

DESIGNED BY	CHECKED BY	SUBMITTED BY
Name A. GOURLEY	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date

REPUBLIC OF INDONESIA  
 MINISTRY OF PUBLIC WORKS  
 DIRECTORATE GENERAL OF HIGHWAYS

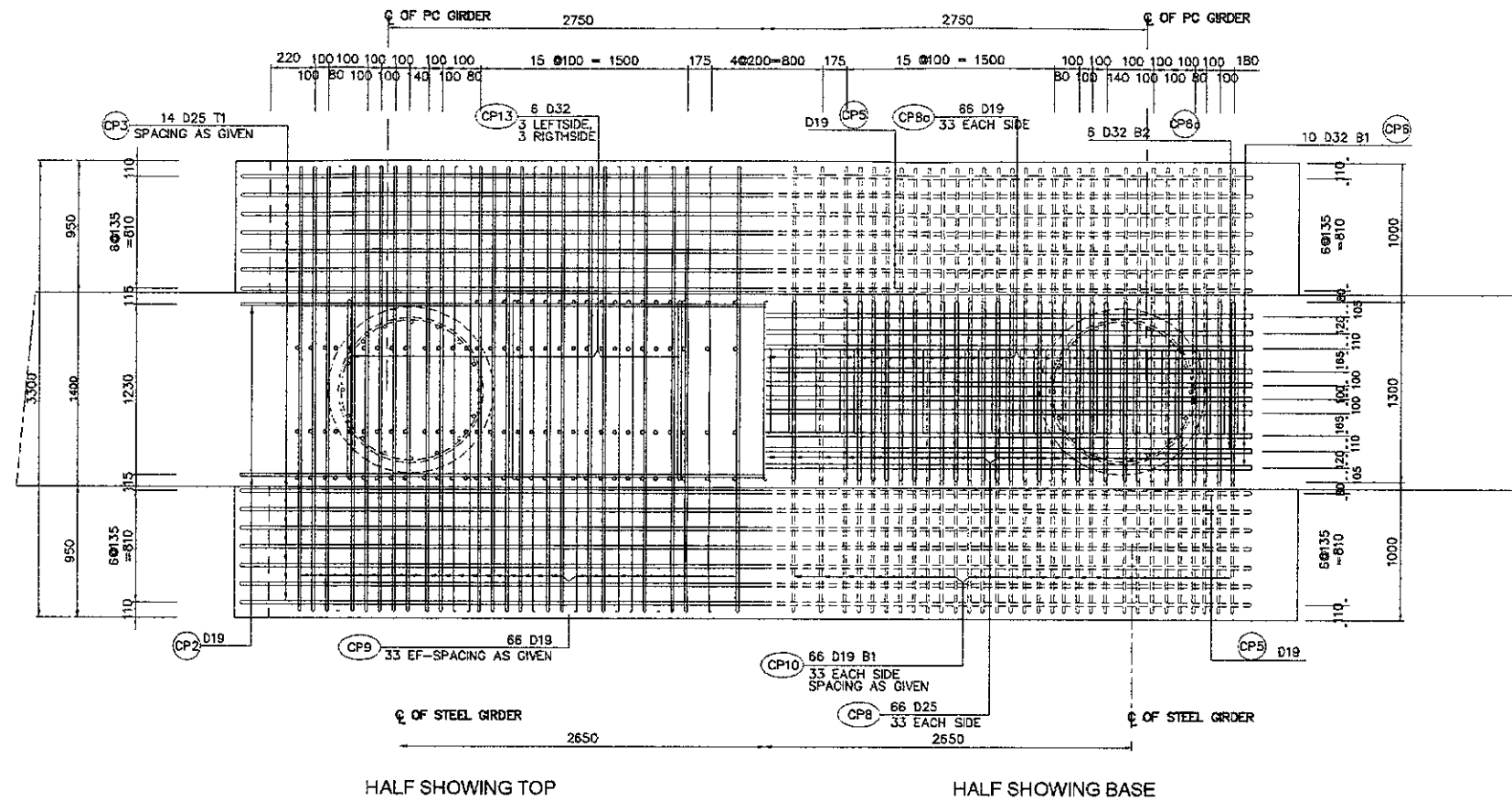
APPROVED BY  
 Ir. HERRY VAZA M.Eng.Sc  
 NIP. : 110038400

PROJECT AND LOCATION :  
 DETAILED DESIGN STUDY OF  
 NORTH JAVA CORRIDOR FLYOVER PROJECT  
 MERAK FLYOVER - CONTRACT PACKAGE 1  
 ( MERAK - BALARAJA )  
 BANTEN PROVINCE

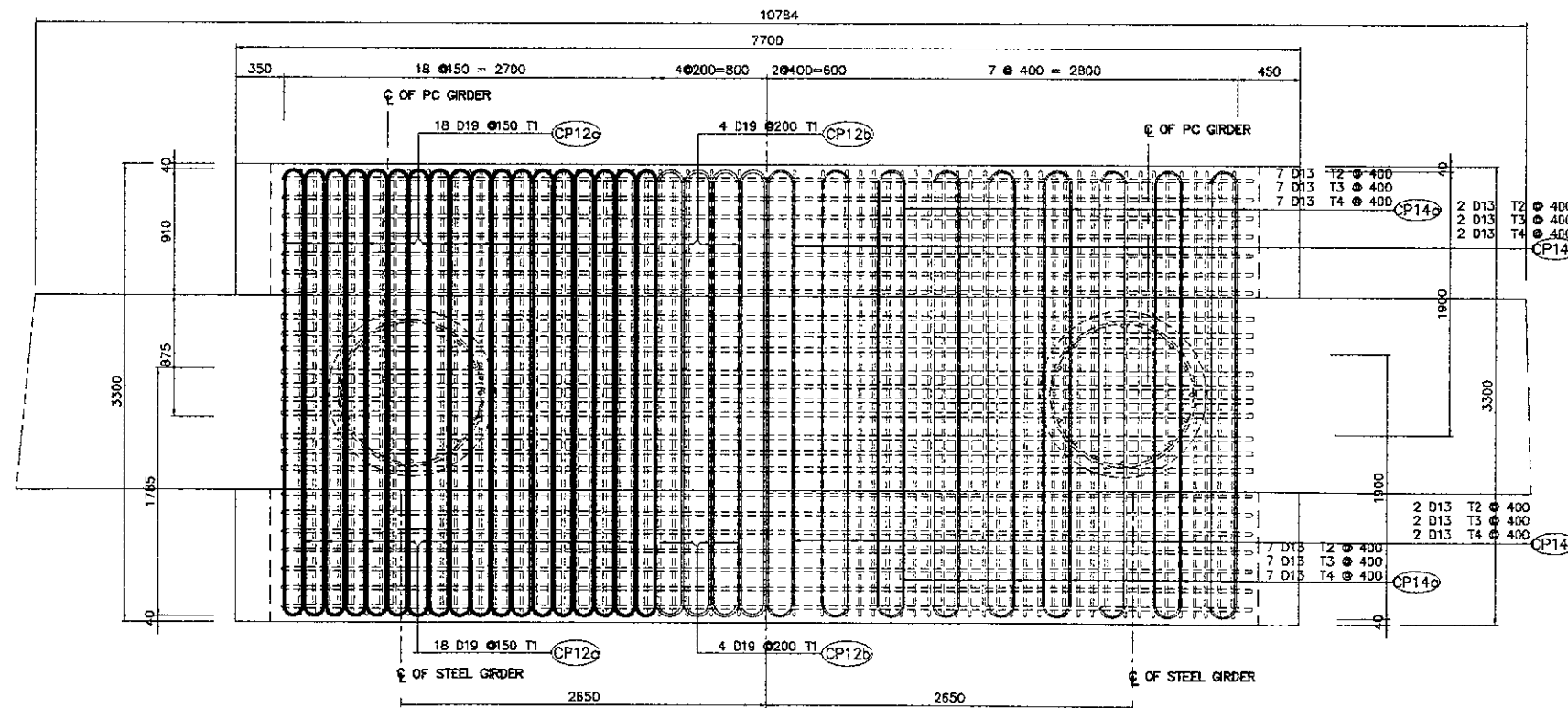
SCALE :  
 1 : 40  
 1 : 50  
 FULL SIZE A3

DRAWING TITLE :  
 PIER COPING REINFORCEMENT  
 P13 (EXP.) (2 OF 4)

DRAWING NO :  
 MSB-051  
 SHEET NO :  
 51 / 94



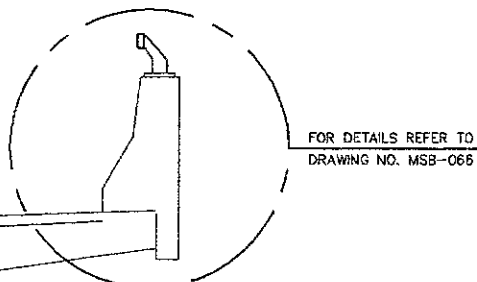
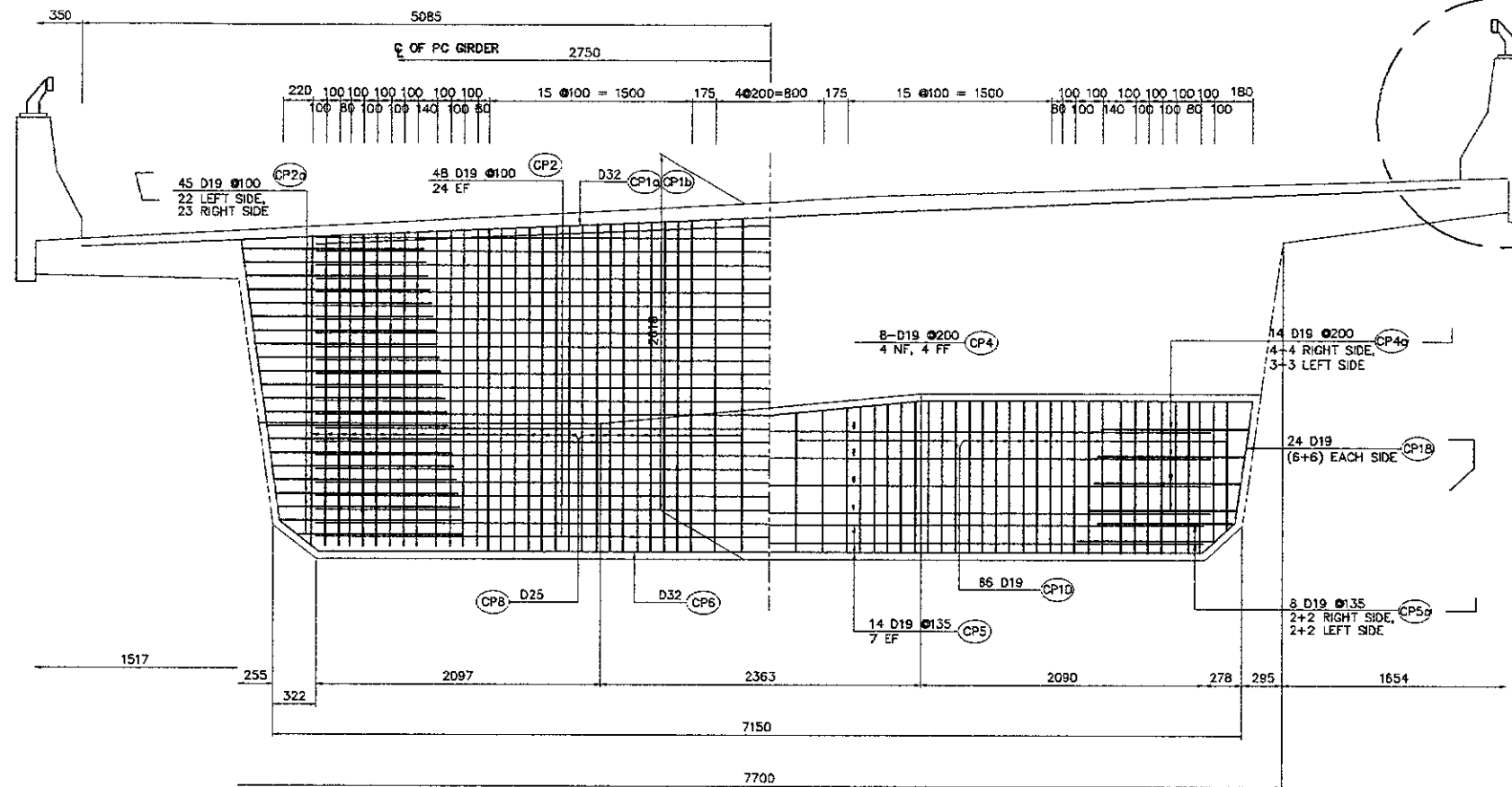
4 PLAN ON BEAM LEDGE  
 SCALE : 1:50



5 STIRRUP PLACING  
 SCALE : 1:50

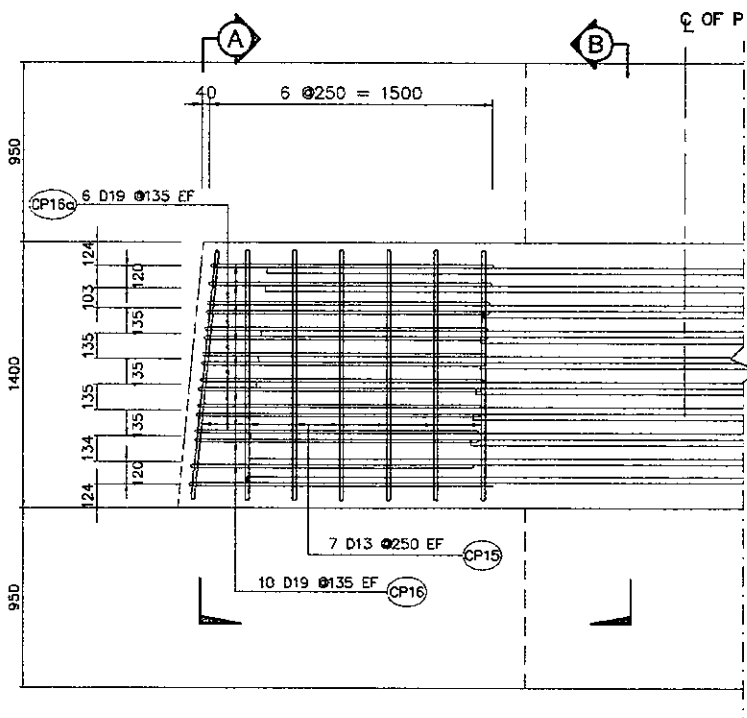
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $F_c' = 30\text{MPa}$
  - REINFORCING STEEL=
    - D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>
    - OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

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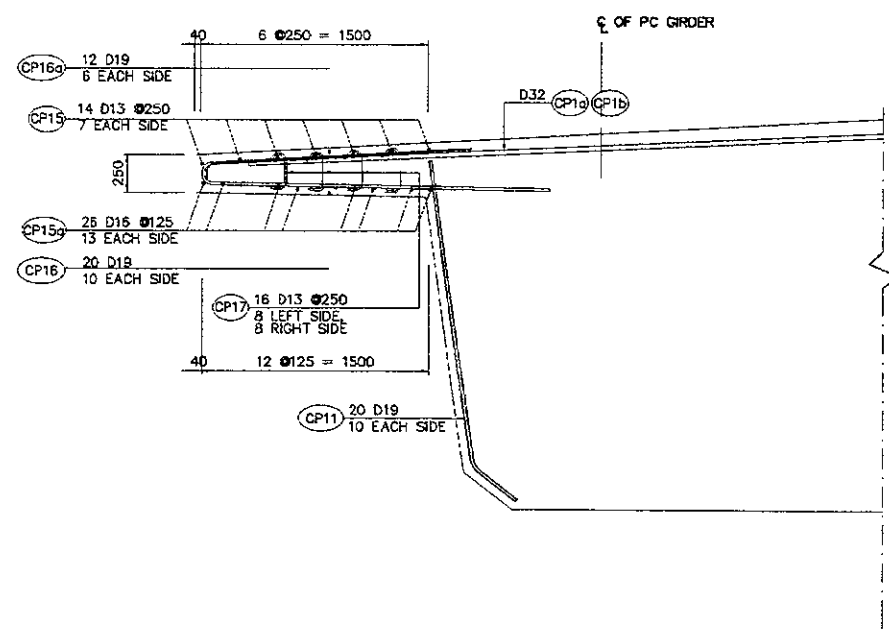


**6 ELEVATION ON COPING TOP**  
 SCALE : 1:50

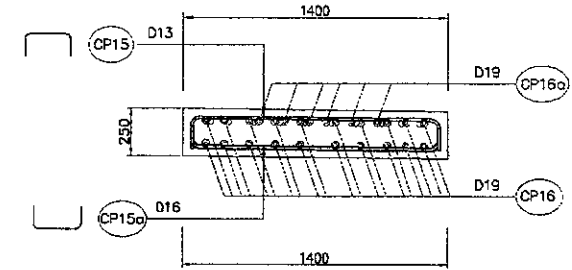
**7 ELEVATION ON BEAM LEDGE**  
 SCALE : 1:50



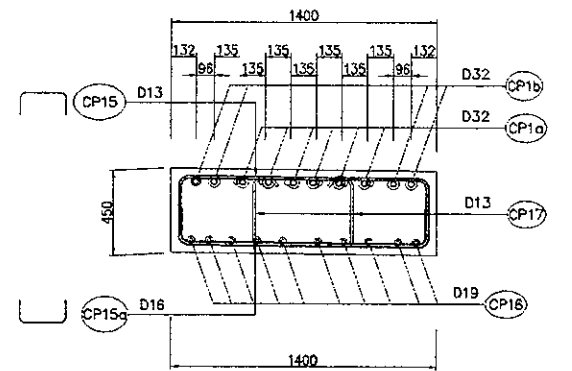
**8 PLAN ON COPING CANTILEVER**  
 SCALE : 1:40



**9 ELEVATION ON COPING CANTILEVER**  
 SCALE : 1:50

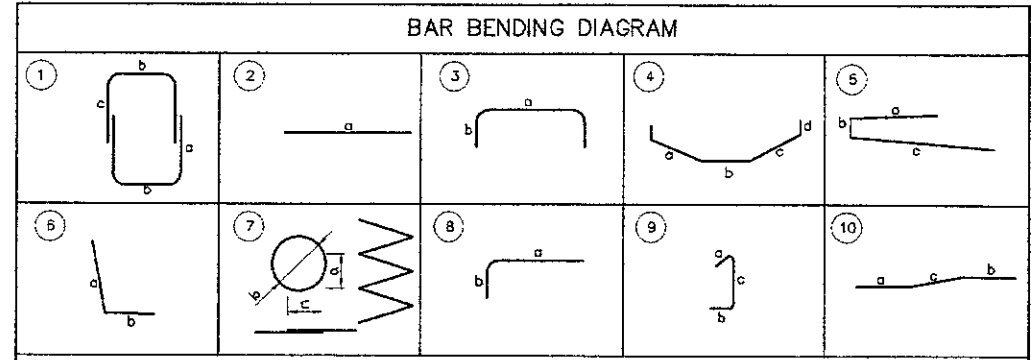
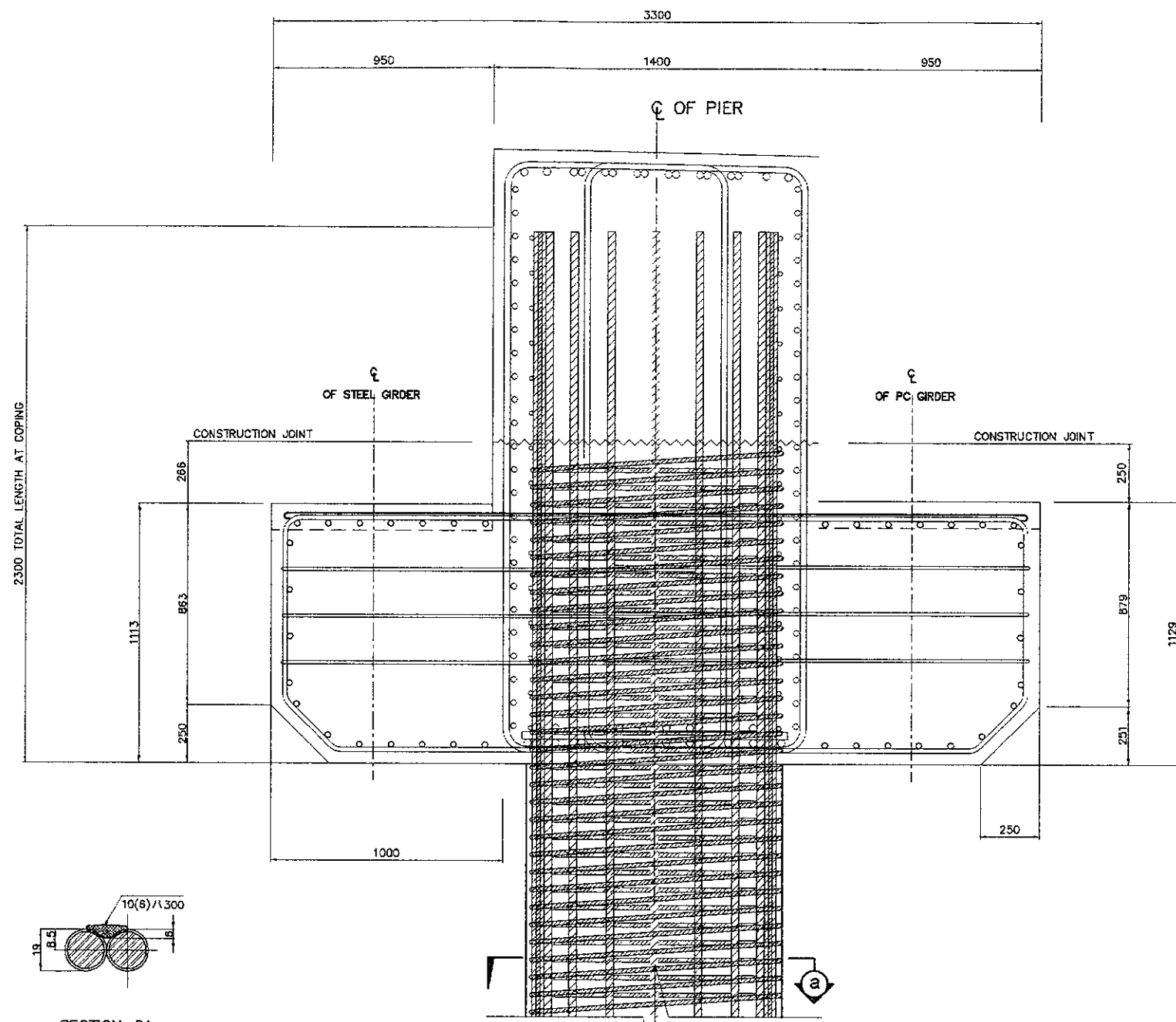


