 4212 4213 4184 4183
3311. 4312 4213 4214 4185 4184; 4313 4215 4216 4187 4186; 4314 4216 4217 4188 4187
3312. 4315 4217 4218 4189 4188; 4316 4218 4219 4190 4189; 4317 4219 4220 4191 4190
3313. 4318 4220 4221 4192 4191; 4319 4221 4222 4193 4192; 4320 4222 4223 4194 4193
3314. 4321 4223 4224 4195 4194; 4322 4224 4225 4196 4195; 4323 4225 4226 4197 4196
3315. 4324 4226 4227 4198 4197; 4325 4227 4228 4199 4198; 4326 4228 4229 4200 4199
3316. 4327 4229 4230 4201 4200; 4328 4230 4231 4202 4201; 4329 4231 4232 4203 4202
3317. 4330 4232 4233 4204 4203; 4331 4233 4234 4205 4204; 4332 4234 4235 4206 4205
3318. 4333 4235 4236 4207 4206; 4334 4236 4237 4208 4207; 4335 4237 4238 4209 4208
3319. 4336 4238 4239 4210 4209; 4337 4239 4240 4211 4210; 4338 4240 4241 4212 4211
3320. 4339 4241 4242 4213 4212; 4340 4242 4243 4214 4213; 4341 4244 4245 4216 4215
3321. 4342 4245 4246 4217 4216; 4343 4246 4247 4218 4217; 4344 4247 4248 4219 4218
3322. 4345 4248 4249 4220 4219; 4346 4249 4250 4221 4220; 4347 4250 4251 4222 4221
3323. 4348 4251 4252 4223 4222; 4349 4252 4253 4224 4223; 4350 4253 4254 4225 4224
3324. 4351 4254 4255 4226 4225; 4352 4255 4256 4227 4226; 4353 4256 4257 4228 4227
3325. 4354 4257 4258 4229 4228; 4355 4258 4259 4230 4229; 4356 4259 4260 4231 4230
3326. 4357 4260 4261 4232 4231; 4358 4261 4262 4233 4232; 4359 4262 4263 4234 4233
3327. 4360 4263 4264 4235 4234; 4361 4264 4265 4236 4235; 4362 4265 4266 4237 4236
3328. 4363 4266 4267 4238 4237; 4364 4267 4268 4239 4238; 4365 4268 4269 4240 4239
3329. 4366 4269 4270 4241 4240; 4367 4270 4271 4242 4241; 4368 4271 4272 4243 4242
3330. 4369 4273 4274 4245 4244; 4370 4274 4275 4246 4245; 4371 4275 4276 4247 4246
3331. 4372 4276 4277 4249 4247; 4373 4277 4278 4249 4248; 4374 4278 4279 4250 4249
3332. 4375 4279 4280 4251 4250; 4376 4280 4281 4252 4251; 4377 4281 4282 4253 4252
3333. 4378 4282 4283 4254 4253; 4379 4283 4284 4255 4254; 4380 4284 4285 4256 4255
3334. 4381 4285 4286 4257 4256; 4382 4286 4287 4258 4257; 4383 4287 4288 4259 4258
3335. 4384 4288 4289 4260 4259; 4385 4289 4290 4261 4260; 4386 4290 4291 4262 4261
3336. 4387 4291 4292 4263 4262; 4388 4292 4293 4264 4263; 4389 4293 4294 4265 4264
3337. 4390 4294 4295 4266 4265; 4391 4295 4296 4267 4266; 4392 4296 4297 4268 4267
3338. 4393 4297 4298 4269 4268; 4394 4298 4299 4270 4269; 4395 4299 4300 4271 4270



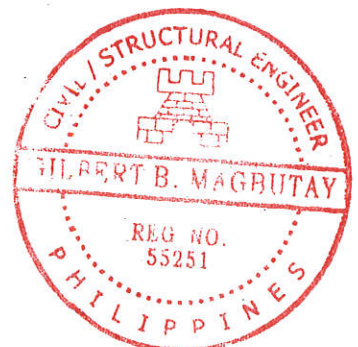
3339. 4396 4300 4301 4272 4271; 4397 4302 4303 4274 4273; 4398 4303 4304 4275 4274
 3340. 4399 4304 4305 4276 4275; 4400 4305 4306 4277 4276; 4401 4306 4307 4278 4277
 3341. 4402 4307 4308 4279 4278; 4403 4308 4309 4280 4279; 4404 4309 4310 4281 4280
 3342. 4405 4310 4311 4282 4281; 4406 4311 4312 4283 4282; 4407 4312 4313 4284 4283
 3343. 4408 4313 4314 4285 4284; 4409 4314 4315 4286 4285; 4410 4315 4316 4287 4286
 3344. 4411 4316 4317 4288 4287; 4412 4317 4318 4289 4288; 4413 4318 4319 4290 4289
 3345. 4414 4319 4320 4291 4290; 4415 4320 4321 4292 4291; 4416 4321 4322 4293 4292
 3346. 4417 4322 4323 4294 4293; 4418 4323 4324 4295 4294; 4419 4324 4325 4296 4295
 3347. 4420 4325 4326 4297 4296; 4421 4326 4327 4298 4297; 4422 4327 4328 4299 4298
 3348. 4423 4328 4329 4300 4299; 4424 4329 4330 4301 4300; 4425 4331 4333 4303 4302
 3349. 4426 4333 4335 4304 4303; 4427 4335 4337 4305 4304; 4428 4337 4339 4306 4305
 3350. 4429 4339 4341 4307 4306; 4430 4341 4343 4308 4307; 4431 4343 4345 4309 4308
 3351. 4432 4345 4347 4310 4309; 4433 4347 4349 4311 4310; 4434 4349 4351 4312 4311
 3352. 4435 4351 4353 4313 4312; 4436 4353 4355 4314 4313; 4437 4355 4357 4315 4314
 3353. 4438 4357 4359 4316 4315; 4439 4359 4361 4317 4316; 4440 4361 4363 4318 4317
 3354. 4441 4363 4365 4319 4318; 4442 4365 4367 4320 4319; 4443 4367 4369 4321 4320
 3355. 4444 4369 4371 4322 4321; 4445 4371 4373 4323 4322; 4446 4373 4375 4324 4323
 3356. 4447 4375 4377 4325 4324; 4448 4377 4379 4326 4325; 4449 4379 4381 4327 4326
 3357. 4450 4381 4383 4328 4327; 4451 4383 4385 4329 4328; 4452 4385 4386 4330 4329
 3358. 4453 4387 4388 4332 4331; 4454 4388 4389 4334 4332; 4455 4389 4390 4336 4334
 3359. 4456 4390 4391 4338 4336; 4457 4391 4392 4340 4338; 4458 4392 4393 4342 4340
 3360. 4459 4393 4394 4344 4342; 4460 4394 4395 4346 4344; 4461 4395 4396 4348 4346
 3361. 4462 4396 4397 4350 4348; 4463 4397 4398 4352 4350; 4464 4398 4399 4354 4352
 3362. 4465 4399 4400 4356 4354; 4466 4400 4401 4358 4356; 4467 4401 4402 4360 4358
 3363. 4468 4402 4403 4362 4360; 4469 4403 4404 4363 4362; 4470 4404 4405 4364 4363
 3364. 4471 4405 4406 4366 4364; 4472 4406 4407 4368 4366; 4473 4407 4408 4370 4368
 3365. 4474 4408 4409 4372 4370; 4475 4409 4410 4374 4372; 4476 4410 4411 4376 4374
 3366. 4477 4411 4412 4378 4376; 4478 4412 4413 4380 4378; 4479 4413 4414 4382 4380
 3367. 4480 4414 4415 4384 4382; 4481 4415 4416 4386 4384; 4482 4417 4418 4388 4387
 3368. 4483 4418 4419 4389 4388; 4484 4419 4420 4390 4389; 4485 4420 4421 4391 4390
 3369. 4486 4421 4422 4392 4391; 4487 4422 4423 4393 4392; 4488 4423 4424 4394 4393
 3370. 4489 4424 4425 4395 4394; 4490 4425 4426 4396 4395; 4491 4426 4427 4397 4396
 3371. 4492 4427 4428 4398 4397; 4493 4428 4429 4399 4398; 4494 4429 4430 4400 4399
 3372. 4495 4430 4431 4401 4400; 4496 4431 4432 4402 4401; 4497 4432 4433 4403 4402
 3373. 4498 4433 4434 4404 4403; 4499 4434 4435 4405 4404; 4500 4435 4436 4406 4405
 3374. 4501 4436 4437 4407 4406; 4502 4437 4438 4408 4407; 4503 4438 4439 4409 4408
 3375. 4504 4439 4440 4410 4409; 4505 4440 4441 4411 4410; 4506 4441 4442 4412 4411
 3376. 4507 4442 4443 4413 4412; 4508 4443 4444 4414 4413; 4509 4444 4445 4415 4414
 3377. 4510 4445 4446 4416 4415; 4511 4447 4448 4418 4417; 4512 4448 4449 4419 4418
 3378. 4513 4449 4450 4420 4419; 4514 4450 4451 4421 4420; 4515 4451 4452 4422 4421
 3379. 4516 4452 4453 4423 4422; 4517 4453 4454 4424 4423; 4518 4454 4455 4425 4424
 3380. 4519 4455 4456 4426 4425; 4520 4456 4457 4427 4426; 4521 4457 4458 4428 4427
 3381. 4522 4458 4459 4429 4428; 4523 4459 4460 4430 4429; 4524 4460 4461 4431 4430
 3382. 4525 4461 4462 4432 4431; 4526 4462 4463 4433 4432; 4527 4463 4464 4434 4433
 3383. 4528 4464 4465 4435 4434; 4529 4465 4466 4436 4435; 4530 4466 4467 4437 4436
 3384. 4531 4467 4468 4438 4437; 4532 4468 4469 4439 4438; 4533 4469 4470 4440 4439
 3385. 4534 4470 4471 4441 4440; 4535 4471 4472 4442 4441; 4536 4472 4473 4443 4442
 3386. 4537 4473 4474 4444 4443; 4538 4474 4475 4445 4444; 4539 4475 4476 4446 4445
 3387. 4540 4477 4478 4448 4447; 4541 4478 4479 4449 4448; 4542 4479 4480 4450 4449
 3388. 4543 4480 4481 4451 4450; 4544 4481 4482 4452 4451; 4545 4482 4483 4453 4452
 3389. 4546 4483 4484 4454 4453; 4547 4484 4485 4455 4454; 4548 4485 4486 4456 4455
 3390. 4549 4486 4487 4457 4456; 4550 4487 4488 4458 4457; 4551 4488 4489 4459 4458
 3391. 4552 4489 4490 4460 4459; 4553 4490 4491 4461 4460; 4554 4491 4492 4462 4461
 3392. 4555 4492 4493 4463 4462; 4556 4493 4494 4464 4463; 4557 4494 4495 4465 4464
 3393. 4558 4495 4496 4466 4465; 4559 4496 4497 4467 4466; 4560 4497 4498 4468 4467
 3394. 4561 4498 4499 4469 4468; 4562 4499 4500 4470 4469; 4563 4500 4501 4471 4470
 3395. 4564 4501 4502 4472 4471; 4565 4502 4503 4473 4472; 4566 4503 4504 4474 4473
 3396. 4567 4504 4505 4475 4474; 4568 4505 4506 4476 4475; 4569 4507 4508 4478 4477
 3397. 4570 4508 4509 4479 4478; 4571 4509 4510 4480 4479; 4572 4510 4511 4481 4480
 3398. 4573 4511 4512 4482 4481; 4574 4512 4513 4483 4482; 4575 4513 4514 4484 4483
 3399. 4576 4514 4515 4485 4484; 4577 4515 4516 4486 4485; 4578 4516 4517 4487 4486
 3400. 4579 4517 4518 4488 4487; 4580 4518 4519 4489 4488; 4581 4519 4520 4490 4489
 3401. 4582 4520 4521 4491 4490; 4583 4521 4522 4492 4491; 4584 4522 4523 4493 4492
 3402. 4585 4523 4524 4494 4493; 4586 4524 4525 4495 4494; 4587 4525 4526 4496 4495
 3403. 4588 4526 4527 4497 4496; 4589 4527 4528 4498 4497; 4590 4528 4529 4499 4498
 3404. 4591 4529 4530 4500 4499; 4592 4530 4531 4501 4500; 4593 4531 4532 4502 4501
 3405. 4594 4532 4533 4503 4502; 4595 4533 4534 4504 4503; 4596 4534 4535 4505 4504



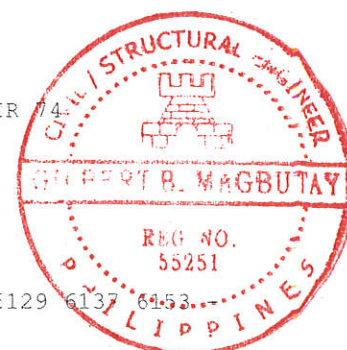
3406. 4597 4535 4536 4506 4505; 4598 4537 4538 4508 4507; 4599 4538 4539 4509 4508
 3407. 4600 4539 4540 4510 4509; 4601 4540 4541 4511 4510; 4602 4541 4542 4512 4511
 3408. 4603 4542 4543 4513 4512; 4604 4543 4544 4514 4513; 4605 4544 4545 4515 4514
 3409. 4606 4545 4546 4516 4515; 4607 4546 4547 4517 4516; 4608 4547 4548 4518 4517
 3410. 4609 4548 4549 4519 4518; 4610 4549 4550 4520 4519; 4611 4550 4551 4521 4520
 3411. 4612 4551 4552 4522 4521; 4613 4552 4553 4523 4522; 4614 4553 4554 4524 4523
 3412. 4615 4554 4555 4525 4524; 4616 4555 4556 4526 4525; 4617 4556 4557 4527 4526
 3413. 4618 4557 4558 4528 4527; 4619 4558 4559 4529 4528; 4620 4559 4560 4530 4529
 3414. 4621 4560 4561 4531 4530; 4622 4561 4562 4532 4531; 4623 4562 4563 4533 4532
 3415. 4624 4563 4564 4534 4533; 4625 4564 4565 4535 4534; 4626 4565 4566 4536 4535
 3416. 4627 4567 4568 4538 4537; 4628 4568 4569 4539 4538; 4629 4569 4570 4540 4539
 3417. 4630 4570 4571 4541 4540; 4631 4571 4572 4542 4541; 4632 4572 4573 4543 4542
 3418. 4633 4573 4574 4544 4543; 4634 4574 4575 4545 4544; 4635 4575 4576 4546 4545
 3419. 4636 4576 4577 4547 4546; 4637 4577 4578 4548 4547; 4638 4578 4580 4549 4548
 3420. 4639 4580 4581 4550 4549; 4640 4581 4582 4551 4550; 4641 4582 4583 4552 4551
 3421. 4642 4583 4584 4553 4552; 4643 4584 4585 4554 4553; 4644 4585 4586 4555 4554
 3422. 4645 4586 4587 4556 4555; 4646 4587 4588 4557 4556; 4647 4588 4589 4558 4557
 3423. 4648 4589 4590 4559 4558; 4649 4590 4591 4560 4559; 4650 4591 4592 4561 4560
 3424. 4651 4592 4593 4562 4561; 4652 4593 4594 4563 4562; 4653 4594 4595 4564 4563
 3425. 4654 4595 4596 4565 4564; 4655 4596 4597 4566 4565; 4656 4598 4599 4568 4567
 3426. 4657 4599 4600 4569 4568; 4658 4600 4601 4570 4569; 4659 4601 4602 4571 4570
 3427. 4660 4602 4603 4572 4571; 4661 4603 4604 4573 4572; 4662 4604 4605 4574 4573
 3428. 4663 4605 4606 4575 4574; 4664 4606 4607 4576 4575; 4665 4607 4608 4577 4576
 3429. 4666 4608 4609 4578 4577; 4667 4609 4610 4580 4578; 4668 4610 4611 4581 4580
 3430. 4669 4611 4612 4582 4581; 4670 4612 4613 4583 4582; 4671 4613 4614 4584 4583
 3431. 4672 4614 4615 4585 4584; 4673 4616 4617 4586 4585; 4674 4617 4618 4587 4586
 3432. 4675 4618 4619 4588 4587; 4676 4619 4620 4589 4588; 4677 4620 4621 4590 4589
 3433. 4678 4621 4622 4591 4590; 4679 4622 4623 4592 4591; 4680 4623 4624 4593 4592
 3434. 4681 4624 4625 4594 4593; 4682 4625 4626 4595 4594; 4683 4626 4627 4596 4595
 3435. 4684 4627 4628 4597 4596; 4685 4629 4630 4599 4598; 4686 4630 4631 4600 4599
 3436. 4687 4631 4632 4601 4600; 4688 4632 4633 4602 4601; 4689 4633 4634 4603 4602
 3437. 4690 4634 4635 4604 4603; 4691 4635 4636 4605 4604; 4692 4636 4637 4606 4605
 3438. 4693 4637 4638 4607 4606; 4694 4638 4639 4608 4607; 4695 4639 4640 4609 4608
 3439. 4696 4640 4641 4610 4609; 4697 4641 4642 4611 4610; 4698 4642 4643 4612 4611
 3440. 4699 4643 4644 4613 4612; 4700 4644 4645 4614 4613; 4701 4645 4646 4615 4614
 3441. 4702 4647 4648 4617 4616; 4703 4648 4649 4618 4617; 4704 4649 4650 4619 4618
 3442. 4705 4650 4651 4620 4619; 4706 4651 4652 4621 4620; 4707 4652 4653 4622 4621
 3443. 4708 4653 4654 4623 4622; 4709 4654 4655 4624 4623; 4710 4655 4656 4625 4624
 3444. 4711 4656 4657 4626 4625; 4712 4657 4658 4627 4626; 4713 4658 4659 4628 4627
 3445. 4714 4660 4661 4630 4629; 4715 4661 4662 4631 4630; 4716 4662 4663 4632 4631
 3446. 4717 4663 4664 4633 4632; 4718 4664 4665 4634 4633; 4719 4665 4666 4635 4634
 3447. 4720 4666 4667 4636 4635; 4721 4667 4668 4637 4636; 4722 4668 4669 4638 4637
 3448. 4723 4669 4670 4639 4638; 4724 4670 4671 4640 4639; 4725 4671 4672 4641 4640
 3449. 4726 4672 4673 4642 4641; 4727 4673 4674 4643 4642; 4728 4674 4675 4644 4643
 3450. 4729 4675 4676 4645 4644; 4730 4676 4677 4646 4645; 4731 4678 4679 4648 4647
 3451. 4732 4679 4680 4649 4648; 4733 4680 4681 4650 4649; 4734 4681 4682 4651 4650
 3452. 4735 4682 4683 4652 4651; 4736 4683 4684 4653 4652; 4737 4684 4685 4654 4653
 3453. 4738 4685 4686 4655 4654; 4739 4686 4687 4656 4655; 4740 4687 4688 4657 4656
 3454. 4741 4688 4689 4658 4657; 4742 4689 4690 4659 4658; 4743 4691 4692 4661 4660
 3455. 4744 4692 4693 4662 4661; 4745 4693 4694 4663 4662; 4746 4694 4695 4664 4663
 3456. 4747 4695 4696 4665 4664; 4748 4696 4697 4666 4665; 4749 4697 4698 4667 4666
 3457. 4750 4698 4699 4668 4667; 4751 4699 4700 4669 4668; 4752 4700 4701 4670 4669
 3458. 4753 4701 4702 4671 4670; 4754 4702 4703 4672 4671; 4755 4703 4704 4673 4672
 3459. 4756 4704 4705 4674 4673; 4757 4705 4706 4675 4674; 4758 4706 4707 4676 4675
 3460. 4759 4707 4708 4677 4676; 4760 4709 4710 4679 4678; 4761 4710 4711 4680 4679
 3461. 4762 4711 4712 4681 4680; 4763 4712 4713 4682 4681; 4764 4713 4714 4683 4682
 3462. 4765 4714 4715 4684 4683; 4766 4715 4716 4685 4684; 4767 4716 4717 4686 4685
 3463. 4768 4717 4718 4687 4686; 4769 4718 4719 4688 4687; 4770 4719 4720 4689 4688
 3464. 4771 4720 4721 4690 4689; 4772 4722 4723 4692 4691; 4773 4723 4724 4693 4692
 3465. 4774 4724 4725 4694 4693; 4775 4725 4726 4695 4694; 4776 4726 4727 4696 4695
 3466. 4777 4727 4728 4697 4696; 4778 4728 4729 4698 4697; 4779 4729 4730 4699 4698
 3467. 4780 4730 4731 4700 4699; 4781 4731 4732 4701 4700; 4782 4732 4733 4702 4701
 3468. 4783 4733 4734 4703 4702; 4784 4734 4735 4704 4703; 4785 4735 4736 4705 4704
 3469. 4786 4736 4737 4706 4705; 4787 4737 4738 4707 4706; 4788 4738 4739 4708 4707
 3470. 4789 4740 4741 4710 4709; 4790 4741 4742 4711 4710; 4791 4742 4743 4712 4711
 3471. 4792 4743 4744 4713 4712; 4793 4744 4745 4714 4713; 4794 4745 4746 4715 4714
 3472. 4795 4746 4747 4716 4715; 4796 4747 4748 4717 4716; 4797 4748 4749 4718 4717



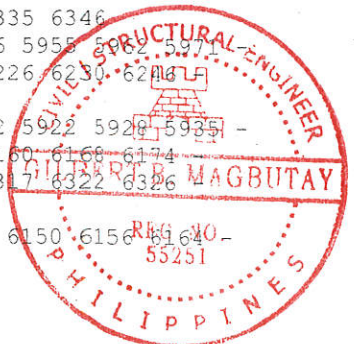
3473. 4798 4749 4750 4719 4718; 4799 4750 4751 4720 4719; 4800 4751 4752 4721 4720
 3474. 4801 4753 4754 4723 4722; 4802 4754 4755 4724 4723; 4803 4755 4756 4725 4724
 3475. 4804 4756 4757 4726 4725; 4805 4757 4758 4727 4726; 4806 4758 4759 4728 4727
 3476. 4807 4759 4760 4729 4728; 4808 4760 4761 4730 4729; 4809 4761 4762 4731 4730
 3477. 4810 4762 4763 4732 4731; 4811 4763 4764 4733 4732; 4812 4764 4765 4734 4733
 3478. 4813 4765 4766 4735 4734; 4814 4766 4767 4736 4735; 4815 4767 4768 4737 4736
 3479. 4816 4768 4769 4738 4737; 4817 4769 4770 4739 4738; 4818 4771 4772 4741 4740
 3480. 4819 4772 4773 4742 4741; 4820 4773 4774 4743 4742; 4821 4774 4775 4744 4743
 3481. 4822 4775 4776 4745 4744; 4823 4776 4777 4746 4745; 4824 4777 4778 4747 4746
 3482. 4825 4778 4779 4748 4747; 4826 4779 4780 4749 4748; 4827 4780 4781 4750 4749
 3483. 4828 4781 4782 4751 4750; 4829 4782 4783 4752 4751; 4830 4784 4785 4754 4753
 3484. 4831 4785 4786 4755 4754; 4832 4786 4787 4756 4755; 4833 4787 4788 4757 4756
 3485. 4834 4788 4789 4758 4757; 4835 4789 4790 4759 4758; 4836 4790 4791 4760 4759
 3486. 4837 4791 4792 4761 4760; 4838 4792 4793 4762 4761; 4839 4793 4794 4763 4762
 3487. 4840 4794 4795 4764 4763; 4841 4795 4796 4765 4764; 4842 4796 4797 4766 4765
 3488. 4843 4797 4798 4767 4766; 4844 4798 4799 4768 4767; 4845 4799 4800 4769 4768
 3489. 4846 4800 4801 4770 4769; 4847 4802 4803 4772 4771; 4848 4803 4804 4773 4772
 3490. 4849 4804 4805 4774 4773; 4850 4805 4806 4775 4774; 4851 4806 4807 4776 4775
 3491. 4852 4807 4808 4777 4776; 4853 4808 4809 4778 4777; 4854 4809 4810 4779 4778
 3492. 4855 4810 4811 4780 4779; 4856 4811 4812 4781 4780; 4857 4812 4813 4782 4781
 3493. 4858 4813 4814 4783 4782; 4859 4815 4816 4785 4784; 4860 4816 4817 4786 4785
 3494. 4861 4817 4818 4787 4786; 4862 4818 4819 4788 4787; 4863 4819 4820 4789 4788
 3495. 4864 4820 4821 4790 4789; 4865 4821 4822 4791 4790; 4866 4822 4823 4792 4791
 3496. 4867 4823 4824 4793 4792; 4868 4824 4825 4794 4793; 4869 4825 4826 4795 4794
 3497. 4870 4826 4827 4796 4795; 4871 4827 4828 4797 4796; 4872 4828 4829 4798 4797
 3498. 4873 4829 4830 4799 4798; 4874 4830 4831 4800 4799; 4875 4831 4832 4801 4800
 3499. 4876 4833 4834 4816 4815; 4877 4834 4835 4817 4816; 4878 4835 4836 4818 4817
 3500. 4879 4836 4837 4819 4818; 4880 4837 4838 4820 4819; 4881 4838 4839 4821 4820
 3501. 4882 4839 4840 4822 4821; 4883 4840 4841 4823 4822; 4884 4841 4842 4824 4823
 3502. 4885 4842 4843 4825 4824; 4886 4843 4844 4826 4825; 4887 4844 4845 4827 4826
 3503. 4888 4846 4847 4828 4827; 4889 4847 4848 4829 4828; 4890 4848 4849 4830 4829
 3504. 4891 4849 4850 4831 4830; 4892 4850 4851 4832 4831; 4893 4852 4853 4834 4833
 3505. 4894 4853 4854 4835 4834; 4895 4854 4855 4836 4835; 4896 4855 4856 4837 4836
 3506. 4897 4856 4857 4838 4837; 4898 4857 4858 4839 4838; 4899 4858 4859 4840 4839
 3507. 4900 4859 4860 4841 4840; 4901 4860 4861 4842 4841; 4902 4861 4862 4843 4842
 3508. 4903 4862 4863 4844 4843; 4904 4863 4864 4845 4844; 4905 4864 4865 4846 4845
 3509. 4906 4865 4866 4847 4846; 4907 4866 4867 4848 4847; 4908 4867 4868 4849 4848
 3510. 4909 4868 4869 4851 4850; 4910 4870 4871 4853 4852; 4911 4871 4872 4854 4853
 3511. 4912 4872 4873 4855 4854; 4913 4873 4874 4856 4855; 4914 4874 4875 4857 4856
 3512. 4915 4875 4876 4858 4857; 4916 4876 4877 4859 4858; 4917 4877 4878 4860 4859
 3513. 4918 4878 4879 4861 4860; 4919 4879 4880 4862 4861; 4920 4880 4881 4863 4862
 3514. 4921 4882 4883 4864 4863; 4922 4884 4885 4865 4864; 4923 4885 4886 4866 4865
 3515. 4924 4887 4888 4867 4866; 4925 4889 4890 4868 4867; 4926 4890 4891 4869 4868
 3516. 4927 4883 4886 4872 4871; 4928 4890 4892 4869 4868; 4929 4886 4888 4873 4872
 3517. 4930 4888 4891 4874 4873; 4931 4891 4893 4875 4874; 4932 4893 4894 4876 4875
 3518. 4933 4894 4895 4877 4876; 4934 4895 4896 4878 4877; 4935 4896 4897 4879 4878
 3519. 4936 4897 4898 4880 4879; 4937 4898 4899 4882 4880; 4938 4899 4900 4884 4882
 3520. 4939 4900 4901 4885 4884; 4940 4901 4902 4887 4885; 4941 4902 4903 4889 4887
 3521. 4942 4903 4904 4890 4889; 4943 4904 4905 4892 4890; 4944 4122 4906 4907 4133
 3522. 4945 4353 4908 4909 4363; 4946 4579 4910 4911 4585; 4947 4845 4912 4913 4851
 3523. DEFINE PMEMBER
 3524. 412 416 423 427 431 435 439 PMEMBER 1
 3525. 8 10 12 14 16 18 20 PMEMBER 2
 3526. 7 9 11 13 15 17 19 PMEMBER 3
 3527. 411 415 422 426 430 434 438 PMEMBER 4
 3528. 413 417 424 428 432 436 440 PMEMBER 5
 3529. 414 418 425 429 433 437 441 PMEMBER 6
 3530. 6350 6352 6354 6356 6358 6360 6362 PMEMBER 7
 3531. 6351 6353 6355 6357 6359 6361 6363 PMEMBER 8
 3532. 5996 5998 6000 6004 6006 6008 6010 PMEMBER 9
 3533. 1076 TO 1078 5844 TO 5847 PMEMBER 10
 3534. 5997 5999 6001 6005 6007 6009 6011 PMEMBER 11
 3535. 700 TO 703 707 TO 709 PMEMBER 12
 3536. 6421 6423 6425 6427 6429 6431 6433 PMEMBER 13
 3537. 6420 6422 6424 6426 6428 6430 6432 PMEMBER 14
 3538. 6020 6022 6024 6028 6030 6032 6034 PMEMBER 15
 3539. 6021 6023 6025 6029 6031 6033 6035 PMEMBER 16



3540. 5855 TO 5857 5861 TO 5864 PMEMBER 17
 3541. 78 80 82 84 86 88 90 PMEMBER 18
 3542. 79 81 83 85 87 89 91 PMEMBER 19
 3543. 6489 6492 6495 6498 6501 6504 6507 PMEMBER 20
 3544. 6490 6493 6496 6499 6502 6505 6508 PMEMBER 21
 3545. 6491 6494 6497 6500 6503 6506 6509 PMEMBER 22
 3546. 122 124 126 128 130 132 134 PMEMBER 23
 3547. 121 123 125 127 129 131 133 PMEMBER 24
 3548. 6044 6046 6048 6051 6053 6055 6057 PMEMBER 25
 3549. 6045 6047 6049 6052 6054 6056 6058 PMEMBER 26
 3550. 5873 TO 5875 5878 TO 5881 PMEMBER 27
 3551. 475 480 485 507 512 517 522 PMEMBER 28
 3552. 5893 5897 5900 5905 5908 5911 5914 PMEMBER 29
 3553. 6066 6071 6075 6080 6084 6089 6093 PMEMBER 30
 3554. 6194 6197 6199 6202 6204 6206 6208 PMEMBER 31
 3555. 6530 6534 6538 6559 6563 6567 6571 PMEMBER 32
 3556. 472 477 482 504 509 514 519 524 527 558 560 561 PMEMBER 33
 3557. 6313 6343 PMEMBER 34
 3558. 6106 6120 6128 6136 6152 6158 6166 6172 PMEMBER 35
 3559. 474 476 479 481 484 503 506 508 511 513 516 518 521 523 526 529 559 562 -
 3560. 563 PMEMBER 36
 3561. 751 754 764 767 769 TO 771 773 TO 778 PMEMBER 37
 3562. 6193 6196 6198 6201 6203 6205 6207 6210 TO 6215 PMEMBER 38
 3563. 6278 6280 6281 6283 6285 TO 6287 6289 TO 6294 PMEMBER 39
 3564. 6529 6531 6533 6535 6537 6556 6558 6560 6562 6564 6566 6568 6570 6572 6574 -
 3565. 6576 6596 6599 6600 PMEMBER 40
 3566. 6528 6532 6536 6557 6561 6565 6569 6573 6575 6595 6597 6598 PMEMBER 41
 3567. 21 TO 42 PMEMBER 42
 3568. 43 TO 54 PMEMBER 43
 3569. 55 TO 77 PMEMBER 44
 3570. 5931 5963 5973 5984 5993 PMEMBER 45
 3571. 6014 TO 6019 PMEMBER 46
 3572. 6101 6115 6123 6131 6147 6161 PMEMBER 47
 3573. 5943 5956 5966 5977 5987 PMEMBER 48
 3574. 6397 TO 6419 PMEMBER 49
 3575. 6386 TO 6395 PMEMBER 50
 3576. 6364 TO 6385 PMEMBER 51
 3577. 6309 6339 PMEMBER 52
 3578. 779 TO 781 783 784 1073 1075 PMEMBER 53
 3579. 712 TO 718 PMEMBER 54
 3580. 6303 6327 6333 6344 PMEMBER 55
 3581. 92 TO 102 PMEMBER 56
 3582. 103 TO 108 PMEMBER 57
 3583. 109 TO 120 PMEMBER 58
 3584. 386 TO 397 PMEMBER 59
 3585. 399 TO 410 PMEMBER 60
 3586. 5932 5964 5974 5985 5994 PMEMBER 61
 3587. 6038 TO 6043 PMEMBER 62
 3588. 5944 5957 5967 5978 5988 PMEMBER 63
 3589. 6102 6116 6124 6132 6148 6162 PMEMBER 64
 3590. 6312 6342 PMEMBER 65
 3591. 6466 TO 6488 PMEMBER 66
 3592. 6304 6328 6334 6345 PMEMBER 67
 3593. 6456 TO 6465 PMEMBER 68
 3594. 6435 TO 6455 PMEMBER 69
 3595. 6311 6341 PMEMBER 70
 3596. 460 TO 471 PMEMBER 71
 3597. 564 570 574 590 644 679 683 696 PMEMBER 72
 3598. 5882 TO 5888 PMEMBER 73
 3599. 5923 5929 5942 5948 5960 5965 5970 5975 5981 5986 5995 PMEMBER 74
 3600. 6059 TO 6064 PMEMBER 75
 3601. 6105 6119 6127 6135 6151 6157 6165 6171 PMEMBER 76
 3602. 6216 6220 6224 6228 6244 6248 6252 6256 PMEMBER 77
 3603. 6346 6335 6329 6323 6314 6305 6299 6295 PMEMBER 78
 3604. 6516 TO 6527 PMEMBER 79
 3605. 566 572 576 592 646 681 693 698 PMEMBER 80
 3606. 1070 5921 5927 5934 5946 5955 5962 5971 5982 5991 6107 6121 6129 6137 6153



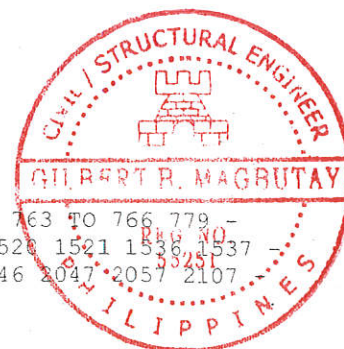
3607. 6159 6167 6173 PMEMBER 81
 3608. 6218 6222 6226 6230 6246 6250 6254 6258 PMEMBER 82
 3609. 6348 6337 6331 6325 6316 6307 6301 6297 PMEMBER 83
 3610. START GROUP DEFINITION
 3611. MEMBER
 3612. GC1 7 TO 20 191 TO 194 230 TO 233 275 TO 278 318 TO 321 375 TO 378 -
 3613. 700 TO 709 1076 TO 1078 5841 TO 5847 5996 TO 6011 6175 TO 6178 6260 TO 6263 -
 3614. 6350 TO 6363
 3615. GC2 1 2 184 185 225 226 264 265 295 296 353 354
 3616. GC3 578 579
 3617. 2C1 78 TO 91 198 TO 201 237 TO 240 282 TO 285 325 TO 328 382 TO 385 -
 3618. 722 TO 724 732 5855 TO 5864 6020 TO 6035 6182 TO 6185 6267 TO 6270 -
 3619. 6420 TO 6433
 3620. 2C2 4 5 187 188 228 229 267 268 300 301 356 357
 3621. 2C3 585 586
 3622. 3C1 411 413 TO 415 417 418 420 422 424 TO 426 428 TO 430 432 TO 434 -
 3623. 436 TO 438 440 441 740 TO 742 5873 TO 5881 6044 TO 6058 6189 TO 6191 6274 -
 3624. 6275 TO 6276 6489 TO 6509
 3625. 3C2 121 TO 134 205 TO 208 244 TO 247 289 TO 292 332 333 335 TO 338 412 416 -
 3626. 421 423 427 431 435 439
 3627. 4C1 472 474 TO 477 479 TO 482 484 485 503 504 506 TO 509 511 TO 514 -
 3628. 516 TO 519 521 TO 524 526 527 529 558 TO 563 751 753 754 764 767 TO 778 5893 -
 3629. 5896 5897 5900 5905 5908 5911 5914 5916 6066 6070 6071 6075 6080 6084 6089 -
 3630. 6093 6094 6193 TO 6199 6201 TO 6215 6278 TO 6281 6283 TO 6294 6528 TO 6538 -
 3631. 6556 TO 6576 6595 TO 6600
 3632. 2B1 164 165 180 181 215 218 254 257 302 305 359 362 568 624 663 779 TO 781 -
 3633. 783 784 798 1073 1075 5924 5943 5949 5956 5966 5977 5987 6101 6115 6123 6131 -
 3634. 6139 6147 6161 6232 6235 6309 6310 6339 6340
 3635. 2B2 195 197 234 236 279 281 322 324 379 381 719 721 5848 5850 6012 -
 3636. 6014 TO 6019 6179 6181 6264 6266
 3637. 2B3 176 177 196 216 217 235 255 256 280 303 304 323 360 361 380 615 616 720 -
 3638. 795 797 5849 5931 5950 5963 5973 5984 5993 6013 6140 6141 6180 6233 6234 -
 3639. 6265 6303 6318 6327 6333 6344
 3640. 2B4 3 170 171 186 211 212 227 250 251 266 271 272 297 TO 299 310 TO 313 339 -
 3641. 340 TO 342 349 350 371 581 584 656 657 662 710 TO 718
 3642. 2B5 355 372 580
 3643. 3B1 166 167 182 183 219 222 258 261 306 309 363 366 367 569 635 678 782 1064 -
 3644. 1074 5925 5944 5951 5957 5967 5978 5988 6102 6116 6124 6132 6142 6148 6162 -
 3645. 6236 6239 6311 6312 6341 6342
 3646. 3B2 202 204 241 243 286 288 329 331 334 386 TO 397 399 TO 410 419 737 739 -
 3647. 5865 5867 6036 6039 TO 6043 6186 6188 6271 6273
 3648. 3B3 178 179 203 220 221 242 259 260 287 307 308 330 364 365 368 398 625 626 -
 3649. 738 802 803 5866 5932 5952 5964 5974 5985 5994 6037 6143 6144 6187 6237 6238 -
 3650. 6272 6304 6319 6328 6334 6345
 3651. 3B4 6 172 173 213 214 252 253 273 274 314 315 343 TO 346 351 352 358 373 -
 3652. 374 587
 3653. 3B5 588 589 664 675 677 734 TO 736
 3654. 4B1 168 169 174 175 189 190 209 210 223 224 248 249 262 263 269 270 293 294 -
 3655. 316 317 347 348 369 370
 3656. 4B2 486 TO 502 565 571 575 591 645 680 684 697 766 1068 5902 5933 5976 6077 -
 3657. 6106 6120 6128 6136 6152 6158 6166 6172 6200 6217 6221 6225 6229 6245 6249 -
 3658. 6253 6257 6282 6296 6300 6306 6315 6324 6330 6336 6347
 3659. 4B3 640 641 1066 1067 5926 5945 5953 5958 5968 5979 5989 6103 6117 6125 6133 -
 3660. 6145 6149 6155 6163 6169 6240 6241 6313 6320 6343
 3661. 4B4 442 TO 471 743 5882 TO 5888 6059 TO 6064 6192 6277
 3662. 4B DUMMY 564 570 574 590 644 679 683 696 1065 5923 5929 5942 5948 5960 5965 -
 3663. 5970 5975 5981 5986 5995 6105 6119 6127 6135 6151 6157 6165 6171 6216 6220 -
 3664. 6224 6228 6244 6248 6252 6256 6295 6299 6305 6314 6323 6329 6335 6346
 3665. 4LRB 566 572 576 592 646 681 693 698 1070 5921 5927 5934 5946 5955 5962 5971 -
 3666. 5982 5991 6107 6121 6129 6137 6153 6159 6167 6173 6218 6222 6226 6230 6241
 3667. 6250 6254 6258 6297 6301 6307 6316 6325 6331 6337 6348
 3668. 4URB 530 TO 557 567 573 577 614 643 654 682 694 699 1071 1072 5922 5929 5935 -
 3669. 5947 5954 5961 5972 5983 5992 6108 6122 6130 6138 6146 6154 6160 6168 6174
 3670. 6219 6223 6227 6231 6243 6247 6251 6255 6259 6298 6302 6308 6317 6322 6326
 3671. 6332 6338 6349 6577 TO 6594
 3672. 4LRB-2 642 1069 5930 5959 5969 5980 5990 6104 6118 6126 6134 6150 6156 6164 -
 3673. 6170 6242 6321



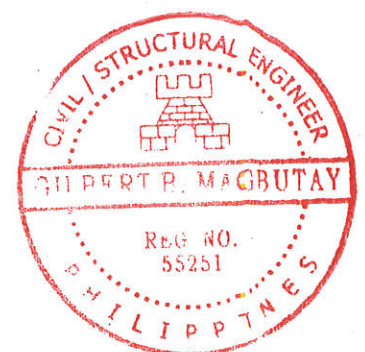
3674. RCD 1 TO 91 109 TO 134 164 TO 581 584 TO 592 614 TO 616 624 TO 626 635 640 -
 3675. 641 TO 646 654 656 657 662 TO 664 675 677 TO 684 693 694 696 TO 724 732 734 -
 3676. 735 TO 743 751 753 754 764 766 TO 784 795 797 798 802 803 1064 TO 1078 5841 -
 3677. 5842 TO 5850 5855 TO 5867 5873 TO 5888 5893 5396 5897 5900 5902 5905 5908 -
 3678. 5911 5914 5916 5921 TO 5935 5942 TO 6064 6066 6070 6071 6075 6077 6080 6084 -
 3679. 6089 6093 6094 6101 TO 6108 6115 TO 6509 6516 TO 6600
 3680. SB-1 5936 TO 5941 6109 TO 6114
 3681. END GROUP DEFINITION
 3682. ELEMENT PROPERTY
 3683. 593 TO 613 617 TO 623 627 TO 634 636 TO 639 647 TO 653 655 658 TO 661 665 -
 3684. 666 TO 674 676 685 TO 692 695 725 TO 731 733 744 TO 750 752 755 TO 763 765 -
 3685. 785 TO 794 796 799 TO 801 804 TO 1063 1079 TO 1315 1883 TO 1885 1888 TO 1912 -
 3686. 2985 2990 TO 2994 3878 TO 3961 3974 TO 4001 4014 TO 4041 THICKNESS 0.2
 3687. 2029 TO 2175 2241 TO 2247 2253 TO 2259 2288 TO 2294 2298 TO 2305 2337 TO 2343 -
 3688. 2347 TO 2354 2383 TO 2389 2393 TO 2400 2429 TO 2435 2448 TO 2455 -
 3689. 2498 TO 2525 2554 TO 2560 2564 TO 2613 2642 TO 2676 2680 TO 2721 -
 3690. 2728 TO 2735 2764 TO 2798 2802 TO 2843 2872 TO 2914 2918 TO 2984 -
 3691. 2986 TO 2989 2995 TO 3099 3128 TO 3155 3196 TO 3223 3264 TO 3291 -
 3692. 3335 TO 3362 3411 TO 3438 3451 TO 3646 THICKNESS 0.2
 3693. 2176 TO 2240 2248 TO 2252 2260 TO 2287 2309 TO 2336 2355 TO 2382 2401 TO 2428 -
 3694. 2456 TO 2497 2526 TO 2553 2614 TO 2641 2736 TO 2763 2844 TO 2871 -
 3695. 3100 TO 3127 3168 TO 3195 3236 TO 3263 3307 TO 3334 3383 TO 3410 -
 3696. 3647 TO 3653 3666 TO 3672 3685 TO 3691 THICKNESS 0.2
 3697. 1878 TO 1882 1886 1887 1913 TO 1954 1956 TO 1969 1971 TO 1984 1993 TO 2027 -
 3698. 4054 TO 4742 4760 TO 4771 4789 TO 4800 4818 TO 4829 4847 TO 4858 -
 3699. 4876 TO 4878 THICKNESS 0.2
 3700. 4743 TO 4759 4772 TO 4788 4801 TO 4817 4830 TO 4846 4859 TO 4875 4879 TO 4891 -
 3701. 4892 THICKNESS 0.2
 3702. 582 583 1316 1323 1330 1337 1344 TO 1348 1355 1356 1838 TO 1841 1955 1970 -
 3703. 2028 2447 3772 3773 4944 TO 4947 THICKNESS 0.1
 3704. 1317 TO 1322 1324 TO 1329 1331 TO 1336 1338 TO 1343 1349 TO 1354 1818 TO 1825 -
 3705. 1985 TO 1992 2439 TO 2446 3375 TO 3382 3752 TO 3759 3858 TO 3864 -
 3706. 3865 THICKNESS 0.15
 3707. 1357 TO 1817 1826 TO 1837 1842 TO 1877 2295 TO 2297 2344 TO 2346 2390 TO 2392 -
 3708. 2436 TO 2438 2561 TO 2563 2677 TO 2679 2799 TO 2801 2915 TO 2917 3167 3235 -
 3709. 3303 3374 3450 THICKNESS 0.2
 3710. 3156 TO 3166 3224 TO 3234 3292 TO 3302 3363 TO 3373 3439 TO 3449 3654 TO 3665 -
 3711. 3673 TO 3684 3692 TO 3751 3760 TO 3771 3774 TO 3857 3866 TO 3877 -
 3712. 3962 TO 3973 4002 TO 4013 4042 TO 4053 4893 TO 4943 THICKNESS 0.2
 3713. 2306 TO 2308 3304 TO 3306 THICKNESS 0.15
 3714. 2722 TO 2727 THICKNESS 0.253
 3715. DEFINE MATERIAL START
 3716. ISOTROPIC CONCRETE
 3717. E 2.17185E+007
 3718. POISSON 0.17
 3719. DENSITY 23.5616
 3720. ALPHA 1E-005
 3721. DAMP 0.05
 3722. TYPE CONCRETE
 3723. STRENGTH FCU 27579
 3724. ISOTROPIC RDOA_SS_2X5
 3725. E 9.65266E+006
 3726. POISSON 0.15
 3727. DENSITY 3.95522
 3728. ALPHA 1.2E-011
 3729. END DEFINE MATERIAL
 3730. MEMBER PROPERTY AMERICAN
 3731. 7 TO 20 191 TO 194 230 TO 233 275 TO 278 318 TO 321 375 TO 378 700 TO 709 -
 3732. 1076 TO 1078 5841 TO 5847 5996 TO 6011 6175 TO 6178 6260 TO 6263 -
 3733. 6350 TO 6363 PRIS YD 0.45 ZD 0.45
 3734. 1 2 184 185 225 226 264 265 295 296 353 354 PRIS YD 0.25 ZD 0.25
 3735. 578 579 PRIS YD 0.3 ZD 0.3
 3736. 78 TO 91 198 TO 201 237 TO 240 282 TO 285 325 TO 328 382 TO 385 722 TO 724 -
 3737. 732 5855 TO 5864 6020 TO 6035 6182 TO 6185 6267 TO 6270 6420 TO 6432 -
 3738. 6433 PRIS YD 0.4 ZD 0.4
 3739. 4 5 187 188 228 229 267 268 300 301 356 357 PRIS YD 0.25 ZD 0.25
 3740. 585 586 PRIS YD 0.3 ZD 0.3



3741. 411 413 TO 415 417 418 420 422 424 TO 426 428 TO 430 432 TO 434 436 TO 438 -
 3742. 440 441 740 TO 742 5873 TO 5881 6044 TO 6058 6189 TO 6191 6274 TO 6276 6489 -
 3743. 6490 TO 6509 PRIS YD 0.4 ZD 0.4
 3744. 121 TO 134 205 TO 208 244 TO 247 289 TO 292 332 333 335 TO 338 412 416 421 -
 3745. 423 427 431 435 439 PRIS YD 0.3 ZD 0.3
 3746. 472 TO 485 503 TO 529 558 TO 563 751 753 754 764 767 TO 778 5893 5896 5897 -
 3747. 5900 5905 5908 5911 5914 5916 6066 6070 6071 6075 6080 6084 6089 6093 6094 -
 3748. 6193 TO 6199 6201 TO 6215 6278 TO 6281 6283 TO 6294 6528 TO 6538 -
 3749. 6556 TO 6576 6595 TO 6600 PRIS YD 0.4 ZD 0.4
 3750. 164 165 180 181 215 218 254 257 302 305 359 362 568 624 663 779 TO 781 783 -
 3751. 784 798 1073 1075 5924 5943 5949 5956 5966 5977 5987 6101 6115 6123 6131 -
 3752. 6139 6147 6161 6232 6235 6309 6310 6339 6340 PRIS YD 0.7 ZD 0.4
 3753. 195 197 234 236 279 281 322 324 379 381 719 721 5848 5850 6012 6014 TO 6019 -
 3754. 6179 6181 6264 6266 PRIS YD 0.5 ZD 0.4
 3755. 176 177 196 216 217 235 255 256 280 303 304 323 360 361 380 615 616 720 795 -
 3756. 797 5849 5931 5950 5963 5973 5984 5993 6013 6140 6141 6180 6233 6234 6265 -
 3757. 6303 6318 6327 6333 6344 PRIS YD 0.5 ZD 0.3
 3758. 3 170 171 186 211 212 227 250 251 266 271 272 297 TO 299 310 TO 313 -
 3759. 339 TO 342 349 350 371 581 584 656 657 662 710 TO 718 PRIS YD 0.35 ZD 0.25
 3760. 355 372 580 PRIS YD 0.45 ZD 0.3
 3761. MEMBER PROPERTY AMERICAN
 3762. 166 167 182 183 219 222 258 261 306 309 363 366 569 635 678 782 1064 1074 -
 3763. 5925 5944 5951 5957 5967 5978 5988 6102 6116 6124 6132 6142 6148 6162 6236 -
 3764. 6239 6311 6312 6341 6342 PRIS YD 0.75 ZD 0.4
 3765. 202 204 241 243 286 288 329 331 334 367 386 TO 397 399 TO 410 419 737 739 -
 3766. 5865 5867 6036 6038 TO 6043 6186 6188 6271 6273 PRIS YD 0.4 ZD 0.4
 3767. 178 179 203 220 221 242 259 260 287 307 308 330 364 365 368 398 625 626 738 -
 3768. 802 803 5866 5932 5952 5964 5974 5985 5994 6037 6143 6144 6187 6237 6238 -
 3769. 6272 6304 6319 6328 6334 6345 PRIS YD 0.4 ZD 0.35
 3770. 6 172 173 213 214 252 253 273 274 314 315 343 TO 346 351 352 358 373 374 -
 3771. 587 PRIS YD 0.45 ZD 0.3
 3772. 588 589 664 675 677 734 TO 736 PRIS YD 0.35 ZD 0.2
 3773. 168 169 174 175 189 190 209 210 223 224 248 249 262 263 269 270 293 294 316 -
 3774. 317 347 348 369 370 PRIS YD 0.75 ZD 0.3
 3775. 486 TO 502 565 571 575 591 645 680 684 697 766 1068 5902 5933 5976 6077 6106 -
 3776. 6120 6128 6136 6152 6158 6166 6172 6200 6217 6221 6225 6229 6245 6249 6253 -
 3777. 6257 6282 6296 6300 6306 6315 6324 6330 6336 6347 PRIS YD 0.95 ZD 0.4
 3778. 640 641 1066 1067 5926 5945 5953 5958 5968 5979 5989 6103 6117 6125 6133 6145 -
 3779. 6149 6155 6163 6169 6240 6241 6313 6320 6343 PRIS YD 0.65 ZD 0.4
 3780. 442 TO 471 743 5882 TO 5888 6059 TO 6064 6192 6277 PRIS YD 0.4 ZD 0.4
 3781. 564 570 574 590 644 679 683 696 1065 5923 5929 5942 5948 5960 5965 5970 5975 -
 3782. 5981 5986 5995 6105 6119 6127 6135 6151 6157 6165 6171 6216 6220 6224 6228 -
 3783. 6244 6248 6252 6256 6295 6299 6305 6314 6323 6329 6335 -
 3784. 6346 PRIS YD 0.3 ZD 0.25
 3785. 566 572 576 592 646 681 693 698 1070 5921 5927 5934 5946 5955 5962 5971 5982 -
 3786. 5991 6107 6121 6129 6137 6153 6159 6167 6173 6218 6222 6226 6230 6246 6250 -
 3787. 6254 6258 6297 6301 6307 6316 6325 6331 6337 6348 PRIS YD 0.45 ZD 0.4
 3788. 530 TO 557 567 573 577 614 643 654 682 694 699 1071 1072 5922 5928 5935 5947 -
 3789. 5954 5961 5972 5983 5992 6108 6122 6130 6138 6146 6154 6160 6168 6174 6219 -
 3790. 6223 6227 6231 6243 6247 6251 6255 6259 6298 6302 6308 6317 6322 6326 6332 -
 3791. 6338 6349 6577 TO 6594 PRIS YD 0.3 ZD 0.2
 3792. MEMBER PROPERTY AITC
 3793. 642 1069 5930 5959 5969 5980 5990 6104 6118 6126 6134 6150 6156 6164 6170 -
 3794. 6242 6321 PRIS YD 0.3 ZD 0.2
 3795. MEMBER PROPERTY AITC
 3796. 21 TO 77 92 TO 120 135 TO 163 6364 TO 6419 6434 TO 6488 6510 TO 6527 6539 -
 3797. 6540 TO 6555 PRIS YD 0.2 ZD 0.2
 3798. MEMBER PROPERTY AITC
 3799. 5936 TO 5941 6109 TO 6114 PRIS YD 0.45 ZD 0.3
 3800. MEMBER PROPERTY AITC
 3801. 5851 TO 5854 5868 TO 5872 5889 TO 5891 PRIS YD 0.2 ZD 0.2
 3802. CONSTANTS
 3803. MATERIAL CONCRETE ALL
 3804. SUPPORTS
 3805. 5 6 11 TO 40 707 708 713 TO 716 731 732 737 TO 740 755 756 763 TO 766 779 -
 3806. 780 789 TO 792 819 820 825 TO 828 1361 1362 1436 TO 1444 1520 1521 1536 1537 -
 3807. 1552 1553 1568 1569 1584 TO 1589 1636 TO 1646 1946 1996 2046 2047 2057 2107



3808. 2136 2177 TO 2180 2276 2305 2346 2347 2399 2428 2469 2470 2513 2551 2592 -
 3809. 2593 2636 2665 TO 2673 2896 2934 2976 3005 3047 3076 3118 3147 3189 TO 3196 -
 3810. 3484 TO 3487 3612 TO 3615 3695 TO 3699 3783 3784 3833 3834 3876 TO 3906 -
 3811. 3907 FIXED
 3812. MEMBER RELEASE
 3813. 5936 5938 5940 6109 6111 6113 START MX MY MZ
 3814. DEFINE UBC LOAD
 3815. ZONE 0.4 I 1 RWX 8.5 RWZ 6.5 STYP 4 NA 1 NV 1.196
 3816. SELFWEIGHT 1
 3817. MEMBER WEIGHT
 3818. 170 171 UNI 10.69
 3819. 211 212 UNI 11.65
 3820. 250 251 271 272 349 350 UNI 8.52
 3821. 310 313 UNI 9.99
 3822. 339 TO 341 UNI 9.73
 3823. 3 UNI 11.42
 3824. 186 UNI 13.398
 3825. 227 UNI 14.718
 3826. 266 UNI 14.688
 3827. 297 TO 299 UNI 5.43
 3828. 311 312 UNI 2.94
 3829. 342 UNI 2.59
 3830. 355 UNI 3.3
 3831. 371 372 UNI 10.44
 3832. 580 UNI 3.76
 3833. 656 UNI 10.01
 3834. 657 UNI 2.97
 3835. 581 584 711 TO 718 UNI 9.9
 3836. 662 UNI 1.98
 3837. 710 UNI 10.31
 3838. 164 165 180 181 215 218 254 257 302 305 359 362 624 779 TO 781 783 784 1073 -
 3839. 1075 5924 5943 5949 5956 5966 5977 5987 6101 6115 6123 6131 6139 6147 6161 -
 3840. 6232 6235 6309 6310 6339 6340 UNI 10.76
 3841. 195 234 279 322 UNI 11.848
 3842. 379 UNI 8.21
 3843. 719 UNI 14.458
 3844. 5848 6012 6179 6264 UNI 5.6
 3845. 176 177 216 217 255 256 303 304 360 361 795 797 5931 5950 5963 5973 5984 5993 -
 3846. 6140 6141 6233 6234 6303 6318 6327 6333 6344 UNI 10.538
 3847. 615 UNI 12.618
 3848. 616 UNI 11.538
 3849. 197 236 281 6014 TO 6019 6181 6266 UNI 5.7
 3850. 324 5850 UNI 11.948
 3851. 381 721 UNI 13.218
 3852. 798 UNI 11.76
 3853. 568 663 UNI 4.32
 3854. 373 374 UNI 1.97
 3855. 664 UNI 1.49
 3856. 345 346 UNI 1.33
 3857. 358 UNI 3.25
 3858. 587 UNI 3.71
 3859. 675 UNI 2.91
 3860. 734 UNI 1.79
 3861. 588 735 UNI 1.22
 3862. 677 UNI 1.42
 3863. 166 167 182 183 219 222 258 261 306 309 363 366 367 569 678 782 1074 5951 -
 3864. 6102 6116 6124 6132 6142 6148 6162 6236 6239 6311 6312 6341 -
 3865. 6342 UNI 10.688
 3866. 202 286 388 TO 397 737 5865 6186 UNI 5.6
 3867. 241 329 334 419 UNI 11.795
 3868. 6036 6271 UNI 9.12
 3869. 203 242 287 330 398 738 5866 6037 6187 6272 UNI 3.36
 3870. 204 6038 TO 6042 6188 UNI 5.7
 3871. 243 288 331 6043 UNI 11.895
 3872. 399 TO 410 UNI 6.97
 3873. 739 UNI 14.935
 3874. 5867 UNI 13.655



3875. 625 802 5952 6143 6144 6237 6238 6304 6319 6328 6334 6345 UNI 7.81
 3876. 6273 UNI 9.22
 3877. 635 UNI 11.688
 3878. 1064 UNI 12.088
 3879. 178 179 220 221 259 260 307 308 364 365 368 626 803 UNI 10.485
 3880. 5932 5964 5974 5985 5994 UNI 4.29
 3881. 5925 5944 5957 5967 5978 5988 UNI 2.24
 3882. 641 1067 5953 6145 6241 6313 6343 UNI 8.88
 3883. 486 TO 502 UNI 3.36
 3884. 766 UNI 12.42
 3885. 5902 6077 6200 6282 UNI 10.72
 3886. 564 570 574 590 644 679 683 696 1065 5923 5929 5942 5948 5960 5965 5970 5975 -
 3887. 5981 5986 5995 6105 6119 6127 6135 6151 6157 6165 6171 6216 6220 6224 6228 -
 3888. 6244 6248 6252 6256 6295 6299 6305 6314 6323 6329 6335 6346 UNI 2.24
 3889. 460 TO 471 UNI 2.85
 3890. 743 UNI 12.5
 3891. 5882 TO 5885 5888 6192 6277 UNI 5.7
 3892. 6059 TO 6064 UNI 9.17
 3893. 640 1066 5926 5945 5958 5968 5979 5989 6103 6117 6125 6133 6149 6155 6163 -
 3894. 6169 6240 6320 UNI 10.568
 3895. JOINT WEIGHT
 3896. 9 10 711 712 735 736 759 760 785 812 816 WEIGHT 8.83
 3897. 669 698 705 706 729 730 753 754 761 762 787 788 817 818 1011 1041 WEIGHT 3.41
 3898. 680 686 1023 1029 WEIGHT 10.12
 3899. 1238 1334 1513 1519 1933 1945 2889 2895 3514 3520 3636 3642 4814 -
 3900. 4905 WEIGHT 6.67
 3901. 1310 1517 1943 2893 3518 3640 4881 WEIGHT 11.05
 3902. 1334 1519 1945 2895 3520 3642 4905 WEIGHT 10.69
 3903. LOAD 1 LOADTYPE SEISMIC TITLE SEISMIC ALONG X DIRECTION
 3904. UBC LOAD X 1
 3905. LOAD 2 LOADTYPE SEISMIC TITLE SEISMIC ALONG Z DIRECTION
 3906. UBC LOAD Z 1
 3907. LOAD 3 LOADTYPE DEAD TITLE DEAD LOAD
 3908. SELFWEIGHT Y -1
 3909. MEMBER LOAD
 3910. 170 171 UNI GY -10.69
 3911. 211 212 UNI GY -11.65
 3912. 250 251 271 272 349 350 UNI GY -8.52
 3913. 310 313 UNI GY -9.99
 3914. 339 TO 341 UNI GY -9.78
 3915. 3 UNI GY -11.42
 3916. 186 UNI GY -13.398
 3917. 227 UNI GY -14.718
 3918. 266 UNI GY -14.688
 3919. 297 TO 299 UNI GY -5.48
 3920. 311 312 UNI GY -2.94
 3921. 342 UNI GY -2.59
 3922. 355 UNI GY -3.3
 3923. 371 372 UNI GY -10.44
 3924. 580 UNI GY -3.76
 3925. 656 UNI GY -10.01
 3926. 657 UNI GY -2.97
 3927. 581 584 711 TO 718 UNI GY -9.9
 3928. 662 UNI GY -1.98
 3929. 710 UNI GY -10.31
 3930. 164 165 180 181 215 218 254 257 302 305 359 362 624 779 TO 781 783 784 1073 -
 3931. 1075 5924 5943 5949 5956 5966 5977 5987 6101 6115 6123 6131 6139 6147 6161 -
 3932. 6232 6235 6309 6310 6339 6340 UNI GY -10.76
 3933. 195 234 279 322 UNI GY -11.848
 3934. 379 UNI GY -8.21
 3935. 719 UNI GY -14.458
 3936. 5848 6012 6179 6264 UNI GY -5.6
 3937. 176 177 216 217 255 256 303 304 360 361 795 797 5931 5950 5963 5973 5984 5993 -
 3938. 6140 6141 6233 6234 6303 6318 6327 6333 6344 UNI GY -10.538
 3939. 615 UNI GY -12.618
 3940. 616 UNI GY -11.538
 3941. 197 236 281 6014 TO 6019 6181 6266 UNI GY -5.7



3942. 324 5850 UNI GY -11.948
 3943. 381 721 UNI GY -13.218
 3944. 798 UNI GY -11.76
 3945. 568 663 UNI GY -4.32
 3946. 373 374 UNI GY -1.97
 3947. 664 UNI GY -1.49
 3948. 345 346 UNI GY -1.33
 3949. 358 UNI GY -3.25
 3950. 587 UNI GY -3.71
 3951. 675 UNI GY -2.91
 3952. 734 UNI GY -1.79
 3953. 588 735 UNI GY -1.22
 3954. 677 UNI GY -1.42
 3955. 166 167 182 183 219 222 258 261 306 309 363 366 569 678 782 1074 5951 6102 -
 3956. 6116 6124 6132 6142 6148 6162 6236 6239 6311 6312 6341 6342 UNI GY -10.688
 3957. 202 286 388 TO 397 737 5865 6186 UNI GY -5.6
 3958. 241 329 UNI GY -11.795
 3959. 6036 6271 UNI GY -9.12
 3960. 203 242 287 330 398 738 5866 6037 6187 6272 UNI GY -3.36
 3961. 204 6038 TO 6042 6188 UNI GY -5.7
 3962. 243 288 331 6043 UNI GY -11.895
 3963. 399 TO 410 UNI GY -6.97
 3964. 739 UNI GY -14.935
 3965. 5867 UNI GY -13.655
 3966. 625 802 5952 6143 6144 6237 6238 6304 6319 6328 6334 6345 UNI GY -7.81
 3967. 6273 UNI GY -9.22
 3968. 635 UNI GY -11.688
 3969. 1064 UNI GY -12.088
 3970. 178 179 220 221 259 260 307 308 364 365 626 803 UNI GY -10.485
 3971. 5932 5964 5974 5985 5994 UNI GY -4.29
 3972. 5925 5944 5957 5967 5978 5988 UNI GY -2.24
 3973. 641 1067 5953 6145 6241 6313 6343 UNI GY -8.88
 3974. 486 TO 502 UNI GY -3.36
 3975. 766 UNI GY -12.42
 3976. 5902 6077 6200 6282 UNI GY -10.72
 3977. 564 570 574 590 644 679 683 696 1065 5923 5929 5942 5948 5960 5965 5970 5975 -
 3978. 5981 5986 5995 6105 6119 6127 6135 6151 6157 6165 6171 6216 6220 6224 6228 -
 3979. 6244 6248 6252 6256 6295 6299 6305 6314 6323 6329 6335 6346 UNI GY -2.24
 3980. 460 TO 471 UNI GY -2.85
 3981. 743 UNI GY -12.5
 3982. 5882 TO 5885 5888 6192 6277 UNI GY -5.7
 3983. 6059 TO 6064 UNI GY -9.17
 3984. 640 1066 5926 5945 5958 5968 5979 5989 6103 6117 6125 6133 6149 6155 6163 -
 3985. 6169 6240 6320 UNI GY -10.568
 3986. JOINT LOAD
 3987. 9 10 711 712 735 736 759 760 785 812 816 FY -3.83
 3988. 669 698 705 706 729 730 753 754 761 762 787 788 817 818 1011 1041 FY -3.41
 3989. 1238 1334 1513 1519 1933 1945 2889 2895 3514 3520 3636 3642 4814 4905 FY -6.67
 3990. 1310 1517 1943 2893 3518 3640 4881 FY -11.05
 3991. 1334 1519 1945 2895 3520 3642 4905 FY -10.69
 3992. 680 686 1023 1029 FY -11.46
 3993. 726 727 804 805 FY -15.1
 3994. 750 751 776 777 FY -14.09
 3995. MEMBER LOAD
 3996. 180 182 215 219 254 258 302 306 359 363 367 1073 1075 5949 5951 6139 6142 -
 3997. 6232 6236 6309 6311 UNI GY -2.16
 3998. 174 175 181 183 189 190 209 210 218 222 TO 224 248 249 257 261 TO 263 269 -
 3999. 270 293 294 305 309 316 317 347 348 362 366 369 370 624 635 640 798 1064
 4000. 1066 5853 5870 5890 5953 6145 6241 6313 UNI GY -2.64
 4001. 1065 1066 UNI GY -3.17
 4002. 743 5882 TO 5885 5887 5888 UNI GY -6.57
 4003. 330 398 UNI GY -2.93
 4004. 364 365 UNI GY -3.57
 4005. 334 419 UNI GY -2.8
 4006. 367 368 UNI GY -2.24
 4007. LOAD 4 LOADTYPE LIVE TITLE FLOOR LIVE LOAD
 4008. FLOOR LOAD



4009. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 0 16.75 ZRANGE 0 6.85 GY
 4010. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 16.75 24.51 ZRANGE 3.425 9.32 GY
 4011. YRANGE 3.6 3.6 FLOAD -3.8 XRANGE 0.51 20.51 ZRANGE 9.32 15 GY
 4012. YRANGE 3.6 3.6 FLOAD -3.8 XRANGE 20.51 24.51 ZRANGE 9.32 15 GY
 4013. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 24.51 44.51 ZRANGE 9.32 15 GY
 4014. YRANGE 3.6 3.6 FLOAD -3.8 XRANGE 0.51 44.51 ZRANGE 15 18 GY
 4015. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 0.51 24.51 ZRANGE 18 23.9 GY
 4016. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 24.51 32.51 ZRANGE 18 23.9 GY
 4017. YRANGE 3.6 3.6 FLOAD -2.4 XRANGE 32.51 44.51 ZRANGE 18 23.9 GY
 4018. YRANGE 7.15 7.15 FLOAD -2.4 XRANGE 0.51 16.51 ZRANGE 9.32 15 GY
 4019. YRANGE 7.15 7.15 FLOAD -2.4 XRANGE 16.51 44.51 ZRANGE 9.32 15 GY
 4020. YRANGE 7.15 7.15 FLOAD -3.8 XRANGE 0.51 44.51 ZRANGE 15 18 GY
 4021. YRANGE 7.15 7.15 FLOAD -2.4 XRANGE 0.51 8.51 ZRANGE 18 23.9 GY
 4022. YRANGE 7.15 7.15 FLOAD -6 XRANGE 8.51 20.51 ZRANGE 18 23.9 GY
 4023. YRANGE 7.15 7.15 FLOAD -2.4 XRANGE 20.51 24.51 ZRANGE 18 23.9 GY
 4024. YRANGE 7.15 7.15 FLOAD -2.4 XRANGE 24.51 44.51 ZRANGE 18 23.9 GY
 4025. YRANGE 12.085 12.085 FLOAD -2.4 XRANGE 20.51 44.51 ZRANGE 9.32 18 GY
 4026. YRANGE 10.67 10.67 FLOAD -2.4 XRANGE 20.51 28.51 ZRANGE 18 23.9 GY
 4027. YRANGE 10.67 10.67 FLOAD -6 XRANGE 28.51 32.51 ZRANGE 18 23.9 GY
 4028. YRANGE 10.67 10.67 FLOAD -2.4 XRANGE 32.51 44.51 ZRANGE 18 23.9 GY
 4029. MEMBER LOAD
 4030. 5936 TO 5941 6109 TO 6114 UNI GY -8.52
 4031. LOAD 5 LOADTYPE ROOF LIVE TITLE ROOF LIVE LOAD
 4032. JOINT LOAD
 4033. 9 10 711 712 735 736 759 760 785 812 816 FY -11.06
 4034. 669 698 705 706 729 730 753 754 761 762 787 788 817 818 1011 1041 FY -4.15
 4035. 1238 1334 1513 1519 1933 1945 2889 2895 3514 3520 3636 3642 4814 4905 FY -8.4
 4036. 1310 1517 1943 2893 3518 3640 4881 FY -13.6
 4037. 1334 1519 1945 2895 3520 3642 4905 FY -13.16
 4038. 680 686 1023 1029 FY -13.8
 4039. 726 727 804 805 FY -18.13
 4040. 750 751 776 777 FY -16.92
 4041. LOAD COMB 6 1.4DL
 4042. 3 1.4
 4043. LOAD COMB 7 1.2 DL + 1.6 LL + 0.5 RLL
 4044. 3 1.2 4 1.6 5 0.5
 4045. LOAD COMB 8 1.2 DL + 0.5 LL + 1.6 RLL
 4046. 3 1.2 4 0.5 5 1.6
 4047. LOAD COMB 9 1.2 DL + 1.0 EQ-X + 0.5 LL
 4048. 3 1.2 1 1.0 4 0.5
 4049. LOAD COMB 10 1.2 DL + 1.0 EQ-Z + 0.5 LL
 4050. 3 1.2 2 1.0 4 0.5
 4051. LOAD COMB 11 0.9 DL + 1.0 EQ-X
 4052. 3 0.9 1 1.0
 4053. LOAD COMB 12 0.9 DL + 1.0 EQ-Z
 4054. 3 0.9 2 1.0
 4055. LOAD COMB 13 0.9 DL - 1.0 EQ-X
 4056. 3 0.9 1 -1.0
 4057. LOAD COMB 14 0.9 DL - 1.0 EQ-Z
 4058. 3 0.9 2 -1.0
 4059. PERFORM ANALYSIS

PROBLEM STATISTICS

NUMBER OF JOINTS	4913	NUMBER OF MEMBERS	1419
NUMBER OF PLATES	4243	NUMBER OF SOLIDS	0
NUMBER OF SURFACES	0	NUMBER OF SUPPORTS	196

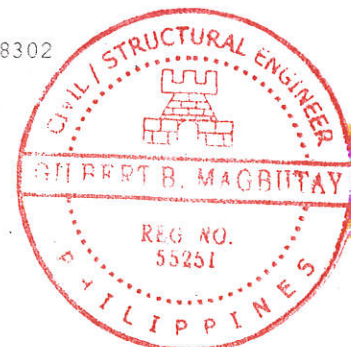
SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

ORIGINAL/FINAL BAND-WIDTH= 1241/ 463/ 2784 DOF

TOTAL PRIMARY LOAD CASES = 5, TOTAL DEGREES OF FREEDOM = 28302

SIZE OF STIFFNESS MATRIX = 78793 DOUBLE KILO-WORDS

REQRD/AVAIL. DISK SPACE = 887.0/1061767.6 MB




```

*****
*
* X DIRECTION : Ta = 0.598 Tb = 0.283 Tuser = 0.000
* T = 0.288, LOAD FACTOR = 1.000
* UBC TYPE = 97
* UBC FACTOR V = 0.1294 x      27991.12 =      3622.38 KN
*
*****
*
* Z DIRECTION : Ta = 0.598 Tb = 0.374 Tuser = 0.000
* T = 0.374, LOAD FACTOR = 1.000
* UBC TYPE = 97
* UBC FACTOR V = 0.1692 x      27991.12 =      4736.96 KN
*
*****

```

4060. START CONCRETE DESIGN

4061. CODE ACI

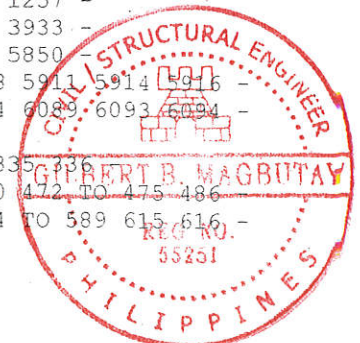
```

4062. FC 20900 MEMB 1 2 7 TO 20 184 185 191 TO 194 225 226 230 TO 233 264 265 275 -
4063. 276 TO 278 295 296 318 TO 321 353 354 375 TO 378 578 579 700 TO 709 -
4064. 1076 TO 1078 5841 TO 5847 5996 TO 6011 6175 TO 6178 6260 TO 6263 -
4065. 6350 TO 6363
4066. FC 11750 MEMB 1878 TO 1954 1956 TO 1969 1971 TO 1984 1993 TO 2027 -
4067. 2029 TO 2077 2260 TO 2266 2309 TO 2315 2355 TO 2361 2401 TO 2407 -
4068. 2456 TO 2469 2498 TO 2504 2526 TO 2532 2564 TO 2577 2614 TO 2620 -
4069. 2642 TO 2648 2680 TO 2693 2736 TO 2742 2764 TO 2770 2802 TO 2815 -
4070. 2844 TO 2850 2880 TO 2886 2918 TO 2931 2960 TO 2994 3100 TO 3106 -
4071. 3128 TO 3134 3168 TO 3174 3196 TO 3202 3236 TO 3242 3264 TO 3270 -
4072. 3307 TO 3313 3335 TO 3341 3383 TO 3389 3411 TO 3417 3451 TO 3499 -
4073. 3878 TO 3905
4074. FC 12130 MEMB 4 5 78 TO 91 187 188 198 TO 201 228 229 237 TO 240 267 268 282 -
4075. 283 TO 285 300 301 325 TO 328 356 357 382 TO 385 585 586 722 TO 724 732 5855 -
4076. 5856 TO 5864 6020 TO 6035 6182 TO 6185 6267 TO 6270 6420 TO 6433
4077. FC 11700 MEMB 3 21 TO 77 164 165 170 171 176 177 180 181 186 195 TO 197 211 -
4078. 212 215 TO 218 227 234 TO 236 250 251 254 TO 257 266 271 272 279 TO 281 297 -
4079. 298 TO 299 302 TO 305 310 TO 313 322 TO 324 339 TO 342 349 350 355 -
4080. 359 TO 362 371 372 379 TO 381 568 580 581 584 615 616 624 656 657 662 663 -
4081. 710 TO 721 779 TO 781 783 784 795 797 798 1073 1075 5848 TO 5850 5924 5931 -
4082. 5936 TO 5939 5943 5949 5950 5956 5963 5966 5973 5977 5984 5987 5993 6012 -
4083. 6013 TO 6019 6101 6109 TO 6112 6115 6123 6131 6139 TO 6141 6147 6161 6179 -
4084. 6180 TO 6181 6232 TO 6235 6264 TO 6266 6303 6309 6310 6318 6327 6333 6339 -
4085. 6340 6344 6364 TO 6419
4086. FC 11250 MEMB 906 TO 923 935 TO 952 964 TO 981 993 TO 1010 1022 TO 1039 1051 -
4087. 1052 TO 1063 1079 TO 1083 1095 TO 1112 2078 TO 2126 2267 TO 2273 2316 TO 2322 -
4088. 2362 TO 2368 2408 TO 2414 2470 TO 2483 2505 TO 2511 2533 TO 2539 -
4089. 2578 TO 2591 2621 TO 2627 2649 TO 2655 2694 TO 2707 2743 TO 2749 -
4090. 2771 TO 2777 2816 TO 2829 2851 TO 2857 2887 TO 2893 2932 TO 2945 -
4091. 2995 TO 3029 3107 TO 3113 3135 TO 3141 3175 TO 3181 3203 TO 3209 -
4092. 3243 TO 3249 3271 TO 3277 3314 TO 3320 3342 TO 3348 3390 TO 3396 -
4093. 3418 TO 3424 3500 TO 3548 3906 TO 3933 3948 TO 3961 3988 TO 4001 -
4094. 4028 TO 4041 4257 TO 4452
4095. FC 11570 MEMB 121 TO 134 205 TO 208 244 TO 247 289 TO 292 332 333 335 TO 338 -
4096. 411 TO 418 420 TO 441 740 TO 742 5873 TO 5881 6044 TO 6058 6189 TO 6191 6274 -
4097. 6275 TO 6276 6489 TO 6509
4098. FC 10380 MEMB 6 109 TO 120 166 167 172 173 173 179 182 183 202 TO 204 213 -
4099. 214 219 TO 222 241 TO 243 252 253 258 TO 261 273 274 286 TO 288 306 TO 309 -
4100. 314 315 329 TO 331 334 343 TO 346 351 352 358 363 TO 368 373 374 386 TO 410 -
4101. 419 569 587 TO 589 625 626 635 664 675 677 678 734 TO 739 782 802 803 1064 -
4102. 1074 5865 TO 5867 5925 5932 5940 5941 5944 5951 5952 5957 5964 5967 5974 -
4103. 5978 5985 5988 5994 6036 TO 6043 6102 6113 6114 6116 6124 6132 6142 TO 6144 -
4104. 6148 6162 6186 TO 6188 6236 TO 6239 6271 TO 6273 6304 6311 6312 6319 6328 -
4105. 6334 6341 6342 6345 6434 TO 6488
4106. FC 13170 MEMB 583 1320 TO 1322 1327 TO 1329 1334 TO 1336 1341 TO 1343 1348 -
4107. 1352 TO 1354 1356 1821 TO 1823 1840 1841 1988 TO 1990 2308 2442 TO 2444 2472 -
4108. 2727 3306 3378 TO 3380 3755 TO 3757 3773 3861 TO 3863 4945
4109. FC 13500 MEMB 1124 TO 1141 1153 TO 1170 1182 TO 1199 1211 TO 1228 -
4110. 1240 TO 1257 1269 TO 1286 1298 TO 1315 1357 TO 1517 2127 TO 2175 -

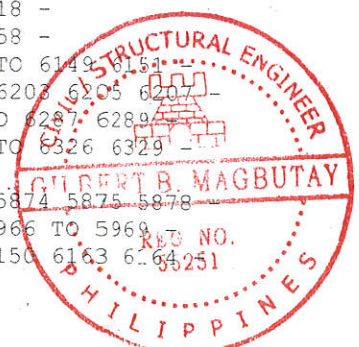
```