**10 SECTION A-A**  
 SCALE : 1:40



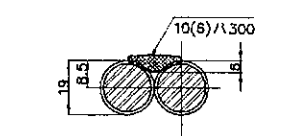
**11 SECTION B-B**  
 SCALE : 1:40

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $f_c' = 30\text{MPa}$
  - REINFORCING STEEL =  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

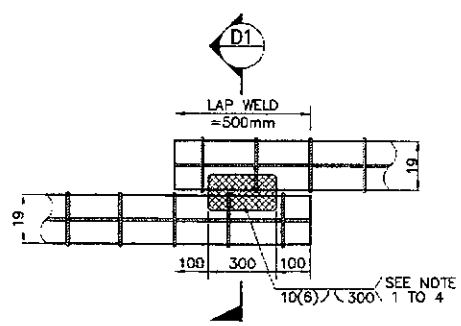


LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	VOLUME OF CONCRETE (m <sup>3</sup> )
				a	b	c	d	e	f					
COPING														
	CP1a	32	2	8870						8870	12	6.31	872	43.69
	CP1b	32	2	10170						10170	4	6.31	257	
	CP2	19	2	6700						6700	48	2.23	717	
	CP2a	19	3	1290	1350					3990	45	2.23	400	
	CP3	25	10	2650	2190	2450				7290	14	3.85	393	
	CP4	19	2	6500						6500	8	2.23	116	
	CP4a	19	8	1995	1075					3070	14	2.23	96	
	CP5	19	2	6400						6400	14	2.23	200	
	CP5a	19	8	1995	1075					3070	8	2.23	55	
	CP6	32	3	6510	550					7610	10	6.31	480	
	CP6a	32	3	6380	550					7480	6	6.31	283	
	CP7	19	1	1000	2000	1000				8000	30	2.23	535	
	CP8	25	1	2400	1290	1150				9680	55	3.85	2480	
	CP8a	25	1	2400	615	1150				8330	56	3.85	2117	
	CP9	19	3	3190	685					4550	56	2.23	671	
	CP10	19	4	305	2750	305	400			4180	66	2.23	812	
	CP11	19	6	2080	365					2445	20	2.23	109	
	CP12a	19	3	150	1785					3720	72	2.23	598	
	CP12b	19	3	200	1785					3770	16	2.23	135	
	CP13	32	2	1150						1150	6	6.31	44	
	CP14a	13	3	200	1900					4000	84	1.04	350	
	CP14b	13	3	200	1900					4000	24	1.04	100	
	CP15	13	3	1300	200					1700	14	1.04	25	
	CP15a	16	3	1300	350					2000	26	1.58	82	
	CP16	19	5	1600	165	1900				3665	20	2.23	164	
	CP16a	19	5	1600	165	165				1930	12	2.23	52	
	CP17	13	9	350	165	165				680	16	1.04	12	
	CP18	19	5	325	775	365				1465	24	2.23	78	
TOTAL WEIGHT FOR / COPING = 11,813 Kgs.														

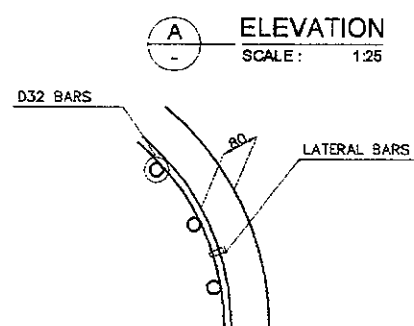
THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY, THE CONTRACTOR SHOULD CHECKED AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.



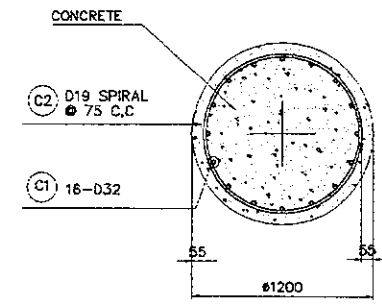
SECTION-D1  
 SINGLE FLARED-V-GROOVE WELD



DETAIL OF SPIRAL REINF.  
 FULL LAP - WELD CONNECTION  
 NOT TO SCALE



TYPICAL BAR LAYOUT DETAIL  
 NOT TO SCALE

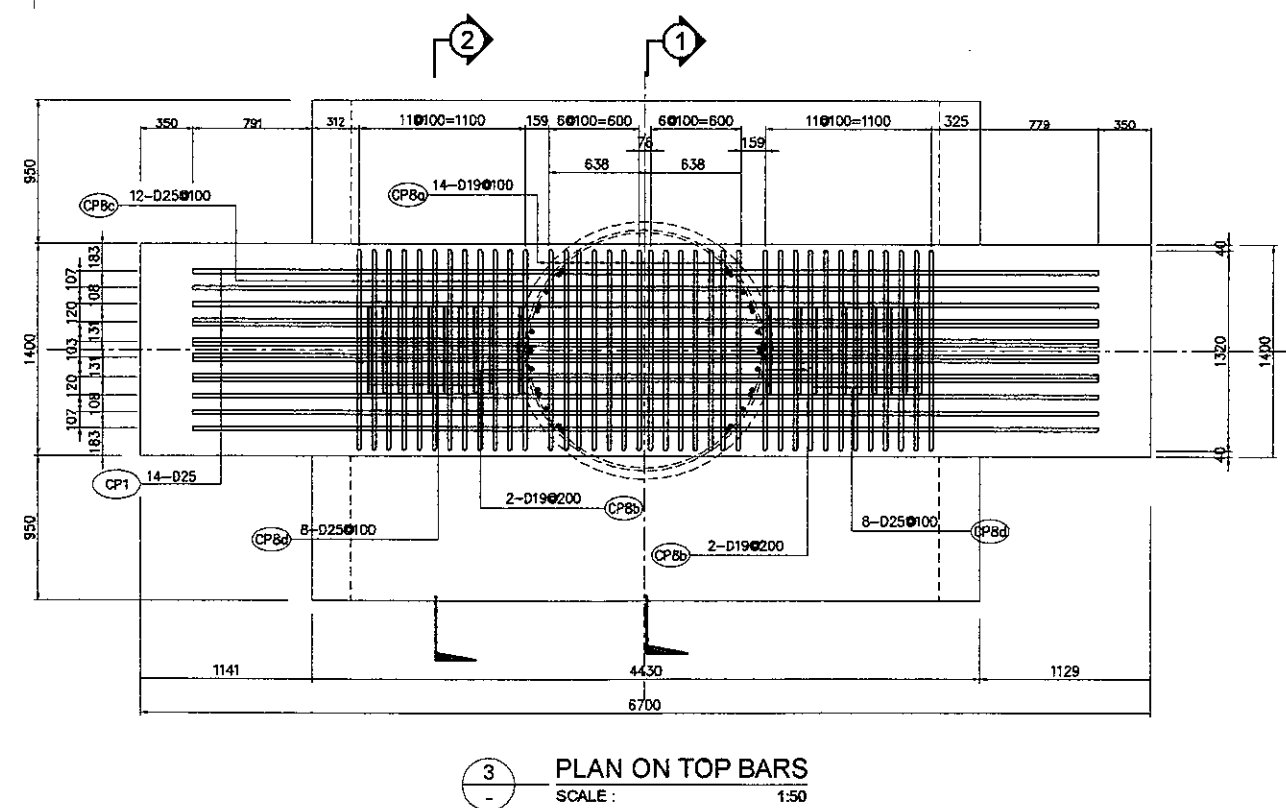
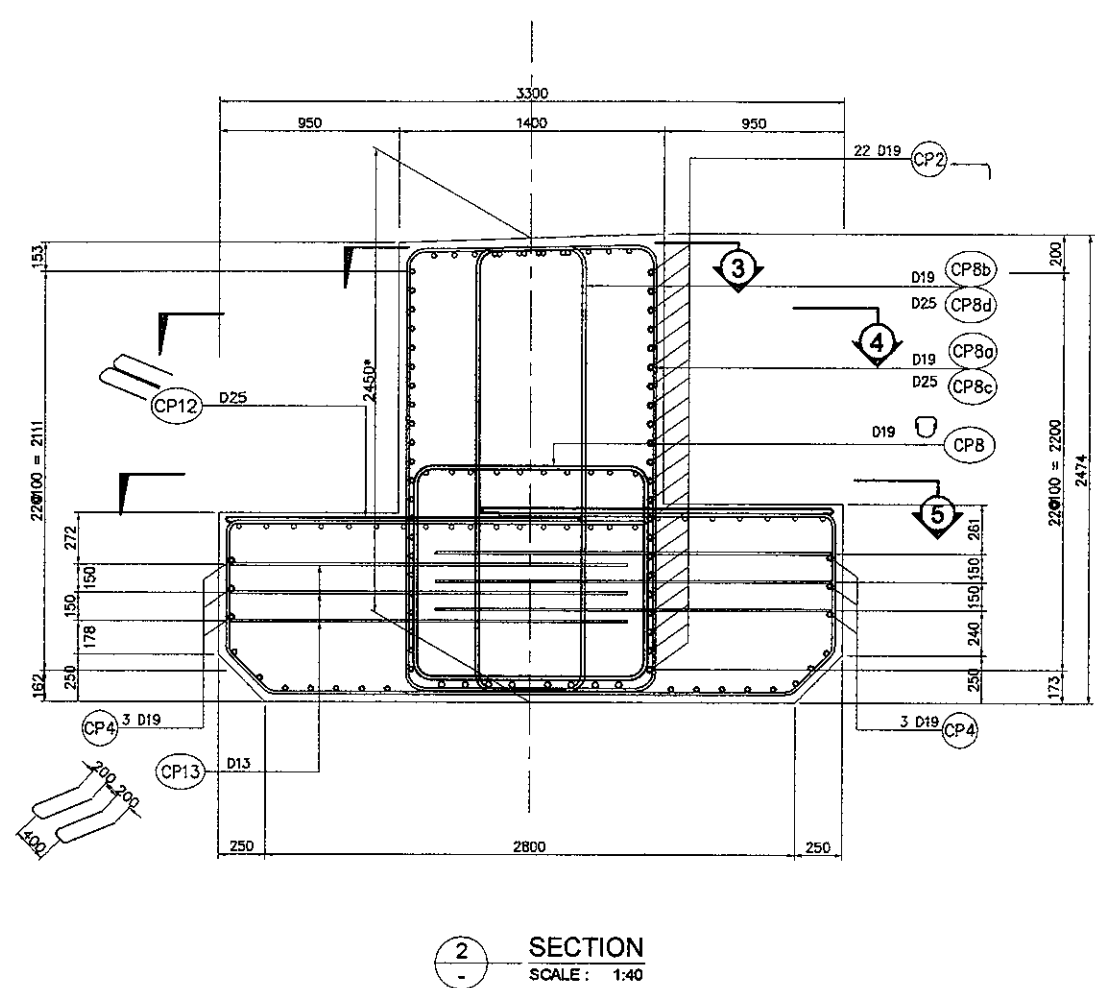
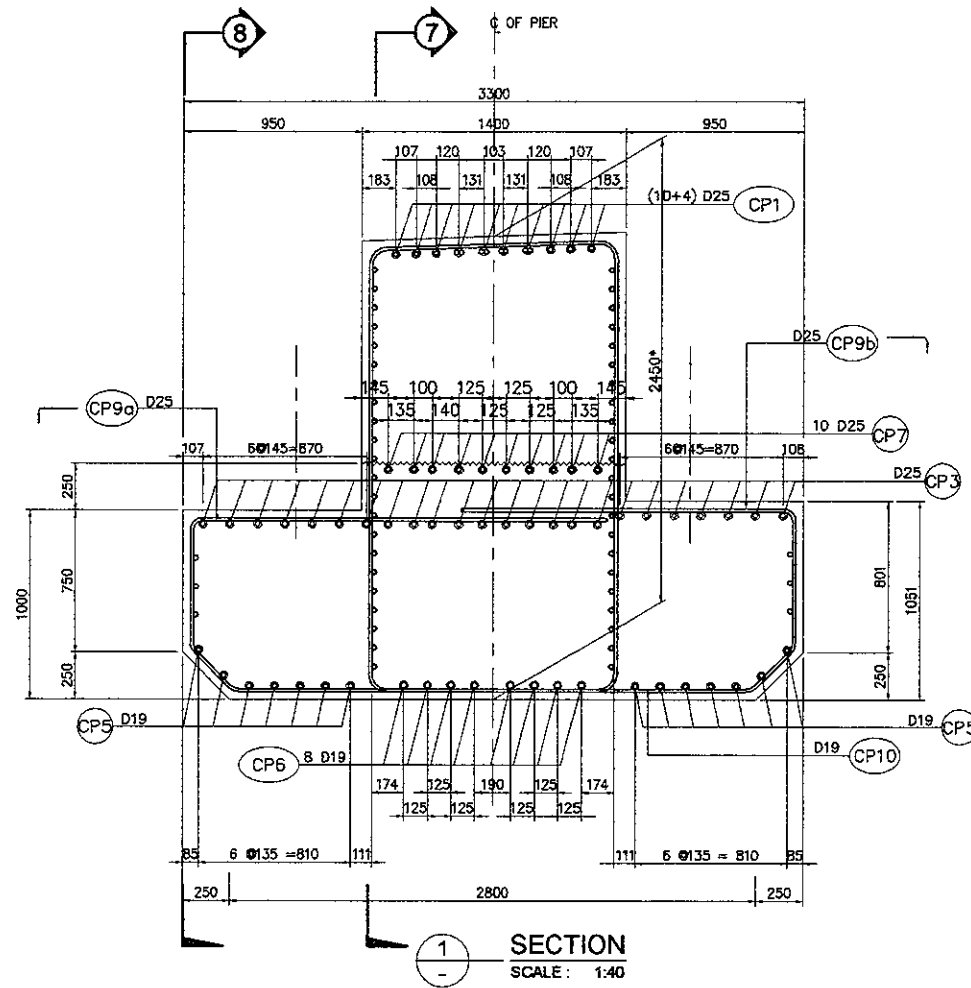


SECTION DETAIL  
 SCALE: 1:50

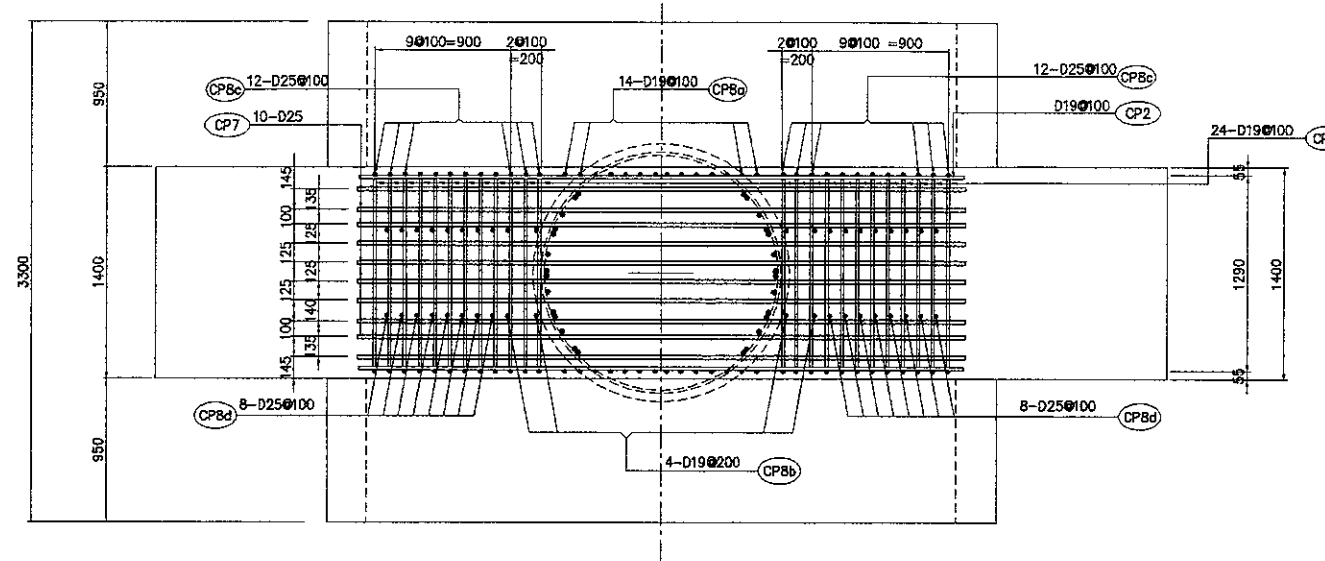
- NOTES ON LAP-WELD CONNECTION :
1. SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  2. WELDING SHOULD CONFORM TO AWS (D1.4) \*STRUCTURAL WELDING CODE REINFORCED STEEL.\*
  3. USE ELECTRODE E80XX.
  4. CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN DURING WELDING.

- NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETERS.
  2. CONCRETE :  $F_c' = 30 \text{ MPa}$
  3. REINFORCING STEEL =  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

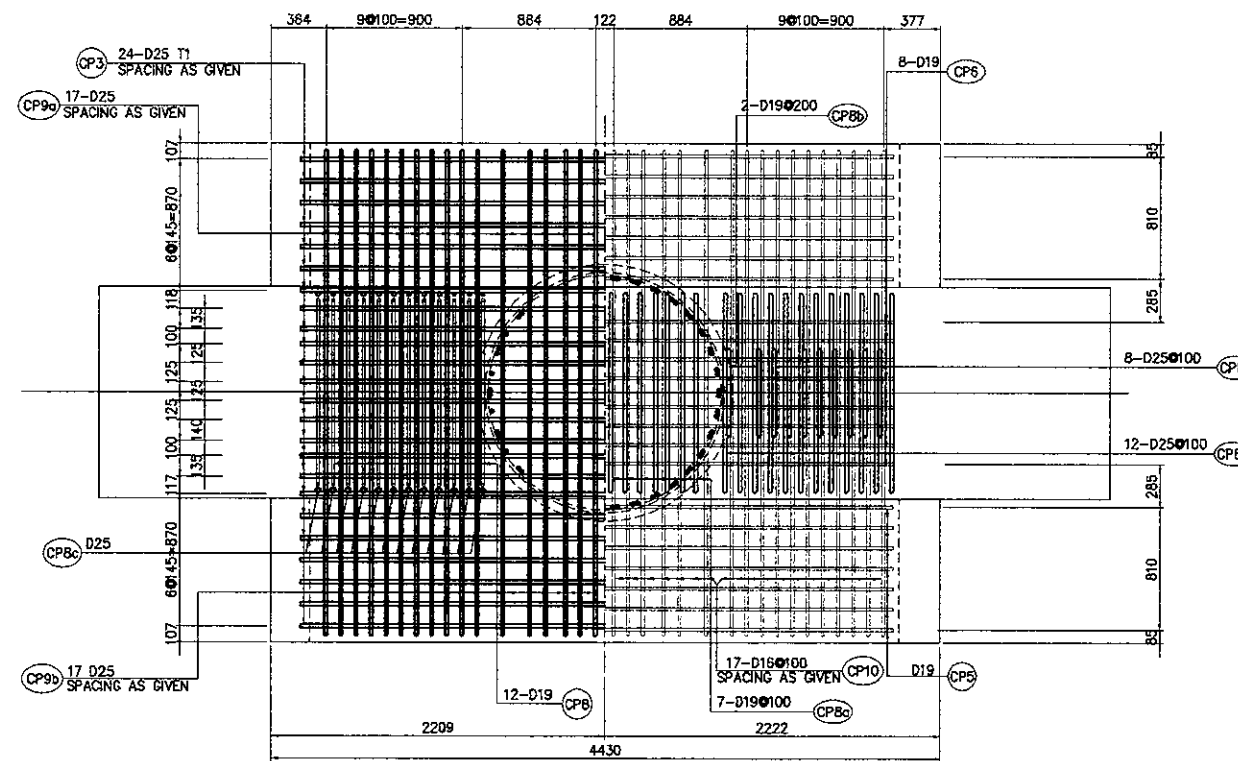
DESIGNED BY		CHECKED BY		SUBMITTED BY	
Name	A. COURLEY	Name	T. OKUMURA	Name	M. KIUCHI
Sign		Sign		Sign	
Date		Date		Date	



DESIGNED BY		CHECKED BY		SUBMITTED BY	
Name	A. GOURLEY	Name	T. OKUMURA	Name	M. KIUCHI
Sign		Sign		Sign	
Date		Date		Date	



4 PLAN AT CONSTRUCTION JOINT
   
 SCALE : 1:50



5 PLAN ON BEAM LEDGE
   
 SCALE : 1:50

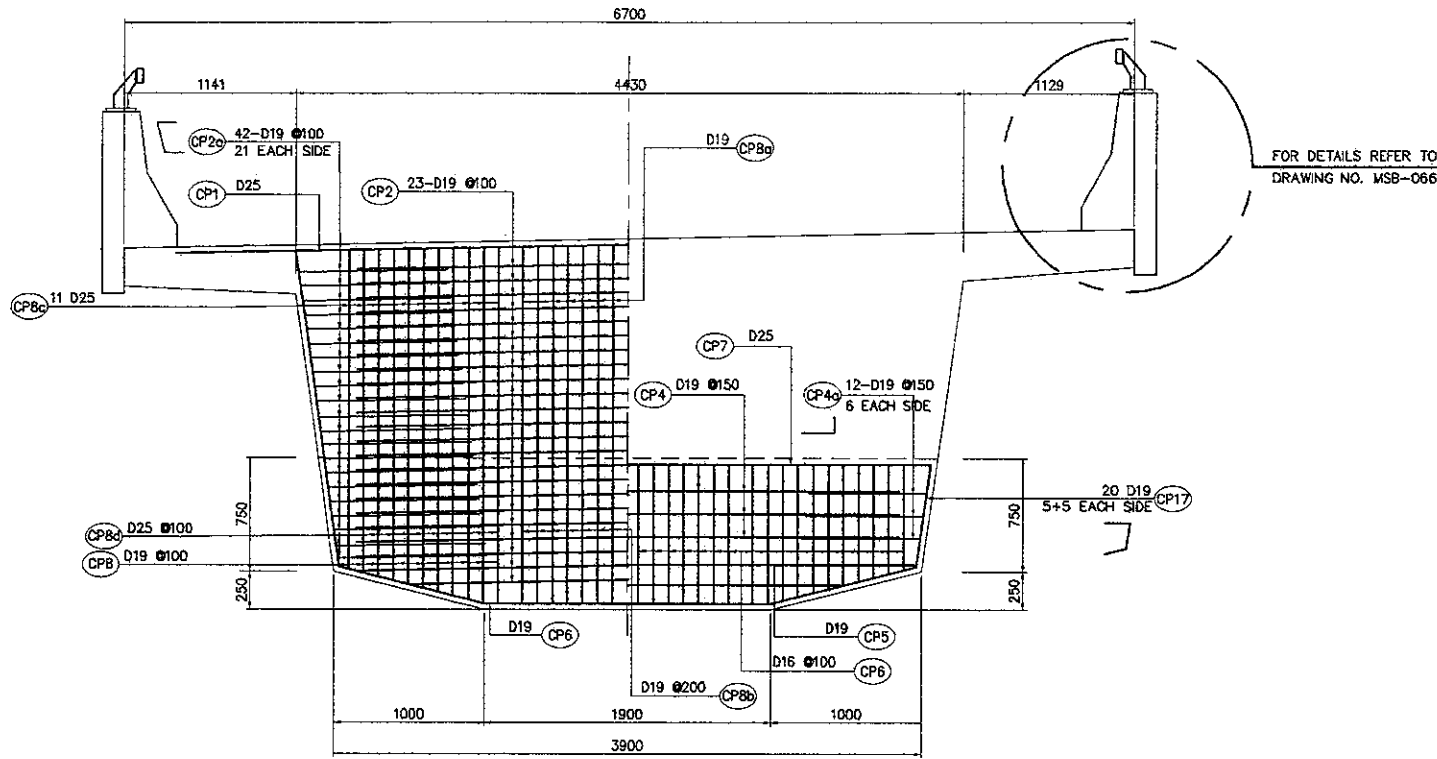
DESIGNED BY	CHECKED BY	SUBMITTED BY
Name: A. GOURLEY	Name: T. OKUMURA	Name: M. KIUCHI
Sign: _____	Sign: _____	Sign: _____
Date: _____	Date: _____	Date: _____

APPROVED BY	Sign	Date
Ir. HERRY VAZA M, Eng.Sc NIP. : 110038400	_____	_____

SCALE :  
 1 : 40  
 1 : 50  
 FULL SIZE A3

DRAWING TITLE :  
**PIER COPING REINFORCEMENT**  
**PB3 (3 OF 4)**

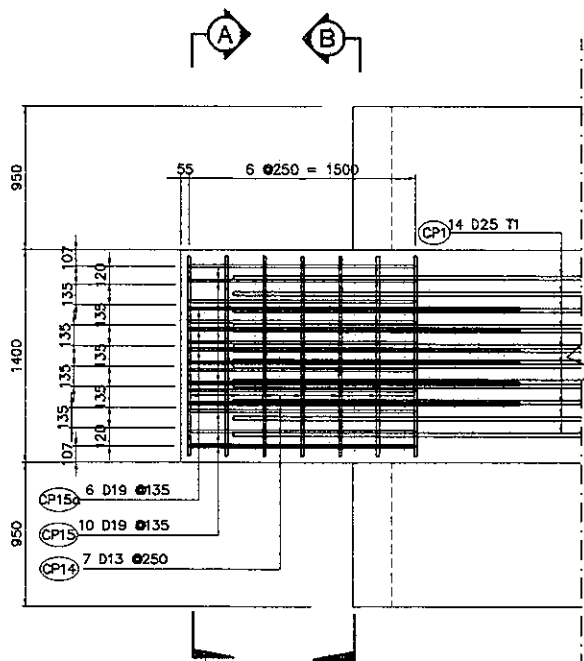
DRAWING NO :  
**MSB-056**  
 SHEET NO :  
 56 / 94



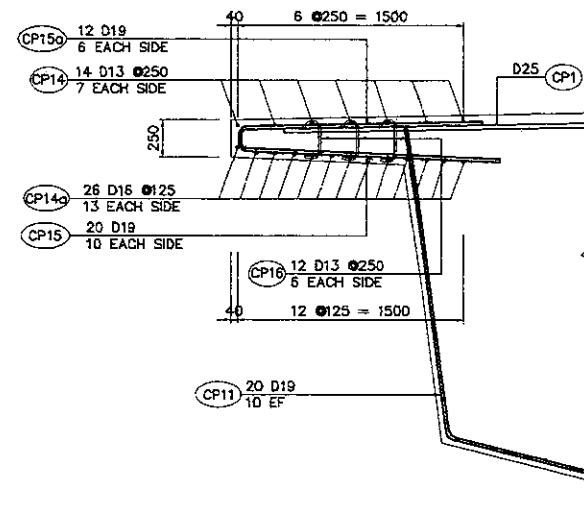
FOR DETAILS REFER TO  
 DRAWING NO. MSB-066

**6** ELEVATION ON COPING  
 SCALE : 1:50

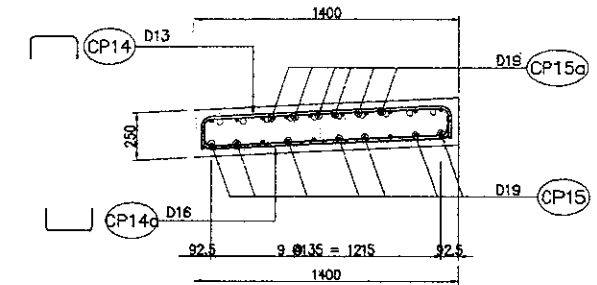
**7** ELEVATION ON BEAM LEDGE  
 SCALE : 1:50



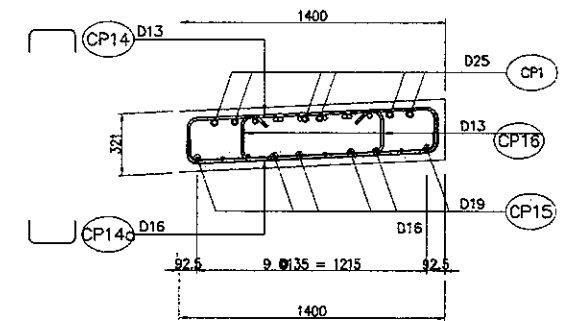
**8** PLAN ON COPING CANTILEVER  
 SCALE : 1:50



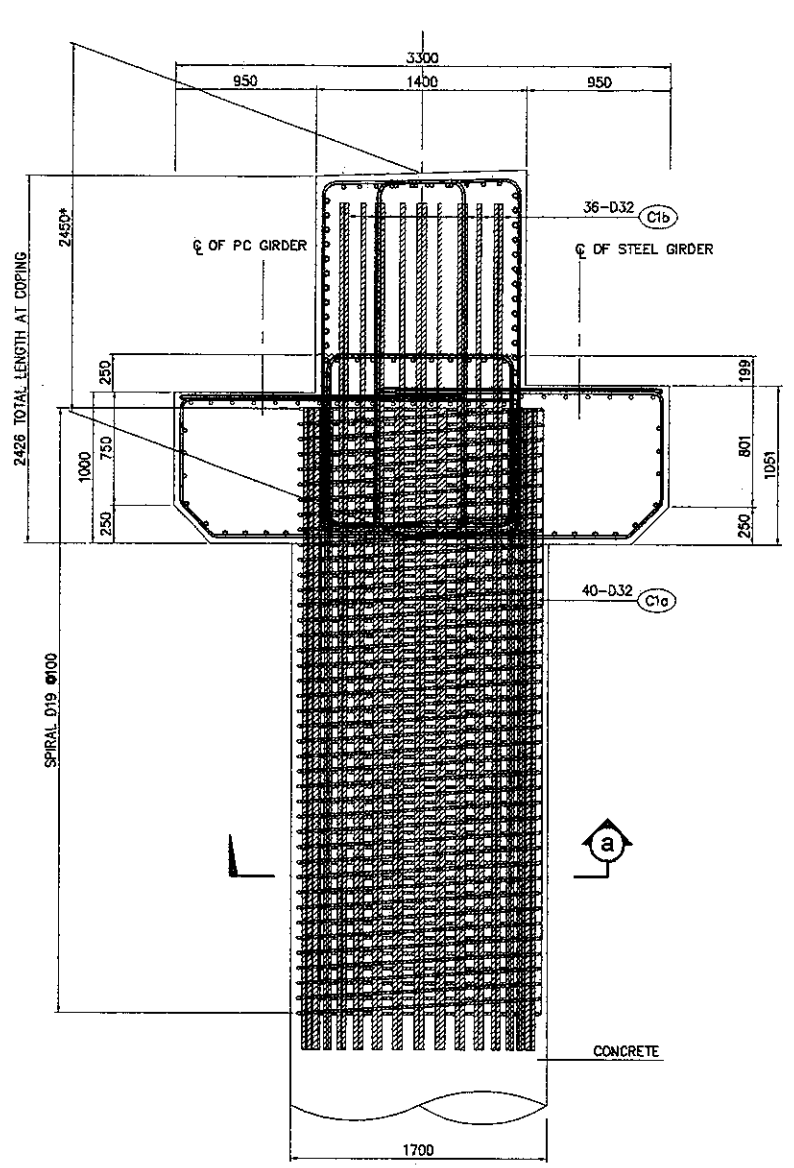
**9** ELEVATION ON COPING CANTILEVER  
 SCALE : 1:50



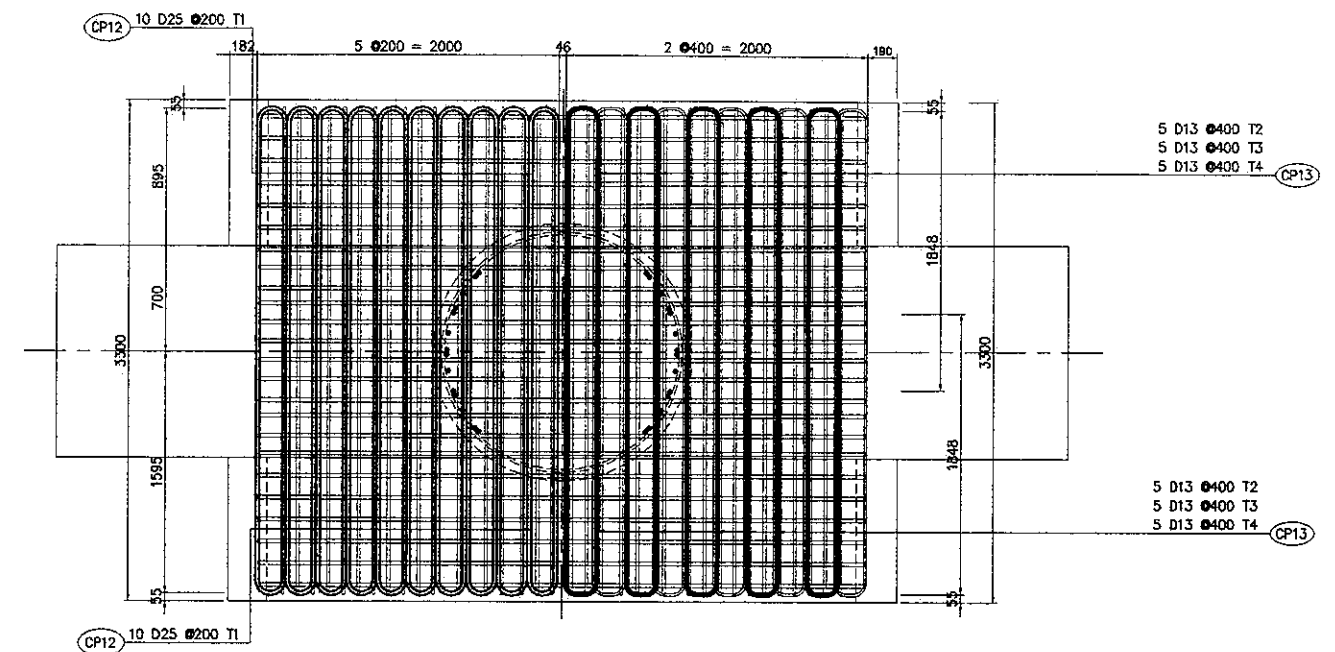
**10** SECTION A-A  
 SCALE : 1:40



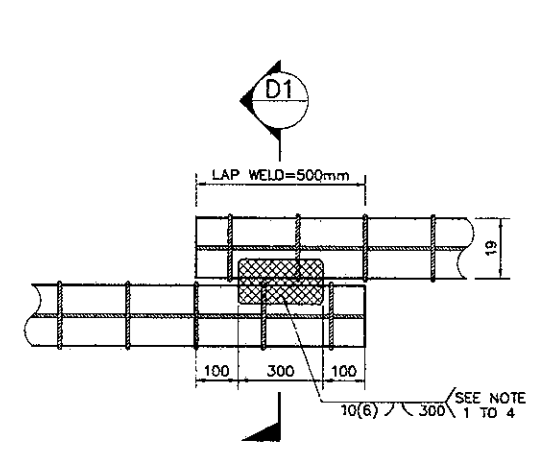
**11** SECTION B-B  
 SCALE : 1:40



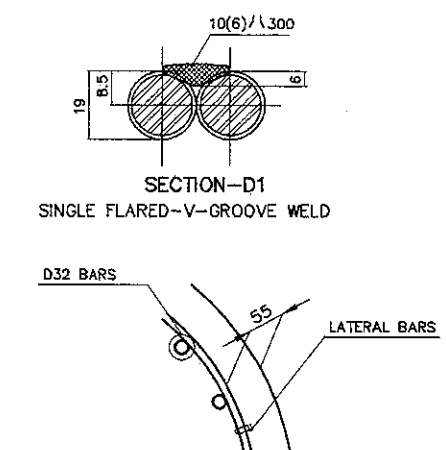
**A ELEVATION**  
SCALE 1:50



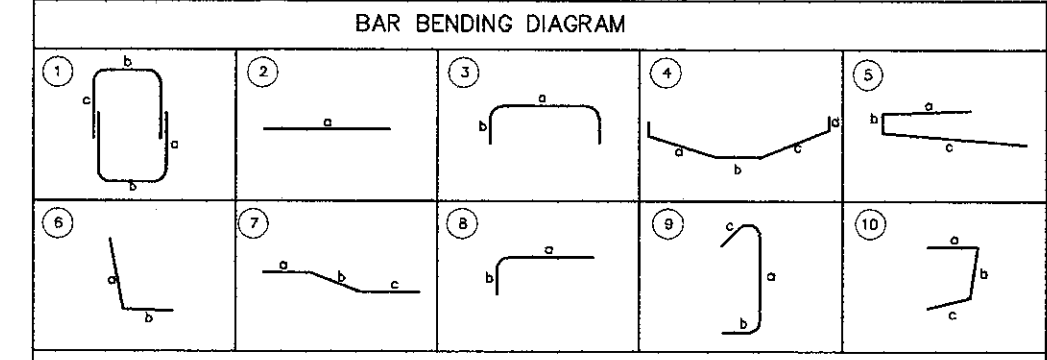
**B STIRRUP PLACING**  
SCALE 1:50



**D DETAIL OF SPIRAL REINF. FULL LAP-WELD CONNECTION**  
NOT TO SCALE

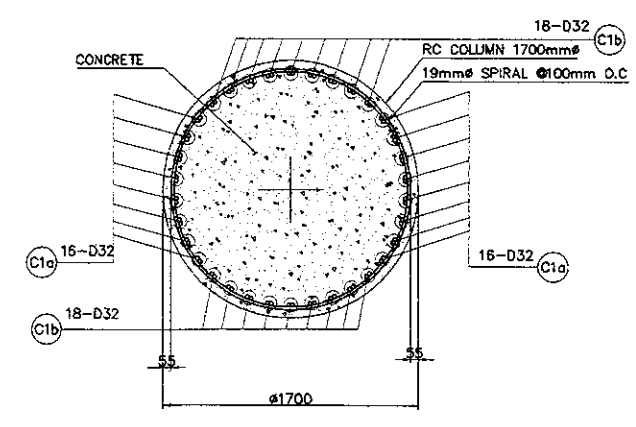


**E TYPICAL BAR LAYOUT DETAIL**  
NOT TO SCALE



SCHEDULE OF REINFORCEMENT														
LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	VOLUME OF CONCRETE (m <sup>3</sup> )
				a	b	c	d	e	f					
COPING														
CP1	25	2	6000							6000	14	3.85	323	22.07
CP2	19	2	4000							4000	44	2.23	392	
CP2a	19	3	3114	1000						5114	42	2.23	479	
CP3	25	2	4000							4000	24	3.85	370	
CP4	19	2	3600							3600	6	2.23	48	
CP4a	19	8	783	1200						1983	12	2.23	53	
CP5	19	2	3000							7910	14	2.23	94	
CP6	19	4	4000							5328	8	2.23	71	
CP7	25	2	4000							6558	10	3.85	154	
CP8	19	1	1150	1225	1200					7150	24	2.23	383	
CP8a	19	1	2365	1300	800					8930	14	2.23	279	
CP8b	19	1	2365	600	800					7530	4	2.23	67	
CP8c	25	1	2365	1300	1150					9630	24	3.85	890	
CP8d	25	1	2365	600	1150					8230	16	3.85	507	
CP9a	25	8	2150	650						2800	34	3.85	367	
CP9b	25	8	1665	510						2175	34	3.85	285	
CP10	19	4	315	2782	315	515				4422	34	2.23	335	
CP11	19	6	2030	1000						3030	20	2.23	135	
CP12	25	3	200	1800						3800	40	3.85	585	
CP13	13	3	200	1800						3800	60	1.04	238	
CP14	13	3	1300	200						1700	14	1.04	25	
CP14a	16	3	1300	350						2000	26	1.58	83	
CP15	19	5	1600	165	3000					3665	20	2.23	164	
CP15a	19	5	1600	165	165					1930	12	2.23	54	
CP16	13	9	350	165	165					680	12	1.04	8	
CP17	19	10	400	890	400					1690	20	2.23	76	
TOTAL WEIGHT FOR / COPING = 6,465 Kgs.														

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECKED AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.