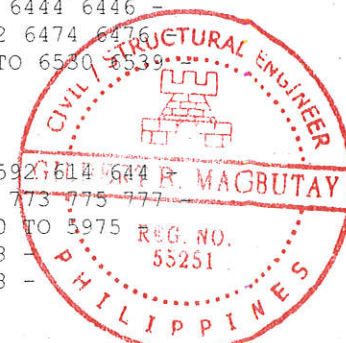
4111. 2274 TO 2280 2323 TO 2329 2369 TO 2375 2415 TO 2421 2496 2512 TO 2518 2540 -
 4112. 2541 TO 2546 2592 TO 2605 2628 TO 2634 2656 TO 2662 2708 TO 2721 2750 TO 2756 -
 4113. 2778 TO 2784 2830 TO 2843 2858 TO 2864 2894 TO 2900 2946 TO 2959 -
 4114. 3030 TO 3064 3114 TO 3120 3142 TO 3148 3182 TO 3188 3210 TO 3216 -
 4115. 3250 TO 3256 3278 TO 3284 3321 TO 3327 3349 TO 3355 3397 TO 3403 -
 4116. 3425 TO 3431 3549 TO 3597 4453 TO 4655
 4117. FC 13500 MEMB 2484 TO 2495 2497
 4118. FC 16300 MEMB 472 TO 485 503 TO 529 558 TO 563 751 753 754 764 767 TO 778 -
 4119. 5893 5896 5897 5900 5905 5908 5911 5914 5916 6066 6070 6071 6075 6080 6084 -
 4120. 6089 6093 6094 6193 TO 6199 6201 TO 6215 6278 TO 6281 6283 TO 6294 -
 4121. 6528 TO 6538 6556 TO 6576 6595 TO 6600
 4122. FC 21500 MEMB 1824 1825 1991 1992 2445 TO 2447 3381 3382 3758 3759 3864 3865 -
 4123. 4946 4947
 4124. FC 9840 MEMB 135 TO 163 168 169 174 175 189 190 209 210 223 224 248 249 262 -
 4125. 263 269 270 293 294 316 317 347 348 369 370 442 TO 454 460 TO 471 -
 4126. 486 TO 497 564 565 640 641 743 766 1065 TO 1068 1518 TO 1528 1535 TO 1557 -
 4127. 1564 TO 1586 1593 TO 1604 1616 TO 1627 1639 TO 1650 1662 TO 1674 -
 4128. 1685 TO 1734 1736 TO 1769 4656 TO 4892 5882 5886 5888 5902 5923 5926 5933 -
 4129. 5945 5953 5958 5960 5976 6059 6064 6077 6103 6105 6106 6145 6155 6192 6200 -
 4130. 6216 6217 6240 6241 6277 6282 6313 6320 6343 6346 6347 6516 TO 6527 6539 -
 4131. 6540 TO 6555
 4132. FC 9840 MEMB 570 571 574 575 590 591 644 645 679 680 683 684 696 697 1735 -
 4133. 1770 TO 1817 1826 TO 1837 1842 TO 1877 2193 2205 TO 2211 2217 TO 2223 2229 -
 4134. 2230 TO 2235 2241 TO 2247 2253 TO 2259 2288 TO 2305 2337 TO 2354 2383 TO 2400 -
 4135. 2429 TO 2438 2448 TO 2455 2519 TO 2525 2554 TO 2563 2606 TO 2613 -
 4136. 2663 TO 2679 2728 TO 2735 2785 TO 2801 2872 TO 2879 2901 TO 2917 -
 4137. 3065 TO 3099 3149 TO 3167 3217 TO 3235 3285 TO 3303 3356 TO 3374 -
 4138. 3432 TO 3450 3598 TO 3646 3654 TO 3665 3673 TO 3684 3692 TO 3751 -
 4139. 3760 TO 3771 3774 TO 3857 3866 TO 3877 3962 TO 3973 4002 TO 4013 -
 4140. 4042 TO 4053 4893 TO 4943 5929 5942 5948 5965 5968 5970 5975 5979 5981 5986 -
 4141. 5989 5995 6060 TO 6063 6117 6119 6120 6125 6127 6128 6133 6135 6136 6149 -
 4142. 6151 6152 6157 6158 6165 6166 6171 6172 6220 6221 6224 6225 6228 6229 6244 -
 4143. 6245 6248 6249 6252 6253 6256 6257 6295 6296 6299 6300 6305 6306 6314 6315 -
 4144. 6323 6324 6329 6330 6335 6336
 4145. FC 9840 MEMB 2176 TO 2192 2194 TO 2204 2212 TO 2216 2224 TO 2228 2236 TO 2240 -
 4146. 2248 TO 2252 2281 TO 2287 2330 TO 2336 2376 TO 2382 2422 TO 2428 -
 4147. 2547 TO 2553 2635 TO 2641 2757 TO 2763 2865 TO 2871 3121 TO 3127 -
 4148. 3189 TO 3195 3257 TO 3263 3328 TO 3334 3404 TO 3410 3647 TO 3653 -
 4149. 3666 TO 3672 3685 TO 3691 5883 TO 5885 5887 6163 6169
 4150. FC 9840 MEMB 455 TO 459 498 TO 502 1529 TO 1534 1558 TO 1563 1587 TO 1592 -
 4151. 1605 TO 1615 1628 TO 1638 1651 TO 1661 1675 TO 1684
 4152. FC 9330 MEMB 1518 TO 1534 1547 TO 1563 1576 TO 1592
 4153. FC 11770 MEMB 530 TO 557 566 567 572 573 576 577 592 614 642 643 646 654 681 -
 4154. 682 693 694 698 699 1069 TO 1072 5921 5922 5927 5928 5930 5934 5935 5946 -
 4155. 5947 5954 5955 5959 5961 5962 5969 5971 5972 5980 5982 5983 5990 TO 5992 -
 4156. 6104 6107 6108 6118 6121 6122 6126 6129 6130 6134 6137 6138 6146 6150 6153 -
 4157. 6154 6156 6159 6160 6164 6167 6168 6170 6173 6174 6218 6219 6222 6223 6226 -
 4158. 6227 6230 6231 6242 6243 6246 6247 6250 6251 6254 6255 6258 6259 6297 6298 -
 4159. 6301 6302 6307 6308 6316 6317 6321 6322 6325 6326 6331 6332 6337 6338 6348 -
 4160. 6349 6577 TO 6594
 4161. FC 11500 MEMB 582 1316 TO 1319 1323 TO 1326 1330 TO 1333 1337 TO 1340 1344 -
 4162. 1345 TO 1347 1349 TO 1351 1355 1818 TO 1820 1838 1839 1955 1970 1985 TO 1987 -
 4163. 2028 2306 2307 2439 TO 2441 2722 TO 2725 3304 3305 3375 TO 3377 3752 TO 3754 -
 4164. 3772 3858 TO 3860 4944
 4165. FYMAIN 230000 MEMB 1 TO 91 109 TO 134 164 TO 592 614 TO 616 624 TO 626 635 -
 4166. 640 TO 646 654 656 657 662 TO 664 675 677 TO 684 693 694 696 TO 724 732 734 -
 4167. 735 TO 743 751 753 754 764 766 TO 784 795 797 798 802 803 906 TO 923 -
 4168. 935 TO 952 964 TO 981 993 TO 1010 1022 TO 1039 1051 TO 1083 1095 TO 1112 -
 4169. 1124 TO 1141 1153 TO 1170 1182 TO 1199 1211 TO 1228 1240 TO 1257 -
 4170. 1269 TO 1286 1298 TO 2305 2309 TO 2721 2728 TO 3303 3307 TO 3933 -
 4171. 3948 TO 3973 3988 TO 4013 4028 TO 4053 4257 TO 4947 5841 TO 5850
 4172. 5855 TO 5867 5873 TO 5888 5893 5896 5897 5900 5902 5905 5908 5911 5914 5916 -
 4173. 5921 TO 5935 5942 TO 6064 6066 6070 6071 6075 6077 6080 6084 6089 6093 6094 -
 4174. 6101 TO 6108 6115 TO 6509 6516 TO 6600
 4175. FYSEC 230000 MEMB 1 TO 91 109 TO 134 164 TO 293 295 TO 333 335 336
 4176. 339 TO 366 369 TO 386 388 398 399 411 TO 414 442 444 454 460 472 TO 475 486
 4177. 497 503 TO 505 526 530 552 558 559 564 TO 569 578 TO 581 584 TO 589 615 616 -



4173. 624 TO 626 635 640 TO 643 656 657 662 TO 664 675 677 678 700 TO 724 732 734 -
 4179. 735 TO 743 751 753 766 TO 768 772 774 776 779 TO 784 795 797 798 802 803 1064 -
 4180. 1065 TO 1074 1076 5841 TO 5843 5848 TO 5850 5855 5858 TO 5860 5865 TO 5867 -
 4181. 5873 5876 5877 5882 5886 5888 5893 5896 5902 5916 5921 TO 5926 5930 TO 5933 -
 4182. 5943 TO 5945 5949 TO 5954 5956 TO 5960 5962 TO 5964 5976 5996 5997 6002 6003 -
 4183. 6012 TO 6014 6019 TO 6021 6026 6027 6036 TO 6038 6043 TO 6045 6050 6059 6064 -
 4184. 6066 6070 6077 6094 6101 TO 6108 6139 TO 6146 6155 6156 6161 6162 -
 4185. 6175 TO 6195 6200 6201 6209 6211 6213 6216 TO 6219 6232 TO 6243 6260 TO 6279 -
 4186. 6282 TO 6284 6288 6290 6292 6298 6303 6304 6309 TO 6313 6318 TO 6322 6327 -
 4187. 6328 6339 TO 6343 6346 TO 6348 6350 TO 6434 6436 6438 6440 6442 6444 6446 -
 4188. 6448 6450 6452 6454 6456 6458 6460 6462 6464 6466 6468 6470 6472 6474 6476 -
 4189. 6478 6480 6482 6484 6486 6488 TO 6491 6505 6506 6508 6509 6516 TO 6530 6539 -
 4190. 6556 6557 6574 6577 6589 6595 6596
 4191. FYSEC 230000 MEMB 334 337 338 367 368 419
 4192. FYSEC 230000 MEMB 294 1075
 4193. FYSEC 230000 MEMB 529 531 553 TO 557 560 TO 563 570 TO 577 590 TO 592 614 -
 4194. 644 TO 646 654 679 TO 684 693 694 696 TO 699 754 764 769 TO 771 773 775 777 -
 4195. 778 5927 TO 5929 5934 5935 5942 5946 TO 5948 5955 5961 5965 5970 TO 5975 -
 4196. 5981 TO 5986 5991 TO 5995 5998 TO 6001 6004 TO 6011 6015 TO 6018 -
 4197. 6022 TO 6025 6028 TO 6035 6039 TO 6042 6046 TO 6049 6051 TO 6058 -
 4198. 6060 TO 6063 6093 6115 TO 6125 6127 TO 6133 6135 TO 6138 6147 TO 6149 6151 -
 4199. 6152 TO 6154 6157 TO 6160 6165 TO 6168 6171 TO 6174 6196 6198 6203 6205 6207 -
 4200. 6210 6212 6214 6215 6220 TO 6231 6244 TO 6259 6280 6281 6285 TO 6287 6289 -
 4201. 6291 6293 TO 6297 6299 TO 6302 6305 TO 6308 6314 TO 6317 6323 TO 6326 6329 -
 4202. 6330 TO 6338 6344 6345 6349 6597 TO 6600
 4203. FYSEC 230000 MEMB 1077 1078 5844 TO 5847 5856 5857 5861 TO 5864 5874 5875 -
 4204. 5878 TO 5881 5883 TO 5885 5887 5897 5900 5905 5908 5911 5914 5966 TO 5969 -
 4205. 5977 TO 5980 5987 TO 5990 6071 6075 6080 6084 6089 6126 6134 6150 6163 6164 -
 4206. 6169 6170 6197 6199 6202 6204 6206 6208
 4207. FYSEC 230000 MEMB 387 389 TO 397 403 TO 410 415 TO 418 420 TO 441 443 445 -
 4208. 446 TO 453 455 TO 459 461 TO 471 476 TO 485 487 TO 496 498 TO 502 506 TO 525 -
 4209. 527 528 532 TO 551 6435 6437 6439 6441 6443 6445 6447 6449 6451 6453 6455 -
 4210. 6457 6459 6461 6463 6465 6467 6469 6471 6473 6475 6477 6479 6481 6483 6485 -
 4211. 6487 6492 TO 6504 6507 6531 TO 6538 6540 TO 6555 6558 TO 6573 6575 6576 6578 -
 4212. 6579 TO 6588 6590 TO 6594
 4213. MAXMAIN 20 MEMB 1 TO 91 109 TO 134 164 TO 293 295 TO 333 335 336 339 TO 366 -
 4214. 369 TO 386 388 398 399 411 TO 414 442 444 454 460 472 TO 475 486 497 503 -
 4215. 504 TO 505 526 530 552 558 559 564 TO 569 578 TO 581 584 TO 589 615 616 624 -
 4216. 625 TO 626 635 640 TO 643 656 657 662 TO 664 675 677 678 700 TO 724 732 734 -
 4217. 735 TO 743 751 753 766 TO 768 772 774 776 779 TO 784 795 797 798 802 803 1064 -
 4218. 1065 TO 1074 1076 5841 TO 5843 5848 TO 5850 5855 5858 TO 5860 5865 TO 5867 -
 4219. 5873 5876 5877 5882 5886 5888 5893 5896 5902 5916 5921 TO 5926 5930 TO 5933 -
 4220. 5943 TO 5945 5949 TO 5954 5956 TO 5960 5962 TO 5964 5976 5996 5997 6002 6003 -
 4221. 6012 TO 6014 6019 TO 6021 6026 6027 6036 TO 6038 6043 TO 6045 6050 6059 6064 -
 4222. 6066 6070 6077 6094 6101 TO 6108 6139 TO 6146 6155 6156 6161 6162 -
 4223. 6175 TO 6195 6200 6201 6209 6211 6213 6216 TO 6219 6232 TO 6243 6260 TO 6279 -
 4224. 6282 TO 6284 6288 6290 6292 6298 6303 6304 6309 TO 6313 6318 TO 6322 6327 -
 4225. 6328 6339 TO 6343 6346 TO 6348 6350 TO 6434 6436 6438 6440 6442 6444 6446 -
 4226. 6448 6450 6452 6454 6456 6458 6460 6462 6464 6466 6468 6470 6472 6474 6476 -
 4227. 6478 6480 6482 6484 6486 6488 TO 6491 6505 6506 6508 6509 6516 TO 6530 6539 -
 4228. 6556 6557 6574 6577 6589 6595 6596
 4229. MAXMAIN 20 MEMB 334 337 338 367 368 419
 4230. MAXMAIN 20 MEMB 294 1075
 4231. MAXMAIN 20 MEMB 529 531 553 TO 557 560 TO 563 570 TO 577 590 TO 592 614 644 -
 4232. 645 TO 646 654 679 TO 684 693 694 696 TO 699 754 764 769 TO 771 773 775 777 -
 4233. 778 5927 TO 5929 5934 5935 5942 5946 TO 5948 5955 5961 5965 5970 TO 5975 -
 4234. 5981 TO 5986 5991 TO 5995 5998 TO 6001 6004 TO 6011 6015 TO 6018 -
 4235. 6022 TO 6025 6028 TO 6035 6039 TO 6042 6046 TO 6049 6051 TO 6058 -
 4236. 6060 TO 6063 6093 6115 TO 6125 6127 TO 6133 6135 TO 6138 6147 TO 6149 6151 -
 4237. 6152 TO 6154 6157 TO 6160 6165 TO 6168 6171 TO 6174 6196 6198 6203 6205 6207 -
 4238. 6210 6212 6214 6215 6220 TO 6231 6244 TO 6259 6280 6281 6285 TO 6287 6289 -
 4239. 6291 6293 TO 6297 6299 TO 6302 6305 TO 6308 6314 TO 6317 6323 TO 6326 6329 -
 4240. 6330 TO 6338 6344 6345 6349 6597 TO 6600
 4241. MAXMAIN 20 MEMB 1077 1078 5844 TO 5847 5856 5857 5861 TO 5864 5874 5875 5878 -
 4242. 5879 TO 5881 5883 TO 5885 5887 5897 5900 5905 5908 5911 5914 5966 TO 5969 -
 4243. 5977 TO 5980 5987 TO 5990 6071 6075 6080 6084 6089 6126 6134 6150 6163 6164 -
 4244. 6169 6170 6197 6199 6202 6204 6206 6208



4243. MAXMAIN 20 MEMB 387 389 TO 397 400 TO 410 415 TO 418 420 TO 441 443 -
 4246. 445 TO 453 455 TO 459 461 TO 471 476 TO 485 487 TO 496 498 TO 502 -
 4247. 506 TO 525 527 528 532 TO 551 6435 6437 6439 6441 6443 6445 6447 6449 6451 -
 4248. 6453 6455 6457 6459 6461 6463 6465 6467 6469 6471 6473 6475 6477 6479 6481 -
 4249. 6483 6485 6487 6492 TO 6504 6507 6531 TO 6538 6540 TO 6555 6558 TO 6573 6575 -
 4250. 6576 6578 TO 6588 6590 TO 6594
 4251. MINMAIN 12 MEMB 1 TO 91 109 TO 134 164 TO 293 295 TO 333 335 336 339 TO 366 -
 4252. 369 TO 386 388 398 399 411 TO 414 442 444 454 460 472 TO 475 486 497 503 -
 4253. 504 TO 505 526 530 552 558 559 564 TO 569 578 TO 581 584 TO 589 615 616 624 -
 4254. 625 TO 626 635 640 TO 643 656 657 662 TO 664 675 677 678 700 TO 724 732 734 -
 4255. 735 TO 743 751 753 766 TO 768 772 774 776 779 TO 784 795 797 798 802 803 1064 -
 4256. 1065 TO 1074 1076 5841 TO 5843 5848 TO 5850 5855 5858 TO 5860 5865 TO 5867 -
 4257. 5873 5876 5877 5882 5886 5888 5893 5896 5902 5916 5921 TO 5926 5930 TO 5933 -
 4258. 5943 TO 5945 5949 TO 5954 5956 TO 5960 5962 TO 5964 5976 5996 5997 6002 6003 -
 4259. 6012 TO 6014 6019 TO 6021 6026 6027 6036 TO 6038 6043 TO 6045 6050 6059 6064 -
 4260. 6066 6070 6077 6094 6101 TO 6108 6139 TO 6146 6155 6156 6161 6162 -
 4261. 6175 TO 6195 6200 6201 6209 6211 6213 6216 TO 6219 6232 TO 6243 6260 TO 6279 -
 4262. 6282 TO 6284 6288 6290 6292 6298 6303 6304 6309 TO 6313 6318 TO 6322 6327 -
 4263. 6328 6339 TO 6343 6346 TO 6348 6350 TO 6434 6436 6438 6440 6442 6444 6446 -
 4264. 6448 6450 6452 6454 6456 6458 6460 6462 6464 6466 6468 6470 6472 6474 6476 -
 4265. 6478 6480 6482 6484 6486 6488 TO 6491 6505 6506 6508 6509 6516 TO 6530 6539 -
 4266. 6556 6557 6574 6577 6589 6595 6596
 4267. MINMAIN 12 MEMB 334 337 338 367 368 419
 4268. MINMAIN 12 MEMB 294 1075
 4269. MINMAIN 12 MEMB 529 531 553 TO 557 560 TO 563 570 TO 577 590 TO 592 614 644 -
 4270. 645 TO 646 654 679 TO 684 693 694 696 TO 699 754 764 769 TO 771 773 775 777 -
 4271. 778 5927 TO 5929 5934 5935 5942 5946 TO 5948 5955 5961 5965 5970 TO 5975 -
 4272. 5981 TO 5986 5991 TO 5995 5998 TO 6001 6004 TO 6011 6015 TO 6018 -
 4273. 6022 TO 6025 6028 TO 6035 6039 TO 6042 6046 TO 6049 6051 TO 6058 -
 4274. 6060 TO 6063 6093 6115 TO 6125 6127 TO 6133 6135 TO 6138 6147 TO 6149 6151 -
 4275. 6152 TO 6154 6157 TO 6160 6165 TO 6168 6171 TO 6174 6196 6198 6203 6205 6207 -
 4276. 6210 6212 6214 6215 6220 TO 6231 6244 TO 6259 6280 6281 6285 TO 6287 6289 -
 4277. 6291 6293 TO 6297 6299 TO 6302 6305 TO 6308 6314 TO 6317 6323 TO 6326 6329 -
 4278. 6330 TO 6338 6344 6345 6349 6597 TO 6600
 4279. MINMAIN 12 MEMB 1077 1078 5844 TO 5847 5856 5857 5861 TO 5864 5874 5875 5878 -
 4280. 5879 TO 5881 5883 TO 5885 5887 5897 5900 5905 5908 5911 5914 5966 TO 5969 -
 4281. 5977 TO 5980 5987 TO 5990 6071 6075 6080 6084 6089 6126 6134 6150 6163 6164 -
 4282. 6169 6170 6197 6199 6202 6204 6206 6208
 4283. MINMAIN 12 MEMB 387 389 TO 397 400 TO 410 415 TO 418 420 TO 441 443 -
 4284. 445 TO 453 455 TO 459 461 TO 471 476 TO 485 487 TO 496 498 TO 502 -
 4285. 506 TO 525 527 528 532 TO 551 6435 6437 6439 6441 6443 6445 6447 6449 6451 -
 4286. 6453 6455 6457 6459 6461 6463 6465 6467 6469 6471 6473 6475 6477 6479 6481 -
 4287. 6483 6485 6487 6492 TO 6504 6507 6531 TO 6538 6540 TO 6555 6558 TO 6573 6575 -
 4288. 6576 6578 TO 6588 6590 TO 6594
 4289. MINSEC 10 MEMB 1 TO 91 109 TO 134 164 TO 293 295 TO 333 335 336 339 TO 366 -
 4290. 369 TO 386 388 398 399 411 TO 414 442 444 454 460 472 TO 475 486 497 503 -
 4291. 504 TO 505 526 530 552 558 559 564 TO 569 578 TO 581 584 TO 589 615 616 624 -
 4292. 625 TO 626 635 640 TO 643 656 657 662 TO 664 675 677 678 700 TO 724 732 734 -
 4293. 735 TO 743 751 753 766 TO 768 772 774 776 779 TO 784 795 797 798 802 803 1064 -
 4294. 1065 TO 1074 1076 5841 TO 5843 5848 TO 5850 5855 5858 TO 5860 5865 TO 5867 -
 4295. 5873 5876 5877 5882 5886 5888 5893 5896 5902 5916 5921 TO 5926 5930 TO 5933 -
 4296. 5943 TO 5945 5949 TO 5954 5956 TO 5960 5962 TO 5964 5976 5996 5997 6002 6003 -
 4297. 6012 TO 6014 6019 TO 6021 6026 6027 6036 TO 6038 6043 TO 6045 6050 6059 6064 -
 4298. 6066 6070 6077 6094 6101 TO 6108 6139 TO 6146 6155 6156 6161 6162 -
 4299. 6175 TO 6195 6200 6201 6209 6211 6213 6216 TO 6219 6232 TO 6243 6260 TO 6279 -
 4300. 6282 TO 6284 6288 6290 6292 6298 6303 6304 6309 TO 6313 6318 TO 6322 6327 -
 4301. 6328 6339 TO 6343 6346 TO 6348 6350 TO 6434 6436 6438 6440 6442 6444 6446 -
 4302. 6448 6450 6452 6454 6456 6458 6460 6462 6464 6466 6468 6470 6472 6474 6476 -
 4303. 6478 6480 6482 6484 6486 6488 TO 6491 6505 6506 6508 6509 6516 TO 6530 6539 -
 4304. 6556 6557 6574 6577 6589 6595 6596
 4305. MINSEC 10 MEMB 334 337 338 367 368 419
 4306. MINSEC 10 MEMB 294 1075
 4307. MINSEC 10 MEMB 529 531 553 TO 557 560 TO 563 570 TO 577 590 TO 592 614 644 -
 4308. 645 TO 646 654 679 TO 684 693 694 696 TO 699 754 764 769 TO 771 773 775 777 -
 4309. 778 5927 TO 5929 5934 5935 5942 5946 TO 5948 5955 5961 5965 5970 TO 5975 -
 4310. 5981 TO 5986 5991 TO 5995 5998 TO 6001 6004 TO 6011 6015 TO 6018 -
 4311. 6022 TO 6025 6028 TO 6035 6039 TO 6042 6046 TO 6049 6051 TO 6058 -



4312. 6060 TO 6063 6093 6115 TO 6125 6127 TO 6133 6135 TO 6138 6147 TO 6149 6151 -
 4313. 6152 TO 6154 6157 TO 6160 6165 TO 6168 6171 TO 6174 6196 6198 6203 6205 6207 -
 4314. 6210 6212 6214 6215 6220 TO 6231 6244 TO 6259 6280 6281 6285 TO 6287 6289 -
 4315. 6291 6293 TO 6297 6299 TO 6302 6305 TO 6308 6314 TO 6317 6323 TO 6326 6329 -
 4316. 6330 TO 6338 6344 6345 6349 6597 TO 6600
 4317. MINSEC 10 MEMB 1077 1078 5844 TO 5847 5856 5857 5861 TO 5864 5874 5875 5878 -
 4318. 5879 TO 5881 5883 TO 5885 5887 5897 5900 5905 5908 5911 5914 5966 TO 5969 -
 4319. 5977 TO 5980 5987 TO 5990 6071 6075 6080 6084 6089 6126 6134 6150 6163 6164 -
 4320. 6169 6170 6197 6199 6202 6204 6206 6208
 4321. MINSEC 10 MEMB 387 389 TO 397 400 TO 410 415 TO 418 420 TO 441 443 -
 4322. 445 TO 453 455 TO 459 461 TO 471 476 TO 485 487 TO 496 498 TO 502 -
 4323. 506 TO 525 527 528 532 TO 551 6435 6437 6439 6441 6443 6445 6447 6449 6451 -
 4324. 6453 6455 6457 6459 6461 6463 6465 6467 6469 6471 6473 6475 6477 6479 6481 -
 4325. 6483 6485 6487 6492 TO 6504 6507 6531 TO 6538 6540 TO 6555 6558 TO 6573 6575 -
 4326. 6576 6578 TO 6588 6590 TO 6594
 4327. DESIGN BEAM 3 6 21 TO 77 92 TO 120 135 TO 155 164 TO 183 186 189 190 -
 4328. 195 TO 197 202 TO 204 209 TO 224 227 234 TO 236 241 TO 243 248 TO 263 266 -
 4329. 269 TO 274 279 TO 281 286 TO 288 293 297 TO 299 302 TO 317 322 TO 324 329 -
 4330. 330 TO 331 339 TO 352 355 358 TO 366 369 TO 374 379 TO 381 386 388 398 399 -
 4331. 442 444 454 460 486 497 530 552 564 TO 569 580 581 584 587 TO 589 615 616 -
 4332. 624 TO 626 635 640 TO 643 656 657 662 TO 664 675 677 678 710 TO 713 -
 4333. 718 TO 721 734 TO 739 743 766 782 784 795 797 798 802 803 1064 TO 1075 5848 -
 4334. 5849 TO 5850 5865 TO 5867 5882 5886 5888 5902 5921 TO 5926 5930 TO 5933 5936 -
 4335. 5937 TO 5941 5943 TO 5945 5949 TO 5954 5956 TO 5960 5962 TO 5964 5976 6012 -
 4336. 6013 TO 6014 6019 6036 TO 6038 6043 6059 6064 6077 6101 TO 6114 6139 TO 6146 -
 4337. 6155 6156 6161 6162 6179 TO 6181 6186 TO 6188 6192 6200 6216 TO 6219 6232 -
 4338. 6233 TO 6243 6264 TO 6266 6271 TO 6273 6277 6282 6298 6303 6304 6309 TO 6313 -
 4339. 6318 TO 6322 6327 6328 6339 TO 6343 6346 TO 6348 6364 6386 6397 6405 6434 -
 4340. 6456 6466 6474 6516 6539 6577 6589

=====
 BEAM NO. 3 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 6850. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX POS MOMENT = 69.46 KN-MET, LOADING 7

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX NEG MOMENT = 73.86 KN-MET, LOADING 10

7J 6849X 250X 350 8J

=====
 BEAM NO. 6 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 6850. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	6850.	YES YES
2	396.	5 - 12MM	0.	6850.	YES YES



BEAM NO. 6 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 0.15 KNS Vc= 63.53 KNS Vs= 0.00 KNS
 T₁= 0.00 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 0.15 KNS Vc= 63.53 KNS Vs= 0.00 KNS
 T₁= 2.00 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

9J 6849X 300X 450 10J

5N12 H 396. 0.TO 6850

3N12 H 54. 0.TO 6850

00000	00000	00000	00000	00000
5#12	5#12	5#12	5#12	5#12
3#12	3#12	3#12	3#12	3#12
000	000	000	000	000

BEAM NO. 21 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 503. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR.
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 503. YES YES
 2 146. 2 - 12MM 0. 503. YES YES

BEAM NO. 21 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 1.99 KNS Vc= 16.52 KNS Vs= 0.00 KNS
 T₁= 0.79 KN-MET Tc= 0.4 KN-MET Ts= 1.0 KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 109. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.94 SQ.CM.

AT END SUPPORT - Vu= 2.18 KNS Vc= 16.52 KNS Vs= 0.00 KNS
 T₁= 0.79 KN-MET Tc= 0.4 KN-MET Ts= 1.0 KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 109. MM

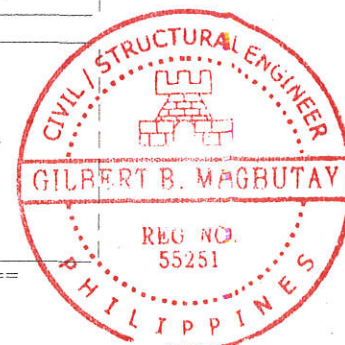
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.94 SQ.CM.

221J 502X 200X 200 222J

2N12cHc154. 0.TO 503

3*10c/c 57

00	00	00	00
2#12	2#12	2#12	2#12
00	00	00	00



BEAM NO. 22 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 14. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	14.	YES	YES
2	146.	2 - 12MM	0.	14.	YES	YES

BEAM NO. 22 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 22 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 22 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 222J 13X 200X 200 223J

2N012 H 154. 0 TO 14

2#12
OO

2#12
OO

2#12
OO

2#12
OO

BEAM NO. 23 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 489. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	489.	YES	YES
2	146.	2 - 12MM	0.	489.	YES	YES

BEAM NO. 23 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.20$ KNS $V_c = 29.06$ KNS $V_s = 0.00$ KNS
 $T_u = 0.21$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 103. MM
 AT END SUPPORT - $V_u = 0.20$ KNS $V_c = 29.06$ KNS $V_s = 0.00$ KNS
 $T_u = 0.21$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 103. MM
 223J 489X 200X 200 224J

2N012cHc154. 0 TO 489 3*10c/c 73

2#12
OO

2#12
OO

2#12
OO

2#12
OO




```

=====
BEAM NO. 24 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 27. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
      (MM)      (MM)      (MM)      STA END

```

```

1      54.      2 - 12MM      0.      27.      YES YES
2      146.     2 - 12MM      0.      27.      YES YES

```

BEAM NO. 24 DESIGN RESULTS - SHEAR

```

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 24 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 24 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
224J      27X 200X 200      225J

```

```

=====
2Nø12 H 154. 0.TO 27
=====

```

```

  OO
2#12
  OO

```

```

  OO
2#12
  OO

```

```

  OO
2#12
  OO

```

```

  OO
2#12
  OO

```

```

=====
BEAM NO. 25 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 476. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
      (MM)      (MM)      (MM)      STA END

```

```

1      54.      2 - 12MM      0.      476.      YES YES
2      146.     2 - 12MM      0.      476.      YES YES

```

BEAM NO. 25 DESIGN RESULTS - SHEAR

```

AT START SUPPORT - Vu= 0.07 KNS Vc= 16.36 KNS Vs= 0.00 KNS
Tu= 0.12 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1
NO STIRRUPS ARE REQUIRED FOR TORSION.

```

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 96. MM

```

AT END SUPPORT - Vu= 0.07 KNS Vc= 29.01 KNS Vs= 0.00 KNS
Tu= 0.12 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

```

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 96. MM

```

225J      475X 200X 200      226J

```

```

=====
2Nø12cHc154. 0.TO 476. 3*10c/c 73
=====

```


2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 26 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 41. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL HEIGHT BAR INFO FROM TO ANCHOR

(MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	41.	YES	YES
2	146.	2 - 12MM	0.	41.	YES	YES

BEAM NO. 26 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 26 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 26 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

226J 40X 200X 200 227J

=====

2No12 H 154. 0. TO 41

=====

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 27 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 462. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL HEIGHT BAR INFO FROM TO ANCHOR

(MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	462.	YES	YES
2	146.	2 - 12MM	0.	462.	YES	YES

BEAM NO. 27 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.02$ KNS $V_c = 16.54$ KNS $V_s = 0.00$ KNS

$T_u = 0.04$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 89. MM

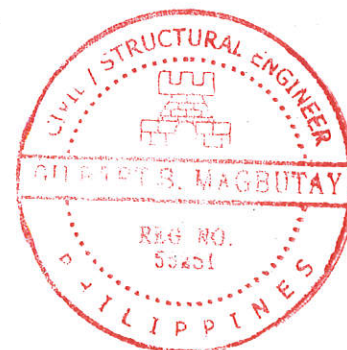
AT END SUPPORT - $V_u = 0.02$ KNS $V_c = 16.54$ KNS $V_s = 0.00$ KNS

$T_u = 0.04$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 89. MM



227J

461X 200X 200

228J

2No12cHc154. | 0.TO 462 |

3*10c/c 73 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 28 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 55. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	55.	YES	YES
2	146.	2 - 12MM	0.	55.	YES	YES

BEAM NO. 28 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 28 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 28 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 228J 54X 200X 200 229J

2No12 H 154. 0.TO 55

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

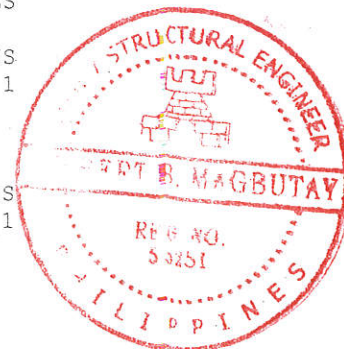
oo

oo

BEAM NO. 29 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 448. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	448.	YES	YES
2	146.	2 - 12MM	0.	448.	YES	YES

BEAM NO. 29 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 0.01 KNS Vc= 16.50 KNS Vs= 0.00 KNS
 T1= 0.01 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 82. MM
 AT END SUPPORT - Vu= 0.01 KNS Vc= 16.50 KNS Vs= 0.00 KNS
 T1= 0.01 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 82. MM

229J

448X 200X 200

230J

2N12cHc154. | 0.TC 443 |

3*10c/c 73 |

 2#12
 00
 00

 2#12
 00
 00

 2#12
 00
 00

 2#12
 00
 00

BEAM NO. 30 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 68. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	68.	YES	YES
2	146.	2 - 12MM	0.	68.	YES	YES

BEAM NO. 30 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 30 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 30 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 230J 67X 200X 200 231J

2N12 H 154. 0.TC 63

 2#12
 00
 00

 2#12
 00
 00

 2#12
 00
 00

 2#12
 00
 00

BEAM NO. 31 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 435. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	435.	YES	YES
2	146.	2 - 12MM	0.	435.	YES	YES

BEAM NO. 31 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 16.46$ KNS $V_s = 0.00$ KNS
 $T_u = 0.06$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 76. MM
 AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 16.46$ KNS $V_s = 0.00$ KNS
 $T_u = 0.06$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 76. MM

231J

434X 200X 200

232J

2N12cHc154. | 0.TO. 435 |

3*10c/c 73 |

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

BEAM NO. 32 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 32. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	57.	YES	NO
2	54.	2 - 12MM	0.	82.	YES	YES
3	146.	2 - 12MM	0.	82.	YES	YES

BEAM NO. 32 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 32 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 32 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 232J 31X 200X 200 233J

2N12 H 154. 0.TO 57

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

BEAM NO. 33 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 421. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

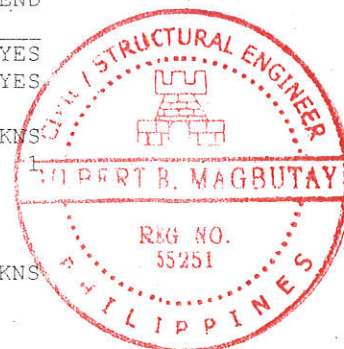
1	54.	2 - 12MM	0.	421.	YES	YES
2	146.	2 - 12MM	0.	421.	YES	YES

BEAM NO. 33 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 16.42$ KNS $V_s = 0.00$ KNS
 $T_u = 0.10$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 69. MM

AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 16.42$ KNS $V_s = 0.00$ KNS

T₁= 0.10 KN-MET T_c= 0.4 KN-MET T_s= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 69. MM
 233J 421X 200X 200 234J

2N₁₂CHc154. 10.TO 421 | 2*10c/c 73 |

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 34 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 95. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	60.	YES	NO
2	54.	2 - 12MM	0.	95.	YES	YES
3	146.	2 - 12MM	0.	95.	YES	YES

BEAM NO. 34 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 34 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 34 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 234J 95X 200X 200 235J

2N₁₂ H 154. 0.TO 60

2#12
 ○○
 ○○

2#12
 ○○
 ○○

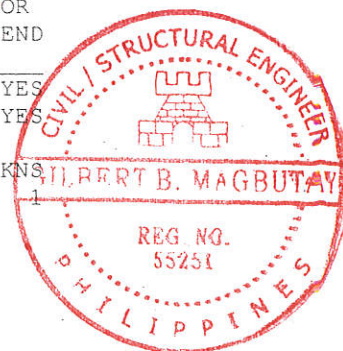
2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 35 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 408. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	408.	YES	YES
2	146.	2 - 12MM	0.	408.	YES	YES

BEAM NO. 35 DESIGN RESULTS - SHEAR
 AT START SUPPORT - V_u= 0.02 KNS V_c= 16.38 KNS V_s= 0.00 KNS
 T₁= 0.14 KN-MET T_c= 0.4 KN-MET T_s= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 62. MM
 AT END SUPPORT - $V_u = 0.02$ KNS $V_c = 16.38$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.14$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 62. MM
 235J 407X 200X 200 236J

=====

2N ϕ 12cHc154. 10. TO 403 | 2*10c/c 73 |

=====

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

=====

BEAM NO. 36 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 109. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	61.	YES	NO
2	54.	2 - 12MM	0.	109.	YES	YES
3	146.	2 - 12MM	0.	109.	YES	YES

BEAM NO. 36 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 36 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 36 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 236J 108X 200X 200 237J

=====

2N ϕ 12 H 154. 0. TO 161

=====

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

2#12 $\circ\circ$
 $\circ\circ$

=====

BEAM NO. 37 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 394. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	394.	YES	YES
2	146.	2 - 12MM	0.	394.	YES	YES

BEAM NO. 37 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.03$ KNS $V_c = 16.33$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.20$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1



NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 55. MM

AT END SUPPORT - $V_u = 0.03$ KNS $V_c = 16.33$ KNS $V_s = 0.00$ KNS

$T_u = 0.20$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 55. MM

237J

393X 200X 200

238J

2N ϕ 12cHc154. 0.TO 394

2*10c/c 73

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

BEAM NO. 38 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN -	HEIGHT	FY -	FC -	MPA, SIZE -	200. X	200. MMS
LEVEL	(MM)	BAR INFO	FROM	TO	ANCHOR	STA END
			(MM)	(MM)		

1	54.	2 - 12MM	0.	59.	YES	NO
2	54.	2 - 12MM	0.	122.	YES	YES
3	146.	2 - 12MM	0.	122.	YES	YES

BEAM NO. 38 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 38 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 38 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

238J

122X 200X 200

239J

2N ϕ 12 H 154. 0.TO 159

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

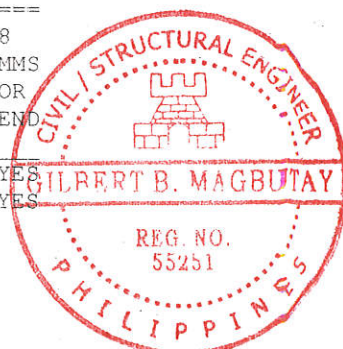
OO

BEAM NO. 39 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN -	HEIGHT	FY -	FC -	MPA, SIZE -	200. X	200. MMS
LEVEL	(MM)	BAR INFO	FROM	TO	ANCHOR	STA END
			(MM)	(MM)		

1	54.	2 - 12MM	0.	380.	YES	YES
2	146.	2 - 12MM	0.	380.	YES	YES

BEAM NO. 39 DESIGN RESULTS - SHEAR



AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 16.26$ KNS $V_s = 0.00$ KNS
 $T_u = 0.21$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 48. MM
 AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 16.26$ KNS $V_s = 0.00$ KNS
 $T_u = 0.21$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 48. MM

239J 380X 200X 200 240J

2N ϕ 12cHc154. 0.TO 380 2*10c/c 73

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 40 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 136. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	45.	YES	NO
2	54.	2 - 12MM	0.	136.	YES	YES
3	146.	2 - 12MM	0.	136.	YES	YES

BEAM NO. 40 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 40 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 40 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 240J 135X 200X 200 241J

2N ϕ 12 H 154. 0.TO 145

2#12
 ○○
 ○○

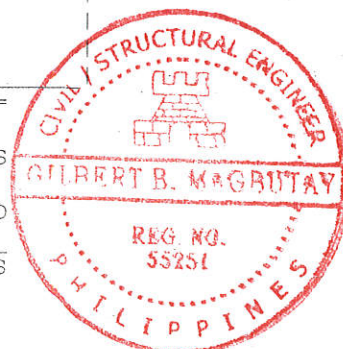
2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 41 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 367. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	367.	YES	YES
---	-----	----------	----	------	-----	-----



2 146. 2 - 12MM 0. 367. YES YES
 BEAM NO. 41 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 7.28$ KNS $V_c = 16.45$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.73$ KN-MET $T_c = 0.4$ KN-MET $T_s = 1.0$ KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 41. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.87 SQ.CM.
 AT END SUPPORT - $V_u = 7.35$ KNS $V_c = 16.45$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.73$ KN-MET $T_c = 0.4$ KN-MET $T_s = 1.0$ KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 41. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.87 SQ.CM.
 241J 366X 200X 200 242J

=====

2N ϕ 12cHc154. 0.TO 367	2*10c/c 57
--------------------------------	------------

=====

2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○
------------	------------	------------	------------

=====

BEAM NO.	42	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 150. MM	FY - 230.	FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

1	54.	2 - 12MM	0.	150.	YES	YES
2	146.	2 - 12MM	0.	150.	YES	YES

BEAM NO. 42 DESIGN RESULTS - SHEAR

- ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 42 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 42 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 242J 149X 200X 200 243J

=====

2N ϕ 12 H 154. 0.TO 150

=====

2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○
------------	------------	------------	------------

=====

BEAM NO.	43	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 353. MM	FY - 230.	FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR



	(MM)		(MM)		(MM)	STA	END
1	54.	2 - 12MM	0.	353.		YES	YES
2	146.	2 - 12MM	0.	353.		YES	YES

BEAM NO. 43 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.79 KNS Tu= 1.7 KN-MET

Vc= 29.2 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - Vu= 0.79 KNS Tu= 1.7 KN-MET

Vc= 29.2 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

243J 353X 200X 200 244J

2No12 H 154. 0 TO 353

2#12
OO
OO

2#12
OO
OO

2#12
OO
OO

2#12
OO
OO

BEAM NO. 44 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 147. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	54.	2 - 12MM	0.	80.	YES	NO	
2	54.	2 - 12MM	0.	147.	YES	YES	
3	146.	2 - 12MM	0.	147.	YES	YES	

BEAM NO. 44 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 44 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 44 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

244J 146X 200X 200 245J

2No12 H 154. 0 TO 180

2#12
OO
OO

2#12
OO
OO

2#12
OO
OO

2#12
OO
OO

BEAM NO. 45 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 356. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----



1	54.	2 - 12MM	0.	356.	YES	YES
2	146.	2 - 12MM	0.	356.	YES	YES
3	146.	2 - 12MM	0.	356.	YES	YES

B E A M N O. 45 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - Vu= 0.60 KNS Vc= 16.49 KNS Vs= 0.00 KNS

T1= 0.00 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 36. MM

AT END SUPPORT - Vu= 0.60 KNS Vc= 16.49 KNS Vs= 0.00 KNS

T1= 0.00 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 36. MM

245J 355X 200X 200 246J

2No12cHc154. 0.TO 356 | 2*10c/c 73

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

B E A M N O. 46 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 144. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA - END

1	54.	2 - 12MM	0.	55.	YES	NO
---	-----	----------	----	-----	-----	----

2	54.	2 - 12MM	0.	144.	YES	YES
---	-----	----------	----	------	-----	-----

3	146.	2 - 12MM	0.	144.	YES	YES
---	------	----------	----	------	-----	-----

B E A M N O. 46 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 46 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 46 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

246J 144X 200X 200 247J

2No12 H 154. 0.TO 155

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

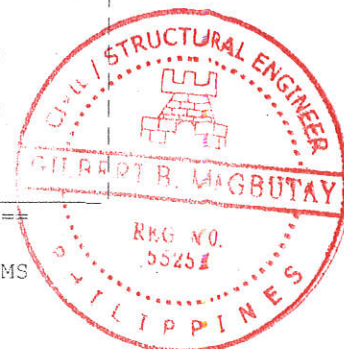
2#12

oo

oo

B E A M N O. 47 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 359. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA. END
-------	----------------	----------	--------------	------------	--------------------

1	54.	2 - 12MM	0.	359.	YES YES
2	146.	2 - 12MM	0.	359.	YES YES

BEAM NO. 47 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.60$ KNS $V_c = 16.40$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.04$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 37. MM

AT END SUPPORT - $V_u = 0.60$ KNS $V_c = 16.40$ KNS $V_s = 0.00$ KNS

$T_1 = 0.04$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 37. MM

247J 358X 200X 200 248J

2N ϕ 12cHc154. 0.TO 359 2*10c/c 73

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 48 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 141. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM)

1	54.	2 - 12MM	0.	141.	YES YES
2	146.	2 - 12MM	0.	141.	YES YES

BEAM NO. 48 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 48 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 48 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

248J 141X 200X 200 249J

2N ϕ 12 H 154. 0.TO 141

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 49 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

REG NO.
55251



LEN - 361. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	361.	YES	YES
2	146.	2 - 12MM	0.	361.	YES	YES

BEAM NO. 49 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.62$ KNS $V_c = 16.35$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.14$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 39. MM

AT END SUPPORT - $V_u = 0.62$ KNS $V_c = 16.35$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.14$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 39. MM

249J 361X 200X 200 250J

2N ϕ 12cHc154. 0.TO 361

2*10c/c 73

2#12

2#12

2#12

2#12

BEAM NO. 50 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 139. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	139.	YES	YES
2	146.	2 - 12MM	0.	139.	YES	YES

BEAM NO. 50 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 50 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 50 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

250J 138X 200X 200 251J

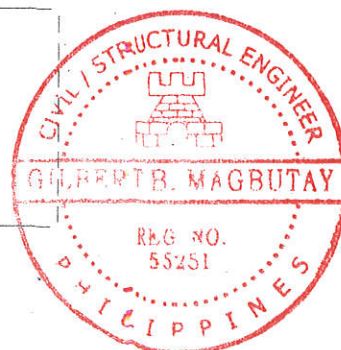
2N ϕ 12 H 154. 0.TO 139

2#12

2#12

2#12

2#12



BEAM NO. 51 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 364. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	2 - 12MM	0.	364.	YES	YES	
2	146.	2 - 12MM	0.	364.	YES	YES	

BEAM NO. 51 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.64$ KNS $V_c = 16.30$ KNS $V_s = 0.00$ KNS
 $T_u = 0.14$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 40. MM

AT END SUPPORT - $V_u = 0.64$ KNS $V_c = 16.30$ KNS $V_s = 0.00$ KNS

$T_u = 0.14$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 40. MM

251J 364X 200X 200 252J

2N ϕ 12cHc154. 0.TO 364

2*10c/c 73

2#12

oo
oo

2#12

oo
oo

2#12

oo
oo

2#12

oo
oo

BEAM NO. 52 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 136. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	2 - 12MM	0.	136.	YES	YES	
2	146.	2 - 12MM	0.	136.	YES	YES	

BEAM NO. 52 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 52 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 52 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

252J 135X 200X 200 253J

2N ϕ 12 H 154. 0.TO 136

2#12

oo
oo

2#12

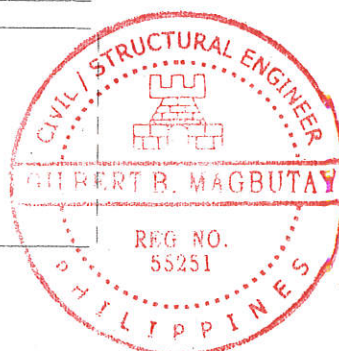
oo
oo

2#12

oo
oo

2#12

oo
oo



=====

BEAM NO. 53 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	367. MM
FY -	230. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT
	(MM)
BAR INFO	FROM
	(MM)
TO	ANCHOR
	(MM)
STA	END

1	54.	2 - 12MM	0.	367.	YES	YES
2	146.	2 - 12MM	0.	367.	YES	YES

BEAM NO. 53 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 7.09$ KNS $V_c = 24.56$ KNS $V_s = 0.00$ KNS

$T_1 = 0.68$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.9$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 42. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.81 SQ.CM.

AT END SUPPORT - $V_u = 7.16$ KNS $V_c = 19.22$ KNS $V_s = 0.00$ KNS

$T_1 = 0.68$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.9$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 42. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.81 SQ.CM.

253J 366X 200X 200 254J

2N ϕ 12cHc154. | 0.TO 367

2*10c/c 57 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

=====

BEAM NO. 54 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	133. MM
FY -	230. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT
	(MM)
BAR INFO	FROM
	(MM)
TO	ANCHOR
	(MM)
STA	END

1	54.	2 - 12MM	0.	133.	YES	YES
---	-----	----------	----	------	-----	-----

2	146.	2 - 12MM	0.	133.	YES	YES
---	------	----------	----	------	-----	-----

3	146.	2 - 12MM	0.	133.	YES	YES
---	------	----------	----	------	-----	-----

BEAM NO. 54 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 54 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 54 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

254J 133X 200X 200 255J

2N ϕ 12 H 154. 0.TO 133



2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 55 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 370. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	370.	YES	YES
2	54.	2 - 12MM	214.	370.	NO	YES
3	146.	2 - 12MM	0.	370.	YES	YES

BEAM NO. 55 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 2.02 KNS Tu= 1.7 KN-MET

Vc= 29.3 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - Vu= 2.02 KNS Tu= 1.7 KN-MET

Vc= 29.3 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

255J 369X 200X 200 256J

2No12 H 154. 0.TO 370.	2No12 H 54. 214.TO 370
------------------------	------------------------

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 56 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 122. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	122.	YES	YES
2	146.	2 - 12MM	0.	122.	YES	YES

BEAM NO. 56 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 56 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 56 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

256J 122X 200X 200 257J

2No12 H 154. 0.TO 122



2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 57 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 381. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	381.	YES	YES
2	146.	2 - 12MM	0.	381.	YES	YES

BEAM NO. 57 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 1.09 KNS Vc= 16.56 KNS Vs= 0.00 KNS

T1= 0.06 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 48. MM

AT END SUPPORT - Vu= 1.09 KNS Vc= 16.56 KNS Vs= 0.00 KNS

T1= 0.06 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 48. MM

257J 380X 200X 200 258J

2No12cHc154.	0.TO 381	2*10c/c 73
--------------	----------	------------

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 58 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 111. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

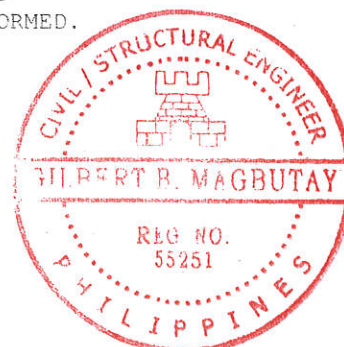
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	111.	YES	YES
2	146.	2 - 12MM	0.	111.	YES	YES

BEAM NO. 58 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 58 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 58 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



258J

110X 200X 200

259J

2No12 H 154. 0.TO 111

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

BEAM NO. 59 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 392. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 392. YES YES
 2 146. 2 - 12MM 0. 392. YES YES

BEAM NO. 59 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.95$ KNS $V_c = 16.50$ KNS $V_s = 0.00$ KNS
 $T_u = 0.05$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 54. MM

AT END SUPPORT - $V_u = 0.95$ KNS $V_c = 16.50$ KNS $V_s = 0.00$ KNS
 $T_u = 0.05$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 54. MM

259J

391X 200X 200

260J

2No12cHc154. 0.TO 392

2*10c/c 73

2#12

OO

OO

2#12

OO

OO

2#12

OO

OO

2#12

OO

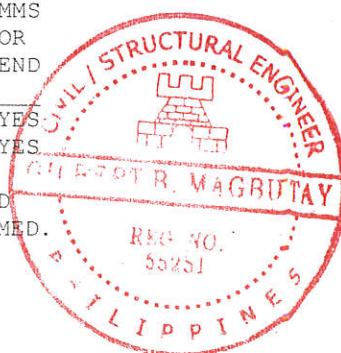
OO

BEAM NO. 60 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 100. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 100. YES YES
 2 146. 2 - 12MM 0. 100. YES YES

BEAM NO. 60 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 60 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 60 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
260J 99X 200X 200 261J

2N512 H 154. 0 TO 100

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 61 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 403. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	403.	YES	YES
2	146.	2 - 12MM	0.	403.	YES	YES
3	146.	2 - 12MM	0.	403.	YES	YES

BEAM NO. 61 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.87$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS

$T_u = 0.00$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 60. MM

AT END SUPPORT - $V_u = 0.87$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS

$T_u = 0.00$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 60. MM

261J 402X 200X 200 262J

2N512cHc154. 10 TO 403

2*10c/c 73

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

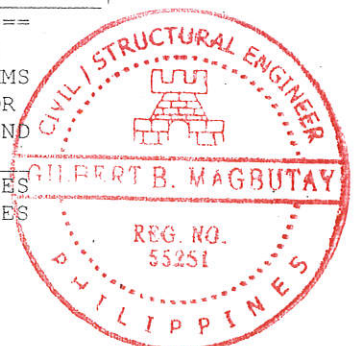
oo

oo

BEAM NO. 62 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 89. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	89.	YES	YES
2	146.	2 - 12MM	0.	89.	YES	YES

BEAM NO. 62 DESIGN RESULTS - SHEAR



** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 62 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 62 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 262J 88X 200X 200 263J

2Nc12 H 154. 0.TO 89

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 63 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 414. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	414.	YES	YES
2	146.	2 - 12MM	0.	414.	YES	YES
3	146.	2 - 12MM	0.	414.	YES	YES

BEAM NO. 63 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.81$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS
 $T_u = 0.03$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 65. MM
 AT END SUPPORT - $V_u = 0.81$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS
 $T_u = 0.03$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 65. MM

263J 413X 200X 200 264J

2Nc12cHc154. 10.TO 414

2*10c/c 73

2#12
 ○○
 ○○

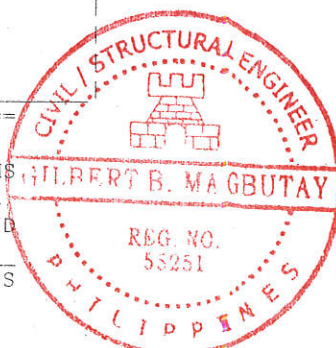
2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 64 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 78. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	78.	YES	YES
---	-----	----------	----	-----	-----	-----



2 146. 2 - 12MM 0. 78. YES YES
 BEAM NO. 64 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 64 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 64 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 264J 77X 200X 200 265J

=====

2N12 H 154. 0 TO 73

=====

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

=====

BEAM NO. 65 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 425. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	34.	2 - 12MM	0.	425.	YES YES
2	146.	2 - 12MM	0.	425.	YES YES
3	146.	2 - 12MM	0.	425.	YES YES

BEAM NO. 65 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 0.74 KNS Vc= 16.49 KNS Vs= 0.00 KNS
 T1= 0.05 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 71. MM

AT END SUPPORT - Vu= 0.74 KNS Vc= 16.49 KNS Vs= 0.00 KNS

T1= 0.05 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 71. MM

265J 425X 200X 200 266J

=====

2N12cHc154. 10 TO 425

=====

2*10c/c 73

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

=====

BEAM NO. 66 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 67. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END



1	34.	2 - 12MM	0.	67.	YES	YES
2	146.	2 - 12MM	0.	67.	YES	YES

B E A M N O. 66 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 66 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 66 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

266J 66X 200X 200 267J

2N>12 H 154. 0 TO 67

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

B E A M N O. 67 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 436. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	34.	2 - 12MM	0.	436.	YES	YES
---	-----	----------	----	------	-----	-----

2	146.	2 - 12MM	0.	436.	YES	YES
---	------	----------	----	------	-----	-----

3	146.	2 - 12MM	0.	436.	YES	YES
---	------	----------	----	------	-----	-----

B E A M N O. 67 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - Vu= 0.67 KNS Vc= 16.49 KNS Vs= 0.00 KNS

Tu= 0.07 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 76. MM

AT END SUPPORT - Vu= 0.67 KNS Vc= 16.49 KNS Vs= 0.00 KNS

Tu= 0.07 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 76. MM

267J 436X 200X 200 268J

2N>12cHc154. | 0 TO 436 |

3*10c/c 73 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

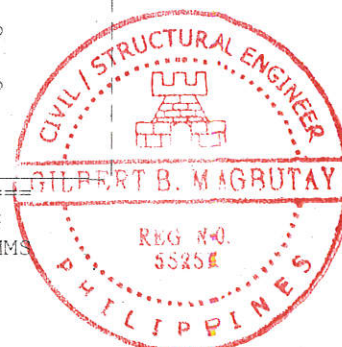
2#12

oo

oo

B E A M N O. 68 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 56. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
1	54.	2 - 12MM	0.	56.	YES	YES
2	146.	2 - 12MM	0.	56.	YES	YES

B E A M N O. 68 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 68 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 68 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

268J

55X 200X 200

269J

2No12 H 154. 0 TO 56

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

B E A M N O. 69 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 447. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
-------	----------------	----------	--------------	------------	-------------------	--

1	54.	2 - 12MM	0.	447.	YES	YES
---	-----	----------	----	------	-----	-----

2	146.	2 - 12MM	0.	447.	YES	YES
---	------	----------	----	------	-----	-----

B E A M N O. 69 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - $V_u = 0.58$ KNS $V_c = 16.50$ KNS $V_s = 0.00$ KNS
 $T_u = 0.10$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 82. MM

AT END SUPPORT - $V_u = 0.58$ KNS $V_c = 16.50$ KNS $V_s = 0.00$ KNS

$T_u = 0.10$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 82. MM

269J

447X 200X 200

270J

2No12cHc154. | 0 TO 447 | 3*10c/c 73

2#12

oo

oo

2#12

oo

oo

2#12

oo

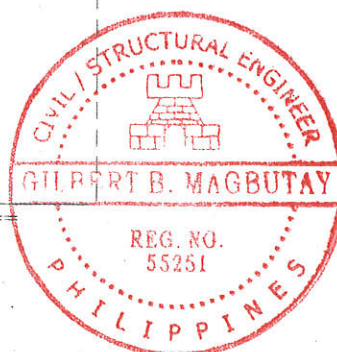
oo

2#12

oo

oo

B E A M N O. 70 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08



LEN - 44. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 44. YES YES
 2 146. 2 - 12MM 0. 44. YES YES

BEAM NO. 70 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 70 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 70 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

270J 44X 200X 200 271J

2No12 H 154. 0.TO 44

2#12
 oo
 oo

2#12
 oo
 oo

2#12
 oo
 oo

2#12
 oo
 oo

BEAM NO. 71 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 458. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 458. YES YES
 2 146. 2 - 12MM 0. 458. YES YES

BEAM NO. 71 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.47 KNS Vc= 16.50 KNS Vs= 0.00 KNS

Tu= 0.14 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 87. MM

AT END SUPPORT - Vu= 0.47 KNS Vc= 16.50 KNS Vs= 0.00 KNS

Tu= 0.14 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 87. MM

271J 458X 200X 200 272J

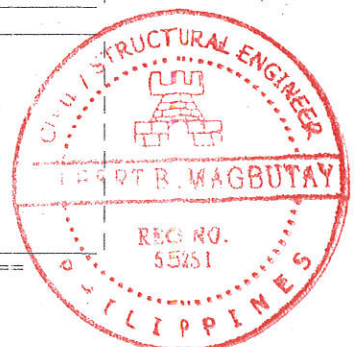
2No12cHc154. | 0.TO 458 | 3*10c/c 73

2#12
 oo
 oo

2#12
 oo
 oo

2#12
 oo
 oo

2#12
 oo
 oo



BEAM NO. 72 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 33. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	33.	YES	YES
2	146.	2 - 12MM	0.	33.	YES	YES

BEAM NO. 72 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 72 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 72 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

272J 33X 200X 200 273J

2N12 H 154. 0 TO 33

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

BEAM NO. 73 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 470. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	470.	YES	YES
2	146.	2 - 12MM	0.	470.	YES	YES

BEAM NO. 73 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.34$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS

$T_1 = 0.22$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 93. MM

AT END SUPPORT - $V_u = 0.34$ KNS $V_c = 16.49$ KNS $V_s = 0.00$ KNS

$T_1 = 0.22$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 93. MM

273J 469X 200X 200 274J

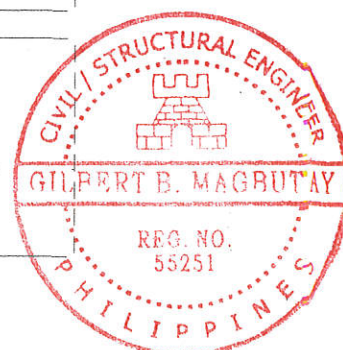
2N12cHc154. 0 TO 470 3*10c/c 73

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○

2#12
 ○○
 ○○



```

=====
BEAM NO.      74 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -        22. MM  FY - 230.  FC - 12.  MPA, SIZE - 200. X 200. MMS
LEVEL  HEIGHT  BAR INFO      FROM      TO      ANCHOR
      (MM)                (MM)      (MM)      STA  END

```

```

1         54.      2 - 12MM      0.         22.      YES  YES
2        146.      2 - 12MM      0.         22.      YES  YES

```

BEAM NO. 74 DESIGN RESULTS - SHEAR

```

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 74 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 74 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
274J                22X 200X 200                275J

```

```

=====
2No12 H 154.  0.TO  22
=====

```

```

  oo
2#12
  oo

```

```

  oo
2#12
  oo

```

```

  oo
2#12
  oo

```

```

  oo
2#12
  oo

```

```

=====
BEAM NO.      75 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -        480. MM  FY - 230.  FC - 12.  MPA, SIZE - 200. X 200. MMS
LEVEL  HEIGHT  BAR INFO      FROM      TO      ANCHOR
      (MM)                (MM)      (MM)      STA  END

```

```

1         54.      2 - 12MM      0.        480.      YES  YES
2        146.      2 - 12MM      0.        480.      YES  YES

```

BEAM NO. 75 DESIGN RESULTS - SHEAR

```

AT START SUPPORT - Vu= 0.13 KNS Vc= 16.45 KNS Vs= 0.00 KNS
T1= 0.29 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

```

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 98. MM

```

AT END SUPPORT - Vu= 0.13 KNS Vc= 16.45 KNS Vs= 0.00 KNS
T1= 0.29 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

```

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 98. MM

```

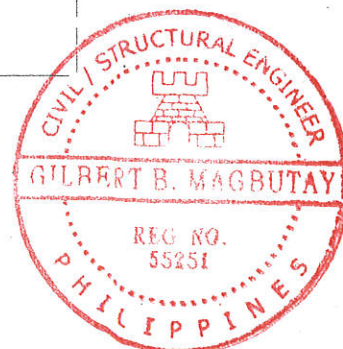
275J                480X 200X 200                276J

```

```

=====
2No12cHc154.  0.TQ  480  | 3*10c/c 73 |
=====

```



2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○
------------------	------------------	------------------	------------------

=====

BEAM NO. 76 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 11. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

1	54.	2 - 12MM	0.	11.	YES YES
2	146.	2 - 12MM	0.	11.	YES YES

BEAM NO. 76 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 76 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 76 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

276J 11X 200X 200 277J

=====

2N#12 H 154. 0. TO 11

=====

2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○
------------------	------------------	------------------	------------------

=====

BEAM NO. 77 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 12. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

1	54.	2 - 12MM	0.	492.	YES YES
2	146.	2 - 12MM	0.	492.	YES YES

BEAM NO. 77 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 1.22$ KNS $V_c = 29.14$ KNS $V_s = 0.00$ KNS

$T_1 = 0.86$ KN-MET $T_c = 0.4$ KN-MET $T_s = 1.1$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 104. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.03 SQ. CM.

AT END SUPPORT - $V_u = 1.04$ KNS $V_c = 16.51$ KNS $V_s = 0.00$ KNS

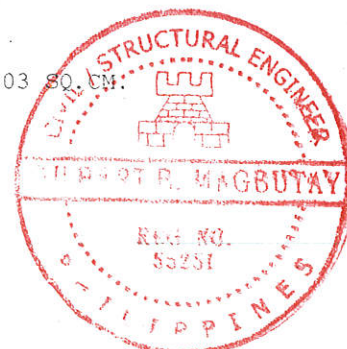
$T_1 = 0.86$ KN-MET $T_c = 0.4$ KN-MET $T_s = 1.1$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 57. MM C/C FOR 104. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.03 SQ. CM.



277J

491X 200X 200

278J

2No12cHc154. 0.TO 492

3*10c/c 57

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 92 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 92 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 2.30$ KNS $V_c = 44.77$ KNS $V_s = 0.00$ KNS
 $T_1 = 1.33$ KN-MET $T_c = 0.7$ KN-MET $T_s = 1.8$ KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 122. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.90 SQ.CM.
 AT END SUPPORT - $V_u = 2.51$ KNS $V_c = 44.77$ KNS $V_s = 0.00$ KNS
 $T_1 = 1.33$ KN-MET $T_c = 0.7$ KN-MET $T_s = 1.8$ KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 122. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.90 SQ.CM.
 459J 516X 200X 200 460J

2No12cHc157. 0.TO 516

4*12c/c 56

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 93 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 93 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.22$ KNS $V_c = 24.53$ KNS $V_s = 0.00$ KNS



$T_1 = 0.40$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 AT END SUPPORT - $V_u = 0.22$ KNS $V_c = 24.53$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.40$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

460J 516X 200X 200 461J

2No12cHc157. 0.TO 516 | 3*12c/c 72 |

2#12	oo	2#12	oo	2#12	oo	2#12	oo
	oo		oo		oo		oo

BEAM NO. 94 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 94 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.09$ KNS $V_c = 24.76$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.28$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

AT END SUPPORT - $V_u = 0.09$ KNS $V_c = 24.76$ KNS $V_s = 0.00$ KNS

$T_1 = 0.28$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

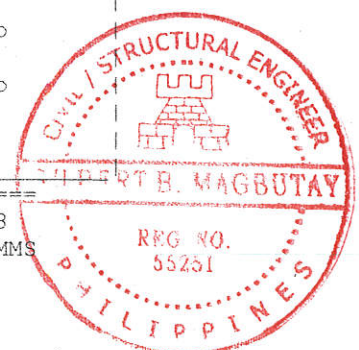
PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

461J 516X 200X 200 462J

2No12cHc157. 0.TO 516 | 3*12c/c 72 |

2#12	oo	2#12	oo	2#12	oo	2#12	oo
	oo		oo		oo		oo

BEAM NO. 95 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
-------	----------------	----------	--------------	------------	-------------------	--

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 95 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.05$ KNS $V_c = 24.90$ KNS $V_s = 0.00$ KNS

$T_1 = 0.18$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

AT END SUPPORT - $V_u = 0.05$ KNS $V_c = 24.90$ KNS $V_s = 0.00$ KNS

$T_1 = 0.18$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

462J 516X 200X 200 463J

2N ϕ 12cHc157. 0 TO 516 | 3*12c/c 72 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 96 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
-------	----------------	----------	--------------	------------	-------------------	--

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 96 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.03$ KNS $V_c = 25.01$ KNS $V_s = 0.00$ KNS

$T_1 = 0.12$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

AT END SUPPORT - $V_u = 0.03$ KNS $V_c = 25.01$ KNS $V_s = 0.00$ KNS

$T_1 = 0.12$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

463J 516X 200X 200 464J

2N ϕ 12cHc157. 0 TO 516 | 3*12c/c 72 |



2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 97 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 97 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.01 KNS Vc= 43.94 KNS Vs= 0.00 KNS

T₁= 0.08 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

AT END SUPPORT - Vu= 0.01 KNS Vc= 43.94 KNS Vs= 0.00 KNS

T₁= 0.08 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

464J 516X 200X 200 465J

2No12cHc157.	0.TO 516	3*12c/c 72
--------------	----------	------------

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 98 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	428.	YES	NO
3	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 98 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.01 KNS Vc= 44.03 KNS Vs= 0.00 KNS

T₁= 0.03 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

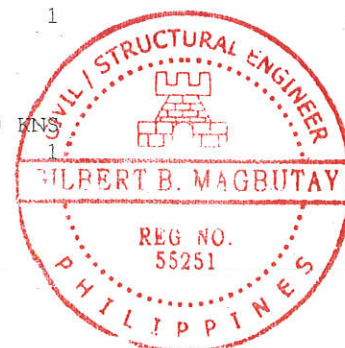
AT END SUPPORT - Vu= 0.01 KNS Vc= 44.03 KNS Vs= 0.00 KNS

T₁= 0.03 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM



465J	516X 200X 200	466J
===== 2No12cHc157. 0.TO 516 3*12c/c 72 =====		
2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○

BEAM NO. 99 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	471.	YES	NO
3	143.	2 - 12MM	0.	516.	YES	YES

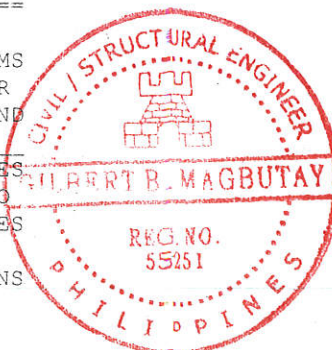
BEAM NO. 99 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.03$ KNS $V_c = 44.13$ KNS $V_s = 0.00$ KNS
 $T_u = 0.02$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 AT END SUPPORT - $V_u = 0.03$ KNS $V_c = 44.13$ KNS $V_s = 0.00$ KNS
 $T_u = 0.02$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM

466J	516X 200X 200	467J
===== 2No12cHc157. 0.TO 516 3*12c/c 72 =====		
2#12 ○○ ○○	2#12 ○○ ○○	2#12 ○○ ○○

BEAM NO. 100 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	471.	YES	NO
3	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 100 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.07$ KNS $V_c = 44.27$ KNS $V_s = 0.00$ KNS



$T_1 = 0.12 \text{ KN-MET}$ $T_c = 0.7 \text{ KN-MET}$ $T_s = 0.0 \text{ KN-MET}$ LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 AT END SUPPORT - $V_u = 0.07 \text{ KNS}$ $V_c = 44.27 \text{ KNS}$ $V_s = 0.00 \text{ KNS}$
 $T_1 = 0.12 \text{ KN-MET}$ $T_c = 0.7 \text{ KN-MET}$ $T_s = 0.0 \text{ KN-MET}$ LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 467J 516X 200X 200 468J

2N ϕ 12cHc157. 0.TO 516 | 3*12c/c 72 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 101 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	471.	YES	NO
3	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 101 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 0.18 \text{ KNS}$ $V_c = 44.54 \text{ KNS}$ $V_s = 0.00 \text{ KNS}$
 $T_1 = 0.17 \text{ KN-MET}$ $T_c = 0.7 \text{ KN-MET}$ $T_s = 0.0 \text{ KN-MET}$ LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 AT END SUPPORT - $V_u = 0.18 \text{ KNS}$ $V_c = 44.54 \text{ KNS}$ $V_s = 0.00 \text{ KNS}$
 $T_1 = 0.17 \text{ KN-MET}$ $T_c = 0.7 \text{ KN-MET}$ $T_s = 0.0 \text{ KN-MET}$ LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 122. MM
 468J 516X 200X 200 469J

2N ϕ 12cHc157. 0.TO 516 | 3*12c/c 72 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 102 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 516. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	516.	YES	YES
2	143.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 102 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 2.20$ KNS $V_c = 23.61$ KNS $V_s = 0.00$ KNS

$T_u = 1.72$ KN-MET $T_c = 0.6$ KN-MET $T_s = 2.3$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 122. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.17 SQ.CM.

AT END SUPPORT - $V_u = 1.99$ KNS $V_c = 23.61$ KNS $V_s = 0.00$ KNS

$T_u = 1.72$ KN-MET $T_c = 0.6$ KN-MET $T_s = 2.3$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 122. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.17 SQ.CM.

469J 516X 200X 200 470J

2N12cHc157. 0.TO 516 | | | 4*12c/c 56 |

2#12
 ∞
 ∞

2#12
 ∞
 ∞

2#12
 ∞
 ∞

2#12
 ∞
 ∞

BEAM NO. 103 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	2 - 12MM	0.	500.	YES	YES
2	143.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 103 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 1.58$ KNS $V_c = 44.87$ KNS $V_s = 0.00$ KNS

$T_u = 1.71$ KN-MET $T_c = 0.7$ KN-MET $T_s = 2.3$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 113. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.16 SQ.CM.

AT END SUPPORT - $V_u = 1.77$ KNS $V_c = 44.87$ KNS $V_s = 0.00$ KNS

$T_u = 1.71$ KN-MET $T_c = 0.7$ KN-MET $T_s = 2.3$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

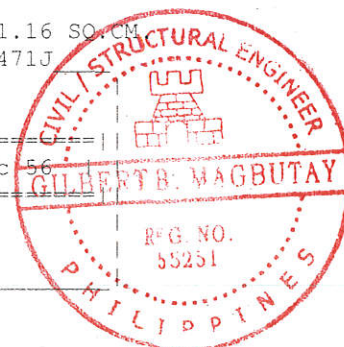
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 113. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.16 SQ.CM.

470J 499X 200X 200 471J

2N12cHc157. 0.TO 500 | | | 4*12c/c 56 |



2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○
------------	------------	------------	------------

=====

BEAM NO. 104 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	500.	YES	YES
2	143.	2 - 12MM	0.	500.	YES	YES
3	143.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 104 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.06$ KNS $V_c = 24.65$ KNS $V_s = 0.00$ KNS

$T_u = 0.16$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM

AT END SUPPORT - $V_u = 0.06$ KNS $V_c = 24.65$ KNS $V_s = 0.00$ KNS

$T_u = 0.16$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM

471J 500X 200X 200 472J

2No12cHc157.	0. TO 500	3*12c/c 72
--------------	-----------	------------

2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○
------------	------------	------------	------------

=====

BEAM NO. 105 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	500.	YES	YES
2	143.	2 - 12MM	0.	500.	YES	YES
3	143.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 105 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.02$ KNS $V_c = 25.02$ KNS $V_s = 0.00$ KNS

$T_u = 0.09$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM

AT END SUPPORT - $V_u = 0.02$ KNS $V_c = 25.02$ KNS $V_s = 0.00$ KNS

$T_u = 0.09$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM



472J		500X 200X 200		473J	
=====		=====		=====	
2N012cHc157. 0.TO 500				3*12c/c 72	
=====		=====		=====	
2#12	oo	2#12	oo	2#12	oo
	oo		oo		oo

=====

BEAM NO. 106 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	-------------	----------	-----------	---------	------------	-----

1	57.	2 - 12MM	0.	500.	YES	YES
2	143.	2 - 12MM	0.	500.	YES	YES
3	143.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 106 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 44.08$ KNS $V_s = 0.00$ KNS

$T_1 = 0.09$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 113. MM

AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 44.08$ KNS $V_s = 0.00$ KNS

$T_1 = 0.09$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 113. MM

473J		499X 200X 200		474J	
=====		=====		=====	
2N012cHc157. 0.TO 500				3*12c/c 72	
=====		=====		=====	
2#12	oo	2#12	oo	2#12	oo
	oo		oo		oo

=====

BEAM NO. 107 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	-------------	----------	-----------	---------	------------	-----

1	57.	2 - 12MM	0.	500.	YES	YES
2	143.	2 - 12MM	0.	500.	YES	YES
3	143.	2 - 12MM	13.	500.	NO	YES

BEAM NO. 107 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.04$ KNS $V_c = 44.41$ KNS $V_s = 0.00$ KNS



$T_1 = 0.16$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM
 AT END SUPPORT - $V_u = 0.04$ KNS $V_c = 44.41$ KNS $V_s = 0.00$ KNS
 $T_1 = 0.16$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 72. MM C/C FOR 114. MM
 474J 500X 200X 200 475J

2No12cHc157. 10.TO 500 | 3*12c/c 72 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

BEAM NO. 108 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 414. FC - 28. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 57. 2 - 12MM 0. 500. YES YES
 2 143. 2 - 12MM 0. 500. YES YES

BEAM NO. 108 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 1.60$ KNS $V_c = 23.79$ KNS $V_s = 0.00$ KNS
 $T_1 = 1.72$ KN-MET $T_c = 0.6$ KN-MET $T_s = 2.3$ KN-MET LOAD 13
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 114. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.17 SQ.CM.

AT END SUPPORT - $V_u = 1.41$ KNS $V_c = 23.79$ KNS $V_s = 0.00$ KNS

$T_1 = 1.72$ KN-MET $T_c = 0.6$ KN-MET $T_s = 2.3$ KN-MET LOAD 13

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 56. MM C/C FOR 114. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.17 SQ.CM.

475J 500X 200X 200 476J

2No12cHc157. 0.TO 500 | 4*12c/c 56 |

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo

2#12

oo

oo



=====

BEAM NO.	109	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	492. MM	FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) STA END

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 109 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.76 KNS Tu= 1.4 KN-MET
Vc= 14.6 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - Vu= 0.76 KNS Tu= 1.4 KN-MET

Vc= 14.6 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 1 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

476J 491X 200X 200 477J

=====

2Nc12 H 154. 0.TO 492

=====

2#12
oo
oo

2#12
oo
oo

2#12
oo
oo

2#12
oo
oo

=====

BEAM NO.	110	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	492. MM	FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) STA END

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 110 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.18 KNS Vc= 15.16 KNS Vs= 0.00 KNS
T₁= 0.18 KN-MET T_c= 0.4 KN-MET T_s= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - Vu= 0.18 KNS Vc= 15.16 KNS Vs= 0.00 KNS

T₁= 0.18 KN-MET T_c= 0.4 KN-MET T_s= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

477J 491X 200X 200 478J

=====

2Nc12cHc154. | 0.TO 492 |

=====

3*10c/c 73



2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 111 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 111 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.08 KNS Vc= 15.37 KNS Vs= 0.00 KNS

T₁= 0.13 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - Vu= 0.08 KNS Vc= 15.37 KNS Vs= 0.00 KNS

T₁= 0.13 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

478J 491X 200X 200 479J

2No12cHc154. 0. TO 492	3*10c/c 73
--------------------------	------------

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 112 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 112 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.05 KNS Vc= 15.48 KNS Vs= 0.00 KNS

T₁= 0.03 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

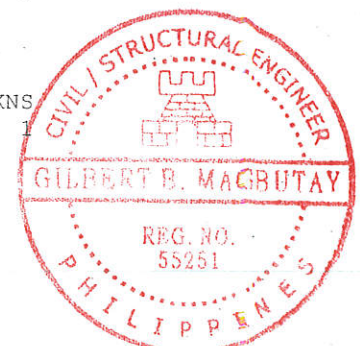
AT END SUPPORT - Vu= 0.05 KNS Vc= 15.48 KNS Vs= 0.00 KNS

T₁= 0.03 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM



479J	491X 200X 200	480J
=====		
2N512cHc154. 0.TO 492		3*10c/c 73
=====		
2#12 oo co	2#12 oo oo	2#12 oo oo

=====

BEAM NO. 113 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA, END
-------	----------------	----------	--------------	------------	--------------------

1	54.	2 - 12MM	0.	492.	YES YES
2	146.	2 - 12MM	0.	492.	YES YES

BEAM NO. 113 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.03 KNS Vc= 15.55 KNS Vs= 0.00 KNS

Ti= 0.03 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - Vu= 0.03 KNS Vc= 15.55 KNS Vs= 0.00 KNS

Ti= 0.03 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

480J	491X 200X 200	481J
=====		
2N512cHc154. 0.TO 492		3*10c/c 73
=====		
2#12 oo oo	2#12 oo oo	2#12 oo oo

=====

BEAM NO. 114 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA, END
-------	----------------	----------	--------------	------------	--------------------

1	54.	2 - 12MM	0.	492.	YES YES
2	146.	2 - 12MM	0.	492.	YES YES

BEAM NO. 114 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.02 KNS Vc= 27.33 KNS Vs= 0.00 KNS

Ti= 0.07 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1



NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - $V_u = 0.02$ KNS $V_c = 14.93$ KNS $V_s = 0.00$ KNS

$T_1 = 0.07$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

481J 491X 200X 200 482J

=====	
2No12cHc154. 0.TO 492	3*10c/c 73
=====	

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

BEAM NO. 115 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	15.	492.	NO	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 115 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 27.38$ KNS $V_s = 0.00$ KNS

$T_1 = 0.11$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 27.38$ KNS $V_s = 0.00$ KNS

$T_1 = 0.11$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

482J 491X 200X 200 483J

=====	
22No12HH1454. 15.TO 4492	3*10c/c 73
=====	

2#12 oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------	------------------	------------------	------------------

BEAM NO. 116 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR



	(MM)		(MM)	(MM)	STA	END
1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

B E A M N O. 116 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - $V_u = 0.00$ KNS $V_c = 27.43$ KNS $V_s = 0.00$ KNS $T_u = 0.15$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - $V_u = 0.00$ KNS $V_c = 27.43$ KNS $V_s = 0.00$ KNS $T_u = 0.15$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

483J 491X 200X 200 484J

2No12cHc154.	0.TO 492	3*10c/c 73
--------------	----------	------------

2#12	2#12	2#12	2#12
------	------	------	------

BEAM NO. 117 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

B E A M N O. 117 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - $V_u = 0.01$ KNS $V_c = 27.49$ KNS $V_s = 0.00$ KNS $T_u = 0.20$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - $V_u = 0.01$ KNS $V_c = 27.49$ KNS $V_s = 0.00$ KNS $T_u = 0.20$ KN-MET $T_c = 0.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

484J 491X 200X 200 485J

2No12cHc154.	0.TO 492	3*10c/c 73
--------------	----------	------------



2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 118 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 118 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.04 KNS Vc= 27.56 KNS Vs= 0.00 KNS

T₁= 0.29 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - Vu= 0.04 KNS Vc= 27.56 KNS Vs= 0.00 KNS

T₁= 0.29 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

485J 491X 200X 200 486J

=====

2No12cHc154. | 0 TO 492 | 3*10c/c 73 |

=====

2#12 oo oo	2#12 oo oo	2#12 oo oo	2#12 oo oo
------------------	------------------	------------------	------------------

=====

BEAM NO. 119 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	492.	YES	YES
2	146.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 119 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.12 KNS Vc= 27.68 KNS Vs= 0.00 KNS

T₁= 0.40 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM

AT END SUPPORT - Vu= 0.12 KNS Vc= 27.68 KNS Vs= 0.00 KNS

T₁= 0.40 KN-MET Tc= 0.4 KN-MET Ts= 0.0 KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 73. MM C/C FOR 104. MM



486J

491X 200X 200

487J

2N12cHc154. | O.TO 492 |

3*10c/c 73 |

2#12	oo
	oo

2#12	oo
	oo

2#12	oo
	oo

2#12	oo
	oo

=====

BEAM NO. 120 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	54.	2 - 12MM	0.	492.	YES	YES	
2	146.	2 - 12MM	0.	492.	YES	YES	

BEAM NO. 120 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 2.43 KNS Tu= 1.2 KN-MET

Vc= 15.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 13 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - Vu= 2.26 KNS Tu= 1.2 KN-MET

Vc= 15.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 13 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

487J

491X 200X 200

488J

2N12 H 154. O.TO 492

2#12	oo
	oo

2#12	oo
	oo

2#12	oo
	oo

2#12	oo
	oo

=====

BEAM NO. 135 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 59. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 2.13 KN-MET, LOADING 10

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 49. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 1.79 KN-MET, LOADING 14



669J

516X 200X 200

670J

=====

BEAM NO.	136	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	516. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 4. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.16 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 4. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.17 KN-MET, LOADING 14

670J

516X 200X 200

671J

=====

BEAM NO.	137	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	516. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.05 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.07 KN-MET, LOADING 10



671J

516X 200X 200

672J

=====

BEAM NO. 138 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

=====

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 10

672J

516X 200X 200

673J

=====

BEAM NO. 139 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

=====

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

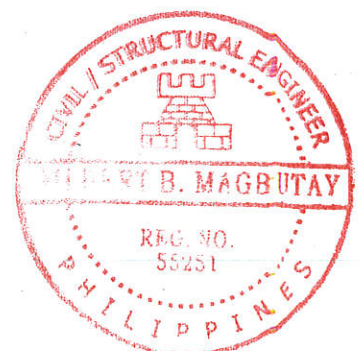
REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.01 KN-MET, LOADING 10

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 6



673J

516X 200X 200

674J

=====

BEAM NO. 140 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.05 KN-MET, LOADING 14

674J

516X 200X 200

675J

=====

BEAM NO. 141 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

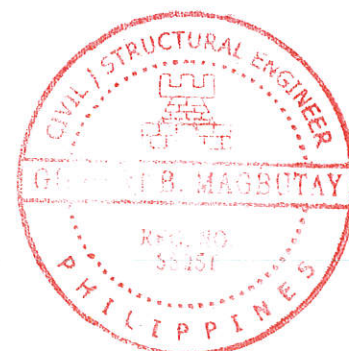
REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 14



675J	516X 200X 200	676J

=====

BEAM NO.	142	DESIGN RESULTS - FLEXURE PER CODE	ACI 318-08
LEN -	516. MM	FY - 414. FC - 10. MPA, SIZE -	200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.03 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 14

676J 516X 200X 200 677J

676J	516X 200X 200	677J

=====

BEAM NO.	143	DESIGN RESULTS - FLEXURE PER CODE	ACI 318-08
LEN -	516. MM	FY - 414. FC - 10. MPA, SIZE -	200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

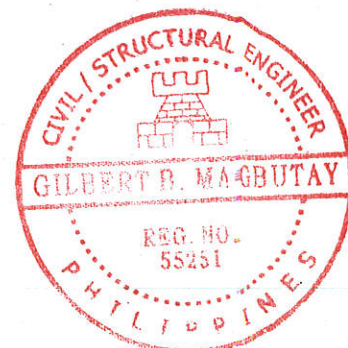
REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.03 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 14



675J

516X 200X 200

676J

=====

BEAM NO. 142 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.03 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 14

676J

516X 200X 200

677J

=====

BEAM NO. 143 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.03 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 14



677J

516X 200X 200

678J

=====

BEAM NO.	144	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	516. MM	FY -	414.	FC -	10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA. END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.03 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.05 KN-MET, LOADING 14

678J

516X 200X 200

679J

=====

BEAM NO.	145	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	516. MM	FY -	414.	FC -	10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA. END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.00 KN-MET, LOADING 1

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

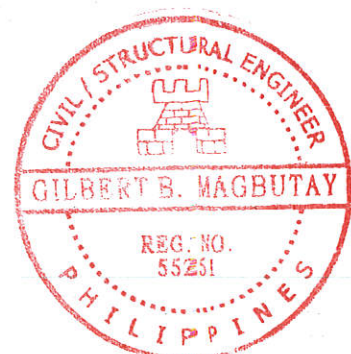
MAX POS MOMENT = 0.40 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.40 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.



REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX NEG MOMENT = 0.00 KN-MET, LOADING 1
 679J 516X 200X 200 680J

=====

BEAM NO.	LEN -	HEIGHT	BAR INFO	FROM	TO	ANCHOR	STA	END
	500. MM	(MM)		(MM)	(MM)			
146	500. MM							

=====

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 12. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX POS MOMENT = 0.44 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX NEG MOMENT = 0.00 KN-MET, LOADING 4

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX NEG MOMENT = 0.42 KN-MET, LOADING 8

680J 499X 200X 200 681J

=====

BEAM NO.	LEN -	HEIGHT	BAR INFO	FROM	TO	ANCHOR	STA	END
	500. MM	(MM)		(MM)	(MM)			
147	500. MM							

=====

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX POS MOMENT = 0.02 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2
 MAX NEG MOMENT = 0.01 KN-MET, LOADING 10

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2



MAX NEG MOMENT = 0.05 KN-MET, LOADING 8
 STAAD SPACE
 681J 500X 200X 200

-- PAGE NO. 181
 682J

=====

BEAM NO.	148	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	500. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.01 KN-MET, LOADING 6

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 8

682J 500X 200X 200 683J

=====

BEAM NO.	149	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	500. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.01 KN-MET, LOADING 6

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 8



683J

499X 200X 200

684J

=====

BEAM NC.	150	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	500. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 6

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.05 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.01 KN-MET, LOADING 6

684J

500X 200X 200

685J

=====

BEAM NC.	151	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	500. MM	FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO FROM TO ANCHOR
	(MM)	(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

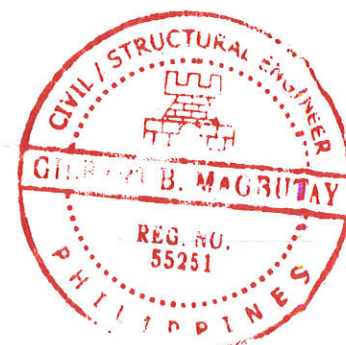
REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.42 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.41 KN-MET, LOADING 8



685J	500X 200X 200	686J

=====

BEAM	NC.	152	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	492. MM	FY - 414.	FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.43 KN-MET, LOADING 8

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.01 KN-MET, LOADING 2

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 11. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.41 KN-MET, LOADING 8

686J	491X 200X 200	687J

=====

BEAM	NC.	153	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN -	492. MM	FY - 414.	FC - 10. MPA, SIZE - 200. X 200. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

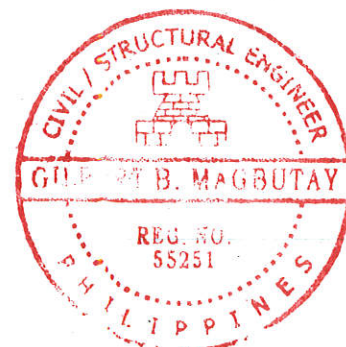
REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 24

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.04 KN-MET, LOADING 10



687J

491X 200X 200

683J

=====

BEAM NC. 154 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFC	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 1.4

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 1.0

688J

491X 200X 200

689J

=====

BEAM NC. 155 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 414. FC - 10. MPA, SIZE - 200. X 200. MMS

LEVEL	HEIGHT (MM)	BAR INFC	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

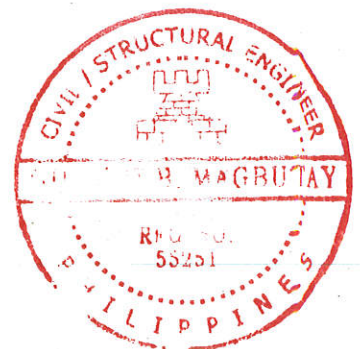
REQD. STEEL = 0. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX POS MOMENT = 0.02 KN-MET, LOADING 1.4

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 2. MM2, MAX. STEEL PERMISSIBLE = 206. MM2

MAX NEG MOMENT = 0.06 KN-MET, LOADING 1.0



639J

491X 200X 200

690J

=====

BEAM NO. 164 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	5 - 12MM	0.	900.	YES	YES	
2	646.	7 - 12MM	0.	900.	YES	YES	

BEAM NO. 164 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 164 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 164 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

221J 899X 400X 700 699J

7N012 H 646. 0.TO 900

5N012 H 54. 0.TO 900

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
5#12	5#12	5#12	5#12
000000	000000	000000	000000

=====

BEAM NO. 165 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

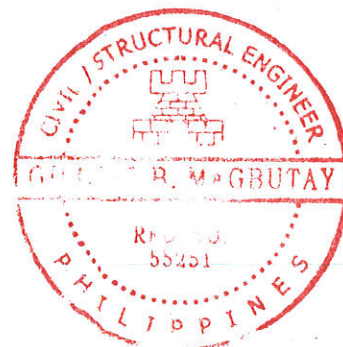
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	5 - 12MM	0.	900.	YES	YES	
2	646.	7 - 12MM	0.	900.	YES	YES	

BEAM NO. 165 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 165 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 165 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



278J	899X 400X 700	700J
=====		
7N012 H 646.	0.TO	900
=====		
5N012 H 54.	0.TO	900
=====		
0000000	0000000	0000000
7#12	7#12	7#12
=====		
5#12	5#12	5#12
00000	00000	00000
=====		

=====

BEAM NO. 166 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	4 - 12MM	0.	900.	YES YES
2	696.	5 - 12MM	0.	900.	YES YES

BEAM NO. 166 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 166 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 166 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

459J 899X 400X 750 701J

=====		
5N012 H 696.	0.TO	900
=====		
4N012 H 54.	0.TO	900
=====		

00000	00000	00000	00000
5#12	5#12	5#12	5#12
=====			
4#12	4#12	4#12	4#12
0000	0000	0000	0000
=====			

=====

BEAM NO. 167 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

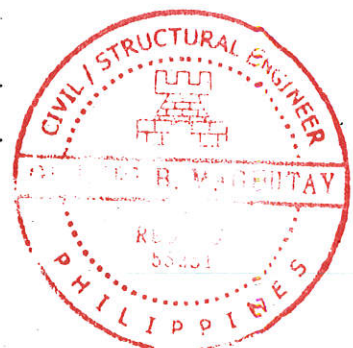
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	4 - 12MM	0.	900.	YES YES
2	696.	5 - 12MM	0.	900.	YES YES

BEAM NO. 167 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 167 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 167 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



488J	899X 400X 750	702J
=====		
5N12 H 696. 0.TO 900		
4N12 H 54. 0.TO 900		
=====		

00000	00000	00000	00000
5#12	5#12	5#12	5#12
4#12	4#12	4#12	4#12
0000	0000	0000	0000

=====

BEAM NO. 168 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	900.	YES	YES	
2	696.	2 - 12MM	0.	900.	YES	YES	

BEAM NO. 168 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 168 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 168 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

669J 899X 300X 750 703J

=====		
2N12 H 696. 0.TO 900		
2N12 H 54. 0.TO 900		
=====		

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

=====

BEAM NO. 169 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 900. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

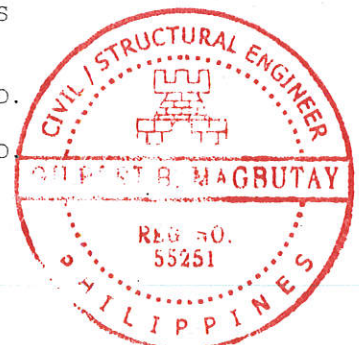
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	900.	YES	YES	
2	696.	2 - 12MM	0.	900.	YES	YES	

BEAM NO. 169 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 169 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 169 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



[illegible]

000 3#12 2#16 00	000 3#12 2#16 00	000 3#16 2#16 00	000 3#16 2#16 00
-------------------------------	-------------------------------	-------------------------------	-------------------------------

	BEAM NC.	172	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	3870. MM	FY - 230.	FC - 10.	MPA, SIZE - 300. X 450. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

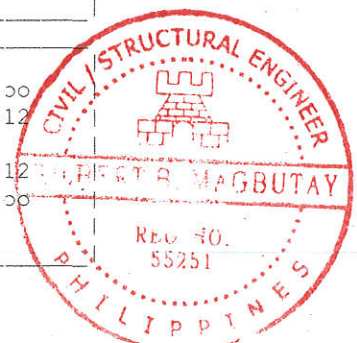
1	54.	2 - 12MM	0.	3870.	YES	YES
2	396.	2 - 12MM	0.	3870.	YES	YES

BEAM NO. 172 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 5.71$ KNS $V_c = 78.24$ KNS $V_s = 0.00$ KNS
 $T_u = 10.11$ KN-MET $T_c = 2.5$ KN-MET $T_s = 13.5$ KN-MET LOAD 10
STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1543. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 5.12 SQ.CM.
 AT END SUPPRT - $V_u = 6.07$ KNS $V_c = 65.28$ KNS $V_s = 0.00$ KNS
 $T_u = 10.11$ KN-MET $T_c = 2.5$ KN-MET $T_s = 13.5$ KN-MET LOAD 10
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1543. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 5.12 SQ.CM.
 9J 3870X 300X 450 711J

[illegible]

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00



=====

BEAM NO. 173 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3870. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	3870.	YES	YES	
2	396.	2 - 12MM	0.	3870.	YES	YES	

BEAM NO. 173 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 3.17 KNS Vc= 61.57 KNS Vs= 0.00 KNS

Tu= 8.34 KN-MET Tc= 2.4 KN-MET Ts= 11.1 KN-MET LOAD 14

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1543. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.22 SQ.CM.

AT END SUPPRT - Vu= 5.67 KNS Vc= 62.09 KNS Vs= 0.00 KNS

Tu= 8.34 KN-MET Tc= 2.4 KN-MET Ts= 11.1 KN-MET LOAD 14

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1543. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.22 SQ.CM.

10J 3870X 300X 450 712J

=====									
2No12 H 396.	0.TO 3870								
12*10c/c144								12*10c/c144	
2No12 H 54.	0.TO 3870								

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

=====

BEAM NO. 174 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1957. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	1957.	YES	YES	
2	696.	2 - 12MM	0.	1881.	YES	NO	
3	696.	2 - 12MM	1462.	1957.	NO	YES	

BEAM NO. 174 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 10.79 KNS Vc= 109.23 KNS Vs= 0.00 KNS

Tu= 11.40 KN-MET Tc= 4.9 KN-MET Ts= 15.2 KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 287. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.31 SQ.CM.

AT END SUPPRT - Vu= 5.33 KNS Vc= 104.69 KNS Vs= 0.00 KNS

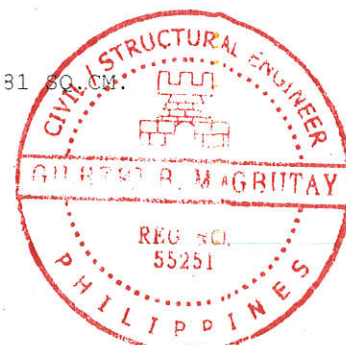
Tu= 11.40 KN-MET Tc= 4.9 KN-MET Ts= 15.2 KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 287. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.31 SQ.CM.



703J	1957X 300X 750	705J
2No12 H 696. 0.TO 1881		2No12 H 696.1462.TO 1957
3*10c/c219		3*10c/c219
2No12 H 54. 0.TO 1957		

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NC. 175 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1957. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	1957.	YES	YES
2	696.	2 - 12MM	0.	1555.	YES	NO
3	696.	2 - 12MM	1136.	1957.	NO	YES

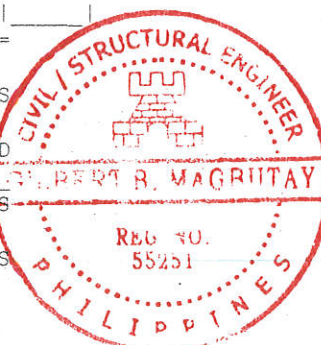
BEAM NO. 175 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 8.62$ KNS $V_c = 111.61$ KNS $V_s = 0.00$ KNS
 $T_u = 11.50$ KN-MET $T_c = 4.8$ KN-MET $T_s = 15.3$ KN-MET LOAD 14
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 287. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.35 SQ.CM.
 AT END SUPPORT - $V_u = 4.52$ KNS $V_c = 104.84$ KNS $V_s = 0.00$ KNS
 $T_u = 11.50$ KN-MET $T_c = 4.8$ KN-MET $T_s = 15.3$ KN-MET LOAD 14
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 287. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.35 SQ.CM.

704J	1957X 300X 750	706J
2No12 H 696. 0.TO 1555		2No12 H 696.1136.TO 1957
3*10c/c219		3*10c/c219
2No12 H 54. 0.TO 1957		

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NC. 176 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	4000.	YES	YES
2	444.	2 - 16MM	0.	1505.	YES	NO
3	444.	4 - 16MM	995.	4000.	NO	YES



243J	4000X	300X	500	713J
------	-------	------	-----	------

255J	4000X	300X	500	719J
------	-------	------	-----	------

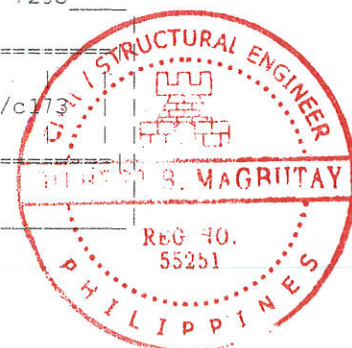
BEAM NO. 178 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 30.81$ KNS $V_c = 71.64$ KNS $V_s = 0.00$ KNS
 $T_u = 1.47$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM
 AT END SUPPORT - $V_u = 33.18$ KNS $V_c = 69.11$ KNS $V_s = 0.00$ KNS
 $T_u = 1.47$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM
 470J 4000X 350X 400 722

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
5#12	5#12	5#12	5#12
00000	00000	00000	00000

BEAM NC. 179 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN - 4000. MM	FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
LEVEL HEIGHT	BAR INFO FROM TO ANCHOR
(MM)	(MM) (MM) STA END

BEAM NO. 179 DESIGN RESULTS - SHEAR.
 AT START SUPPRT - $V_u = 30.59$ KNS $V_c = 71.58$ KNS $V_s = 0.00$ KNS
 $T_u = 1.56$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM
 AT END SUPPRT - $V_u = 33.40$ KNS $V_c = 68.66$ KNS $V_s = 0.00$ KNS
 $T_u = 1.56$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

476J	4000X 350X 400	723J
5No12 H 346.	0.TO 1736	7No12 H 346.1764.TO 4000
11*10c/c173		11*10c/c173
5No12 H 34.	0.TO 4000	



00000	00000	0000000	0000000
5#12	5#12	7#12	7#12
5#12	5#12	5#12	5#12
00000	00000	00000	00000

=====

BEAM NO. 180 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3100. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3100.	YES	YES
2	646.	3 - 12MM	0.	1154.	YES	NO
3	646.	6 - 12MM	1042.	3100.	NO	YES

BEAM NO. 180 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 14.11$ KNS $V_c = 141.97$ KNS $V_s = 0.00$ KNS
 $T_u = 9.56$ KN-MET $T_c = 7.6$ KN-MET $T_s = 12.7$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 908. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.14 SQ.CM.
 AT END SUPPRT - $V_u = 43.85$ KNS $V_c = 257.33$ KNS $V_s = 0.00$ KNS
 $T_u = 9.56$ KN-MET $T_c = 7.6$ KN-MET $T_s = 12.7$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 908. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.14 SQ.CM.
 699J 3100X 400X 700 717J

3No12 H 646.	0.TO 1154	6No12 H 646.	1042.TO 3100				
5*10c/c232						5*10c/c232	
4No12 H 54.	0.TO 3100						

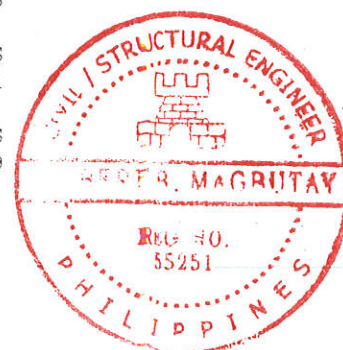
000	000	000000	000000
3#12	3#12	6#12	6#12
4#12	4#12	4#12	4#12
0000	0000	0000	0000

=====

BEAM NO. 181 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3100. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3100.	YES	YES
2	646.	6 - 12MM	0.	3100.	YES	YES

BEAM NO. 181 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 22.16$ KNS $V_c = 145.27$ KNS $V_s = 0.00$ KNS
 $T_u = 0.18$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPRT - $V_u = 58.02$ KNS $V_c = 152.13$ KNS $V_s = 0.00$ KNS
 $T_u = 4.19$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 9
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 908. MM



700J	3100X 400X 700	720J
6No12 H 646. 0.TO 3100		
		5*10c/c262
4No12 H 54. 0.TO 3100		

000000 6#12	000000 6#12	000000 6#12	000000 6#12
4#12 0000	4#12 0000	4#12 0000	4#12 0000

BEAM NO. 182 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3100. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3100.	YES	YES
2	696.	2 - 12MM	0.	1436.	YES	NO
3	696.	5 - 12MM	1277.	3100.	NO	YES

BEAM NO. 182 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 11.87$ KNS $V_c = 143.44$ KNS $V_s = 0.00$ KNS
 $T_u = 12.98$ KN-MET $T_c = 7.9$ KN-MET $T_s = 17.3$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 858. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.15 SQ.CM.
 AT END SUPPORT - $V_u = 40.39$ KNS $V_c = 184.35$ KNS $V_s = 0.00$ KNS
 $T_u = 12.98$ KN-MET $T_c = 7.9$ KN-MET $T_s = 17.3$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 858. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.15 SQ.CM.

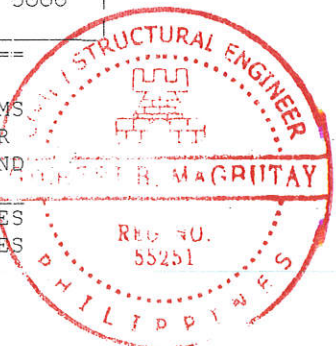
701J	3100X 400X 750	721J
2No12 H 696. 0.TO 1436	5No12 H 696.1277.TO 3100	
5*10c/c244		5*10c/c244
4No12 H 54. 0.TO 3100		

00 2#12	00 2#12	00000 5#12	00000 5#12
4#12 0000	4#12 0000	4#12 0000	4#12 0000

BEAM NO. 183 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3100. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3100.	YES	YES
2	696.	5 - 12MM	0.	3100.	YES	YES

BEAM NO. 183 DESIGN RESULTS - SHEAR



2 696. 2 - 12MM 0. 1143. YES YES
 BEAM NO. 189 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 189 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 189 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 705J 1142X 300X 750 725J

2N512 H 696. 0.TO 1143

2N512 H 54. 0.TO 1143

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 190 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1143. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 1143. YES YES
 2 696. 2 - 12MM 0. 1143. YES YES

BEAM NO. 190 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 190 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 190 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 706J 1142X 300X 750 729J

2N512 H 696. 0.TO 1143

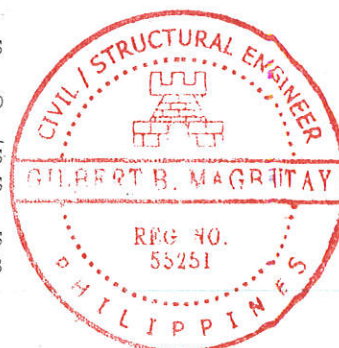
2N512 H 54. 0.TO 1143

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 195 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5630. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 56. 6 - 16MM 0. 5680. YES YES
 2 444. 6 - 16MM 0. 5680. YES YES

BEAM NO. 195 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 39.14$ KNS $V_c = 100.73$ KNS $V_s = 0.00$ KNS
 $T_u = 0.12$ KN-MET $T_c = 4.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2398. MM
 AT END SUPCRT - $V_u = 40.29$ KNS $V_c = 100.73$ KNS $V_s = 0.00$ KNS
 $T_u = 0.12$ KN-MET $T_c = 4.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2398. MM
 717J 5680X 400X 500 718

[illegible]

000000 6#16 6#16 000000	000000 6#16 6#16 000000	000000 6#16 6#16 000000	000000 6#16 6#16 000000
--------------------------------------	--------------------------------------	--------------------------------------	--------------------------------------

BEAM NC.		196 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08				
LEN -	3000. MM	FY -	230.	FC -	12. MPA, SIZE -	300. X 500. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR	
	(MM)		(MM)	(MM)		STA. END
1	100	1	100	100	100	100
2	200	2	200	200	200	200
3	300	3	300	300	300	300
4	400	4	400	400	400	400
5	500	5	500	500	500	500
6	600	6	600	600	600	600
7	700	7	700	700	700	700
8	800	8	800	800	800	800
9	900	9	900	900	900	900
10	1000	10	1000	1000	1000	1000
11	1100	11	1100	1100	1100	1100
12	1200	12	1200	1200	1200	1200
13	1300	13	1300	1300	1300	1300
14	1400	14	1400	1400	1400	1400
15	1500	15	1500	1500	1500	1500
16	1600	16	1600	1600	1600	1600
17	1700	17	1700	1700	1700	1700
18	1800	18	1800	1800	1800	1800
19	1900	19	1900	1900	1900	1900
20	2000	20	2000	2000	2000	2000
21	2100	21	2100	2100	2100	2100
22	2200	22	2200	2200	2200	2200
23	2300	23	2300	2300	2300	2300
24	2400	24	2400	2400	2400	2400
25	2500	25	2500	2500	2500	2500
26	2600	26	2600	2600	2600	2600
27	2700	27	2700	2700	2700	2700
28	2800	28	2800	2800	2800	2800
29	2900	29	2900	2900	2900	2900
30	3000	30	3000	3000	3000	3000

1	54.	2 - 12MM	0.	3000.	YES	YES
2	446.	4 - 12MM	0.	3000.	YES	YES

BEAM NO. 196 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 0.56 KNS Vc= 75.94 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - Vu= 0.56 KNS Vc= 75.94 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

```

=====
718J                2999X 300X 500                719J
=====
| 4N012 H 446.    0.TO 3000
|
| 2N012 H  54.    0.TO 3000
|
=====

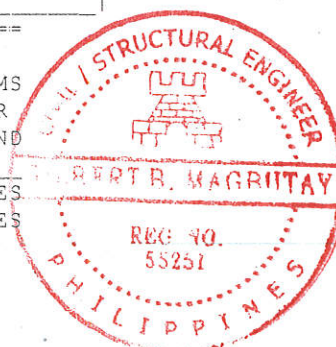
```

○○○○ 4#12	○○○○ 4#12	○○○○ 4#12	○○○○ 4#12
2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○

	BEAM NO.	197	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	5900. MM	FY - 230.	FC - 12.	MPA, SIZE - 400. X 500. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	7 - 12MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	5900.	YES	YES

BEAM NO. 197 DESIGN RESULTS - SHEAR



[illegible]

000000 6#16	000000 6#16	000000 6#16	000000 6#16
7#12 0000000	7#12 0000000	7#12 0000000	7#12 0000000

BEAM NO.		202 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	5630. MM	FY -	230.	FC -	10. MPA, SIZE - 400. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END
1	1000	1	1000	1000	1000
2	1000	1	1000	1000	1000
3	1000	1	1000	1000	1000
4	1000	1	1000	1000	1000
5	1000	1	1000	1000	1000
6	1000	1	1000	1000	1000
7	1000	1	1000	1000	1000
8	1000	1	1000	1000	1000
9	1000	1	1000	1000	1000
10	1000	1	1000	1000	1000
11	1000	1	1000	1000	1000
12	1000	1	1000	1000	1000
13	1000	1	1000	1000	1000
14	1000	1	1000	1000	1000
15	1000	1	1000	1000	1000
16	1000	1	1000	1000	1000
17	1000	1	1000	1000	1000
18	1000	1	1000	1000	1000
19	1000	1	1000	1000	1000
20	1000	1	1000	1000	1000
21	1000	1	1000	1000	1000
22	1000	1	1000	1000	1000
23	1000	1	1000	1000	1000
24	1000	1	1000	1000	1000
25	1000	1	1000	1000	1000
26	1000	1	1000	1000	1000
27	1000	1	1000	1000	1000
28	1000	1	1000	1000	1000
29	1000	1	1000	1000	1000
30	1000	1	1000	1000	1000
31	1000	1	1000	1000	1000
32	1000	1	1000	1000	1000
33	1000	1	1000	1000	1000
34	1000	1	1000	1000	1000
35	1000	1	1000	1000	1000
36	1000	1	1000	1000	1000
37	1000	1	1000	1000	1000
38	1000	1	1000	1000	1000
39	1000	1	1000	1000	1000
40	1000	1	1000	1000	1000
41	1000	1	1000	1000	1000
42	1000	1	1000	1000	1000
43	1000	1	1000	1000	1000
44	1000	1	1000	1000	1000
45	1000	1	1000	1000	1000
46	1000	1	1000	1000	1000
47	1000	1	1000	1000	1000
48	1000	1	1000	1000	1000
49	1000	1	1000	1000	1000
50	1000	1	1000	1000	1000
51	1000	1	1000	1000	1000
52	1000	1	1000	1000	1000
53	1000	1	1000	1000	1000
54	1000	1	1000	1000	1000
55	1000	1	1000	1000	1000
56	1000	1	1000	1000	1000
57	1000	1	1000	1000	1000
58	1000	1	1000	1000	1000
59	1000	1	1000	1000	1000
60	1000	1	1000	1000	1000
61	1000	1	1000	1000	1000
62	1000	1	1000	1000	1000
63	1000				

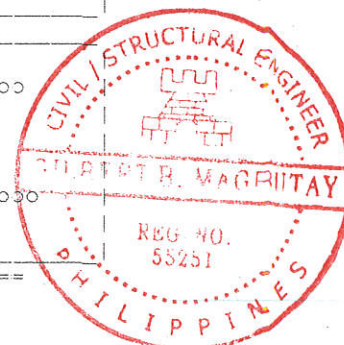
1	54.	8 - 12MM	0.	5680.	YES	YES
2	344.	5 - 16MM	0.	5680.	YES	YES

BEAM NO. 202 DESIGN RESULTS - SHEAR
AT START SUPPRT - $V_u = 32.21$ KNS $V_c = 79.33$ KNS $V_s = 0.00$ KNS
 $T_u = 0.12$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM
AT END SUPPRT - $V_u = 33.33$ KNS $V_c = 78.38$ KNS $V_s = 0.00$ KNS
 $T_u = 0.12$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM

721J		5680X 400X 400		722J
=====				
=====				
5No16 H 344.		0.TO 5680		
16*10c/c173				16*10c/c173
8No12 H 34.		0.TO 5680		
=====				

00000	00000	00000	00000
5#16	5#16	5#16	5#16
8#12	8#12	8#12	8#12
00000000	00000000	00000000	00000000

BEAM NO. 203 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 3000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM)

1 54. 2 - 12MM 0. 3000. YES YES
 2 346. 5 - 12MM 0. 3000. YES YES

BEAM NO. 203 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 0.48 KNS Vc= 64.49 KNS Vs= 0.00 KNS
 Tu= 0.03 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 0.48 KNS Vc= 64.49 KNS Vs= 0.00 KNS
 Tu= 0.03 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

722J

2999X 350X 400

723J

5No12 H 346. 0.TO 3000

2No12 H 54. 0.TO 3000

00000 5#12 2#12 00	00000 5#12 2#12 00	00000 5#12 2#12 00	00000 5#12 2#12 00
-----------------------------	-----------------------------	-----------------------------	-----------------------------

BEAM NO. 204 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM)

1 54. 8 - 12MM 0. 5900. YES YES
 2 344. 6 - 16MM 0. 5900. YES YES

BEAM NO. 204 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 35.55 KNS Vc= 77.74 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

AT END SUPPCRT - Vu= 33.60 KNS Vc= 79.25 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

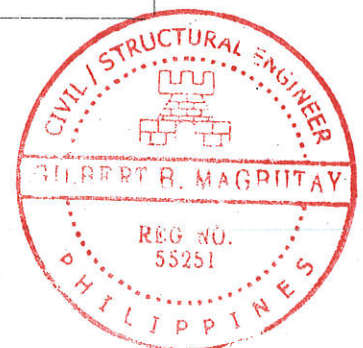
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

723J

5899X 400X 400

724C

6No16 H 344. 0.TO 5900
 17*10c/c173 17*10c/c173
 8No12 H 54. 0.TO 5900



000000 6#16	000000 6#16	000000 6#16	000000 6#16
8#12 00000000	8#12 00000000	8#12 00000000	8#12 00000000

=====

BEAM NO. 209 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1714. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	1714.	YES	YES
2	696.	2 - 12MM	0.	1270.	YES	NO

BEAM NO. 209 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 0.54$ KNS $V_c = 192.18$ KNS $V_s = 0.00$ KNS
 $T_u = 6.72$ KN-MET $T_c = 4.9$ KN-MET $T_s = 9.0$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.34 SQ.CM.
 AT END SUPPRT - $V_u = 0.54$ KNS $V_c = 192.18$ KNS $V_s = 0.00$ KNS
 $T_u = 6.72$ KN-MET $T_c = 4.9$ KN-MET $T_s = 9.0$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.34 SQ.CM.
 725J 1714X 300X 750 729J

2No12 H 696.	0.TO 1270	
2*10c/c219		2*10c/c219
2No12 H 54.	0.TO 1714	

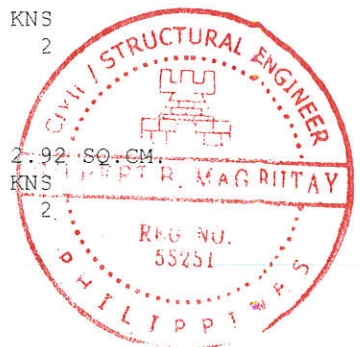
00 2#12	00 2#12	00 2#12	
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 210 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1714. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	1714.	YES	YES
2	696.	2 - 12MM	0.	1714.	YES	YES

BEAM NO. 210 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 0.20$ KNS $V_c = 106.92$ KNS $V_s = 0.00$ KNS
 $T_u = 6.93$ KN-MET $T_c = 4.6$ KN-MET $T_s = 9.2$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.92 SQ.CM.
 AT END SUPPRT - $V_u = 0.20$ KNS $V_c = 106.92$ KNS $V_s = 0.00$ KNS
 $T_u = 6.93$ KN-MET $T_c = 4.6$ KN-MET $T_s = 9.2$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.92 SQ.CM.
728J 1714X 300X 750 730J

2No12 H 696.	0.TC 1714	
2*10c/c219		2*10c/c219
2No12 H 54.	0.TC 1714	

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO.		211 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	3620. MM	FY -	230.	FC -	12. MPA, SIZE - 250. X 350. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	3 - 12MM	0.	3620.	YES	YES
2	296.	4 - 12MM	0.	3620.	YES	YES

BEAM NO. 211 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 21.03$ KNS $V_c = 43.32$ KNS $V_s = 0.00$ KNS
 $T_u = 1.04$ KN-MET $T_c = 1.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 3
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 148. MM C/C FOR 1518. MM
AT END SUPPCRT - $V_u = 20.61$ KNS $V_c = 43.52$ KNS $V_s = 0.00$ KNS
 $T_u = 1.04$ KN-MET $T_c = 1.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 148. MM C/C FOR 1518. MM

709J 3620X 250X 350 733J

[illegible]

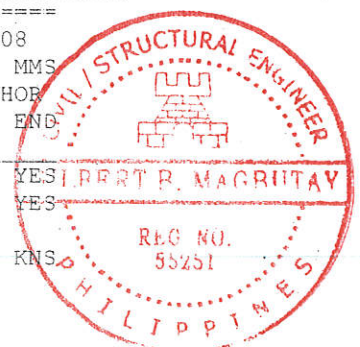
0000 4#12 3#12 000	0000 4#12 3#12 000	0000 4#12 3#12 000	0000 4#12 3#12 000
---------------------------------	---------------------------------	---------------------------------	---------------------------------

	BEAM NC.	212	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	3620. MM	FY - 230.	FC - 12.	MPA, SIZE - 250. X 350. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	3 - 12MM	0.	3620.	YES	YES
2	296.	4 - 12MM	0.	3620.	YES	YES

BEAM NO. 212 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 21.15$ KNS $V_c = 42.02$ KNS $V_s = 0.00$ KNS

AT START SUPPORT - $V_u = 21.15$ KNS $V_c = 42.02$ KNS $V_s = 0.00$ KNS



BEAM NO. 214 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3620. MM FY - 230. MPA FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	2 - 12MM	0.	3620.	YES	YES	
2	396.	2 - 12MM	0.	3620.	YES	YES	

BEAM NO. 214 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 6.12$ KNS $V_c = 61.74$ KNS $V_s = 0.00$ KNS
 $T_u = 3.07$ KN-MET $T_c = 2.4$ KN-MET $T_s = 4.1$ KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1418. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.56 SQ.CM.
 AT END SUPPORT - $V_u = 6.51$ KNS $V_c = 61.42$ KNS $V_s = 0.00$ KNS
 $T_u = 3.07$ KN-MET $T_c = 2.4$ KN-MET $T_s = 4.1$ KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1418. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.56 SQ.CM.
 712J 3620X 300X 450 736J

=====									
2No12 H 396.	0.TO 3620								
11*10c/c144								11*10c/c144	
2No12 H 54.	0.TO 3620								
=====									

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 215 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. MPA FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	3 - 12MM	0.	4000.	YES	YES	
2	646.	5 - 12MM	0.	1379.	YES	NO	
3	642.	2 - 20MM	1202.	4000.	NO	YES	

BEAM NO. 215 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 12.85$ KNS $V_c = 142.53$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 7.8$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - $V_u = 12.85$ KNS $V_c = 141.96$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 7.8$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

717J 4000X 400X 700 741J

=====															
5No12 H 646.	0.TO 1379	20 H 642.	1202.TO 4000												
=====															
3No12 H 54.	0.TO 4000														
=====															



1	54.	3 - 12MM	0.	3955.	YES	NO
2	444.	4 - 16MM	0.	4000.	YES	YES

BEAM NO. 216 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 30.57 KNS Vc= 75.92 KNS Vs= 0.00 KNS
 Tu= 0.04 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 AT END SUPPORT - Vu= 30.83 KNS Vc= 75.92 KNS Vs= 0.00 KNS
 Tu= 0.04 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 718J 4000X 300X 500 742

[illegible]

0000	0000	0000	0000
4#16	4#16	4#16	4#16
3#12	3#12	3#12	
000	000	000	

1	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 217 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 30.68$ KNS $V_c = 75.81$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

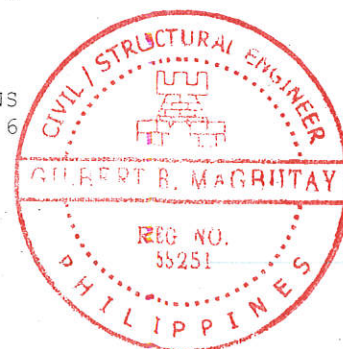
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUPPRT - $V_u = 30.71$ KNS $V_c = 75.81$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM



719J	4000X 300X 500	743J
6N12 H 446.	0.TO 4000	8*10c/c223
3N12 H 54.	0.TO 4000	
000000	000000	000000
6#12	6#12	6#12
3#12	3#12	3#12
000	000	000

BEAM NO. 218 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 218 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 13.91 KNS Vc= 141.79 KNS Vs= 0.00 KNS
 Tu= 0.20 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 13.91 KNS Vc= 141.51 KNS Vs= 0.00 KNS
 Tu= 0.20 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

720J	4000X 400X 700	744J
6N12 H 646.	0.TO 4000	
3N12 H 54.	0.TO 4000	
000000	000000	000000
6#12	6#12	6#12
3#12	3#12	3#12
000	000	000

BEAM NO. 219 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	3890.	YES	NO
2	696.	3 - 12MM	0.	1069.	YES	NO
3	696.	5 - 12MM	1431.	4000.	NO	YES

BEAM NO. 219 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 9.71 KNS Vc= 144.96 KNS Vs= 0.00 KNS
 Tu= 0.41 KN-MET Tc= 7.5 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 9.71 KNS Vc= 144.96 KNS Vs= 0.00 KNS
 Tu= 0.41 KN-MET Tc= 7.5 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.



721J	4000X 400X 750	745J
=====		
3No12 H 696.	0.TO 1069	5No12 H 696.1431.TO 4000
3No12 H 54.	0.TO 3890	
=====		

ooo		ooooo	ooooo
3#12		5#12	5#12
3#12	3#12	3#12	
ooo	ooo	ooo	

=====

BEAM NO. 220 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3615.	YES	NO
2	346.	7 - 12MM	0.	1402.	YES	NO
3	346.	7 - 12MM	1431.	4000.	NO	YES

BEAM NO. 220 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 31.64 KNS Vc= 64.69 KNS Vs= 0.00 KNS
 Tu= 1.20 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

AT END SUPPORT - Vu= 32.35 KNS Vc= 64.69 KNS Vs= 0.00 KNS
 Tu= 1.20 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

722J	4000X 350X 400	746J
=====		
7No12 H 346.	0.TO 1402	7No12 H 346.1431.TO 4000
11*10c/c173		11*10c/c173
4No12 H 54.	0.TO 3615	
=====		

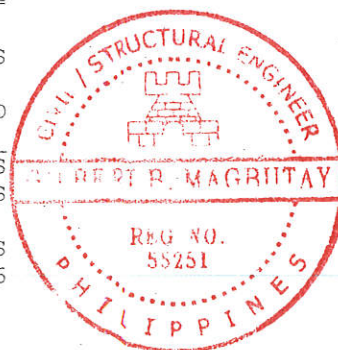
oooooooo	oooooooo	oooooooo	oooooooo
7#12	7#12	7#12	7#12
4#12	4#12	4#12	
oooo	oooo	oooo	

=====

BEAM NO. 221 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 221 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 31.32 KNS Vc= 66.95 KNS Vs= 0.00 KNS
 Tu= 1.30 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6



BEAM NO. 223 DESIGN RESULTS - SHEAR

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.34 SQ. CM.

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

ADDITIONAL LONGITUDINAL STEEL REQ'D. FOR TORSIONAL RESISTANCE = 2.34 SQ. CM.

729J

2285X 300X 750

749J

2N012 H 696.	0.TO 2286			
4*10c/c219			4*10c/c219	
2N012 H 154.	0.TO 2286			

○○	○○	○○	○○
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
○○	○○	○○	○○

BEAM NO. 224 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN -	2236. MM	FY -	230.	FC -	10.	MPA, SIZE -	300. X	750. MMS
LEVEL	HEIGHT	BAR INFC		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

BEAM NO. 224 DESIGN RESULTS - SHEAR

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.92 SQ. CM.

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

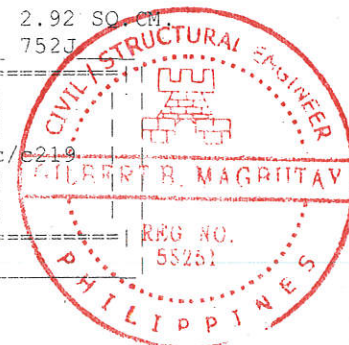
ADDITIONAL LONGITUDINAL STEEL REOD. FOR TORSIONAL RESISTANCE = 2.92 SQ. CM

730J

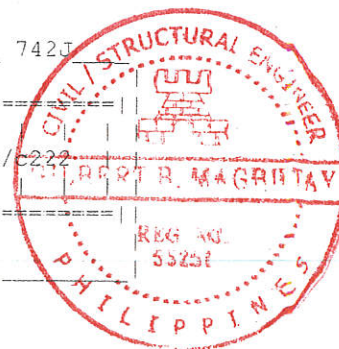
2285X 300X 750

7525

2N012 H 696.	0.TO 2286
4*10c/c219	4*10c/c219
2N012 H 54.	0.TO 2286



0011R 2500R 300 7340

[illegible][illegible]

000000 6#16	000000 6#16	000000 6#16	000000 6#16
6#16 000000	6#16 000000	6#16 000000	6#16 000000

=====

BEAM NO. 235 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3000.	YES	YES
2	446.	5 - 12MM	0.	3000.	YES	YES

BEAM NO. 235 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 0.86 KNS Vc= 75.90 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 0.86 KNS Vc= 75.90 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

742J 2999X 300X 500 743J

5N12 H 446. 0.TO 3000
2N12 H 54. 0.TO 3000

000000 5#12	000000 5#12	000000 5#12	000000 5#12
2#12 00	2#12 00	2#12 00	2#12 00

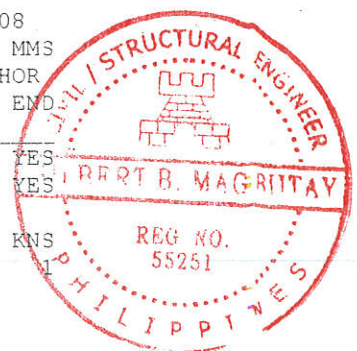
=====

BEAM NO. 236 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	7 - 12MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	5900.	YES	YES

BEAM NO. 236 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 60.87 KNS Vc= 100.64 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM
 AT END SUPPORT - Vu= 59.99 KNS Vc= 100.64 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM





STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - $V_u = 26.12$ KNS $V_c = 61.87$ KNS $V_s = 0.00$ KNS $T_u = 0.89$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

746J 2999X 350X 400 747J

=====	=====	=====	=====
7N12 H 346. 0.TO 3000			
			8*10c/c173
2N12 H 54. 0.TO 3000			
=====	=====	=====	=====

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NC. 243 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	7 - 16MM	0.	5900.	YES	YES
2	342.	7 - 20MM	0.	5900.	YES	YES

BEAM NO. 243 DESIGN RESULTS - SHEAR

AT START SUPPCRT - $V_u = 103.02$ KNS $V_c = 80.50$ KNS $V_s = 56.86$ KNS $T_u = 0.37$ KN-MET $T_c = 3.3$ KN-MET $T_s = 0.0$ KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT IS REQUIRED FOR SHEAR.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 2608. MM

AT END SUPPCRT - $V_u = 97.53$ KNS $V_c = 82.39$ KNS $V_s = 47.64$ KNS $T_u = 0.37$ KN-MET $T_c = 3.3$ KN-MET $T_s = 0.0$ KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT IS REQUIRED FOR SHEAR.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 2608. MM

747J 5899X 400X 400 748J

=====	=====	=====	=====
7N20 H 342. 0.TO 5900			
17*10c/c172			17*10c/c172
7N16 H 56. 0.TO 5900			
=====	=====	=====	=====

0000000	0000000	0000000	0000000
7#20	7#20	7#20	7#20
7#16	7#16	7#16	7#16
0000000	0000000	0000000	0000000

BEAM NC. 248 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 571. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END



1	54.	2 - 12MM	0.	571.	YES	YES
2	696.	2 - 12MM	0.	571.	YES	YES

B E A M N O. 248 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 248 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 248 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

749J 571X 300X 750 753J

2N012 H 696. 0.TO 571

2N012 H 54. 0.TO 571

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

B E A M N O. 249 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 571. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	571.	YES	YES
2	696.	2 - 12MM	0.	571.	YES	YES

B E A M N O. 249 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 249 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 249 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

752J 571X 300X 750 754J

2N012 H 696. 0.TO 571

2N012 H 54. 0.TO 571

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

B E A M N O. 250 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 3260. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

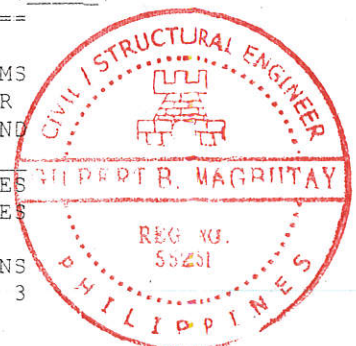
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	3260.	YES	YES
2	296.	4 - 12MM	0.	3260.	YES	YES

B E A M N O. 250 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - Vu= 16.72 KNS Vc= 42.76 KNS Vs= 0.00 KNS

Tu= 0.71 KN-MET Tc= 1.4 KN-MET Ts= 0.0 KN-MET LOAD 3



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
1	54.	2 - 12MM	0.	3260.	YES	YES
2	396.	2 - 12MM	0.	3260.	YES	YES

B E A M N O. 252 D E S I G N R E S U L T S - S H E A R
 AT START SUPPRT - Vu= 5.36 KNS Vc= 65.24 KNS Vs= 0.00 KNS
 Tu= 2.64 KN-MET Tc= 2.5 KN-MET Ts= 3.5 KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.34 SQ.CM.
 AT END SUPPRT - Vu= 4.09 KNS Vc= 70.81 KNS Vs= 0.00 KNS
 Tu= 2.64 KN-MET Tc= 2.5 KN-MET Ts= 3.5 KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.34 SQ.CM.
 735J. 3260X 300X 450 759J

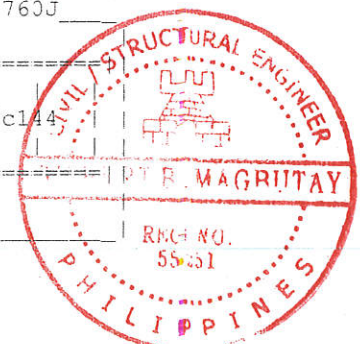
	2No12 H 396.		0.TO 3260														
	10*10c/c144														10*10c/c144		
	2No12 H 54.		0.TO 3260														

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NC.		253 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	3260. MM	FY - 230.	FC - 10. MPA, SIZE - 300. X 450. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END

1	54.	2 - 12MM	0.	3260.	YES	YES
2	396.	2 - 12MM	0.	3260.	YES	YES

B E A M N O. 253 D E S I G N R E S U L T S - S H E A R
 AT START SUPPORT - $V_u = 0.71$ KNS $V_c = 61.29$ KNS $V_s = 0.00$ KNS
 $T_u = 2.58$ KN-MET $T_c = 2.5$ KN-MET $T_s = 3.4$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.30 SQ.CM.
 AT END SUPPORT - $V_u = 0.71$ KNS $V_c = 61.25$ KNS $V_s = 0.00$ KNS
 $T_u = 2.58$ KN-MET $T_c = 2.5$ KN-MET $T_s = 3.4$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.30 SQ.CM.
 736J 3260X 300X 450 760J

[illegible]

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 254 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	5 - 12MM	0.	1712.	YES	NO
3	646.	6 - 12MM	1454.	4000.	NO	YES

BEAM NO. 254 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 13.68 KNS Vc= 143.54 KNS Vs= 0.00 KNS
 Tu= 0.12 KN-MET Tc= 8.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPRT - Vu= 13.68 KNS Vc= 143.76 KNS Vs= 0.00 KNS
 Tu= 0.12 KN-MET Tc= 8.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

741J 4000X 400X 700 767J

=====

5No12 H 646. 0.TO 1712 6No12 H 646.1454.TO 4000

3No12 H 54. 0.TO 4000

=====

00000 5#12	00000 5#12	000000 6#12	000000 6#12
3#12 000	3#12 000	3#12 000	3#12 000

=====

BEAM NO. 255 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	442.	2 - 20MM	0.	1632.	YES	NO
3	444.	4 - 16MM	995.	4000.	NO	YES

BEAM NO. 255 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 30.16 KNS Vc= 79.90 KNS Vs= 0.00 KNS
 Tu= 0.08 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 AT END SUPPRT - Vu= 31.23 KNS Vc= 79.05 KNS Vs= 0.00 KNS
 Tu= 0.08 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM



742J

4000X 300X 500

763J

```

=====
2N20|H 442. 0.TO 1632 444. 995.TO 4000 | | | | | | | | | |
8*10c/c223 | | | | | | | | | | 8*10c/c223|
3N12|H 54. 0.TO 4000 | | | | | | | | | |
=====

```

2#20	4#16	4#16	4#16
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 256 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 256 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 30.32 KNS Vc= 75.85 KNS Vs= 0.00 KNS
 Tu= 0.05 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUPPRT - Vu= 31.08 KNS Vc= 75.85 KNS Vs= 0.00 KNS
 Tu= 0.05 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

743J

4000X 300X 500

769J

```

=====
6N12|H 446. 0.TO 4000 | | | | | | | | | |
8*10c/c223 | | | | | | | | | | 8*10c/c223|
3N12|H 54. 0.TO 4000 | | | | | | | | | |
=====

```

6#12	6#12	6#12	6#12
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 257 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 257 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 14.50 KNS Vc= 146.62 KNS Vs= 0.00 KNS
 Tu= 0.11 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.



AT END SUPPCRT - Vu= 14.50 KNS Vc= 146.62 KNS Vs= 0.00 KNS
 Tu= 0.11 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

744J 4000X 400X 700 770J

6N12 H 646.	0.TO 4000
3N12 H 54.	0.TO 4000

000000	000000	000000	000000
6#12	6#12	6#12	6#12
3#12	3#12	3#12	3#12
000	000	000	000

BEAM NO. 258 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3931.	YES	NO
2	696.	5 - 12MM	0.	4000.	YES	YES

BEAM NO. 258 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 9.98 KNS Vc= 141.75 KNS Vs= 0.00 KNS
 Tu= 0.34 KN-MET Tc= 7.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 9.98 KNS Vc= 141.75 KNS Vs= 0.00 KNS
 Tu= 0.34 KN-MET Tc= 7.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

745J 4000X 400X 750 771J

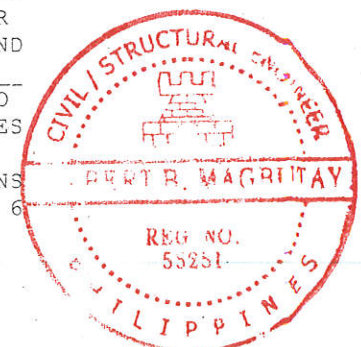
5N12 H 696.	0.TO 4000
2N12 H 54.	0.TO 3931

00000	00000	00000	00000
5#12	5#12	5#12	5#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 259 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3613.	YES	NO
2	346.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 259 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 31.71 KNS Vc= 64.69 KNS Vs= 0.00 KNS
 Tu= 0.83 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



772J

○○○○○○○ 7#12	○○○○○○○ 7#12	○○○○○○○ 7#12	○○○○○○○ 7#12
4#12 ○○○	4#12 ○○○	4#12 ○○○	

1	54.	5 - 12MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	4000.	YES	YES

AT START SUPPCRT - Vu= 31.80 KNS Vc= 69.25 KNS Vs= 0.00 KNS
Tu= 0.07 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

AT END SUPPCRT - Vu= 32.19 KNS Vc= 68.97 KNS Vs= 0.00 KNS
Tu= 0.07 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6

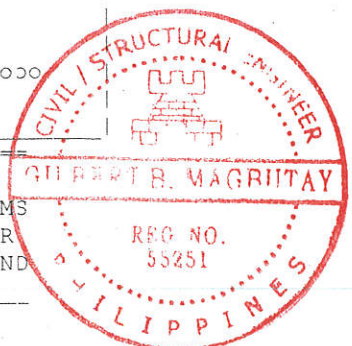
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10-MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

773J

<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>
---	---	---	---

[illegible]

1 54. 3 - 12MM 0. 4000. YES YES
2 694. 3 - 16MM 0. 4000. YES YES

B E A M N O. 261 D E S I G N R E S U L T S - S H E A R

AT START SUPPCRT - Vu= 10.42 KNS Vc= 267.58 KNS Vs= 0.00 KNS
Tu= 0.52 KN-MET Tc= 8.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 10.42 KNS Vc= 267.58 KNS Vs= 0.00 KNS
Tu= 0.52 KN-MET Tc= 8.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

748J

4000X 400X 750

774J

3N16 H 694. 0.TO 4000

3N12 H 54. 0.TO 4000

000 3#16	000 3#16	000 3#16	000 3#16
3#12 000	3#12 000	3#12 000	3#12 000

B E A M N O. 262 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 2857. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 2857. YES YES
2 696. 2 - 12MM 0. 2857. YES YES

B E A M N O. 262 D E S I G N R E S U L T S - S H E A R

AT START SUPPCRT - Vu= 2.92 KNS Vc= 108.45 KNS Vs= 0.00 KNS
Tu= 0.15 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 2.92 KNS Vc= 108.45 KNS Vs= 0.00 KNS
Tu= 0.15 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

753J

2857X 300X 750

761J

2N12 H 696. 0.TO 2857

2N12 H 54. 0.TO 2857

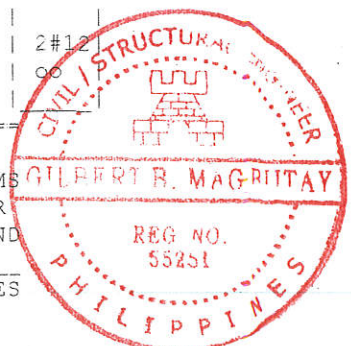
00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

B E A M N O. 263 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 2857. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS

LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 2857. YES YES



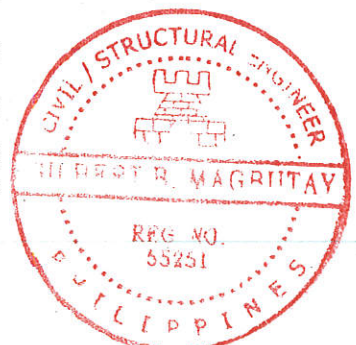
754J 2857X 300X 750 762J

2N012 H 54. 0.T0 2857

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

757J 6849X 250X 350 758J

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 269 IS BEYOND



THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 269 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 761J 571X 300X 750 775J

3No12 H 696.	0.TO	571
2No12 H 54.	0.TO	571

ooo	ooo	ooo	ooo
3#12	3#12	3#12	3#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 270 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 571. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	571.	YES	YES
2	696.	2 - 12MM	0.	571.	YES	YES

BEAM NO. 270 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 270 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 270 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 762J 571X 300X 750 778J

2No12 H 696.	0.TO	571
2No12 H 54.	0.TO	571

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 271 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3260. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3260.	YES	YES
2	292.	3 - 20MM	0.	3260.	YES	YES

BEAM NO. 271 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 10.53$ KNS $V_c = 41.26$ KNS $V_s = 0.00$ KNS
 $T_u = 3.92$ KN-MET $T_c = 1.4$ KN-MET $T_s = 5.2$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 1338. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.64 SQ. CM.



000 3#20 2#12 00	000 3#20 2#12 00	000 3#20 2#12 00	000 3#20 2#12 00
-------------------------------	-------------------------------	-------------------------------	-------------------------------

1	54.	2 - 12MM	0.	3260.	YES	YES
2	296.	4 - 12MM	0.	3260.	YES	YES

BEAM NO. 272 DESIGN RESULTS - SHEAR
 AT START SUPPRT. - $V_u = 20.48$ KNS $V_c = 41.16$ KNS $V_s = 0.00$ KNS
 $T_u = 4.01$ KN-MET $T_c = 1.4$ KN-MET $T_s = 5.3$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 1338. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.71 SQ.CM.
 AT END SUPPRT - $V_u = 23.45$ KNS $V_c = 40.90$ KNS $V_s = 0.00$ KNS
 $T_u = 4.01$ KN-MET $T_c = 1.4$ KN-MET $T_s = 5.3$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 1338. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.71 SQ.CM.
 758J 3260X 250X 350 784J

0000 4#12 2#12 00	0000 4#12 2#12 00	0000 4#12 2#12 00	0000 4#12 2#12 00
--------------------------------	--------------------------------	--------------------------------	--------------------------------

BEAM NO. 273 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 3260. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR



B E A M N O. 273 D E S I G N R E S U L T S - S H E A R

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM

ADDITIONAL LONGITUDINAL STEEL REOD. FOR TORSIONAL RESISTANCE = 5.49 SQ.CM.

AT END SUPPCRT - $V_u = 11.48$ KNS $V_c = 60.71$ KNS $V_s = 0.00$ KNS

Tu= 10.85 KN-MET Tc= 2.4 KN-MET Ts= 14.5 KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 5.49 SQ. CM.

759J	3260X	300X	450	785J
------	-------	------	-----	------

[illegible]

○○○○ 4#16	○○○○ 4#16	○○○○ 4#16	○○○○ 4#16
2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○

	BEAM NC.	274	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	3260. MM	FY - 230.	FC - 10.	MPA, SIZE - 300. X 450. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA. END

BEAM NO. 274 DESIGN RESULTS - SHEAR

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.32 SQ. CM.

AT END SUPPCRT - $V_u = 6.44$ KNS $V_c = 62.88$ KNS $V_s = 0.00$ KNS

Tu= 7.54 KN-MET Tc= 2.4 KN-MET Ts= 10.1 KN-MET LOAD 14

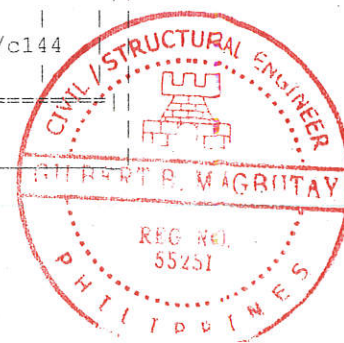
STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1238. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.32 SQ. CM.

760J	3260X	300X	450	786J
------	-------	------	-----	------

[illegible]

[illegible]

000000	000000	000000	000000
6#16	6#16	6#16	6#16
6#16	6#16	6#16	6#16
000000	000000	000000	000000

A circular red ink seal of a Professional Engineer. The outer ring contains the text "CIVIL / STRUCTURAL ENGINEER" at the top and "PHILIPPINES" at the bottom, separated by a dotted line. In the center is a graphic of a bridge or structure. Below the graphic, the name "GILBERT R. MAGRUIATAY" is written in a horizontal band. At the bottom of the seal, the text "REG. NO. 55251" is visible.

768J

2993X 300X 500

769J

5N12 H 446. 0.TO 3000

2N12 H 54. 0.TO 3000

00000

5#12

2#12

00

00000

5#12

2#12

00

00000

5#12

2#12

00

00000

5#12

2#12

00

BEAM NO. 281 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	6 - 12MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	5900.	YES	YES

BEAM NO. 281 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 60.69 KNS Vc= 100.52 KNS Vs= 0.00 KNS
 Tu= 0.04 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM

AT END	SUPPORT	- Vu=	60.16 KNS	Vc=	100.52 KNS	Vs=	0.00 KNS
Tu=	0.04 KN-MET	Tc=	4.7 KN-MET	Ts=	0.0 KN-MET	LOAD	7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM

769J

5899X 400X 500

770J

6N16 H 444. 0.TO 5900

13*10c/c223

13*10c/c223

6N12 H 54. 0.TO 5900

000000

6#16

6#12

000000

000000

6#16

6#12

000000

000000

6#16

6#12

000000

000000

6#16

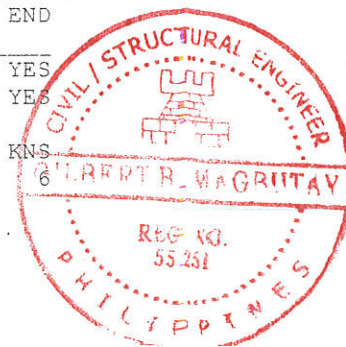
6#12

000000

BEAM NO. 286 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5630. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	8 - 12MM	0.	5680.	YES	YES
2	344.	5 - 16MM	0.	5680.	YES	YES

BEAM NO. 286 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 32.25 KNS Vc= 79.81 KNS Vs= 0.00 KNS
 Tu= 0.07 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM
 AT END SUPPCRT - $V_u = 33.29$ KNS $V_c = 78.80$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM

771J 5680X 400X 400 772J

[illegible]

00000 5#16 8#12 00000000	00000 5#16 8#12 00000000	00000 5#16 8#12 00000000	00000 5#16 8#12 00000000
---------------------------------------	---------------------------------------	---------------------------------------	---------------------------------------

BEAM NO.		287 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	3000. MM	FY - 230.	FC - 10. MPA, SIZE - 350. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) (MM) STA END
1	100	1	100
2	200	2	200
3	300	3	300
4	400	4	400
5	500	5	500
6	600	6	600
7	700	7	700
8	800	8	800
9	900	9	900
10	1000	10	1000
11	1100	11	1100
12	1200	12	1200
13	1300	13	1300
14	1400	14	1400
15	1500	15	1500
16	1600	16	1600
17	1700	17	1700
18	1800	18	1800
19	1900	19	1900
20	2000	20	2000
21	2100	21	2100
22	2200	22	2200
23	2300	23	2300
24	2400	24	2400
25	2500	25	2500
26	2600	26	2600
27	2700	27	2700
28	2800	28	2800
29	2900	29	2900
30	3000	30	3000

1	54.	2 - 12MM	0.	3000.	YES	YES
2	346.	7 - 12MM	0.	3000.	YES	YES

BEAM NO. 287 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 0.88$ KNS $V_c = 64.61$ KNS $V_s = 0.00$ KNS
 $T_u = 0.12$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 31.06 KNS Vc= 64.62 KNS Vs= 0.00 KNS
Tu= 0.15 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

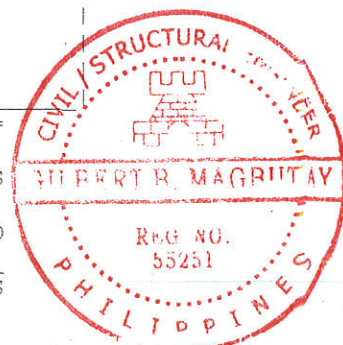
772J 2999X 350X 400 773J

7N012 H 346.	0.TO 3000						
2N012 H 54.	0.TO 3000				8*10c/c173		

<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>
--	--	--	--

BEAM NC.		288 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	5900. MM	FY - 230.	FC - 10. MPA, SIZE - 400. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO ANCHOR
	(MM)		(MM) (MM) STA END
1	100	1	100
2	200	2	200
3	300	3	300
4	400	4	400
5	500	5	500
6	600	6	600
7	700	7	700
8	800	8	800
9	900	9	900
10	1000	10	1000
11	1100	11	1100
12	1200	12	1200
13	1300	13	1300
14	1400	14	1400
15	1500	15	1500
16	1600	16	1600
17	1700	17	1700
18	1800	18	1800
19	1900	19	1900
20	2000	20	2000
21	2100	21	2100
22	2200	22	2200
23	2300	23	2300
24	2400	24	2400
25	2500	25	2500
26	2600	26	2600
27	2700	27	2700
28	2800	28	2800
29	2900	29	2900
30	3000	30	3000
31	3100	31	3100
32	3200	32	3200
33	3300	33	3300
34	3400	34	3400
35	3500	35	3500
36	3600	36	3600
37	3700	37	3700
38	3800	38	3800
39	3900	39	3900
40	4000	40	4000
41	4100	41	4100
42	4200	42	4200
43	4300	43	4300
44	4400	44	4400
45	4500	45	4500
46	4600	46	4600
47	4700	47	4700
48	4800	48	4800
49	4900	49	4900
50	5000	50	5000
51	5100	51	5100
52	5200	52	5200
53	5300	53	5300
54	5400	54	5400
55	5500	55	5500
56	5600	56	5600
57	5700	57	5700
58	5800	58	5800
59	5900	59	5900
60	6000	60	6000
61	6100	61	6100
62	6200	62	6200
63	6300	63	6300
64	6400	64	6400
65	6500	65	6500
66	6600	66	6600
67	6700	67	6700
68	6800	68	6800
69	6900	69	6900
70	7000	70	7000
71	7100	71	7100
72	7200	72	7200
73	7300	73	7300
74	7400	74	7400
75	7500	75	7500
76	7600	76	7600
77	7700	77	7700
78	7800	78	7800
79	7900	79	7900
80	8000	80	8000
81	8100	81	8100
82	8200	82	8200
83	8300	83	8300
84	8400	84	8400
85	8500	85	8500
86	8600	86	8600
87	8700	87	8700
88	8800	88	8800
89	8900	89	8900
90	9000	90	9000
91	9100	91	9100
92			

1	58.	6 - 20MM	0.	5900.	YES	YES
---	-----	----------	----	-------	-----	-----



***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX NEG MOMENT = 134.92 KN-MET, LOADING 7
773J 5899X 400X 400 774J

6N20 H 38. 0.TO 5900

6#20
000000

6#20
000000

6#20
000000

6#20
000000

BEAM NC. 293 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2236. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	2286.	YES	YES
2	696.	2 - 12MM	0.	2286.	YES	YES

BEAM NO. 293 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 2.22$ KNS $V_c = 193.00$ KNS $V_s = 0.00$ KNS
 $T_u = 6.62$ KN-MET $T_c = 4.9$ KN-MET $T_s = 8.8$ KN-MET LOAD 2
STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.79 SQ.CM.

AT END SUPPRT - $V_u = 2.22$ KNS $V_c = 193.00$ KNS $V_s = 0.00$ KNS
 $T_u = 6.62$ KN-MET $T_c = 4.9$ KN-MET $T_s = 8.8$ KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 451. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.79 SQ.CM.

775J 2285X 300X 750 787J

2N20 H 696. 0.TO 2286

4*10c/c219

4*10c/c219

2N20 H 154. 0.TO 2286

00
2#12

00
2#12

00
2#12

00
2#12

2#12
00

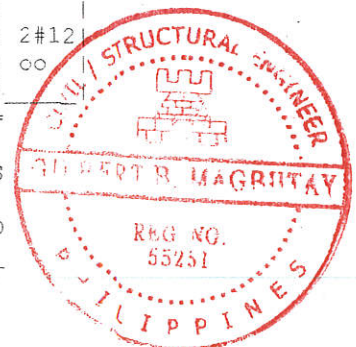
2#12
00

2#12
00

2#12
00

BEAM NC. 297 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2233. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

***MEMBER FAILS IN MAX REINFORCEMENT.



INCREASE MEMBER SIZE.

MAX POS MOMENT = 70.04 KN-MET, LOADING 7

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1218. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2

MAX NEG MOMENT = 58.30 KN-MET, LOADING 7

781J

2283X 250X 350

782J

BEAM NO. 298 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 2283. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX POS MOMENT = 65.97 KN-MET, LOADING 7

1 296.

2 - 12MM

0.

2283.

YES YES

782J

2283X 250X 350

783J

2No12 H 296. 0.TO 2283			

BEAM NO. 299 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 2283. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1342. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2

MAX POS MOMENT = 62.67 KN-MET, LOADING 7

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1175. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2

MAX NEG MOMENT = 56.74 KN-MET, LOADING 7



304 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08						
LEN -	4000. MM	FY -	230.	FC -	12.	MPA, SIZE - 300. X 500. MM
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	3 - 12MM	0.	4000.	YES	YES
2	444.	4 - 16MM	0.	4000.	YES	YES

BEAM NO. 304 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 30.09$ KNS $V_c = 75.87$ KNS $V_s = 0.00$ KNS
 $T_u = 0.62$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUPPRT - $V_u = 31.30$ KNS $V_c = 75.87$ KNS $V_s = 0.00$ KNS
 $T_u = 0.62$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

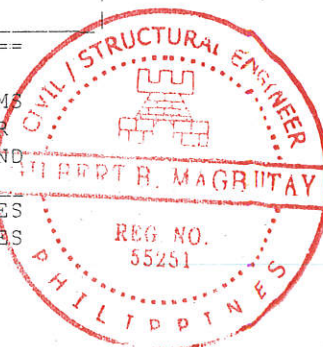
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

305 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08							
LEN -	4000. MM	FY -	230.	FC -	12.	MPA, SIZE -	400. X 700. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR	STA	END
	(MM)		(MM)	(MM)			
1	54.	3 - 12MM	0.	4000.	YES	YES	
2	646.	7 - 12MM	0.	4000.	YES	YES	

BEAM NO. 305 DESIGN RESULTS - SHEAR



AT START SUPPCRT - Vu= 14.39 KNS Vc= 146.34 KNS Vs= 0.00 KNS
 Tu= 0.19 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - Vu= 14.39 KNS Vc= 146.34 KNS Vs= 0.00 KNS
 Tu= 0.19 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

770J

4000X 400X 700

796J

7N12 H 646. 0.TO 4000

3N12 H 54. 0.TO 4000

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 306 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	696.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 306 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 13.58 KNS Vc= 135.75 KNS Vs= 0.00 KNS
 Tu= 0.36 KN-MET Tc= 6.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - Vu= 13.58 KNS Vc= 135.75 KNS Vs= 0.00 KNS
 Tu= 0.36 KN-MET Tc= 6.6 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

771J

4000X 400X 750

797J

7N12 H 696. 0.TO 4000

3N12 H 54. 0.TO 4000

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 307 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 307 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 31.32 KNS Vc= 66.50 KNS Vs= 0.00 KNS



○○○○○○ 7#12 2#16 ○○	○○○○○○ 7#12 2#16 ○○	○○○○○○ 7#12 2#16 ○○	○○○○○○ 7#12 2#16 ○○
--------------------------------------	--------------------------------------	--------------------------------------	--------------------------------------

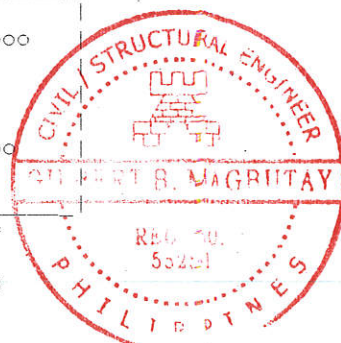
BEAM NO.		308 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	4000. MM	FY -	230.	FC -	10. MPA, SIZE - 350. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END
1	100	1	100	100	100
2	200	2	200	200	200
3	300	3	300	300	300
4	400	4	400	400	400
5	500	5	500	500	500
6	600	6	600	600	600
7	700	7	700	700	700
8	800	8	800	800	800
9	900	9	900	900	900
10	1000	10	1000	1000	1000
11	1100	11	1100	1100	1100
12	1200	12	1200	1200	1200
13	1300	13	1300	1300	1300
14	1400	14	1400	1400	1400
15	1500	15	1500	1500	1500
16	1600	16	1600	1600	1600
17	1700	17	1700	1700	1700
18	1800	18	1800	1800	1800
19	1900	19	1900	1900	1900
20	2000	20	2000	2000	2000
21	2100	21	2100	2100	2100
22	2200	22	2200	2200	2200
23	2300	23	2300	2300	2300
24	2400	24	2400	2400	2400
25	2500	25	2500	2500	2500
26	2600	26	2600	2600	2600
27	2700	27	2700	2700	2700
28	2800	28	2800	2800	2800
29	2900	29	2900	2900	2900
30	3000	30	3000	3000	3000
31	3100	31	3100	3100	3100
32	3200	32	3200	3200	3200
33	3300	33	3300	3300	3300
34	3400	34	3400	3400	3400
35	3500	35	3500	3500	3500
36	3600	36	3600	3600	3600
37	3700	37	3700	3700	3700
38	3800	38	3800	3800	3800
39	3900	39	3900	3900	3900
40	4000	40	4000	4000	4000

BEAM NO. 308 DESIGN RESULTS - SHEAR
AT START SUPPRT - $V_u = 30.59$ KNS $V_c = 54.55$ KNS $V_s = 0.00$ KNS
 $T_u = 0.40$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM
AT END SUPPRT - $V_u = 33.40$ KNS $V_c = 64.55$ KNS $V_s = 0.00$ KNS
 $T_u = 0.40$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>	<p>0000000</p> <p>7#12</p> <p>5#12</p> <p>00000</p>
---	---	---	---

BEAM NO. 309 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	
					STA	END

1	54.	2 - 12MM	0.	3263.	YES	NO
2	692.	2 - 20MM	0.	4000.	YES	YES

BEAM NO. 309 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 8.63$ KNS $V_c = 271.17$ KNS $V_s = 0.00$ KNS

$T_u = 0.18$ KN-MET $T_c = 8.8$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - $V_u = 43.65$ KNS $V_c = 113.19$ KNS $V_s = 0.00$ KNS

$T_u = 1.60$ KN-MET $T_c = 3.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 10

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM. 2-LEGGED STIRRUPS AT 262. MM C/C FOR 1308. MM

774J 4000X 400X 750 800J

2N20 H 692.	0 TO 4000						
						6*10c/c262	
2N12 H 54.	0 TO 3263						

2#20	2#20	2#20	2#20
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 310 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2740. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	
					STA	END

1	54.	4 - 12MM	0.	2740.	YES	YES
---	-----	----------	----	-------	-----	-----

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX NEG MOMENT = 85.12 KN-MET, LOADING 6

781J 2740X 250X 350 807J

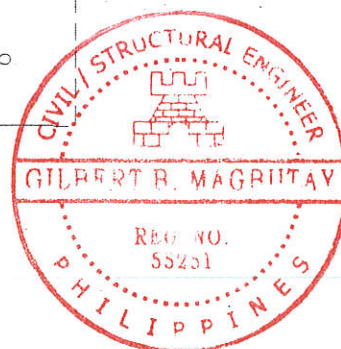
4N12 H 54.	0 TO 2740						
------------	-----------	--	--	--	--	--	--

4#12	4#12	4#12	4#12
0000	0000	0000	0000

BEAM NO. 311 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2740. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	
					STA	END



1	54.	3 - 12MM	0.	2740.	YES	YES
2	296.	2 - 12MM	0.	520.	YES	NO
3	296.	2 - 12MM	279.	2740.	NO	YES

BEAM NO. 311 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 7.55$ KNS $T_u = 10.6$ KN-MET
 $V_c = 42.0$ KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - $V_u = 3.24$ KNS $T_u = 10.6$ KN-MET
 $V_c = 42.0$ KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

782J 2740X 250X 350 808J

2No12 HN296.H 20.TO275200 2740

3No12 H 54. 0.TO 2740

oo	oo	oo	oo
2#12	2#12	2#12	2#12
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 312 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2740. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	56.	2 - 16MM	0.	2740.	YES	YES
2	296.	2 - 12MM	0.	2740.	YES	YES

BEAM NO. 312 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 13.78$ KNS $V_c = 41.71$ KNS $V_s = 0.00$ KNS
 $T_u = 6.26$ KN-MET $T_c = 1.4$ KN-MET $T_s = 8.3$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 1078. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.23 SQ.CM.

AT END SUPPORT - $V_u = 12.34$ KNS $V_c = 41.71$ KNS $V_s = 0.00$ KNS $T_u = 6.26$ KN-MET $T_c = 1.4$ KN-MET $T_s = 8.3$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 1078. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.23 SQ.CM.