**C SECTION DETAIL**  
SCALE 1:50

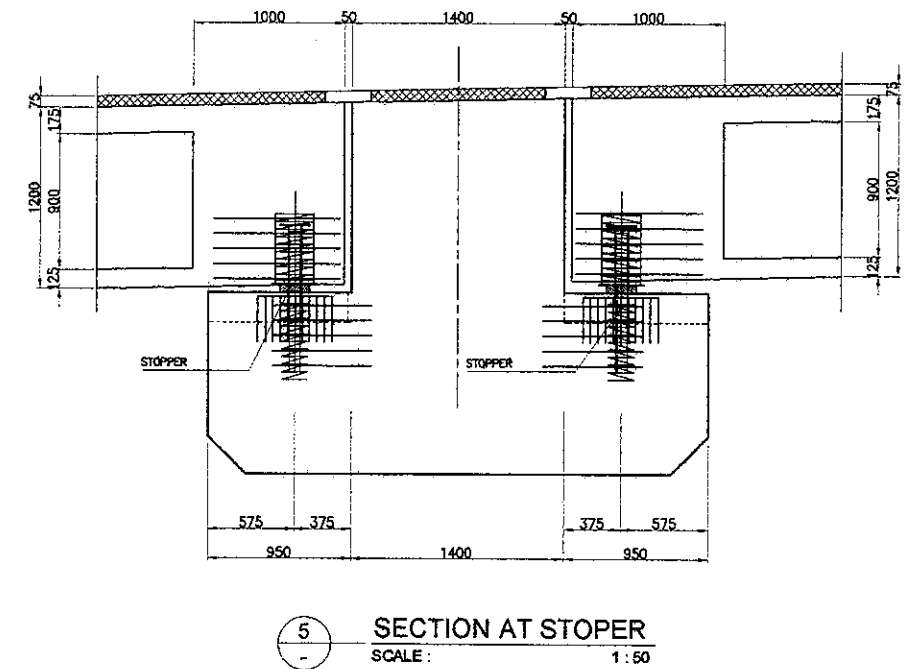
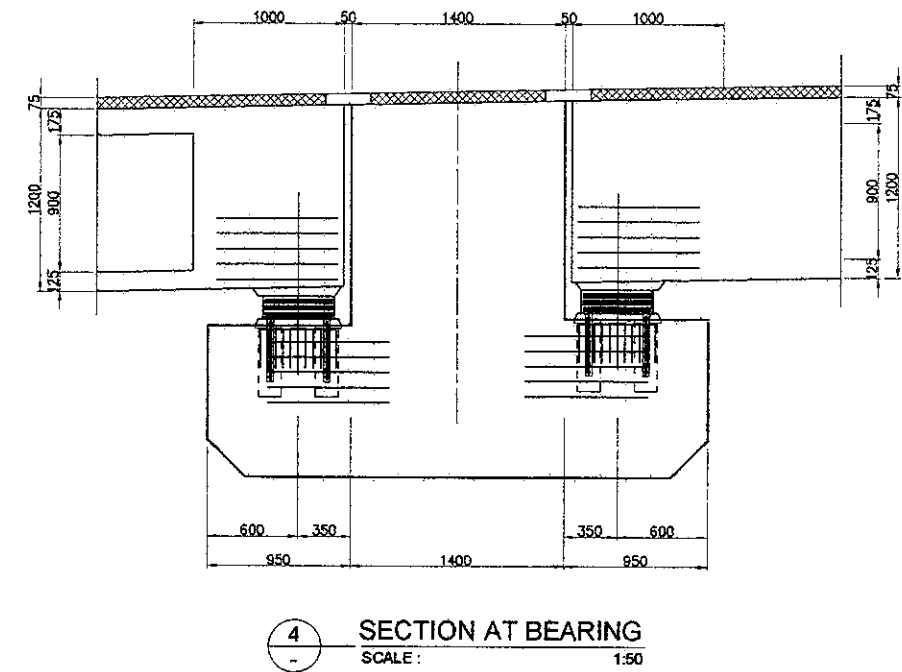
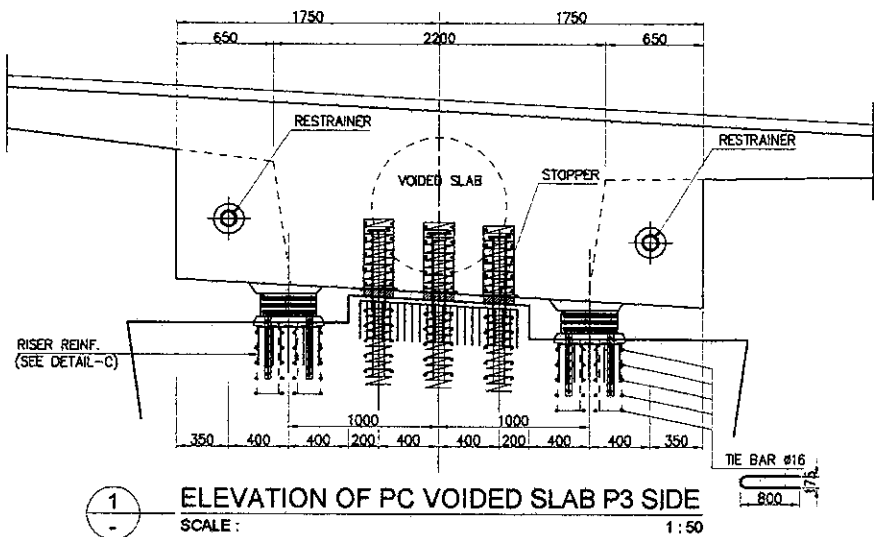
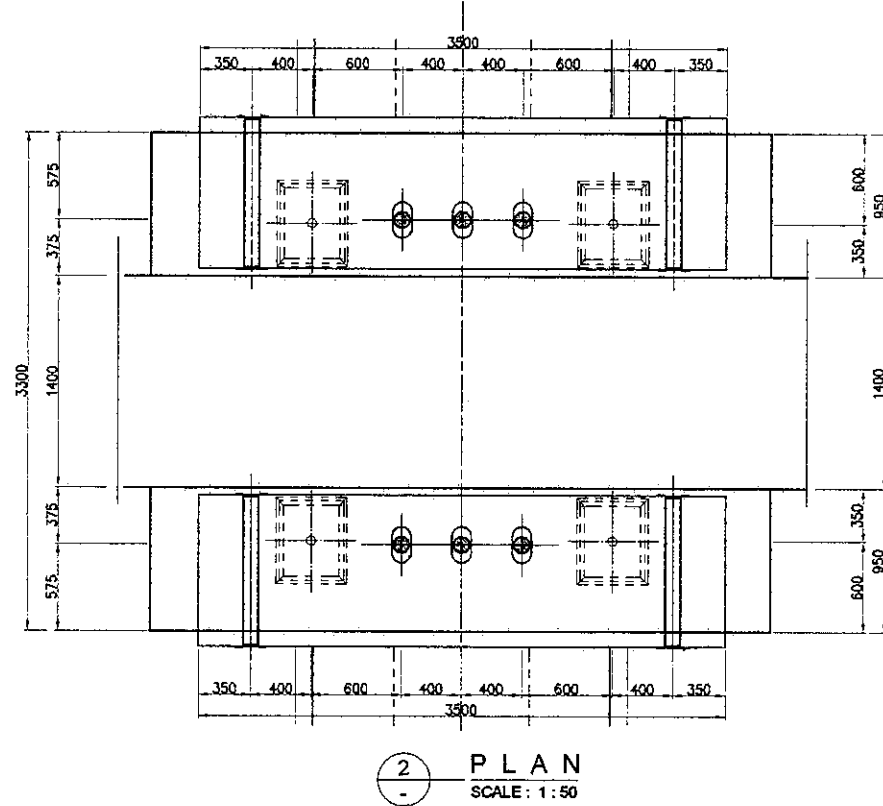
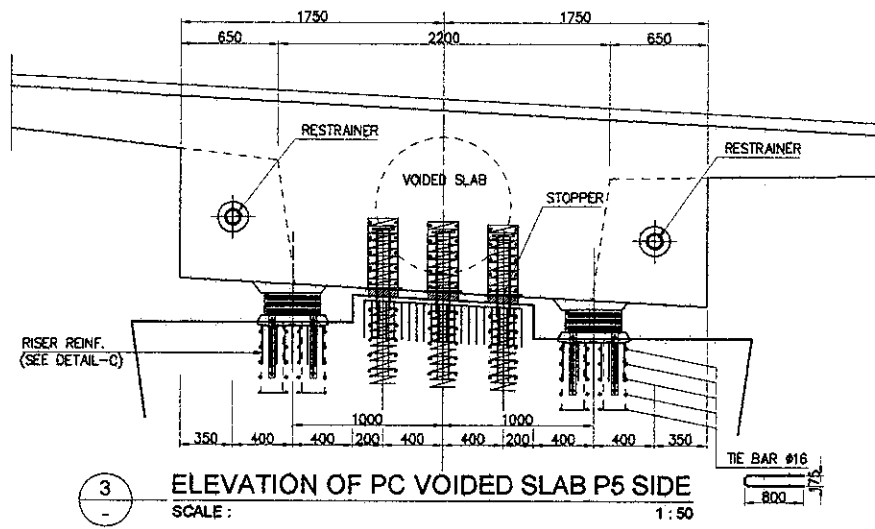
- NOTES ON LAP-WELD CONNECTION :**
- SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  - WELDING SHOULD CONFORM TO AWS (D1.4)  
\*STRUCTURAL WELDING CODE REINFORCED STEEL.\*
  - USE ELECTRODE E90XX.
  - CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN DURING WELDING.

- NOTE :**
- ALL DIMENSION ARE IN MILIMETERS.
  - SEE DRAWING MSB-038 FOR COLUMN REINFORCEMENT.

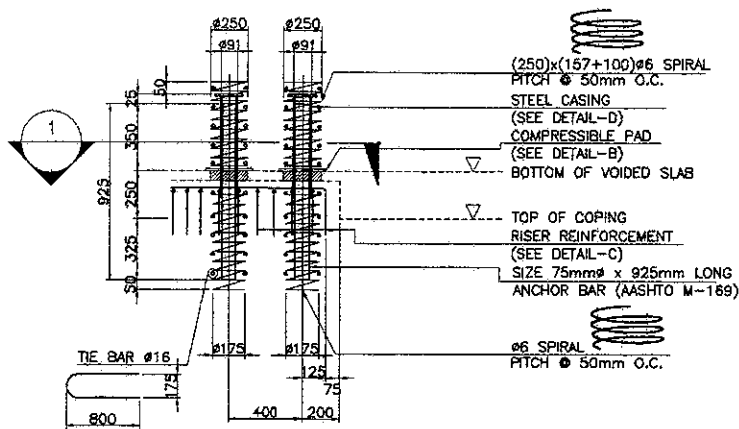
DESIGNED BY	CHECKED BY	SUBMITTED BY
Name: A. GOURLEY	Name: T. OKUMURA	Name: M. KIUCHI
Sign	Sign	Sign
Date	Date	Date

APPROVED BY

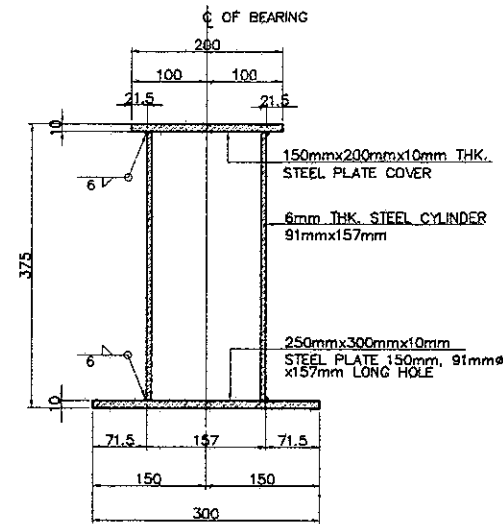
Ir. HERRY VAZA M,Eng.Sc NIP. : 110038400	Sign
	Date



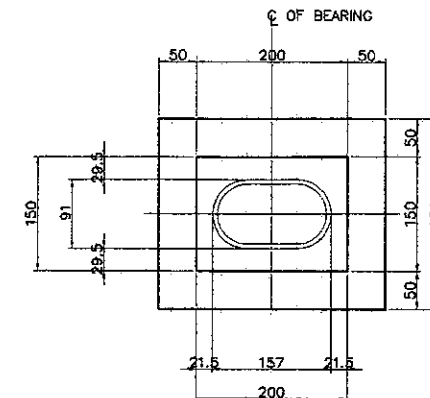




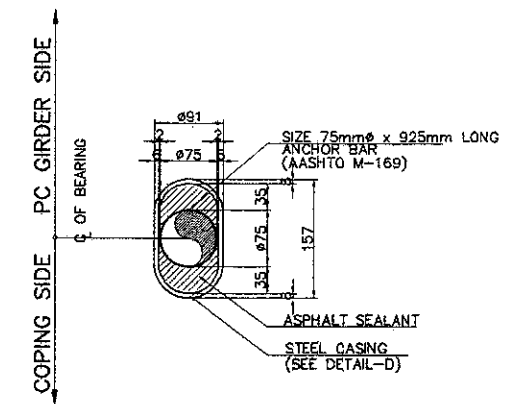
**A** DOWEL BAR DETAILS  
 SCALE : 1:40



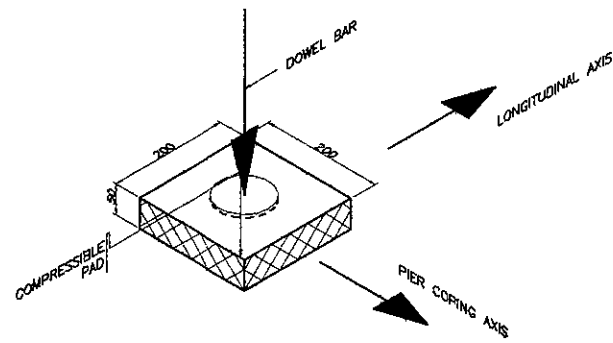
**D1** ELEVATION  
 SCALE : 1:10



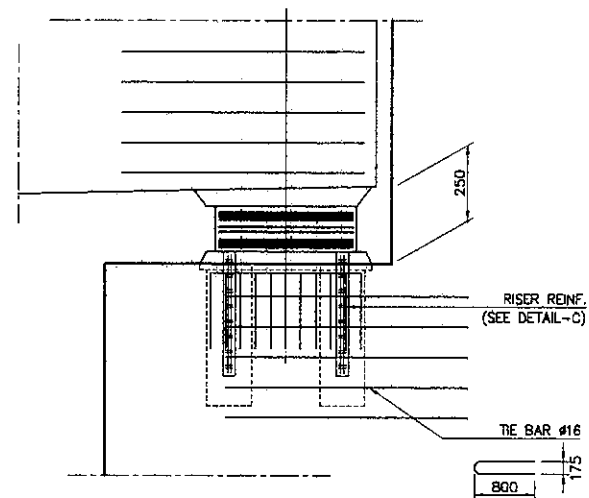
**D2** PLAN  
 SCALE : 1:10



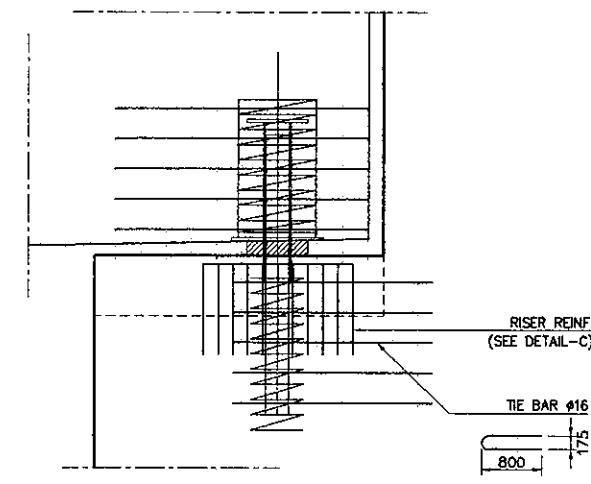
**1** SECTION  
 SCALE : 1:10



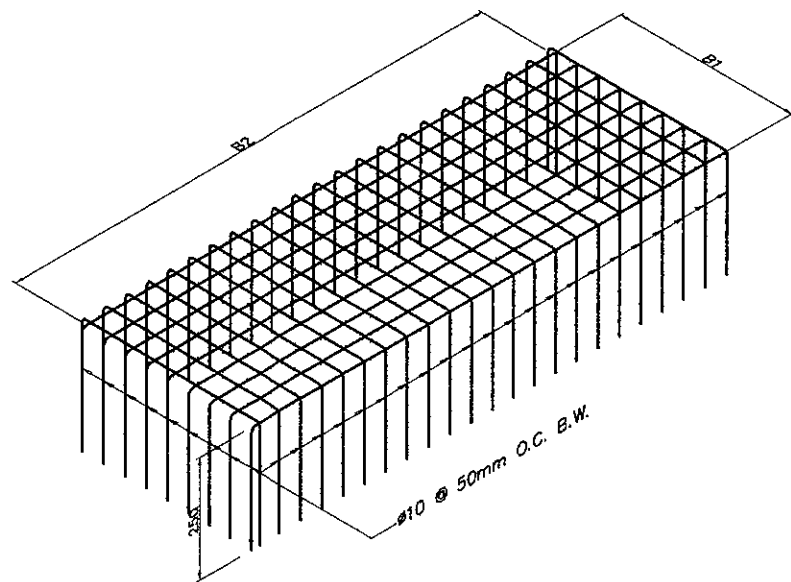
**B** COMPRESSIBLE PAD FOR DOWELS  
 SCALE : 1:10



**2** DETAIL AT BEARING  
 SCALE : 1:25



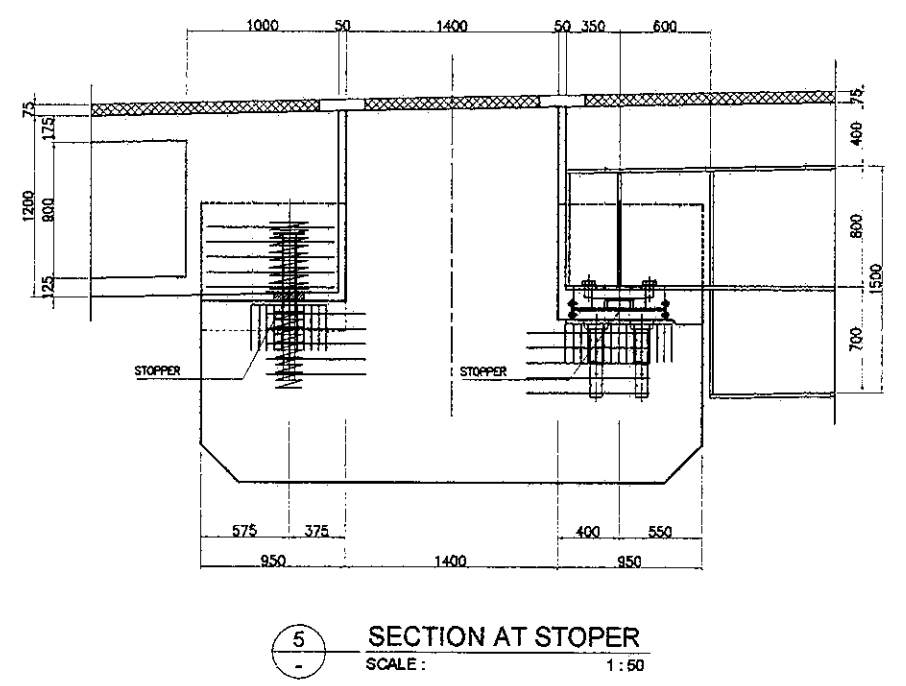
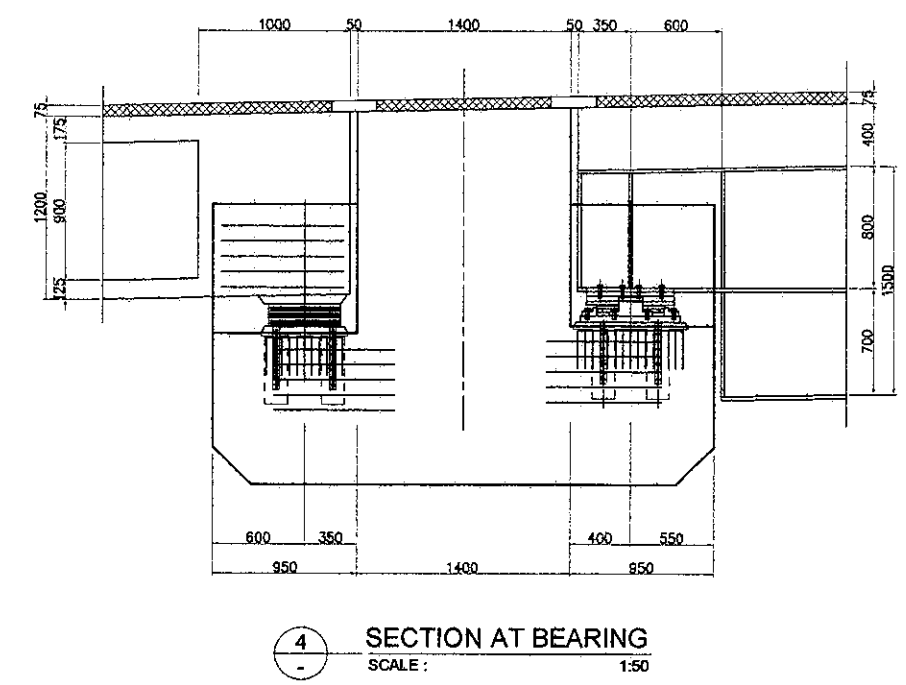
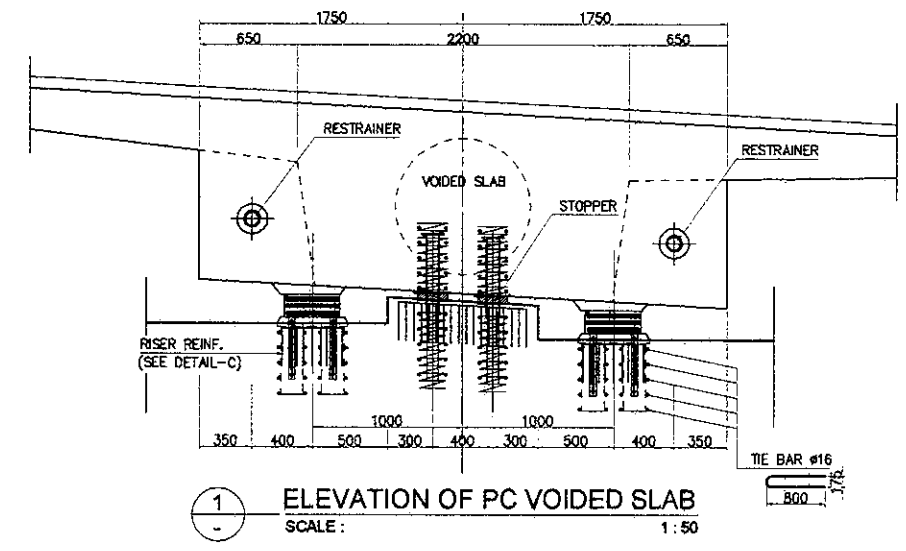
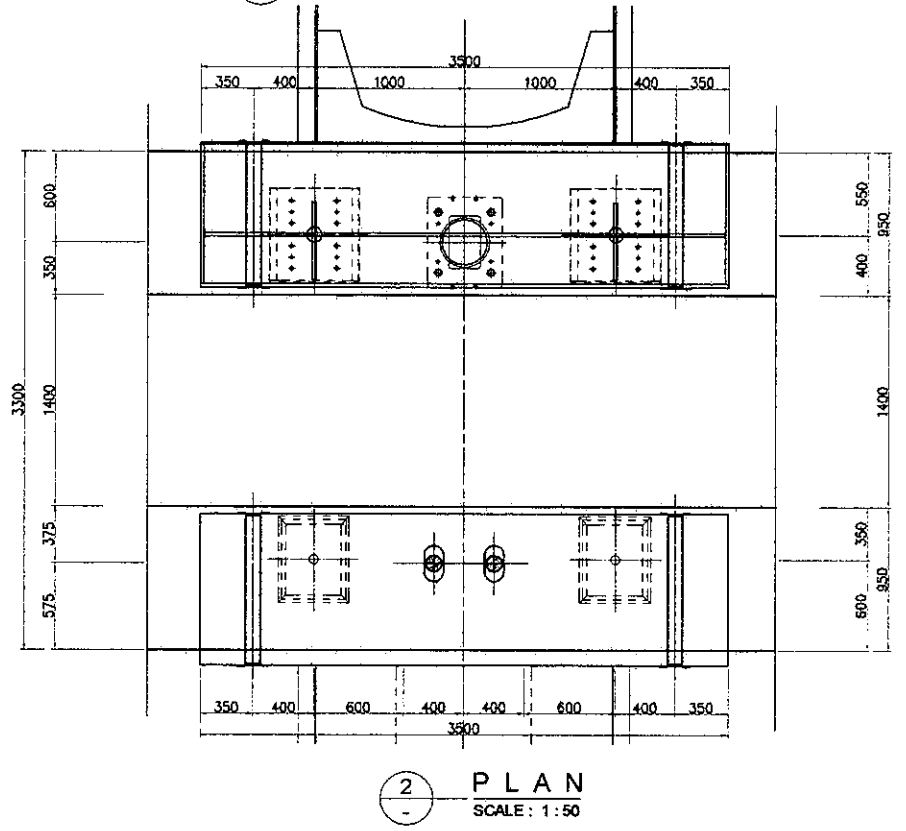
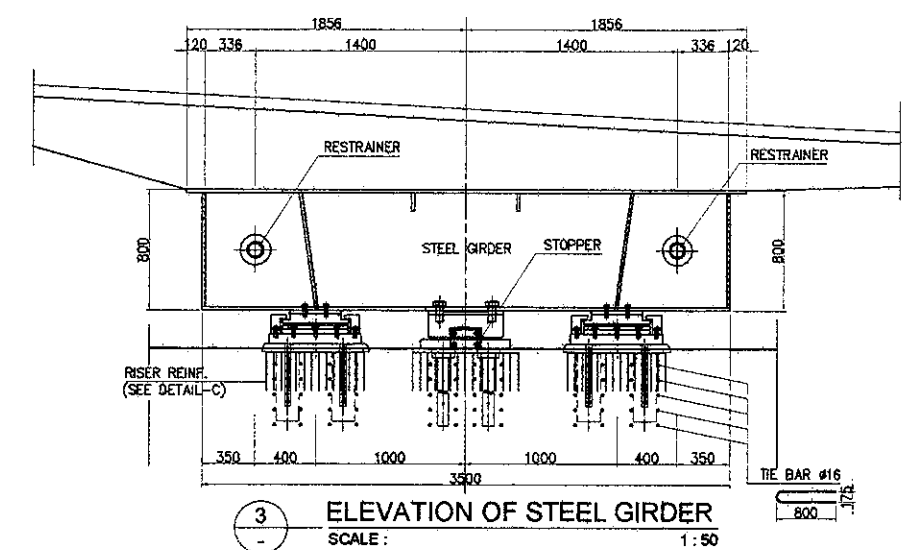
**3** DETAIL AT STOPPER  
 SCALE : 1:25