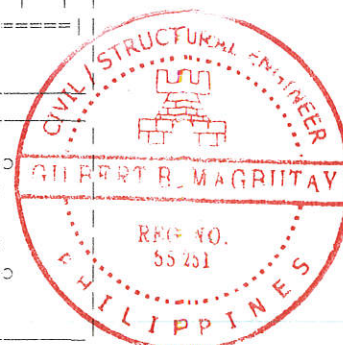
783J 2740X 250X 350 810J

2No12 H 296. 0.TO 2740

12*10c/c107

2No16 H 56. 0.TO 2740

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#16	2#16	2#16	2#16
oo	oo	oo	oo



```

=====
BEAM NO. 313 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2740. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
      (MM)      (MM)      (MM)      STA END

```

```

1      56.      3 - 16MM      0.      2740.      YES YES
2      294.     4 - 16MM      0.      2740.      YES YES

```

BEAM NO. 313 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 44.21$ KNS $T_u = 8.5$ KN-MET

$V_c = 45.2$ KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 7 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPRT - $V_u = 6.44$ KNS $T_u = 8.5$ KN-MET

$V_c = 40.3$ KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 7 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

784J 2740X 250X 350 811J

```

=====
4No16 H 294. 0.TO 2740

```

```

3No16 H 56. 0.TO 2740
=====

```

oooo 4#16 3#16 ooo	oooo 4#16 3#16 ooo	oooo 4#16 3#16 ooo	oooo 4#16 3#16 ooo
---------------------------------	---------------------------------	---------------------------------	---------------------------------

```

=====
BEAM NO. 314 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2740. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
      (MM)      (MM)      (MM)      STA END

```

```

1      54.      3 - 12MM      0.      2740.      YES YES
2      392.     3 - 20MM      0.      2740.      YES YES

```

BEAM NO. 314 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 19.85$ KNS $V_c = 62.20$ KNS $V_s = 0.00$ KNS

$T_u = 9.75$ KN-MET $T_c = 2.5$ KN-MET $T_s = 13.0$ KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 978. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.94 SQ.CM.

AT END SUPPRT - $V_u = 12.38$ KNS $V_c = 65.66$ KNS $V_s = 0.00$ KNS

$T_u = 9.75$ KN-MET $T_c = 2.5$ KN-MET $T_s = 13.0$ KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 978. MM

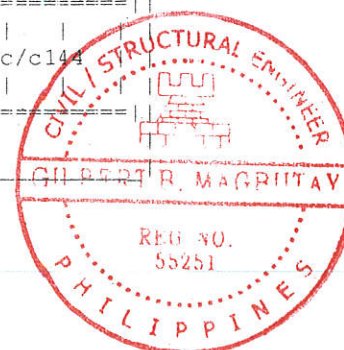
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.94 SQ.CM.

785J 2740X 300X 450 812J

```

=====
3No20 H 392. | 0.TO 2740 | | | | | | | |
8*10c/c144 | | | | | | | | 8*10c/c144
3No12 H 54. | 0.TO 2740 | | | | | | | |
=====

```

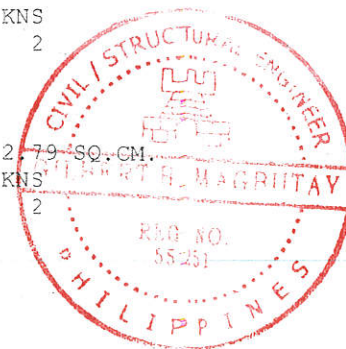


BEAM NO. 315 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 1.09 KNS Vc= 79.45 KNS Vs= 0.00 KNS
 Tu= 4.91 KN-MET Tc= 2.5 KN-MET Ts= 6.6 KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 978. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.49 SQ.CM.
 AT END SUPPCRT - Vu= 1.09 KNS Vc= 111.89 KNS Vs= 0.00 KNS
 Tu= 4.91 KN-MET Tc= 2.5 KN-MET Ts= 6.6 KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 978. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.49 SQ.CM.
 786J 2740X 300X 450 816J

[illegible]

000 3#12	000 3#12	000 3#12	000 3#12
5#12 00000	5#12 00000	5#12 00000	5#12 00000

BEAM NO. 316 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 2.22$ KNS $V_c = 193.00$ KNS $V_s = 0.00$ KNS
 $T_u = 6.62$ KN-MET $T_c = 4.9$ KN-MET $T_s = 8.8$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.7
 AT END SUPPORT - $V_u = 2.22$ KNS $V_c = 193.00$ KNS $V_s = 0.00$ KNS
 $T_u = 6.62$ KN-MET $T_c = 4.9$ KN-MET $T_s = 8.8$ KN-MET LOAD 2
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.79 SQ.CM.
 787J 1714X 300X 750 803J

3No12 H 696.	0.TO 1714		
2*10c/c219		2*10c/c219	
2No12 H 54.	0.TO 1714		

ooo	ooo	ooo	ooo
3#12	3#12	3#12	3#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 317 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1714. MM FY - 230. FC - 10. MPA, SIZE - 300. X 750. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	1714.	YES	YES
2	694.	2 - 16MM	0.	1714.	YES	YES

BEAM NO. 317 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 3.99 KNS Vc= 106.20 KNS Vs= 0.00 KNS
 Tu= 7.37 KN-MET Tc= 4.5 KN-MET Ts= 9.8 KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.11 SQ.CM.

AT END SUPPCRT - Vu= 3.99 KNS Vc= 106.20 KNS Vs= 0.00 KNS
 Tu= 7.37 KN-MET Tc= 4.5 KN-MET Ts= 9.8 KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 165. MM

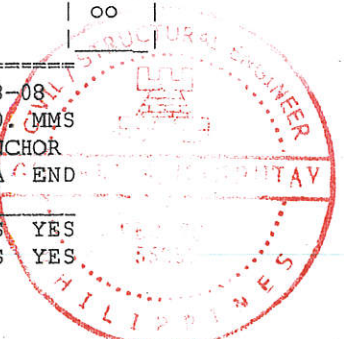
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 3.11 SQ.CM.
 788J 1714X 300X 750 806J

2No16 H 694.	0.TO 1714		
2*10c/c219		2*10c/c219	
2No12 H 54.	0.TO 1714		

oo	oo	oo	oo
2#16	2#16	2#16	2#16
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NC. 322 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5630. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	6 - 16MM	0.	5680.	YES	YES
2	444.	6 - 16MM	0.	5680.	YES	YES



[illegible]

○○○○○○ 6#16	○○○○○○ 6#16	○○○○○○ 6#16	○○○○○○ 6#16
6#16 ○○○○○○	6#16 ○○○○○○	6#16 ○○○○○○	6#16 ○○○○○○

BEAM NO.		323 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN -	3000. MM	FY -	230.	FC -	12. MPA, SIZE - 300. X 500. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END
1	100	1	100	100	100
2	200	2	200	200	200
3	300	3	300	300	300
4	400	4	400	400	400
5	500	5	500	500	500
6	600	6	600	600	600
7	700	7	700	700	700
8	800	8	800	800	800
9	900	9	900	900	900
10	1000	10	1000	1000	1000
11	1100	11	1100	1100	1100
12	1200	12	1200	1200	1200
13	1300	13	1300	1300	1300
14	1400	14	1400	1400	1400
15	1500	15	1500	1500	1500
16	1600	16	1600	1600	1600
17	1700	17	1700	1700	1700
18	1800	18	1800	1800	1800
19	1900	19	1900	1900	1900
20	2000	20	2000	2000	2000
21	2100	21	2100	2100	2100
22	2200	22	2200	2200	2200
23	2300	23	2300	2300	2300
24	2400	24	2400	2400	2400
25	2500	25	2500	2500	2500
26	2600	26	2600	2600	2600
27	2700	27	2700	2700	2700
28	2800	28	2800	2800	2800
29	2900	29	2900	2900	2900
30	3000	30	3000	3000	3000

1	54.	2 - 12MM	0.	3000.	YES	YES
2	446.	5 - 12MM	0.	3000.	YES	YES

BEAM NO. 323 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 1.41$ KNS $V_c = 74.41$ KNS $V_s = 0.00$ KNS
 $T_u = 0.07$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

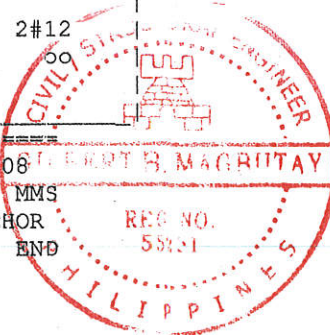
AT END	SUPPCT -	Vu=	1.41 KNS	Vc=	73.97 KNS	Vs=	0.00 KNS
Tu=	0.07 KN-MET	Tc=	3.0 KN-MET	Ts=	0.0 KN-MET	LOAD	1

794J 2999X 300X 500 795J

```
=====
|=====
| 5No12 H 446.    0.TO 3000
|=====
| 2No12 H  54.    0.TO 3000
|=====
```

00000 5#12	00000 5#12	00000 5#12	00000 5#12
2#12 00	2#12 00	2#12 00	2#12 00

	BEAM NC.	. 324	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	5900. MM	FY - 230.	FC - 12. MPA, SIZE - 400. X	500. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END



1	58.	3 - 20MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	5900.	YES	YES

BEAM NO. 324 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 42.55 KNS Vc= 100.37 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 221. MM C/C FOR 2508. MM
 AT END SUPPORT - Vu= 41.02 KNS Vc= 100.37 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 221. MM C/C FOR 2508. MM
 795J 5899X 400X 500 796

[illegible]

○○○○○○ 6#16 3#20 ○○○	○○○○○○ 6#16 3#20 ○○○	○○○○○○ 6#16 3#20 ○○○	○○○○○○ 6#16 3#20 ○○○
-----------------------------------	-----------------------------------	-----------------------------------	-----------------------------------









	BEAM NC.	329	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08					
LEN -	5630. MM	FY -	230.	FC -	10.	MPA, SIZE -	400. X	400. MMS
LEVEL	HEIGHT	BAR INFC		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

1	54.	8 - 12MM	0.	5680.	YES	YES
2	344.	7 - 16MM	0.	5680.	YES	YES

BEAM NO. 329 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 38.79 KNS Vc= 73.12 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM
 AT END SUPPORT - Vu= 38.98 KNS Vc= 73.12 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM
 797J 5680X 400X 400 798

[illegible]

7No12 H 346.	0.TO 3000								
2No12 H 54.	0.TO 3000					8*10c/c173			

6No20 H 58. 0.TO 5900



6#20 oooooo	6#20 oooooo	6#20 oooooo	6#20 oooooo
----------------	----------------	----------------	----------------

=====

BEAM NO. 339 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2283. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	4 - 12MM	0.	2283.	YES	YES	
2	296.	2 - 12MM	184.	2283.	NO	YES	

BEAM NO. 339 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 4.02 KNS Tu= 14.9 KN-MET

Vc= 40.6 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPORT - Vu= 16.10 KNS Tu= 14.9 KN-MET

Vc= 49.4 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

807J 2283X 250X 350 808J

2No12 H 296. 184.TO 2283
4No12 H 54. 0.TO 2283

4#12 oooo	2#12 4#12 oooo	2#12 4#12 oooo	2#12 4#12 oooo
--------------	----------------------	----------------------	----------------------

=====

BEAM NO. 340 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1142. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	58.	2 - 20MM	0.	1142.	YES	YES	
2	294.	3 - 16MM	0.	1142.	YES	YES	

BEAM NO. 340 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 30.74 KNS Tu= 24.9 KN-MET

Vc= 48.7 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

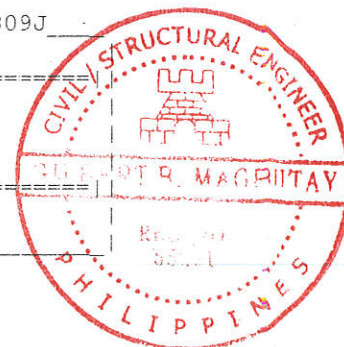
AT END SUPPORT - Vu= 37.35 KNS Tu= 24.9 KN-MET

Vc= 53.1 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

808J 1141X 250X 350 809J

3No16 H 294. 0.TO 1142
2No20 H 58. 0.TO 1142



ooo 3#16	ooo 3#16	ooo 3#16	ooo 3#16
2#20 oo	2#20 oo	2#20 oo	2#20 oo

=====

BEAM NO. 341 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1142. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	4 - 12MM	0.	1142.	YES YES
2	296.	4 - 12MM	0.	1142.	YES YES

BEAM NO. 341 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 22.62 KNS Tu= 14.4 KN-MET

Vc= 42.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPCRT - Vu= 16.01 KNS Tu= 14.4 KN-MET

Vc= 42.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

809J 1141X 250X 350 810J

4No12 H 296. 0.TO 1142

4No12 H 54. 0.TO 1142

oooo 4#12	oooo 4#12	oooo 4#12	oooo 4#12
4#12 oooo	4#12 oooo	4#12 oooo	4#12 oooo

=====

BEAM NO. 342 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2283. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	2283.	YES YES
2	296.	3 - 12MM	0.	2283.	YES YES

BEAM NO. 342 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 0.92 KNS Tu= 8.7 KN-MET

Vc= 42.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 7 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

AT END SUPPCRT - Vu= 17.80 KNS Tu= 8.7 KN-MET

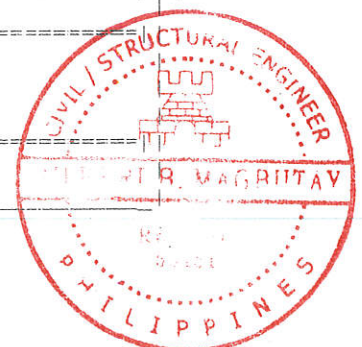
Vc= 42.0 KNS, ACI 318:CLAUSE 11.6.3.1

LOAD 7 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

810J 2283X 250X 350 811J

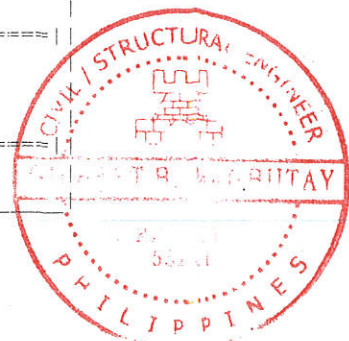
3No12 H 296. 0.TO 2283

2No12 H 54. 0.TO 2283



00 2#12	00 2#12	00 2#12	00 2#12
00 2#12	00 2#12	00 2#12	00 2#12

2NO12 H 54. 0.T0 1142



00000 5#12	00000 5#12	00000 5#12	00000 5#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 345 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1142. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	1142.	YES	YES
2	394.	2 - 16MM	0.	1142.	YES	YES

BEAM NO. 345 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 7.23$ KNS $V_c = 60.99$ KNS $V_s = 0.00$ KNS
 $T_u = 3.15$ KN-MET $T_c = 2.5$ KN-MET $T_s = 4.2$ KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 179. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.59 SQ.CM.
 AT END SUPPRT - $V_u = 5.62$ KNS $V_c = 112.05$ KNS $V_s = 0.00$ KNS
 $T_u = 3.15$ KN-MET $T_c = 2.5$ KN-MET $T_s = 4.2$ KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 179. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.59 SQ.CM.
 814J 1141X 300X 450 815J

2No16 H 394.	0.TO 1142		
3*10c/c144		3*10c/c144	
2No12 H 54.	0.TO 1142		

00 2#16	00 2#16	00 2#16	00 2#16
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 346 DESIGN RESULTS - FLEXURE PER CODE ACI 318-0
 LEN - 2283. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	2283.	YES	YES
2	396.	2 - 12MM	0.	2283.	YES	YES

BEAM NO. 346 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 2.08$ KNS $V_c = 61.80$ KNS $V_s = 0.00$ KNS
 $T_u = 3.15$ KN-MET $T_c = 2.5$ KN-MET $T_s = 4.2$ KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 750. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.59 SQ.CM.
 AT END SUPPORT - $V_u = 4.68$ KNS $V_c = 112.05$ KNS $V_s = 0.00$ KNS
 $T_u = 3.15$ KN-MET $T_c = 2.5$ KN-MET $T_s = 4.2$ KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



[illegible]

00 2#12	00 2#12	00 2#12	00 2#12
00 2#12	00 2#12	00 2#12	00 2#12

1	54.	2 - 12MM	0.	1143.	YES	YES
2	696.	3 - 12MM	0.	1143.	YES	YES

B E A M N O . 3 4 7 D E S I G N R E S U L T S - S H E A R
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 347 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 347 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 803J 1142K 300X 750 817J

3No12 H 696.	0.TO 1143
2No12 H 54.	0.TO 1143

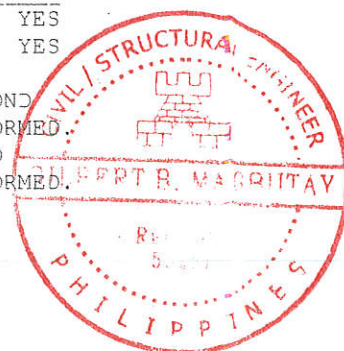
000	000	000	000
3#12	3#12	3#12	3#12
2#12	2#12	2#12	2#12
00	00	00	00

1	54.	2 - 12MM	0.	1143.	YES	YES
2	694.	2 - 16MM	0.	1143.	YES	YES

B E A M N O . 3 4 8 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 348 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 348 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



806J	1142X 300X 750	813J
=====		
2N016 H 694.	0.TO 1143	
2N012 H 54.	0.TO 1143	
=====		

00	00	00	00
2#16	2#16	2#16	2#16
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 349 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1530. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

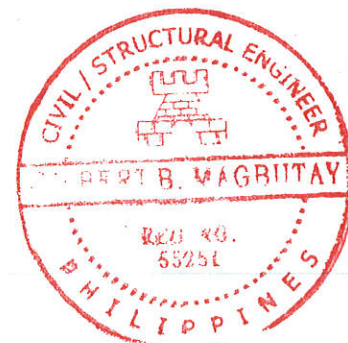
*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.
 REQD. STEEL = 985. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2
 MAX POS MOMENT = 49.36 KN-MET, LOADING 6
 ***MEMBER FAILS IN MAX REINFORCEMENT.
 INCREASE MEMBER SIZE.

MAX NEG MOMENT = 119.94 KN-MET, LOADING 7
 809J 1579X 250X 350 821J

BEAM NO. 350 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1530. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	1580.	YES	YES
2	294.	3 - 16MM	0.	1580.	YES	YES

BEAM NO. 350 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 20.45 KNS Tu= 8.2 KN-MET
 Vc= 43.3 KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 6 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.
 AT END SUPPCRT - Vu= 35.20 KNS Tu= 8.2 KN-MET
 Vc= 43.2 KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 6 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.



811J

1579X 250X 350

822J

3No16 H 294. 0.TO 1580

2No16 H 56. 0.TO 1580

ooo
3#16ooo
3#16ooo
3#16ooo
3#162#16
oo2#16
oo2#16
oo2#16
oo

BEAM NC. 351 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1580. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 56. 2 - 16MM 0. 1192. YES NO
 2 396. 6 - 12MM 0. 1580. YES YES

BEAM NO. 351 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 36.56 KNS Vc= 62.92 KNS Vs= 0.00 KNS
 Tu= 8.43 KN-MET Tc= 2.4 KN-MET Ts= 11.2 KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 398. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.27 SQ.CM.
 AT END SUPPCRT - Vu= 39.60 KNS Vc= 62.92 KNS Vs= 0.00 KNS
 Tu= 8.43 KN-MET Tc= 2.4 KN-MET Ts= 11.2 KN-MET LOAD 3
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 398. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 4.27 SQ.CM.

814J

1579X 300X 450

823J

6No12 H 396. 10.TO 1580

4*10c/c144

4*10c/c144

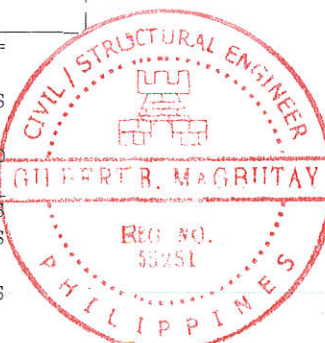
2No16 H 56. 10.TO 1192

oooooo
6#12oooooc
6#12oooooo
6#12oooooo
6#122#16
oo2#16
oo2#16
oo

BEAM NC. 352 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1580. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 4 - 12MM 0. 1580. YES YES
 2 396. 3 - 12MM 0. 1580. YES YES

BEAM NO. 352 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 24.01 KNS Vc= 61.74 KNS Vs= 0.00 KNS



000	000	000	000
3#12	3#12	3#12	3#12
4#12	4#12	4#12	4#12
0000	0000	0000	0000

	BEAM NO.	355	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08					
LEN -	3425. MM	FY -	230.	FC -	12.	MPA, SIZE -	300. X	450. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

1	56.	2 - 16MM	0.	3425.	YES	YES
2	396.	2 - 12MM	0.	3425.	YES	YES

BEAM NO. 355 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 22.91$ KNS $V_c = 67.09$ KNS $V_s = 0.00$ KNS
 $T_u = 15.12$ KN-MET $T_c = 2.6$ KN-MET $T_s = 20.2$ KN-MET LOAD 7
STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1321. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 7.66 SQ. CM.

AT END SUPPCRT - Vu= 15.47 KNS Vc= 67.09 KNS Vs= 0.00 KNS

Tu= 15.12 KN-MET Tc= 2.6 KN-MET Ts= 20.2 KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

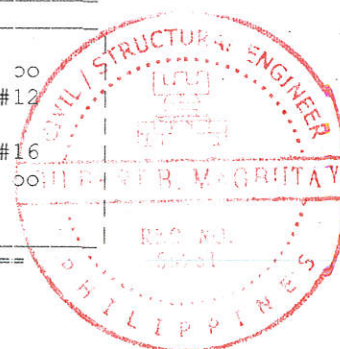
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1321. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 7.66 SQ. CM.

821J	3424X 300X 450	822J
2No12 H 396.	0.TO 3425	
11*12c/c144		11*12c/c144
2No16 H 156.	0.TO 3425	

00 2#12 2#16 00	00 2#12 2#16 00	00 2#12 2#16 00	00 2#12 2#16 00
------------------------------	------------------------------	------------------------------	------------------------------



BEAM NO. 358 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3425. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3425.	YES	YES
2	396.	2 - 12MM	0.	3425.	YES	YES

BEAM NO. 358 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.73 KNS Vc= 61.00 KNS Vs= 0.00 KNS
 Tu= 0.03 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 0.73 KNS Vc= 61.38 KNS Vs= 0.00 KNS
 Tu= 0.03 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

823J

3424X 300X 450

824J

2No12 H 396. 0.TO 3425

2No12 H 54. 0.TO 3425

00
2#12

2#12
00

00
2#12

2#12
00

00
2#12

2#12
00

00
2#12

2#12
00

BEAM NO. 359 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	5 - 12MM	0.	4000.	YES	YES

BEAM NO. 359 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 9.86 KNS Vc= 267.73 KNS Vs= 0.00 KNS
 Tu= 0.35 KN-MET Tc= 8.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 9.86 KNS Vc= 267.73 KNS Vs= 0.00 KNS
 Tu= 0.35 KN-MET Tc= 8.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

793J

4000X 400X 700

829J

5No12 H 646. 0.TO 4000

3No12 H 54. 0.TO 4000

00000
5#12

00000
5#12

00000
5#12

00000
5#12

3#12
000

3#12
000

3#12
000

3#12
000

BEAM NO. 360 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
1	56.	2 - 16MM	0.	4000.	YES	YES
2	444.	4 - 16MM	0.	1839.	YES	NO
3	442.	2 - 20MM	1535.	4000.	NO	YES

BEAM NO. 360 DESIGN RESULTS - SHEAR

AT START SUPCRT - $V_u = 32.61$ KNS $V_c = 78.05$ KNS $V_s = 0.00$ KNS
 $T_u = 0.31$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM

AT END SUPCRT - $V_u = 46.40$ KNS $V_c = 79.69$ KNS $V_s = 0.00$ KNS
 $T_u = 0.09$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM

794J 4000X 300X 500 830J

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
4No16/H	444.	0.TO 1839	2No20 H	442.1535.TO 4000		
9*10c/c	222				9*10c/c	222
2No16/H	56.	0.TO 4000				

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
4#16		4#16	2#20	2#20		
2#16		2#16	2#16	2#16		
oo		oo	oo	oo		

BEAM NO. 361 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	3 - 12MM	0.	4000.	YES	YES
2	442.	2 - 20MM	0.	4000.	YES	YES

BEAM NO. 361 DESIGN RESULTS - SHEAR

AT START SUPCRT - $V_u = 32.87$ KNS $V_c = 75.60$ KNS $V_s = 0.00$ KNS
 $T_u = 0.32$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUPCRT - $V_u = 28.52$ KNS $V_c = 75.60$ KNS $V_s = 0.00$ KNS
 $T_u = 0.32$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

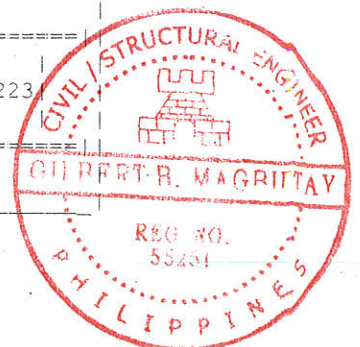
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

795J 4000X 300X 500 831J

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
2No20/H	442.	0.TO 4000				
8*10c/c	223				8*10c/c	223
3No12/H	54.	0.TO 4000				



00 2#20	00 2#20	00 2#20	00 2#20
3#12 000	3#12 000	3#12 000	3#12 000

=====

BEAM NO. 362 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	3 - 12MM	0.	4000.	YES	YES	
2	642.	2 - 20MM	0.	4000.	YES	YES	

BEAM NO. 362 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 15.86 KNS Vc= 146.73 KNS Vs= 0.00 KNS

Tu= 0.28 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 15.86 KNS Vc= 146.73 KNS Vs= 0.00 KNS

Tu= 0.28 KN-MET Tc= 7.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

796J 4000X,400X 700 832J

=====

2No20 H 642. 0.TO 4000

3No12 H 54. 0.TO 4000

=====

00 2#20	00 2#20	00 2#20	00 2#20
3#12 000	3#12 000	3#12 000	3#12 000

=====

BEAM NO. 363 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	4 - 12MM	0.	4000.	YES	YES	
2	692.	2 - 20MM	0.	4000.	YES	YES	

BEAM NO. 363 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 53.40 KNS Vc= 139.37 KNS Vs= 0.00 KNS

Tu= 4.69 KN-MET Tc= 7.0 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 1308. MM

AT END SUPPRT - Vu= 20.26 KNS Vc= 139.68 KNS Vs= 0.00 KNS

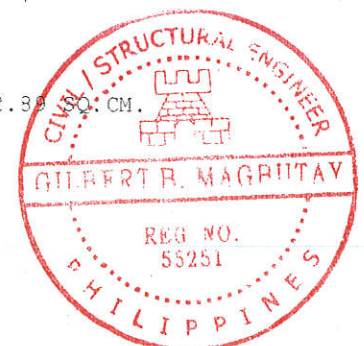
Tu= 9.03 KN-MET Tc= 7.0 KN-MET Ts= 12.0 KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

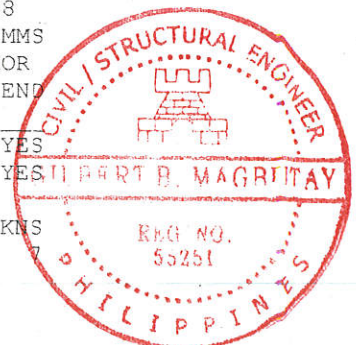
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 1308. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.38 SQ. CM.



845J



3#20 3#16	3#20 3#16	3#20 3#16	3#20 3#16
--------------	--------------	--------------	--------------

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 184. MM C/C FOR 1308. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 8.33 SQ.CM.
~~AT END SUPPRT - $V_u = 34.03$ KNS $V_c = 156.95$ KNS $V_s = 0.00$ KNS~~
 ~~$T_u = 26.03$ KN-MET $T_c = 8.0$ KN-MET $T_s = 34.7$ KN-MET LOAD 7~~
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 184. MM C/C FOR 1308. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 8.33 SQ.CM.
 800J 400X 400X 750 853J

00000000	00000000	00000000	00000000
7#12	7#12	7#12	7#12
2#16	2#16	2#16	2#16
00	00	00	00

A circular professional seal for a Civil Structural Engineer in the Philippines. The seal features a central emblem of a castle or fort. The text "CIVIL STRUCTURAL ENGINEER" is written along the top inner edge, and "PHILIPPINES" is written along the bottom inner edge. A horizontal banner across the center contains the name "R. MAGBITAY". Below the banner, the text "REG. NO. 55251" is visible. The seal is stamped in red ink on a document that includes a table with columns for "No.", "Description of Work", and "Amount". The seal is positioned over the "Description of Work" column, partially obscuring the entry for "REPAIR OF ROOF OF BANGKAYAN".

B E A M N O. 369 D E S I G N R E S U L T S - S H E A R

817J 2857X 300X 750 1011J

0000	0000	0000	0000
4#12	4#12	4#12	4#12
5#12	5#12	5#12	5#12
00000	00000	00000	00000

```

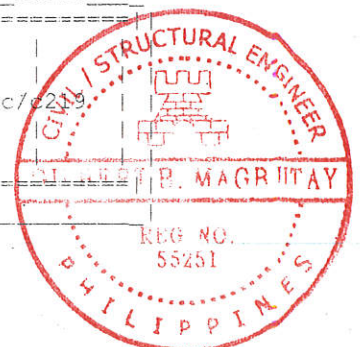
(MM)                                     (MM)                                     (MM)                                     STA  END

```

2	694.	2 - 16MM	0.	2857.	YES	YES
---	------	----------	----	-------	-----	-----

BEAM NO. 370 DESIGN RESULTS - SHEAR

818J	2857X 300X 750	1041J
------	----------------	-------

[illegible]

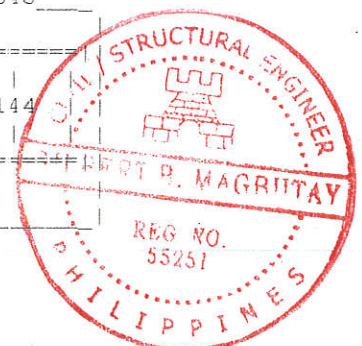
1	54.	2 - 12MM	0.	3520.	YES	YES
*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.						
REQD. STEEL = 1344. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2						
MAX NEG MOMENT = 62.71 KN-MET, LOADING 7						
821J		3519X 250X 350				1363

2N012 H 54. 0.T0 3520

2#12 OO	2#12 OO	2#12 OO	2#12 OO
------------	------------	------------	------------

1	54.	2 - 12MM	0.	3520.	YES	YES
2	394.	4 - 16MM	0.	3520.	YES	YES

BEAM NO. 372 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 33.81$ KNS $V_c = 64.99$ KNS $V_s = 0.00$ KNS
 $T_u = 2.43$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 198. MM C/C FOR 1368. MM
 AT END SUPPORT - $V_u = 19.78$ KNS $V_c = 66.18$ KNS $V_s = 0.00$ KNS
 $T_u = 3.16$ KN-MET $T_c = 2.6$ KN-MET $T_s = 4.2$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1368. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.60 SQ.CM.
 822J 3519X 300X 450 1364J

[illegible]

oooo 4#16	oooo 4#16	oooo 4#16	oooo 4#16
2#12 oo	2#12 oo	2#12 oo	2#12 oo

=====

BEAM NO. 373 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3520. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	3520.	YES	YES	
2	396.	6 - 12MM	0.	3520.	YES	YES	

BEAM NO. 373 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 4.19 KNS Vc= 61.12 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 4.19 KNS Vc= 60.68 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

823J 3519X 300X 450 1367J

6No12 H 396.	0.TO 3520
2No12 H 54.	0.TO 3520

ooooooo 6#12	ooooooo 6#12	ooooooo 6#12	ooooooo 6#12
2#12 oo	2#12 oo	2#12 oo	2#12 oo

=====

BEAM NO. 374 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3520. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	3520.	YES	YES	
2	396.	5 - 12MM	0.	3520.	YES	YES	

BEAM NO. 374 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 3.68 KNS Vc= 61.02 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 3.68 KNS Vc= 60.64 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

824J 3519X 300X 450 1363J

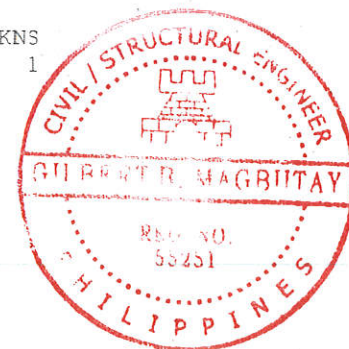
5No12 H 396.	0.TO 3520
2No12 H 54.	0.TO 3520



[illegible]

000000 6#16	000000 6#16	000000 6#16	000000 6#16
5#16 00000	5#16 00000	5#16 00000	5#16 00000

BEAM NO. 380 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 1.88 KNS Vc= 134.35 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - Vu= 1.88 KNS Vc= 134.35 KNS Vs= 0.00 KNS
 Tu= 0.02 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.



830J	2999X 300X 500	831J
=====		
5N#12 H 446.	0.TO 3000	
2N#12 H 54.	0.TO 3000	
=====		
00000	00000	00000
5#12	5#12	5#12
2#12	2#12	2#12
00	00	00

BEAM NO. 381 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	5 - 16MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	2472.	YES	NO
3	444.	6 - 16MM	2199.	5900.	NO	YES

BEAM NO. 381 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 45.63 KNS Vc= 109.99 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 4.8 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2508. MM

AT END SUPPORT - Vu= 44.31 KNS Vc= 111.73 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 4.8 KN-MET Ts= 0.0 KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2508. MM

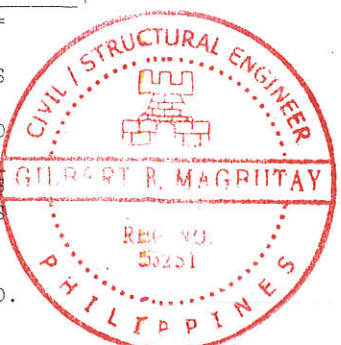
831J	5899X 400X 500	832J
=====		
6N#16 H 444.	0.TO 2472	6N#16 H 444.2199.TO 5900
13*10c/c222		13*10c/c222
5N#16 H 56.	0.TO 5900	
=====		

000000	000000	000000	000000
6#16	6#16	6#16	6#16
5#16	5#16	5#16	5#16
00000	00000	00000	00000

BEAM NO. 386 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 516. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	516.	YES	YES
2	342.	2 - 20MM	0.	516.	YES	YES

BEAM NO. 386 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 386 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 386 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
833J 516X 400X 400 834J

=====

2No20 H 342. 0.TO 516

=====

2No16 H 56. 0.TO 516

=====

2#20

2#16

oo

oo

2#20

2#16

oo

oo

2#20

2#16

oo

oo

2#20

2#16

oo

oo

=====

BEAM NO. 388 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 133. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFC	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	2 - 12MM	0.	133.	YES	YES
2	346.	2 - 12MM	0.	133.	YES	YES

BEAM NO. 388 DESIGN RESULTS - SHEAR

** LOCATION FOR SHEAR AT START OF MEMBER 388 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 388 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
835J 132X 400X 400 836J

=====

2No12 H 346. 0.TO 133

=====

2No12 H 54. 0.TO 133

=====

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

=====

BEAM NO. 398 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 3000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFC	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	3 - 12MM	0.	3000.	YES	YES
2	346.	5 - 12MM	0.	3000.	YES	YES

BEAM NO. 398 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 29.92 KNS Vc= 62.80 KNS Vs= 0.00 KNS

Tu= 0.36 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD

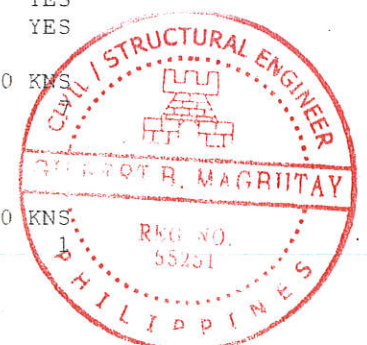
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

AT END SUPPRT - Vu= 2.82 KNS Vc= 63.50 KNS Vs= 0.00 KNS

Tu= 0.30 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD



STIRRUPS ARE NOT REQUIRED.

845J

2999X 350X 400

846J

```

=====
5No12/H 346.  0.TO 3000 |  |  |
3*10c/c173    |  |  |
3No12/H  54.  0.TO 3000 |  |  |
=====

```

```

ooooo
5#12
3#12
ooo

```

```

ooooo
5#12
3#12
ooo

```

```

ooooo
5#12
3#12
ooo

```

```

ooooo
5#12
3#12
ooo

```

```

=====
BEAM NC.  399 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 492. MM  FY - 230.  FC - 10.  MPA, SIZE - 400. X 400. MMS
LEVEL  HEIGHT  BAR INFC  FROM  TO  ANCHOR
      (MM)      (MM)      (MM)      STA  END

```

```

1      54.      2 - 12MM      0.      492.      YES YES
2      344.     2 - 16MM      0.      492.     YES YES

```

BEAM NO. 399 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 399 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 399 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

```

846J      491X 400X 400      847J

```

```

=====
2No16 H 344.  0.TO 492
2No12 H  54.  0.TO 492
=====

```

```

oo
2#16
2#12
oo

```

```

oo
2#16
2#12
oo

```

```

oo
2#16
2#12
oo

```

```

oo
2#16
2#12
oo

```

```

=====
BEAM NC.  442 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 516. MM  FY - 230.  FC - 10.  MPA, SIZE - 400. X 400. MMS

```

```

LEVEL  HEIGHT  BAR INFC  FROM  TO  ANCHOR
      (MM)      (MM)      (MM)      STA  END

```

```

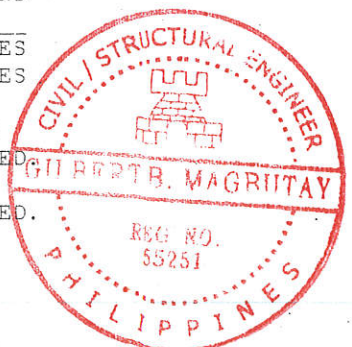
1      54.      2 - 12MM      0.      516.      YES YES
2      346.     2 - 12MM      0.      516.     YES YES

```

BEAM NO. 442 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 442 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 442 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



1011J	516X 400X 400	1012J
=====		
2N12 H 346.	0.TO 516	
2N12 H 54.	0.TO 516	
=====		

2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12

BEAM NO. 444 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 133. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	133.	YES YES
2	346.	2 - 12MM	0.	133.	YES YES

BEAM NO. 444 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 444 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 444 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 1013J 132X 400X 400 1014J

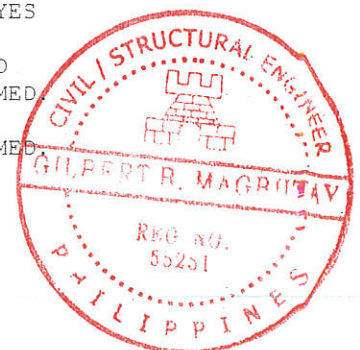
2N12 H 346.	0.TO 133
2N12 H 54.	0.TO 133
=====	

2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12

BEAM NO. 454 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	500.	YES YES
2	344.	2 - 16MM	0.	500.	YES YES

BEAM NO. 454 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 454 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 454 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED



1023J

499X 400X 400

1024J

2No16 H 344. 0.TO 500

3No12 H 34. 0.TO 500

2#16
3#12

ooo

2#16
3#12

ooo

2#16
3#12

ooo

2#16
3#12

ooo

=====

BEAM NC. 460 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 492. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	492.	YES	YES
2	346.	2 - 12MM	0.	492.	YES	YES

BEAM NO. 460 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 460 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 460 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1029J 491X 400X 400 1030J

2No12 H 346. 0.TO 492

2No12 H 34. 0.TO 492

2#12
2#12

ooo

2#12
2#12

ooo

2#12
2#12

ooo

2#12
2#12

ooo

=====

BEAM NC. 486 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 516. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS

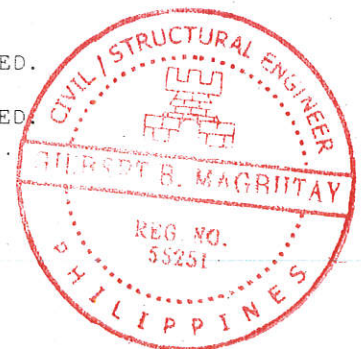
LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	516.	YES	YES
2	896.	2 - 12MM	0.	516.	YES	YES

BEAM NO. 486 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 486 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 486 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



1104J	516X 400X 949	1105J
=====		
2N12 H 896.	0.TO 516	
2N12 H 54.	0.TO 516	
=====		

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

=====

BEAM NO. 497 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
(MM)	(MM)		(MM)	(MM)	STA END

1	56.	2 - 16MM	0.	500.	YES YES
2	896.	5 - 12MM	0.	500.	YES YES

BEAM NO. 497 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 497 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 497 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1115J	499X 400X 949	1116J
=====		
5N12 H 896.	0.TO 500	
2N16 H 56.	0.TO 500	
=====		

00000	00000	00000	00000
5#12	5#12	5#12	5#12
2#16	2#16	2#16	2#16
00	00	00	00

=====

BEAM NO. 530 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 511. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
(MM)	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	511.	YES YES
2	246.	2 - 12MM	0.	511.	YES YES
3	246.	2 - 12MM	71.	511.	NO YES

BEAM NO. 530 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.01 KNS Vc= 28.02 KNS Vs= 0.00 KNS

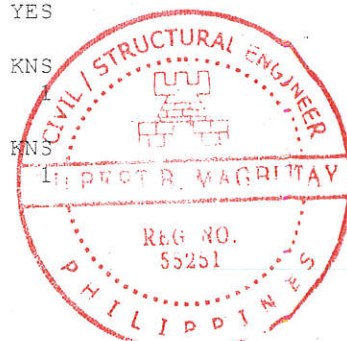
Tu= 0.20 KN-MET Tc= 0.8 KN-MET Ts= 0.0 KN-MET LOAD

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 0.01 KNS Vc= 28.02 KNS Vs= 0.00 KNS

Tu= 0.20 KN-MET Tc= 0.8 KN-MET Ts= 0.0 KN-MET LOAD

STIRRUPS ARE NOT REQUIRED.



1252J	510X 200X 300	1253J
=====		
2N12 H 246.12 0.TO 6.5111.TC. 511		
2N12 H 54. 0.TO 511		
=====		

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

=====

BEAM NO. 552 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 447. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	447.	YES	YES
2	246.	2 - 12MM	0.	447.	YES	YES

BEAM NO. 552 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 552 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 552 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1274J	447X 200X 300	1275J
=====		
2N12 H 246. 0.TO 447		
2N12 H 54. 0.TO 447		
=====		

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

=====

BEAM NO. 564 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 250. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	500.	YES	YES
2	246.	3 - 12MM	0.	500.	YES	YES
3	246.	2 - 12MM	120.	500.	NO	YES

BEAM NO. 564 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 16.11 KNS Vc= 23.37 KNS Vs= 0.00 KNS

Tu= 0.02 KN-MET Tc= 0.3 KN-MET Ts= 0.0 KN-MET LOAD

NO STIRRUPS ARE REQUIRED FOR TORSION.

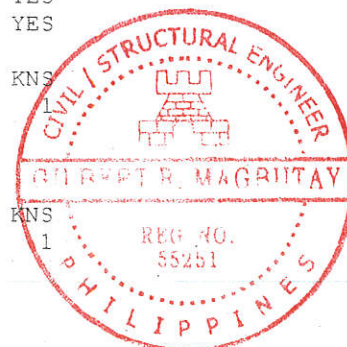
REINFORCEMENT FOR SHEAR IS PER CL.11.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 8. MM

AT END SUPPORT - Vu= 16.11 KNS Vc= 23.37 KNS Vs= 0.00 KNS

Tu= 0.02 KN-MET Tc= 0.3 KN-MET Ts= 0.0 KN-MET LOAD

NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 8. MM
 1029J 499X 250X 300 1335J

3No12 H 246.	0.TO	1500 246.	120.TO	500			
2*10c/c123						2*10c/c123	
2No12 H 54.	0.TO	500					

ooo	ooo	ooo	ooo
3#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 565 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	2 - 12MM	0.	500.	YES	YES
2	896.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 565 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 565 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 565 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1121J 499X 400X 949 1338J

2No12 H 896.	0.TO	500
--------------	------	-----

2No12 H 54.	0.TO	500
-------------	------	-----

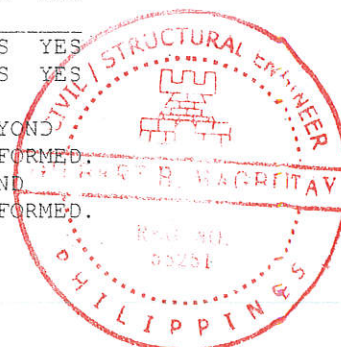
oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 566 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 400. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	500.	YES	YES
2	396.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 566 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 566 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 566 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



1280J	499X 400X 450	1344J
2N12 H 396. 0.TO 500		
2N12 H 54. 0.TO 500		
2#12	2#12	2#12
2#12	2#12	2#12
oo	oo	oo

BEAM NC. 567 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	387.	YES	NO
2	246.	2 - 12MM	0.	500.	YES	YES

BEAM NO. 567 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - $V_u = 0.66$ KNS $V_c = 27.93$ KNS $V_s = 0.00$ KNS
 $T_u = 1.40$ KN-MET $T_c = 0.8$ KN-MET $T_s = 1.9$ KN-MET LOAD 14
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.28 SQ.CM.
 AT END SUPPCRT - $V_u = 0.64$ KNS $V_c = 27.93$ KNS $V_s = 0.00$ KNS
 $T_u = 1.40$ KN-MET $T_c = 0.8$ KN-MET $T_s = 1.9$ KN-MET LOAD 14
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.28 SQ.CM.

1334J 499X 200X 300 1347J

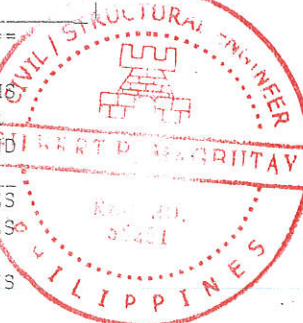
2N12 H 246. 0.TO 500	
2*10c/c 32	2*10c/c 82
2N12 H 54. 0.TO 387	

2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NC. 568 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1340. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	1340.	YES	YES
2	646.	5 - 12MM	0.	1340.	YES	YES

BEAM NO. 568 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - $V_u = 44.41$ KNS $V_c = 262.35$ KNS $V_s = 0.00$ KNS



Tu= 8.15 KN-MET Tc= 8.1 KN-MET Ts= 10.9 KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 28. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.68 SQ.CM.

AT END SUPPRT - Vu= 43.34 KNS Vc= 262.35 KNS Vs= 0.00 KNS

Tu= 8.15 KN-MET Tc= 8.1 KN-MET Ts= 10.9 KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 28. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.68 SQ.CM.

829J

1339X 400X 700

1366J

5No12 H 646.	10.TO 1340		
2*10c/c232		2*10c/c232	
4No12 H 54.	10.TO 1340		

00000	00000	00000	00000
5#12	5#12	5#12	5#12
4#12	4#12	4#12	4#12
0000	0000	0000	0000

BEAM NC. 569 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1340. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	5 - 12MM	0.	1340.	YES	YES
2	696.	4 - 12MM	0.	1340.	YES	YES

BEAM NO. 569 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 569 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 569 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

833J

1339X 400X 750

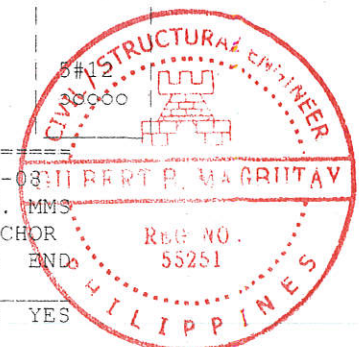
1370J

4No12 H 696.	0.TO 1340		
5No12 H 54.	0.TO 1340		

0000	0000	0000	0000
4#12	4#12	4#12	4#12
5#12	5#12	5#12	5#12
00000	00000	00000	00000

BEAM NC. 580 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3425. MM FY - 230. FC - 12. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3425.	YES	YES
---	-----	----------	----	-------	-----	-----



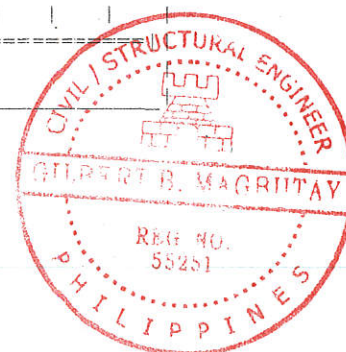
[illegible]

000 3#12	000 3#12	000 3#12	000 3#12
2#12 00	2#12 00	2#12 00	2#12 00

	BEAM NC.	581	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	2145. MM	FY - 230	FC - 12.	MPA, SIZE - 250. X 350. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	2 - 12MM	0.	2145.	YES	YES
2	294.	2 - 16MM	0.	2145.	YES	YES

BEAM NO. 581 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 18.88$ KNS $V_c = 41.52$ KNS $V_s = 0.00$ KNS
 $T_u = 0.53$ KN-MET $T_c = 1.4$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 148. MM C/C FOR 781. MM
 AT END SUPPORT - $V_u = 6.21$ KNS $V_c = 38.94$ KNS $V_s = 0.00$ KNS
 $T_u = 1.37$ KN-MET $T_c = 1.2$ KN-MET $T_s = 1.8$ KN-MET LOAD 9
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 107. MM C/C FOR 781. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.92 SQ.CM.
 1364J 2145X 250X 350 1365J

[illegible]

oo 2#16 2#12 oo	oo 2#16 2#12 oo	oo 2#16 2#12 oo	oo 2#16 2#12 oo
--------------------------	--------------------------	--------------------------	--------------------------

=====

BEAM NO. 584 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 325. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	325.	YES	YES
2	296.	3 - 12MM	0.	325.	YES	YES

BEAM NO. 584 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 584 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 584 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1365J 325X 250X 350 1366J

=====

3No12 H 296. 0.TO 325

2No12 H 54. 0.TO 325

=====

ooo 3#12 2#12 oo	ooo 3#12 2#12 oo	ooo 3#12 2#12 oo	ooo 3#12 2#12 oo
---------------------------	---------------------------	---------------------------	---------------------------

=====

BEAM NO. 587 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3425. MM FY - 230. FC - 10. MPA, SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	3425.	YES	YES
2	396.	2 - 12MM	0.	3425.	YES	YES

BEAM NO. 587 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.94 KNS Vc= 63.52 KNS Vs= 0.00 KNS

Tu= 0.14 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 0.94 KNS Vc= 63.52 KNS Vs= 0.00 KNS

Tu= 0.14 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

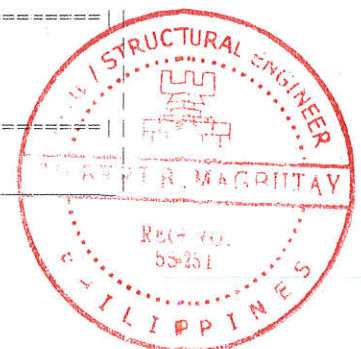
1367J 3424X 300X 450 1368J

=====

2No12 H 396. 0.TO 3425

2No12 H 54. 0.TO 3425

=====



00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

BEAM NC.	588 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2170. MM	FY - 230. FC - 10. MPA, SIZE - 200. X 350. MMS
LEVEL HEIGHT	BAR INFO FROM TO ANCHOR
(MM)	(MM) (MM) STA END

1	54.	3 - 12MM	0.	2170.	YES	YES
2	294.	2 - 16MM	0.	2170.	YES	YES

B E A M N O. 588 D E S I G N R E S U L T S - S H E A R
 AT START SUPPRT - Vu= 13.88 KNS Vc= 29.76 KNS Vs= 0.00 KNS
 Tu= 1.65 KN-MET Tc= 0.8 KN-MET Ts= 2.2 KN-MET LOAD 9
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 94. MM C/C FOR 793. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.42 SQ.CM.
 AT END SUPPRT - Vu= 8.42 KNS Vc= 29.76 KNS Vs= 0.00 KNS
 Tu= 1.65 KN-MET Tc= 0.8 KN-MET Ts= 2.2 KN-MET LOAD 9
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 94. MM C/C FOR 793. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.42 SQ.CM.
 1368J 2170X 200X 350 1369J

[illegible]

00	00	00	00
2#16	2#16	2#16	2#16
3#12	3#12	3#12	3#12
000	000	000	000

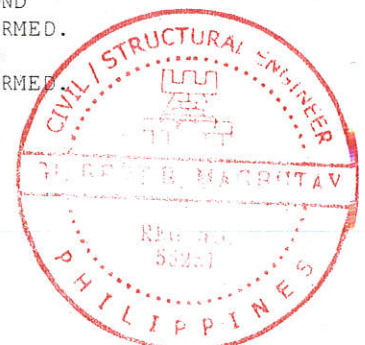
BEAM NO. 589 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN - 300. MM	FY - 230.	FC - 10.	MPA, SIZE - 200. X 350. MMS
LEVEL	HEIGHT	BAR INFC	FROM TO ANCHOR
(MM)		(MM)	(MM) STA END
1	100	1	100 200 300
2	200	2	200 300 400
3	300	3	300 400 500
4	400	4	400 500 600
5	500	5	500 600 700
6	600	6	600 700 800
7	700	7	700 800 900
8	800	8	800 900 1000
9	900	9	900 1000 1100
10	1000	10	1000 1100 1200
11	1100	11	1100 1200 1300
12	1200	12	1200 1300 1400
13	1300	13	1300 1400 1500
14	1400	14	1400 1500 1600
15	1500	15	1500 1600 1700
16	1600	16	1600 1700 1800
17	1700	17	1700 1800 1900
18	1800	18	1800 1900 2000
19	1900	19	1900 2000 2100
20	2000	20	2000 2100 2200
21	2100	21	2100 2200 2300
22	2200	22	2200 2300 2400
23	2300	23	2300 2400 2500
24	2400	24	2400 2500 2600
25	2500	25	2500 2600 2700
26	2600	26	2600 2700 2800
27	2700	27	2700 2800 2900
28	2800	28	2800 2900 3000
29	2900	29	2900 3000 3100
30	3000	30	3000 3100 3200
31	3100	31	3100 3200 3300
32	3200	32	3200 3300 3400
33	3300	33	3300 3400 3500
34	3400	34	3400 3500 3600
35	3500	35	3500 3600 3700
36	3600	36	3600 3700 3800
37	3700	37	3700 3800 3900
38	3800	38	3800 3900 4000
39	3900	39	3900 4000 4100
40	4000	40	4000 4100 4200
41	4100	41	4100 4200 4300
42	4200	42	4200 4300 4400
43	4300	43	4300 4400 4500
44	4400	44	4400 4500 4600
45	4500	45	4500 4600 4700
46	4600	46	4600 4700 4800
47	4700	47	4700 4800 4900
48	4800	48	4800 4900 5000
49	4900	49	4900 5000 5100
50	5000	50	5000 5100 5200
51	5100	51	5100 5200 5300
52	5200	52	5200 5300 5400
53	5300	53	5300 5400 5500
54	5400	54	5400 5500 5600
55	5500	55	5500 5600 5700
56	5600	56	5600 5700 5800
57	5700	57	5700 5800 5900
58	5800	58	5800 5900 6000
59	5900	59	5900 6000 6100
60	6000	60	6000 6100 6200
61	6100	61	6100 6200 6300
62	6200	62	6200 6300 6400
63	6300	63	6300 6400 6500
64	6400	64	6400 6500 6600
65	6500	65	6500 6600 6700
66	6600	66	6600 6700 6800
67	6700	67	6700 6800 6900
68	6800	68	6800 6900 7000
69	6900	69	6900 7000 7100
70	7000	70	7000 7100 7200
71	7100	71	7100 7200 7300
72	7200	72	7200 7300 7400
73	7300	73	7300 7400 7500
74	7400	74	7400 7500 7600
75	7500		

1	54.	3 - 12MM	0.	300.	YES	YES
2	296.	2 - 12MM	0.	300.	YES	YES

B E A M N O . 589 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 589 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 589 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.



1369J

300X 200X 350

1370J

2No12 H 296. 0.TO 300

3No12 H 54. 0.TO 300

oo
2#12oo
2#12oo
2#12oo
2#123#12
ooo3#12
ooo3#12
ooo3#12
ooo

BEAM NO. 615 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	36.	2 - 16MM	0.	4000.	YES	YES
2	444.	3 - 16MM	0.	1839.	YES	NO
3	444.	4 - 16MM	1328.	4000.	NO	YES

BEAM NO. 615 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 31.97$ KNS $V_c = 75.16$ KNS $V_s = 0.00$ KNS
 $T_u = 0.14$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM
 AT END SUPPORT - $V_u = 38.50$ KNS $V_c = 75.16$ KNS $V_s = 0.00$ KNS
 $T_u = 0.14$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM

830J

399X 300X 500

1491J

3No16 H 444. 0.TO 1839 4No16 H 444.1328.TO 4000

9*10c/c222

9*10c/c222

2No16 H 56. 0.TO 4000

ooo
3#16oooo
4#16oooo
4#16oooo
4#162#16
oo2#16
oo2#16
oo2#16
oo

BEAM NO. 616 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 616 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 32.76$ KNS $V_c = 75.49$ KNS $V_s = 0.00$ KNS
 $T_u = 0.15$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6



NO. STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
AT END SUPPRT - $V_u = 32.99$ KNS $V_c = 75.49$ KNS $V_s = 0.00$ KNS
 $T_u = 0.15$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
831J 3999X 300X 500 1492

[illegible]

000000 6#12	000000 6#12	000000 6#12	000000 6#12
3#12 000	3#12 000	3#12 000	3#12 000

LEN -	BEAM - NC.	624 DESIGN RESULTS -	FLEXURE PER CODE ACI	318-08
LEVEL	4000. MM	FY - 230. FC - 12.	MPA, SIZE - 400. X	700. MMS
HEIGHT	BAR INFO	FROM	TO	ANCHOR
(MM)		(MM)	(MM)	STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	4 - 12MM	0.	1379.	YES	NO
3	644.	3 - 16MM	1328.	4000.	NO	YES

BEAM NO. 624 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 12.64$ KNS $V_c = 142.42$ KNS $V_s = 0.00$ KNS
 $T_u = 0.20$ KN-MET $T_c = 7.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
STIRRUPS ARE NOT REQUIRED.

STIRRUPS ARE NOT REQUIRED.

AT END	SUPPORT -	Vu=	12.64 KNS	Vc=	141.62 KNS	Vs=	0.00 KNS
Tu=	0.20 KN-MET	Tc=	7.7 KN-MET	Ts=	0.0 KN-MET	LOAD	1

STIRRUPS ARE NOT REQUIRED.

832J 3999X 400X 700 1493J

```
=====
4No12 H 646.    O.TO 13793No16 H 644.1328.TO 4000
=====

3No12 H 54.    O.TO 4000
=====
```

0000 4#12	0000 3#16	000 3#16	000 3#16
3#12 000	3#12 000	3#12 000	3#12 000

LEN -	BEAM NC.	625 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08				
LEVEL	4000. MM	FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS				
	HEIGHT	BAR INFO	FROM	TO	ANCHOR	
	(MM)		(MM)	(MM)		STA END

1	56.	2 - 16MM	0.	3708.	YES	NO
---	-----	----------	----	-------	-----	----



2 346. 5 - 12MM 0. 1402. YES NO
 3 346. 7 - 12MM 1764. 4000. NO YES

BEAM NO. 625 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 36.47$ KNS $V_c = 58.36$ KNS $V_s = 0.00$ KNS
 $T_u = 0.37$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM
 AT END SUPPORT - $V_u = 29.71$ KNS $V_c = 65.04$ KNS $V_s = 0.00$ KNS
 $T_u = 0.58$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM
 845J 3999X 350X 400 1498J

=====	=====	=====	=====
5No12 H 346. 0.TO 1402 7No12 H 346.1764.TO 4000			
11*10c/c172 11*10c/c172			
2No16 H 346. 0.TO 3708			
=====	=====	=====	=====

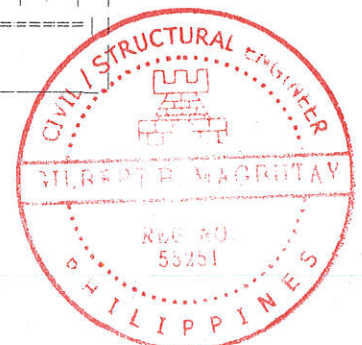
=====	=====	=====	=====
000000 5#12	000000 5#12	00000000 7#12	00000000 7#12
2#16 00	2#16 00	2#16 00	
=====	=====	=====	=====

BEAM NO. 626 DESIGN RESULTS - FLEXURE PER CODE ACI 318-0
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	2069.	YES	NO
3	346.	7 - 12MM	1764.	4000.	NO	YES

BEAM NO. 626 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 32.87$ KNS $V_c = 66.83$ KNS $V_s = 0.00$ KNS
 $T_u = 1.64$ KN-MET $T_c = 2.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM
 AT END SUPPORT - $V_u = 31.12$ KNS $V_c = 67.99$ KNS $V_s = 0.00$ KNS
 $T_u = 1.64$ KN-MET $T_c = 2.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM
 846J 3999X 350X 400 1499J

=====	=====	=====	=====
7No12 H 346. 0.TO 2069 7No12 H 346.1764.TO 4000			
11*10c/c172 11*10c/c172			
2No16 H 346. 0.TO 4000			
=====	=====	=====	=====



00000000 7#12	00000000 7#12	00000000 7#12	00000000 7#12
2#16 00	2#16 00	2#16 00	2#16 00

BEAM NO. 635 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	4000.	YES	YES
2	696.	4 - 12MM	0.	1736.	YES	NO
3	696.	5 - 12MM	1431.	4000.	NO	YES

BEAM NO. 635 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 22.75$ KNS $V_c = 106.83$ KNS $V_s = 0.00$ KNS
 $T_u = 4.99$ KN-MET $T_c = 2.3$ KN-MET $T_s = 6.7$ KN-MET LOAD 10
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 1308. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.60 SQ.CM.

AT END SUPPRT - $V_u = 48.51$ KNS $V_c = 106.83$ KNS $V_s = 0.00$ KNS
 $T_u = 4.99$ KN-MET $T_c = 2.3$ KN-MET $T_s = 6.7$ KN-MET LOAD 10

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 1308. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.60 SQ.CM.

858J

3999X 400X 750

1500J

4No12 H 696.	0. TO 1736	5No12 H 696.	1431. TO 4000						
7*10c/c244								7*10c/c244	
4No12 H 54.	0. TO 4000								

0000 4#12	0000 4#12	00000 5#12	00000 5#12
4#12 0000	4#12 0000	4#12 0000	4#12 0000

BEAM NO. 640 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	4 - 12MM	0.	3964.	YES	NO
2	596.	4 - 12MM	0.	1413.	YES	NO
3	596.	5 - 12MM	1753.	4000.	NO	YES

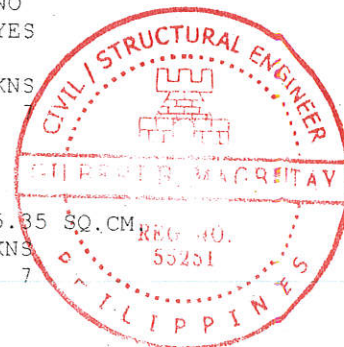
BEAM NO. 640 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 34.60$ KNS $V_c = 133.38$ KNS $V_s = 0.00$ KNS
 $T_u = 15.82$ KN-MET $T_c = 6.3$ KN-MET $T_s = 21.1$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 1408. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 5.85 SQ.CM.

AT END SUPPRT - $V_u = 44.37$ KNS $V_c = 168.67$ KNS $V_s = 0.00$ KNS
 $T_u = 15.82$ KN-MET $T_c = 6.3$ KN-MET $T_s = 21.1$ KN-MET LOAD 7



STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 219. MM C/C FOR 1408. MM
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 5.35 SQ.CM.
1041J 3999X 400X 650 1503J

4No12IH 596.	0.TO 1413	5No12 H 596.1753.TO 4000			
8*10c/c219					8*10c/c219
4No12IH 54.	0.TO 3964				

0000 4#12	0000 4#12	0000 5#12	0000 5#12
4#12 0000	4#12 0000	4#12 0000	

	BEAM NO.	641	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08					
LEN -	4000. MM	FY -	230.	FC -	10.	MPA, SIZE -	400. X	650. MMS
LEVEL	HEIGHT	BAR INFO.		FROM		TO		ANCHOR
	(MM)	.		(MM)		(MM)		STA END

1	56.	3 - 16MM	0.	4000.	YES	YES
2	592.	3 - 20MM	0.	4000.	YES	YES

BEAM NO. 641 DESIGN RESULTS - SHEAR
AT START SUPPCRT - $V_u = 17.98$ KNS $V_c = 123.42$ KNS $V_s = 0.00$ KNS
 $T_u = 22.56$ KN-MET $T_c = 6.3$ KN-MET $T_s = 30.1$ KN-MET LOAD 7
STIRRUPS ARE REQUIRED FOR TORSION.

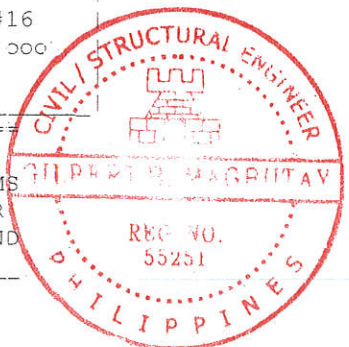
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 181. MM C/C FOR 1408. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 7.63 SQ.CM.
 AT END SUPPORT - $V_u = 46.37$ KNS $V_c = 123.42$ KNS $V_s = 0.00$ KNS
 $T_u = 22.56$ KN-MET $T_c = 6.3$ KN-MET $T_s = 30.1$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 181. MM C/C FOR 1408. MM
ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 7.63 SQ.CM.
1104J 3999X 400X 650 1506J

[illegible]

000 3#20	000 3#20	000 3#20	000 3#20
3#16 000	3#16 000	3#16 000	3#16 000

BEAM NO. - 642 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN - 4000. MM	FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
LEVEL HEIGHT	BAR INFO FROM TO ANCHOR
(MM)	(MM) (MM) STA END
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100



AT START SUPPORT - Vu= 3.27 KNS Vc= 26.97 KNS Vs= 0.00 KNS
Tu= 0.83 KN-MET Tc= 0.8 KN-MET Ts= 1.1 KN-MET LOAD 14

1238J	3999X	200X	300	1513J
-------	-------	------	-----	-------

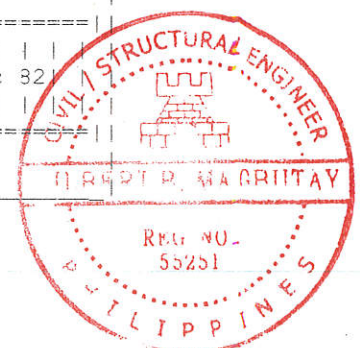
[illegible]

○○ 2#12	○○ 2#12	○○ 2#12	○○ 2#12
2#12 ○○	2#12 ○○	2#12 ○○	2#12 ○○

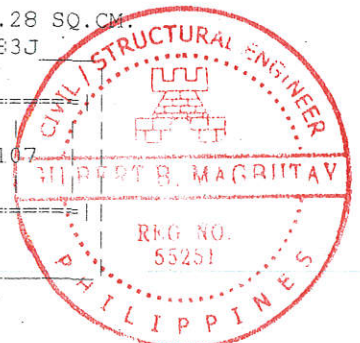
LEN -	4000. MM	FY -	230.	FC -	12.	MPA, SIZE -	200. X	300. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

1	54.	2 - 12MM	0.	4000.	YES	YES
2	246.	3 - 12MM	0.	4000.	YES	YES

1310J 3999X 200X 300 1517J

[illegible]

3#12 ooo	3#12 ooo	3#12 ooo	3#12 ooo
-------------	-------------	-------------	-------------

[illegible]

000 3#12	000 3#12	000 3#12	000 3#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 662 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2660. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	2660.	YES	YES	
2	296.	2 - 12MM	0.	2660.	YES	YES	

BEAM NO. 662 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 1.96 KNS Vc= 75.37 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 1.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 1.96 KNS Vc= 40.50 KNS Vs= 0.00 KNS

Tu= 0.04 KN-MET Tc= 1.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1365J 2660X 250X 350 1489J

=====

2N012 H 296. 0.TO 2660

2N012 H 54. 0.TO 2660

=====

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 663 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 2660. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	56.	2 - 16MM	0.	2660.	YES	YES	
2	646.	8 - 12MM	0.	2660.	YES	YES	

BEAM NO. 663 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 23.92 KNS Vc= 267.87 KNS Vs= 0.00 KNS

Tu= 0.09 KN-MET Tc= 8.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPRT - Vu= 23.92 KNS Vc= 145.40 KNS Vs= 0.00 KNS

Tu= 0.09 KN-MET Tc= 8.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

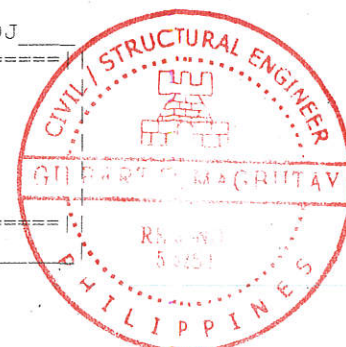
1366J 2660X 400X 700 1490J

=====

8N012 H 646. 0.TO 2660

2N016 H 56. 0.TO 2660

=====



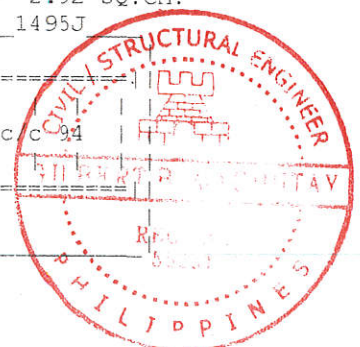
1	54.	2 - 12MM	0.	2660.	YES	YES
*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.						
REQD. STEEL =		1000. MM2,	MAX. STEEL PERMISSIBLE =		1017. MM2	
MAX NEG MOMENT =		46.06 KN-MET,	LOADING	6		
1367J			2660X 200X	350		1494J

2N012 H 54. 0.T0 2660

Four vertical rectangular frames, each containing the text '2#12' and 'OO' below it.

1	54.	2 - 12MM	0.	2660.	YES	YES
2	294.	3 - 16MM	0.	2660.	YES	YES

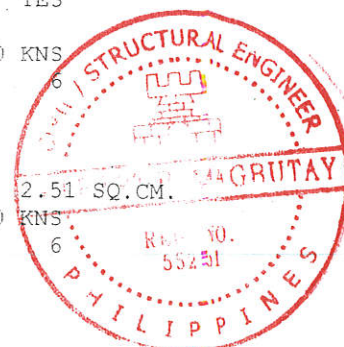
B E A M N O. 675 D E S I G N R E S U L T S - S H E A R
 AT START SUPPRT - Vu= 15.80 KNS Vc= 31.44 KNS Vs= 0.00 KNS
 Tu= 3.40 KN-MET Tc= 0.9 KN-MET Ts= 4.5 KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 94. MM C/C FOR 1038. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.92 SQ.CM.
 AT END SUPPORT - Vu= 2.54 KNS Vc= 31.44 KNS Vs= 0.00 KNS
 Tu= 3.40 KN-MET Tc= 0.9 KN-MET Ts= 4.5 KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 94. MM C/C FOR 1038. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.92 SQ.CM.
 1368J 2660X 200X 350 1495J

[illegible]

[illegible]

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

BEAM NO. 678 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - $V_u = 22.04$ KNS $V_c = 148.26$ KNS $V_s = 0.00$ KNS
 $T_u = 7.83$ KN-MET $T_c = 7.8$ KN-MET $T_s = 10.4$ KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 244. MM C/C FOR 638. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.5
 AT END. SUPPCRT - $V_u = 53.76$ KNS $V_c = 148.26$ KNS $V_s = 0.00$ KNS
 $T_u = 7.83$ KN-MET $T_c = 7.8$ KN-MET $T_s = 10.4$ KN-MET LOAD 9



[illegible]

00 2#12	000000 6#16	000000 6#16	000000 6#16
4#12 0000	4#12 0000	4#12 0000	4#12 0000

	BEAM NO.	710	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	2765. MM	FY - 230.	FC - 12.	MPA, SIZE - 250. X 350. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	3 - 12MM	0.	2765.	YES	YES
2	294.	3 - 16MM	0.	2765.	YES	YES

BEAM NO. 710 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 2.87$ KNS $T_u = 9.5$ KN-MET
 $V_c = 40.4$ KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.
 AT END SUPPORT - $V_u = 24.11$ KNS $T_u = 9.5$ KN-MET
 $V_c = 42.2$ KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 3 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.

1481J . 2765X 250X 350 . 1482J

3No16 H 294.	0.TO 2765
3No12 H 54.	0.TO 2765

000 3#16	000 3#16	000 3#16	000 3#16
3#12 000	3#12 000	3#12 000	3#12 000

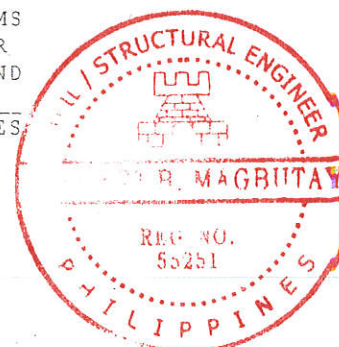
	BEAM NO.	711	DESIGN RESULTS - FLEXURE PER CODE ACI 318-0					
LEN -	650. MM	FY -	230.	FC -	12.	MPA, SIZE -	250. X	350. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

1	54.	2 - 12MM	0.	660.	YES	YES
---	-----	----------	----	------	-----	-----

```

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.
REQD. STEEL = 1220. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2
MAX NEG MOMENT = 58.37 KN-MET, LOADING 7

```



1482J	659X 250X 350	1483J
2No12 H 54. 0.TO 660		
=====		
2#12 oo	2#12 oo	2#12 oo

=====

BEAM NC. 712 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 240. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL HEIGHT BAR INFC FROM TO ANCHOR

(MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 240. YES YES

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX NEG MOMENT = 66.97 KN-MET, LOADING 7

1483J 240X 250X 350 1484J

1483J	240X 250X 350	1484J
2No12 H 54. 0.TO 240		
=====		
2#12 oo	2#12 oo	2#12 oo

=====

BEAM NC. 713 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 446. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL HEIGHT BAR INFC FROM TO ANCHOR

(MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 446. YES YES

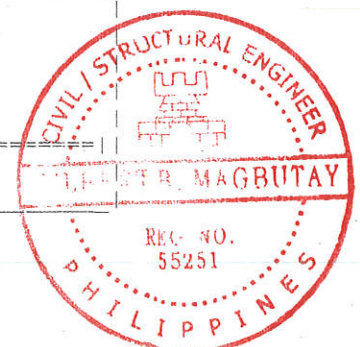
*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.

REQD. STEEL = 1001. MM2, MAX. STEEL PERMISSIBLE = 1433. MM2

MAX NEG MOMENT = 50.01 KN-MET, LOADING 7

1484J 445X 250X 350 1485J

1484J	445X 250X 350	1485J
2No12 H 54. 0.TO 446		
=====		



2#12 OO	2#12 OO	2#12 OO	2#12 OO
------------	------------	------------	------------

=====

BEAM NO. 718 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 325. MM FY - 230. FC - 12. MPA, SIZE - 250. X 350. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	325.	YES	YES
2	296.	2 - 12MM	0.	325.	YES	YES

BEAM NO. 718 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 718 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 718 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1489J 325X 250X 350 1490J

2No12 H 296.	0.TO	325
2No12 H 54.	0.TO	325

2#12 OO	2#12 OO	2#12 OO	2#12 OO
2#12 OO	2#12 OO	2#12 OO	2#12 OO

=====

BEAM NO. 719 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5680. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	56.	5 - 16MM	0.	5680.	YES	YES
2	444.	6 - 16MM	0.	5680.	YES	YES

BEAM NO. 719 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 46.29$ KNS $V_c = 111.42$ KNS $V_s = 0.00$ KNS

$T_u = 0.76$ KN-MET $T_c = 4.9$ KN-MET $T_s = 0.0$ KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2398. MM

AT END SUPPORT - $V_u = 45.66$ KNS $V_c = 112.31$ KNS $V_s = 0.00$ KNS

$T_u = 0.76$ KN-MET $T_c = 4.9$ KN-MET $T_s = 0.0$ KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2398. MM



1490J	5680X 400X 500	1491J
6N16 H 444. 0.TO 5680		
12*10c/c222		12*10c/c222
5N16 H 56. 0.TO 5680		
000000 6#16	000000 6#16	000000 6#16
5#16 00000	5#16 00000	5#16 00000

BEAM NC. 720 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3000.	YES	YES
2	444.	3 - 16MM	0.	3000.	YES	YES

BEAM NO. 720 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 2.00 KNS Vc= 78.48 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 2.00 KNS Vc= 77.30 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 3.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

1491J	2999X 300X 500	1492J
3N16 H 444. 0.TO 3000		
2N12 H 54. 0.TO 3000		
000 3#16	000 3#16	000 3#16
2#12 00	2#12 00	2#12 00

BEAM NC. 721 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	5 - 16MM	0.	5900.	YES	YES
2	444.	6 - 16MM	0.	2472.	YES	NO
3	444.	6 - 16MM	2199.	5900.	NO	YES

BEAM NO. 721 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 44.86 KNS Vc= 110.79 KNS Vs= 0.00 KNS
 Tu= 0.14 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 2508. MM



000000 6#16	000000 6#16	000000 6#16	000000 6#16
5#16 000000	5#16 000000	5#16 000000	5#16 000000

1	54.	2 - 12MM	0.	3425.	YES	YES
2	296.	2 - 12MM	0.	3425.	YES	YES

AT START SUPPCRT - Vu= 7.12 KNS Vc= 33.48 KNS Vs= 0.00 KNS
Tu= 3.24 KN-MET Tc= 0.9 KN-MET Ts= 4.3 KN-MET LOAD 6
STIRRUPS ARE REQUIRED FOR TORSION.

AT END SUPPORT - Vu= 6.56 KNS Vc= 32.27 KNS Vs= 0.00 KNS
Tu= 3.24 KN-MET Tc= 0.9 KN-MET Ts= 4.3 KN-MET LOAD 6

1494J	3424X 200X 350	1495J
-------	----------------	-------

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

A circular professional seal for a Civil Engineer in the Philippines. The outer ring contains the text "CIVIL ENGINEER" at the top and "PHILIPPINES" at the bottom, separated by a dotted line. In the center, there is a graphic of a building and the text "REGISTERED PROFESSIONAL ENGINEER" and "H. MAGRITAY". Below the name, it says "REG. NO. 55251".

1 54. 3 - 12MM 1114. 2170. NO YES
 2 294. 3 - 16MM 0. 2170. YES YES
 BEAM NO. 735 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 21.83 KNS Tu= 5.3 KN-MET
 Vc= 31.5 KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 6 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.
 AT END SUPPORT - Vu= 15.46 KNS Tu= 5.3 KN-MET
 Vc= 34.0 KNS, ACI 318:CLAUSE 11.6.3.1
 LOAD 6 TORSION VALUE TOO HIGH, INCREASE MEMBER SIZE.
 1496J 2170X 200X 350 1495J

=====

3No16 H 294. 0.TO 2170
3No12 H 54.1114.TO 2170

=====

ooo 3#16	ooo 3#16	ooo 3#16 3#12 ooo	ooo 3#16 3#12 ooo
-------------	-------------	----------------------------	----------------------------

=====

BEAM NO. 736 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 300. MM FY - 230. FC - 10. MPA, SIZE - 200. X 350. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

*** A SUITABLE BAR ARRANGEMENT COULD NOT BE DETERMINED.
 REQD. STEEL = 724. MM2, MAX. STEEL PERMISSIBLE = 1017. MM2
 MAX NEG MOMENT = 36.03 KN-MET, LOADING 6
 1497J 300X 200X 350 1496J

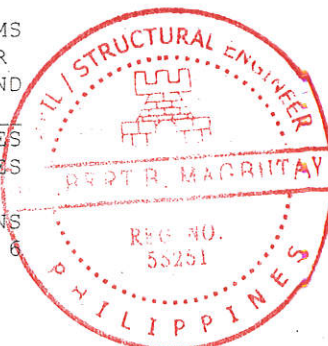
--	--	--	--

--	--	--	--

=====

BEAM NO. 737 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5680. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1 54. 7 - 12MM 0. 5680. YES YES
 2 344. 5 - 16MM 0. 5680. YES YES
 BEAM NO. 737 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 33.25 KNS Vc= 75.80 KNS Vs= 0.00 KNS
 Tu= 0.24 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.



=====	=====	=====	=====
5N016 H 344.	0.TO 5680		
16*10c/c173			16*10c/c173
7N012 H 54.	0.TO 5680		
=====	=====	=====	=====

ooooo	ooooo	ooooo	ooooo
5#16	5#16	5#16	5#16
7#12	7#12	7#12	7#12
ooooooooo	ooooooooo	ooooooooo	ooooooooo

	BEAM NO.	738	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08				
LEN -	3000. MM	EY -	230.	FC -	10.	MPA, SIZE -	350. X 400. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO	ANCHOR
	(MM)			(MM)		(MM)	STA END

1	54.	2 - 12MM	0.	3000.	YES	YES
2	346.	7 - 12MM	0.	3000.	YES	YES

BEAM NO. 738 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 32.53$ KNS $V_c = 63.18$ KNS $V_s = 0.00$ KNS
 $T_u = 0.35$ KN-MET $T_c = 2.5$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM
 AT END SUPPORT - $V_u = 2.51$ KNS $V_c = 62.32$ KNS $V_s = 0.00$ KNS
 $T_u = 0.73$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

```

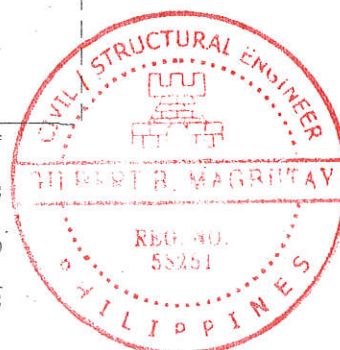
=====
1498J                               2999X 350X 400                               1499J
=====
| 7No12|H 346.   0.TO 3000 |   |   | |
| 8*10c/c173    |   |   |   |   |
| 2No12|H 54.   0.TO 3000 |   |   |
|=====

```

<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#12</p> <p>○○</p>
--	--	--	--

BEAM NO. 739 DESIGN RESULTS - FLEXURE PER CODE ACI 318-0									
LEN - 5900. MM		FY - 230.	FC - 10.	MPA, SIZE - 400. X 400. MMS					
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR				
	(MM)		(MM)	(MM)	STA END				
1	100	4	0	5900	1	100	100	100	100
2	200	4	0	5900	1	200	200	200	200
3	300	4	0	5900	1	300	300	300	300
4	400	4	0	5900	1	400	400	400	400
5	500	4	0	5900	1	500	500	500	500
6	600	4	0	5900	1	600	600	600	600
7	700	4	0	5900	1	700	700	700	700
8	800	4	0	5900	1	800	800	800	800
9	900	4	0	5900	1	900	900	900	900
10	1000	4	0	5900	1	1000	1000	1000	1000
11	1100	4	0	5900	1	1100	1100	1100	1100
12	1200	4	0	5900	1	1200	1200	1200	1200
13	1300	4	0	5900	1	1300	1300	1300	1300
14	1400	4	0	5900	1	1400	1400	1400	1400
15	1500	4	0	5900	1	1500	1500	1500	1500
16	1600	4	0	5900	1	1600	1600	1600	1600
17	1700	4	0	5900	1	1700	1700	1700	1700
18	1800	4	0	5900	1	1800	1800	1800	1800
19	1900	4	0	5900	1	1900	1900	1900	1900
20	2000	4	0	5900	1	2000	2000	2000	2000
21	2100	4	0	5900	1	2100	2100	2100	2100
22	2200	4	0	5900	1	2200	2200	2200	2200
23	2300	4	0	5900	1	2300	2300	2300	2300
24	2400	4	0	5900	1	2400	2400	2400	2400
25	2500	4	0	5900	1	2500	2500	2500	2500
26	2600	4	0	5900	1	2600	2600	2600	2600
27	2700	4	0	5900	1	2700	2700	2700	2700
28	2800	4	0	5900	1	2800	2800	2800	2800
29	2900	4	0	5900	1	2900	2900	2900	2900
30	3000	4	0	5900	1	3000	3000	3000	3000
31	3100	4	0	5900	1	3100	3100	3100	3100
32	3200	4	0	5900	1	3200	3200	3200	3200
33	3300	4	0	5900	1	3300	3300	3300	3300
34	3400	4	0	5900	1	3400	3400	3400	3400
35	3500	4	0	5900	1	3500	3500	3500	3500
36	3600	4	0	5900	1	3600	3600	3600	3600
37	3700	4	0	5900	1	3700	3700	3700	3700
38	3800	4	0	5900	1	3800	3800	3800	3800
39	3900	4	0	5900	1	3900	3900	3900	3900
40	4000	4	0	5900	1	4000	4000	4000	4000
41	4100	4	0	5900	1	4100	4100		

1	58.	3 - 20MM	0.	5900.	YES	YES
---	-----	----------	----	-------	-----	-----



[illegible]

<p>○○○○○</p> <p>6#20</p> <p>3#20</p> <p>○○○</p>	<p>○○○○○</p> <p>6#20</p> <p>3#20</p> <p>○○○</p>	<p>○○○○○</p> <p>6#20</p> <p>3#20</p> <p>○○○</p>	<p>○○○○○</p> <p>6#20</p> <p>3#20</p> <p>○○○</p>
---	---	---	---

743 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08							
LEN -	5900. MM	FY - 230.	FC - 10.	MPA, SIZE -	400. X	400. MMS	
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR		
	(MM)		(MM)	(MM)	STA	END	
1	36.	6 - 16MM	0.	5320.	YES	NO	
2	342.	6 - 20MM	0.	2119.	YES	NO	
3	342.	6 - 20MM	1568.	5900.	NO	YES	

BEAM NO. 743 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 100.19$ KNS $V_c = 78.65$ KNS $V_s = 54.93$ KNS
 $T_u = 0.90$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT IS REQUIRED FOR SHEAR.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 2608. MM
 AT END SUPPRT - $V_u = 101.34$ KNS $V_c = 78.30$ KNS $V_s = 56.83$ KNS
 $T_u = 0.90$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT IS REQUIRED FOR SHEAR.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 2608. MM
 1502J 5899X 400X 400 1503

[illegible]

000000 6#20 6#16 000000	000000 6#20 6#16 000000	000000 6#20 6#16 000000	000000 6#20
--------------------------------------	--------------------------------------	--------------------------------------	----------------

	BEAM NC.	766	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	8630. MM	FY - 230.	FC - 10. MPA, SIZE - 400. X	950. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	58.	7 - 20MM	0.	8680.	YES	YES
2	894.	7 - 16MM	0.	8680.	YES	YES

BEAM NO. 766 DESIGN RESULTS - SHEAR
 AT START SUPPRT - $V_u = 97.50$ KNS $V_c = 257.60$ KNS $V_s = 0.00$ KNS
 $T_u = 3.85$ KN-MET $T_c = 10.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 3448. MM
 AT END SUPPRT - $V_u = 143.34$ KNS $V_c = 326.54$ KNS $V_s = 0.00$ KNS
 $T_u = 4.09$ KN-MET $T_c = 10.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 3448. MM
 1506J 8680X 400X 949 1507

[illegible]

00000 7#16	00000 7#16	00000 7#16	00000 7#16
7#20 00000	7#20 00000	7#20 00000	7#20 00000

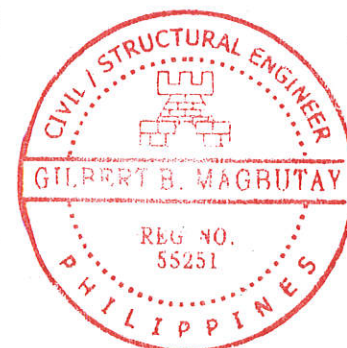
BEAM NC.		782 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08			
LEN	2135. MM	FY - 230.	FC - 10.	MPA, SIZE - 400. X	750. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	2185.	YES	YES
2	694.	3 - 16MM	0.	2185.	YES	YES

```

      BEAM NO. 782 DESIGN RESULTS - SHEAR
AT START SUPPORT - Vu= 8.78 KNS Vc= 144.00 KNS Vs= 0.00 KNS
Tu= 0.40 KN-MET Tc= 7.4 KN-MET Ts= 0.0 KN-MET LOAD 1
      STIRRUPS ARE NOT REQUIRED.
AT END SUPPORT - Vu= 8.78 KNS Vc= 144.00 KNS Vs= 0.00 KNS
Tu= 0.40 KN-MET Tc= 7.4 KN-MET Ts= 0.0 KN-MET LOAD 1
      STIRRUPS ARE NOT REQUIRED.

```



1632J	2185X 400X 750	1497J
=====		
3No16 H 694.	0.TO 2185	
=====		
2No12 H 54.	0.TO 2185	
=====		
ooo 3#16	ooo 3#16	ooo 3#16
2#12 oo	2#12 oo	2#12 oo

BEAM NC. 784 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 437. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	5 - 12MM	0.	437.	YES	YES
2	646.	8 - 12MM	0.	437.	YES	YES

BEAM NO. 784 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 784 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 784 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1583J 436X 400X 700 1631J

=====		
8No12 H 646.	0.TO 437	
=====		
5No12 H 54.	0.TO 437	
=====		

ooooooo 8#12	ooooooo 8#12	ooooooo 8#12	ooooooo 8#12
5#12 oooooo	5#12 oooooo	5#12 oooooo	5#12 oooooo

BEAM NC. 795 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 795 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 30.89$ KNS $V_c = 75.53$ KNS $V_s = 0.00$ KNS
 $T_u = 0.47$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.

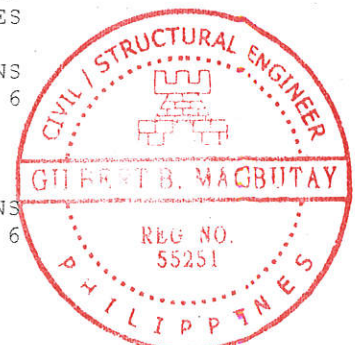
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUPPORT - $V_u = 30.51$ KNS $V_c = 75.53$ KNS $V_s = 0.00$ KNS
 $T_u = 0.47$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
1491J 3999X 300X 500

1696J

[illegible]

000000 6#12	000000 6#12	000000 6#12	000000 6#12
3#12 000	3#12 000	3#12 000	3#12 000

	BEAM NO.	797	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	4000. MM	FY - 230.	FC - 12. MPA, SIZE - 300. X	500. MMS
LEVEL	HEIGHT	BAR INFO	FROM TO	ANCHOR
	(MM)		(MM) (MM)	STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	442.	2 - 20MM	0.	4000.	YES	YES

BEAM NO. 797 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 30.29$ KNS $V_c = 75.48$ KNS $V_s = 0.00$ KNS
 $T_u = 0.64$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

AT END SUP:PORT - Vu= 31.11 KNS Vc= 75.48 KNS Vs= 0.00 KNS
Tu= 0.64 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

1492J 3999X 300X 500 1697J

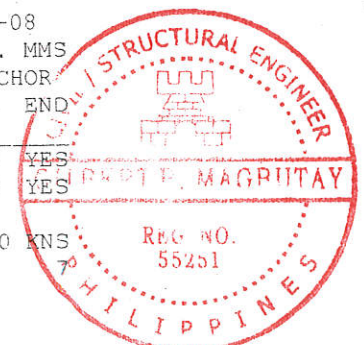
[illegible]

00 2#20 3#12 000	00 2#20 3#12 000	00 2#20 3#12 000	00 2#20 3#12 000
-------------------------------	-------------------------------	-------------------------------	-------------------------------

=====									
BEAM NO.		798		DESIGN RESULTS - FLEXURE PER CODE ACI				318-08	
LEN -	4000. MM	FY -	230.	FC -	12.	MPA, SIZE -	400. X	700. MMS	
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR	
	(MM)			(MM)		(MM)		STA	END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	646.	8 - 12MM	0.	4000.	YES	YES

BEAM NO. 798 DESIGN RESULTS - SHEAR
AT START SUPCRT - $V_u = 31.74$ KNS $V_c = 144.21$ KNS $V_s = 0.00$ KNS
 $T_u = 8.13$ KN-MET $T_c = 7.4$ KN-MET $T_s = 10.8$ KN-MET LOAD 7





B E A M N O . 1065 D E S I G N R E S U L T S - S H E A R
 AT START SUPPRT - Vu= 15.14 KNS Vc= 29.88 KNS Vs= 0.00 KNS
 Tu= 0.49 KN-MET Tc= 0.9 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 122. MM C/C FOR 1758. MM
 AT END SUPPRT - Vu= 17.12 KNS Vc= 29.88 KNS Vs= 0.00 KNS
 Tu= 0.49 KN-MET Tc= 0.9 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 122. MM C/C FOR 1758. MM
 1502J 3999X 250X 300 1818

[illegible]

3#16	3#16	3#16	3#16
2#16	2#16	2#16	2#16

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.6



1503J	3999X 400X 650	1825J
6No16/H 594. 0.TO 4000		8*10c/c219
4No12/H 54. 0.TO 4000		
000000 6#16	000000 6#16	000000 6#16
4#12 0000	4#12 0000	4#12 0000

BEAM NO. 1067 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	4000.	YES	YES
2	596.	4 - 12MM	0.	4000.	YES	YES

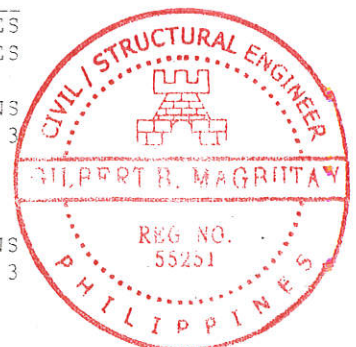
BEAM NO. 1067 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 4.94 KNS Vc= 123.45 KNS Vs= 0.00 KNS
 Tu= 0.05 KN-MET Tc= 6.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 4.94 KNS Vc= 123.45 KNS Vs= 0.00 KNS
 Tu= 0.05 KN-MET Tc= 6.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

1506J	3999X 400X 650	1865J
4No12 H 596. 0.TO 4000		
2No12 H 54. 0.TO 4000		
0000 4#12	0000 4#12	0000 4#12
2#12 00	2#12 00	2#12 00

BEAM NO. 1068 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	58.	7 - 20MM	0.	4000.	YES	YES
2	892.	6 - 20MM	0.	4000.	YES	YES

BEAM NO. 1068 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 91.79 KNS Vc= 179.18 KNS Vs= 0.00 KNS
 Tu= 3.21 KN-MET Tc= 9.8 KN-MET Ts= 0.0 KN-MET LOAD 3
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 1108. MM
 AT END SUPPORT - Vu= 71.95 KNS Vc= 179.18 KNS Vs= 0.00 KNS
 Tu= 3.21 KN-MET Tc= 9.8 KN-MET Ts= 0.0 KN-MET LOAD 3



[illegible]

○○○○○ 6#20	○○○○○ 6#20	○○○○○ 6#20	○○○○○ 6#20
○○○○○ 7#20	○○○○○ 7#20	○○○○○ 7#20	○○○○○ 7#20

BEAM NO. 1069 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03									
LEN - 4000. MM		FY - 230.		FC - 12.		MPA, SIZE - 200. X 300. MMS			
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR				
	(MM)		(MM)	(MM)		STA	END		
1	100	4#10	0	4000	ANCHOR	0	4000		
2	200	4#10	0	4000	ANCHOR	0	4000		
3	300	4#10	0	4000	ANCHOR	0	4000		
4	400	4#10	0	4000	ANCHOR	0	4000		
5	500	4#10	0	4000	ANCHOR	0	4000		
6	600	4#10	0	4000	ANCHOR	0	4000		
7	700	4#10	0	4000	ANCHOR	0	4000		
8	800	4#10	0	4000	ANCHOR	0	4000		
9	900	4#10	0	4000	ANCHOR	0	4000		
10	1000	4#10	0	4000	ANCHOR	0	4000		
11	1100	4#10	0	4000	ANCHOR	0	4000		
12	1200	4#10	0	4000	ANCHOR	0	4000		
13	1300	4#10	0	4000	ANCHOR	0	4000		
14	1400	4#10	0	4000	ANCHOR	0	4000		
15	1500	4#10	0	4000	ANCHOR	0	4000		
16	1600	4#10	0	4000	ANCHOR	0	4000		
17	1700	4#10	0	4000	ANCHOR	0	4000		
18	1800	4#10	0	4000	ANCHOR	0	4000		
19	1900	4#10	0	4000	ANCHOR	0	4000		
20	2000	4#10	0	4000	ANCHOR	0	4000		
21	2100	4#10	0	4000	ANCHOR	0	4000		
22	2200	4#10	0	4000	ANCHOR	0	4000		
23	2300	4#10	0	4000	ANCHOR	0	4000		
24	2400	4#10	0	4000	ANCHOR	0	4000		
25	2500	4#10	0	4000	ANCHOR	0	4000		
26	2600	4#10	0	4000	ANCHOR	0	4000		
27	2700	4#10	0	4000	ANCHOR	0	4000		
28	2800	4#10	0	4000	ANCHOR	0	4000		
29	2900	4#10	0	4000	ANCHOR	0	4000		
30	3000	4#10	0	4000	ANCHOR	0	4000		
31	3100	4#10	0	4000	ANCHOR	0	4000		
32	3200	4#10	0	4000	ANCHOR	0	4000		
33	3300	4#10	0	4000	ANCHOR	0	4000		
34	3400	4#10	0	4000	ANCHOR	0	4000		
35	3500	4#10	0	4000	ANCHOR	0	4000		
36	3600	4#10	0	4000	ANCHOR	0	4000		
37	3700	4#10	0	4000	ANCHOR	0	4000		
38	3800	4#10	0	4000	ANCHOR	0	4000		
39	3900	4#10	0	4000	ANCHOR	0	4000		
40	4000	4#10	0	4000	ANCHOR	0	4000		

1	54.	2 - 12MM	0.	3833.	YES	NO
2	246.	2 - 12MM	0.	1291.	YES	NO
3	246.	3 - 12MM	1876.	4000.	NO	YES

BEAM NO. 1069 DESIGN RESULTS - SHEAR

AT START SUPPORT -	Vu=	1.90 KNS	Vc=	26.99 KNS	Vs=	0.00 KNS
Tu=	0.06 KN-MET	Tc=	0.8 KN-MET	Ts=	0.0 KN-MET	LOAD 1
STIRRUPS ARE NOT REQUIRED.						
AT END SUPPORT -	Vu=	1.90 KNS	Vc=	27.00 KNS	Vs=	0.00 KNS
Tu=	0.06 KN-MET	Tc=	0.8 KN-MET	Ts=	0.0 KN-MET	LOAD 1
STIRRUPS ARE NOT REQUIRED.						

1513J 3999X 200X 300 1933J

```
=====
```

2N012 H 246.	0.TO 1291	3N012 H 246..876.TO 4000
--------------	-----------	--------------------------

```
=====
```

2N012 H 54.	0.TO 3833
-------------	-----------

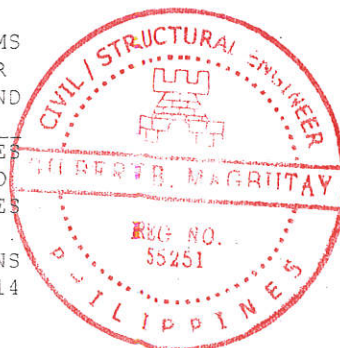
```
=====
```

○○ 2#12	2#12 ○○	○○○ 3#12 2#12 ○○	○○○ 3#12
------------	------------	---------------------------	-------------

	BEAM NO.	1070	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08		
LEN -	4000. MM	FY -	230.	FC -	12. MPA, SIZE - 400. X 450. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	34.	3 - 12MM	0.	4000.	YES	YES
2	336.	3 - 12MM	0.	2044.	YES	NO
3	336.	2 - 12MM	1789.	4000.	NO	YES

BEAM NO. 1070 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 12.04$ KNS $V_c = 171.90$ KNS $V_s = 0.00$ KNS
 $T_u = 17.21$ KN-MET $T_c = 5.1$ KN-MET $T_s = 22.9$ KN-MET LOAD 14



STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 153. MM C/C FOR 1608. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 6.97 SQ.CM.

AT END SUPPORT - $V_u = 0.24$ KNS $V_c = 171.90$ KNS $V_s = 0.00$ KNS $T_u = 17.21$ KN-MET $T_c = 5.1$ KN-MET $T_s = 22.9$ KN-MET LOAD 14

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 153. MM C/C FOR 1608. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 6.97 SQ.CM.

1515J

3999X 400X 450

1941J

```

=====
3No12 H 396. | 0.TO 2044 | | 2No12 H 396.1789.TO 4000 | | | | |
12*10c/c133 | | | | | | | | | | 12*10c/c153 |
3No12 H 34. | 0.TO 4000 | | | | | | | | |
=====

```

ooo	ooo	oo	oo
3#12	3#12	2#12	2#12
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 1071 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	54.	2 - 12MM	0.	4000.	YES	YES	
2	246.	3 - 12MM	0.	4000.	YES	YES	

BEAM NO. 1071 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 3.01$ KNS $V_c = 27.03$ KNS $V_s = 0.00$ KNS $T_u = 0.06$ KN-MET $T_c = 0.8$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - $V_u = 3.01$ KNS $V_c = 27.04$ KNS $V_s = 0.00$ KNS $T_u = 0.06$ KN-MET $T_c = 0.8$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1517J

3999X 200X 300

1943J

```

=====
3No12 H 246. | 0.TO 4000 |
2No12 H 54. | 0.TO 4000 |
=====

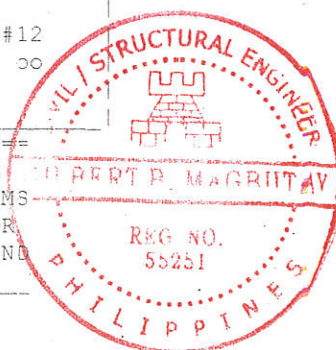
```

ooo	ooo	ooo	ooo
3#12	3#12	3#12	3#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 1072 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----



AT START SUPCRT - Vu= 3.16 KNS Vc= 60.50 KNS Vs= 0.00 KNS
Tj= 2.35 KN-MET Tc= 1.2 KN-MET Ts= 3.1 KN-MET LOAD 14
STIRRUPS ARE REQUIRED FOR TORSION.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 1758. MM

AT END SUPPORT - Vu= 1.31 KNS Vc= 60.50 KNS Vs= 0.00 KNS

T ₁ =	2.35 KN-MET	T _C =	1.2 KN-MET	T _S =	3.1 KN-MET	LOAD	14
------------------	-------------	------------------	------------	------------------	------------	------	----

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 1758. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.16 SQ. CM.

1519J	3999X	200X	300	1945J
-------	-------	------	-----	-------

[illegible]

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

LEN -	900. MM	FY -	230.	FC -	12.	MPA, SIZE -	400. X	700. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

1	54.	5 - 12MM	0.	900.	YES	YES
2	644.	5 - 16MM	0.	900.	YES	YES

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 1073 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 1073 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1631J 900X 400X 700 1635J

```
=====
```

5N016 H 644.	0.TO	900
--------------	------	-----

```
=====
```



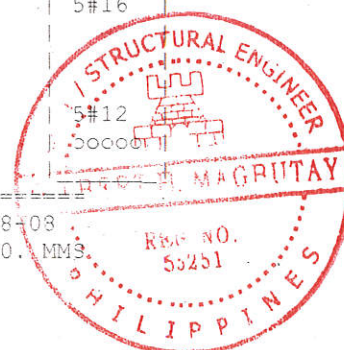
```
=====
```

5N012 H 54.	0.TO	900
-------------	------	-----

```
=====
```

00000	00000	00000	00000
5#16	5#16	5#16	5#16
5#12	5#12	5#12	5#12
00000	00000	00000	00000

LEN - 1815. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
1	54.	2 - 12MM	0.	1815.	YES	YES
2	696.	4 - 12MM	0.	1815.	YES	YES
B E A M N O. 1074 D E S I G N R E S U L T S - S H E A R						
AT START SUPPORT - Vu= 8.78 KNS Vc= 144.69 KNS Vs= 0.00 KNS						
Ti= 0.40 KN-MET Tc= 7.5 KN-MET Ts= 0.0 KN-MET LOAD 1						
STIRRUPS ARE NOT REQUIRED.						
AT END SUPPORT - Vu= 8.78 KNS Vc= 144.69 KNS Vs= 0.00 KNS						
Ti= 0.40 KN-MET Tc= 7.5 KN-MET Ts= 0.0 KN-MET LOAD 1						
STIRRUPS ARE NOT REQUIRED.						
1632J		1814X 400X 750			1756J	

4N512 H 696. 0.TO 1815

2N512 H 54. 0.TO 1815

0000	0000	0000	0000
4#12	4#12	4#12	4#12
2#12	2#12	2#12	2#12
00	00	00	00

BEAM NO. 1075 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 915. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	7 - 12MM	0.	915.	YES	YES
2	646.	5 - 12MM	0.	915.	YES	YES

B E A M N O. 1075 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 1075 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 1075 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

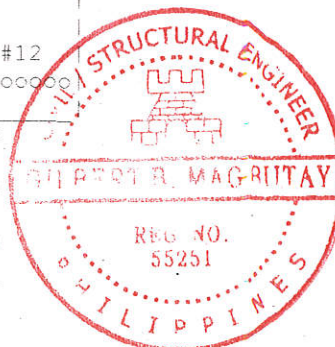
1635J 914X 400X 700 1695J

5N512 H 646. 0.TO 915

7N512 H 54. 0.TO 915

00000	00000	00000	00000
5#12	5#12	5#12	5#12
7#12	7#12	7#12	7#12
0000000	0000000	0000000	0000000

BEAM NO. 5948 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5630. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END



1697J	5399X	400X	500	1693J
-------	-------	------	-----	-------

	BEAM NO.	5865	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	5630. MM	FY - 230.	FC - 10.	MPA, SIZE - 400. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1756J 5680X 400X 400 1757J

3#20 7#12 00000000	3#20 7#12 00000000	3#20 7#12 00000000	3#20 7#12 00000000
--------------------------	--------------------------	--------------------------	--------------------------

=====

BEAM NO. 5866 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	2 - 12MM	0.	3000.	YES	YES	
2	344.	3 - 16MM	0.	3000.	YES	YES	

BEAM NO. 5866 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 25.80 KNS Vc= 62.29 KNS Vs= 0.00 KNS

Tu= 2.05 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

AT END SUPPORT - Vu= 3.01 KNS Vc= 62.06 KNS Vs= 0.00 KNS

Tu= 0.19 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1757J 2999X 350X 400 1758J

3No16 H 344. 0.TO 3000			
8*10c/c173			
2No12 H 34. 0.TO 3000			

3#16 2#12 00	3#16 2#12 00	3#16 2#12 00	3#16 2#12 00
--------------------	--------------------	--------------------	--------------------

=====

BEAM NO. 5867 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	8 - 12MM	0.	5900.	YES	YES	
2	342.	6 - 20MM	0.	5900.	YES	YES	

BEAM NO. 5867 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 43.68 KNS Vc= 78.23 KNS Vs= 0.00 KNS

Tu= 0.28 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

AT END SUPPORT - Vu= 47.21 KNS Vc= 76.72 KNS Vs= 0.00 KNS

Tu= 0.28 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM



1758J

5899X 400X 400

1759J

```

=====
6N20 H 342. | 0.TO 5903 | | | | | | | | | | | | | | | | | | | | | |
17*10c/c173 | | | | | | | | | | | | | | | | | | | | | |
8N212 H 54. | 0.TO 5903 | | | | | | | | | | | | | | | | | | | | | |
=====

```

```

=====
000000      000000      000000      000000
6#20         6#20         6#20         6#20
8#12         8#12         8#12         8#12
00000000    00000000    00000000    00000000
=====

```

```

=====
BEAM NO. 5882 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03
LEN - 540. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

```

```

1 54. 2 - 12MM 0. 540. YES YES
2 346. 4 - 12MM 0. 540. YES YES

```

BEAM NO. 5882 DESIGN RESULTS - SHEAR

```

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5882 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5882 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

```

```

1818J 539X 400X 400 1819J

```

```

=====
4N212 H 346. 0.TO 540.

```

```

2N212 H 54. 0.TO 540
=====

```

```

=====
0000      0000      0000      0000
4#12      4#12      4#12      4#12
2#12      2#12      2#12      2#12
00        00        00        00
=====

```

```

=====
BEAM NO. 5886 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 50. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

```

```

1 54. 2 - 12MM 0. 50. YES YES
2 346. 2 - 12MM 0. 50. YES YES

```

BEAM NO. 5886 DESIGN RESULTS - SHEAR

```

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5886 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5886 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

```



1822J	50X 400X 400	1823J
2N12 H 346.	0.TO 50	
2N12 H 34.	0.TO 50	
2#12	2#12	2#12
2#12	2#12	2#12

BEAM NO. 5888 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3200. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	4 - 16MM	0.	3200.	YES YES
2	342.	4 - 20MM	0.	3200.	YES YES

BEAM NO. 5888 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 6.61 KNS Vc= 71.55 KNS Vs= 0.00 KNS
 Tu= 3.40 KN-MET Tc= 3.1 KN-MET Ts= 4.5 KN-MET LOAD 1
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 157. MM C/C FOR 1258. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.48 SQ.CM.
 AT END SUPPORT - Vu= 6.61 KNS Vc= 71.55 KNS Vs= 0.00 KNS
 Tu= 3.40 KN-MET Tc= 3.1 KN-MET Ts= 4.5 KN-MET LOAD 1
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 157. MM C/C FOR 1258. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.48 SQ.CM.

1824J	3200X 400X 400	1825J
4N20 H 342.	0.TO 3200	
10*10c/c157		10*10c/c157
4N16 H 156.	0.TO 3200	

4#20	4#20	4#20	4#20
4#16	4#16	4#16	4#16

BEAM NO. 5902 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 8680. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	58.	7 - 20MM	0.	8680.	YES YES
2	896.	6 - 12MM	0.	8680.	YES YES

BEAM NO. 5902 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 136.32 KNS Vc= 290.10 KNS Vs= 0.00 KNS



Tu= 2.61 KN-MET Tc= 10.5 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 3448. MM
 AT END SUPPRT - Vu= 89.24 KNS Vc= 218.93 KNS Vs= 0.00 KNS
 Tu= 2.47 KN-MET Tc= 10.5 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 3448. MM

1865J	8680X 400X 949	1866J
6No12 H 896.	0.TO 8680	
15*10c/c262		15*10c/c262
7No20 H 58.	0.TO 8680	

ooooo	ooooo	ooooo	ooooo
6#12	6#12	6#12	6#12
7#20	7#20	7#20	7#20
ooooo	ooooo	ooooo	ooooo

BEAM NO. 5921 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 400. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	500.	YES	YES
2	396.	2 - 12MM	0.	500.	YES	YES

BEAM N.O. 5921 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5921 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5921 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

1941J 500X 400X 450 1983J

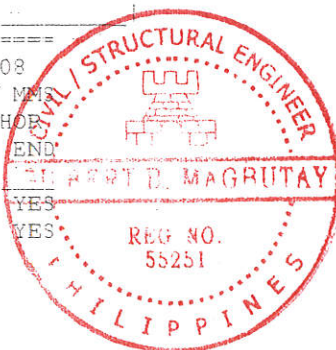
2No12 H 396.	0.TO 500
2No12 H 54.	0.TO 500

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 5922 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	500.	YES	YES
2	246.	2 - 12MM	0.	500.	YES	YES

BEAM N.O. 5922 DESIGN RESULTS - SHEAR



AT START SUPPORT - $V_u = 1.51$ KNS $V_c = 26.33$ KNS $V_s = 0.00$ KNS
 $T_u = 0.70$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.9$ KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.64 SQ.CM.

AT END SUPPORT - $V_u = 1.51$ KNS $V_c = 26.33$ KNS $V_s = 0.00$ KNS

$T_u = 0.70$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.9$ KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.64 SQ.CM.

1945J

500X 200X 300

1986J

2No12 H 246. | 0.TO 500

2*10c/c 32

2*10c/c 32

2No12 H 54. | 0.TO 500

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

BEAM NO. 5923 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 571. MM FY - 230. FC - 10. MPA, SIZE - 250. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	2 - 12MM	0.	571.	YES	YES	
2	246.	3 - 12MM	0.	571.	YES	YES	

BEAM NO. 5923 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 24.29$ KNS $V_c = 27.57$ KNS $V_s = 4.81$ KNS

$T_u = 0.42$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT IS REQUIRED FOR SHEAR.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 44. MM

AT END SUPPORT - $V_u = 24.29$ KNS $V_c = 27.57$ KNS $V_s = 4.81$ KNS

$T_u = 0.42$ KN-MET $T_c = 0.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT IS REQUIRED FOR SHEAR.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 44. MM

1818J

571X 250X 300

1987J

3No12 H 246. | 0.TO 571

2*10c/c123

2*10c/c123

2No12 H 54. | 0.TO 571

ooo

3#12

2#12

oo

ooo

3#12

2#12

oo

ooo

3#12

2#12

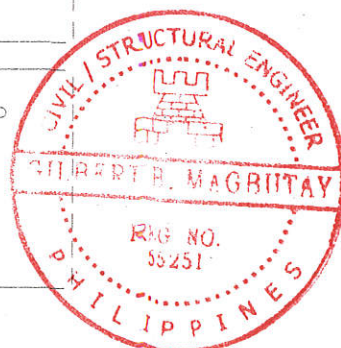
oo

ooo

3#12

2#12

oo



=====

BEAM NO. 5924 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1400. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	58.	4 - 20MM	0.	1400.	YES	YES	
2	642.	5 - 20MM	0.	1400.	YES	YES	

BEAM NO. 5924 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 36.67$ KNS $V_c = 144.14$ KNS $V_s = 0.00$ KNS

$T_u = 30.85$ KN-MET $T_c = 7.5$ KN-MET $T_s = 41.1$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 207. MM C/C FOR 58. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 10.13 SQ.CM.

AT END SUPPRT - $V_u = 117.51$ KNS $V_c = 144.85$ KNS $V_s = 11.82$ KNS

$T_u = 29.14$ KN-MET $T_c = 7.5$ KN-MET $T_s = 38.9$ KN-MET LOAD 9

STIRRUPS ARE REQUIRED FOR SHEAR AND TORSION.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 203. MM C/C FOR 58. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 9.57 SQ.CM.

1698J 1400X 400X 700 2048J

5N20 H 642.	0 TO 1400		
2*12c/c207		2*12c/c203	
4N20 H 58.	0 TO 1400		

5#20	5#20	5#20	5#20
4#20	4#20	4#20	4#20

=====

BEAM NO. 5925 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1400. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	58.	5 - 20MM	0.	1400.	YES	YES	
2	692.	6 - 20MM	0.	1400.	YES	YES	

BEAM NO. 5925 DESIGN RESULTS - SHEAR

AT START SUPPRT - $V_u = 14.77$ KNS $V_c = 157.11$ KNS $V_s = 0.00$ KNS

$T_u = 52.90$ KN-MET $T_c = 8.0$ KN-MET $T_s = 70.5$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 16 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 16.93 SQ.CM.

AT END SUPPRT - $V_u = 14.52$ KNS $V_c = 157.09$ KNS $V_s = 0.00$ KNS

$T_u = 52.90$ KN-MET $T_c = 8.0$ KN-MET $T_s = 70.5$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 16 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 16.93 SQ.CM.



1759J	1400X 400X 750	2051J
6No20 H 632. 0.TO 1400		
2*16c/c232		2*16c/c232
5No20 H 58. 0.TO 1400		
ooooooo	ooooooo	ooooooo
6#20	6#20	6#20
5#20	5#20	5#20
ooooooo	ooooooo	ooooooo

BEAM NO. 5926 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1400. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	6 - 16MM	0.	1400.	YES	YES
2	594.	7 - 16MM	0.	1400.	YES	YES

BEAM NO. 5926 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 27.02$ KNS $V_c = 123.63$ KNS $V_s = 0.00$ KNS
 $T_u = 32.60$ KN-MET $T_c = 6.3$ KN-MET $T_s = 43.5$ KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 180. MM C/C FOR 108. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 11.03 SQ.CM.

AT END SUPPORT - $V_u = 20.51$ KNS $V_c = 123.63$ KNS $V_s = 0.00$ KNS

$T_u = 32.60$ KN-MET $T_c = 6.3$ KN-MET $T_s = 43.5$ KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 180. MM C/C FOR 108. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 11.03 SQ.CM.

1825J 1400X 400X 650 2054J

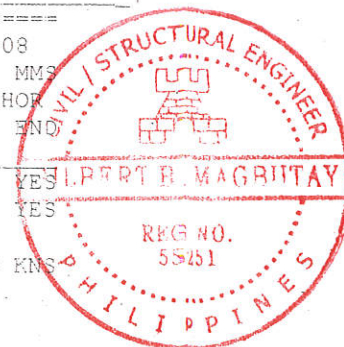
7No16 H 594. 0.TO 1400		
2*12c/c130		2*12c/c130
6No16 H 56. 0.TO 1400		

ooooooo	ooooooo	ooooooo	ooooooo
7#16	7#16	7#16	7#16
6#16	6#16	6#16	6#16
ooooooo	ooooooo	ooooooo	ooooooo

BEAM NO. 5930 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1925. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	1925.	YES	YES
2	246.	3 - 12MM	0.	1925.	YES	YES

BEAM NO. 5930 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 13.27$ KNS $V_c = 26.69$ KNS $V_s = 0.00$ KNS



[illegible]

000 3#12 2#16 00	000 3#12 2#16 00	000 3#12 2#16 00	000 3#12 2#16 00
-------------------------------	-------------------------------	-------------------------------	-------------------------------

	BEAM NO.	5931	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	2100. MM	FY - 230.	FC - 12:	MPA, SIZE - 300. X 500. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

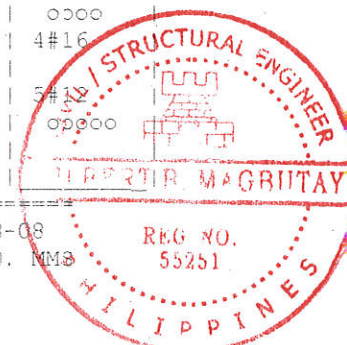
1	54.	5 - 12MM	0.	2100.	YES	YES
2	444.	4 - 16MM	0.	2100.	YES	YES

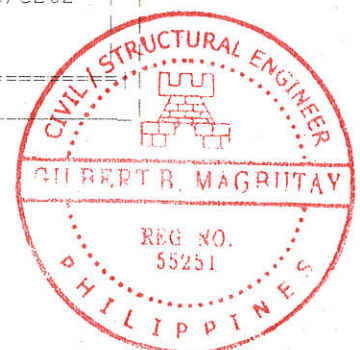
BEAM NO. 5931 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 39.79 KNS Vc= 75.60 KNS Vs= 0.00 KNS
 Tu= 0.43 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 608. MM
 AT END SUPPORT - Vu= 39.79 KNS Vc= 75.60 KNS Vs= 0.00 KNS
 Tu= 0.43 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 608. MM
 1697J 2100X 300X 500 2205

[illegible]

0000	0000	0000	0000
4#16	4#16	4#16	4#16
5#12	5#12	5#12	5#12
00000	00000	00000	00000

BEAM NO. 5932 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 2100. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS





CC	OO	OO	OO
2#12	2#12	2#12	2#12
7#20	7#20	7#20	7#20
OOOOO	OOOOO	OOOOO	OOOOO

=====

BEAM NO. 5936 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1860. MM FY - 414. FC - 12. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	59.	2 - 16MM	0.	1860.	YES	YES
2	393.	2 - 12MM	0.	1860.	YES	YES

BEAM NO. 5936 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 29.39 KNS Vc= 69.61 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 196. MM C/C FOR 543. MM.

AT END SUPPRT - Vu= 5.09 KNS Vc= 64.44 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

2048J

1859X 300X 450

2049J

=====

2#12 H 393. 0 TO 1860
 4#12c/c196
 2#16 H 59. 0 TO 1860
 =====

OO	OO	OO	OO
2#12	2#12	2#12	2#12
2#16	2#16	2#16	2#16
OO	OO	OO	OO

=====

BEAM NO. 5937 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1855. MM FY - 414. FC - 12. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	59.	2 - 16MM	0.	1855.	YES	YES
2	391.	2 - 16MM	0.	1855.	YES	YES

BEAM NO. 5937 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 45.18 KNS Vc= 61.64 KNS Vs= 0.00 KNS
 Tu= 9.56 KN-MET Tc= 2.3 KN-MET Ts= 12.7 KN-MET LOAD 7
 STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 143. MM C/C FOR 541. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.71 SQ. CM.

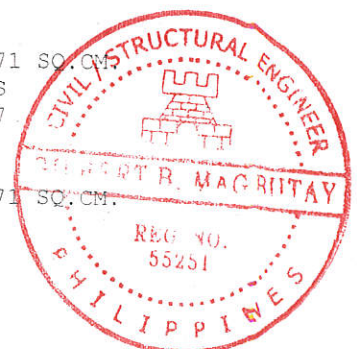
AT END SUPPORT - Vu= 64.06 KNS Vc= 61.64 KNS Vs= 23.78 KNS

Tu= 9.56 KN-MET Tc= 2.3 KN-MET Ts= 12.7 KN-MET LOAD 7

STIRRUPS ARE REQUIRED FOR SHEAR AND TORSION.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 143. MM C/C FOR 541. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.71 SQ. CM.



2049J	1854X 300X 450	2050J
=====		
2N#16 H 391. 0.TO 1853		
5*12c/c143		5*12c/c143
2N#16 H 59. 0.TO 1853		
=====		
oo	oo	oo
2#16	2#16	2#16
2#16	2#16	2#16
oo	oo	oo

BEAM NO. 5938 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1860. MM FY - 414. FC - 12. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	57.	5 - 12MM	0.	1860.	YES	YES
2	393.	2 - 12MM	0.	1860.	YES	YES

BEAM NO. 5938 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 45.29 KNS Vc= 76.31 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 2.9 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 197. MM C/C FOR 543. MM
 AT END SUPPORT - Vu= 26.32 KNS Vc= 65.51 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 2.9 KN-MET Ts= 0.0 KN-MET LOAD 7
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 12 MM 2-LEGGED STIRRUPS AT 197. MM C/C FOR 543. MM

2051J 1859X 300X 450 2052J

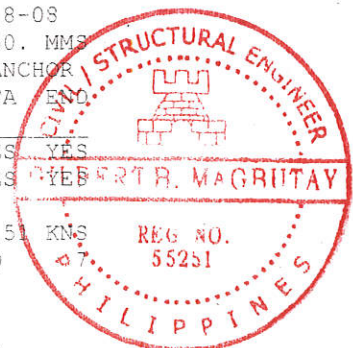
=====		
2N#12 H 393. 0.TO 1860		
4*12c/c197		4*12c/c197
5N#12 H 57. 0.TO 1860		
=====		

oo	oo	oo	oo
2#12	2#12	2#12	2#12
5#12	5#12	5#12	5#12
ooooo	ooooo	ooooo	ooooo

BEAM NO. 5939 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1855. MM FY - 414. FC - 12. MPA, SIZE - 300. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	59.	4 - 16MM	0.	1855.	YES	YES
2	393.	4 - 12MM	0.	1855.	YES	YES

BEAM NO. 5939 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 67.99 KNS Vc= 57.15 KNS Vs= 33.51 KNS
 Tu= 10.69 KN-MET Tc= 1.9 KN-MET Ts= 1.42 KN-MET LOAD
 STIRRUPS ARE REQUIRED FOR SHEAR AND TORSION.

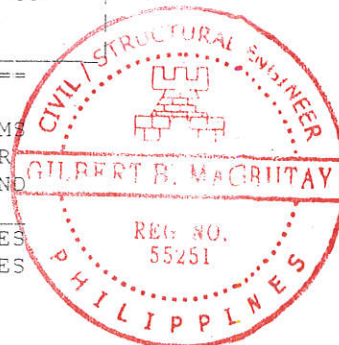


C O O O 4#12	O O O O 4#12	O O O O 4#12	O O O O 4#12
4#16 C O O O	4#16 O O O O	4#16 O O O O	4#16 O O O O

BEAM NO. 5940 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 9.12 KNS Vc= 55.94 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 1.9 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 9.12 KNS Vc= 55.94 KNS Vs= 0.00 KNS
 Tu= 0.00 KN-MET Tc= 1.9 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

<p>000</p> <p>3#12</p> <p>2#12</p> <p>00</p>	<p>000</p> <p>3#12</p> <p>2#12</p> <p>00</p>	<p>000</p> <p>3#12</p> <p>2#12</p> <p>00</p>	<p>000</p> <p>3#12</p> <p>2#12</p> <p>00</p>
--	--	--	--

1	57.	2 - 12MM	0.	1855.	YES	YES
2	393.	2 - 12MM	0.	1855.	YES	YES



2No12 H 393.	0.TO 1855				
5*12c/c143				5*12c/c143	
2No12 H 57.	0.TO 1855				

00	00	00	00
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
00	00	00	00

[illegible]

1	58.	5 - 20MM	0.	525.	YES	YES
2	642.	5 - 20MM	0.	525.	YES	YES

B E A M N O . 5943 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5943 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

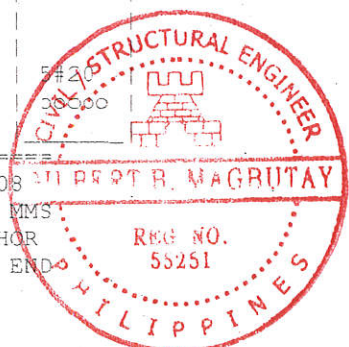
** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5943 IS BEYOND
THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2048J 525X 400X 700 2114J

5No20 H 642. 0.TO 525

00000	00000	00000	00000
5#20	5#20	5#20	5#20
5#20	5#20	5#20	5#20
00000	00000	00000	00000

	BEAM NO.	5944	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN -	525. MM	FY - 230.	FC - 10.	MPA, SIZE - 400. X 750. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END



1	58.	6 - 20MM	0.	525.	YES	YES
2	692.	6 - 20MM	0.	525.	YES	YES

B E A M N O. 5944 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5944 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5944 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2051J 525X 400X 750 2121J

6N20 H 692. 0.TO 525

6N20 H 58. 0.TO 525

000000	000000	000000	000000
6#20	6#20	6#20	6#20
6#20	6#20	6#20	6#20
000000	000000	000000	000000

B E A M N O. 5945 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

LEN - 525. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	56.	7 - 16MM	0.	525.	YES	YES
2	592.	5 - 20MM	0.	525.	YES	YES

B E A M N O. 5945 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5945 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5945 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2054J 525X 400X 650 2128J

5N20 H 592. 0.TO 525

7N16 H 56. 0.TO 525

000000	000000	000000	000000
5#20	5#20	5#20	5#20
7#16	7#16	7#16	7#16
0000000	0000000	0000000	0000000

B E A M N O. 5949 D E S I G N R E S U L T S - F L E X U R E P E R C O D E A C I 318-08

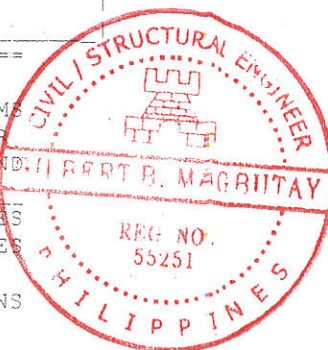
LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	56.	2 - 16MM	0.	4000.	YES	YES
2	646.	6 - 12MM	0.	4000.	YES	YES

B E A M N O. 5949 D E S I G N R E S U L T S - S H E A R

AT START SUPPRT - Vu= 10.72 KNS Vc= 127.88 KNS Vs= 0.00 KNS



T₁= 0.19 KN-MET T_c= 6.0 KN-MET T_s= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - V_u= 54.67 KNS V_c= 126.14 KNS V_s= 0.00 KNS
 T₁= 0.11 KN-MET T_c= 5.8 KN-MET T_s= 0.0 KN-MET LOAD 9
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 1358. MM

1695J	4000X 400X 700	2716J
6No12 H 646.	0.TO 4000	
		7*10c/c262
2No16 H 56.	0.TO 4000	

000000	000000	000000	000000
6#12	6#12	6#12	6#12
2#16	2#16	2#16	2#16
00	00	00	00

BEAM NO. 5950 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

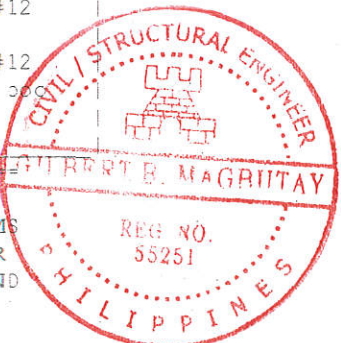
1.	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 5950 DESIGN RESULTS - SHEAR
 AT START SUPPORT - V_u= 30.60 KNS V_c= 75.67 KNS V_s= 0.00 KNS
 T_u= 0.05 KN-MET T_c= 3.0 KN-MET T_s= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 AT END SUPPORT - V_u= 30.79 KNS V_c= 75.67 KNS V_s= 0.00 KNS
 T_u= 0.05 KN-MET T_c= 3.0 KN-MET T_s= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM

1696J	4000X 300X 500	2717J
6No12 H 446.	0.TO 4000	
8*10c/c223		8*10c/c223
3No12 H 54.	0.TO 4000	

000000	000000	000000	000000
6#12	6#12	6#12	6#12
3#12	3#12	3#12	3#12
000	000	000	000

BEAM NO. 5951 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END



1	54.	3 - 12MM	0.	4000.	YES	YES
2	694.	3 - 16MM	0.	4000.	YES	YES

BEAM NO. 5951 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 16.15$ KNS $V_c = 145.98$ KNS $V_s = 0.00$ KNS
 $T_u = 0.26$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - $V_u = 16.15$ KNS $V_c = 145.98$ KNS $V_s = 0.00$ KNS
 $T_u = 0.26$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1756J

4000X 400X 750

2767J

3N#16 H 694. 0.TO 4000

3N#12 H 54. 0.TO 4000

000	000	000	000
3#16	3#16	3#16	3#16
3#12	3#12	3#12	3#12
000	000	000	000

BEAM NO. 5952 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	6 - 12MM	0.	4000.	YES	YES

BEAM NO. 5952 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 25.51$ KNS $V_c = 63.60$ KNS $V_s = 0.00$ KNS
 $T_u = 0.76$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

AT END SUPPORT - $V_u = 26.07$ KNS $V_c = 63.60$ KNS $V_s = 0.00$ KNS
 $T_u = 0.76$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

1757J

4000X 350X 400

2768J

6N#12 H 346. 0.TO 4000
 11*10c/c172
 2N#16 H 56. 0.TO 4000

000000	000000	000000	000000
6#12	6#12	6#12	6#12
2#16	2#16	2#16	2#16
00	00	00	00

BEAM NO. 5953 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 3 - 12MM 0. 4000. YES YES
 2 596. 5 - 12MM 0. 4000. YES YES

BEAM NO. 5953 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 10.11 KNS Vc= 119.61 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 6.3 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 10.11 KNS Vc= 119.89 KNS Vs= 0.00 KNS
 Tu= 0.09 KN-MET Tc= 6.3 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1865J 4000X 400X 650 2845J

5N12 H 596. 0.TO 4000

3N12 H 54. 0.TO 4000

00000
 5#12

00000
 5#12

00000
 5#12

00000
 5#12

3#12
 000

3#12
 000

3#12
 000

3#12
 000

BEAM NO. 5954 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1 54. 2 - 12MM 0. 4000. YES YES
 2 246. 3 - 12MM 0. 4000. YES YES

BEAM NO. 5954 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 3.09 KNS Vc= 27.03 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 3.09 KNS Vc= 27.02 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

1943J 4000X 200X 300 2893J

3N12 H 246. 0.TO 4000

2N12 H 54. 0.TO 4000

000
 3#12

000
 3#12

000
 3#12

000
 3#12

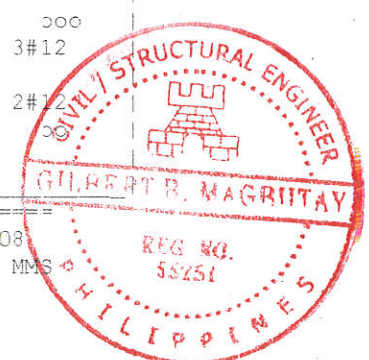
2#12
 00

2#12
 00

2#12
 00

2#12
 00

BEAM NO. 5956 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03
 LEN - 519. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
1	58.	5 - 20MM	0.	519.	YES	YES
2	642.	5 - 20MM	0.	519.	YES	YES

BEAM NO. 5956 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5956 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5956 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2114J 518X 400X 700 2312J

5No20 H 642.	0.TO	519
5No20 H 58.	0.TO	519

00000	00000	00000	00000
5#20	5#20	5#20	5#20
5#20	5#20	5#20	5#20
00000	00000	00000	00000

BEAM NC. 5957 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 519. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
-------	----------------	----------	--------------	------------	-------------------	--

1	58.	6 - 20MM	0.	519.	YES	YES
2	692.	6 - 20MM	0.	519.	YES	YES

BEAM NO. 5957 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5957 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5957 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2121J 518X 400X 750 2319J

6No20 H 692.	0.TO	519
6No20 H 58.	0.TO	519

000000	000000	000000	000000
6#20	6#20	6#20	6#20
6#20	6#20	6#20	6#20
000000	000000	000000	000000

BEAM NC. 5958 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 519. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END	
-------	----------------	----------	--------------	------------	-------------------	--

1	56.	7 - 16MM	0.	519.	YES	YES
2	592.	5 - 20MM	0.	519.	YES	YES



BEAM NO. 5958 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5958 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5958 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2128J

518X 400X 650

2326J

5No20 H 592.	0.TO	519
7No16 H 56.	0.TO	519

00000 5#20	00000 5#20	00000 5#20	00000 5#20
7#16 0000000	7#16 0000000	7#16 0000000	7#16 0000000

BEAM NC. 5959 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 519. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	519.	YES	YES
2	246.	3 - 12MM	0.	519.	YES	YES

BEAM NO. 5959 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 17.92$ KNS $V_c = 24.16$ KNS $V_s = 0.00$ KNS
 $T_u = 0.02$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 17. MM

AT END SUPPORT - $V_u = 17.92$ KNS $V_c = 24.16$ KNS $V_s = 0.00$ KNS
 $T_u = 0.02$ KN-MET $T_c = 0.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 123. MM C/C FOR 17. MM

2135J

518X 200X 300

2333J

3No12 H 246.	0.TO	519
2*10c/c123		2*10c/c123
2No12 H 54.	0.TO	519

000 3#12	000 3#12	000 3#12	000 3#12
2#12 00	2#12 00	2#12 00	2#12 00

BEAM NC. 5960 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 136. MM FY - 230. FC - 10. MPA, SIZE - 250. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	186.	YES	YES
---	-----	----------	----	------	-----	-----



2 242. 3 - 20MM 0. 186. YES YES

BEAM NO. 5960 DESIGN RESULTS - SHEAR

- ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5960 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5960 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2261J 135X 250X 300 2267J

3N20 H 242. 0.TO 186

2N16 H 56. 0.TO 186

000
3#20
2#16
00

000
3#20
2#16
00

000
3#20
2#16
00

000
3#20
2#16
00

BEAM NO. 5962 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 400. MM FY - 230. FC - 12. MPA, SIZE - 400. X 450. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1 54. 2 - 12MM 0. 400. YES YES
 2 396. 2 - 12MM 0. 400. YES YES

BEAM NO. 5962 DESIGN RESULTS - SHEAR

- ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5962 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5962 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2266J 400X 400X 450 2342J

2N12 H 396. 0.TO 400

2N12 H 54. 0.TO 400

00
2#12
2#12
00

00
2#12
2#12
00

00
2#12
2#12
00

00
2#12
2#12
00

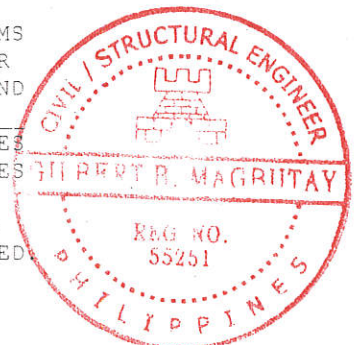
BEAM NO. 5963 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 475. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1 56. 2 - 16MM 0. 475. YES YES
 2 446. 6 - 12MM 0. 475. YES YES

BEAM NO. 5963 DESIGN RESULTS - SHEAR

- ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5963 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5963 IS BEYOND



THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2205J

474X 300X 500

2360J

6N12 H 446. 0.TO 475

2N16 H 36. 0.TO 475

000000

6#12

2#16

00

000000

6#12

2#16

00

000000

6#12

2#16

00

000000

6#12

2#16

00

BEAM NO. 5964 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 475. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	3 - 12MM	0.	475.	YES	YES
2	346.	6 - 12MM	0.	475.	YES	YES

BEAM NO. 5964 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 5964 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 5964 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2233J

474X 350X 400

2374J

6N12 H 346. 0.TO 475

3N12 H 54. 0.TO 475

000000

6#12

3#12

000

000000

6#12

3#12

000

000000

6#12

3#12

000

000000

6#12

3#12

000

BEAM NO. 5976 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
1	54.	3 - 12MM	0.	1900.	YES	YES
2	892.	7 - 20MM	0.	1900.	YES	YES

BEAM NO. 5976 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 97.79 KNS Vc= 181.24 KNS Vs= 0.00 KNS

Tu= 3.70 KN-MET Tc= 9.9 KN-MET Ts= 0.0 KN-MET LOAD

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 58. MM

AT END SUPPORT - Vu= 98.83 KNS Vc= 181.24 KNS Vs= 0.00 KNS

Tu= 3.70 KN-MET Tc= 9.9 KN-MET Ts= 0.0 KN-MET LOAD

NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 58. MM
2265J 1899K 400X 949

7N>20 H 892.	0.TO 1900	
2*10c/c262		2*10c/c262
3N>12 H 54.	0.TO 1900	

00000	00000	00000	00000
7#20	7#20	7#20	7#20
3#12	3#12	3#12	3#12
000	000	000	000

	BEAM NO.	6012	DESIGN RESULTS - FLEXURE PER CODE ACI 318-03			
LEN -	5630. MM	FY -	230.	FC -	12.	MPA, SIZE - 400. X 500. MMS
LEVEL	HEIGHT	BAR INFO		FROM	TO	ANCHOR
	(MM)			(MM)	(MM)	STA END

1	54.	6 - 12MM	0.	5011.	YES	NO
2	444.	5 - 16MM	0.	5680.	YES	YES

BEAM NO. 6012 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 54.73$ KNS $V_c = 106.79$ KNS $V_s = 0.00$ KNS
 $T_u = 0.27$ KN-MET $T_c = 4.7$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

AT END SUPPRT - Vu= 59.36 KNS Vc= 104.24 KNS Vs= 0.00 KNS
Tu= 0.27 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

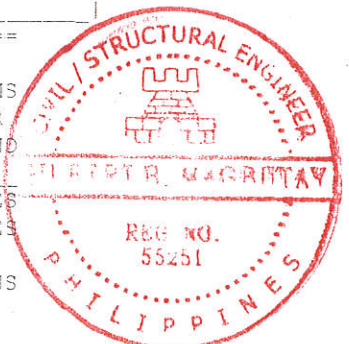
2716J		5630X 400X 500		2717J	
5No16 H 444.	0.TO 5680				
12*10c/c223					12*10c/c223
6No12 H 54.	0.TO 5011				

000000 5#16	00000 5#16	00000 5#16	00000 5#16
6#12 000000	6#12 000000	6#12 000000	

BEAM NO. 6013 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08									
LEN - 3000. MM		FY - 230.		FC - 12.		MPA, SIZE - 300. X 500. MMS			
LEVEL	HEIGHT	BAR INEC		FROM	TO		ANCHOR		
	(MM)			(MM)	(MM)		STA END		
1	100	2	2	0	3000	3000	0	3000	0
2	100	2	2	0	3000	3000	0	3000	0
3	100	2	2	0	3000	3000	0	3000	0
4	100	2	2	0	3000	3000	0	3000	0
5	100	2	2	0	3000	3000	0	3000	0
6	100	2	2	0	3000	3000	0	3000	0
7	100	2	2	0	3000	3000	0	3000	0
8	100	2	2	0	3000	3000	0	3000	0
9	100	2	2	0	3000	3000	0	3000	0
10	100	2	2	0	3000	3000	0	3000	0
11	100	2	2	0	3000	3000	0	3000	0
12	100	2	2	0	3000	3000	0	3000	0
13	100	2	2	0	3000	3000	0	3000	0
14	100	2	2	0	3000	3000	0	3000	0
15	100	2	2	0	3000	3000	0	3000	0
16	100	2	2	0	3000	3000	0	3000	0
17	100	2	2	0	3000	3000	0	3000	0
18	100	2	2	0	3000	3000	0	3000	0
19	100	2	2	0	3000	3000	0	3000	0
20	100	2	2	0	3000	3000	0	3000	0
21	100	2	2	0	3000	3000	0	3000	0
22	100	2	2	0	3000	3000	0	3000	0
23	100	2	2	0	3000	3000	0	3000	0
24	100	2	2	0	3000	3000	0	3000	0
25	100	2	2	0	3000	3000	0	3000	0
26	100	2	2	0	3000	3000	0	3000	0
27	100	2	2	0	3000	3000	0	3000	0
28	100	2	2	0	3000	3000	0	3000	0
29	100	2	2	0	3000	3000	0	3000	0
30	100	2	2	0	3000	3000	0	3000	0
31	100	2	2	0	3000	3000	0	3000	0
32	100	2	2	0	3000	3000	0	3000	0
33	100	2	2	0	3000	3000	0	3000	0
34	100	2	2	0	3000	3000	0	3000	0
35	100	2	2	0	3000	3000	0	3000	0
36	100	2	2	0	3000	3000	0	3000	0
37	100	2	2	0	3000	3000	0	3000	0
38	100	2	2	0	3000	3000	0	3000	0
39	100	2	2	0	3000	3000	0	3000	0
40	100	2	2	0	3000	3000	0	3000	0
41	100	2	2	0	3000	3000	0	3000	0
42	100	2	2	0	3000	3000	0	3000	0
43	100	2	2	0	3000	3000	0	3000	0
44	1								

1	54.	3 - 12MM	0.	3000.	YES	YES
2	444.	2 - 16MM	0.	3000.	YES	YES

BEAM NO. 6013 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 6.44$ KNS $V_c = 75.78$ KNS $V_s = 0.00$ KNS



T₁= 1.38 KN-MET T_c= 3.0 KN-MET T_s= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - V_u= 6.44 KNS V_c= 75.78 KNS V_s= 0.00 KNS
 T₁= 1.38 KN-MET T_c= 3.0 KN-MET T_s= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

2717J 2999X 300X 500 2718J

2N₁₆ H 444. 0.TO 3000

3N₁₂ H 54. 0.TO 3000

oo	oo	oo	oo
2#16	2#16	2#16	2#16
3#12	3#12	3#12	3#12
ooo	ooo	ooo	ooo

BEAM NO. 6014 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 540. MM. FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	2 - 12MM	0.	540.	YES	YES
2	446.	2 - 12MM	0.	540.	YES	YES

B E A M N O. 6014 D E S I G N R E S U L T S - S H E A R
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6014 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6014 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2718J 539X 400X 500 2719J

2N₁₂ H 446. 0.TO 540

2N₁₂ H 54. 0.TO 540

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 6019 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 3200. MM. FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	4 - 12MM	0.	3200.	YES	YES
2	446.	5 - 12MM	0.	1446.	YES	NO
3	442.	2 - 20MM	835.	3200.	NO	YES

B E A M N O. 6019 D E S I G N R E S U L T S - S H E A R
 AT START SUPPCRT - V_u= 6.05 KNS V_c= 100.73 KNS V_s= 0.00 KNS
 T_u= 0.72 KN-MET T_c= 4.7 KN-MET T_s= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.




```
=====
```

5N>12 H 446.	0.TON1446H 442. 835.TO 3200
4N>12 H 54.	0.TO 3200

```
=====
```

00000 5#12 4#12 0000	00000 2#20 4#12 0000	00 2#20 4#12 0000	00 2#20 4#12 0000
-----------------------------------	-----------------------------------	--------------------------------	--------------------------------

2767J 5630X 400X 400 2768J

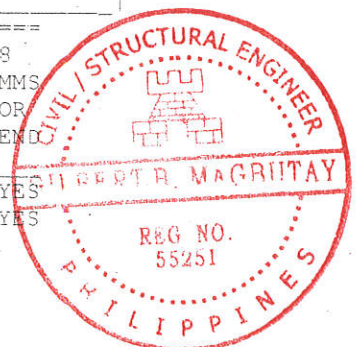
```

=====
6No16 H 344.| 0.TO 5680| | | | | | | | | | | |
16*10c/c173 | | | | | | | | | | | | 16*10c/c173
8No12 H 54.| 0.TO 4544| | | | | | | | | | | |
=====

```

000000 6#16 8#12 00000000	000000 6#16 8#12 00000000	000000 6#16 8#12 00000000	000000 6#16
--	--	--	----------------------------

BEAM NO. 6037 DESIGN RESULTS - SHEAR



AT START SUPPORT - Vu= 31.00 KNS Vc= 53.78 KNS Vs= 0.00 KNS
Tu= 0.56 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

AT END SUPPCRT - Vu= 1.32 KNS Vc= 64.33 KNS Vs= 0.00 KNS

T1= 2.86 KN-MET Tc= 2.6 KN-MET Ts= 3.8 KN-MET LOAD 9

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 144. MM C/C FOR 1158. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.36 SQ. CM.

2768J

2999X 350X 400

2769J

[illegible]

000000 6#12 3#12 000	000000 6#12 3#12 000	000000 6#12 3#12 000	000000 6#12 3#12 000
---------------------------------------	---------------------------------------	---------------------------------------	---------------------------------------

BEAM NO.		6038		DESIGN RESULTS - FLEXURE PER CODE ACI 318-03	
LEN -	540. MM	FY -	230.	FC -	10. MPA, SIZE - 400. X 400. MMS
LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	540.	YES	YES
2	346.	2 - 12MM	0.	540.	YES	YES

BEAM NO. 6038 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6038 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

* LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6038 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2769J

539X 400X 400

2770J

=====

2No12 H 346.	0.TO	540
--------------	------	-----

=====

2No12 H 54.	0.TO	540
-------------	------	-----

=====

2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12

BEAM NO. 6043 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08	
LEN - 3200. MM	FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
LEVEL HEIGHT	BAR INFO FROM TO ANCHOR
(MM)	(MM) (MM) (MM) STA END
1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1	56.	2 - 16MM	0.	3200.	YES	YES
---	-----	----------	----	-------	-----	-----




[illegible]

<p>○○○○○○○</p> <p>7#12</p> <p>2#16</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#16</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#16</p> <p>○○</p>	<p>○○○○○○○</p> <p>7#12</p> <p>2#16</p> <p>○○</p>
--	--	--	--

1	54.	3 - 12MM	0.	540.	YES	YES
2	344.	2 - 16MM	0.	540.	YES	YES

2N016 H 344.	0.TO	540
3N012 H 54.	0.TO	540

2#16 3#12	2#16 3#12	2#16 3#12	2#16 3#12
--------------	--------------	--------------	--------------



PHILIPPINES
STRUCTURAL ENGINEER
R.E.G. NO.
55251
MAGRUTAY

AT START SUPPORT - Vu= 49.00 KNS Vc= 84.33 KNS Vs= 0.00 KNS
Tu= 0.11 KN-MET Tc= 3.3 KN-MET Ts= 0.0 KN-MET LOAD 7

2824J 3200X 400X 400 2825J

LEN -	BEAM NO.	DESIGN RESULTS -	FLEXURE PER CODE	ACI	318-08
8630. MM	FY - 230.	FC - 10.	MPA, SIZE -	400. X	950. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR
(MM)	(MM)	(MM)	(MM)	(MM)	STA END

1	58.	7 - 20MM	0.	8680.	YES	YES
2	896.	8 - 12MM	0.	8680.	YES	YES

AT START SUPPORT - Vu= 92.22 KNS Vc= 235.37 KNS Vs= 0.00 KNS
Tu= 5.47 KN-MET Tc= 10.6 KN-MET Ts= 0.0 KN-MET LOAD 6

2845J 8680X 400X 949 2846J

A circular professional seal for a Civil Structural Engineer in the Philippines. The outer ring contains the text "CIVIL / STRUCTURAL ENGINEER" at the top and "PHILIPPINES" at the bottom, separated by a dotted line. In the center, there is a graphic of a building with a flag on top. Below the graphic, the text "REGISTERED PROFESSIONAL ENGINEER" is written in a semi-circle. At the bottom of the seal, the name "R. MAGRITYAY" and the number "50231" are inscribed.

00000	00000	00000	00000
8#12	8#12	8#12	8#12
7#20	7#20	7#20	7#20
00000	00000	00000	00000

BEAM NO. 6101 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 465. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	3 - 12MM	0.	465.	YES	YES
2	646.	3 - 12MM	0.	465.	YES	YES

BEAM NO. 6101 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6101 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6101 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 2724J 465X 400X 700 2941J

3No12 H 646. 0.TO 465

3No12 H 54. 0.TO 465

000	000	000	000
3#12	3#12	3#12	3#12
3#12	3#12	3#12	3#12
000	000	000	000

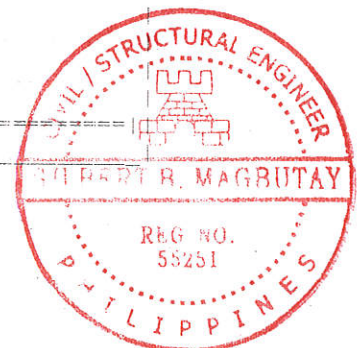
BEAM NO. 6102 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 465. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	2 - 12MM	0.	465.	YES	YES
2	696.	2 - 12MM	0.	465.	YES	YES

BEAM NO. 6102 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6102 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6102 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 2775J 465X 400X 750 2948J

2No12 H 696. 0.TO 465

2No12 H 54. 0.TO 465



00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 6103 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 465. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	465.	YES	YES
2	596.	2 - 12MM	0.	465.	YES	YES

BEAM NO. 6103 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6103 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6103 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2825J 465X 400X 650 2955J

=====

2N012 H 596. 0.TO 465

2N012 H 54. 0.TO 465

=====

00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 6104 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 465. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	465.	YES	YES
2	246.	2 - 12MM	0.	465.	YES	YES

BEAM NO. 6104 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6104 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6104 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2889J 465X 200X 300 2962J

=====

2N012 H 246. 0.TO 465

2N012 H 54. 0.TO 465

=====



00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 6105 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 250. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX POS MOMENT = 47.96 KN-MET, LOADING 7

***MEMBER FAILS IN MAX REINFORCEMENT.

INCREASE MEMBER SIZE.

MAX NEG MOMENT = 52.63 KN-MET, LOADING 13.

1	246.	2 - 12MM	78.	500.	NO	YES
2819J			500X 250X 300			2963J

=====

2No12 H 246. 78.TO 500

	00 2#12	00 2#12	00 2#12
--	------------	------------	------------

=====

BEAM NO. 6106 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	500.	YES	YES
2	892.	7 - 20MM	0.	500.	YES	YES

BEAM NO. 6106 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6106 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6106 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2846J		500X 400X 949		2966J
-------	--	---------------	--	-------

=====

7No20 H 892. 0.TO 500

=====

2No12 H 54. 0.TO 500



ooooo 7#20	ooooo 7#20	ooooo 7#20	ooooo 7#20
2#12 oo	2#12 oo	2#12 oo	2#12 oo

=====

BEAM NO. 6107 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN -	500. MM	FY -	230.	FC -	12.	MPA,	SIZE -	400. X	450. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR				
	(MM)		(MM)	(MM)	STA	END			

1	54.	2 - 12MM	0.	500.	YES	YES
2	396.	2 - 12MM	0.	500.	YES	YES

=====

B E A M N O. 6107 D E S I G N R E S U L T S - S H E A R

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6107 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6107 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

2891J 500X 400X 450 2972J

2No12 H 396.	0.TO	500
2No12 H 54.	0.TO	500

oo 2#12	oo 2#12	oo 2#12	oo 2#12
2#12 oo	2#12 oo	2#12 oo	2#12 oo

=====

BEAM NO. 6108 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN -	500. MM	FY -	230.	FC -	12.	MPA,	SIZE -	200. X	300. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR				
	(MM)		(MM)	(MM)	STA	END			

1	54.	2 - 12MM	0.	500.	YES	YES
2	246.	2 - 12MM	0.	500.	YES	YES

=====

B E A M N O. 6108 D E S I G N R E S U L T S - S H E A R

AT START SUPPORT - $V_u = 0.03$ KNS $V_c = 26.87$ KNS $V_s = 0.00$ KNS

$T_u = 0.78$ KN-MET $T_c = 0.7$ KN-MET $T_s = 1.0$ KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.72 SQ.CM.

AT END SUPPORT - $V_u = 0.03$ KNS $V_c = 26.87$ KNS $V_s = 0.00$ KNS

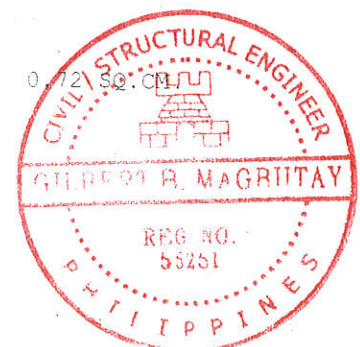
$T_u = 0.78$ KN-MET $T_c = 0.7$ KN-MET $T_s = 1.0$ KN-MET LOAD 2

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.72 SQ.CM.



2895J

500X 200X 300

2975J

=====

2N ϕ 12 H 246. | 0.TO 500

2*10c/c 32 |

2N ϕ 12 H 54. | 0.TO 500

=====

2*10c/c 32

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

oo

2#12

2#12

oo

=====

BEAM NO. 6109 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08.

LEN - 1860. MM FY - 414. FC - 12. MPA. SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	1860.	YES	YES
2	391.	2 - 16MM	0.	1860.	YES	YES

BEAM NO. 6109 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 1.68 KNS Vc= 66.86 KNS Vs= 0.00 KNS

Tu= 0.00 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 31.95 KNS Vc= 64.68 KNS Vs= 0.00 KNS

Tu= 0.00 KN-MET Tc= 2.4 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 197. MM C/C FOR 543. MM

2925J

1859X 300X 450

2926J

=====

2N ϕ 16 H 391. 0.TO 1860

4*12c/c197

2N ϕ 12 H 57. 0.TO 1860

=====

oo

2#16

2#12

oo

oo

2#16

2#12

oo

oo

2#16

2#12

oo

oo

2#16

2#12

oo

=====

BEAM NO. 6110 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 1855. MM FY - 414. FC - 12. MPA. SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	57.	2 - 12MM	0.	1855.	YES	YES
2	391.	2 - 16MM	0.	1855.	YES	YES

BEAM NO. 6110 DESIGN RESULTS - SHEAR

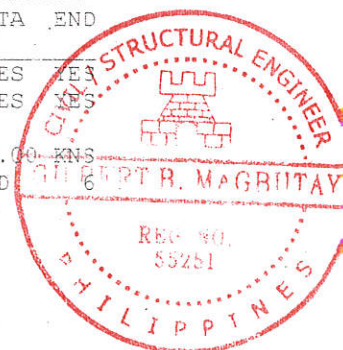
AT START SUPPORT - Vu= 26.13 KNS Vc= 61.20 KNS Vs= 0.00 KNS

Tu= 5.79 KN-MET Tc= 2.2 KN-MET Ts= 7.7 KN-MET LOAD 6

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 143. MM C/C FOR 541. MM



2N016 H 391.	0.TO 1855				
5*12c/c143				5*12c/c143	
2N012 H 57.	0.TO 1855				

00 2#16	00 2#16	00 2#16	00 2#16
2#12 00	2#12 00	2#12 00	2#12 00

BEAM NO. 6111 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03							
LEN -	1860. MM	FY -	414.	FC -	12.	MPA, SIZE -	300. X 450. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR		
	(MM)		(MM)	(MM)	STA. END		
1	1860	414	12	300	450		

1	57.	2 - 12MM	22.	1860.	NO	YES
2	391.	2 - 16MM	0.	1860.	YES	YES

BEAM NO. 6111 DESIGN RESULTS - SHEAR
AT START SUPPRT - Vu= 0.76 KNS Vc= 66.05 KNS Vs= 0.00 KNS
Tu= 0.00 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 35.87 KNS Vc= 67.00 KNS Vs= 0.00 KNS
Tu= 0.00 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

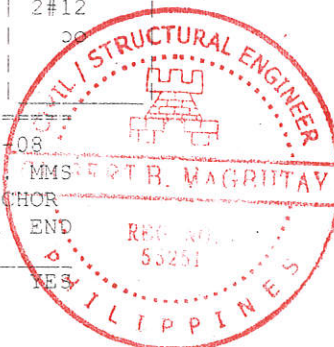
PROVIDE 12 MM 2-LEGGED STIRRUPS AT 197. MM C/C FOR 543. MM

2928J	1859X 300X 450	2929J
2N016 H 391.	0.TO 1860	
2N012 H 57.	22.TO 1860	4*12c/c197

00 2#16	00 2#16	00 2#16	00 2#16
	2#12 00	2#12 00	2#12 00

BEAM NO.	6112	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 1835. MM	FY - 414.	FC - 12. MPA, SIZE - 300. X 450 MMS
LEVEL HEIGHT	BAR INFO	FROM TO ANCHOR
(MM)	(MM)	(MM) STA END

1	57.	2 - 12MM	0.	1855.	YES	YES
---	-----	----------	----	-------	-----	-----



2N012 H 393.	0.TO 1855				
5*12c/c143				5*12c/c143	
2N012 H 57.	0.TO 1855				

00 2#12	00 2#12	00 2#12	00 2#12
00 2#12	00 2#12	00 2#12	00 2#12

1	57.	2 - 12MM	51.	956.	NO	NO
2	391.	2 - 16MM	0.	1860.	YES	YES

=====

2No16 H 391. 0.TO 1860

4*12c/c197

2No12 H 57. 51.TO 956

=====

00 2#16	00 2#16	00 2#16
	00 2#12	
	00	



=====

BEAM NO. 6114 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 1855. MM FY - 414. FC - 10. MPA, SIZE - 300. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	57.	2 - 12MM	0.	1855.	YES	YES	
2	393.	2 - 12MM	0.	1855.	YES	YES	

BEAM NO. 6114 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 3.11 KNS Vc= 55.40 KNS Vs= 0.00 KNS

Tu= 2.98 KN-MET Tc= 1.9 KN-MET Ts= 4.0 KN-MET LOAD 3

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 143. MM C/C FOR 541. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.85 SQ.CM.

AT END SUPPORT - Vu= 0.33 KNS Vc= 55.40 KNS Vs= 0.00 KNS

Tu= 2.98 KN-MET Tc= 1.9 KN-MET Ts= 4.0 KN-MET LOAD 3

STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 12 MM 2-LEGGED STIRRUPS AT 143. MM C/C FOR 541. MM

ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 0.85 SQ.CM.

2932J

1954X 300X 450

2933J

2N12 H 393. | 0.TO 1855 |

5*12c/c143 | | | 5*12c/c143 |

2N12 H 57. | 0.TO 1855 |

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

=====

BEAM NO. 6139 DESIGN RESULTS - FLEXURE PER CODE ACI 318-03

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	3 - 12MM	0.	4000.	YES	YES	
2	646.	6 - 12MM	0.	4000.	YES	YES	

BEAM NO. 6139 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 15.20 KNS Vc= 135.86 KNS Vs= 0.00 KNS

Tu= 0.29 KN-MET Tc= 6.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 15.20 KNS Vc= 135.86 KNS Vs= 0.00 KNS

Tu= 0.29 KN-MET Tc= 6.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

2716J

4000X 400X 700

3483J

6N12 H 646. | 0.TO 4000 |

3N12 H 54. | 0.TO 4000 |



1	54.	3 - 12MM	0.	4000.	YES	YES
2	446.	6 - 12MM	0.	4000.	YES	YES

[illegible]

000000 6#12	000000 6#12	000000 6#12	000000 6#12
3#12 000	3#12 000	3#12 000	3#12 000

1	54.	4 - 12MM	0.	4000.	YES	YES
2	444.	4 - 16MM	0.	4000.	YES	YES

A circular professional seal for Gilbert B. MacRutay, a Civil/Structural Engineer in the Philippines. The seal features a central emblem of a bridge or structure. The text around the top reads "CIVIL / STRUCTURAL ENGINEER" and around the bottom reads "PHILIPPINES". The name "GILBERT B. MACRUTAY" is inscribed across the middle. Below the name, the registration number "REG. NO. 55251" is visible. To the left of the seal, the text "KNS 7" is written.