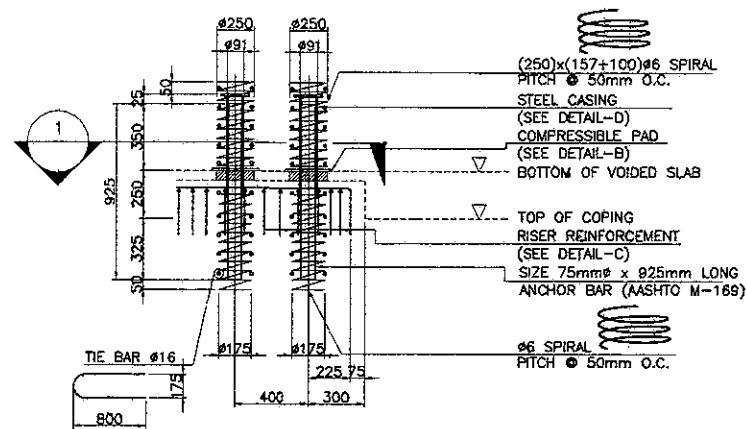


**C** RISER REINFORCEMENT  
 NOT TO SCALE

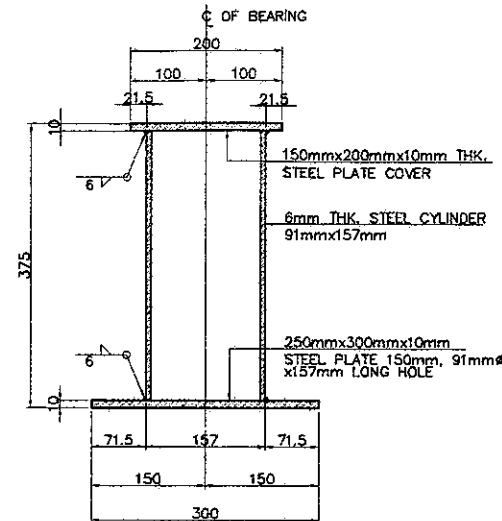
PIER NO.		SCHEDULE OF RISER REINFORCEMENT & TIE BAR											
		RISER REINFORCEMENT								TIE BAR			
		BEARING				STOPPER				BEARING		STOPPER	
PC VOIDED SLAB		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT		
		B1	B2	B1	B2	B1	B2	B1	B2	QTY.	QTY.	QTY.	QTY.
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(PCS.)	(PCS.)	(PCS.)	(PCS.)
P4	P3 SIDE	500	400	500	400	500	525	500	525	10	10	15	15
	P5 SIDE	500	400	500	400	500	525	500	525	10	10	15	15

NOTE:  
 ALL METALS SHALL BE HOT-DIPPED GALVANIZED CONFORMING  
 TO LATEST ASTM REQUIREMENTS.

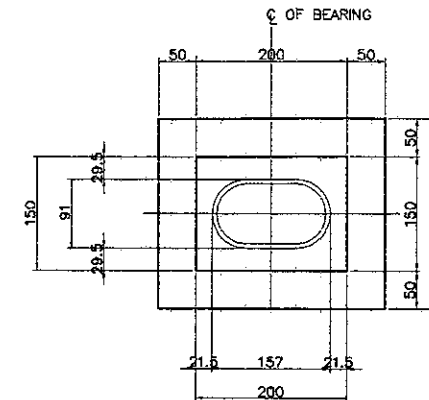




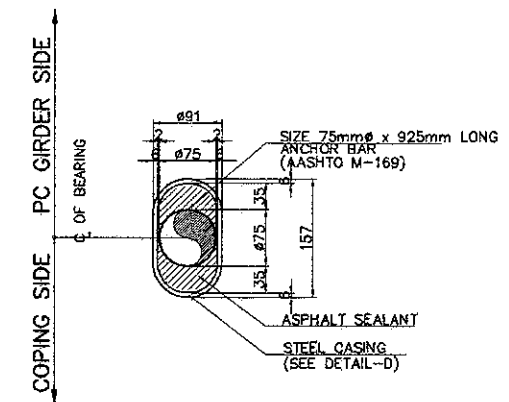
**A** DOWEL BAR DETAILS  
 SCALE : 1:40



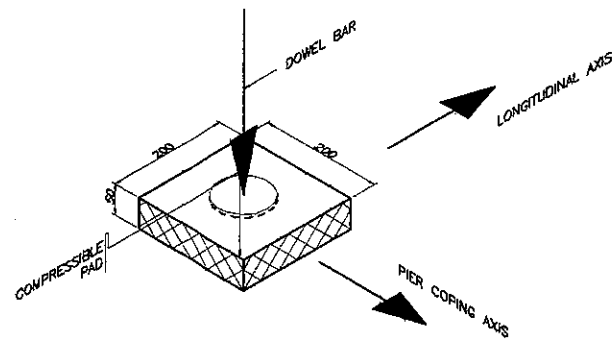
**D1** ELEVATION  
 SCALE : 1:10



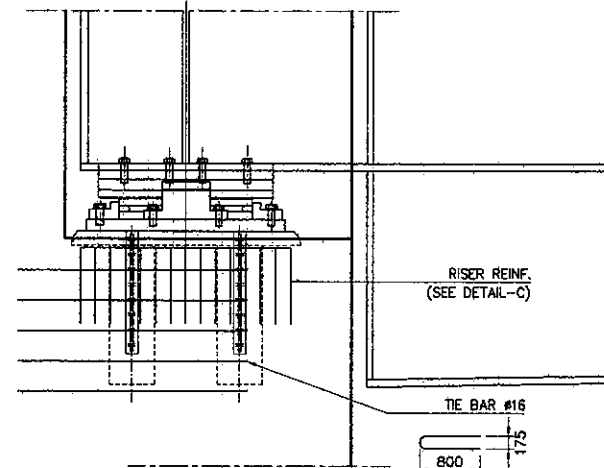
**D2** PLAN  
 SCALE : 1:10



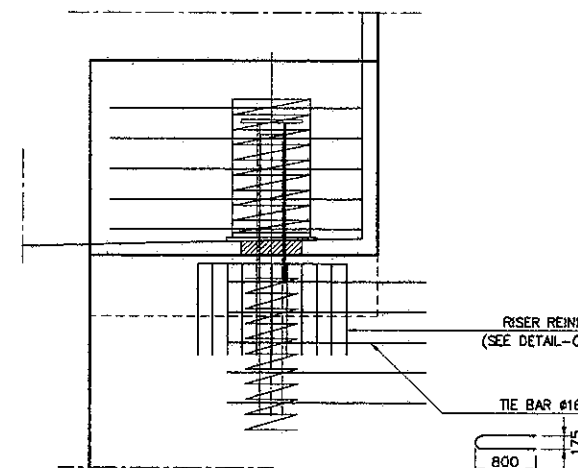
**1** SECTION  
 SCALE : 1:10



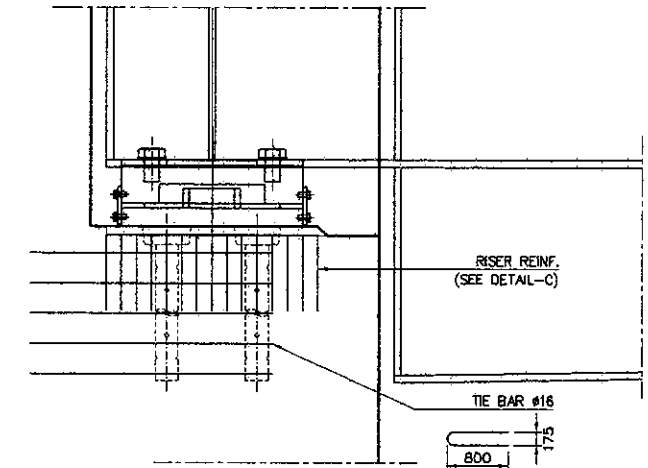
**B** COMPRESSIBLE PAD FOR DOWELS  
 SCALE : 1:10



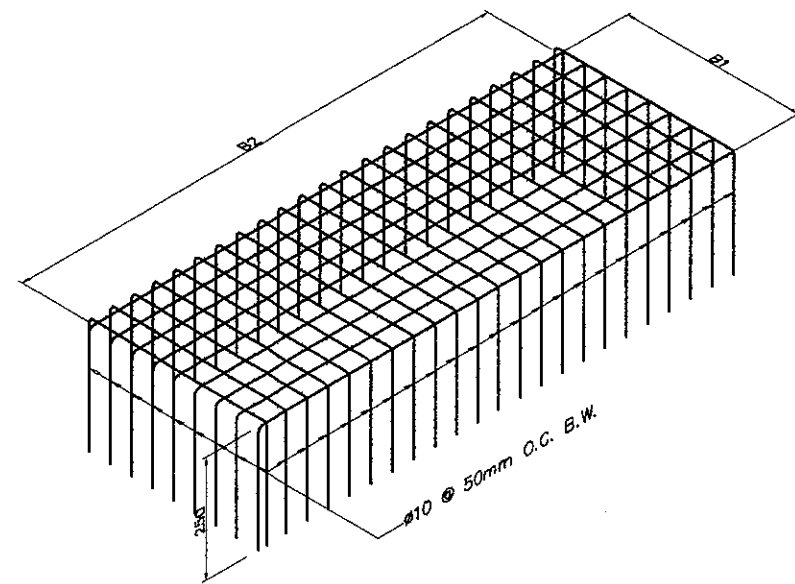
**3** DETAIL AT BEARING (STEEL)  
 SCALE : 1:25



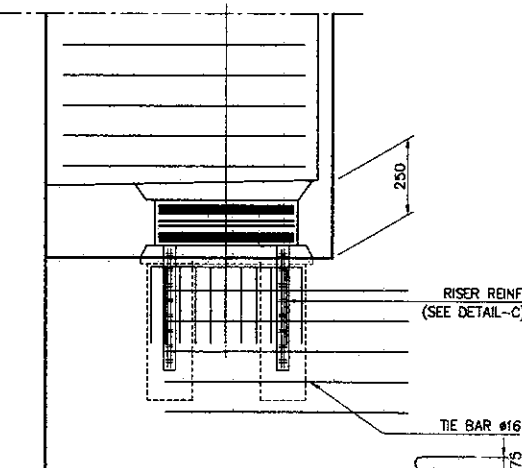
**4** DETAIL AT STOPPER (PC)  
 SCALE : 1:25



**5** DETAIL AT STOPPER (STEEL)  
 SCALE : 1:25



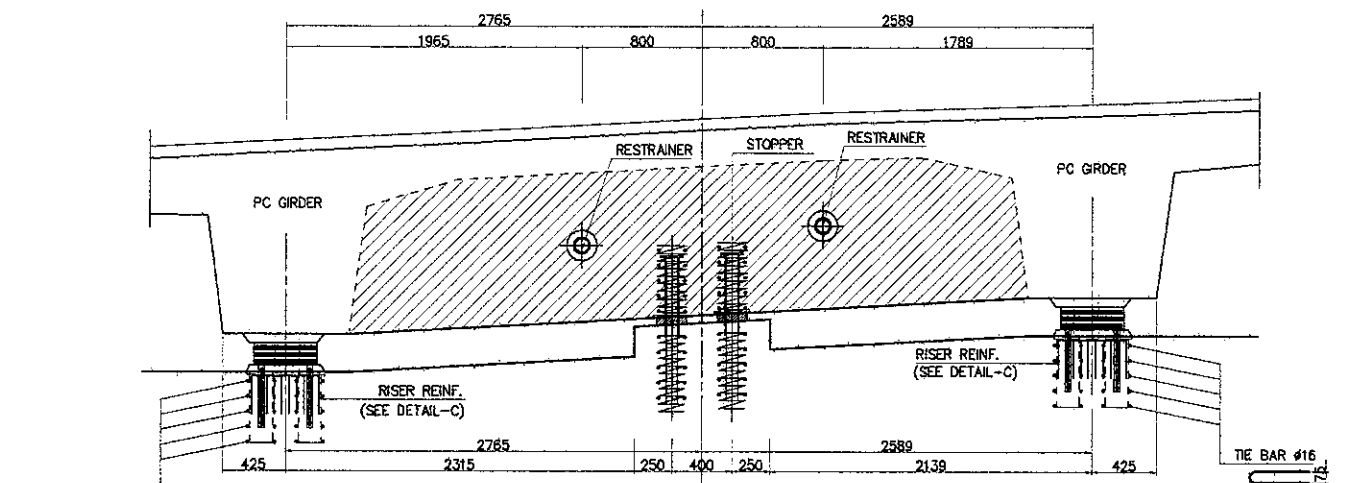
**C** RISER REINFORCEMENT  
 NOT TO SCALE



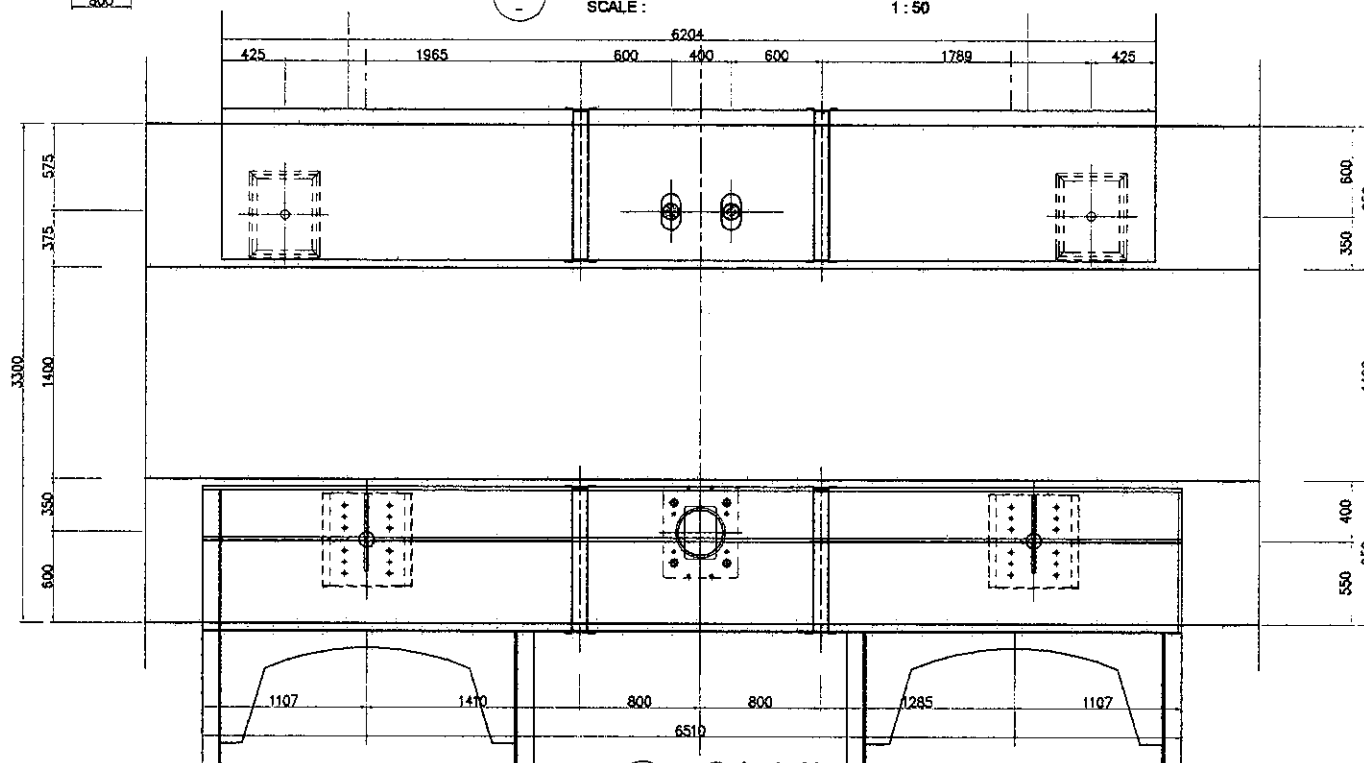
**2** DETAIL AT BEARING (PC)  
 SCALE : 1:25

PIER NO.		SCHEDULE OF RISER REINFORCEMENT & TIE BAR											
		RISER REINFORCEMENT								TIE BAR			
		BEARING				STOPPER				BEARING		STOPPER	
		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT		
		B1	B2	B1	B2	B1	B2	B1	B2	QTY.	QTY.		
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(PCS.)	(PCS.)		
P8	P7 SIDE	500	400	500	400	500	425	500	425	10	10		
	P9 SIDE	700	650	700	650	700	700	700	700	10	10		

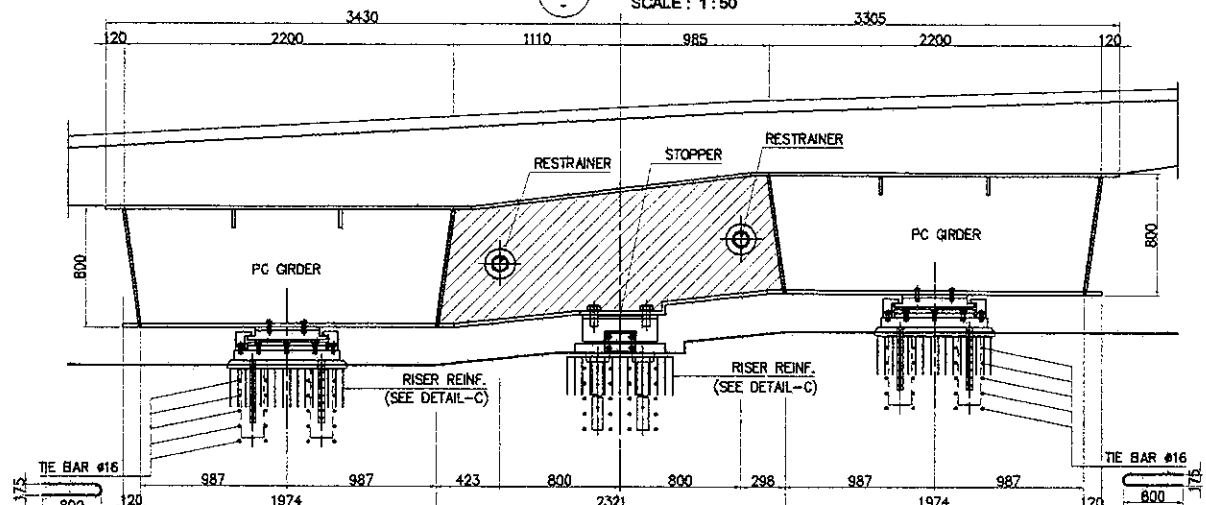
NOTE:  
 ALL METALS SHALL BE HOT-DIPPED GALVANIZED CONFORMING TO LATEST ASTM REQUIREMENTS.