2718J	4000X 300X 500	3490J
4Nc16IH 444.	0.TO 4000	
8*10c/c223		8*10c/c223
4Nc12IH 54.	0.TO 4000	
0000	0000	0000
4#16	4#16	4#16
4#12	4#12	4#12
0000	0000	0000

BEAM NC. 6142 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	632.	2 - 20MM	0.	4000.	YES	YES

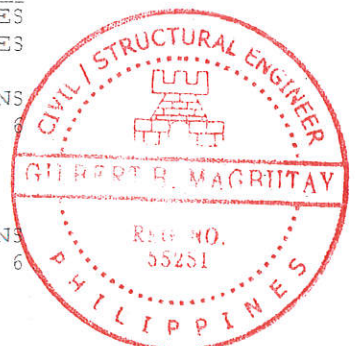
BEAM NO. 6142 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 13.22 KNS Vc= 147.66 KNS Vs= 0.00 KNS
 Tu= 0.32 KN-MET Tc= 7.7 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 13.22 KNS Vc= 147.66 KNS Vs= 0.00 KNS
 Tu= 0.32 KN-MET Tc= 7.7 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

2767J	4000X 400X 750	3492J
2Nc20 H 692.	0.TO 4000	
3Nc12 H 54.	0.TO 4000	
00	00	00
2#20	2#20	2#20
3#12	3#12	3#12
000	000	000

BEAM NC. 6143 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 6143 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 25.08 KNS Vc= 63.63 KNS Vs= 0.00 KNS
 Tu= 0.82 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM
 AT END SUPPORT - Vu= 26.49 KNS Vc= 63.63 KNS Vs= 0.00 KNS
 Tu= 0.82 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6

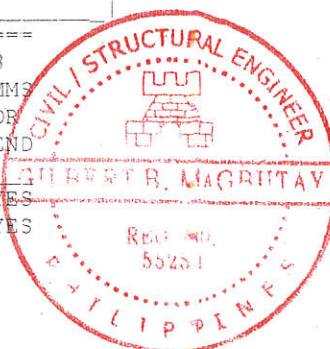


BEAM NO. 6144 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08						
LEN -	4000. MM	FY -	230.	FC -	10.	MPA, SIZE - 350. X 400. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR	
	(MM)		(MM)	(MM)	STA	END
1	54.	5 - 12MM	0.	4000.	YES	YES
2	346.	7 - 12MM	0.	4000.	YES	YES

BEAM NO. 6144 DESIGN RESULTS - SHEAR
AT START SUPPORT - $V_u = 27.75$ KNS $V_c = 63.73$ KNS $V_s = 0.00$ KNS
 $T_u = 1.37$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM
AT END SUPPORT - $V_u = 38.49$ KNS $V_c = 63.78$ KNS $V_s = 0.00$ KNS
 $T_u = 2.03$ KN-MET $T_c = 2.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 7
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1658. MM

BEAM NO. 6145 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08							
LEN -	4000. MM	FY -	230.	FC -	10.	MPA, SIZE -	400. X 650. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO	ANCHOR		
	(MM)		(MM)	(MM)	STA	END	
1	54.	2 - 12MM	0.	4000.	YES	YES	
2	596.	5 - 12MM	0.	4000.	YES	YES	

BEAM NO. 6145 DESIGN RESULTS - SHEAR



AT START SUPPORT - Vu= 8.84 KNS Vc= 123.52 KNS Vs= 0.00 KNS
 Tu= 0.10 KN-MET Tc= 6.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 8.84 KNS Vc= 123.52 KNS Vs= 0.00 KNS
 Tu= 0.10 KN-MET Tc= 6.2 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

2845J

4000X 400X 650

3503J

=====

5No12 H 596. 0.TO 4000

=====

2No12 H 54. 0.TO 4000

=====

00000 5#12	00000 5#12	00000 5#12	00000 5#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 6146 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	4000.	YES	YES
2	246.	2 - 12MM	0.	4000.	YES	YES

BEAM NO. 6146 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 3.10 KNS Vc= 27.81 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.3 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 3.10 KNS Vc= 27.81 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.3 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

2893J

4000X 200X 300

3513J

=====

2No12 H 246. 0.TO 4000

=====

2No12 H 54. 0.TO 4000

=====

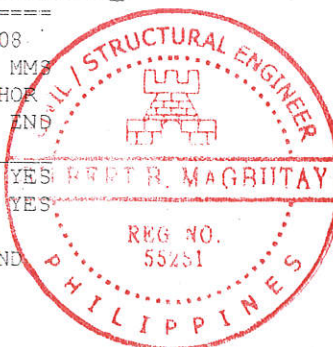
00 2#12	00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00	2#12 00

=====

BEAM NO. 6155 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 558. MM FY - 230. FC - 10. MPA, SIZE - 400. X 650. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	558.	YES	YES
2	596.	4 - 12MM	0.	558.	YES	YES

BEAM NO. 6155 DESIGN RESULTS - SHEAR
 ** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6155 IS BEYOND



THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.
 ** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6155 IS BEYOND
 THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

3365J	558X 400X 650	3442J
4N12 H 536.	0.TO 553	
2N16 H 56.	0.TO 553	
0000 4#12	0000 4#12	0000 4#12
2#16 00	2#16 00	2#16 00

BEAM NO. 6156 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 558. MM FY - 230. FC - 12. MPA. SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	54.	2 - 12MM	0.	558.	YES	YES
2	246.	2 - 12MM	0.	558.	YES	YES

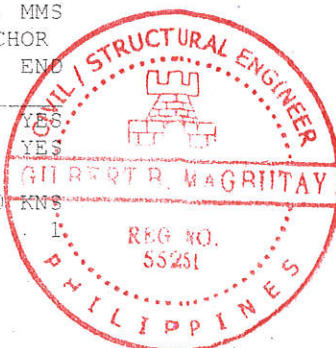
BEAM NO. 6156 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 0.96 KNS Vc= 51.93 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 0.9 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPORT - Vu= 0.96 KNS Vc= 51.93 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 0.9 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

3421J	558X 200X 300	3449J
2N12 H 246.	0.TO 558	
2N12 H 54.	0.TO 558	
00 2#12	00 2#12	00 2#12
2#12 00	2#12 00	2#12 00

BEAM NO. 6161 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1675. MM FY - 230. FC - 12. MPA. SIZE - 400. X 700. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) STA END

1	58.	3 - 20MM	0.	1675.	YES	YES
2	644.	6 - 16MM	0.	1675.	YES	YES

BEAM NO. 6161 DESIGN RESULTS - SHEAR
 AT START SUPPORT - Vu= 84.33 KNS Vc= 170.07 KNS Vs= 0.00 KNS
 Tu= 0.80 KN-MET Tc= 8.0 KN-MET Ts= 0.0 KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 196. MM
 AT END SUPPORT - $V_u = 1.28$ KNS $V_c = 258.22$ KNS $V_s = 0.00$ KNS
 $T_u = 8.35$ KN-MET $T_c = 7.9$ KN-MET $T_s = 11.1$ KN-MET LOAD 6
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 232. MM C/C FOR 196. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 2.74 SQ.CM.
 3247J 1675K 400X 700 3491J

6No16 H 644.	0.TO 1675		
2*10c/c262		2*10c/c232	
3No20 H 58.	0.TO 1675		

000000 6#16	000000 6#16	000000 6#16	000000 6#16.
3#20 000	3#20 000	3#20 000	3#20 000

BEAM NO. 6162 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 1675. MM FY - 230. FC - 10. MPA. SIZE - 400. X 750. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	6 - 16MM	0.	1675.	YES	YES
2	692.	4 - 20MM	0.	1675.	YES	YES

BEAM NO. 6162 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 76.46$ KNS $V_c = 145.08$ KNS $V_s = 0.00$ KNS
 $T_u = 1.72$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM C/C FOR 146. MM
 AT END SUPPORT - $V_u = 76.46$ KNS $V_c = 145.08$ KNS $V_s = 0.00$ KNS
 $T_u = 1.72$ KN-MET $T_c = 7.6$ KN-MET $T_s = 0.0$ KN-MET LOAD 1
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 262. MM. C/C FOR 146. MM
 3306J 1675X 400X 750 3495J

4No20 H 692.	0.TO 1675		
2*10c/c262		2*10c/c262	
6No16 H 56.	0.TO 1675		

0000 4#20	0000 4#20	0000 4#20	0000 4#20
6#16 000000	6#16 000000	6#16 000000	6#16 000000

BEAM NO. 6179 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5630. MM FY - 230. FC - 12. MPA. SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END



1	54.	6 - 12MM	0.	5680.	YES	YES
2	444.	5 - 16MM	0.	5680.	YES	YES

BEAM NO. 6179 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 54.56 KNS Vc= 106.67 KNS Vs= 0.00 KNS
Tu= 0.02 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

AT END SUPPCRT - Vu= 59.53 KNS Vc= 104.03 KNS Vs= 0.00 KNS
Tu= 0.02 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

3488J

5680X 400X 500

3489J

[illegible]

5#16
6#12

5#16
6#12

5#16
6#12

00000
5#16
6#12
00000

BEAM NO. 6180 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS

LEVEL	HEIGHT	BAR INFC	FROM	TO	ANCHOR
	(MM)		(MM)	(MM)	STA END

1	54.	2 - 12MM	0.	3000.	YES	YES
2	446.	4 - 12MM	0.	3000.	YES	YES

BEAM NO. 6180 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 0.53 KNS Vc= 75.87 KNS Vs= 0.00 KNS
Tu= 0.31 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 0.53 KNS Vc= 75.87 KNS Vs= 0.00 KNS
Tu= 0.31 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

3489J

2999X 300X 500

3490J

4N012 H 446. 0.TO 3000
2N012 H 54. 0.TO 3000

4#12
2#12

○○○○
4#12
2#12
○○

4#1.2
2#1.2

4#12
2#12

BEAM NO. 6181 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 5900. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	7 - 12MM	0.	5900.	YES	YES	
2	444.	5 - 16MM	0.	5900.	YES	YES	

BEAM NO. 6181 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 60.05 KNS Vc= 105.64 KNS Vs= 0.00 KNS
 Tu= 0.62 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM

AT END SUPPORT - Vu= 60.81 KNS Vc= 105.26 KNS Vs= 0.00 KNS
 Tu= 0.62 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2508. MM

3490J 5893X 400X 500 3491J

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
5No16 H 444.	0. TO 5900						
13*10c/c223						13*10c/c223	
7No12 H 54.	0. TO 5900						

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
5#16		5#16		5#16		5#16	
7#12		7#12		7#12		7#12	
00000000		00000000		00000000		00000000	

BEAM NO. 6186 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5630. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
1	54.	7 - 12MM	0.	4554.	YES	NO	
2	344.	5 - 16MM	0.	5680.	YES	YES	

BEAM NO. 6186 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 31.26 KNS Vc= 78.23 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM

AT END SUPPORT - Vu= 34.28 KNS Vc= 76.41 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6

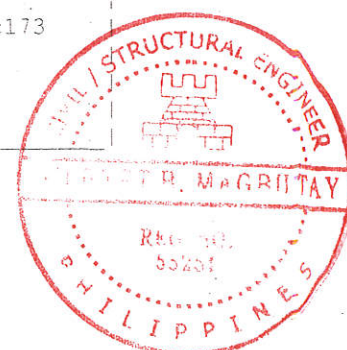
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2498. MM

3492J 5680X 400X 400 3493J

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
5No16 H 344.	0. TO 5680						
16*10c/c173						16*10c/c173	
7No12 H 54.	0. TO 4554						



00000	00000	00000	00000
5#16	5#16	5#16	5#16
7#12	7#12	7#12	
0000000	0000000	0000000	

=====

BEAM NO. 6187 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	2 - 12MM	0.	3000.	YES	YES
2	346.	7 - 12MM	0.	3000.	YES	YES

BEAM NO. 6187 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 30.88 KNS Vc= 62.24 KNS Vs= 0.00 KNS

Tu= 0.60 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

AT END SUPPRT - Vu= 0.29 KNS Vc= 63.59 KNS Vs= 0.00 KNS

Tu= 0.66 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD 1.

STIRRUPS ARE NOT REQUIRED.

3493J

2999X 350X 400

3494J

7No12 H 346.	0.TO 3000			
8*10c/c173				
2No12 H 54.	0.TO 3000			

0000000	0000000	0000000	0000000
7#12	7#12	7#12	7#12
2#12	2#12	2#12	2#12
00	00	00	00

=====

BEAM NO. 6188 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	END
-------	----------------	----------	--------------	------------	---------------	-----

1	54.	8 - 12MM	0.	5900.	YES	YES
2	344.	6 - 16MM	0.	5900.	YES	YES

BEAM NO. 6188 DESIGN RESULTS - SHEAR

AT START SUPPRT - Vu= 33.69 KNS Vc= 78.44 KNS Vs= 0.00 KNS

Tu= 0.46 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

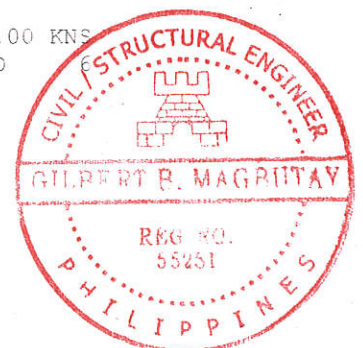
AT END SUPPRT - Vu= 35.46 KNS Vc= 77.29 KNS Vs= 0.00 KNS

Tu= 0.46 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM



3494J

5899X 400X 400

3495J

```

=====
6No16 H 344. | 0.TO 5900 | | | | | | | | | | | | | |
17*10c/c173 | | | | | | | | | | | | | | 17*10c/c173
8No12 H 54. | 0.TO 5900 | | | | | | | | | | | | | |
=====

```

```

000000
6#16

```

```

000000
6#16

```

```

000000
6#16

```

```

000000
6#16

```

```

8#12
00000000

```

```

8#12
00000000

```

```

8#12
00000000

```

```

8#12
00000000

```

```

=====
BEAM NO. 6192 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

```

```

1 54. 8 - 12MM 0. 5900. YES YES
2 344. 6 - 16MM 0. 5900. YES YES

```

```

BEAM NO. 6192 DESIGN RESULTS - SHEAR
AT START SUPPRT - Vu= 32.88 KNS Vc= 80.75 KNS Vs= 0.00 KNS
Tu= 0.95 KN-MET Tc= 3.3 KN-MET Ts= 0.0 KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM
AT END SUPPRT - Vu= 36.28 KNS Vc= 76.59 KNS Vs= 0.00 KNS
Tu= 0.95 KN-MET Tc= 3.3 KN-MET Ts= 0.0 KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.
REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

```

3497J

5899X 400X 400

3498J

```

=====
6No16 H 344. | 0.TO 5900 | | | | | | | | | | | | | |
17*10c/c173 | | | | | | | | | | | | | | 17*10c/c173
8No12 H 54. | 0.TO 5900 | | | | | | | | | | | | | |
=====

```

```

000000
6#16

```

```

000000
6#16

```

```

000000
6#16

```

```

000000
6#16

```

```

8#12
00000000

```

```

8#12
00000000

```

```

8#12
00000000

```

```

8#12
00000000

```

```

=====
BEAM NO. 6200 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
LEN - 8630. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS
LEVEL HEIGHT BAR INFO FROM TO ANCHOR
(MM) (MM) (MM) STA END

```

```

1 58. 7 - 20MM 0. 8680. YES YES
2 892. 6 - 20MM 0. 8680. YES YES

```

```

BEAM NO. 6200 DESIGN RESULTS - SHEAR
AT START SUPPRT - Vu= 117.43 KNS Vc= 243.48 KNS Vs= 0.00 KNS
Tu= 0.84 KN-MET Tc= 10.8 KN-MET Ts= 0.0 KN-MET LOAD
NO STIRRUPS ARE REQUIRED FOR TORSION.

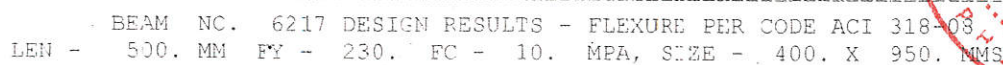
```



○○○○○ 6#20	○○○○○ 6#20	○○○○○ 6#20	○○○○○ 6#20
7#20 ○○○○○	7#20 ○○○○○	7#20 ○○○○○	7#20 ○○○○○

3497J	500X	250X	300	3521J
-------	------	------	-----	-------

<p>oo</p> <p>2#12</p>	<p>oo</p> <p>2#12</p>	<p>oo</p> <p>2#12</p>
<p>2#12</p> <p>oo</p>	<p>2#12</p> <p>oo</p>	<p>2#12</p> <p>oo</p>



LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

1	54.	2 - 12MM	0.	500.	YES YES
2	896.	2 - 12MM	0.	500.	YES YES

BEAM NO. 6217 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6217 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6217 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

3504J 500X 400X 949 3524J

2No12 H 896. 0.TO 500

2No12 H 54. 0.TO 500

oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 6218 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 400. X 450. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

1	54.	2 - 12MM	0.	500.	YES YES
2	396.	2 - 12MM	0.	500.	YES YES

BEAM NO. 6218 DESIGN RESULTS - SHEAR

** LOCATION FOR DESIGN FOR SHEAR AT START OF MEMBER 6218 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

** LOCATION FOR DESIGN FOR SHEAR AT END OF MEMBER 6218 IS BEYOND THE MIDPOINT OF MEMBER. DESIGN FOR SHEAR AND TORSION NOT PERFORMED.

3516J 500X 400X 450 3530J

2No12 H 396. 0.TO 500

2No12 H 54. 0.TO 500

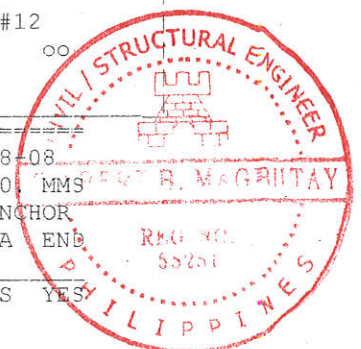
oo	oo	oo	oo
2#12	2#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 6219 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 500. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA END
-------	----------------	----------	--------------	------------	-------------------

1	54.	2 - 12MM	0.	500.	YES YES
---	-----	----------	----	------	---------



2No12 H 246.	0.TO	500	
2*10c/c 32			2*10c/c 32
2No12 H 54.	0.TO	500	

00 2#12	00 2#12	00 2#12	00 2#12
00 2#12	00 2#12	00 2#12	00 2#12

	BEAM NO.	6232	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	4000. MM	FY - 230.	FC - 12.	MPA, SIZE - 400. X 700. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	3 - 12MM	0.	4000.	YES	YES
2	646.	5 - 12MM	0.	2046.	YES	NO
3	646.	5 - 12MM	1788.	4000.	NO	YES

BEAM NO. 6232 DESIGN RESULTS - SHEAR
 AT START SUPPCRT - Vu= 13.66 KNS Vc= 140.90 KNS Vs= 0.00 KNS
 Tu= 0.36 KN-MET Tc= 7.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.
 AT END SUPPCRT - Vu= 13.66 KNS Vc= 140.90 KNS Vs= 0.00 KNS
 Tu= 0.36 KN-MET Tc= 7.1 KN-MET Ts= 0.0 KN-MET LOAD 1
 STIRRUPS ARE NOT REQUIRED.

3488J 4000X 400X 700 3616J

5No12 H 646.	0.TO 2046	5No12 H 646.1788.TO 4000
3No12 H 54.	0.TO 4000	

00000 5#12	00000 5#12	00000 5#12	00000 5#12
3#12 000	3#12 000	3#12 000	3#12 000




BEAM NO. 6233 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 30.42$ KNS $V_c = 75.66$ KNS $V_s = 0.00$ KNS
 $T_u = 0.00$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 AT END SUPPORT - $V_u = 30.98$ KNS $V_c = 75.66$ KNS $V_s = 0.00$ KNS
 $T_u = 0.00$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 1558. MM
 3489J . 4000X 300X 500 3617

0000	0000	0000	0000
4#16	4#16	4#16	4#16
3#12	3#12	3#12	3#12
000	000	000	000

	BEAM NC.	6234	DESIGN RESULTS - FLEXURE PER CODE ACI 318-08					
LEN -	4000. MM	FY -	230.	FC -	12.	MPA, SIZE -	300. X	500. MMS
LEVEL	HEIGHT	BAR INFO		FROM		TO		ANCHOR
	(MM)			(MM)		(MM)		STA END

BEAM NO. 6234 DESIGN RESULTS - SHEAR
 AT START SUPPORT - $V_u = 31.10$ KNS $V_c = 75.55$ KNS $V_s = 0.00$ KNS
 $T_u = 0.09$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM
 AT END SUPPORT - $V_u = 30.30$ KNS $V_c = 75.55$ KNS $V_s = 0.00$ KNS
 $T_u = 0.09$ KN-MET $T_c = 3.0$ KN-MET $T_s = 0.0$ KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 222. MM C/C FOR 1558. MM



00000 5#12	00000 5#12	00000 5#12	00000 5#12
2#16 00	2#16 00	2#16 00	2#16 00

=====

BEAM NO. 6235 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 400. X 700. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	3 - 12MM	0.	4000.	YES	YES	
2	644.	2 - 16MM	0.	1172.	YES	NO	
3	646.	5 - 12MM	1121.	4000.	NO	YES	

BEAM NO. 6235 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 12.57 KNS Vc= 144.91 KNS Vs= 0.00 KNS

Tu= 0.17 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 12.57 KNS Vc= 141.49 KNS Vs= 0.00 KNS

Tu= 0.17 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

3491J 4000X 400X 700 3619J

=====

2No16 H 644. 0.TO 11722 H 646.1121.TO 4000

3No12 H 54. 0.TO 4000

=====

00 2#16	00000 5#12	00000 5#12	00000 5#12
3#12 000	3#12 000	3#12 000	3#12 000

=====

BEAM NO. 6236 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 400. X 750. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	----------------	----------	--------------	------------	--------	-----	-----

1	54.	3 - 12MM	0.	4000.	YES	YES	
2	696.	5 - 12MM	0.	1736.	YES	NO	
3	694.	2 - 16MM	1630.	4000.	NO	YES	

BEAM NO. 6236 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 12.88 KNS Vc= 148.22 KNS Vs= 0.00 KNS

Tu= 0.37 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - Vu= 12.88 KNS Vc= 148.22 KNS Vs= 0.00 KNS

Tu= 0.37 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.



3192J	4000X 400X 750	3620J
5No12 H 696.	0.TO 1736	2No16 H 694.1630.TO 4000
3No12 H 34.	0.TO 4000	
00000 5#12	00000 5#12	00 2#16
3#12 000	3#12 000	3#12 000

BEAM NO. 6237 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	346.	6 - 12MM	0.	1736.	YES	NO
3	346.	6 - 12MM	1764.	4000.	NO	YES

BEAM NO. 6237 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 26.04 KNS Vc= 63.60 KNS Vs= 0.00 KNS
 Tu= 0.68 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
 NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

AT END SUPPRT - Vu= 25.54 KNS Vc= 63.60 KNS Vs= 0.00 KNS
 Tu= 0.68 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

3493J	4000X 350X 400	3621J
6No12 H 346.	0.TO 1736	6No12 H 346.1764.TO 4000
11*10c/c172		11*10c/c172
2No16 H 356.	0.TO 4000	
000000 6#12	000000 6#12	000000 6#12
2#16 00	2#16 00	2#16 00

000000 6#12	000000 6#12	000000 6#12	000000 6#12
2#16 00	2#16 00	2#16 00	2#16 00

BEAM NO. 6238 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 4000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	56.	2 - 16MM	0.	4000.	YES	YES
2	344.	3 - 16MM	0.	2203.	YES	NO
3	342.	2 - 20MM	1496.	4000.	NO	YES

BEAM NO. 6238 DESIGN RESULTS - SHEAR
 AT START SUPPRT - Vu= 25.04 KNS Vc= 63.36 KNS Vs= 0.00 KNS



Tu= 0.42 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6
NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

AT END SUPPCRT - Vu= 26.53 KNS Vc= 63.36 KNS Vs= 0.00 KNS

Tu= 0.42 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 172. MM C/C FOR 1658. MM

3494J 4000X 350X 400 3622J

[illegible]

3#16 2#16	3#16 2#16	2#20 2#16	2#20 2#16
--------------	--------------	--------------	--------------

	BEAM NO.	6239	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	4000. MM	FY - 230.	FC - 10.	MPA, SIZE - 400. X 750. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

1	54.	4 - 12MM	0.	4000.	YES	YES
2	694.	3 - 16MM	0.	1537.	YES	NO
3	696.	5 - 12MM	1098.	4000.	NO	YES

BEAM NO. 6239 DESIGN RESULTS - SHEAR

AT START SUPPCRT - Vu= 23.79 KNS Vc= 148.02 KNS . Vs= 0.00 KNS

Tu= 0.25 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPCRT - $V_u = 23.79$ KNS $V_c = 148.02$ KNS $V_s = 0.00$ KNS

Tu= 0.25 KN-MET Tc= 7.8 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

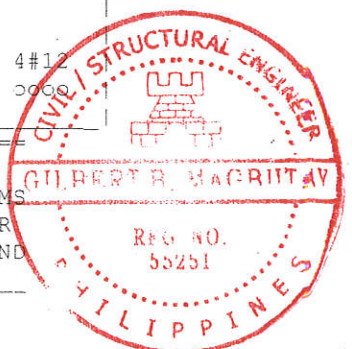
3495J 4000X 400X 750 3623J

3No16 H 694. 0.TO51537 H 696.1098.TO 4000

4No12 H 54. 0.TO 4000

000	0000	00000	0000
3#16	5#12	5#12	5#12
4#12	4#12	4#12	4#12
0000	0000	0000	0000

BEAM NO. 6240 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08									
LEN - 4000. MM		FY - 230.	FC - 10.	MPA, SIZE - 400. X 650. MMS					
LEVEL	HEIGHT	BAR INFO		FROM	TO	ANCHOR			
	(MM)			(MM)	(MM)				STA END
1	100	1	1	0	4000	1	1	1	0
2	200	1	1	0	4000	1	1	1	0
3	300	1	1	0	4000	1	1	1	0
4	400	1	1	0	4000	1	1	1	0
5	500	1	1	0	4000	1	1	1	0
6	600	1	1	0	4000	1	1	1	0
7	700	1	1	0	4000	1	1	1	0
8	800	1	1	0	4000	1	1	1	0
9	900	1	1	0	4000	1	1	1	0
10	1000	1	1	0	4000	1	1	1	0
11	1100	1	1	0	4000	1	1	1	0
12	1200	1	1	0	4000	1	1	1	0
13	1300	1	1	0	4000	1	1	1	0
14	1400	1	1	0	4000	1	1	1	0
15	1500	1	1	0	4000	1	1	1	0
16	1600	1	1	0	4000	1	1	1	0
17	1700	1	1	0	4000	1	1	1	0
18	1800	1	1	0	4000	1	1	1	0
19	1900	1	1	0	4000	1	1	1	0
20	2000	1	1	0	4000	1	1	1	0
21	2100	1	1	0	4000	1	1	1	0
22	2200	1	1	0	4000	1	1	1	0
23	2300	1	1	0	4000	1	1	1	0
24	2400	1	1	0	4000	1	1	1	0
25	2500	1	1	0	4000	1	1	1	0
26	2600	1	1	0	4000	1	1	1	0
27	2700	1	1	0	4000	1	1	1	0
28	2800	1	1	0	4000	1	1	1	0
29	2900	1	1	0	4000	1	1	1	0
30	3000	1	1	0	4000	1	1	1	0
31	3100	1	1	0	4000	1	1	1	0
32	3200	1	1	0	4000	1	1	1	0
33	3300	1	1	0	4000	1	1	1	0
34	3400	1	1	0	4000	1	1	1	0
35	3500	1	1	0	4000	1	1	1	0
36	3600	1	1	0	4000	1	1	1	0
37	3700	1	1	0	4000	1	1	1	0
38	3800	1	1	0	4000	1	1	1	0
39	3900	1	1	0	4000	1	1	1	0
40	4000	1	1	0	4000	1	1	1	0



[illegible]

00000 5#16	00000 5#16	00000 5#16	00000 5#16
6#12 000000	6#12 000000	6#12 000000	6#12 000000

	BEAM NO.	6241	DESIGN RESULTS - FLEXURE PER CODE ACI	318-08
LEN -	4000. MM	FY - 230.	FC - 10.	MPA, SIZE - 400. X 650. MMS
LEVEL	HEIGHT	BAR INFO	FROM	TO ANCHOR
	(MM)		(MM)	(MM) STA END

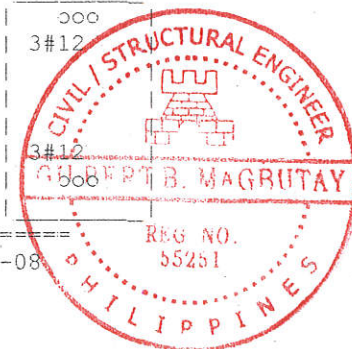
1	54.	3 - 12MM	0.	4000.	YES	YES
2	596.	5 - 12MM	0.	1413.	YES	NO
3	596.	3 - 12MM	1753.	4000.	NO	YES

B E A M N O. 6241 D E S I G N R E S U L T S - S H E A R									
AT START SUPPORT -		Vu=	8.76 KNS	Vc=	123.39 KNS	Vs=	0.00 KNS		
Tu=	0.19 KN-MET	Tc=	6.2 KN-MET	Ts=	0.0 KN-MET	LOAD	1		
STIRRUPS ARE NOT REQUIRED.									
AT END SUPPORT -		Vu=	8.76 KNS	Vc=	123.39 KNS	Vs=	0.00 KNS		
Tu=	0.19 KN-MET	Tc=	6.2 KN-MET	Ts=	0.0 KN-MET	LOAD	1		
STIRRUPS ARE NOT REQUIRED.									

3503J	4000X 400X 650	3629J
5No12 H 596. 0.TO 1413	3No12 H 596.1753.TO 4000	
3No12 H 54. 0.TO 4000		

00000 5#12	00000 5#12	000 3#12	000 3#12
3#12 000	3#12 000	3#12 000	3#12 000

BEAM NO. 6242 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	4000.	YES YES
2	246.	3 - 12MM	0.	1957.	YES NO
3	246.	2 - 12MM	1876.	4000.	NO YES

BEAM NO. 6242 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 3.04 KNS Vc= 27.38 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 3.04 KNS Vc= 27.38 KNS Vs= 0.00 KNS
 Tu= 0.01 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

3514J 4000X 200X 300 3636J

3No12 H 246. 0.TO 1957 2No12 H 246.1876.TO 4000

2No12 H 54. 0.TO 4000

ooo	ooo	oo	oo
3#12	3#12	2#12	2#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 6243 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 4000. MM FY - 230. FC - 12. MPA, SIZE - 200. X 300. MMS
 LEVEL HEIGHT BAR INFC FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	4000.	YES YES
2	246.	3 - 12MM	0.	4000.	YES YES

BEAM NO. 6243 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 3.21 KNS Vc= 27.51 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 3.21 KNS Vc= 27.51 KNS Vs= 0.00 KNS
 Tu= 0.06 KN-MET Tc= 0.7 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

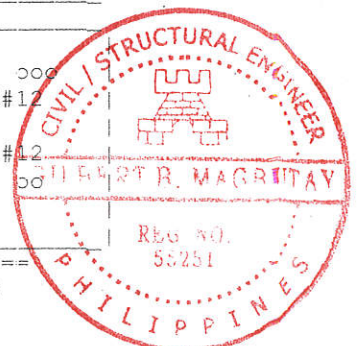
3518J 4000X 200X 300 3640J

3No12 H 246. 0.TO 4000

2No12 H 54. 0.TO 4000

ooo	ooo	ooo	ooo
3#12	3#12	3#12	3#12
2#12	2#12	2#12	2#12
oo	oo	oo	oo

BEAM NO. 6264 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08



LEN - 5630. MM FY - 230. FC - 12. MPA, SIZE - 400. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	6 - 12MM	0.	5680.	YES	YES
2	444.	5 - 16MM	0.	5680.	YES	YES

BEAM NO. 6264 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 55.17 KNS Vc= 101.09 KNS Vs= 0.00 KNS
 Tu= 0.45 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

AT END SUPPORT - Vu= 58.92 KNS Vc= 101.09 KNS Vs= 0.00 KNS
 Tu= 0.45 KN-MET Tc= 4.7 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 223. MM C/C FOR 2398. MM

3616J 5680X 400X 500 3617J

5No16 H 444.	0.TO 5680																		
12*10c/c223																			12*10c/c223
6No12 H 54.	0.TO 5680																		

00000 5#16	00000 5#16	00000 5#16	00000 5#16
6#12 000000	6#12 000000	6#12 000000	6#12 000000

BEAM NO. 6265 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3000. MM FY - 230. FC - 12. MPA, SIZE - 300. X 500. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

1	54.	2 - 12MM	0.	3000.	YES	YES
2	444.	2 - 16MM	0.	3000.	YES	YES

BEAM NO. 6265 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 0.34 KNS Vc= 75.96 KNS Vs= 0.00 KNS
 Tu= 0.86 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

AT END SUPPORT - Vu= 0.34 KNS Vc= 75.96 KNS Vs= 0.00 KNS
 Tu= 0.86 KN-MET Tc= 3.0 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

3617J 2999X 300X 500 3618J

2No16 H 444.	0.TO 3000																		
2No12 H 54.	0.TO 3000																		



[illegible]

○○○○○○ 6#16	○○○○○○ 6#16	○○○○○○ 6#16	○○○○○○ 6#16
7#12 ○○○○○○	7#12 ○○○○○○	7#12 ○○○○○○	

A circular red ink seal of a Professional Engineer in the Philippines. The outer ring contains the text "CIVIL / STRUCTURAL ENGINEER" at the top and "PHILIPPINES" at the bottom, separated by a dotted line. In the center is a graphic of a castle or fort. Below the graphic, the name "CARLOS R. MAGNITAY" is stamped. At the bottom of the seal, "REG. NO. 55251" is stamped. The seal is partially obscured by a horizontal line and the text "KNS 3" appears to the left of the seal.

3620J	5680X 400X 400	3621J
=====		
6N16 H 344. 6N0.TOH1483.1120.TO 5680		16*10c/c173
16*10c/c173		
8N12 H 54. 0.TO 4544		
=====		
000000	000000	000000
6#16	6#16	6#16
8#12	8#12	8#12
00000000	00000000	00000000

=====

BEAM NO. 6272 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 3000. MM FY - 230. FC - 10. MPA, SIZE - 350. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	54.	2 - 12MM	0.	3000.	YES	YES	
2	346.	6 - 12MM	0.	3000.	YES	YES	

BEAM NO. 6272 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 27.90 KNS Vc= 64.63 KNS Vs= 0.00 KNS

Tu= 1.23 KN-MET Tc= 2.6 KN-MET Ts= 0.0 KN-MET LOAD 7

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 1158. MM

AT END SUPPORT - Vu= 0.35 KNS Vc= 63.67 KNS Vs= 0.00 KNS

Tu= 0.12 KN-MET Tc= 2.5 KN-MET Ts= 0.0 KN-MET LOAD 1

STIRRUPS ARE NOT REQUIRED.

3621J	2999X 350X 400	3622J
=====		
6N12 H 346. 0.TO 3000		
8*10c/c173		
2N12 H 54. 0.TO 3000		
=====		
000000	000000	000000
6#12	6#12	6#12
2#12	2#12	2#12
00	00	00

=====

BEAM NO. 6273 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08

LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR	STA	END
-------	-------------	----------	-----------	---------	--------	-----	-----

1	54.	8 - 12MM	0.	4709.	YES	NO	
2	342.	4 - 20MM	0.	1654.	YES	NO	
3	344.	6 - 16MM	2168.	5900.	NO	YES	

BEAM NO. 6273 DESIGN RESULTS - SHEAR

AT START SUPPORT - Vu= 34.07 KNS Vc= 74.00 KNS Vs= 0.00 KNS

Tu= 0.39 KN-MET Tc= 3.2 KN-MET Ts= 0.0 KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.



REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

AT END SUPPCRT - $V_u = 33.69$ KNS $V_c = 74.00$ KNS $V_s = 0.00$ KNS

$T_u = 0.39$ KN-MET $T_c = 3.2$ KN-MET $T_s = 0.0$ KN-MET LOAD 3

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

3622J

5899X 400X 400

3623J

```

=====
4No20 H 342. | 0.TO 1654 6No16 H 344.2168.TO15900 | | | | |
17*10c/c173 | | | | | | | | | | | 17*10c/c173
8No12 H 54. | 0.TO 4709 | | | | | | | | |
=====

```

<pre> 0000 4#20 8#12 00000000 </pre>	<pre> 8#12 00000000 </pre>	<pre> 000000 6#16 8#12 00000000 </pre>	<pre> 000000 6#16 </pre>
--------------------------------------	----------------------------	--	--------------------------

BEAM NC. 6277 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 5900. MM FY - 230. FC - 10. MPA, SIZE - 400. X 400. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR
 (MM) (MM) (MM) STA END

LEVEL	HEIGHT (MM)	BAR INFO	FROM (MM)	TO (MM)	ANCHOR STA	ANCHOR END
1	54.	8 - 12MM	0.	5208.	YES	NO
2	344.	5 - 16MM	0.	1534.	YES	NO
3	342.	3 - 20MM	2015.	5900.	NO	YES

BEAM NO. 6277 DESIGN RESULTS - SHEAR

AT START SUPPORT - $V_u = 34.96$ KNS $V_c = 76.93$ KNS $V_s = 0.00$ KNS

$T_u = 0.18$ KN-MET $T_c = 3.3$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

AT END SUPPCRT - $V_u = 34.19$ KNS $V_c = 77.64$ KNS $V_s = 0.00$ KNS

$T_u = 0.18$ KN-MET $T_c = 3.3$ KN-MET $T_s = 0.0$ KN-MET LOAD 6

NO STIRRUPS ARE REQUIRED FOR TORSION.

REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.

PROVIDE 10 MM 2-LEGGED STIRRUPS AT 173. MM C/C FOR 2608. MM

3625J

5899X 400X 400

3626J

```

=====
5No16 H 344. | 0.TO 15343No20 H 342.2015.TO 5900 | | | | |
17*10c/c173 | | | | | | | | | | | 17*10c/c173
8No12 H 54. | 0.TO 5208 | | | | | | | | |
=====

```

<pre> 00000 5#16 8#12 00000000 </pre>	<pre> 8#12 00000000 </pre>	<pre> 000 3#20 8#12 00000000 </pre>	<pre> 000 3#20 </pre>
---------------------------------------	----------------------------	-------------------------------------	-----------------------

BEAM NC. 6282 DESIGN RESULTS - FLEXURE PER CODE ACI 318-08
 LEN - 8630. MM FY - 230. FC - 10. MPA, SIZE - 400. X 950. MMS
 LEVEL HEIGHT BAR INFO FROM TO ANCHOR



PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.16 SQ.CM.
 AT END SUPPRT - $V_u = 0.67$ KNS $V_c = 27.93$ KNS $V_s = 0.00$ KNS
 $T_u = 1.27$ KN-MET $T_c = 0.8$ KN-MET $T_s = 1.7$ KN-MET LOAD 14
 STIRRUPS ARE REQUIRED FOR TORSION.
 REINFORCEMENT FOR SHEAR IS PER CL.11.5.5.1.
 PROVIDE 10 MM 2-LEGGED STIRRUPS AT 82. MM C/C FOR 8. MM
 ADDITIONAL LONGITUDINAL STEEL REQD. FOR TORSIONAL RESISTANCE = 1.16 SQ.CM.
 3875J 500X 200X 300 4905J

2N ϕ 12 H 246. 0.TO 500		
2*10c/c 32		2*10c/c 32
2N ϕ 12 H 54. 0.TO 500		

oo 2#12	oo 2#12	oo 2#12	oo 2#12
2#12 oo	2#12 oo	2#12 oo	2#12 oo

*****END OF BEAM DESIGN*****

4354. DESIGN COLUMN 1 2 4 5 7 TO 20 78 TO 91 121 TO 134 184 185 187 188 191 TO 194 -
 4355. 198 TO 201 205 TO 208 225 226 228 TO 233 237 TO 240 244 TO 247 264 265 267 -
 4356. 268 275 TC 278 282 TO 285 289 TO 292 295 296 300 301 318 TO 321 325 TO 328 -
 4357. 332 333 335 336 353 354 356 357 375 TO 378 382 TO 385 411 TO 414 438 439 -
 4358. 472 TO 475 503 TO 505 526 558 559 578 579 585 586 700 TO 709 722 TO 724 732 -
 4359. 740 TO 742 751 753 767 768 772 774 776 1076 5841 TO 5843 5855 5858 TO 5860 -
 4360. 5873 5876 5877 5893 5896 5916 5996 5997 6002 6003 6020 6021 6026 6027 6044 -
 4361. 6045 6050 6066 6070 6094 6175 TO 6178 6182 TO 6185 6189 TO 6191 6193 TO 6195 -
 4362. 6201 6209 6211 6213 6260 TO 6263 6267 TO 6270 6274 TO 6276 6278 6279 6283 -
 4363. 6284 6288 6290 6292 6350 TO 6363 6420 TO 6433 6489 TO 6509 6528 TO 6538 6556 -
 4364. 6557 TO 6576 6595 6596

=====

COLUMN NC. 1 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 2550.0 SQ. MM

=====

COLUMN NC. 2 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 2637.5 SQ. MM

=====

COLUMN NC. 4 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 3118.7 SQ. MM

=====

COLUMN NC. 5 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 3075.0 SQ. MM

=====

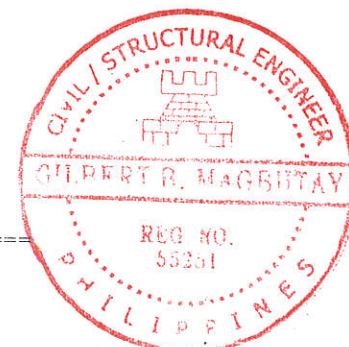
COLUMN NC. 7 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NC. 8 DESIGN PER ACI 318-08 -- AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 9 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 10 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 11 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 12 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 13 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

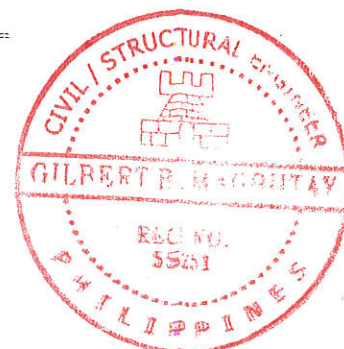
AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 14 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				



=====

COLUMN NO. 15 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 16 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 17 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 18 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 19 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 20 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 78 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI



3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 79 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 80 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 81 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 82 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 83 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

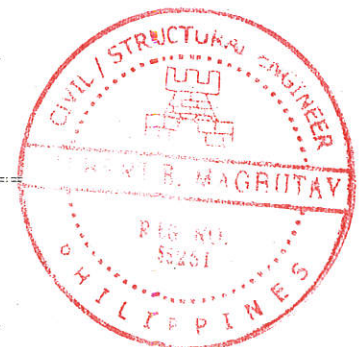
COLUMN NO. 84 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 85 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 86 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 87 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 88 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 89 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 90 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

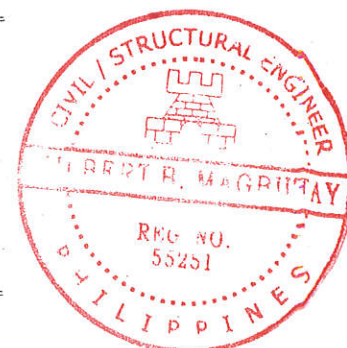
AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 91 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====



COLUMN NO. 121 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 963.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

4 - 20 MM 1.396 13 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 122 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 123 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 12 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 124 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 125 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 12 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 126 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 127 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 12 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 128 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 129 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 130 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 131 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 132 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 133 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 963.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 20 MM	1.396	10	END	0.650

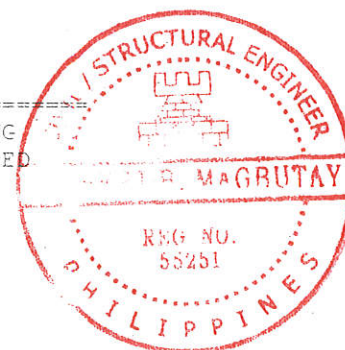
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 134 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



3 - 12 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 184 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 3250.0 SQ. MM

=====

COLUMN NO. 185 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.
 AREA OF STEEL REQUIRED = 3337.5 SQ. MM

=====

COLUMN NO. 187 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1456.2 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 2.574 7 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 250.00 MM

=====

COLUMN NO. 188 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1806.2 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 20 MM 4.021 10 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 250.00 MM

=====

COLUMN NO. 191 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 192 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 193 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

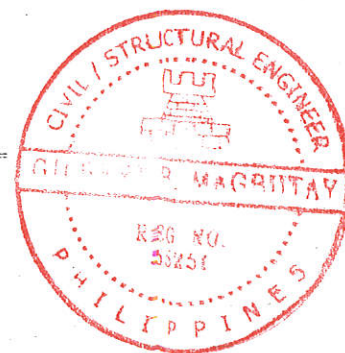
20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 194 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 198 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 199 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 200 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 201 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 205 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 206 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 207 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 12 MM	1.005	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				
=====				
COLUMN NO. 208 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED				
ONLY MINIMUM STEEL IS REQUIRED.				
AREA OF STEEL REQUIRED = 900.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 12 MM	1.005	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				
=====				
COLUMN NO. 225 DESIGN PER ACI 318-03 - AXIAL + BENDING				
*** NO PROPER BAR ARRANGEMENT IS POSSIBLE.				
AREA OF STEEL REQUIRED = 3906.2 SQ. MM				
=====				
COLUMN NO. 226 DESIGN PER ACI 318-03 - AXIAL + BENDING				
*** NO PROPER BAR ARRANGEMENT IS POSSIBLE.				
AREA OF STEEL REQUIRED = 3950.0 SQ. MM				
=====				
COLUMN NO. 228 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED				
AREA OF STEEL REQUIRED = 1062.5 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 20 MM	2.011	14	STA	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 250.00 MM				
=====				
COLUMN NO. 229 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED				
AREA OF STEEL REQUIRED = 1237.5 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
12 - 12 MM	2.171	10	STA	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				
=====				
COLUMN NO. 230 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED				
ONLY MINIMUM STEEL IS REQUIRED.				
AREA OF STEEL REQUIRED = 2025.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				
=====				
COLUMN NO. 231 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED				
ONLY MINIMUM STEEL IS REQUIRED.				
AREA OF STEEL REQUIRED = 2025.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				
=====				
COLUMN NO. 232 DESIGN PER ACI 318-03 - AXIAL + BENDING				
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED				
ONLY MINIMUM STEEL IS REQUIRED.				
AREA OF STEEL REQUIRED = 2025.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI



 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 233 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 237 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 238 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 239 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 240 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

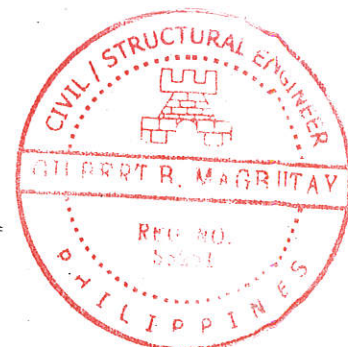
 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 244 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1278.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 12 - 12 MM 1.508 2 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 245 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 246 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 247 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED

AREA OF STEEL REQUIRED = 1152.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 4 - 20 MM 1.396 12 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 264 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.

AREA OF STEEL REQUIRED = 3687.5 SQ. MM
 =====

COLUMN NO. 265 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.

AREA OF STEEL REQUIRED = 3556.2 SQ. MM
 =====

COLUMN NO. 267 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1325.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 12 - 12 MM 2.171 9 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 268 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1193.7 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 4 - 20 MM 2.011 9 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 250.00 MM
 =====

COLUMN NO. 275 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 276 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI



 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 277 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 278 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

 20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 282 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 283 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 284 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 285 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1712.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
16 - 12 MM	1.131	7	END	0.650

 16 - 12 MM 1.131 7 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 289 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1152.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 20 MM	1.396	2	STA	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 290 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.003	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 291 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.003	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 292 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1152.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

4 - 20 MM	1.396	10	STA	0.650
-----------	-------	----	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 295 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.

AREA OF STEEL REQUIRED = 2987.5 SQ. MM

=====

COLUMN NO. 296 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2331.2 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 20 MM	4.021	10	END	0.650
-----------	-------	----	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 250.00 MM

=====

COLUMN NO. 300 DESIGN PER ACI 318-03 - AXIAL + BENDING
 *** NO PROPER BAR ARRANGEMENT IS POSSIBLE.

AREA OF STEEL REQUIRED = 2637.5 SQ. MM

=====

COLUMN NO. 301 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1762.5 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 20 MM	4.021	7	STA	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 250.00 MM

=====

COLUMN NO. 318 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 319 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 320 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 321 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 325 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 326 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 327 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 328 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 332 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1593.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.787 7 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 333 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1971.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

12 - 16 MM 2.681 10 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 335 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 336 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 12 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 353 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 625.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

4 - 16 MM 1.287 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 250.00 MM

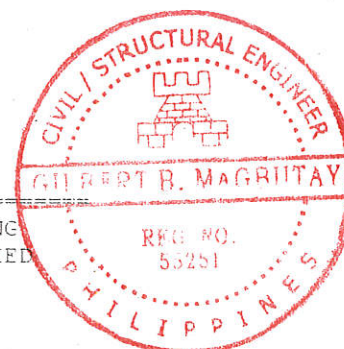
=====

COLUMN NO. 354 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 625.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

4 - 16 MM 1.287 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 250.00 MM

=====

COLUMN NO. 356 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED



AREA OF STEEL REQUIRED = 2418.7 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
3 - 20 MM	4.021	9	STA	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 250.00 MM

COLUMN NO. 357 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 250.0 X 250.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 625.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
4 - 16 MM	1.287	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 250.00 MM

COLUMN NO. 375 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 376 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 377 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 378 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 382 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2048.0 SQ. MM

BAR CONFIGURATION	REINF. PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.414	2	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 383 DESIGN PER ACI 318-08 - AXIAL + BENDING



FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 384 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 385 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 411 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 412 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 12 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 413 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

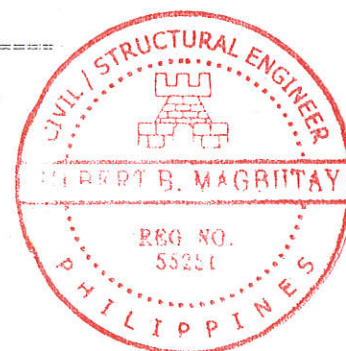
COLUMN NO. 414 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 438 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 439 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 12 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 472 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 473 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 474 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 475 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 503 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA CF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 504 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 505 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 526 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 558 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 559 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 255.00 MM
 =====

COLUMN NO. 578 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 12 MM	1.005	1	END	0.650

 3 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 579 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED





ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 585 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.
AREA OF STEEL REQUIRED = 1215.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
4 - 20 MM	1.395	13	STA	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 586 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 12 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 700 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.
AREA OF STEEL REQUIRED = 2592.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
24 - 12 MM	1.340	1	STA	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 701 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 702 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 703 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 704 DESIGN PER ACI 318-03 - AXIAL + BENDING



FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 705 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 706 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 707 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 708 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 709 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 722 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 723 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 724 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 732 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 740 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 741 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 742 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

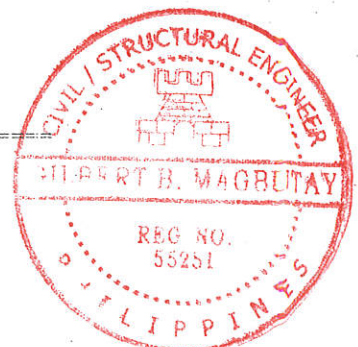
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 751 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 753 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 767 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 3392.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 12 - 20 MM 2.356 10 STA 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 768 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 772 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 774 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

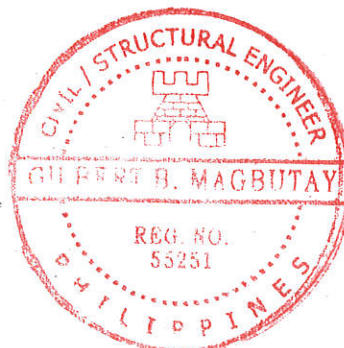
COLUMN NO. 776 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 1076 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 AREA OF STEEL REQUIRED = 3209.3 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
15 - 16 MM	1.589	2	STA	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 5841 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 5842 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 5843 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 5855 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1936.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

20 - 12 MM	1.414	11	STA	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 5858 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 5859 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 5860 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED



AREA OF STEEL REQUIRED = 1936.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.414 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5873 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2720.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 16 - 16 MM 2.011 9 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5876 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5877 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2384.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

12 - 16 MM 1.508 9 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5893 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1824.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.414 9 STA 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5896 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5916 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5996 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5997 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 6002 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 6003 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 6020 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6021 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

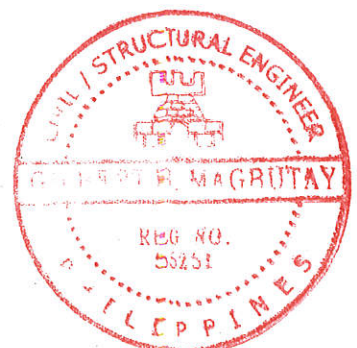
AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6026 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====



COLUMN NO. 6027 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6044 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6045 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6050 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6066 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

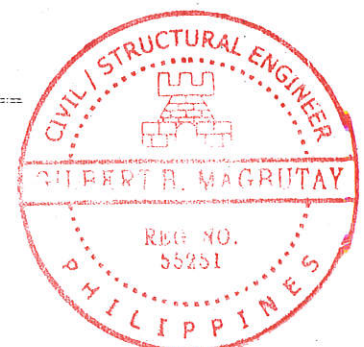
3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6070 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6094 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6175 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6176 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6177 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6178 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6182 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6183 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

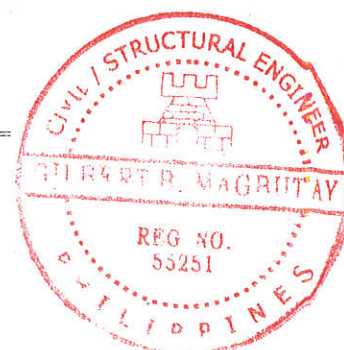
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6184 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.650
=====				
COLUMN NO. 6185 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED AREA CF STEEL REQUIRED = 2048.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 192.00 MM	1.414	13	END	0.900
=====				
COLUMN NO. 6189 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA CF STEEL REQUIRED = 1600.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.650
=====				
COLUMN NO. 6190 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA CF STEEL REQUIRED = 1600.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.650
=====				
COLUMN NO. 6191 DESIGN PER ACI 318-03 - AXIAL + BENDIN FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED AREA CF STEEL REQUIRED = 2272.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
12 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.508	13	END	0.900
=====				
COLUMN NO. 6193 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA CF STEEL REQUIRED = 1600.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.650
=====				
COLUMN NO. 6194 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED AREA CF STEEL REQUIRED = 1936.0 SQ. MM				
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 192.00 MM	1.414	13	STA	0.900
=====				
COLUMN NO. 6195 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA CF STEEL REQUIRED = 1600.0 SQ. MM				



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 6201 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2720.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
16 - 16 MM	2.011	10	STA	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 6209 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 6211 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 6213 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

=====

COLUMN NO. 6260 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 6261 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

=====

COLUMN NO. 6262 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6263 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6267 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

COLUMN NO. 6268 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

COLUMN NO. 6269 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

COLUMN NO. 6270 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

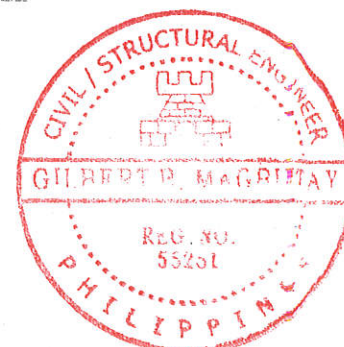
AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				

COLUMN NO. 6274 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				



=====

COLUMN NO. 6275 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6276 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6278 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6279 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6283 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1936.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.414 10 STA 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6284 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

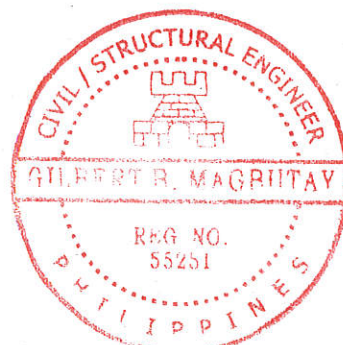
=====

COLUMN NO. 6288 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6290 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6292 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6350 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2166.8 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	2	STA	0.900

20 - 12 MM 1.117 2 STA 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6351 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

20 - 12 MM 1.117 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6352 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900

20 - 12 MM 1.117 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6353 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650

20 - 12 MM 1.117 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6354 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6355 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6356 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6357 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6358 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6359 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

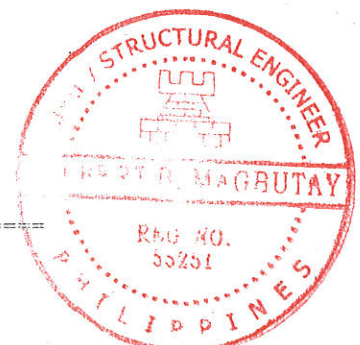
20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6360 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6361 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

20 - 12 MM	1.117	1	END	0.650
------------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6362 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

20 - 12 MM	1.117	1	END	0.900
------------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6363 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

20 - 12 MM	1.117	1	END	0.650
------------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6420 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6421 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6422 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6423 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM



=====

COLUMN NO. 6424 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6425 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6426 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6427 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6428 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6429 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

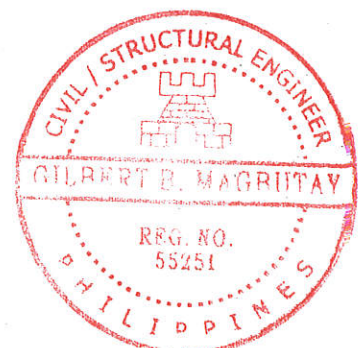
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6430 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI



3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6431 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6432 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6433 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6489 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6490 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6491 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6492 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6493 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6494 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6495 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6496 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6497 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6498 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====



COLUMN NO. 6499 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6500 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6501 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6502 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6503 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6504 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

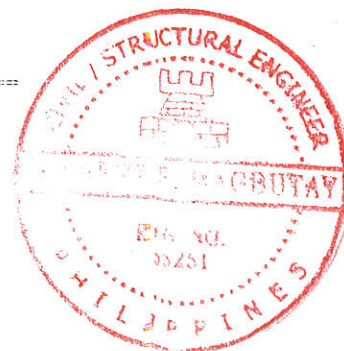
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6505 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6506 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6507 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6508 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6509 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6528 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6529 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

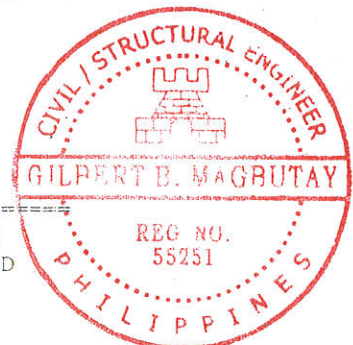
BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6530 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6531 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6532 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6533 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6534 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6535 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6536 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

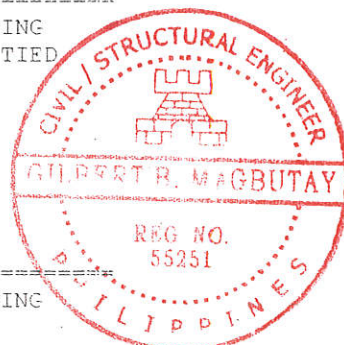
AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6537 DESIGN PER ACI 318-03 - AXIAL + BENDING



FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6538 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6556 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6557 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
AREA OF STEEL REQUIRED = 1712.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
16 - 12 MM	1.131	9	STA	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 6558 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6559 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

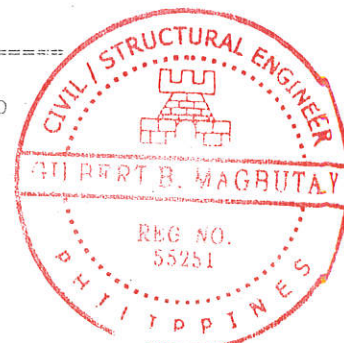
COLUMN NO. 6560 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM



=====

COLUMN NO. 6561 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6562 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6563 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6564 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6565 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6566 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

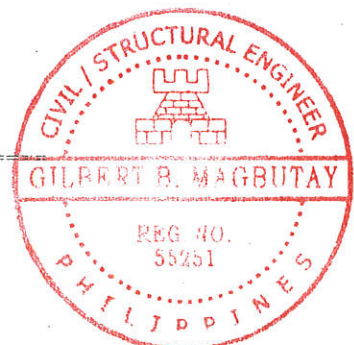
=====

COLUMN NO. 6567 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

=====



8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6568 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6569 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6570 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6571 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6572 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

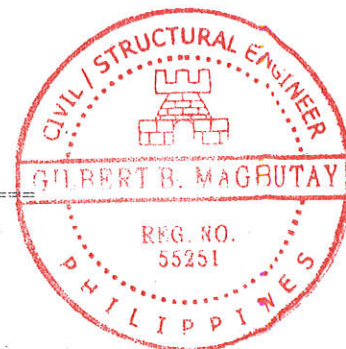
COLUMN NO. 6573 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6574 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6575 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6576 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6595 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6596 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

*****END OF COLUMN DESIGN RESULTS*****
 4365. DESIGN COLUMN 337 338
 =====

COLUMN NO. 337 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 12 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 338 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 12 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 192.00 MM

*****END OF COLUMN DESIGN RESULTS*****

4366. DESIGN COLUMN 415 TO 418 420 TO 437 440 441 476 TO 485 506 TO 525 527 TO 529 -
 4367. 560 TO 563 754 764 769 TO 771 773 775 777 778 1077 1078 5844 TO 5847 5856 -
 4368. 5857 5861 TO 5864 5874 5875 5878 TO 5881 5397 5900 5905 5908 5911 5914 5998 -
 4369. 5999 TO 6001 6004 TO 6011 6022 TO 6025 6023 TO 6035 6046 TO 6049 6051 TO 6058 -
 4370. 6071 6075 6080 6084 6089 6093 6196 TO 6199 6202 TO 6208 6210 6212 6214 6215 -
 4371. 6280 6281 6285 TO 6287 6289 6291 6293 6294 6597 TO 6600

=====

COLUMN NO. 415 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 416 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 417 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 418 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 420 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 421 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED

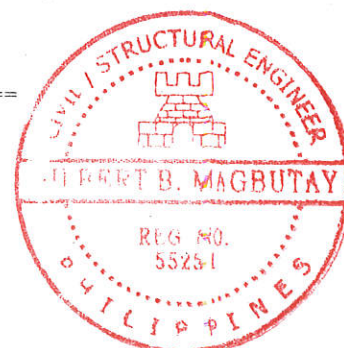
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 422 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 423 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 424 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 425 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.900
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 426 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 16 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 427 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

8 - 12 MM	1.005	1	END	0.650
-----------	-------	---	-----	-------

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

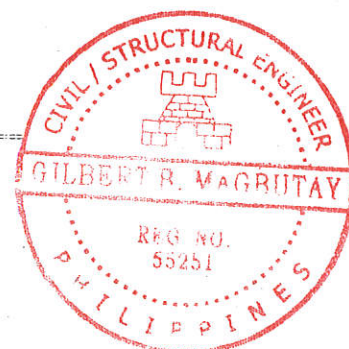
TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 428 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



3 - 16 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 429 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 430 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM 1.003 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 431 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 12 MM 1.003 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 432 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 433 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

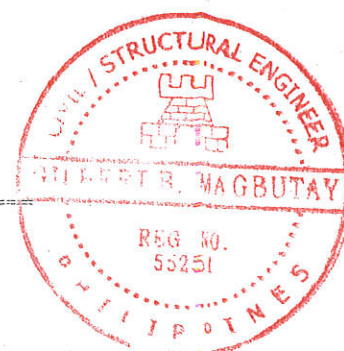
COLUMN NO. 434 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----

3 - 16 MM 1.003 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 435 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 300.0 X 300.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 900.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 12 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 436 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 437 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 440 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 441 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 11.6 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 476 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 477 DESIGN PER ACI 318-08 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SCRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM



=====

COLUMN NO. 478 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 479 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 480 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 481 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 482 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 483 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 484 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

=====



3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 485 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 506 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 507 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 508 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 509 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 510 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 511 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 512 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 513 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 514 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 515 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

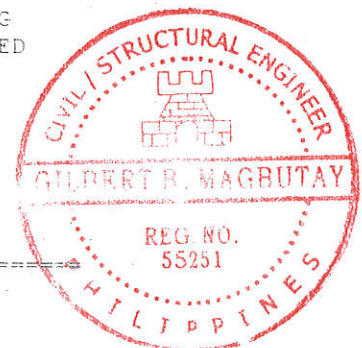
 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 516 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 517 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.
 AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====



COLUMN NO. 518 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 519 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 520 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 521 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 522 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 523 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

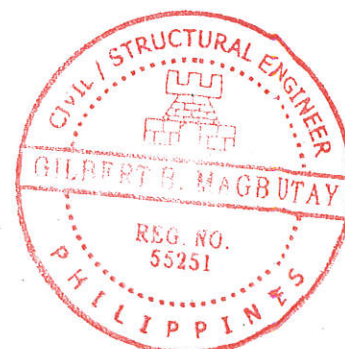
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 524 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 525 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 527 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 528 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 529 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 560 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 561 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

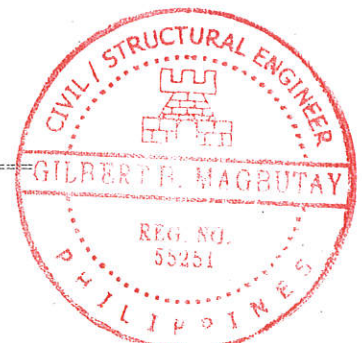
3 - 16 MM 1.005 1 END 0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 562 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.900
=====				
COLUMN NO. 563 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA OF STEEL REQUIRED = 1600.0 SQ. MM				
3 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.650
=====				
COLUMN NO. 754 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA OF STEEL REQUIRED = 1600.0 SQ. MM				
3 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.900
=====				
COLUMN NO. 764 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED AREA OF STEEL REQUIRED = 2048.0 SQ. MM				
20 - 12 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 192.00 MM	1.414	7	END	0.650
=====				
COLUMN NO. 769 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED AREA OF STEEL REQUIRED = 2160.0 SQ. MM				
20 - 12 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 192.00 MM	1.414	10	STA	0.900
=====				
COLUMN NO. 770 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA OF STEEL REQUIRED = 1600.0 SQ. MM				
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.900
=====				
COLUMN NO. 771 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED. AREA OF STEEL REQUIRED = 1600.0 SQ. MM				
8 - 16 MM (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE) TIE BAR NUMBER 10 SPACING 256.00 MM	1.005	1	END	0.900
=====				
COLUMN NO. 773 DESIGN PER ACI 318-03 - AXIAL + BENDING FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED ONLY MINIMUM STEEL IS REQUIRED.				



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 775 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 777 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 778 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 1077 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2561.1 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 24 - 12 MM 1.340 2 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 1078 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2308.5 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

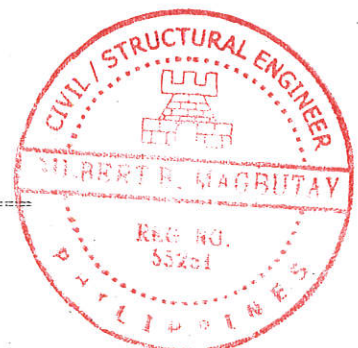
 12 - 16 MM 1.191 2 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5844 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2166.8 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 2 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5845 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5846 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5847 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 5856 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5857 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5861 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

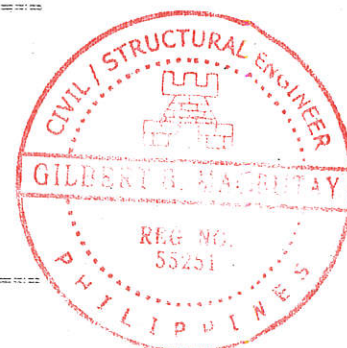
AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 5862 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====



COLUMN NO. 5863 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5864 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2608.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
24 - 12 MM	1.695	11	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 5874 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5875 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5878 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5879 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

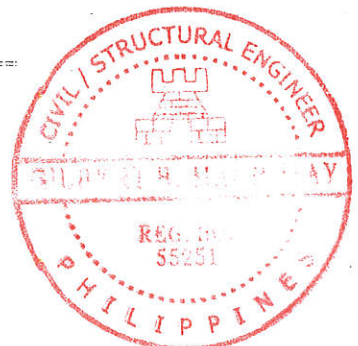
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5880 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)



TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5881 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2832.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
16 - 16 MM	2.011	9	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 192.00 MM

COLUMN NO. 5897 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5900 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5905 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5908 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5911 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.003	1	END	0.900

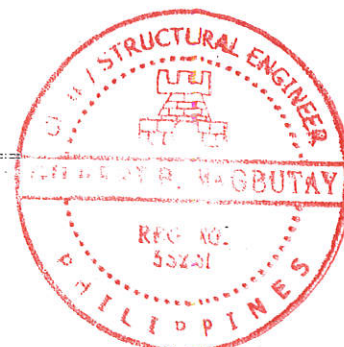
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 5914 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
-------------------	------------	------	----------	-----



3 - 16 MM 1.003 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 5998 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 5999 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6000 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6001 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6004 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

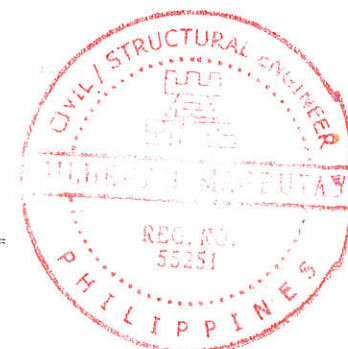
COLUMN NO. 6005 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

20 - 12 MM 1.117 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6006 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6007 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6008 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6009 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6010 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6011 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 20.9 MPA, SQRE SIZE - 450.0 X 450.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 2025.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
20 - 12 MM	1.117	1	END	0.900
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 192.00 MM				

COLUMN NO. 6022 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650
(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)				
TIE BAR NUMBER 10 SPACING 256.00 MM				



=====

COLUMN NO. 6023 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6024 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6025 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6028 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6029 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6030 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

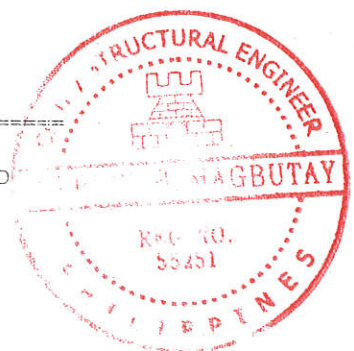
TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6031 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650



8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6032 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6033 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6034 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6035 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 12.1 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6046 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

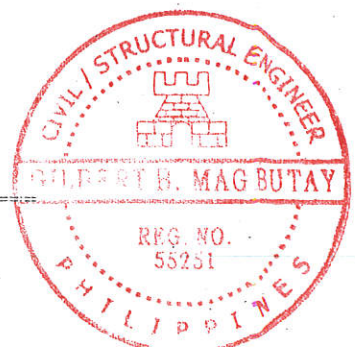
COLUMN NO. 6047 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6048 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6049 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

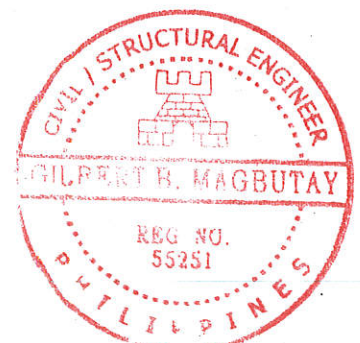
COLUMN NO. 6051 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM



=====

COLUMN NO. 6052 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6053 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6054 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6055 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6056 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6057 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 1824.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

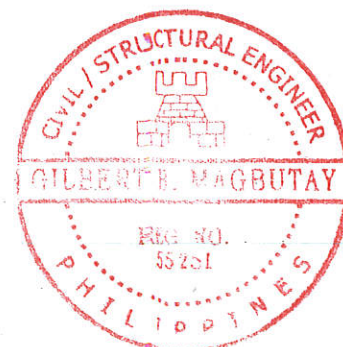
20 - 12 MM 1.414 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6058 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 11.6 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI



8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6071 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6075 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6080 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6084 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6089 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

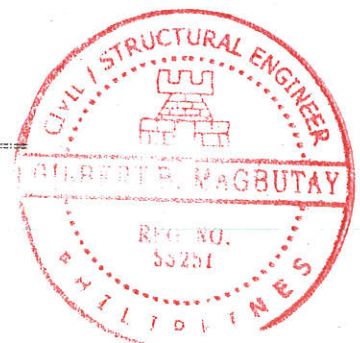
COLUMN NO. 6093 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

8 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6196 DESIGN PER ACI 318-03 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.



AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6197 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6198 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2944.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 16 - 16 MM 2.011 7 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 6199 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6202 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6203 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2048.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 20 - 12 MM 1.414 10 STA 0.900
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM
 =====

COLUMN NO. 6204 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM
 BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

 3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM
 =====

COLUMN NO. 6205 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED



ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6206 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6207 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6208 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6210 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6212 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM

COLUMN NO. 6214 DESIGN PER ACI 318-03 - AXIAL + BENDING
FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED

ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)
TIE BAR NUMBER 10 SPACING 256.00 MM



=====

COLUMN NO. 6215 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.900
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6280 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6281 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 AREA OF STEEL REQUIRED = 2496.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 20 MM 1.571 7 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 192.00 MM

=====

COLUMN NO. 6285 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6286 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6287 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650
 (PROVIDE EQUAL NUMBER OF BARS CN EACH FACE)
 TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6289 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION REINF PCT. LOAD LOCATION PHI

3 - 16 MM 1.005 1 END 0.650



(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6291 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6293 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6294 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6597 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6598 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6599 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM

BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
3 - 16 MM	1.005	1	END	0.650

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

=====

COLUMN NO. 6600 DESIGN PER ACI 318-08 - AXIAL + BENDING
 FY - 230.0 FC - 16.3 MPA, SQRE SIZE - 400.0 X 400.0 MMS, TIED
 ONLY MINIMUM STEEL IS REQUIRED.