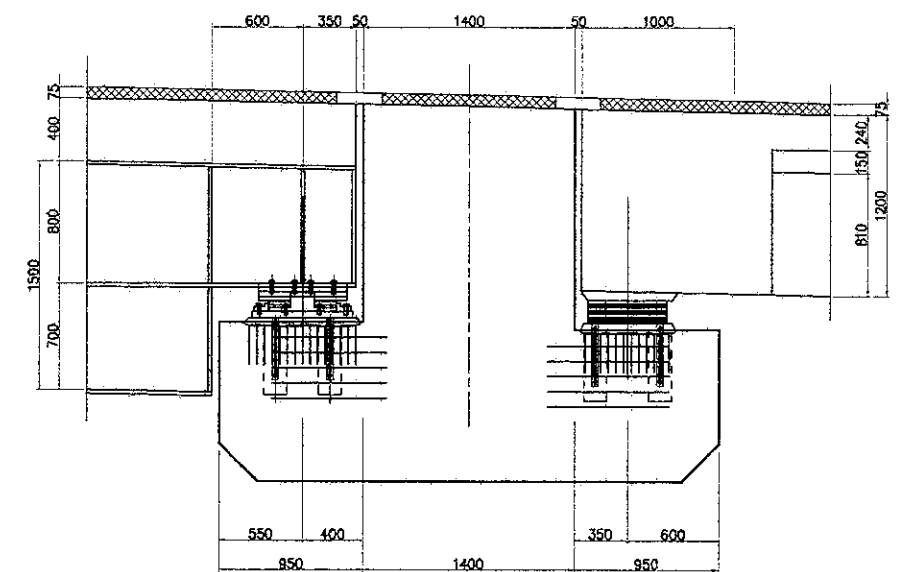
**3 ELEVATION OF PC GIRDER**  
 SCALE : 1 : 50



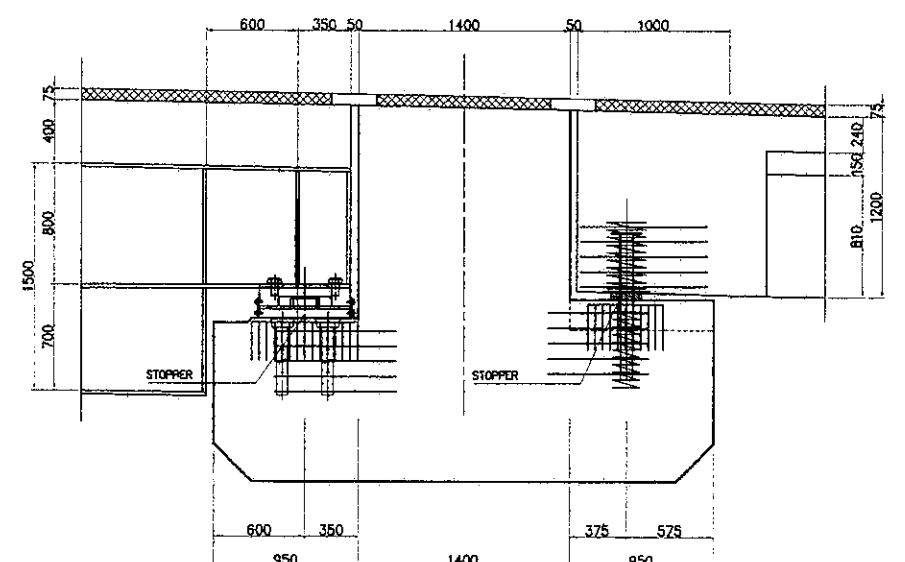
**2 PLAN**  
 SCALE : 1 : 50



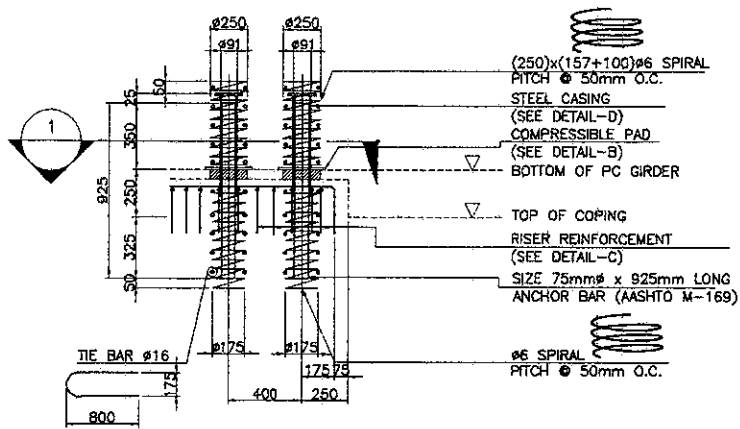
**1 ELEVATION OF STEEL GIRDER**  
 SCALE : 1 : 50



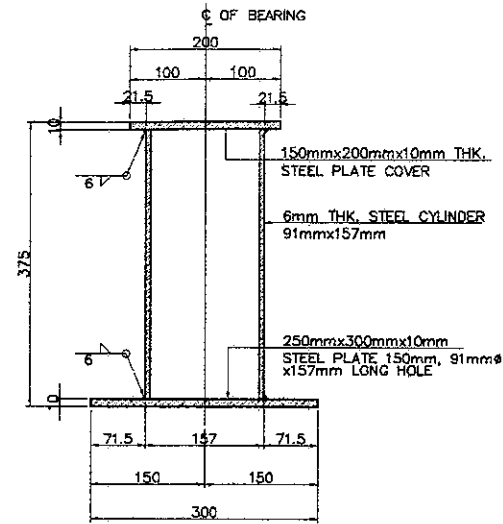
**4 SECTION AT BEARING**  
 SCALE : 1 : 50



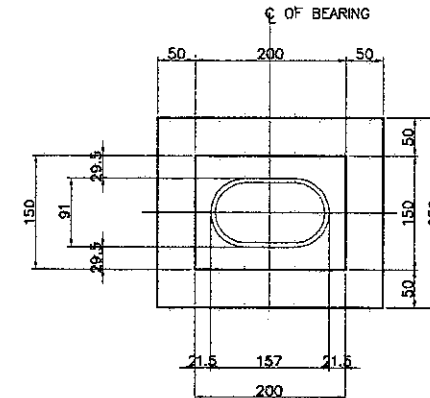
**5 SECTION AT STOPPER**  
 SCALE : 1 : 50



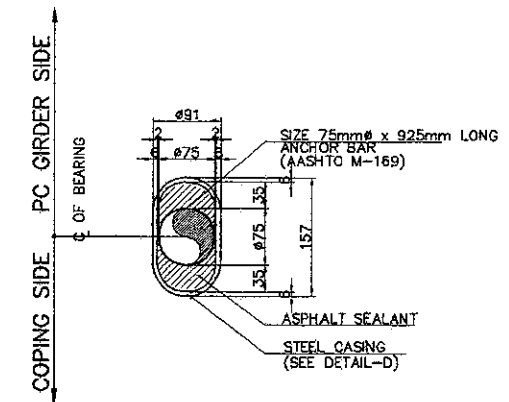
**A** DOWEL BAR DETAILS  
 SCALE: 1:40



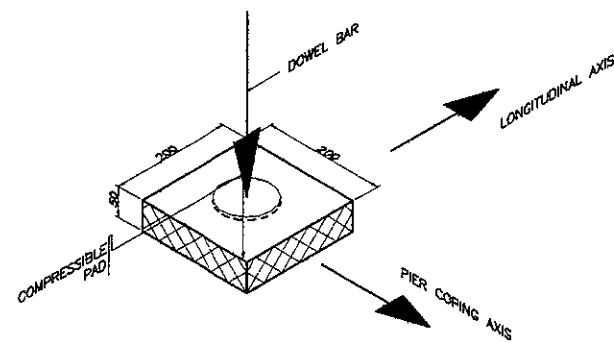
**D1** ELEVATION  
 SCALE: 1:10



**D2** PLAN  
 SCALE: 1:10

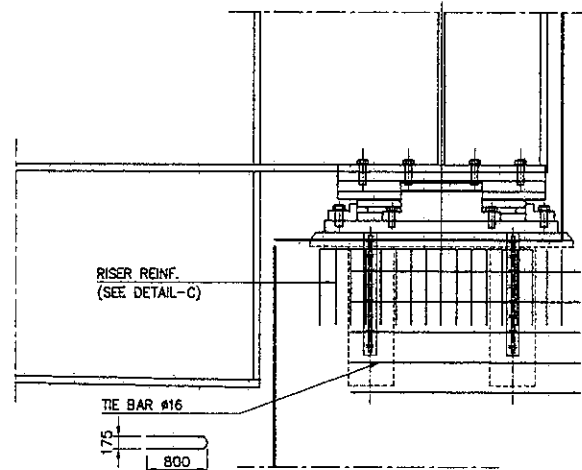


**1** SECTION  
 SCALE: 1:10

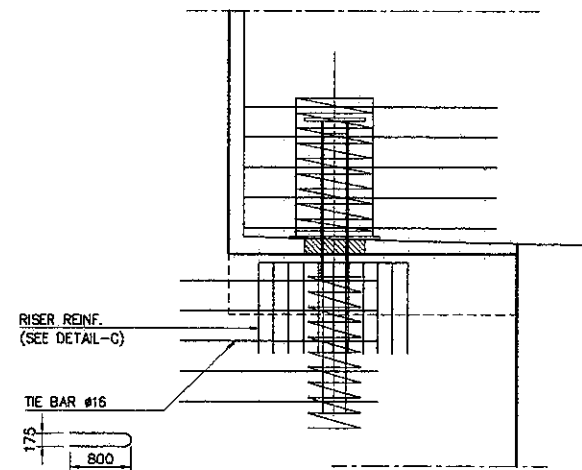


**B** COMPRESSIBLE PAD FOR DOWELS  
 SCALE: 1:10

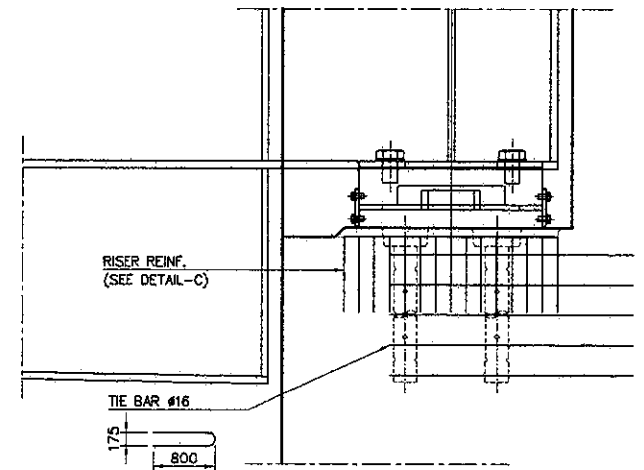
**D** STEEL CASING DETAILS  
 SCALE: 1:10



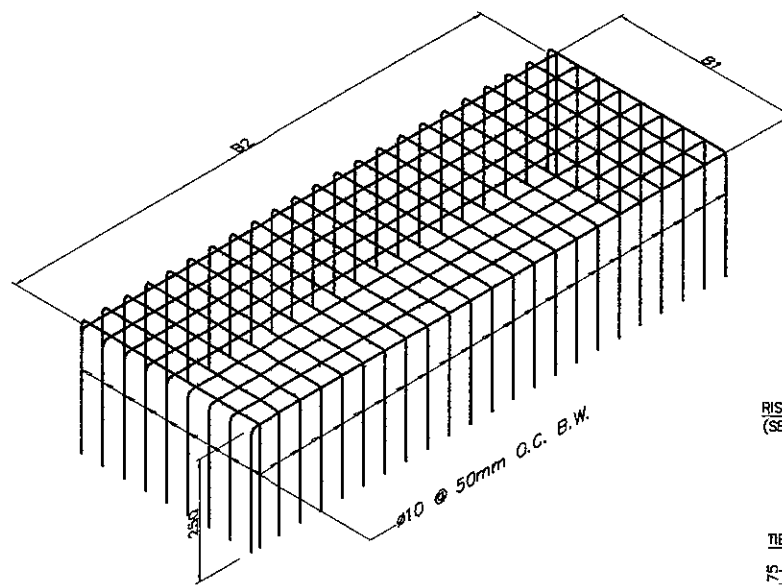
**3** DETAIL AT BEARING (STEEL)  
 SCALE: 1:25



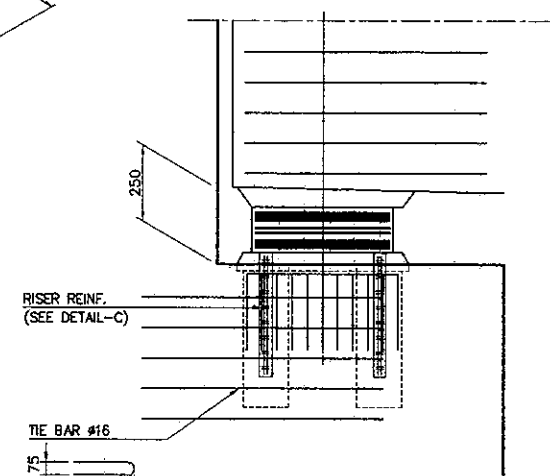
**4** DETAIL AT STOPPER (PC)  
 SCALE: 1:25



**5** DETAIL AT STOPPER (STEEL)  
 SCALE: 1:25



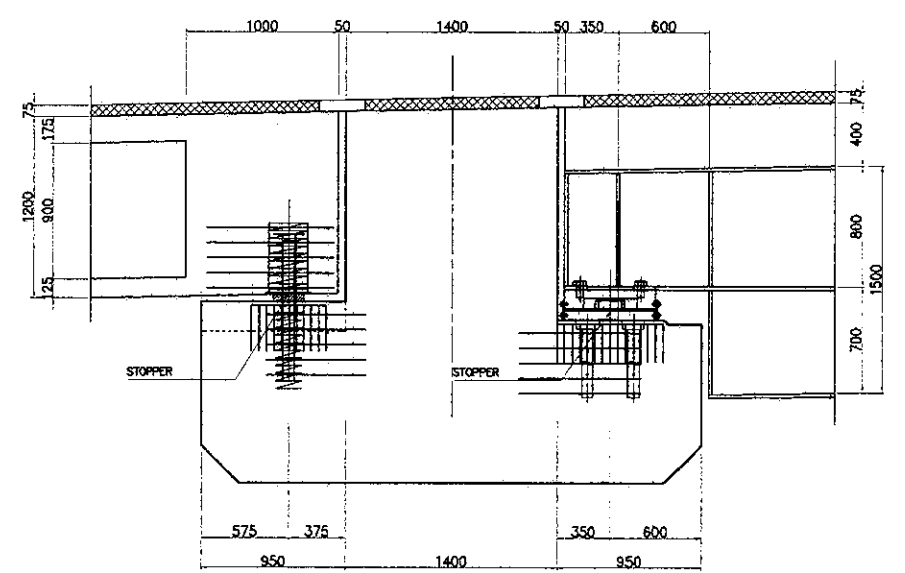
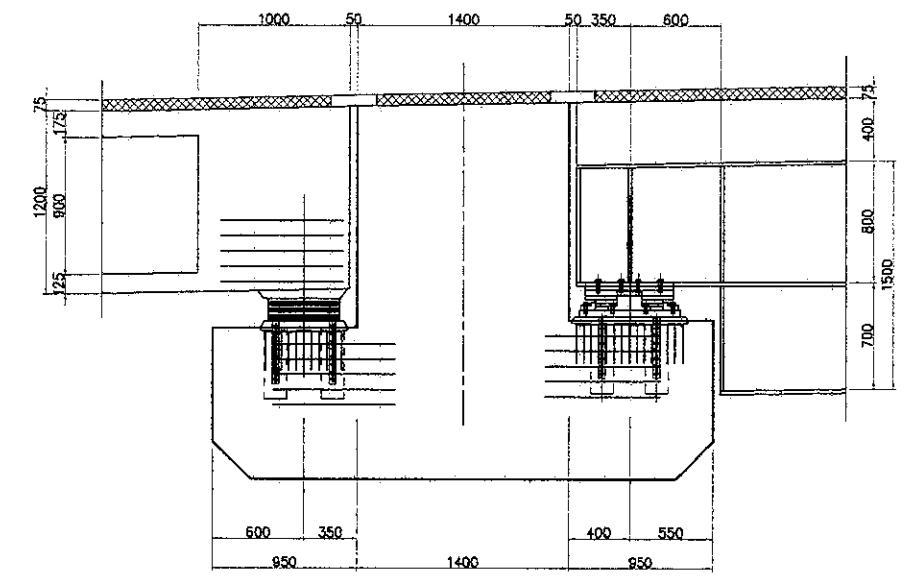
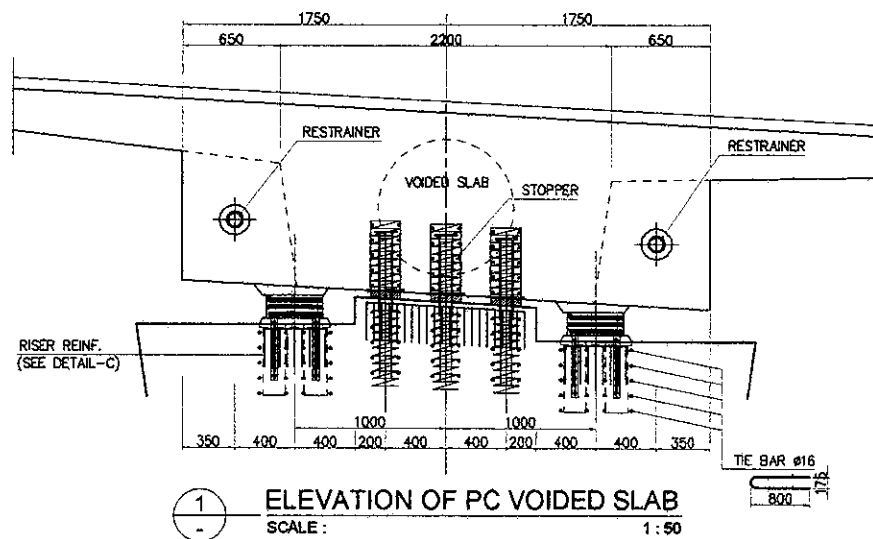
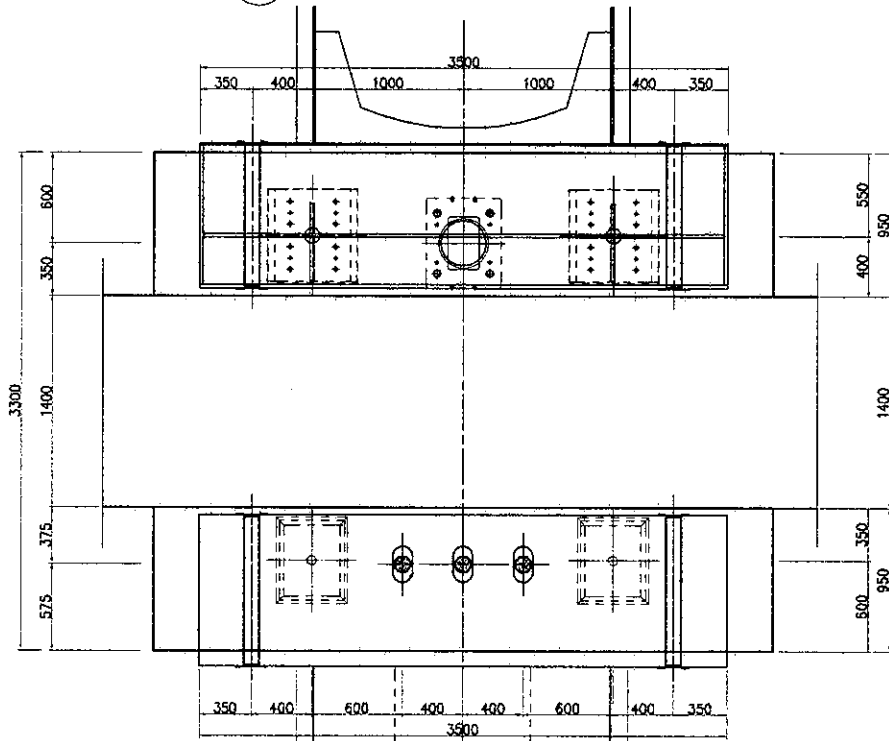
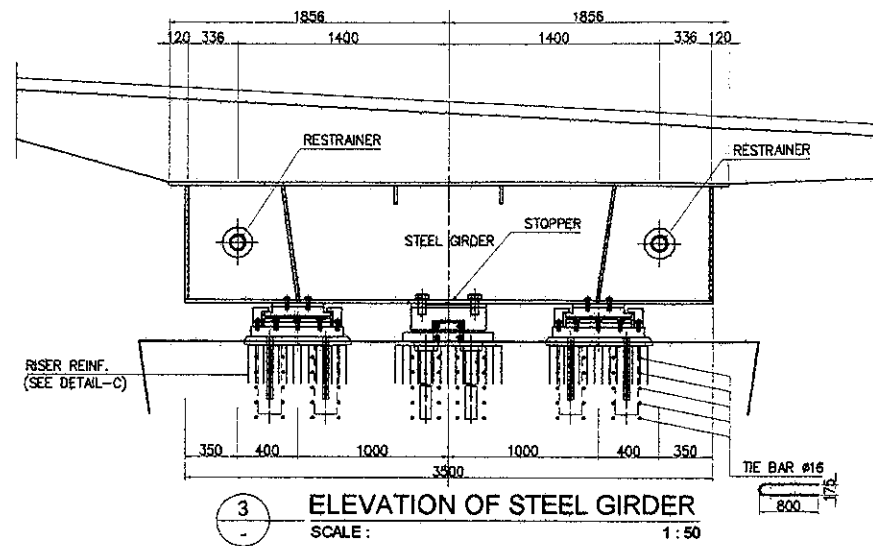
**C** RISER REINFORCEMENT  
 NOT TO SCALE

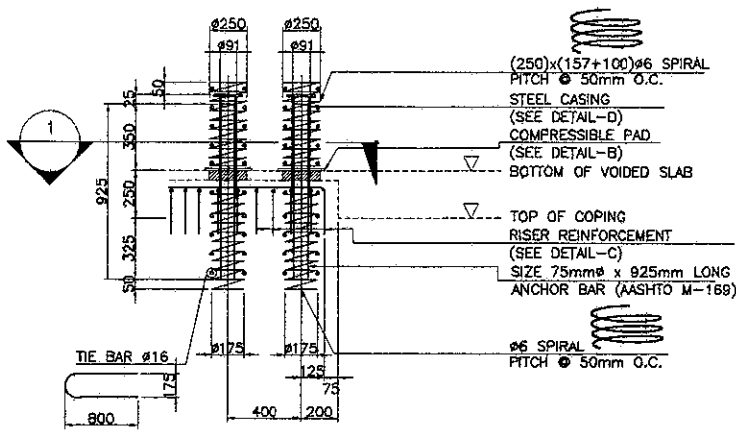


**2** DETAIL AT BEARING (PC)  
 SCALE: 1:25

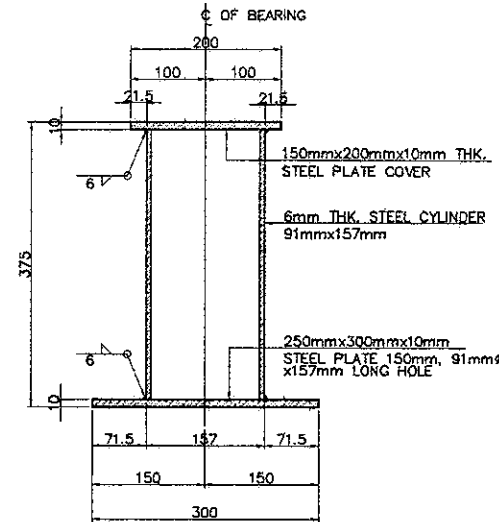
PIER NO.	PC CONC./STEEL GIRDER	RISER REINFORCEMENT								TIE BAR				
		BEARING				STOPPER				BEARING		STOPPER		
		LEFT	B2	RIGHT	B2	LEFT	B2	RIGHT	B2	LEFT	RIGHT	LEFT	RIGHT	
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(PCS.)	(PCS.)	(PCS.)	(PCS.)
P13	P12 SIDE	800	750	800	750	700	700	700	700	10	10	5	5	
	P14 SIDE	550	450	550	450	500	750	500	750	10	10	10	10	

NOTE:  
 ALL METALS SHALL BE HOT-DIPPED GALVANIZED CONFORMING TO LATEST ASTM REQUIREMENTS.

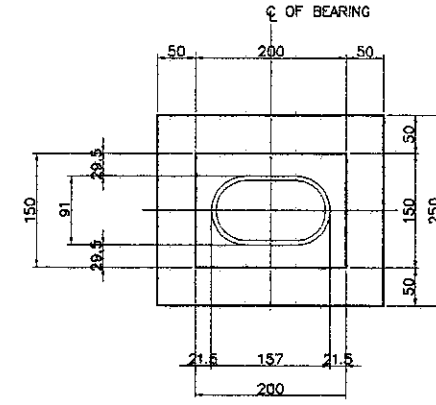




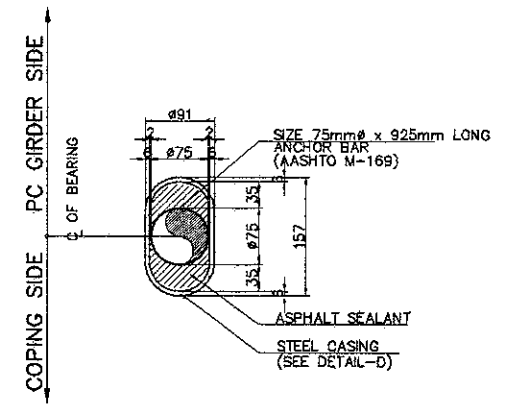
**A** DOWEL BAR DETAILS  
 SCALE : 1:40



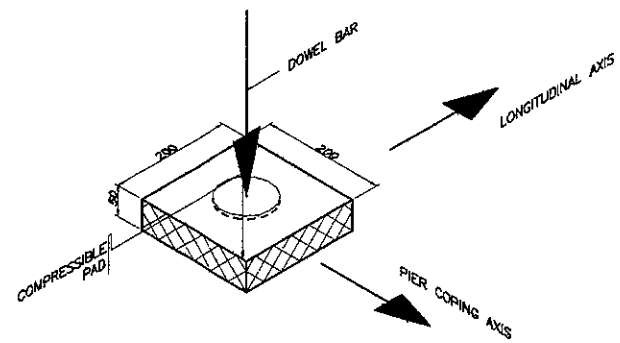
**D1** ELEVATION  
 SCALE : 1:10



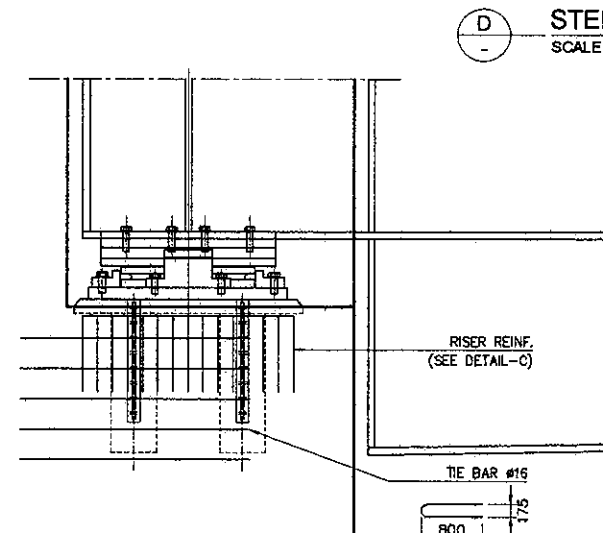
**D2** PLAN  
 SCALE : 1:10



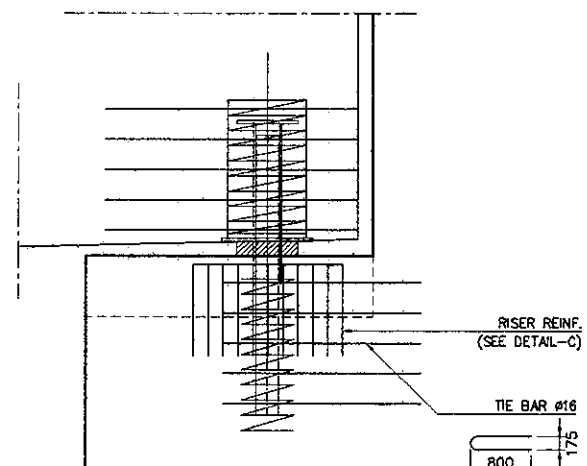
**1** SECTION  
 SCALE : 1:10



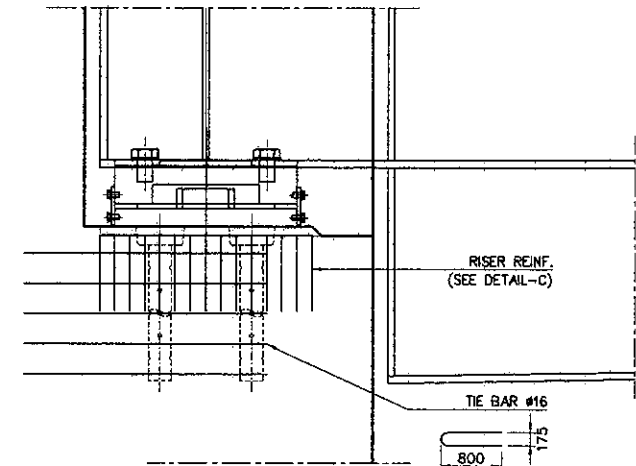
**B** COMPRESSIBLE PAD FOR DOWELS  
 SCALE : 1:10



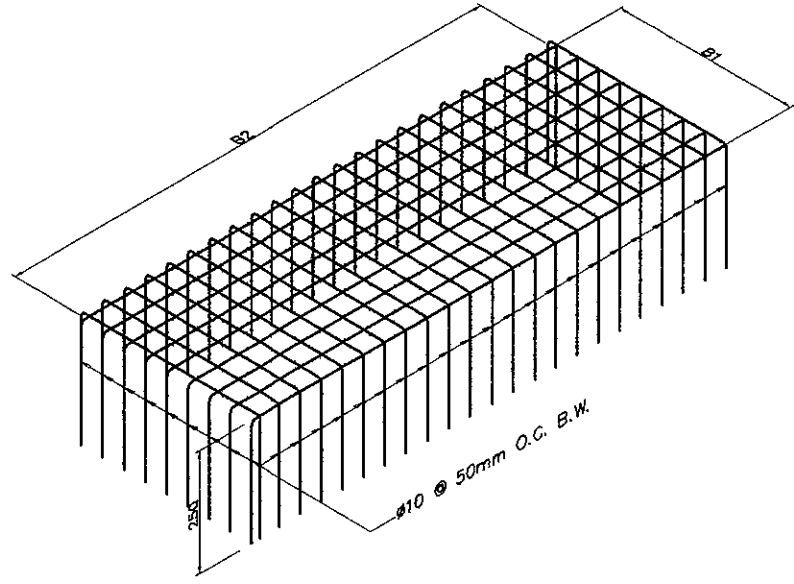
**3** DETAIL AT BEARING (STEEL)  
 SCALE : 1:25



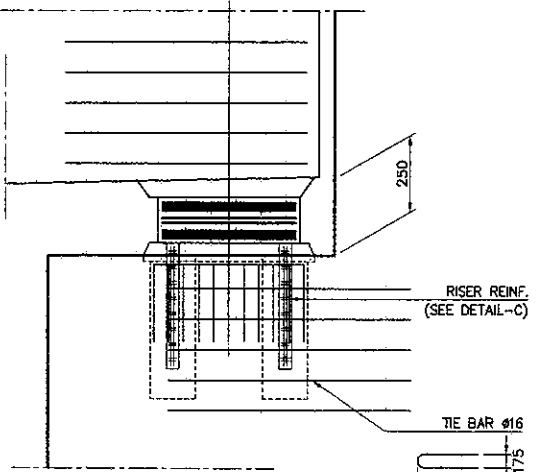
**4** DETAIL AT STOPPER (PC)  
 SCALE : 1:25



**5** DETAIL AT STOPPER (STEEL)  
 SCALE : 1:25



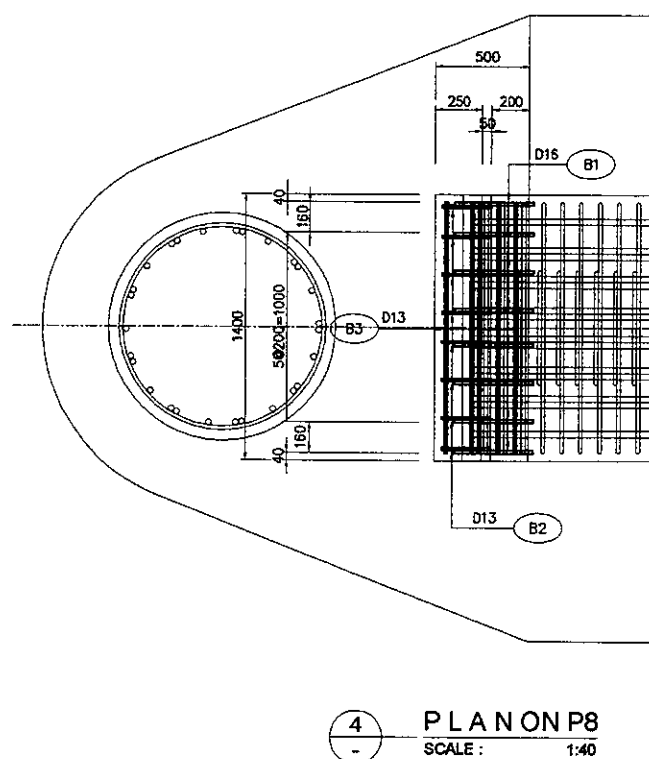
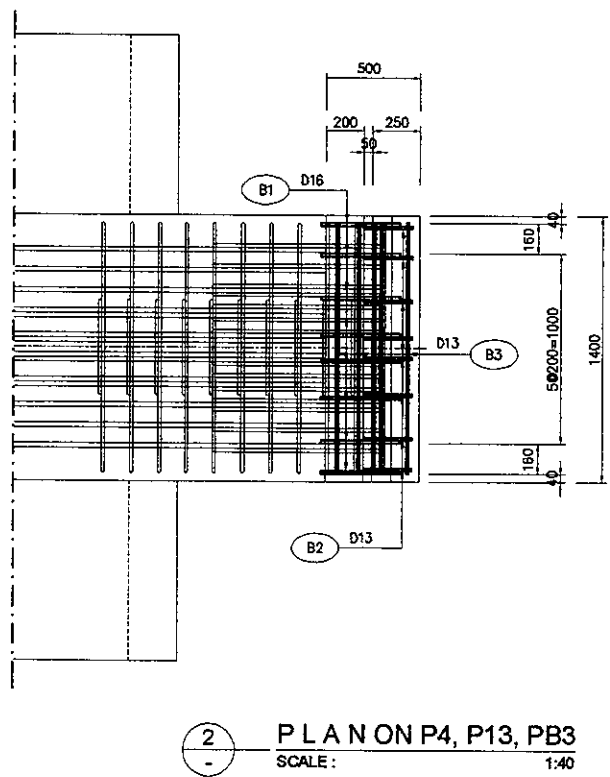
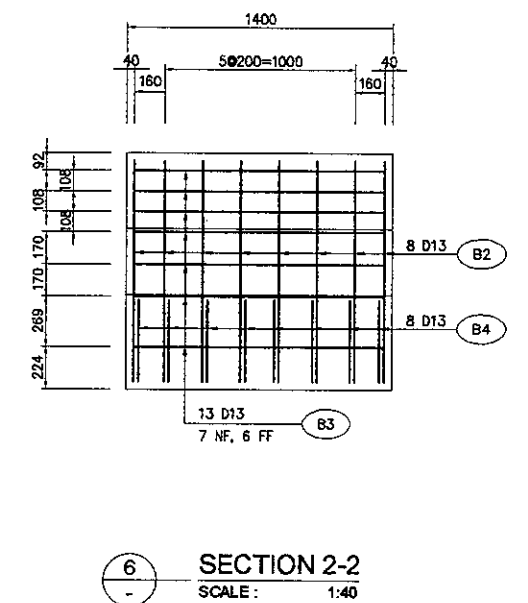
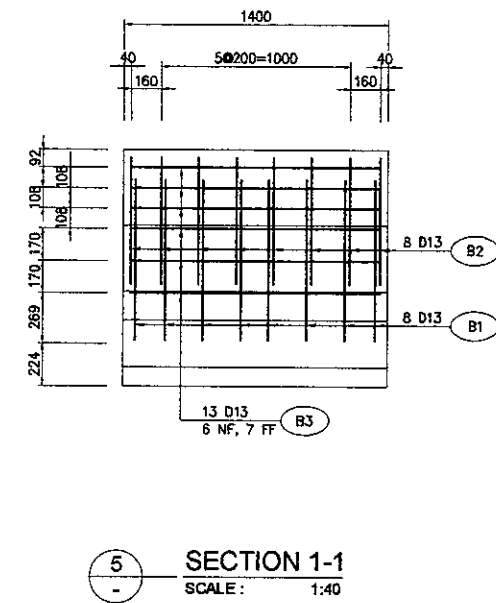
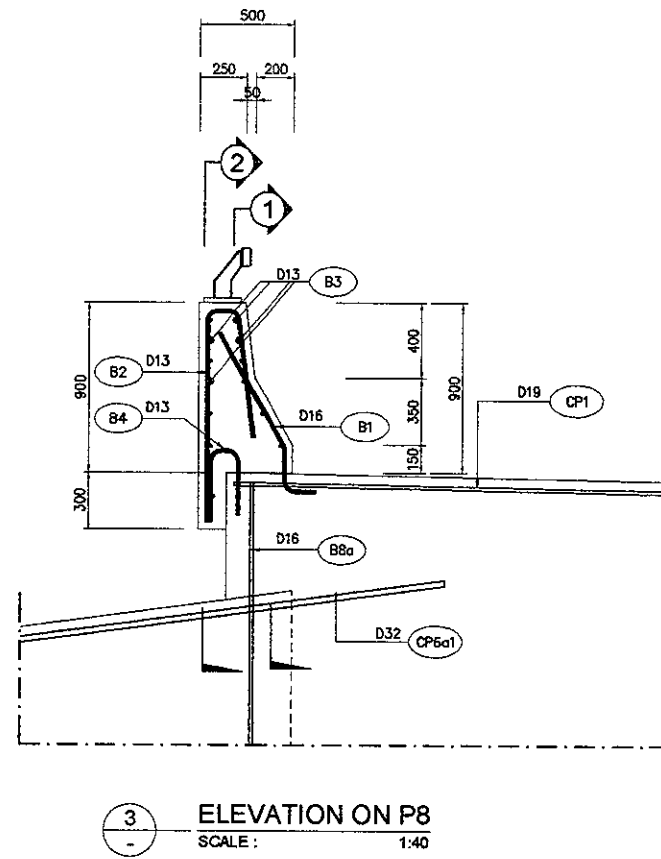
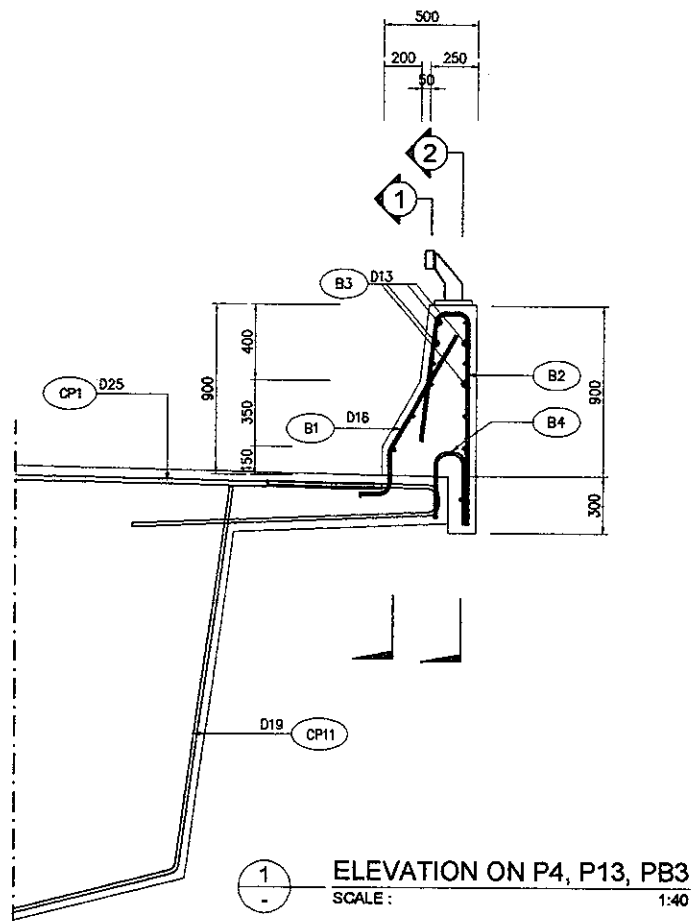
**C** RISER REINFORCEMENT  
 NOT TO SCALE



**2** DETAIL AT BEARING (PC)  
 SCALE : 1:25

PIER NO.		SCHEDULE OF RISER REINFORCEMENT & TIE BAR											
		RISER REINFORCEMENT								TIE BAR			
		BEARING				STOPPER				BEARING		STOPPER	
		LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT		
		B1	B2	B1	B2	B1	B2	B1	B2	QTY.	QTY.		
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(PCS.)	(PCS.)		
PB3	PB2 SIDE	500	400	500	400	500	525	500	525	10	10		
	PB4 SIDE	700	650	700	650	700	700	700	700	10	10		
										15	15		
										5	5		

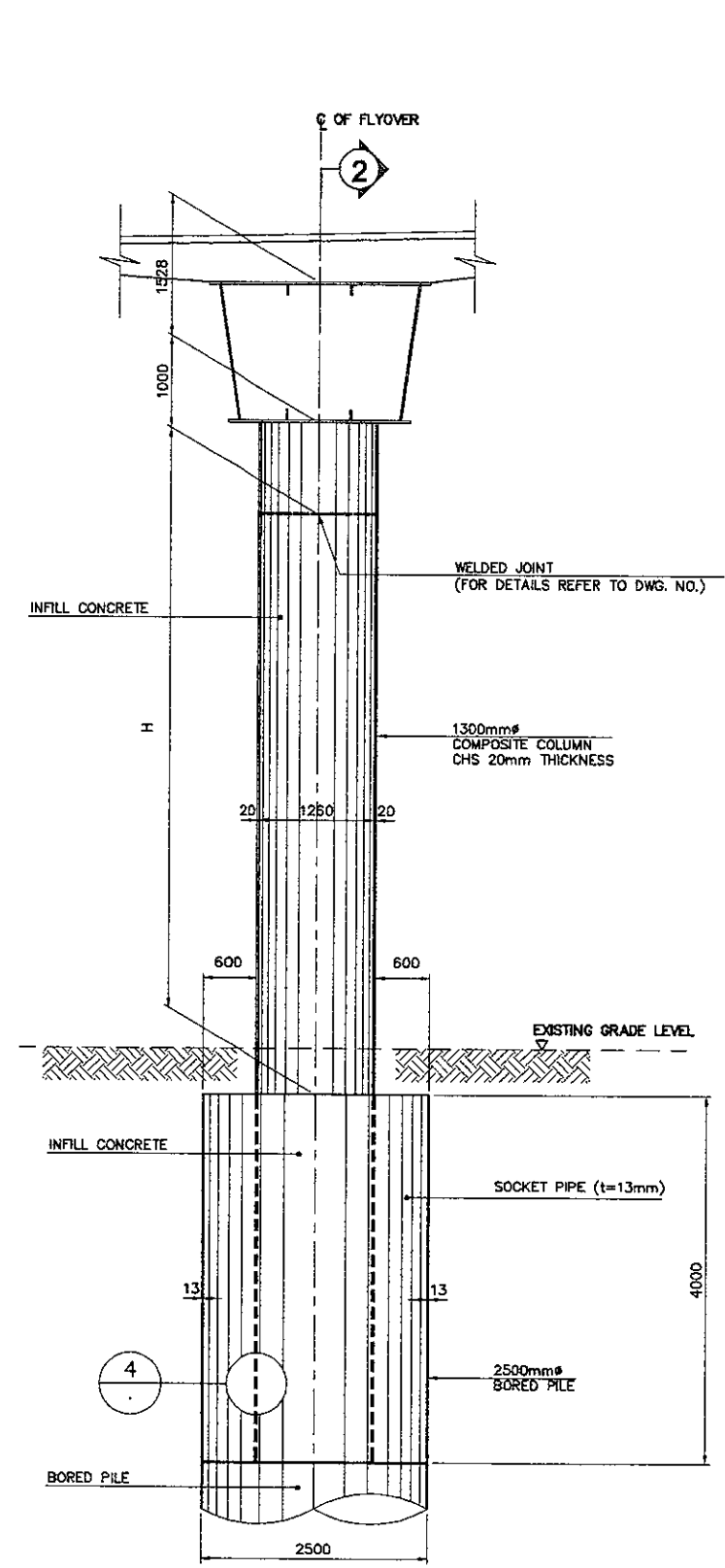
NOTE:  
 ALL METALS SHALL BE HOT-DIPPED GALVANIZED CONFORMING TO LATEST ASTM REQUIREMENTS.