AREA OF STEEL REQUIRED = 1600.0 SQ. MM



BAR CONFIGURATION	REINF PCT.	LOAD	LOCATION	PHI
8 - 16 MM	1.005	1	END	0.900

(PROVIDE EQUAL NUMBER OF BARS ON EACH FACE)

TIE BAR NUMBER 10 SPACING 256.00 MM

*****END OF COLUMN DESIGN RESULTS*****

4372. END CONCRETE DESIGN

4373. FINISH

***** END OF THE STAAD.Pro RUN *****

**** DATE= APR 30, 2017 TIME= 7: 9:51 ****

* For questions on STAAD.Pro, please contact *

* Bentley Systems or Partner offices *

* *

* Telephone Web / Email *

* USA +1 (714) 974-2500 *

* UK +44 (0) 808 101 9246 *

* SINGAPORE +65 6225-6158 *

* FRANCE +33 (0) 1 55238400 *

* GERMANY +49 0931 40468 *

* INDIA +91 (033) 4006-2021 *

* JAPAN +81 (03) 5952-6500 <http://www.ctc-g.co.jp> *

* CHINA +86 21 6288 4040 *

* THAILAND +66 (0) 2645-1018/19 partha.p@reiscftwareth.com *

* *

* Worldwide <http://selectservices.bentley.com/en-US/> *

* *





GIBMA Engineering Services

Design - Construction - Project Management - Surveys

Structural Retrofitting Analysis and Designs

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1

BEAM 78

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

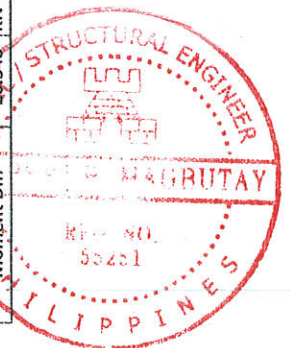
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
es'	0.0002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	34.852 KN-m

D/C RATIO	0.57	SAFE
Moment Diff	26.348	KN-m



CFRP Design for A_{CFRP}

Mu	-26.348	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d'	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 79

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

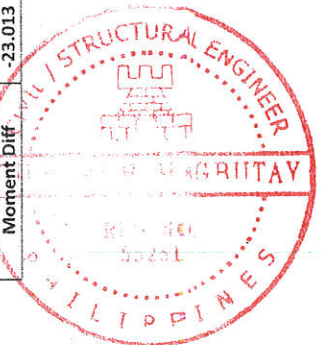
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

calculated values		
c	60.5	mm
"a"	51.425	mm
es'	0.00002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	38.187 KN-m

D/C-RATIO	0.62	SAFE
Moment Diff	-23.013	KN-m



CFRP Design for A_{CFRP}

Mu	-23.013	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

(f'c > fy (Assumption Valid))

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 80

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'_c	12.13	MPa
β_1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

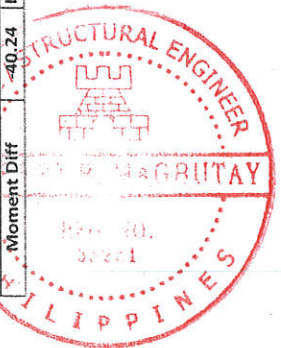
calculated values		
c	60.5	mm
"a"	51.425	mm
es'	0.00002	
fs'	4	MPa
et	0.0139	

calculated ϕ	1.48
use ϕ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	20.96 KN-m

D/C RATIO	0.34	SAFE
Moment Diff	-40.24	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-40.24	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$f'_c \neq f_y$ (Assumption Valid)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
--------	---

$$A_{CFRP} = \rho b d$$

Area 1 = $\rho_{max} b d$	-	mm ²
---------------------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1

BEAM 198

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties			
b	400		mm
h	400		mm
d	340		mm
d'	60		mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

Steel Properties			
top bars	3		pcs
bot bars	3		pcs
top dia	20		mm
bot dia	20		mm
As	942.48		mm ²
As'	942.48		mm ²
As2	16.39		mm ²
As1	926.09		mm ²
fy	230		MPa

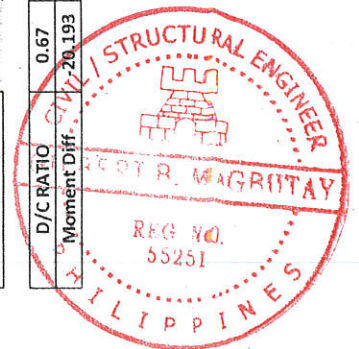
Calculated values		
c	60.5	mm
"a"	51.425	mm
εs'	0.00002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	41.007 KN-m

D/C RATIO	0.67	SAFE
Moment Diff.	20.193	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-20.193	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \rho \cdot b \cdot d^2 \cdot f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi \cdot b \cdot d^2}$$

$$\rho = \frac{0.85 f_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} \cdot b \cdot d$$

$$a = \frac{A1 \cdot f_y}{0.85 f_c \cdot b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1

BEAM 199

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	12.13	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
f _y	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
ε _s	0.00002	
f _s	4	MPa
ε _t	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	30.432 KN-m
D/C RATIO	0.5 SAFE
Moment Diff	30.768 KN-m



CFRP Design for A_{CFRP}

Mu	-30.768	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f'_c} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$R_n = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

f_s < f_y (Assumption Valid)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u' = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 200
LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	12.13	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

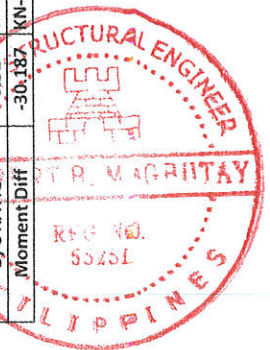
Calculated values		
c	60.5	mm
"a"	51.425	mm
εs'	0.00002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	31.013 KN-m

D/C RATIO	0.51	SAFE
Moment Diff	-30.187	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-30.187	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 201
LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'_c	17.13	MPa
β_1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
es'	0.00002	
fs'	4	MPa
et	0.0139	

calculated ϕ	1.48
use ϕ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	40.171 KN-m

D/C RATIO	0.66	SAFE
Moment Diff	-21.029	KN-m



CFRP Design for A_{CFRP}

Mu	-21.029	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f'_c} \left(\frac{600}{600 + f_y} \right)$$

ρ_{max}	-
--------------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'_c}} \right)$$

ρ	-
--------	---

$$A_{CFRP} = \rho b d$$

A_{CFRP}	-	mm ²
------------	---	-----------------

$$Area 1 = \rho_{max} b d$$

A_1	-	mm ²
-------	---	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A_s	-	mm ²
fs'	-	MPa

A_{CFRP}	-	mm ²
------------	---	-----------------

A_{CFRP}	-	mm ²
------------	---	-----------------

is by Assumption Valid

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 240

LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

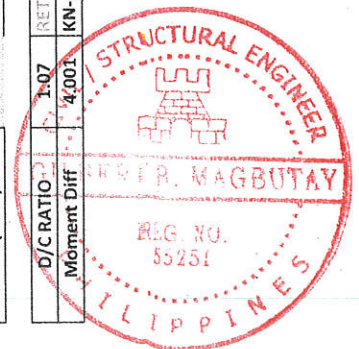
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
εs'	0.00002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	65.201 KN-m

D/C RATIO	1.07	RETROFIT
Moment Diff	4.001	KN-m



CFRP Design for A_{CFRP}

Mu	4.001	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	39.86	KN-m
------	-------	------

Design CFRP in a fraction only

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.069461806
----	-------------

$$\rho = \frac{0.85 f_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f_c}} \right)$$

ρ	1.4224E-05
---	------------

$$A_{CFRP} = \rho b d$$

A _{CFRP}	2.28	mm ²
-------------------	------	-----------------

$$Area 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f_c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 325
LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

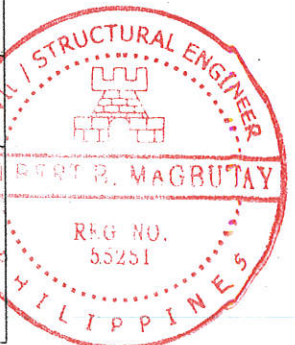
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	16.39	mm ²
As1	926.09	mm ²
fy	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
εs'	0.00002	
fs'	4	MPa
et	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	40.491 KN-m

D/C RATIO	0.66	SAFE
Moment Diff	20.709	KN-m



CFRP Design for A_{CFRP}

Mu	-20.709	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
Rn = $\frac{Mu}{\phi b d^2}$	-

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d	-	mm ²
-------------------	---	-----------------

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A2	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-1
BEAM 328
LOCATION SECOND FLOOR TO 3RD FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

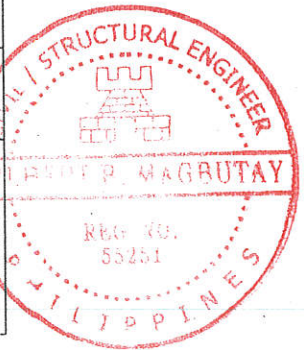
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm²
As'	942.48	mm²
As2	16.39	mm²
As1	926.09	mm²
fy	230	MPa

Calculated values		
c	60.5	mm
"a"	51.425	mm
εs'	0.00002	
fs'	4	MPa
εt	0.0139	

calculated φ	1.48
use φ	0.9

Mu (CAP) =	61.2 KN-m
Mu (DEM) =	70.169 KN-m

D/C RATIO	1.15	RETROFIT
Moment Diff	8.969	KN-m



CFRP Design for A_{CFRP}

Mu	8.969	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	39.86	KN-m
------	-------	------

Design Mu for Moment only

Mu

Rn	0.155711806
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	3.20216E-05
---	-------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	5.12	mm²
-------------------	------	-----

A ₁	-	mm²
Area 1 = ρmax bd		

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm²
c	-	mm
d	400	mm
d'	0	mm
εt	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2

BEAM 4

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f'_c	12.13	MPa
β_1	0.85	

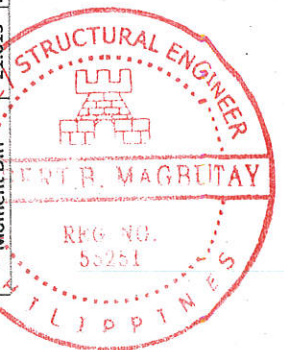
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
f_y	230	MPa

calculated values		
ϵ	43.97	mm
"a"	41.6245	mm
ϵ_s	0	
f_s'	0	MPa
ϵ_t	0.0089	

calculated ϕ	1.15
use ϕ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	33.775 KN-m

D/C RATIO	2.78	RETROFIT
Moment Diff	21.615	KN-m



CFRP Design for A_{CFRP}

Mu	21.615	KN-m
f_y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ_{max}	0.000146336
--------------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	9.73	KN-m
------	------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	1.537066667
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	0.00034138
--------	------------

Area CFRP = $\rho b d$

A_{CFRP}		mm ²
------------	--	-----------------

Area 1 = $\rho_{max} b d$

A_1	9.15	mm ²
-------	------	-----------------

$$\alpha = \frac{A_1 f_y}{0.85 f'_c b}$$

a	17.39	mm ²
c	20.46	mm
d	250	mm
d'	0	mm
ϵ_t	0.0337	

calculated ϕ	3.29
use ϕ	0.9

Example CFRP for Tension and Compression

Mu1(new)	7.48	KN-m
Mu2(new)	14.135	KN-m

A_2	23.23	mm ²
f_s'	600	MPa

Area CFRP (Tension)

A_{CFRP}	189.71	mm ²
------------	--------	-----------------

Area CFRP (Compression)

A_{CFRP}	32.38	mm ²
------------	-------	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2
BEAM 5

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties			
b	250		mm
h	250		mm
d	194		mm
d'	56		mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

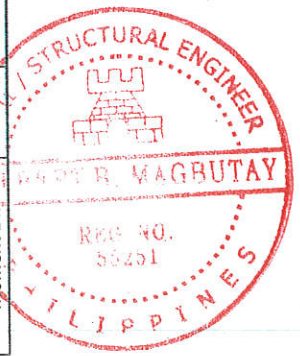
Steel Properties			
top bars	3		pcs
bot bars	3		pcs
top dia	12		mm
bot dia	12		mm
As	339.29		mm²
As'	339.29		mm²
As2	0		mm²
As1	339.29		mm²
fy	230		MPa

calculated values		
c	48.97	mm
"a"	41.6245	mm
εs'	0	
fs'	0	MPa
εt	0.0089	

calculated φ	1.15
use φ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	35.567 KN-m

D/C RATIO	2.92	RETROFIT
Moment Diff	23.407	KN-m



CFRP Design for A_{CFRP}

Mu	23.407	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y} = 0.000146336$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	9.73	KN-m
------	------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2} = 1.564497778$$

fy fy (Assumption Value)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'c}} \right)$$

ρ	0.0003727
---	-----------

$$A_{CFRP} = \rho b d$$

A ₁	9.15	mm²
----------------	------	-----

$$Area 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y \cdot}{0.85 f'c b}$$

a	17.39	mm
c	20.46	mm
d	250	mm
d'	0	mm
εt	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	7.48	KN-m
Mu2(new)	15.92	KN-m

A _z	26.17	mm²
fs'	600	MPa

Area CFRP (Tension)	213.72	mm²
A _{CFRP}		

Area CFRP (Compression)	35.32	mm²
A _{CFRP}		

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2
BEAM 187

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f _c	12.13	MPa
β ₁	0.85	

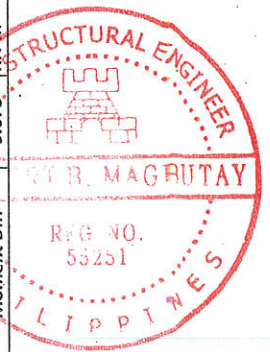
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
f _y	230	MPa

calculated values		
c	48.97	mm
"a"	41.6245	mm
es'	0	
fs'	0	MPa
et	0.0089	

calculated φ	1.15
use φ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	21.233 KN-m

D/C RATIO	1.75/RETROFIT
Moment Diff	9.073 KN-m



CFRP Design for A_{CFRP}

Mu	9.073	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y} = 0.000146336$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	9.73	KN-m
------	------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2} = 0.645191111$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	0.000136071
---	-------------

$$\text{Area CFRP} = \rho b d = 8.5 \text{ mm}^2$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	250	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2

BEAM 229

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

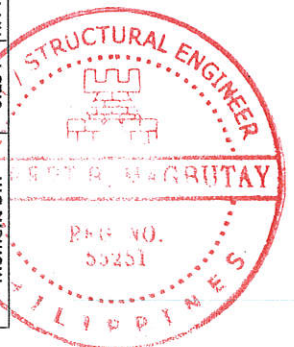
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

calculated values		
c	48.97	mm
"a"	41.6245	mm
es'	0	
fs'	0	MPa
et	0.0089	

calculated φ	1.15
use φ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	18.314 KN-m

D/C RATIO	1.51	RETROFIT
Moment Diff	6.154	KN-m



CFRP Design for A_{CFRP}

Mu	6.154	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	9.73	KN-m
------	------	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.437617778
----	-------------

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	9.12901E-05
---	-------------

$$A_{CFRP} = \rho b d$$

A _{CFRP}	5.71	mm ²
-------------------	------	-----------------

$$Area 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
u	250	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2
BEAM 300

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f'_c	12.13	MPa
β_1	0.85	

Steel Properties		
top bars	5	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
f_y	230	MPa

calculated values		
c	48.97	mm
"a"	41.6245	mm
es	0	
fs'	0	MPa
et	0.0089	

calculated ϕ	1.15
use ϕ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	22.55 KN-m

D/C RATIO	1.85	RETROFIT
Moment Diff	10.39	KN-m

CFRP Design for A_{CFRP}

Mu	10.39	KN-m
f_y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ_{max}	0.000146336
--------------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	9.73	KN-m
------	------	------

Design ϕ for tension and compression

Mu

Rn	0.738844444
$Rn = \frac{Mu}{\phi b d^2}$	

$\phi = 0.9$ (Assumed value)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	0.000156613
--------	-------------

$A_{CFRP} = \rho b d$		mm ²
-----------------------	--	-----------------

A_1	9.15	mm ²
Area 1 = $\rho_{max} b d$		

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	17.39	mm ²
c	20.46	mm
d	250	mm
d'	0	mm
et	0.0337	

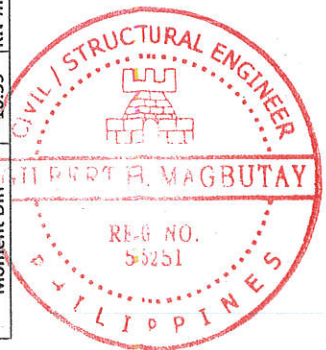
calculated ϕ	3.29
use ϕ	0.9

Mu1(new)	7.48	KN-m
Mu2(new)	2.91	KN-m

A_s	4.78	mm ²
fs'	600	MPa

Area CFRP (Tension)	39.04	mm ²
---------------------	-------	-----------------

Area CFRP (Compression)	13.93	mm ²
-------------------------	-------	-----------------



MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-2

BEAM 357

LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f _c	12.13	MPa
β ₁	0.85	

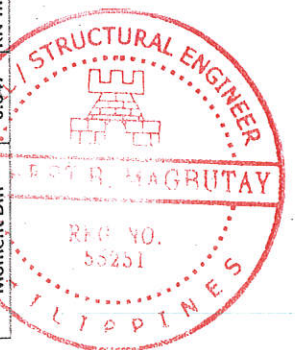
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
f _y	230	MPa

calculated values		
c	48.97	mm
"a"	41.6245	mm
es'	0	
fs'	0	MPa
et	0.0089	

calculated φ	1.15
use φ	0.9

Mu (CAP) =	12.16 KN-m
Mu (DEM) =	12.207 KN-m

D/C RATIO	1	SAFE
Moment Diff	0.047	KN-m



CFRP Design for A_{CFRP}

Mu	0.047	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	9.73	KN-m
------	------	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.003342222
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	6.82197E-07
---	-------------

Area CFRP = ρ b d

A _{CFRP}	0.04	mm ²
-------------------	------	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	250	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-3
BEAM 585
LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	244	mm
d'	56	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

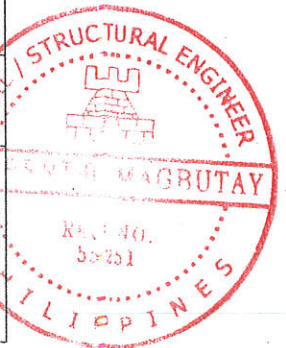
Steel Properties		
top bars	5	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

Calculated values		
c	46.17	mm
"a"	39.2445	mm
es'	0	
fs'	0	MPa
et	0.0129	

calculated φ	1.41
use φ	0.9

Mu (CAP) =	15.76 KN-m
Mu (DEM) =	25.812 KN-m

D/C RATIO	1.84	RETROFIT
Moment Diff	10.052	KN-m



CFRP Design for A_{CFRP}

Mu	10.052	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	16.82	KN-m
------	-------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	0.413662551
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	8.6186E-05
---	------------

Area CFRP = ρ b d

A _{CFRP}	7.76	mm ²
-------------------	------	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _z	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 2C-3
BEAM 586
LOCATION SECOND FLOOR TO THIRD FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	244	mm
d'	56	mm

Concrete Properties		
f'c	12.13	MPa
β1	0.85	

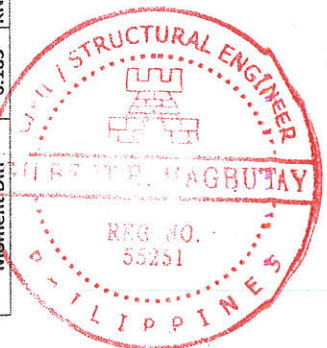
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

calculated values		
c	46.17	mm
"a"	39.2445	mm
es'	0	
fs'	0	MPa
et	0.0129	

calculated φ	1.41
use φ	0.9

Mu (CAP) =	15.76 KN-m
Mu (DEM) =	15.943 KN-m

D/C RATIO	1.01	SAFE
Moment Diff	0.183	KN-m



CFRP Design for A_{CFRP}

Mu	0.183	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_c} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000146336
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	16.82	KN-m
------	-------	------

Design of FRP for Flexure only

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	0.007530864
----	-------------

$$\rho = \frac{0.85 f_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f_c}} \right)$$

ρ	1.53747E-06
---	-------------

Area CFRP = ρ b d

A _{CFRP}	0.14	mm ²
-------------------	------	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$\alpha = \frac{A_1 f_y}{0.85 f_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
BEAM 411

LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	11.57	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
fy	230	MPa

Calculated values		
c	61.28	mm
"a"	52.088	mm
εs'	0.00006	
fs'	12	MPa
et	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	26.982 KN-m

D/C RATIO	0.44	SAFE
Moment Diff	33.928	KN-m



CFRP Design for A_{CFRP}

Mu	-33.928	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{fy} \right)}{600 + fy}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρ_{max} b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
BEAM 420
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
f _y	230	MPa

calculated values		
c	61.28	mm
"a"	52.088	mm
es'	0.00006	
fs'	12	MPa
et	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	32.381 KN-m

D/C RATIO	0.53	SAFE
Moment Diff	46.28529	KN-m



CFRP Design for A_{CFRP}

Mu	-28.529	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$A_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1

BEAM 430

LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	11.57	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
fy	230	MPa

calculated values		
c	61.28	mm
"a"	52.088	mm
es'	0.00006	
fs'	12	MPa
et	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	7.246 KN-m

D/C RATIO	0.12
Moment Diff	-53.664 KN-m



CFRP Design for A_{CFRP}

Mu	-53.664	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Rn	Mu
$Rn = \frac{Mu}{\phi b d^2}$	

By ACI 318M Chapter 22.4.2.4

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	Area CFRP = ρ b d	mm ²
-------------------	-------------------	-----------------

A ₁	Area 1 = ρ _{max} b d	mm ²
----------------	-------------------------------	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
 BEAM 440
 LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	11.57	MPa
β1	0.85	

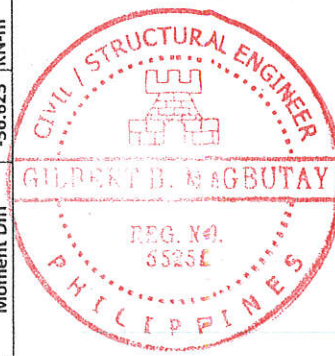
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
fy	230	MPa

Calculated values		
c	61.28	mm
"a"	52.088	mm
es'	0.00006	
fs'	12	MPa
et	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	24.287 KN-m

D/C RATIO	0.4	SAFE
Moment Diff	-36.623	KN-m



CFRP Design for A_{CFRP}

Mu	-36.623	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \rho \frac{f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{41 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
BEAM 5873
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

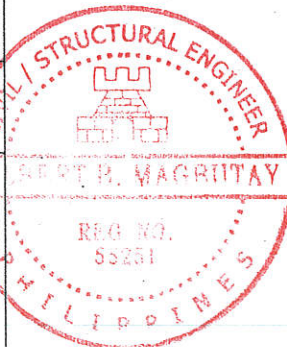
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
f _y	230	MPa

Calculated values		
c	61.28	mm
"a"	52.088	mm
ε _s	0.00006	
f _s	12	MPa
ε _t	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	70.463 KN-m

D/C RATIO	1.16	RETROFIT
Moment Diff	9.553	KN-m



CFRP Design for A_{CFRP}

Mu	9.553	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000139581
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	38.02	KN-m
------	-------	------

Mu

Rn	0.165850694
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	3.41374E-05
---	-------------

Area CFRP = 0 bd

A _{CFRP}	5.46	mm ²
-------------------	------	-----------------

A ₁	-	mm ²
Area 1 = ρ _{max} bd		

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
BEAM 5881
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	11.57	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
As	942.48	mm ²	
As'	942.48	mm ²	
As2	49.17	mm ²	
As1	893.31	mm ²	
fy	230	MPa	

Calculated values			
c	61.28	mm	
"a"	52.088	mm	
es'	0.00006		
fs'	12	MPa	
et	0.0136		

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	67.974 KN-m

D/C RATIO	1.12	RETROFIT
Moment Diff	7.064	KN-m



CFRP Design for A_{CFRP}

Mu	7.064	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + fy} \right)}{fy}$$

ρ max	0.000139581
-------	-------------

$$M_{max} = \rho \phi b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	38.02	KN-m
------	-------	------

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.122638889
----	-------------

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	2.51864E-05
---	-------------

Area CFRP = ρ b d

A _{CFRP}	4.03	mm ²
-------------------	------	-----------------

Area 1 = ρ_{max} b d

A ₁	-	mm ²
----------------	---	-----------------

$$\alpha = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-1
BEAM 6509
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	11.57	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	49.17	mm ²
As1	893.31	mm ²
fy	230	MPa

Calculated values		
c	61.28	mm
"a"	52.088	mm
es'	0.00006	
fs'	12	MPa
et	0.0136	

calculated φ	1.46
use φ	0.9

Mu (CAP) =	60.91 KN-m
Mu (DEM) =	42.751 KN-m

D/C RATIO	0.7
Moment Diff	18.159 KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-18.159	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
BEAM 121
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties			
b	300	mm	
h	300	mm	
d	240	mm	
d'	60	mm	

Concrete Properties	
f'_c	11.57 MPa
β_1	0.85

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
ρ	59.33
"a"	50.4305
ϵ_s'	0
f_s'	0
ϵ_t	0.0091

calculated ϕ	1.17
use ϕ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	15.865 KN-m

D/C RATIO	0.57
Moment Diff	-12.075



CFRP Design for A_{CFRP}

Mu	-12.075	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ_{max}	-
--------------	---

$$M_{max} = \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
--------	---

Area CFRP = $\rho b d$

A_{CFRP}	-	mm ²
------------	---	-----------------

Area 1 = pmax bd

A1	-	mm ²
----	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	300	mm
d'	0	mm
ϵ_t	-	

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A2	-	mm ²
fs'	-	MPa

A_{CFRP}	-	mm ²
------------	---	-----------------

A_{CFRP}	-	mm ²
------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
BEAM 130
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	240	mm
d'	60	mm

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
f _y	230	MPa

calculated values		
c	59.33	mm
"a"	50.4305	mm
ε _s	0	
f _s	0	MPa
ε _t	0.0091	

calculated φ	1.17
use φ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	3.554 KN-m

D/C RATIO	0.13
Moment Diff	-24.386 KN-m



CFRP Design for A_{CFRP}

Mu	-24.386	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
BEAM 290
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	240	mm
d'	60	mm

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

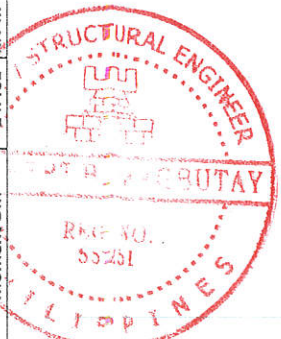
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
f _y	230	MPa

calculated values	
c	59.33 mm
"a"	50.4305 mm
ε _s	0
f _s '	0 MPa
ε _t	0.0091

calculated φ	1.17
use φ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	3.458 KN-m

D/C RATIO	0.12	SAFE
Moment Diff	-24.482	KN-m



CFRP Design for A_{CFRP}

Mu	-24.482	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

$$R_n = \frac{M_u}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$A_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
ε _t	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
BEAM 332
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties			
b	300	mm	
h	300	mm	
d	240	mm	
d'	60	mm	

Concrete Properties		
f'_c	11.57	MPa
β_1	0.85	

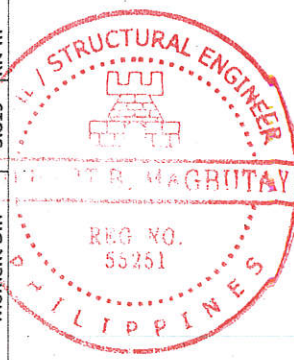
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
c	59.33 mm
"a"	50.4305 mm
es'	0
fs'	0 MPa
et	0.0091

calculated ϕ	1.17
use ϕ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	31.759 KN-m

D/C RATIO	1.14	RETROFIT
Moment Diff	3.819	KN-m



CFRP Design for A_{CFRP}

Mu	3.819	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ_{max}	0.000139581
--------------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	16.04	KN-m
------	-------	------

Mmax

Mu

Rn	0.157160494
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	3.2334E-05
--------	------------

$$\text{Area CFRP} = \rho b d$$

A_{CFRP}	2.91	mm ²
------------	------	-----------------

A_1	-	mm ²
-------	---	-----------------

$$\text{Area 1} = p_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A_2	-	mm ²
fs'	-	MPa

A_{CFRP}	-	mm ²
------------	---	-----------------

A_{CFRP}	-	mm ²
------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
 BEAM 333
 LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	240	mm
d'	60	mm

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

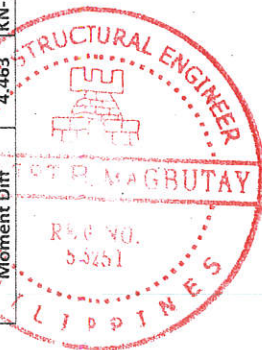
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
f _y	230	MPa

calculated values		
c	59.33	mm
"a"	50.4305	mm
es'	0	
fs'	0	MPa
et	0.0091	

calculated φ	1.17
use φ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	32.403 KN-m

D/C RATIO	1.16	RETROFIT
Moment Diff	4.463	KN-m



CFRP Design for A_{CFRP}

Mu	4.463	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000139581
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	16.04	KN-m
------	-------	------

Mmax Mu

Rn	0.1835662551
----	--------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	3.78388E-05
---	-------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	3.41	mm ²
-------------------	------	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2

BEAM 333

LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties			
b	300	mm	
h	300	mm	
d	240	mm	
d'	60	mm	

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
f _y	230	MPa

calculated values		
c	59.33	mm
"a"	50.4305	mm
es'	0	
fs'	0	MPa
et	0.0091	

calculated φ	1.17
use φ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	32.403 KN-m

D/C RATIO	1.16
Moment Diff	4.463

CFRP Design for A_{CFRP}

Mu	4.463	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000139581
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	16.04	KN-m
------	-------	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.183662551
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	3.78388E-05
---	-------------

$$A_{CFRP} = \rho b d$$

A _{CFRP}	3.41	mm ²
-------------------	------	-----------------

$$Area_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 3C-2
BEAM 439
LOCATION 3RD FLOOR TO 4TH FLOOR

Beam Properties			
b	300	mm	
h	300	mm	
d	240	mm	
d'	60	mm	

Concrete Properties		
f _c	11.57	MPa
β ₁	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

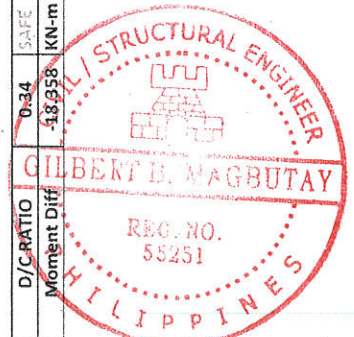
calculated values	
c	59.33 mm
"a"	50.4305 mm
es'	0
fs'	0 MPa
et	0.0091

calculated φ	1.17
use φ	0.9

Mu (CAP) =	27.94 KN-m
Mu (DEM) =	9.582 KN-m

D/C RATIO	0.34	SAFE
Moment Diff	18.358	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-18.358	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

(c) x by (Assumption Value)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 472
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f _c	16.3	MPa
β ₁	0.85	

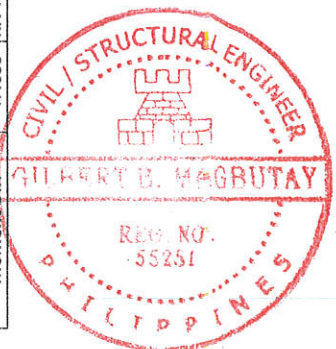
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

Calculated values	
c	55.57 mm
"a"	47.2345 mm
es'	0
fs'	0 MPa
et	0.0154

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	14.085 KN-m

D/C RATIO	0.23	SAFE
Moment Diff	-47.635	KN-m



CFRP Design for A_{CFRP}

Mu	-47.635	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced
 $\rho_{max} = 0.75 (0.85 f'_{c} \beta_1) / f_y$
 $(600 / (600 + f_y))$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \rho \beta_1) / (1 - \rho \beta_1)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = M_u / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'_{c} / f_y) (1 - \sqrt{1 - 2 R_n}) / (0.85 f'_{c})$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$A_{s1} = \rho_{max} b d$$

A _{s1}	-	mm ²
-----------------	---	-----------------

$$a = (A_s f_y) / (0.85 f'_{c} b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _{s2}	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Mu Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 480
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties	
f'c	16.3
β1	0.85
	MPa

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

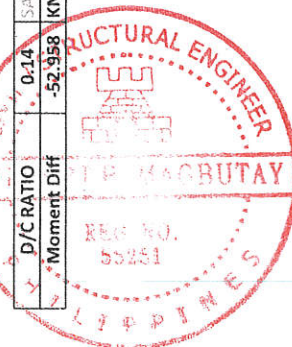
calculated values	
c	55.57
"a"	47.2345
es'	0
fs'	0
et	0.0154
	MPa

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	8.762 KN-m

P/C RATIO	0.14	SAFE
Moment Diff	-52.958	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-52.958	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'c \beta_1)^{1/2}}{(600 + f_y)}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \{0.59 \rho f_y / (f'c)\})$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = Mu / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'c) / f_y (1 - \sqrt{1 - 2Rn / (0.85 f'c)})$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 560
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	16.3	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
As	942.48	mm ²	
As'	942.48	mm ²	
As2	0	mm ²	
As1	942.48	mm ²	
fy	230	MPa	

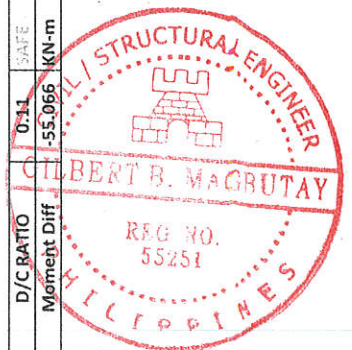
calculated values		
c	55.57	mm
"a"	47.2345	mm
εs'	0	
fs'	0	MPa
et	0.0154	

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	6.654 KN-m

D/C RATIO	0.11	SAFE
Moment Diff	-55.066	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-55.066	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'c \beta_1)}{(600 + f_y)}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \phi \rho f_y / f'c)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = Mu / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'c) / f_y (1 - \sqrt{1 - 2Rn / (0.85 f'c)})$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 764
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	16.3	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
As	942.48	mm²	
As'	942.48	mm²	
As2	0	mm²	
As1	942.48	mm²	
fy	230	MPa	

calculated values		
ε	55.57	mm
"a"	47.2345	mm
εs'	0	
fs'	0	MPa
et	0.0154	

calculated φ	1.58
use φ	0.9

Mu (CAP) =	51.72 KN-m
Mu (DEM) =	69.803 KN-m

D/C RATIO	1.13	RETRACT
Moment Diff	8.083	KN-m



CFRP Design for A_{CFRP}

Mu	8.083	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

ρ max	0.000196643
-------	-------------

$$\rho_{max} = 0.75 \frac{(0.85 f'c \beta_1)}{(600 + f_y)} \quad \text{or} \quad \rho_{max} = \frac{M_{max}}{f_y A_g d^2} \leq 0.59 \frac{f_y}{f'c}$$

Mmax	53.56	KN-m
------	-------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi (b d^2)}$$

Rn	0.140329861
----	-------------

$$\rho = \frac{(0.85 f'c) / f_y (1 - \sqrt{1 - 2R_n})}{(0.85 f'c)}$$

ρ	2.87853E-05
---	-------------

A _{CFRP}	4.61	mm²
-------------------	------	-----

A ₁	-	mm²
----------------	---	-----

$$a = (A_1 f_y) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 767
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400		mm
h	400		mm
d	340		mm
d'	60		mm

Concrete Properties		
f'c	16.3	MPa
β1	0.85	

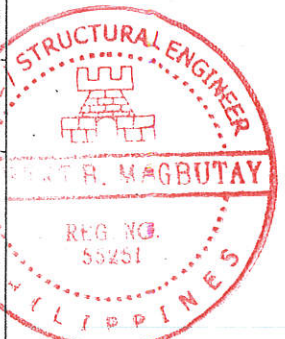
Steel Properties			
top bars	3		pcs
bot bars	3		pcs
top dia	20		mm
bot dia	20		mm
As	942.48		mm ²
As'	942.48		mm ²
As2	0		mm ²
As1	942.48		mm ²
fy	230		MPa

Calculated values			
c	55.57		mm
"a"	47.2345		mm
εs'	0		
fs'	0		MPa
et	0.0154		

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	81.289 KN-m

D/C RATIO	1.32	RETROFIT
Moment Diff	19.569	KN-m



CFRP Design for A_{CFRP}

Mu	19.569	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'c \beta_1)}{(600 + f_y)} / f_y$$

p max	0.000196643
-------	-------------

$$M_{max} = \phi \rho \beta_1 d^2 f_y (1 - \beta_1)$$

Mmax	53.56	KN-m
------	-------	------

Design of CFRP for Moment only

Mmax	Mu
------	----

$$R_n = M_u / (\phi \beta_1 d^2)$$

Rn	0.339739583
----	-------------

fy by Assumption Valid

$$\rho = (0.85 f'c) / f_y (1 - \sqrt{1 - 2R_n}) / (0.85 f'c)$$

p	7.02062E-05
---	-------------

A _{CFRP}	11.23	mm ²
-------------------	-------	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d'	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 5900
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	16.3	MPa
β1	0.85	

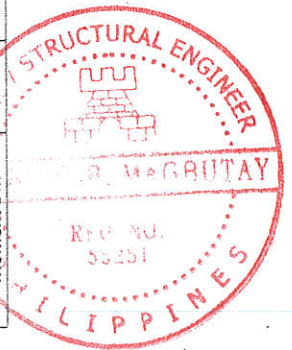
Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
As	942.48	mm ²	
As'	942.48	mm ²	
As2	0	mm ²	
As1	942.48	mm ²	
fy	230	MPa	

calculated values		
c	55.57	mm
"a"	47.2345	mm
es	0	
fs'	0	MPa
et	0.0154	

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	17.424 KN-m

D/C RATIO	0.28	SAFE
Moment Diff	-44.296	KN-m



CFRP Design for A_{CFRP}

Mu	-44.296	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 (0.85 f'c c \beta_1) / fy$$

ρ max	-
-------	---

$$M_{max} = \phi \rho [bd]^2 fy (1 - [0.59 \rho fy / (f'c)])$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = Mu / (\phi [bd]^2)$$

Rn	-
----	---

$$\rho = (0.85 f'c) / fy (1 - \sqrt{1 - 2Rn / (0.85 f'c)})$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} bd$$

$$a = (A_1 fy) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 6198

LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'_c	16.3	MPa
β_1	0.85	

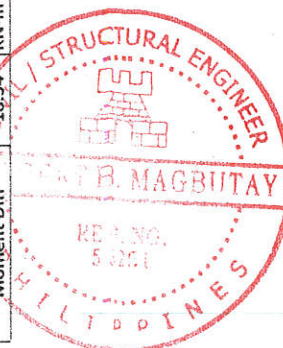
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

calculated values	
c	55.57 mm
"a"	47.2345 mm
es'	0
fs'	0 MPa
et	0.0154

calculated ϕ	1.58
use ϕ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	80.26 KN-m

D/C-RATIO	1.3	REINFOR
Moment Diff	18.54	KN-m



CFRP Design for A_{CFRP}

Mu	18.54	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'_c \beta_1)}{(600 + f_y)} / f_y$$

ρ_{max}	0.000196643
--------------	-------------

$$M_{max} = \phi \rho b d^2 f_y (1 - \frac{0.59 \rho f_y}{(f'_c)})$$

Mmax	53.56	KN-m
------	-------	------

Mmax

Mu

$$R_n = M_u / (\phi b d^2)$$

Rn	0.321875
----	----------

$$\rho = \frac{(0.85 f'_c) / f_y (1 - \sqrt{1 - 2R_n})}{(0.85 f'_c)}$$

ρ	6.64701E-05
--------	-------------

$$Area_{CFRP} = 0. b d$$

A_{CFRP}	10.64	mm ²
------------	-------	-----------------

A_1	-	mm ²
-------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'_c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A_2	-	mm ²
fs'	-	MPa

A_{CFRP}	-	mm ²
------------	---	-----------------

A_{CFRP}	-	mm ²
------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 6201
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	16.3 MPa
β1	0.85

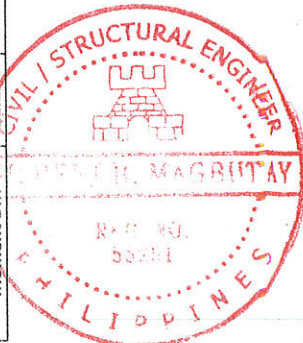
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

calculated values	
c	55.57 mm
"a"	47.2345 mm
εs'	0
fs'	0 MPa
et	0.0154

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	82.894 KN-m

D/C RATIO	1.34	RETROFIT
Moment Diff	21.174	KN-m



CFRP Design for A_{CFRP}

Mu	21.174	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 (0.85 f'c \beta_1) / f_y$$

ρ max	0.000196643
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y (1 - \phi \rho f_y / f'c)$$

Mmax	53.56	KN-m
------	-------	------

By using φ_{sp} for design only

Mu

$$Rn = Mu / (\phi b d^2)$$

Rn	0.367604167
----	-------------

f'c & fy (Assumption Value)

$$\rho = (0.85 f'c) / f_y (1 - \sqrt{1 - 2Rn / (0.85 f'c)})$$

ρ	7.60438E-05
---	-------------

A _{CFRP}	12.17	mm ²
-------------------	-------	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1
BEAM 6285
LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	16.3	MPa
β ₁	0.85	

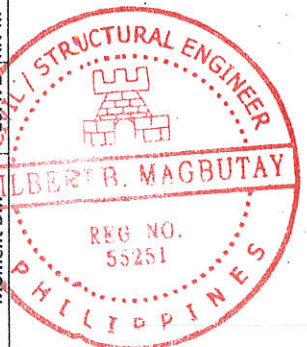
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

Calculated values		
c	55.57	mm
"a"	47.2345	mm
εs'	0	
fs'	0	MPa
et	0.0154	

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	41.248 KN-m

D/C RATIO	0.67	SAFE
Moment Diff	20.472	KN-m



CFRP Design for A_{CFRP}

Mu	-20.472	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'_c \beta_1)}{(600 + f_y)}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \phi \rho f_y / f'_c)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = M_u / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'_c) / f_y (1 - \sqrt{1 - 2R_n / (0.85 f'_c)})$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'_c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Req Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1

BEAM 6570

LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'_c	16.3	MPa
β_1	0.85	

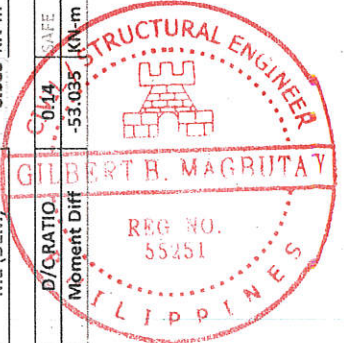
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

calculated values		
c	55.57	mm
"a"	47.2345	mm
es'	0	
fs'	0	MPa
et	0.0154	

calculated ϕ	1.58
use ϕ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	8.685 KN-m

P/QRATIO	0.14
Moment Diff	-53.035



CFRP Design for A_{CFRP}

Mu	-53.035	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'_c \beta_1)}{(600 + f_y)}$$

ρ_{max}	-
--------------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \sqrt{1 - 2 \rho n})$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = Mu / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'_c) / f_y (1 - \sqrt{1 - 2 Rn})$$

ρ	-
--------	---

AreaCFRP = $\rho b d$	-	mm ²
-----------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'_c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK 4C-1

BEAM 6600

LOCATION 4TH FLOOR TO ROOF BEAM

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	16.3	MPa
β ₁	0.85	

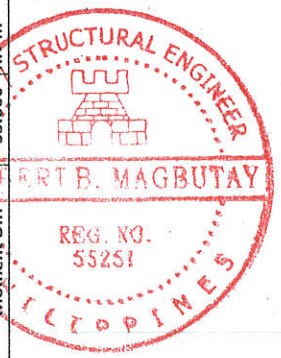
Steel Properties		
top bars	5	pCS
bot bars	3	pCS
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	942.48	mm ²
fy	230	MPa

Calculated values		
c	55.57	mm
"a"	47.2345	mm
es'	0	
fs'	0	MPa
et	0.0154	

calculated φ	1.58
use φ	0.9

Mu (CAP) =	61.72 KN-m
Mu (DEM) =	6.054 KN-m

D/C RATIO	0.1
Moment Diff	55.666



CFRP Design for A_{CFRP}

Mu	-55.666	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{(0.85 f'_c \beta_1)}{(600 + f_y)}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y (1 - \sqrt{1 - 2Rn})$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = Mu / (\phi b d^2)$$

Rn	-
----	---

$$\rho = (0.85 f'_c) / f_y (1 - \sqrt{1 - 2Rn} / (0.85 f'_c))$$

ρ	-
---	---

$$Area_{CFRP} = 0. b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = (A_1 f_y) / (0.85 f'_c b)$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 7
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties	
f'c	20.9 MPa
β1	0.8484

Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
fy	230	MPa

Calculated values	
c	58.02 mm
"a"	49.224168 mm
es'	0
fs'	0 MPa
et	0.0172

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 kN-m
Mu (DEM) =	28.87 kN-m
D/C RATIO	0.24
Moment Diff	-89.94 kN-m



CFRP Design for A_{CFRP}

Mu	-89.94	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

p max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	kN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

p	-
---	---

Area CFRP = p bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = pmax bd

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

f_y ≠ f_y (Assumption Valid)

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 15
LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	450		mm
h	450		mm
d	390		mm
d'	60		mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties			
top bars	5		pcs
bot bars	5		pcs
top dia	20		mm
bot dia	20		mm
As	1570.8		mm ²
As'	1570.8		mm ²
As2	0		mm ²
As1	1570.8		mm ²
fy	230		MPa

calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	8.638 KN-m

D/C RATIO	0.07	SAFE
Moment Diff	-110.172	KN-m



CFRP Design for A_{CFRP}

Mu	-110.172	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	$\frac{Mu}{\phi b d^2}$
----	-------------------------

Eq. 8.14 (NSCP 2015)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 230
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

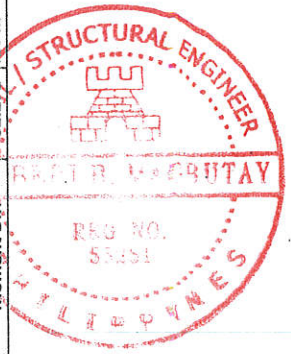
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
fy	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	36.539 KN-m

D/C RATIO	0.31	SAFE
Moment Diff	-82.271	KN-m



CFRP Design for A_{CFRP}

Mu	-82.271	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

f'c ≠ fy (Assumption Valid)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _s	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$u = \frac{A_1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d'	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 320

LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	450	mm	
h	450	mm	
d	390	mm	
d'	60	mm	

Concrete Properties		
f'_c	20.9	MPa
β_1	0.8484	

Steel Properties			
top bars	5	pcs	
bot bars	5	pcs	
top dia	20	mm	
bot dia	20	mm	
As	1570.8	mm ²	
As'	1570.8	mm ²	
As2	0	mm ²	
As1	1570.8	mm ²	
fy	230	MPa	

Calculated values			
c	58.02	mm	
"a"	49.224168	mm	
es'	0		
fs'	0	MPa	
et	0.0172		

calculated ϕ	1.69
use ϕ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	28.561 KN-m

D/C RATIO	0.24	SAFE
Moment Diff	-90.249	KN-m

CFRP Design for A_{CFRP}

Mu	-90.249	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f'_c}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ_{max}	-
--------------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
--------	---

Area CFRP = $\rho b d$	-	mm ²
------------------------	---	-----------------

Area 1 = $\rho_{max} b d$	-	mm ²
---------------------------	---	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated ϕ	-
use ϕ	-

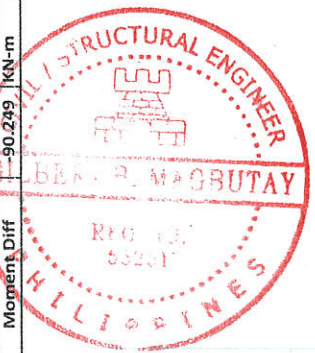
Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

Az	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

* No Need for CFRP



MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 5841
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

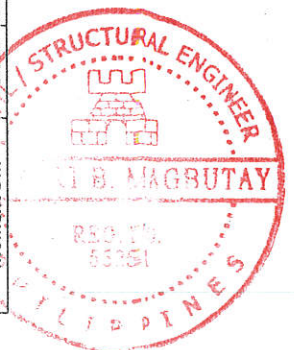
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
fy	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	39.097 KN-m

D/C RATIO	0.33	SAFE
Moment Diff	79.713	KN-m



CFRP Design for A_{CFRP}

Mu	-79.713	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

p max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area\ 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

$$\text{calculated } \phi$$

use φ	-
-------	---

$$Mu1(new)$$

Mu2(new)	-	KN-m
----------	---	------

$$A_2$$

fs'	-	MPa
-----	---	-----

$$A_{CFRP}$$

-	-	mm ²
---	---	-----------------

$$A_{CFRP}$$

-	-	mm ²
---	---	-----------------

Not Used for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 6000
LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	450	mm	
h	450	mm	
d	390	mm	
d'	60	mm	

Concrete Properties		
f'_c	20.9	MPa
β_1	0.8484	

Steel Properties			
top bars	5	pcs	
bot bars	5	pcs	
top dia	20	mm	
bot dia	20	mm	
As	1570.8	mm ²	
As'	1570.8	mm ²	
As2	0	mm ²	
As1	1570.8	mm ²	
fy	230	MPa	

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated ϕ	1.69
use ϕ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	9.747 KN-m

D/C RATIO	0.08	SAFE
Moment Diff	-109.063	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-109.063	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ_{max}	-
--------------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

fy > Ry (Assumption Valid)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
--------	---

$$Area_{CFRP} = \rho b d$$

A_{CFRP}	-	mm ²
------------	---	-----------------

A_1	-	mm ²
-------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d'	450	mm
d'	0	mm
et	-	mm

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A_2	-	mm ²
fs'	-	MPa

A_{CFRP}	-	mm ²
------------	---	-----------------

A_{CFRP}	-	mm ²
------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 6010
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f _c	20.9	MPa
β ₁	0.8484	

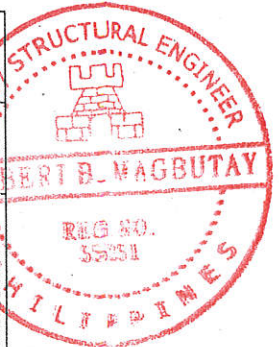
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
f _y	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	26.207 KN-m

D/C RATIO	0.22
Moment Diff	-92.603 KN-m



CFRP Design for A_{CFRP}

Mu	-92.603	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$Area 1 = \rho_{max} b d$$

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 6350
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
fy	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.59
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	30.188 KN-m

D/C RATIO	0.25
Moment Diff	-88.622 KN-m



CFRP Design for A_{CFRP}

Mu	-88.622	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

8" x 8" (As_{min}) (As_{min}) (As_{min})

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1

BEAM 6360

LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm²
As'	1570.8	mm²
As2	0	mm²
As1	1570.8	mm²
fy	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	20.155 KN-m

D/C RATIO	0.174
Moment Diff	-98.655 KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-98.655	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + fy} \right)}{fy}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm²
-------------------	---	-----

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm²
----------------	---	-----

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
 BEAM 5360
 LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	450	mm	
h	450	mm	
d	300	mm	
d'	60	mm	

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties			
top bars	5	pcs	
bot bars	5	pcs	
top dia	20	mm	
bot dia	20	mm	
As	1570.8	mm ²	
As'	1570.8	mm ²	
As2	0	mm ²	
As1	1570.8	mm ²	
fy	230	MPa	

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	20.155 KN-m

p/QRATIO	0.17
Moment Diff	-98.655 KN-m



CFRP Design for A_{CFRP}

Mu	-98.655	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

fs' = fy (Assumption Valid)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK C-1
BEAM 6363

LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	450	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f _c	20.9	MPa
β ₁	0.8484	

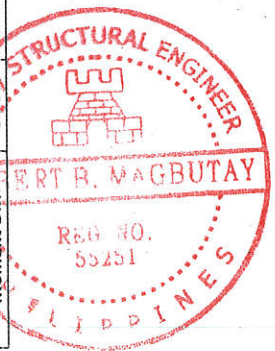
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	20	mm
bot dia	20	mm
As	1570.8	mm ²
As'	1570.8	mm ²
As2	0	mm ²
As1	1570.8	mm ²
fy	230	MPa

Calculated values		
c	58.02	mm
"a"	49.224168	mm
es'	0	
fs'	0	MPa
et	0.0172	

calculated φ	1.69
use φ	0.9

Mu (CAP) =	118.81 KN-m
Mu (DEM) =	34.801 KN-m

p/c RATIO	0.029	SAFE
Moment Diff	-84,009	KN-m



CFRP Design for A_{CFRP}

Mu	-84.009	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d'	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-2
BEAM 1
LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	250	mm	
h	250	mm	
d	194	mm	
d'	56	mm	

Concrete Properties		
f _c	20.9	MPa
β ₁	0.8484	

Steel Properties			
top bars	5	pcs	
bot bars	3	pcs	
top dia	12	mm	
bot dia	12	mm	
As	339.29	mm ²	
As'	339.29	mm ²	
As2	0	mm ²	
As1	339.29	mm ²	
f _y	230	MPa	

Calculated values			
c	40.81	mm	
"a"	34.623204	mm	
es'	0		
fs'	0	MPa	
et	0.0113		

calculated φ	1.31
use φ	0.9

Mu (CAP) =	12.41 KN-m
Mu (DEM) =	38.89 KN-m

D/C RATIO	3.13
Moment Diff	26.48



CFRP Design for A_{CFRP}

Mu	26.48	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_c} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000251663
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	16.74	KN-m
------	-------	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	1.883022222
----	-------------

$$\rho = \frac{0.85 f_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f_c}} \right)$$

ρ	0.000407152
---	-------------

Area CFRP = ρ b d

A _{CFRP}		mm ²
-------------------	--	-----------------

Area 1 = ρ max b d

A ₁	15.73	mm ²
----------------	-------	-----------------

$$a = \frac{A_1 f_y}{0.85 f_c b}$$

a	17.35	mm ²
c	20.45	mm
d	250	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Design CFRP for Tension and Compression

Mu1(new)	12.86	KN-m
Mu2(new)	13.62	KN-m

A ₂	22.38	mm ²
fs'	600	MPa

Area CFRP (Tension)

A _{CFRP}	182.77	mm ²
-------------------	--------	-----------------

Area CFRP (Compression)

A _{CFRP}	38.11	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-2
BEAM 225
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

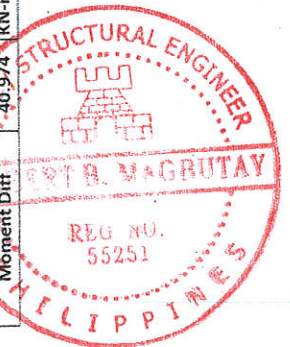
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

calculated values		
c	40.81	mm
"a"	34.623204	mm
es'	0	
fs'	0	MPa
et	0.0113	

calculated φ	1.31
use φ	0.9

Mu (CAP) =	12.41 KN-m
Mu (DEM) =	53.384 KN-m

D/C RATIO	0.4/4.3
Moment Diff	40.974



CFRP Design for A_{CFRP}

Mu	40.974	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{fy}$$

ρ max	0.000251663
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	16.74	KN-m
------	-------	------

Design Code for Reinforced Concrete

Mu

Rn	2.913705667
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	0.000653538
---	-------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}		mm ²
-------------------	--	-----------------

A ₁	15.73	mm ²
----------------	-------	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	17.35	mm
c	20.45	mm
d	250	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	12.86	KN-m
Mu2(new)	28.114	KN-m

A ₂	46.2	mm ²
fs'	600	MPa

Area CFRP (Tension)

A _{CFRP}	377.3	mm ²
-------------------	-------	-----------------

Area CFRP (Compression)

A _{CFRP}	61.93	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-2
BEAM 295
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	250	mm
h	250	mm
d	194	mm
d'	56	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

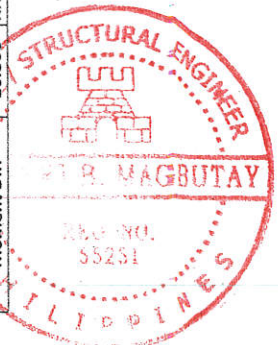
Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

calculated values		
c	40.81	mm
"a"	34.623204	mm
es'	0	
fs'	0	MPa
et	0.0113	

calculated φ	1.31
use φ	0.9

Mu (CAP) =	12.41 KN-m
Mu (DEM) =	39.216 KN-m

D/C RATIO	3.16	RETROFIT
Moment Diff	26.806	KN-m



CFRP Design for A_{CFRP}

Mu	26.806	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	0.000251663
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	16.74	KN-m
------	-------	------

Mmax Mu

Rn	1.906204444
$Rn = \frac{Mu}{\phi b d^2}$	

fs' = fy (Assumption Value)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	0.000412486
---	-------------

A _{CFRP}		mm ²
Area CFRP = ρ b d		

A ₁	15.73	mm ²
Area 1 = ρmax b d		

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	17.35	mm ²
c	20.45	mm
d	250	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	12.86	KN-m
Mu2(new)	13.946	KN-m

A ₂	22.92	mm ²
fs'	600	MPa

A _{CFRP} (Tension)	187.18	mm ²
-----------------------------	--------	-----------------

A _{CFRP} (Compression)	38.65	mm ²
---------------------------------	-------	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-2
BEAM 354
LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	250	mm	
h	250	mm	
d	194	mm	
d'	56	mm	

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	12	mm	
bot dia	12	mm	
As	339.29	mm ²	
As'	339.29	mm ²	
As2	0	mm ²	
As1	339.29	mm ²	
fy	230	MPa	

Calculated values			
c	40.81	mm	
"a"	34.623204	mm	
es'	0		
fs'	0	MPa	
et	0.0113		

calculated φ	1.31
use φ	0.9

Mu (CAP) =	12.41 KN-m
Mu (DEM) =	9.619 KN-m

D/C RATIO	0.78	SAFE
Moment Diff	2.791	KN-m



CFRP Design for A_{CFRP}

Mu	-2.791	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + fy} \right)}{fy}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$\alpha = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	250	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-3
BEAM 578

LOCATION GROUND TO SECOND FLOOR

Beam Properties			
b	300	mm	
h	300	mm	
d	244	mm	
d'	56	mm	

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

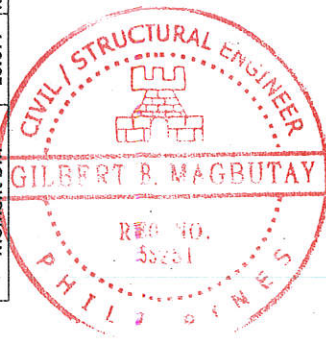
Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	12	mm	
bot dia	12	mm	
As	339.29	mm ²	
As'	339.29	mm ²	
As2	0	mm ²	
As1	339.29	mm ²	
fy	230	MPa	

Calculated values			
c	38.21	mm	
"a"	32.417364	mm	
es'	0		
fs'	0	MPa	
et	0.0162		

calculated φ	1.63
use φ	0.9

Mu (CAP) =	16 KN-m
Mu (DEM) =	26.677 KN-m

D/C RATIO	1.67	RETROFIT
Moment Diff	10.677	KN-m



CFRP Design for A_{CFRP}

Mu	10.677	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	0.000251663
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	28.92	KN-m
------	-------	------

Design Mu for Column

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	0.439382716
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	9.08072E-05
---	-------------

Area CFRP = ρ b d

A _{CFRP}	8.17	mm ²
-------------------	------	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF COLUMNS (NSCP 2015)

MARK GC-3
BEAM 579
LOCATION GROUND TO SECOND FLOOR

Beam Properties		
b	300	mm
h	300	mm
d	244	mm
d'	56	mm

Concrete Properties		
f'c	20.9	MPa
β1	0.8484	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	12	mm
bot dia	12	mm
As	339.29	mm ²
As'	339.29	mm ²
As2	0	mm ²
As1	339.29	mm ²
fy	230	MPa

calculated values		
c	38.21	mm
"a"	32.417364	mm
es'	0	
fs'	0	MPa
et	0.0162	

calculated φ	1.63
use φ	0.9

Mu (CAP) =	16 KN-m
Mu (DEM) =	6.454 KN-m

D/C RATIO	0.4	SAFE
Moment Diff	-9.546	KN-m

CFRP Design for A_{CFRP}

Mu	-9.546	KN-m
Fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.95 f'c b}$$

a	-	mm ²
c	-	mm
d	300	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _p	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 164 (L)
LOCATION 2F

Beam Properties		
b	400	mm
h	700	mm
d	640	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
ρ1	0.85	

Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	43.71	mm ²
As1	898.77	mm ²
fy	230	MPa

calculated values		
c	60.88	mm
"a"	51.743	mm
es'	0.00004	
fs'	8	MPa
et	0.0285	

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	0.306 KN-m

D/C RATIO	0	SAFE
Moment Diff	-119.194	KN-m



CFRP Design for A_{CFRP}

Mu	-119.194	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax: Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	700	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 215 (L)
LOCATION 2F

Beam Properties		
b	400	mm
h	700	mm
d	640	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

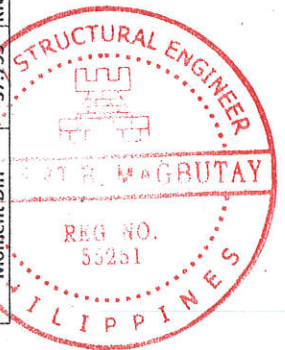
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	43.71	mm ²
As1	898.77	mm ²
f _y	230	MPa

calculated values		
c	60.88	mm
"a"	51.743	mm
es'	0.00004	
fs'	8	MPa
et	0.0285	

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	61.747 KN-m

D/C RATIO	0.52	SAFE
Moment Diff	-57.753	KN-m



CFRP Design for A_{CFRP}

Mu	-57.753	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρ_{max} bd

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	700	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Steel for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 359 (L)
LOCATION 2F

Beam Properties		
b	400	mm
h	700	mm
d	640	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
A _s	942.48	mm ²
A _s '	1256.64	mm ²
A _{s2}	43.71	mm ²
A _{s1}	898.77	mm ²
f _y	230	MPa

calculated values		
c	60.88	mm
"a"	51.748	mm
ε _s '	0.00004	
ε _t '	8	MPa
ε _t	0.0285	

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	52.302 KN-m

D/C RATIO	0.44	SAFE
Moment Diff	-67.198	KN-m



CFRP Design for A_{CFRP}

Mu	-67.198	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{f_c} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$\alpha = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	700	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{GFR}	-	mm ²
------------------	---	-----------------

A _{GFR}	-	mm ²
------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 780 (R)
LOCATION 2F

Beam Properties	
b	400 mm
h	700 mm
d	640 mm
d'	60 mm

Concrete Properties	
f _c	11.7 MPa
β ₁	0.85

Steel Properties	
top bars	4 pcs
bot bars	3 pcs
top dia	20 mm
bot dia	20 mm
A _s	942.48 mm ²
A _s '	1256.64 mm ²
A _{s2}	43.71 mm ²
A _{s1}	898.77 mm ²
f _y	230 MPa

calculated values	
c	60.88 mm
"a"	51.748 mm
ε _s	0.00004
f _s '	8 MPa
ε _t	0.0285

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	33.443 KN-m

D/C RATIO	0.28	SAFE
Moment Diff.	-86.057	KN-m

NO GOOD FOR CFRP

CFRP Design for A_{CFRP}

Mu	-86.057 KN-m
f _y	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	$\frac{Mu}{\phi b d^2}$
----	-------------------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d	mm ²
-------------------	-----------------

A _i	-	mm ²
----------------	---	-----------------

$$Area\ 1 = \rho_{max} b d$$

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	700	mm
d'	0	mm
ε _t	-	mm

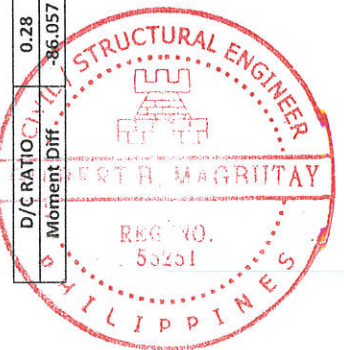
calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 798 (L)
LOCATION 2F

Beam Properties			
b	400	mm	
h	700	mm	
d	640	mm	
d'	60	mm	

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

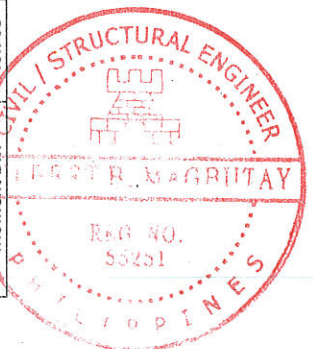
Steel Properties			
top bars	4	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
A _s	942.48	mm ²	
A _s '	1256.64	mm ²	
A _{s2}	43.71	mm ²	
A _{s1}	898.77	mm ²	
f _y	230	MPa	

calculated values		
c	60.88	mm
"a"	51.748	mm
es'	0.00004	
fs'	8	MPa
et	0.0285	

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	78.795 KN-m

D/C RATIO	0.66	SAFE
Moment Diff	40.705	KN-m



CFRP Design for A_{CFRP}

Mu	40.705	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	700	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 6101 (L)
LOCATION 2F

Beam Properties			
b	400	mm	
h	700	mm	
d	640	mm	
d'	60	mm	

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

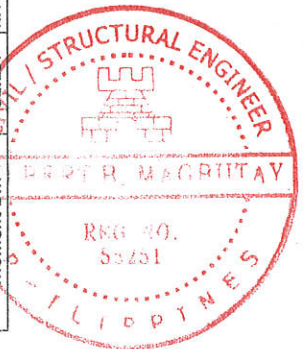
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	43.71	mm ²
As1	898.77	mm ²
fy	230	MPa

calculated values	
c	60.88
"a"	51.743
es'	0.00004
fs'	8
et	0.0285

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	27.303 KN-m

D/C RATIO	0.23	SAFE
Moment Diff	27.92.197	KN-m



CFRP Design for A_{CFRP}

Mu	-92.197	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	700	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 6235 (R)
LOCATION 2F

Beam Properties		
b	400	mm
h	700	mm
d	640	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	43.71	mm ²
As1	898.77	mm ²
fy	230	MPa

calculated values		
c	60.88	mm
"a"	51.743	mm
es'	0.00004	
fs'	8	MPa
et	0.0285	

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	54.394 KN-m

D/C RATIO	0.46	SAFE
Moment Diff	65.106	KN-m

CFRP Design for A_{CFRP}

Mu	-65.106	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A _s	-	mm ²
Area 1 = ρmax b d		

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	700	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

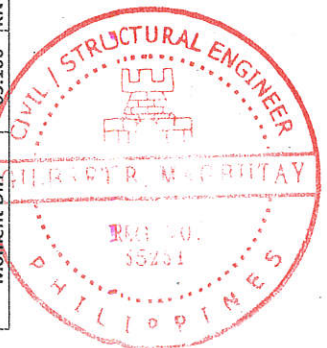
Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No steel for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-1
BEAM 6340 (R)
LOCATION 2F

Beam Properties			
b	400	mm	
h	700	mm	
d	640	mm	
d'	60	mm	

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

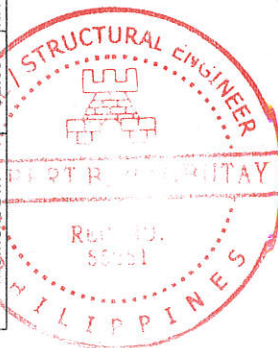
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	43.71	mm ²
As1	898.77	mm ²
fy	230	MPa

calculated values	
c	60.88 mm
"a"	51.748 mm
es'	0.00004
fs'	8 MPa
et	0.0285

calculated φ	2.43
use φ	0.9

Mu (CAP) =	119.5 KN-m
Mu (DEM) =	56.846 KN-m

D/C RATIO	0.56	SAFE
Moment Diff	52.654	KN-m



CFRP Design for A_{CFRP}

Mu	-52.654	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced:

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area CFRP = ρ b d

A _i	-	mm ²
----------------	---	-----------------

Area 1 = ρmax b d

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	700	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 195 (R)
LOCATION 2F

Beam Properties		
b	400	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

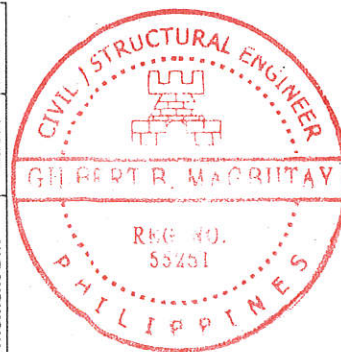
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	55.69	mm
"a"	47.3305	mm
es'	0	
fs'	0	MPa
et	0.0207	

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	96.849 KN-m

D/C RATIO	1.79	RETROFIT
Moment Diff	42.699	KN-m



CFRP Design for A_{CFRP}

Mu	42.699	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	60.08	KN-m
------	-------	------

Mmax Mu

Design CFRP for Tension only

Rn	0.474433333
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	9.92499E-05
---	-------------

A _{CFRP}	19.85	mm ²
-------------------	-------	-----------------

$$\text{Area CFRP} = \rho b d$$

A _s	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 281 (L)
LOCATION 2F

Beam Properties		
b	400	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
c	55.69 mm
"a"	47.3365 mm
es'	0
fs'	0 MPa
et	0.0207

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	66.376 KN-m

D/C RATIO	1.23	RETROFIT
Moment Diff	12.226	KN-m



CFRP Design for A_{CFRP}

Mu	12.226	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	60.08	KN-m
------	-------	------

Mmax Mu

Rn	0.13584444
----	------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	2.79153E-05
---	-------------

A _{CFRP}	5.58	mm ²
-------------------	------	-----------------

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c h}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 721 (1)
LOCATION 2F

Beam Properties		
b	400	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	55.69	mm
"a"	47.3365	mm
es'	0	
fs'	0	MPa
et	0.0207	

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	85.747 KN-m

D/C RATIO	1.58	RETRORIT
Moment Diff	31.997	KN-m



CFRP Design for A_{CFRP}

Mu	31.597	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	60.08	KN-m
------	-------	------

Mmax Mu

Rn	0.351077778
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	7.29599E-05
---	-------------

A _{CFRP}	14.59	mm ²
Area CFRP = ρ b d		

A _s	-	mm ²
Area 1 = ρmax b d		

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 5850 (L)
LOCATION 2F

Beam Properties		
b	400	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
AsL	628.32	mm ²
fy	230	MPa

calculated values		
c	55.69	mm
"a"	47.3305	mm
es'	0	
fs'	0	MPa
et	0.0207	

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	99.983 KN-m

D/c RATIO	1.85	RETROFIT
Moment Difr	45.833	KN-m



CFRP Design for A_{CFRP}

Mu	45.833	KN-m
fy	4900	MPa

Area 1 = ρ_{max} bd

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ _{max}	0.000141149
------------------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

M _{max}	60.08	KN-m
------------------	-------	------

M_{max} Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

R _n	0.509255556
----------------	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	0.000106736
---	-------------

Area CFRP = ρ bd

A _{CFRP}	21.35	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 6015 (R)
LOCATION 2F

Beam Properties			
b	400	mm	
h	500	mm	
d	440	mm	
d'	60	mm	

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

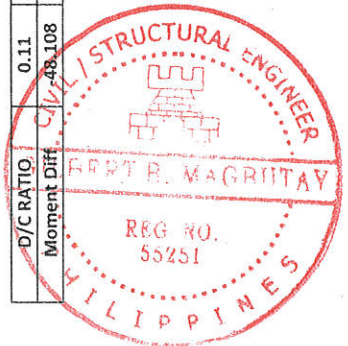
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
c	55.69 mm
"a"	47.3365 mm
es'	0
fs'	0 MPa
et	0.0207

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	6.042 KN-m

D/C RATIO	0.11	SAFE
Moment Diff.	48.108	KN-m



CFRP Design for A_{CFRP}

Mu	-43.108	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 6179 (R)
LOCATION 2F

Beam Properties		
b	400	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

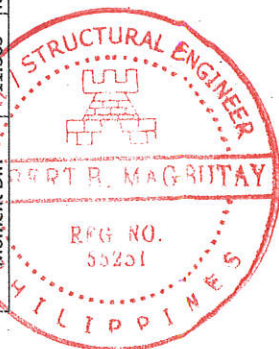
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	942.48	mm ²
A _{s2}	0	mm ²
A _{s1}	628.32	mm ²
f _y	230	MPa

calculated values		
c	55.69	mm
"a"	47.3365	mm
es'	0	
fs'	0	MPa
et	0.0207	

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	65.513 KN-m

D/C RATIO	1.21	RETRACT
Moment Diff	11.363	KN-m



CFRP Design for A_{CFRP}

Mu	11.363	KN-m
f _y	4900	MPa

A ₁	-	mm ²
----------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	60.08	KN-m
------	-------	------

Mmax Mu

Rn	0.126255556
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	2.59321E-05
---	-------------

A _{CFRP}	5.19	mm ²
-------------------	------	-----------------

$$\text{Area CFRP} = \rho b d$$

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-2
BEAM 6266 (R)
LOCATION 2F

Beam Properties			
b	400	mm	
h	500	mm	
d	440	mm	
d'	60	mm	

Concrete Properties	
f'c	11.7
β1	0.85

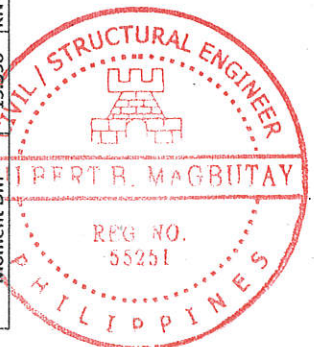
Steel Properties	
top bars	3
bot bars	2
top dia	20
bot dia	20
As	628.32
As'	942.48
As2	0
As1	628.32
fy	230

calculated values	
C	55.69
"a"	47.3305
es'	0
fs'	0
et	0.0207

calculated φ	1.92
use φ	0.9

Mu (CAP) =	54.15 KN-m
Mu (DEM) =	67.548 KN-m

D/C RATIO	1.25
Moment Diff	13.398



CFRP Design for A_{CFRP}

Mu	13.398	KN-m
fy	4900	MPa

A _t	-	mm ²
----------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	60.08	KN-m
------	-------	------

Mmax Mu

Design CFRP for tension only

Rn	0.148866667
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	3.06118E-05
---	-------------

A _{CFRP}	6.12	mm ²
-------------------	------	-----------------

Area CFRP = ρ b d

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 176 (L)
LOCATION 2F

Beam Properties		
b	300	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	59.37	mm
"a"	50.4045	mm
es'	0	
fs'	0	MPa
et	0.0192	

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	44.971 KN-m

D/C RATIO	0.83	SAFE
Moment Diff	-8.979	KN-m

CFRP Design for A_{CFRP}

Mu	-8.979	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

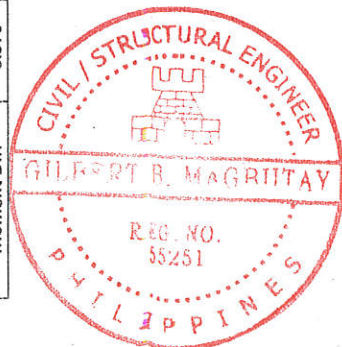
Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Noted for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 177 (R)
LOCATION 2F

Beam Properties		
b	300	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s '	628.32	mm ²
A _s	942.48	mm ²
A _{s2}	0	mm ²
A _{s1}	628.32	mm ²
f _y	230	MPa

calculated values	
c	59.37
a _s	50.4645
e _s '	0
f _s '	0
e _t	0.0192

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	42.034 KN-m

D/C RATIO	0.78	SAFE
Moment-Diff	-11.916	KN-m



CFRP Design for A_{CFRP}

Mu	-11.916	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A _s	-	mm ²
Area 1 = ρ _{max} b d		

$$a = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
e _t	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Steel for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 280 (R)
LOCATION 2F

Beam Properties		
b	300	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	59.37	mm
"a"	50.4645	mm
es'	0	
fs'	0	MPa
et	0.0192	

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	33.999 KN-m

D/C RATIO	0.63	SAFE
Moment Diff	-19.951	KN-m

CFRP Design for A_{CFRP}

Mu	-19.951	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	$Rn = \frac{Mu}{\phi b d^2}$
	-

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 360 (L)
LOCATION 2F

Beam Properties	
b	300 mm
h	500 mm
d	440 mm
d'	60 mm

Concrete Properties	
f _c	11.7 MPa
β ₁	0.85

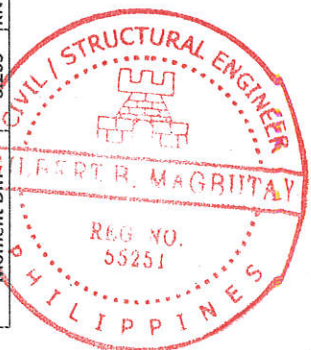
Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
A _s	628.32 mm ²
A _s '	942.48 mm ²
A _{s2}	0 mm ²
A _{s1}	628.32 mm ²
f _y	230 MPa

calculated values	
c	59.37 mm
"a"	50.4045 mm
ε _s '	0
f _s '	0 MPa
ε _t	0.0192

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	45.747 KN-m

D/C RATIO	0.85	SAFE
Moment Diff.	-8.203	KN-m



CFRP Design for A_{CFRP}

Mu	-8.203	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d'	500	mm
d'	0	mm
ε _t	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 615 (L)
LOCATION 2F

Beam Properties	
b	300 mm
h	500 mm
d	440 mm
d'	60 mm

Concrete Properties	
f'c	11.7 MPa
β1	0.85

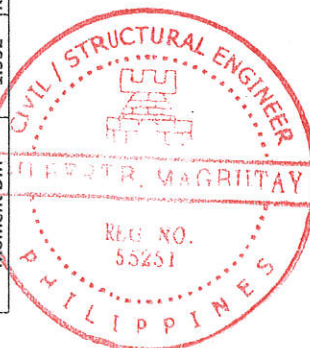
Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	942.48 mm ²
As2	0 mm ²
As1	628.32 mm ²
fy	230 MPa

calculated values	
c	59.37 mm
"a"	50.4645 mm
es'	0
fs'	0 MPa
et	0.0192

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	51.998 KN-m

D/C RATIO	0.96 SAFE
Moment Diff	-1.952 KN-m



CFRP Design for A_{CFRP}

Mu	-1.952 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _s	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$u = \frac{A_1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 797 (R)
LOCATION 2F

Beam Properties			
b	300	mm	
h	500	mm	
d	440	mm	
d'	60	mm	

Concrete Properties	
f'c	11.7 MPa
β1	0.85

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm²
As'	942.48	mm²
As2	0	mm²
As1	628.32	mm²
fy	230	MPa

calculated values	
c	59.37 mm
a"	50.4645 mm
es'	0
fs'	0 MPa
εt	0.0192

calculated φ	1.82
use φ	0.9

Mu (CAP) =	59.95 KN-m
Mu (DEM) =	40.365 KN-m

D/C RATIO	0.75	SAFE
Moment Diff	-13.584	KN-m



CFRP Design for A_{CFRP}

Mu	-13.584	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm²
Area CFRP = ρ b d		

A _t	-	mm²
Area 1 = ρmax b d		

$$u = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
εt	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

rho based for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 5950 (R)
LOCATION 2F

Beam Properties	
b	300 mm
h	500 mm
d	440 mm
d'	60 mm

Concrete Properties	
f _c	11.7 MPa
β ₁	0.85

Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
A _s	628.32 mm ²
A _s '	942.48 mm ²
A _{s2}	0 mm ²
A _{s1}	628.32 mm ²
f _y	230 MPa

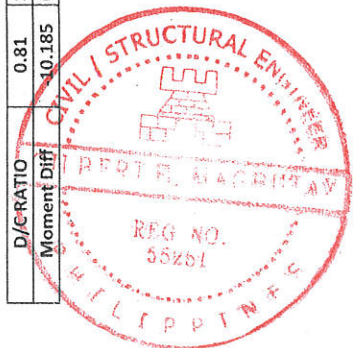
calculated values	
c	59.37 mm
"a"	50.4045 mm
ε _s '	0
ε _s	0
ε _t	0.0192

calculated φ	1.82
use φ	0.9

Mu [CAP] =	53.95 KN-m
Mu [DEM] =	43.765 KN-m

D/C-RATIO	0.81	SAFE
Moment Diff	10.185	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-10.185	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
ε _t	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _t	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015).

MARK 2B-3
BEAM 6180 (L)
LOCATION 2F

Beam Properties		
b	300	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	942.48	mm ²
A _{s2}	0	mm ²
A _{s1}	628.32	mm ²
f _y	230	MPa

calculated values		
c	59.37	mm
"a"	50.4045	mm
es'	0	
fs'	0	MPa
et	0.0192	

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	28.432 KN-m

D/C RATIO	0.53	SAFE
Moment Diff	25.518	KN-m

CFRP Design for A_{CFRP}

Mu	-25.518	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area } I = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c h}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

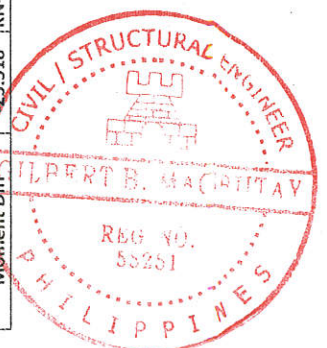
Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _i	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 6265 (R)
LOCATION 2F

Beam Properties	
b	300 mm
h	500 mm
d	440 mm
d'	60 mm

Concrete Properties	
f'c	11.7 MPa
β1	0.85

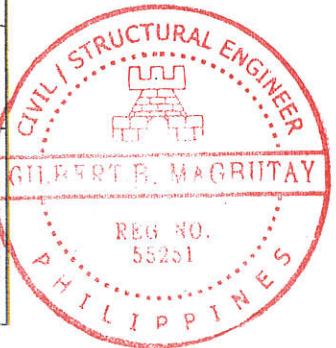
Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	942.48 mm ²
As2	0 mm ²
As1	628.32 mm ²
fy	230 MPa

calculated values	
c	59.37 mm
"a"	50.4645 mm
es'	0
fs'	0 MPa
et	0.0192

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEM) =	24.284 KN-m

D/C RATIO	0.45	SAFE
Moment Diff	-29.666	KN-m



CFRP Design for A_{CFRP}

Mu	-29.666	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c h}$$

a	-	mm
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-3
BEAM 6333 (R)
LOCATION 2F

Beam Properties		
b	300	mm
h	500	mm
d	440	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

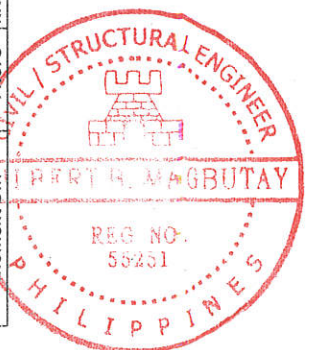
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	59.37	mm
"a"	50.4045	mm
es'	0	
fs'	0	MPa
et	0.0192	

calculated φ	1.82
use φ	0.9

Mu (CAP) =	53.95 KN-m
Mu (DEMAND) =	9.277 KN-m

D/C RATIO	0.17	SAFE
Moment Diff	44.673	KN-m



CFRP Design for A_{CFRP}

Mu	-44.673	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area CFRP = ρ b d

A _s	-	mm ²
----------------	---	-----------------

Area 1 = ρ max b d

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	500	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Based for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 3 (L)
LOCATION 2F

Beam Properties	
b	250 mm
h	350 mm
d	290 mm
d'	60 mm

Concrete Properties	
f'c	11.7 MPa
β1	0.85

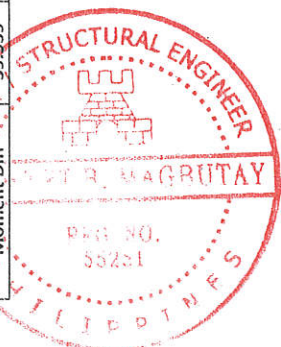
Steel Properties	
top bars	2 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	628.32 mm ²
As2	54.64 mm ²
As1	573.68 mm ²
fy	230 MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	73.859 KN-m

D/C RATIO	2.18	RETROFIT
Moment Diff	39.959	KN-m



CFRP Design for A_{CFRP}

Mu	39.959 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	18.4 KN-m
------	-----------

Mmax < Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	1.449759637
----	-------------

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	0.000321302
---	-------------

Area CFRP = ρ b d

A _{CFRP}	- mm ²
-------------------	-------------------

Area 1 = ρmax b d

A ₁	12.35 mm ²
----------------	-----------------------

$$\alpha = \frac{A1 f_y}{0.85 f'c b}$$

a	24.34 mm'
c	28.64 mm
d	350 mm
d'	0 mm
et	0.0337 mm

calculated φ	3.29
use φ	0.9

Mu1(new)	15.13 KN-m
Mu2(new)	24.829 KN-m

A ₂	24.48 mm'
fs'	600 MPa

Area CFRP (Tension)

A _{CFRP}	199.92 mm ²
-------------------	------------------------

Area CFRP (Compression)

A _{CFRP}	36.83 mm ²
-------------------	-----------------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 3 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

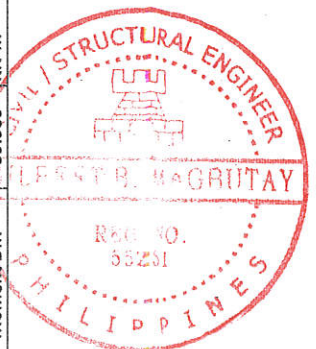
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	73.859 KN-m

D/C RATIO	2.18	RETROFIT
Moment-Diff	39.959	KN-m



CFRP Design for A_{CFRP}

Mu	39.959	KN-m
fy	4900	MPa

A _i	12.35	mm ²
----------------	-------	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	18.4	KN-m
------	------	------

Mmax Mu

Design CFRP for Tension and Compression

Rn	1.449759637
----	-------------

Mu1(new)	15.13	KN-m
Mu2(new)	24.829	KN-m

A _s	24.48	mm ²
fs'	600	MPa

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	0.000321302
---	-------------

Area CFRP (Tension)

A _{CFRP}	199.92	mm ²
-------------------	--------	-----------------

Area CFRP (Compression)

A _{CFRP}	36.83	mm ²
-------------------	-------	-----------------

Area CFRP = ρ bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 170 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

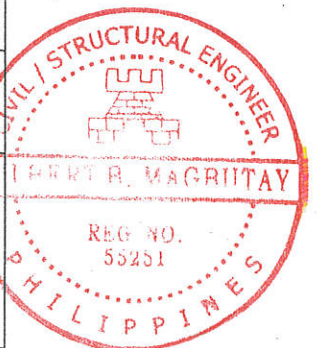
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	30.612 KN-m

D/C RATIO	0.9	SAP87
Moment Diff	-3.288	KN-m



CFRP Design for A_{CFRP}

Mu	-3.288	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 250 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

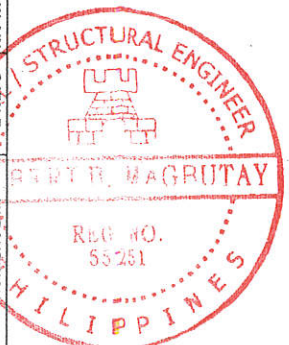
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	19.721 KN-m

D/C RATIO	0.58	SAFE
Moment Diff	14.179	KN-m



CFRP Design for A_{CFRP}

Mu	-14.179	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _s	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 28-4
BEAM 340 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties	
f _c	11.7 MPa
β ₁	0.85

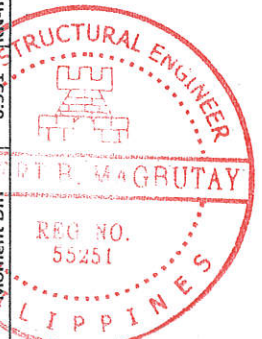
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	628.32	mm ²
A _{s2}	54.64	mm ²
A _{s1}	573.68	mm ²
f _y	230	MPa

calculated values	
c	62.17 mm
a _n	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	34.831 KN-m

D/C RATIO	1.03	RETROFIT
Moment Diff	0.931	KN-m



CFRP Design for A_{CFRP}

Mu	0.931	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	18.4	KN-m
------	------	------

Design CFRP for Tension only

Mu

Rn	0.033777778
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	6.90517E-06
---	-------------

A _{CFRP}	0.6	mm ²
-------------------	-----	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 350 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

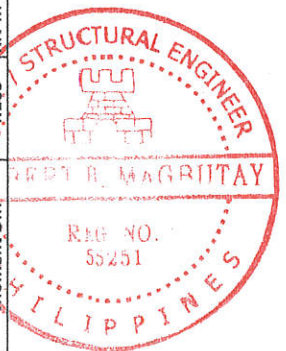
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	29.735 KN-m

D/C RATIO	0.88	SAFE
Moment Diff	4.165	KN-m



CFRP Design for A_{CFRP}

Mu	4.165	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

fy & fy (Assumption Value)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

$$Area\ 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 710 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

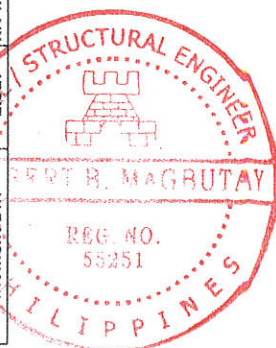
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	31.573 KN-m

D/C RATIO	0.93	SAFE
Moment Diff	2.327	KN-m



CFRP Design for A_{CFRP}

Mu	-2.327	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _i	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 28-4
BEAM 715 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

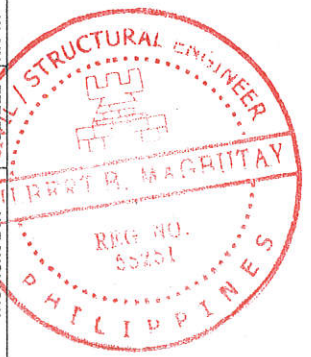
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	2.588 KN-m

D/C RATIO	0.08	SAFE
Moment Diff	31.212	KN-m



CFRP Design for A_{CFRP}

Mu	-31.212	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A _i	-	mm ²
Area I = ρmax b d		

$$u = \frac{A1 f_y}{0.85 f'c h}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _i	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 718 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

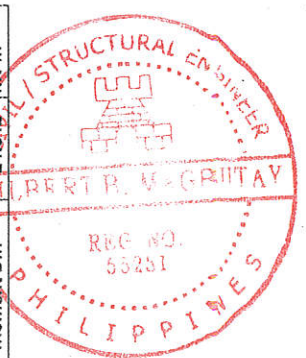
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	9.258 KN-m

D/C RATIO	0.27	SAFE
Moment Diff	24.642	KN-m



CFRP Design for A_{CFRP}

Mu	-24.642	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area } I = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 3 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

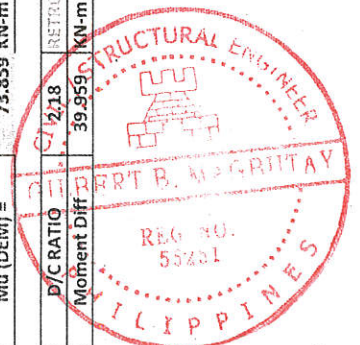
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	628.32	mm ²
A _{s2}	54.64	mm ²
A _{s1}	573.68	mm ²
f _y	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	73.859 KN-m

D/C RATIO	0.1218
Moment Diff	39.959 KN-m



CFRP Design for A_{CFRP}

Mu	39.959	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	18.4	KN-m
------	------	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	1.449759637
----	-------------

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	0.000321302
---	-------------

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρ_{max} b d

A ₁	12.35	mm ²
----------------	-------	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	24.34	mm ²
c	28.64	mm
d	350	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	15.13	KN-m
Mu2(new)	24.829	KN-m

A ₂	24.48	mm ²
fs'	500	MPa

Area CFRP (Tension)

A _{CFRP}	199.92	mm ²
-------------------	--------	-----------------

Area CFRP (Compression)

A _{CFRP}	36.83	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 170 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

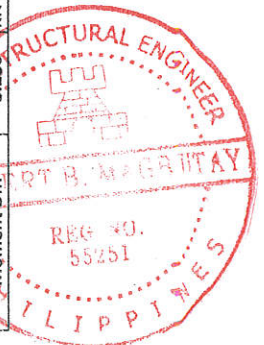
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	30.612 KN-m

D/C RATIO	1/0.9	SAFE
Moment Diff	-3.288	KN-m



CFRP Design for A_{CFRP}

Mu	-3.288	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$a = \frac{A_t fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 250 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	628.32	mm ²
A _{s2}	54.64	mm ²
A _{s1}	573.68	mm ²
f _y	230	MPa

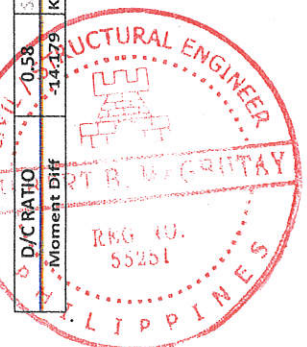
calculated values		
c	62.17	mm
"a"	52.8445	mm
ε _s '	0.0001	
f _s '	20	MPa
ε _t	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	19.721 KN-m

D/C RATIO	0.58	SAFE
Moment Dif	-14.179	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-14.179	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$A_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 310 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

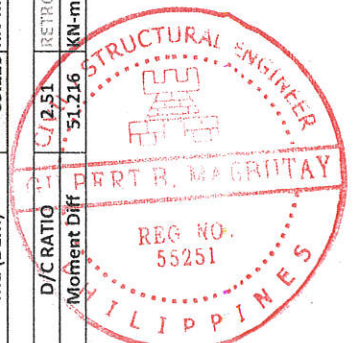
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	85.116 KN-m

D/C RATIO	0.1251	RETROFIT
Moment Diff	51.216	KN-m



CFRP Design for A_{CFRP}

Mu	51.216	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	18.4	KN-m
------	------	------

Design CFRP for Tension and Compression

Mu

Rn	1.858176871
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$p = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

p	0.000423379
---	-------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area CFRP = ρ b d

A _i	12.35	mm ²
----------------	-------	-----------------

Area I = pmax b d

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	24.34	mm ²
c	28.64	mm
d	350	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	15.13	KN-m
Mu2(new)	36.086	KN-m

A _s	35.58	mm ²
fs'	600	MPa

Area CFRP (Tension)

A _{CFRP}	290.57	mm ²
-------------------	--------	-----------------

Area CFRP (Compression)

A _{CFRP}	47.93	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 340 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

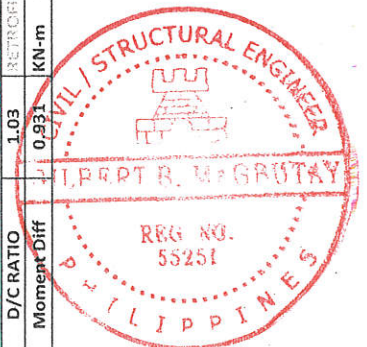
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	34.831 KN-m

D/C RATIO	1.03	RETROFIT
Moment Diff	0.951	KN-m



CFRP Design for A_{CFRP}

Mu	0.931	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y} = 0.000141149$$

ρ max	0.000141149
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	18.4	KN-m
------	------	------

(Example 12.4 for Tension only)

Mu

Rn	0.033777778
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	6.90517E-06
---	-------------

A _{CFRP}	0.6	mm ²
-------------------	-----	-----------------

Area CFRP = ρ b d

A _t	-	mm ²
----------------	---	-----------------

Area 1 = ρmax b d

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

$$a = \frac{A1 f_y}{0.85 f'c b}$$

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 350 (L)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

calculated values		
c	62.17	mm
"a"	52.8445	mm
es'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	29.735 KN-m

D/C RATIO	0.88
Moment Diff.	4.165



CFRP Design for A_{CFRP}

Mu	-4.165	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area\ 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 710 (R)
LOCATION 2F

Beam Properties		
b	250	mm
h	350	mm
d	290	mm
d'	60	mm

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

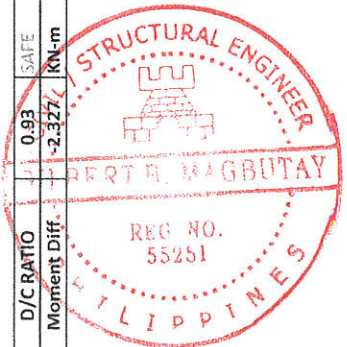
calculated values		
c	62.17	mm
"a"	52.8445	mm
εs'	0.0001	
fs'	20	MPa
et	0.011	

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	31.573 KN-m

D/C RATIO	0.93	SAFE
Moment Diff.	-2.327%	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-2.327	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	350	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 715 (L)
LOCATION 2F

Beam Properties	
b	250 mm
h	350 mm
d	290 mm
d'	60 mm

Concrete Properties	
f'c	11.7 MPa
β1	0.85

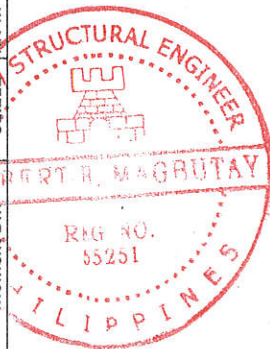
Steel Properties	
top bars	2 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	628.32 mm ²
As2	54.64 mm ²
As1	573.68 mm ²
fy	230 MPa

calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	2.688 KN-m

D/C RATIO	0.08	SAFE
Moment Diff	-31.212	KN-m



CFRP Design for A_{CFRP}

Mu	-31.212	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c h}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Based for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-4
BEAM 718 (R)
LOCATION 2F

Beam Properties			
b	250	mm	
h	350	mm	
d	290	mm	
d'	60	mm	

Concrete Properties		
f'c	11.7	MPa
β1	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	54.64	mm ²
As1	573.68	mm ²
fy	230	MPa

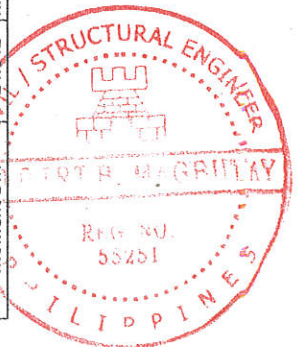
calculated values	
c	62.17 mm
"a"	52.8445 mm
es'	0.0001
fs'	20 MPa
et	0.011

calculated φ	1.29
use φ	0.9

Mu (CAP) =	33.9 KN-m
Mu (DEM) =	9.258 KN-m

D/C RATIO	0.27	SAFE
Moment Diff	0.4724642	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-24.642	KN-m
fy	4900	MPa

A _i	-	mm ²
----------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-5
BEAM 355 (L)
LOCATION 2F

Beam Properties		
b	300	mm
h	450	mm
d	390	mm
d'	60	mm

Concrete Properties		
f _c	11.7	MPa
β ₁	0.85	

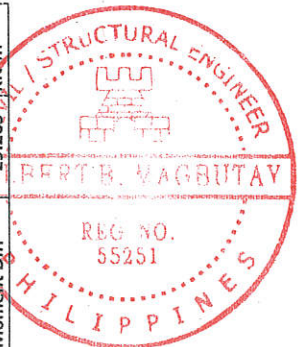
Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
A _s	628.32	mm ²
A _s '	628.32	mm ²
A _{s2}	0	mm ²
A _{s1}	628.32	mm ²
f _y	230	MPa

calculated values		
c	59.14	mm
"a"	50.269	mm
es'	0	
fs'	0	MPa
et	0.0168	

calculated φ	1.67
use φ	0.9

Mu (CAP) =	47.46 KN-m
Mu (DEM) =	18.197 KN-m

D/C RATIO	0.38	SAFE
Moment Diff	-29.263	KN-m



CFRP Design for A_{CFRP}

Mu	-29.263	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{f_y}{0.85 f'_c \beta_1} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρ_{max} b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-5
BEAM 372 (L)
LOCATION 2F

Beam Properties	
b	300 mm
h	450 mm
d	390 mm
d'	60 mm

Concrete Properties	
f _c	11.7 MPa
β ₁	0.85

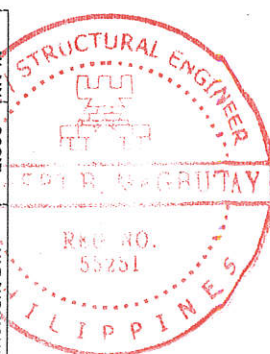
Steel Properties	
top bars	2 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
A _s	628.32 mm ²
A _s '	628.32 mm ²
A _{s2}	0 mm ²
A _{s1}	628.32 mm ²
f _y	230 MPa

calculated values	
c	59.14 mm
"a" _n	50.269 mm
ε _s '	0
f _s '	0 MPa
et	0.0168

calculated φ	1.67
use φ	0.9

Mu (CAP) =	47.46 KN-m
Mu (DEM) =	44.592 KN-m

D/C RATIO	0.94
Moment Diff.	-2.868



CFRP Design for A_{CFRP}

Mu	-2.868 KN-m
f _y	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

M _{max}	-	KN-m
------------------	---	------

M_{max} Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

$$A_s = \rho_{max} b d$$

a	-	mm ²
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 2B-5
BEAM 580 (L)
LOCATION 2F

Beam Properties	
b	300 mm
h	450 mm
d	390 mm
d'	60 mm

Concrete Properties	
f'c	11.7 MPa
β1	0.85

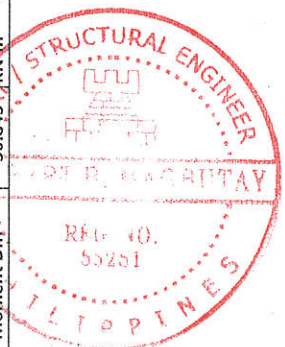
Steel Properties	
top bars	2 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	628.32 mm ²
As2	0 mm ²
As1	628.32 mm ²
fy	230 MPa

calculated values	
c	59.14 mm
"a"	50.269 mm
es'	0
fs'	0 MPa
et	0.0168

calculated φ	1.67
use φ	0.9

Mu (CAP) =	47.46 KN-m
Mu (DEM) =	16.617 KN-m

D/C RATIO	0.35
Moment Diff.	-30.843 KN-m



CFRP Design for A_{CFRP}

Mu	-30.843 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

p max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-
------	---

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-
-------------------	---

A _t	-
----------------	---

$$\text{Area 1} = \rho_{max} b d$$

mm ²	-
-----------------	---

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-
c	-
d	450
d'	0
et	-

calculated φ	-
use φ	-

Mu1(new)	-
Mu2(new)	-

A _z	-
fs'	-

A _{CFRP}	-
-------------------	---

A _{CFRP}	-
-------------------	---

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-1
BEAM 166 (L)
LOCATION 3F

Beam Properties		
b	400	mm
h	750	mm
d	690	mm
d'	60	mm

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	131.13	mm ²
As1	811.35	mm ²
fy	230	MPa

calculated values	
c	62.44 mm
"a"	53.074 mm
es'	0.00012
fs'	24 MPa
et	0.0302

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	59.169 KN-m

D/C RATIO	0.46
Moment Diff	-69.361 KN-m



CFRP Design for A_{CFRP}

Mu	-69.361 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-1
BEAM 182 (L)
LOCATION 3F

Beam Properties			
b	400	mm	
h	750	mm	
d	690	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

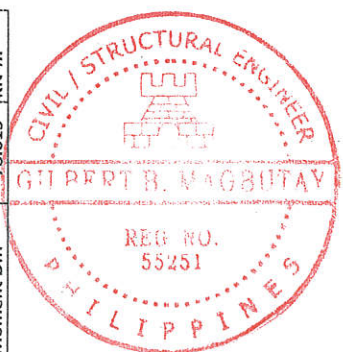
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	131.13	mm ²
As1	811.35	mm ²
fy	230	MPa

calculated values	
c	62.44
"a"	53.074
es'	0.00012
fs'	24
et	0.0302

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	50.515 KN-m

D/C RATIO	0.39	SAFE
Moment Diff	-78.015	KN-m



CFRP Design for A_{CFRP}

Mu	-78.015	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{UWR}	-	mm ²
------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-1
BEAM 366 (M)
LOCATION 3F

Beam Properties			
b	400	mm	
h	750	mm	
d	690	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	4	pcs	
top dia	20	mm	
bot dia	20	mm	
As	1256.64	mm ²	
As'	942.48	mm ²	
As2	344.21	mm ²	
Asl	912.43	mm ²	
fy	230	MPa	

calculated values	
c	69.82 mm
"a"	59.347 mm
es'	0.00042
fs'	84 MPa
et	0.0266

calculated φ	2.3
use φ	0.9

Mu (CAP) =	169.61 kN-m
Mu (DEM) =	35.052 kN-m

D/C RATIO	0.21	SAFE
Moment Diff	-134.558	kN-m



CFRP Design for A_{CFRP}

Mu	-134.558	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	kN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A _s	-	mm ²
Area 1 = ρ max b d		

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-1
BEAM 1064 (L)
LOCATION 3F

Beam Properties		
b	400	mm
h	750	mm
d	690	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

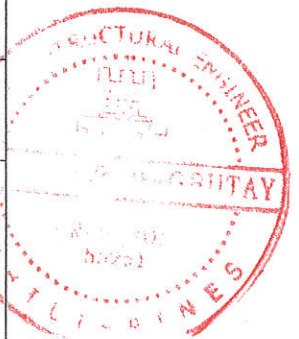
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	131.13	mm ²
As1	811.35	mm ²
fy	230	MPa

calculated values	
c	62.44 mm
a"	53.074 mm
es'	0.00012
fs'	24 MPa
et	0.0302

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	106.833 KN-m

D/C RATIO	0.83	SAFE
Moment Diff	-21.697	KN-m



CFRP Design for A_{CFRP}

Mu	-21.697	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A ₁	-	mm ²
Area 1 = ρ max b d		

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-1
BEAM 5944 (R)
LOCATION 3F

Beam Properties		
b	400	mm
h	750	mm
d	690	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

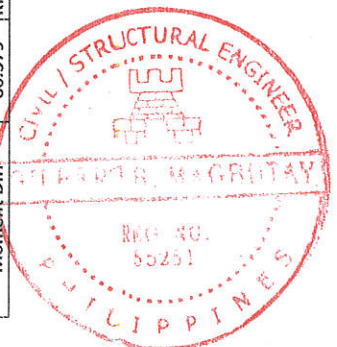
Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	131.13	mm ²
As1	811.35	mm ²
fy	230	MPa

calculated values		
c	62.44	mm
"a"	53.074	mm
es'	0.00012	
fs'	24	MPa
et	0.0302	

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 kN-m
Mu (DEM) =	214.909 kN-m

D/C RATIO	1.67	RETROFIT
Moment-Diff	86.379	kN-m



CFRP Design for A_{CFRP}

Mu	86.379	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	119.92	kN-m
------	--------	------

Mmax Mu

Design CFRP for beam apply

Rn	0.426562963
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2 Rn}{0.85 f'c}} \right)$$

ρ	8.92664E-05
---	-------------

A _{CFRP}	26.78	mm ²
-------------------	-------	-----------------

Area CFRP = ρ b d

A _s	-	mm ²
----------------	---	-----------------

Area 1 = ρmax b d

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-1
BEAM 6116 (R)
LOCATION 3F

Beam Properties		
b	400	mm
h	750	mm
d	690	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	4	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As	942.48	mm ²
As'	1256.64	mm ²
As2	131.13	mm ²
As1	811.35	mm ²
fy	230	MPa

calculated values		
c	62.44	mm
"a"	53.074	mm
es'	0.00012	
fs'	24	MPa
et	0.0302	

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	23.007 KN-m

D/C RATIO	0.18	SAFE
Moment Diff	-105.523	KN-m

CFRP Design for A_{CFRP}

Mu	-105.523	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-1
BEAM 6236 (R)
LOCATION 3F

Beam Properties	
b	400 mm
h	750 mm
d	690 mm
d'	60 mm

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties	
top bars	4 pcs
bot bars	3 pcs
top dia	20 mm
bot dia	20 mm
As	942.48 mm ²
As'	1256.64 mm ²
As2	131.13 mm ²
As1	811.35 mm ²
fy	230 MPa

calculated values	
c	62.44 mm
"a"	53.074 mm
es'	0.00012
fs'	24 MPa
et	0.0302

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	52.82 KN-m

D/C RATIO	0.41 SAFE
Moment Diff	-75.71 KN-m



CFRP Design for A_{CFRP}

Mu	-75.71 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

$$A_1 = \text{Area 1} = \rho_{max} b d$$

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

$$A_{CFRP} = \text{mm}^2$$

$$A_{CFRP} = \text{mm}^2$$

Phi Used for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-1
BEAM 6342 (L)
LOCATION 3F

Beam Properties			
b	400	mm	
h	750	mm	
d	690	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties			
top bars	4	pcs	
bot bars	3	pcs	
top dia	20	mm	
bot dia	20	mm	
As	942.48	mm ²	
As'	1256.64	mm ²	
As2	131.13	mm ²	
As1	811.35	mm ²	
fy	230	MPa	

calculated values	
c	62.44 mm
"a"	53.074 mm
es'	0.00012
fs'	24 MPa
εt	0.0302

calculated φ	2.54
use φ	0.9

Mu (CAP) =	128.53 KN-m
Mu (DEM) =	87.519 KN-m

D/C RATIO	0.68	SAFE
Moment Diff	-41.011	KN-m

CFRP Design for A_{CFRP}

Mu	-41.011	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area_{CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	750	mm
d'	0	mm
εt	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 202 (L)
LOCATION 3F

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	2	pcs	
top dia	20	mm	
bot dia	20	mm	
As	628.32	mm ²	
As'	942.48	mm ²	
As2	0	mm ²	
As1	628.32	mm ²	
fy	230	MPa	

calculated values		
c	57.25	mm
"a"	48.6025	mm
es'	0	
fs'	0	MPa
et	0.0149	

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	64.259 KN-m

D/C RATIO	1.57	RETROFIT
Moment-Diff	23.199	KN-m



CFRP Design for A_{CFRP}

Mu	23.199	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	34.11	KN-m
------	-------	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	0.402760417
----	-------------

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	8.41629E-05
---	-------------

Area CFRP = ρ b d

A _{CFRP}	13.47	mm ²
-------------------	-------	-----------------

Area 1 = ρmax b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 202 (R)
LOCATION 3F

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

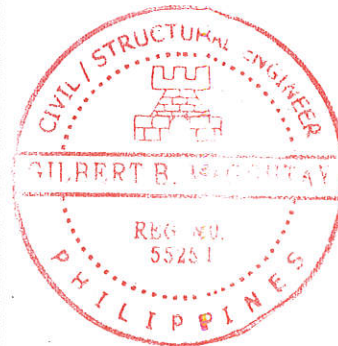
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	57.25	mm
"a"	48.6625	mm
es'	0	
fs'	0	MPa
et	0.0148	

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	64.259 KN-m

D/C RATIO	1.57	RETROFIT
Moment Diff	23.199	KN-m



CFRP Design for A_{CFRP}

Mu	23.199	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	34.11	KN-m
------	-------	------

Mmax Mu

Design CFRP for Tension only

Rn	0.402760417
----	-------------

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	8.41629E-05
---	-------------

A _{CFRP}	13.47	mm ²
-------------------	-------	-----------------

Area CFRP = ρ b d

A _s	-	mm ²
----------------	---	-----------------

Area 1 = ρmax b d

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 390 (R)
LOCATION 3F

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values		
c	57.25	mm
"a"	48.6025	mm
es'	0	
fs'	0	MPa
et	0.0148	

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	3.095 KN-m

D/C RATIO	0.08	SAFE
Moment Diff	-37.965	KN-m

CFRP Design for A_{CFRP}

Mu	-37.965	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area CFRP = ρ b d

A _i	-	mm ²
----------------	---	-----------------

Area 1 = ρmax b d

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Mu1, Mu2 for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 400 (R)
LOCATION 3F

Beam Properties	
b	400 mm
h	400 mm
d	340 mm
d'	60 mm

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	20 mm
bot dia	20 mm
As	628.32 mm ²
As'	942.48 mm ²
As2	0 mm ²
As1	628.32 mm ²
fy	230 MPa

calculated values	
c	57.25 mm
"a"	48.6625 mm
es'	0
fs'	0 MPa
et	0.0143

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	5.458 KN-m

D/C RATIO	0.16 SAFE
Moment Diff	34.592 KN-m



CFRP Design for A_{CFRP}

Mu	34.592 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-
------	---

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-
-------------------	---

$$\text{Area CFRP} = \rho b d$$

A _t	-
----------------	---

$$\text{Area } I = \rho_{max} b d$$

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-
c	-
d	400 mm
d'	0 mm
et	-

calculated φ	-
use φ	-

Mu1(new)	-
Mu2(new)	-

A ₂	-
fs'	-

A _{CFRP}	-
-------------------	---

A _{CFRP}	-
-------------------	---

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 410 (M)
LOCATION 3F

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	20	mm
bot dia	20	mm
As'	942.48	mm ²
As'	942.48	mm ²
As2	122.93	mm ²
As1	819.55	mm ²
fy	230	MPa

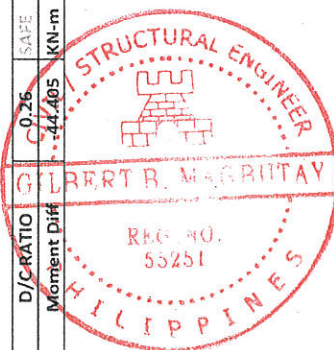
calculated values	
c	63.07 mm
"a"	53.6095 mm
es'	0.00015
fs'	30 MPa
et	0.0132

calculated φ	1.43
use φ	0.9

Mu (CAP) =	60.26 KN-m
Mu (DEM) =	15.855 KN-m

D/C RATIO	0.26	SAFE
Moment Diff	44.405	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-44.405	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	-

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-2
BEAM 5865 (L)
LOCATION 3F

Beam Properties		
b	400	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

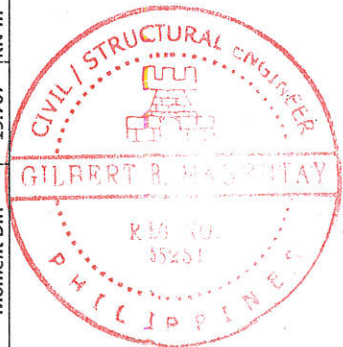
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm²
As'	942.48	mm²
As2	0	mm²
As1	628.32	mm²
fy	230	MPa

calculated values	
c	57.25 mm
"a"	48.6625 mm
es'	0
fs'	0 MPa
et	0.0148

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	60.767 KN-m

D/C RATIO	1.48	RETROFIT
Moment Diff	19.707	KN-m



CFRP Design for A_{CFRP}

Mu	19.707	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	34.11	KN-m
------	-------	------

USE φ = 0.9 FOR TOP AND BOT

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	0.342135417
----	-------------

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

ρ	7.12325E-05
---	-------------

$$A_{CFRP} = \rho b d$$

A _{CFRP}	11.4	mm²
-------------------	------	-----

$$Area 1 = \rho_{max} b d$$

A ₁	-	mm²
----------------	---	-----

$$u = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 6042 (R)
LOCATION 3F

Beam Properties			
b	400		mm
h	400		mm
d	340		mm
d'	60		mm

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
c	57.25 mm
"a"	48.6025 mm
es'	0
fs'	0 MPa
et	0.0148

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	20.707 KN-m

D/C RATIO	0.5	SAFE
Moment Diff.	20.353	KN-m



CFRP Design for A_{CFRP}

Mu	-20.353	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c h}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 6188 (L)
LOCATION 3F

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm²
As'	942.48	mm²
As2	0	mm²
As1	628.32	mm²
fy	230	MPa

calculated values	
c	57.25 mm
"a"	48.6025 mm
es'	0
fs'	0 MPa
et	0.0149

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	56.707 KN-m

D/C RATIO	1.62	RETROFIT
Moment Diff.	1/25.647	KN-m



CFRP Design for A_{CFRP}

Mu	25.647	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	34.11	KN-m
------	-------	------

Design CFRP for tension only

Mu

Rn	0.445260417
----	-------------

By Tension Only

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	9.32859E-05
---	-------------

A _{CFRP}	14.93	mm²
-------------------	-------	-----

A _i	-	mm²
----------------	---	-----

Area 1 = ρmax bd

$$u = \frac{A1 f_y}{0.85 f'c h}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-2
BEAM 6273 (R)
LOCATION 3F

Beam Properties			
b	400	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

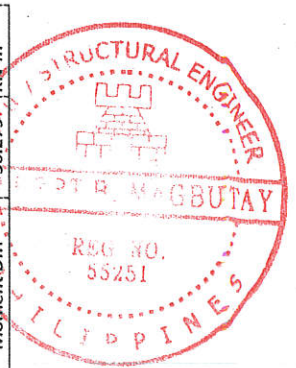
Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	942.48	mm ²
As2	0	mm ²
As1	628.32	mm ²
fy	230	MPa

calculated values	
c	57.25 mm
"a"	48.6025 mm
es'	0
fs'	0 MPa
et	0.0149

calculated φ	1.54
use φ	0.9

Mu (CAP) =	41.06 KN-m
Mu (DEM) =	77.339 KN-m

D/C RATIO	1.88	RETROFIT
Moment-Diff	36.279	KN-m



CFRP Design for A_{CFRP}

Mu	36.279	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	0.000125224
-------	-------------

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	34.11	KN-m
------	-------	------

Design CFRP for Tension and Compression

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	0.62984375
----	------------

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

ρ	0.000133488
---	-------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

A ₁	20.04	mm ²
----------------	-------	-----------------

$$u = \frac{A_1 f_y}{0.85 f'c b}$$

a	27.82	mm
c	32.73	mm
d	400	mm
d'	0	mm
et	0.0337	

calculated φ	3.29
use φ	0.9

Mu1(new)	28.82	KN-m
Mu2(new)	7.459	KN-m

A _s	6.04	mm ²
fs'	600	MPa

$$\text{Area CFRP (Tension)}$$

A _{CFRP}	49.33	mm ²
-------------------	-------	-----------------

$$\text{Area CFRP (Compression)}$$

A _{CFRP}	26.08	mm ²
-------------------	-------	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-3
BEAM 178 (R)
LOCATION 3F

Beam Properties		
b	350	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties	
f _c	10.38 MPa
β ₁	0.85

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
A _s	1256.64	mm ²
A _s '	1256.64	mm ²
A _{s2}	458.95	mm ²
A _{s1}	797.69	mm ²
f _y	230	MPa

calculated values	
c	69.8 mm
"a" _n	59.33 mm
es'	0.00042
fs'	84 MPa
et	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	39.559 KN-m

D/C RATIO	0.51	SAFE
Moment Diff	-38.281	KN-m

CFRP Design for A_{CFRP}

Mu	-38.281	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

f_y > f_y (Assumption Valid)

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A _i	-	mm ²
----------------	---	-----------------

$$Area\ 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-3
BEAM 220 (L)
LOCATION 3F

Beam Properties			
b	350	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

calculated values	
c	69.8 mm
"a"	59.33 mm
es'	0.00042
fs'	84 MPa
et	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	39.443 KN-m

D/C RATIO	0.51	SAFE
Moment Diff	-38.397	KN-m

CFRP Design for A_{CFRP}

Mu	-38.397	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

Area 1 = ρmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-3

BEAM 260 (L)

LOCATION 3F

Beam Properties			
b	350	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

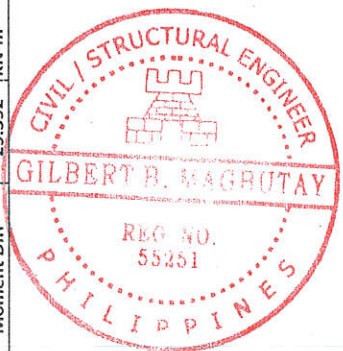
Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

calculated values	
c	69.8 mm
"a"	59.33 mm
es'	0.00042
fs'	84 MPa
εt	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 kN-m
Mu (DEM) =	48.448 kN-m

D/C RATIO	0.62	SAFE
Moment Diff	-29.392	kN-m



CFRP Design for A_{CFRP}

Mu	-29.392	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	kN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

Check by EA assumption Valid

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
εt	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-3

BEAM 330 (R)

LOCATION	3F
101	101
102	102
103	103
104	104
105	105
106	106
107	107
108	108
109	109
110	110
111	111
112	112
113	113
114	114
115	115
116	116
117	117
118	118
119	119
120	120
121	121
122	122
123	123
124	124
125	125
126	126
127	127
128	128
129	129
130	130
131	131
132	132
133	133
134	134
135	135
136	136
137	137
138	138
139	139
140	140
141	141
142	142
143	143
144	144
145	145
146	146
147	147
148	148
149	149
150	150
151	151
152	152
153	153
154	154
155	155
156	156
157	157
158	158
159	159
160	160
161	161
162	162
163	163
164	164
165	165
166	166
167	167
168	168
169	169
170	170
171	171
172	172
173	173
174	174
175	175
176	176
177	177
178	178
179	179
180	180
181	181
182	182
183	183
184	184
185	185
186	186
187	187
188	188
189	189
190	190
191	191
192	192
193	193
194	194
195	195
196	196
197	197
198	198
199	199
200	200

Beam Properties	
b	350 mm
h	400 mm
d	340 mm
d'	60 mm

Concrete Properties		
f'_c	10.38	MPa
β_1	0.85	

Steel Properties			
top bars	4		pcs
bot bars	4		pcs
top dia	20		mm
bot dia	20		mm
As	1256.64		mm ²
As'	1256.64		mm ²
As2	459.95		mm ²
As1	797.69		mm ²
fy	230		MPa

calculated values	
c	69.8
"a"	59.33
es'	0.00042
fs'	84
et	0.0116

calculated ϕ	1.33
use ϕ	0.9

M_u (CAP) =	77.84	KN-m
M_u (DEM) =	50.071	KN-m

D/C RATIO	0.64	SAFE
Moment Diff	-27.769	KN-m

No Need to Turn On

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

Area CRP = 0.00		mm ²
A _{CRP}	-	

CFRP Design for A_{CFRP}

Mu	-27.769	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f' c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ_{\max}	-
---------------	---

$$M_{\max} = \varphi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

	Mmax	Mu
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

Rn	$Rn = \frac{Mu}{\varphi b d^2}$	-
----	---------------------------------	---

[illegible]

A_{csp}	-	mm^2
------------------	---	---------------

A		mm ²
---	---	-----------------

Area 1 = pinax bd		
A ₁	-	mm ²


$$a = \frac{A1fy}{0.85f'cb}$$

a	-	mm ²
c	-	mm
d	400	mm
d''	0	mm
et	-	

calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A_2	-	mm'
fs'	-	MPa



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-3
BEAM 738 (R)
LOCATION 3F

Beam Properties		
b	350	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

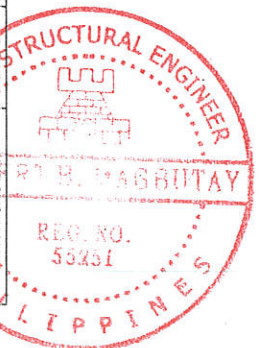
calculated values		
c	69.8	mm
"a"	59.33	mm
es'	0.00042	
fs'	84	MPa
et	0.0116	

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	37.851 KN-m

OD/C RATIO	0.40	SAFE
Moment Diff	-39.989	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-39.989	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

Area 1 = omax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-3
BEAM 5964 (R)
LOCATION 3F

Beam Properties		
b	350	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

calculated values	
c	69.8 mm
"a"	59.33 mm
es'	0.00042
fs'	84 MPa
et	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	34.442 KN-m

D/C RATIO	0.44	SAFE
Moment Diff	43.398	KN-m



CFRP Design for A_{CFRP}

Mu	-43.398	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A _i	-	mm ²
Area I = pmax b d		

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Phi Used for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-3
BEAM 6187 (L)
LOCATION 3F

Beam Properties			
b	350	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

calculated values	
c	69.8 mm
"a"	59.33 mm
es'	0.00042
fs'	84 MPa
et	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	35.145 KN-m

D/C RATIO	0.45	SAFE
Moment Diff	42.695	KN-m

No Need for CFRP

CFRP Design for A_{CFRP}

Mu	-42.695	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

Not a Valid Value

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

Area 1 = ρmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-3
BEAM 6319 (R)
LOCATION 3F

Beam Properties		
b	350	mm
h	400	mm
d	340	mm
d'	60	mm

Concrete Properties		
f _c	10.38	MPa
β ₁	0.85	

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

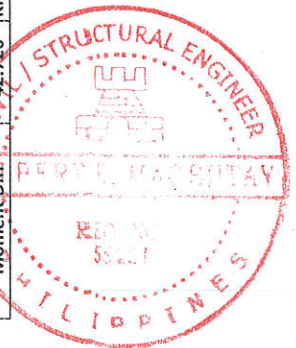
calculated values		
c	69.8	mm
a"	59.33	mm
es'	0.00042	
fs'	84	MPa
et	0.0116	

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 KN-m
Mu (DEM) =	35.114 KN-m

D/C RATIO	0.45	SAFE
Moment Diff	41.42726	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-42.726	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 3B-3
BEAM 6345 (R)
LOCATION 3F

Beam Properties			
b	350	mm	
h	400	mm	
d	340	mm	
d'	60	mm	

Concrete Properties	
f'c	10.38 MPa
β1	0.85

Steel Properties		
top bars	4	pcs
bot bars	4	pcs
top dia	20	mm
bot dia	20	mm
As	1256.64	mm ²
As'	1256.64	mm ²
As2	458.95	mm ²
As1	797.69	mm ²
fy	230	MPa

calculated values	
c	69.8 mm
"a"	59.33 mm
es'	0.00042
fs'	84 MPa
et	0.0116

calculated φ	1.33
use φ	0.9

Mu (CAP) =	77.84 kN-m
Mu (DEM) =	19.055 kN-m

D/C RATIO	0.24	SAFE
Moment Diff	-58.785	kN-m



CFRP Design for A_{CFRP}

Mu	-58.785	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	kN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

NSCP Assumption Valid

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

$$Area\ 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	400	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-4
BEAM 6 (L)
LOCATION 3F

Beam Properties			
b	300	mm	
h	450	mm	
d	390	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

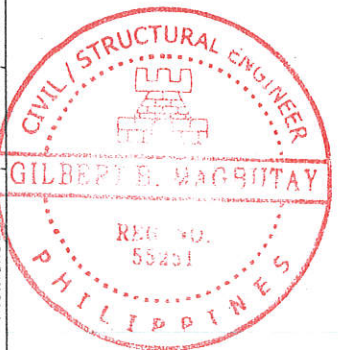
Steel Properties			
top bars	2	pcs	
bot bars	2	pcs	
top dia	20	mm	
bot dia	20	mm	
As	628.32	mm ²	
As'	628.32	mm ²	
As2	32.78	mm ²	
As1	595.54	mm ²	
fy	230	MPa	

calculated values		
c	61.13	mm
"a"	51.9605	mm
es'	0.00006	
fs'	12	MPa
et	0.0161	

calculated φ	1.62
use φ	0.9

Mu (CAP) =	47.11 kN-m
Mu (DEM) =	30.207 kN-m

D/C RATIO	0.64	SAFE
Moment Diff	-16.903	kN-m



CFRP Design for A_{CFRP}

Mu	-16.903	kN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	kN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = pmax bd

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	kN-m
Mu2(new)	-	kN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-4
BEAM 358 (L)
LOCATION 3F

Beam Properties			
b	300	mm	
h	450	mm	
d	390	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties			
top bars	2	pcs	
bot bars	2	pcs	
top dia	20	mm	
bot dia	20	mm	
As	628.32	mm ²	
As'	628.32	mm ²	
As2	32.78	mm ²	
As1	595.54	mm ²	
fy	230	MPa	

calculated values	
c	61.13 mm
"a"	51.9605 mm
es'	0.00006
fs'	12 MPa
et	0.0161

calculated φ	1.62
use φ	0.9

Mu (CAP) =	47.11 KN-m
Mu (DEM) =	8.433 KN-m

D/C RATIO	0.18	SAFE
Moment-Diff	38.677	KN-m



CFRP Design for A_{CFRP}

Mu	-38.677	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

Rein. (Assumption Valid)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area\ 1 = \rho_{max} b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 38-4
 BEAM 587 (R)
 LOCATION 3F

Beam Properties			
b	300	mm	
h	450	mm	
d	390	mm	
d'	60	mm	

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	32.78	mm ²
As1	595.54	mm ²
fy	230	MPa

calculated values	
c	61.13 mm
"a"	51.9605 mm
es'	0.00006
fs'	12 MPa
et	0.0161

calculated φ	1.62
use φ	0.9

Mu (CAP) =	47.11 KN-m
Mu (DEM) =	10.734 KN-m

D/C RATIO	0.23	SAFE
Moment Diff	36.376	KN-m



CFRP Design for A_{CFRP}

Mu	36.376	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$Area_1 = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

LOCATION	3F
1000	
1001	
1002	
1003	
1004	
1005	
1006	
1007	
1008	
1009	
1010	
1011	
1012	
1013	
1014	
1015	
1016	
1017	
1018	
1019	
1020	
1021	
1022	
1023	
1024	
1025	
1026	
1027	
1028	
1029	
1030	
1031	
1032	
1033	
1034	
1035	
1036	
1037	
1038	
1039	
1040	
1041	
1042	
1043	
1044	
1045	
1046	
1047	
1048	
1049	
1050	
1051	
1052	
1053	
1054	
1055	
1056	
1057	
1058	
1059	
1060	
1061	
1062	
1063	
1064	
1065	
1066	
1067	
1068	
1069	
1070	
1071	
1072	
1073	
1074	
1075	
1076	
1077	
1078	
1079	
1080	
1081	
1082	
1083	
1084	
1085	
1086	
1087	
1088	
1089	
1090	
1091	
1092	
1093	
1094	
1095	
1096	
1097	
1098	
1099	
1100	
1101	
1102	
1103	
1104	
1105	
1106	
1107	
1108	
1109	
1110	
1111	
1112	
1113	
1114	
1115	
1116	
1117	
1118	
1119	
1120	
1121	
1122	
1123	
1124	
1125	
1126	
1127	
1128	
1129	
1130	
1131	
1132	
1133	
1134	
1135	
1136	
1137	
1138	
1139	
1140	
1141	
1142	
1143	
1144	
1145	
1146	
1147	
1148	
1149	
1150	
1151	
1152	
1153	
1154	
1155	
1156	
1157	
1158	
1159	
1160	
1161	
1162	
1163	
1164	
1165	
1166	
1167	
1168	
1169	
1170	
1171	
1172	
1173	
1174	
1175	
1176	
1177	
1178	
1179	
1180	
1181	
1182	
1183	
1184</	

Beam Properties	
b	200 mm
h	350 mm
d	290 mm
d'	60 mm

Concrete Properties		
f'c	10.38	MPa
β1	0.85	

Steel Properties		
top bars	2	pcs
bot bars	2	pcs
top dia	20	mm
bot dia	20	mm
As	628.32	mm ²
As'	628.32	mm ²
As2	185.76	mm ²
As1	447.56	mm ²
f _y	230	MPa

calculated values		
c	67.71	mm
"a"	57.5535	mm
es'	0.00034	
fs'	68	MPa
st	0.0098	

calculated ϕ	1.21
use ϕ	0.9

M_u (CAP) =	32.77	KN-m
M_u (DEM) =	36.033	KN-m

D/C RATIO	1.1	RETROFIT
Moment Diff	3.763	KN-m

CFRP Design for A_{CFRP}

Mu	3.263	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f' c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

p max	0.000125224
-------	-------------

$$M_{\max} = \phi_p b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	13.06	KN-m
------	-------	------

Design CTRP for Foreign only

	Mmax	Mu
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

$$R_n = \frac{Mu}{\phi b d^2}$$

Rn	0.147981859
----	-------------

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

D	3.0458E-05
---	------------

Area CFRP = 0.04

A_{con}	2.13	mm^2
------------------	------	---------------

Area 1 = ρ_{\max} bd

A_1	-	mm^2
-------	---	---------------

$$a = \frac{A1fy}{0.85f'cb}$$

a	-	mm ²
c	-	mm
d	350	mm
d'	0	mm
et	-	

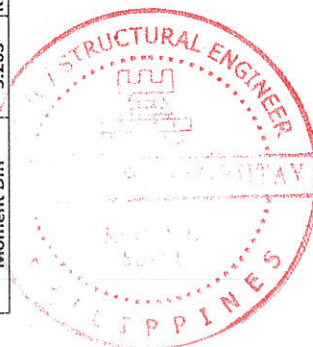
calculated ϕ	-
use ϕ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
f _s	-	MPa

A_{con}	-	mm^2
------------------	---	---------------

A_{eff}	σ_{eff}	mm^2
0.000	0.000	0.000
0.001	0.001	0.001
0.002	0.002	0.002
0.003	0.003	0.003
0.004	0.004	0.004
0.005	0.005	0.005
0.006	0.006	0.006
0.007	0.007	0.007
0.008	0.008	0.008
0.009	0.009	0.009
0.010	0.010	0.010
0.011	0.011	0.011
0.012	0.012	0.012
0.013	0.013	0.013
0.014	0.014	0.014
0.015	0.015	0.015
0.016	0.016	0.016
0.017	0.017	0.017
0.018	0.018	0.018
0.019	0.019	0.019
0.020	0.020	0.020
0.021	0.021	0.021
0.022	0.022	0.022
0.023	0.023	0.023
0.024	0.024	0.024
0.025	0.025	0.025
0.026	0.026	0.026
0.027	0.027	0.027
0.028	0.028	0.028
0.029	0.029	0.029
0.030	0.030	0.030
0.031	0.031	0.031
0.032	0.032	0.032
0.033	0.033	0.033
0.034	0.034	0.034
0.035	0.035	0.035
0.036	0.036	0.036
0.037	0.037	0.037
0.038	0.038	0.038
0.039	0.039	0.039
0.040	0.040	0.040
0.041	0.041	0.041
0.042	0.042	0.042
0.043	0.043	0.043
0.044	0.044	0.044
0.045	0.045	0.045
0.046	0.046	0.046
0.047	0.047	0.047
0.048	0.048	0.048
0.049	0.049	0.049
0.050	0.050	0.050
0.051	0.051	0.051
0.052	0.052	0.052
0.053	0.053	0.053
0.054	0.054	0.054
0.055	0.055	0.055
0.056	0.056	0.056
0.057	0.057	0.057
0.058	0.058	0.058
0.059	0.059	0.059
0.060	0.060	0.060
0.061	0.061	0.061
0.062	0.062	0.062
0.063	0.063	0.063
0.064	0.064	0.064
0.065	0.065	0.065
0.066	0.066	0.066
0.067	0.067	0.067
0.068	0.068	0.068
0.069	0.069	0.069
0.070	0.070	0.070
0.071	0.071	0.071
0.072	0.072	0.072
0.073	0.073	0.073
0.074	0.074	0.074
0.075	0.075	0.075
0.076	0.076	0.076
0.077	0.077	0.077
0.078	0.078	0.078
0.079	0.079	0.079
0.080	0.080	0.080
0.081	0.081	0.081
0.082	0.082	0.082
0.083	0.083	0.083
0.084	0.084	0.084
0.085	0.085	0.085
0.086	0.086	0.086
0.087	0.087	0.087
0.088	0.088	0.088
0.089	0.089	0.089
0.090	0.090	0.090
0.091	0.091	0.091
0.092	0.092	0.092
0.093	0.093	0.093
0.094	0.094	0.094
0.095	0.095	0.095
0.096	0.096	0.096
0.097	0.097	0.097
0.098	0.098	0.098
0.099	0.099	0.099
0.100	0.100	0.100



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-1
BEAM 168 (L)
LOCATION 4F

Beam Properties			
b	300	mm	
h	750	mm	
d	692	mm	
d'	58	mm	

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

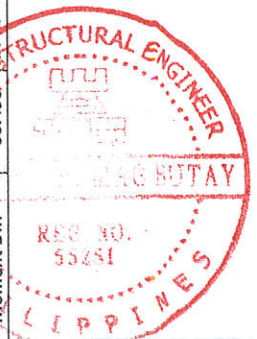
Steel Properties			
top bars	4	pcs	
bot bars	4	pcs	
top dia	16	mm	
bot dia	16	mm	
As	804.25	mm ²	
As'	804.25	mm ²	
As2	209.8	mm ²	
As1	594.45	mm ²	
fy	230	MPa	

calculated values	
c	64.36 mm
"a"	54.706 mm
es'	0.0003
fs'	60 MPa
et	0.0293

calculated φ	2.48
use φ	0.9

Mu (CAP) =	109.32 KN-m
Mu (DEM) =	20.827 KN-m

D/C RATIO	0.194 SAFE
Moment Diff	-88.495 KN-m



CFRP Design for A_{CFRP}

Mu	-88.493	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = pmax bd

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-1
BEAM 210 (L)
LOCATION 4F

Beam Properties	
b	300 mm
h	750 mm
d	692 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

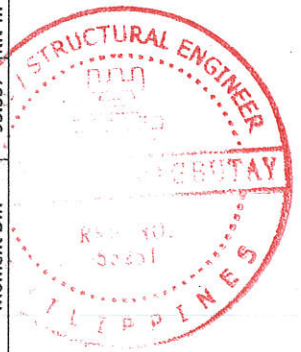
Steel Properties	
top bars	4 pcs
bot bars	4 pcs
top dia	16 mm
bot dia	16 mm
As	804.25 mm ²
As'	804.25 mm ²
As2	209.8 mm ²
As1	594.45 mm ²
fy	230 MPa

calculated values	
c	64.36 mm
"a"	54.706 mm
es'	0.0003
fs'	60 MPa
et	0.0293

calculated φ	2.48
use φ	0.9

Mu (CAP) =	109.32 KN-m
Mu (DEM) =	15.783 KN-m

D/C RATIO	0.14	SAFE
Moment Diff	93.537	KN-m



CFRP Design for A_{CFRP}

Mu	-93.537 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

b_{eff} by (Assumption Value)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$Area 1 = \rho_{max} b d$$

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 48-1
BEAM 270 (R)
LOCATION 4F

Beam Properties	
b	300 mm
h	750 mm
d	692 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

Steel Properties	
top bars	4 pcs
bot bars	4 pcs
top dia	16 mm
bot dia	16 mm
As	804.25 mm ²
As'	804.25 mm ²
As2	209.3 mm ²
As1	594.45 mm ²
fy	230 MPa

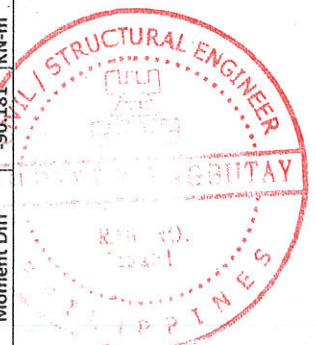
calculated values	
c	64.36 mm
"a"	54.706 mm
es'	0.0003
fs'	60 MPa
et	0.0293

calculated φ	2.48
use φ	0.9

Mu (CAP) =	109.32 KN-m
Mu (DEM) =	19.139 KN-m

D/C RATIO	0.18	SAFE
Moment Diff	-90.181	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-90.181 KN-m
fy	4900 MPa

A _i	-	mm ²
----------------	---	-----------------

Area 1 = ρmax bd

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$u = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	750	mm
d'	0	mm
et	-	mm

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

calculated φ	-
use φ	-

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-1
BEAM 370 (L)
LOCATION 4F

Beam Properties	
b	300 mm
h	750 mm
d	692 mm
d'	58 mm

Concrete Properties	
f _c	9.84 MPa
β ₁	0.85

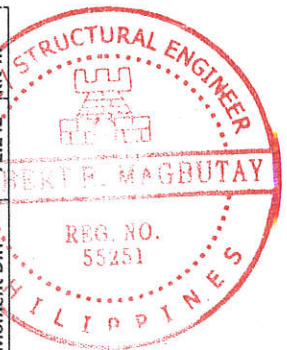
Steel Properties	
top bars	4 pcs
bot bars	4 pcs
top dia	16 mm
bot dia	16 mm
As	804.25 mm ²
As'	804.25 mm ²
As2	209.8 mm ²
As1	594.45 mm ²
fy	230 MPa

calculated values	
c	64.36 mm
"a"	54.706 mm
es'	0.0003
fs'	60 MPa
et	0.0293

calculated φ	2.48
use φ	0.9

Mu (CAP) =	109.32 KN-m
Mu (DEM) =	37.078 KN-m

D/C RATIO	0.3477 SAFE
Moment Diff	-72.242 KN-m



CFRP Design for A_{CFRP}

Mu	-72.242 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-
------	---

Mmax

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

if R_n > R_n(max) then use φ = 0.65

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-
-------------------	---

A _t	-
----------------	---

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_t f_y}{0.85 f'_c b}$$

a	-
c	-
d	750 mm
d'	0 mm
et	-

calculated φ	-
use φ	-

Mu1(new)	-
Mu2(new)	-

A ₂	-
fs'	-

A _{CFRP}	-
-------------------	---

A _{CFRP}	-
-------------------	---

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 48-2
BEAM 486 (L)
LOCATION 4F

Beam Properties	
b	400 mm
h	950 mm
d	892 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

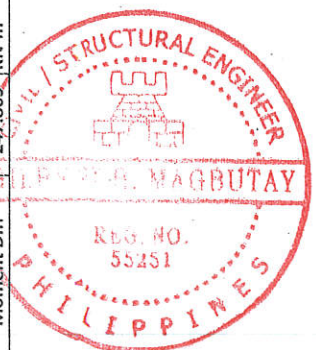
Steel Properties	
top bars	8 pcs
bot bars	8 pcs
top dia	16 mm
bot dia	16 mm
As	1608.5 mm²
As'	1608.5 mm²
As2	741.31 mm²
As1	867.19 mm²
fy	230 MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	34.851 KN-m

D/C RATIO	0.12	SAFE
Moment Diff	247.869	KN-m



CFRP Design for A_{CFRP}

Mu	-247.869	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A_{CFRP}	-	mm²
------------	---	-----

Area 1 = pmax bd

A1	-	mm²
----	---	-----

$$a = \frac{A1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A2	-	mm²
fs'	-	MPa

A_{CFRP}	-	mm²
------------	---	-----

A_{CFRP}	-	mm²
------------	---	-----

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 490 (R)
LOCATION 4F

Beam Properties			
b	400	mm	
h	950	mm	
d	892	mm	
d'	58	mm	

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm ²
As'	1608.5	mm ²
As2	741.31	mm ²
As1	867.19	mm ²
fy	230	MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	9.603 KN-m

D/C RATIO	0.03	SAFE
Moment Diff	273.127	KN-m



CFRP Design for A_{CFRP}

Mu	-273.127	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

A1	-	mm ²
----	---	-----------------

Area 1 = pmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A2	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 48-2
BEAM 500 (L)
LOCATION 4F

Beam Properties	
b	400 mm
h	950 mm
d	892 mm
d'	58 mm

Concrete Properties	
f _c	9.84 MPa
β ₁	0.85

Steel Properties	
top bars	8 pcs
bot bars	8 pcs
top dia	16 mm
bot dia	16 mm
A _s	1608.5 mm ²
A _s '	1608.5 mm ²
A _{s2}	741.31 mm ²
A _{s1}	867.19 mm ²
f _y	230 MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
ε _s '	0.00053
f _s '	106 MPa
ε _t	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	22.218 KN-m

D/C RATIO	0.08	SAFE
Moment Diff	-260.512	KN-m

CFRP Design for A_{CFRP}

Mu	-260.512 KN-m
f _y	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

M _{max}	-	KN-m
------------------	---	------

M_u

$$R_n = \frac{M_u}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

$$A_{CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

Area 1 = p_{max} b d

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
ε _t	-	-

calculated φ	-
use φ	-

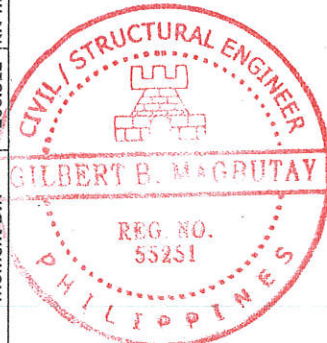
Mu ₁ (new)	-	KN-m
Mu ₂ (new)	-	KN-m

A ₂	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 680 (M)
LOCATION 4F

Beam Properties		
b	400	mm
h	950	mm
d	892	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm²
As'	1608.5	mm²
As2	741.31	mm²
As1	867.19	mm²
fy	230	MPa

calculated values		
c	70.38	mm
"a"	59.823	mm
es'	0.00053	
fs'	106	MPa
et	0.035	

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	29.875 KN-m

D/C RATIO	0.11	SAFE
Moment Diff	252.855	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-252.855	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax > Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

$$Area_{CFRP} = \rho b d$$

A ₁	-	mm²
----------------	---	-----

Area 1 = pmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm²
fs'	-	MPa

A _{CFRP}	-	mm²
-------------------	---	-----

A _{CFRP}	-	mm²
-------------------	---	-----

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 48-2
BEAM 6120 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	950	mm
d	892	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

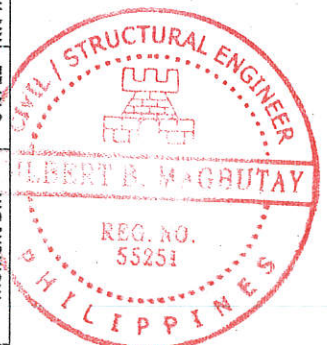
Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm ²
As'	1608.5	mm ²
As2	741.31	mm ²
As1	867.19	mm ²
fy	230	MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	218.018 KN-m

D/C RATIO	0.77	SAFE
Moment Diff	-64.712	KN-m



CFRP Design for A_{CFRP}

Mu	-64.712	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn = fy (Assumption Valid)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

Area 1 = pmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 6200 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	950	mm
d	892	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm ²
As'	1608.5	mm ²
As2	741.31	mm ²
As1	867.19	mm ²
fy	230	MPa

calculated values		
c	70.38	mm
"a"	59.823	mm
es'	0.00053	
fs'	106	MPa
et	0.035	

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	227.534 KN-m

D/C RATIO	0.8	SAFE
Moment Diff	-55.196	KN-m



CFRP Design for A_{CFRP}

Mu	-55.196	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A _t	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 6225 (R)
LOCATION 4F

Beam Properties		
b	400	mm
h	950	mm
d	892	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

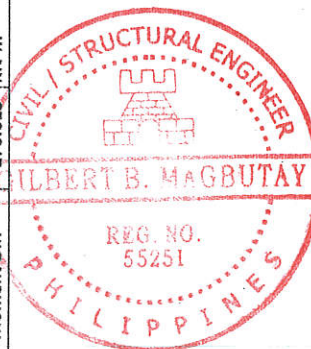
Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm ²
As'	1608.5	mm ²
As2	741.31	mm ²
As1	867.19	mm ²
fy	230	MPa

calculated values		
c	70.38	mm
"a"	59.823	mm
es'	0.00053	
fs'	106	MPa
et	0.035	

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	12.117 KN-m

D/C RATIO	0.04	SAFE
Moment Diff	-270.613	KN-m



CFRP Design for A_{CFRP}

Mu	-270.613	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

A _t	-	mm ²
----------------	---	-----------------

Area 1 = pmax bd

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _z	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 6300 (L)
LOCATION 4F

Beam Properties	
b	400 mm
h	950 mm
d	892 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

Steel Properties	
top bars	8 pcs
bot bars	8 pcs
top dia	16 mm
bot dia	16 mm
As	1608.5 mm ²
As'	1608.5 mm ²
As2	741.31 mm ²
As1	867.19 mm ²
fy	230 MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	32.027 KN-m

D/C RATIO	0.11
Moment Diff	SAFE



CFRP Design for A_{CFRP}

Mu	-250.703 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-
Mu	-

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-
mm ²	-

A _t	-
mm ²	-

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-
c	-
d	950 mm
d'	0 mm
et	-

calculated φ	-
use φ	-

Mu1(new)	-
Mu2(new)	-

A _t	-
fs'	-

A _{CFRP}	-
mm ²	-

A _{CFRP}	-
mm ²	-

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 6330 (L)
LOCATION 4F

Beam Properties	
b	400 mm
h	950 mm
d	892 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

Steel Properties	
top bars	8 pcs
bot bars	8 pcs
top dia	16 mm
bot dia	16 mm
As	1608.5 mm ²
As'	1608.5 mm ²
As2	741.31 mm ²
As1	867.19 mm ²
fy	230 MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	17.467 KN-m

D/C RATIO	0.06
Moment Diff.	SAFE



CFRP Design for A_{CFRP}

Mu	-265.263 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + f'c} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

Area 1 = pmax bd

$$u = \frac{A_1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(ncw)	-	KN-m
Mu2(ncw)	-	KN-m

A _z	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-2
BEAM 6347 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	950	mm
d	892	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

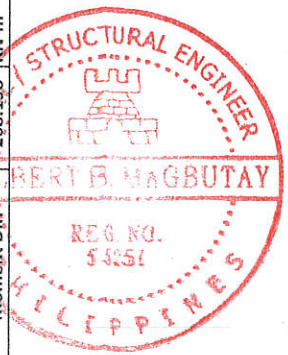
Steel Properties		
top bars	8	pcs
bot bars	8	pcs
top dia	16	mm
bot dia	16	mm
As	1608.5	mm ²
As'	1608.5	mm ²
As2	741.31	mm ²
As1	867.19	mm ²
fy	230	MPa

calculated values	
c	70.38 mm
"a"	59.823 mm
es'	0.00053
fs'	106 MPa
et	0.035

calculated φ	2.85
use φ	0.9

Mu (CAP) =	282.73 KN-m
Mu (DEM) =	14.532 KN-m

D/C RATIO	0.05	SAFE
Moment Diff	-268.198	KN-m



CFRP Design for A_{CFRP}

Mu	-268.198	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Is a by assumption valid?

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A _s	-	mm ²
----------------	---	-----------------

$$Area_1 = \phi_{max} b d$$

$$u = \frac{A_1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	950	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 640 (R)
LOCATION 4F

Beam Properties	
b	400 mm
h	650 mm
d	592 mm
d'	58 mm

Concrete Properties	
f'c	9.84 MPa
β1	0.85

Steel Properties	
top bars	5 pcs
bot bars	5 pcs
top dia	16 mm
bot dia	16 mm
As	1005.31 mm ²
As'	1005.31 mm ²
As2	218.55 mm ²
As1	786.76 mm ²
fy	230 MPa

calculated values	
c	63.36 mm
"a"	53.856 mm
es'	0.00025
fs'	50 MPa
et	0.025

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	41.783 KN-m

D/C RATIO	0.36	SAFE
Moment Diff	74.397	KN-m



CFRP Design for A_{CFRP}

Mu	-74.397	KN-m
fy	4900	MPa

A _i	-	mm ²
----------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	650	mm
d'	0	mm
et	-	mm

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

calculated φ	-
use φ	-

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$Area_{CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 48-3
BEAM 1067 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

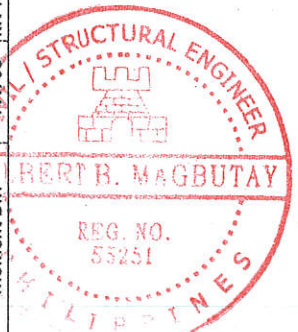
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
As	1005.31	mm ²
As'	1005.31	mm ²
As2	218.55	mm ²
Asl	786.76	mm ²
fy	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
es'	0.00025	
fs'	50	MPa
et	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	38.472 KN-m

D/C RATIO	0.33	SAFE
Moment Diff	0.77708	KN-m



CFRP Design for A_{CFRP}

Mu	-77.708	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	650	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 125 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

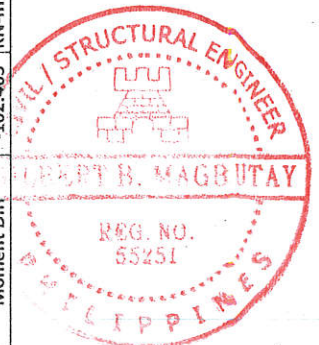
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
As	1005.31	mm ²
As'	1005.31	mm ²
As2	218.55	mm ²
As1	786.76	mm ²
fy	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
εs'	0.00025	
fs'	50	MPa
εt	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	13.717 KN-m

D/C RATIO	0.12	SAFE
Moment Diff	-102.463	KN-m



CFRP Design for A_{CFRP}

Mu	-102.463	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

Re = fy (Assumption Valid)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

A ₁	-	mm ²
----------------	---	-----------------

$$u = \frac{A1 fy}{0.85 f'c h}$$

a	-	mm
c	-	mm
d	650	mm
d'	0	mm
εt	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 6145 (R)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f _c	9.84	MPa
β ₁	0.85	

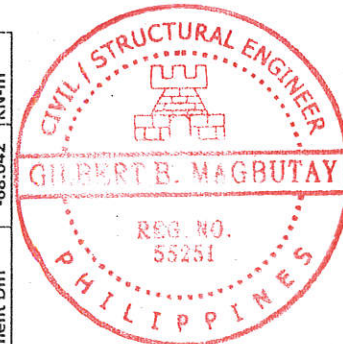
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
A _s	1005.31	mm ²
A _s '	1005.31	mm ²
A _{s2}	218.55	mm ²
A _{s1}	786.76	mm ²
f _y	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
ε _s	0.00025	
f _s	50	MPa
ε _t	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	48.138 KN-m

D/C RATIO	0.41	SAFE
Moment Diff	-68.042	KN-m



CFRP Design for A_{CFRP}

Mu	-68.042	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Not a by Assumption Valid

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	650	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s	-	MPa

$$A_{CFRP}$$

$$A_{CFRP}$$

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 6145 (R)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
As	1005.31	mm ²
As'	1005.31	mm ²
As2	218.55	mm ²
As1	786.76	mm ²
fy	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
es'	0.00025	
fs'	50	MPa
et	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	48.138 KN-m

D/C RATIO	0.41	SAGE
Moment Diff	-68.042	KN-m



CFRP Design for A_{CFRP}

Mu	-68.042	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn < fy (Assumption Valid)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$A_{CFRP} = \rho b d$$

$$Area\ 1 = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	650	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

$$A_{CFRP}$$

$$A_{CFRP}$$

Not Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 6240 (L)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f'c	9.84	MPa
β1	0.85	

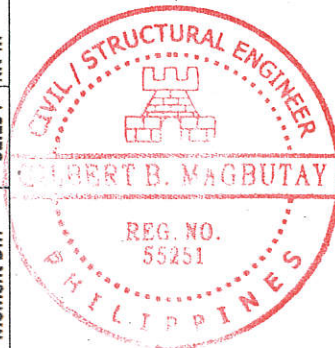
Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
As	1005.31	mm ²
As'	1005.31	mm ²
As2	218.55	mm ²
As1	786.76	mm ²
fy	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
εs'	0.00025	
fs'	50	MPa
εt	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	84.985 KN-m

D/C RATIO	0.73	SAFE
Moment Diff	-31.194	KN-m



CFRP Design for A_{CFRP}

Mu	-31.194	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

5. 2 b (Assumption Valid)

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$a' = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	650	mm
d'	0	mm
εt	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK 4B-3
BEAM 6343 (M)
LOCATION 4F

Beam Properties		
b	400	mm
h	650	mm
d	592	mm
d'	58	mm

Concrete Properties		
f _c	9.84	MPa
β ₁	0.85	

Steel Properties		
top bars	5	pcs
bot bars	5	pcs
top dia	16	mm
bot dia	16	mm
A _s	1005.31	mm ²
A _s '	1005.31	mm ²
A _{s2}	218.55	mm ²
A _{s1}	786.76	mm ²
f _y	230	MPa

calculated values		
c	63.36	mm
"a"	53.856	mm
ε _s '	0.00025	
f _s '	50	MPa
ε _t	0.025	

calculated φ	2.2
use φ	0.9

Mu (CAP) =	116.18 KN-m
Mu (DEM) =	50.589 KN-m

D/C RATIO	0.44	SAFE
Moment Diff	-65.591	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-65.591	KN-m
f _y	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

Area CFRP = ρ b d

A _{CFRP}	-	mm ²
-------------------	---	-----------------

Area 1 = ρ_{max} b d

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm ²
c	-	mm
d	650	mm
d'	0	mm
ε _t	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
f _s '	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 566 (L)
LOCATION ROOF LEVEL

Beam Properties		
b	400	mm
h	450	mm
d	392	mm
d'	58	mm

Concrete Properties		
f'c	11.77	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	16	mm
bot dia	16	mm
As	402.12	mm ²
As'	603.19	mm ²
As2	0	mm ²
As1	402.12	mm ²
fy	230	MPa

calculated values		
c	48.37	mm
"a"	41.1145	mm
es'	0	
fs'	0	MPa
et	0.0213	

calculated φ	1.96
use φ	0.9

Mu (CAP) =	30.92	KN-m
Mu (DEM) =	16.271	KN-m

D/C RATIO	0.53	SAFE
Moment Diff	14.649	KN-m



CFRP Design for A_{CFRP}

Mu	-14.649	KN-m
fy	4900	MPa

Area 1 = pmax bd

A ₁	-	mm ²
----------------	---	-----------------

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1 \left(\frac{600}{600 + fy} \right)}{fy}$$

p max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

Rn	-
----	---

87% of A_s comparison valid

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

p	-
---	---

Area CFRP = p bd

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 1070 (L)
LOCATION ROOF LEVEL

Beam Properties	
b	400 mm
h	450 mm
d	392 mm
d'	58 mm

Concrete Properties	
f'c	11.77 MPa
β1	0.85

Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	16 mm
bot dia	16 mm
As	402.12 mm ²
As'	603.19 mm ²
As2	0 mm ²
As1	402.12 mm ²
fy	230 MPa

calculated values	
c	48.37 mm
"a"	41.1145 mm
es'	0
fs'	0 MPa
et	0.0213

calculated φ	1.96
use φ	0.9

Mu (CAP) =	30.92 KN-m
Mu (DEM) =	30.419 KN-m

D/C RATIO	0.98	SAFE
Moment Diff	0.501	KN-m

CFRP Design for A_{CFRP}

Mu	-0.501 KN-m
fy	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Mu

Rn	-
$Rn = \frac{Mu}{\phi b d^2}$	

Re: fy (Assumption Value)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
Area CFRP = ρ b d		

A ₁	-	mm ²
Area 1 = ρmax b d		

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A _s	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP



MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 5982 (R)
LOCATION ROOF LEVEL

Beam Properties		
b	400	mm
h	450	mm
d	392	mm
d'	58	mm

Concrete Properties		
f'c	11.77	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	16	mm
bot dia	16	mm
As	402.12	mm ²
As'	603.19	mm ²
As2	0	mm ²
As1	402.12	mm ²
fy	230	MPa

calculated values		
c	48.37	mm
"a"	41.1145	mm
es'	0	
fs'	0	MPa
et	0.0213	

calculated φ	1.96
use φ	0.9

Mu (CAP) =	30.92 KN-m
Mu (DEM) =	15.791 KN-m

D/C RATIO	0.51	SAFE
Moment Diff	15.129	KN-m

No Need for CFRP



CFRP Design for A_{CFRP}

Mu	-15.129	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$Rn = \frac{Mu}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

p	-
---	---

$$\text{Area CFRP} = \rho b d$$

Area 1 = ρmax bd	-	mm ²
------------------	---	-----------------

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 6167 (L)
LOCATION ROOF LEVEL

Beam Properties		
b	400	mm
h	450	mm
d	392	mm
d'	58	mm

Concrete Properties		
f'c	11.77	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	16	mm
bot dia	16	mm
As	402.12	mm ²
As'	603.19	mm ²
As2	0	mm ²
As1	402.12	mm ²
fy	230	MPa

calculated values		
c	48.37	mm
"a"	41.1145	mm
es'	0	
fs'	0	MPa
et	0.0213	

calculated φ	1.96
use φ	0.9

Mu (CAP)	30.92 KN-m
Mu (DEM)	11.911 KN-m

D/C RATIO	0.39	SAFE
Moment Diff	-19.009	KN-m



CFRP Design for A_{CFRP}

Mu	-19.009	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax

Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

ρ = fy / (Assumption Value)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

A _{CFRP}	-	mm ²
-------------------	---	-----------------

$$\text{Area CFRP} = \rho b d$$

A _i	-	mm ²
----------------	---	-----------------

$$\text{Area } 1 = \rho_{max} b d$$

$$a = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm ²
c	-	mm
d	450	mm
d'	0	mm
et	-	mm

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
 BEAM 6250 (M)
 LOCATION ROOF LEVEL

Beam Properties		
b	400	mm
h	450	mm
d	392	mm
d'	58	mm

Concrete Properties		
f _c	11.77	MPa
β ₁	0.85	

Steel Properties		
top bars	3	pcs
bot bars	3	pcs
top dia	16	mm
bot dia	16	mm
As	603.19	mm ²
As'	603.19	mm ²
As2	0	mm ²
As1	603.19	mm ²
fy	230	MPa

calculated values		
c	52.33	mm
"a"	44.4805	mm
es'	0	
fs'	0	MPa
et	0.0195	

calculated φ	1.84
use φ	0.9

Mu (CAP)	46.17	KN-m
Mu (DEM)	14.734	KN-m

B/C RATIO	0.32	SAFE
Moment Diff	-31.436	KN-m



CFRP Design for A_{CFRP}

Mu	-31.436	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

f_c / f_y (Assumption V_u/V_{u1})

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

$$\text{Area 1} = \rho_{max} b d$$

$$a = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 6301 (R)
LOCATION ROOF LEVEL

Beam Properties	
b	400 mm
h	450 mm
d	392 mm
d'	58 mm

Concrete Properties	
f _c	11.77 MPa
ρ ₁	0.85

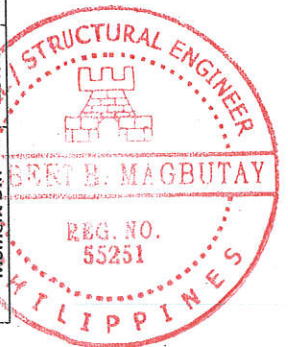
Steel Properties	
top bars	3 pcs
bot bars	2 pcs
top dia	16 mm
bot dia	16 mm
As	402.12 mm ²
As'	603.19 mm ²
As2	0 mm ²
As1	402.12 mm ²
f _y	230 MPa

calculated values	
c	48.37 mm
"a"	41.145 mm
es'	0
fs'	0 MPa
et	0.0213

calculated φ	1.96
use φ	0.9

Mu (CAP) =	30.92 KN-m
Mu (DEM) =	17.308 KN-m

D/C RATIO	0.56 SAFE
Moment Diff	-13.612 KN-m



CFRP Design for A_{CFRP}

Mu	-13.612 KN-m
f _y	4900 MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'_c \beta_1 \left(\frac{600}{600 + f_y} \right)}{f_y}$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'_c} \right)$$

Mmax	-
Mmax	KN-m

Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

Rn	-
----	---

φ = 1 by Assumption Valid

$$\rho = \frac{0.85 f'_c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'_c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-
Area CFRP	mm ²

A ₁	-
Area 1 = ρmax bd	mm ²

$$u = \frac{A_1 f_y}{0.85 f'_c b}$$

a	-
c	-
d	450 mm
d'	0 mm
et	-

calculated φ	-
use φ	-

Mu1(new)	-
Mu2(new)	-
Mu1	KN-m
Mu2	KN-m

A ₂	-
fs'	-
A ₂	mm ²
fs'	MPa

A _{CFRP}	-
A _{CFRP}	mm ²

A _{CFRP}	-
A _{CFRP}	mm ²

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1
BEAM 6331 (L)
LOCATION ROOF LEVEL

Beam Properties		
b	400	mm
h	450	mm
d	392	mm
d'	58	mm

Concrete Properties		
f'c	11.77	MPa
β1	0.85	

Steel Properties		
top bars	3	pcs
bot bars	2	pcs
top dia	16	mm
bot dia	16	mm
As	402.12	mm ²
As'	603.19	mm ²
As2	0	mm ²
As1	402.12	mm ²
fy	230	MPa

calculated values		
c	48.37	mm
"a"	41.1145	mm
es'	0	
fs'	0	MPa
et	0.0213	

calculated φ	1.96
use φ	0.9

Mu (CAP)	30.92 KN-m
Mu (DEM)	17.342 KN-m
O/C RATIO	0.56 SAFE
Moment Diff	-13.578 KN-m



CFRP Design for A_{CFRP}

Mu	-13.578	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{f_y} \left(\frac{600}{600 + f_y} \right)$$

$$M_{max} = \phi \rho b d^2 f_y \left(1 - 0.59 \frac{\rho f_y}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

$$R_n = \frac{M_u}{\phi b d^2}$$

$$\rho = \frac{0.85 f'c}{f_y} \left(1 - \sqrt{1 - \frac{2 R_n}{0.85 f'c}} \right)$$

ρ	-
---	---

$$Area_{CFRP} = \rho b d$$

A ₁	-	mm ²
----------------	---	-----------------

$$a = \frac{A_1 f_y}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP

MOMENT CAPACITY OF BEAMS (NSCP 2015)

MARK UP1 RB-1

BEAM 6348 (M)

LOCATION ROOF LEVEL

Beam Properties			
b	400	mm	
h	450	mm	
d	392	mm	
d'	58	mm	

Concrete Properties		
f'c	11.77	MPa
β1	0.85	

Steel Properties			
top bars	3	pcs	
bot bars	3	pcs	
top dia	16	mm	
bot dia	16	mm	
As	603.19	mm ²	
As'	603.19	mm ²	
As2	0	mm ²	
As1	603.19	mm ²	
fy	230	MPa	

calculated values	
c	52.33 mm
"a"	44.4805 mm
es'	0
fs'	0 MPa
et	0.0195

calculated φ	1.84
use φ	0.9

Mu (CAP) =	46.17 KN-m
Mu (DEM) =	16.511 KN-m

D/E RATIO	0.36	SAFE
Moment Diff	-29.659	KN-m



CFRP Design for A_{CFRP}

Mu	-29.659	KN-m
fy	4900	MPa

Maximum value of rho associated with phi using singly reinforced

$$\rho_{max} = 0.75 \frac{0.85 f'c \beta_1}{fy} \left(\frac{600}{600 + fy} \right)$$

ρ max	-
-------	---

$$M_{max} = \phi \rho b d^2 fy \left(1 - 0.59 \frac{\rho fy}{f'c} \right)$$

Mmax	-	KN-m
------	---	------

Mmax Mu

Rn	-
----	---

$$Rn = \frac{Mu}{\phi b d^2}$$

fy & fy (Assumption Value)

$$\rho = \frac{0.85 f'c}{fy} \left(1 - \sqrt{1 - \frac{2Rn}{0.85 f'c}} \right)$$

ρ	-
---	---

$$\text{Area CFRP} = \rho b d$$

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A ₁	-	mm ²
----------------	---	-----------------

$$\text{Area 1} = \rho_{max} b d$$

$$u = \frac{A1 fy}{0.85 f'c b}$$

a	-	mm
c	-	mm
d	450	mm
d'	0	mm
et	-	

calculated φ	-
use φ	-

Mu1(new)	-	KN-m
Mu2(new)	-	KN-m

A ₂	-	mm ²
fs'	-	MPa

A _{CFRP}	-	mm ²
-------------------	---	-----------------

A _{CFRP}	-	mm ²
-------------------	---	-----------------

No Need for CFRP