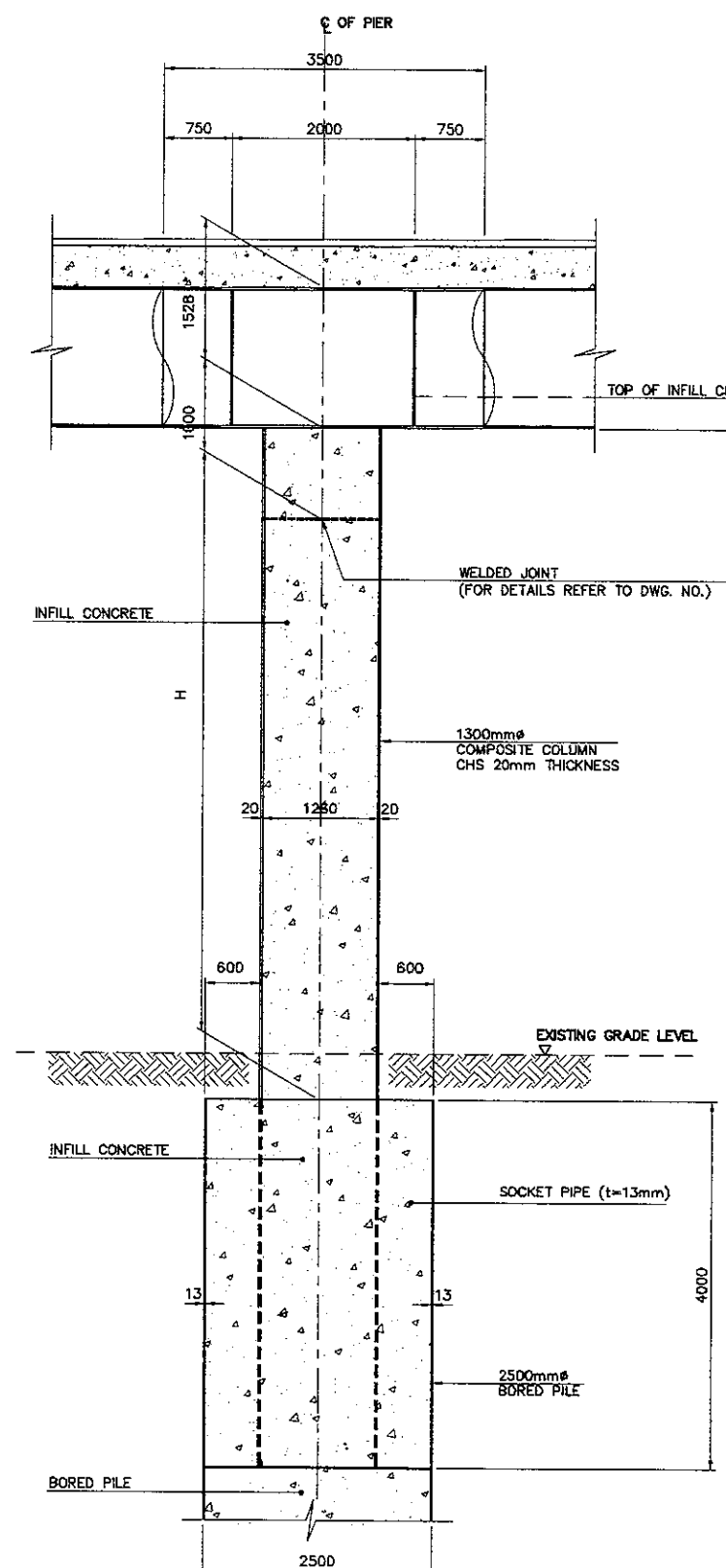
BAR BENDING DIAGRAM															
1	2	3	4												
SCHEDULE OF REINFORCEMENT															
LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m.)	WEIGHT (kg.)	VOLUME OF CONCRETE (cu.m)	
				a	b	c	d	e	f						
BARRIER PIER P4, P8, P13, PB3	B1	16	1	700	220	150					1070	8	1.58	14	0.378
	B2	13	2	1165	650	145					1960	8	1.04	16	
	B3	13	3	1320							1320	13	1.04	18	
	B4	13	4	420	330	160					910	8	1.04	8	
TOTAL WEIGHT FOR / BARRIER = 56 Kgs.															
THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY, THE CONTRACTOR SHOULD CHECKED AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.															

NOTES :  
 1. ALL DIMENSION ARE IN MILLIMETERS.  
 2. CONCRETE :  $f_c' = 30 \text{ MPa}$   
 3. REINFORCING STEEL : YIELD STRENGTH = 390 N/mm<sup>2</sup>

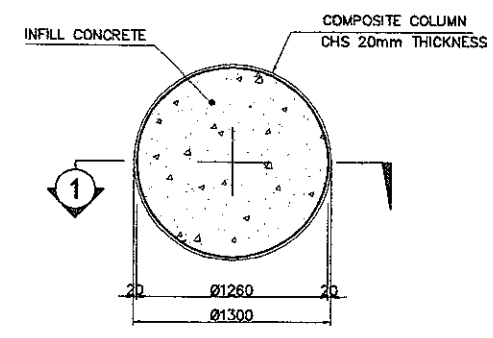




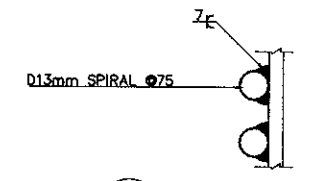
1 ELEVATION  
 SCALE 1:80



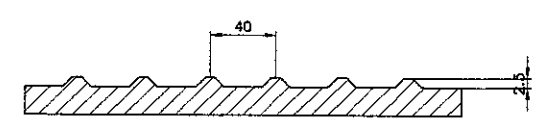
2 SECTION  
 SCALE 1:80



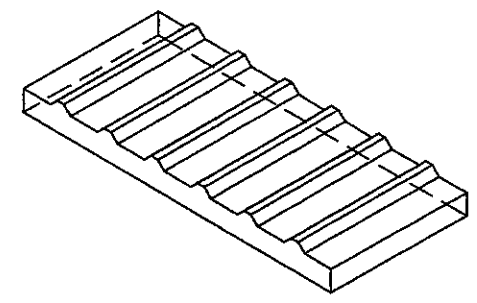
3 SECTION  
 SCALE 1:50



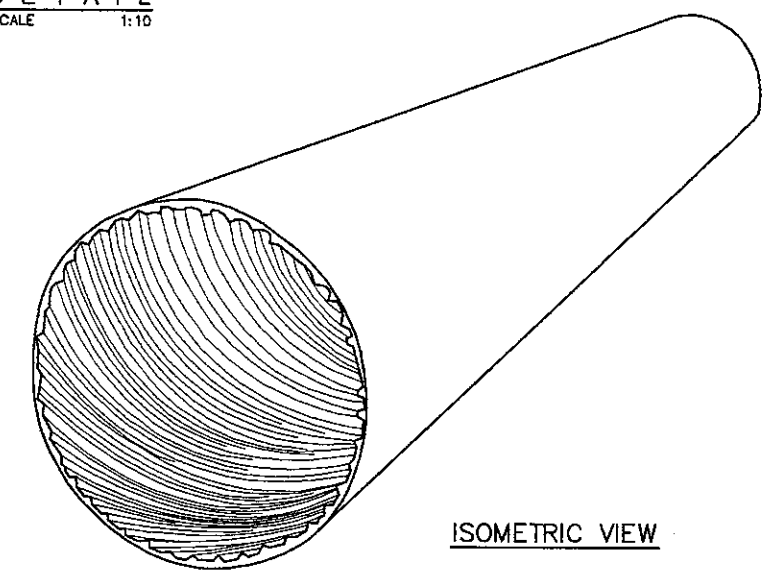
4 DETAIL  
 SCALE 1:10



5 INNER RIB DETAIL  
 NOT TO SCALE



ISOMETRIC VIEW



ISOMETRIC VIEW

BAR BENDING DIAGRAM

SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (m)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER P10&P11	13	-	-	75	1300	450					228.902	1	1.04	238
				TOTAL WEIGHT / COLUMN = 238 Kgs.										

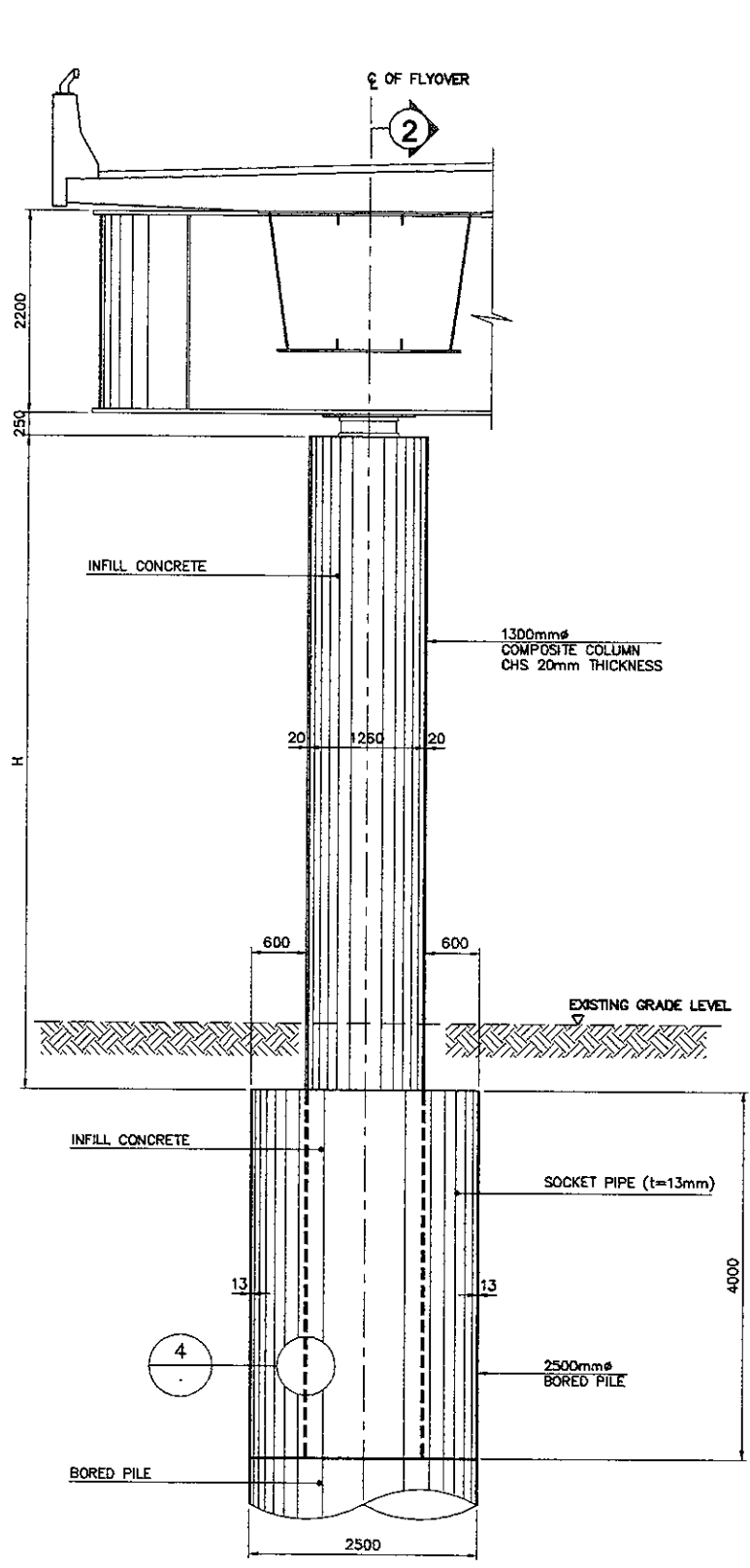
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $f_c' = 30$  MPa.
  - REINFORCING STEEL : YIELD STRENGTH = 390 N/mm<sup>2</sup>.

CONCRETE VOLUME (m <sup>3</sup> )		
P10		15.474
P11		15.271

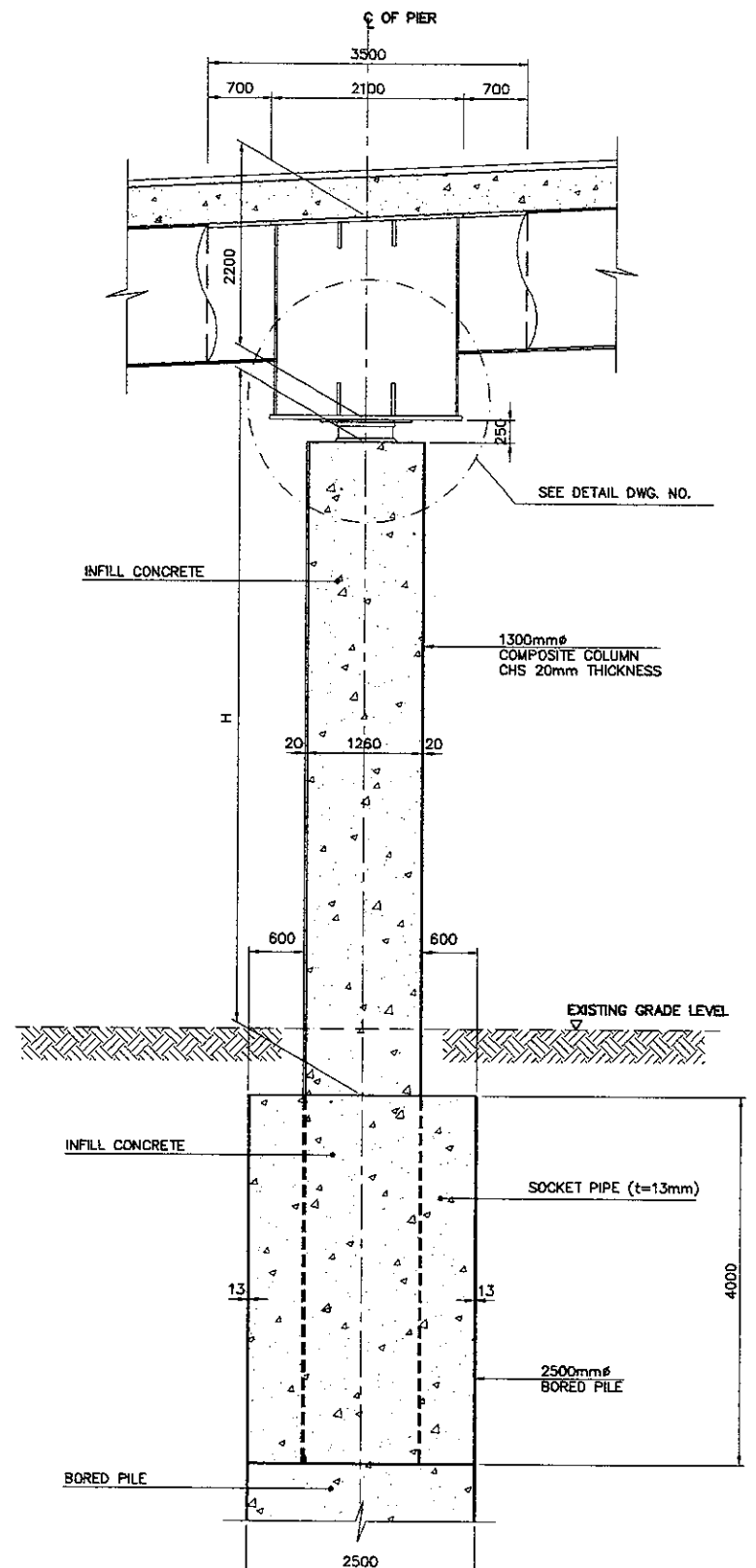
PIER NO.	DIMENSION(mm) OUT TO OUT				TOTAL LENGTH	REMARKS
	NO. OF PCS.	HEIGHT (H)	DIAMETER (MM)*	THICKNESS (MM)		
P10	1	7060	1300	20	11060	CORRUGATED
P11	1	6897	1300	20	10897	CORRUGATED

\* OUTSIDE DIAMETER OF COMPOSITE COLUMN

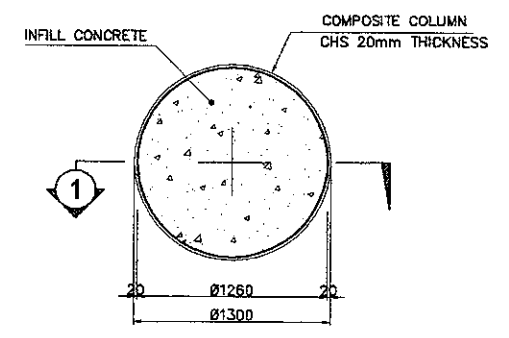
COMPOSITE COLUMN CASING DETAIL (P10 & P11)  
 SCALE AS SHOWN



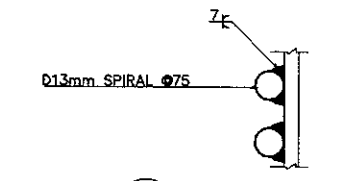
1 ELEVATION  
 SCALE 1:80



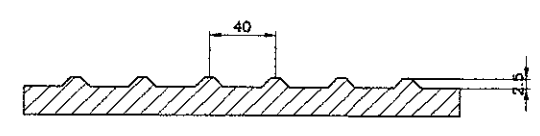
2 SECTION  
 SCALE 1:80



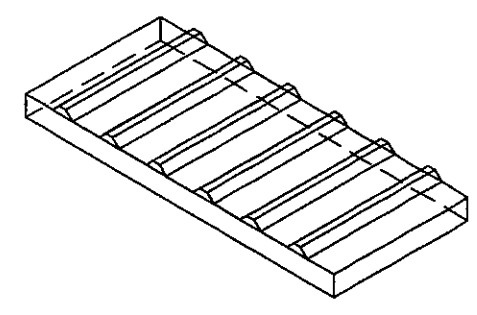
3 SECTION  
 SCALE 1:50



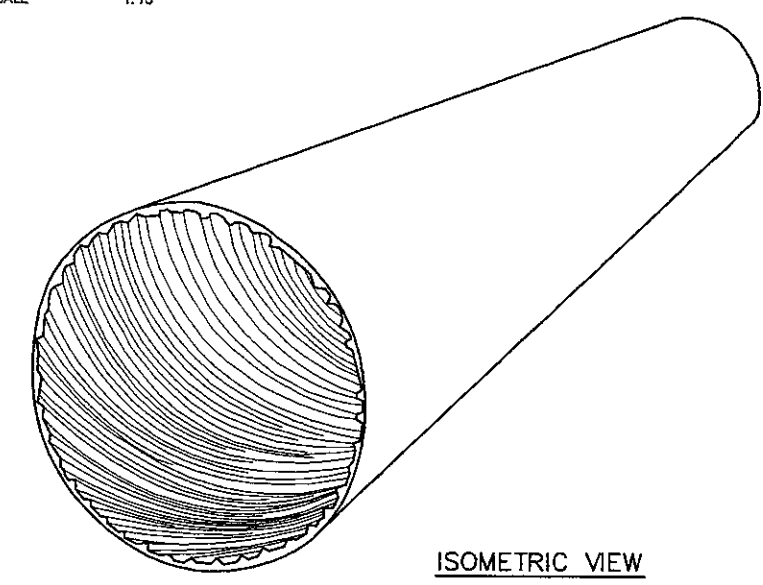
4 DETAIL  
 SCALE 1:10



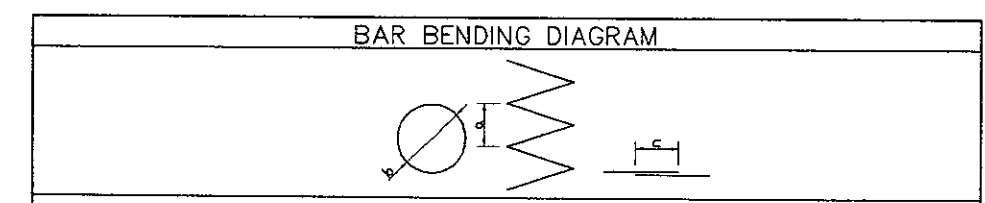
5 INNER RIB DETAIL  
 NOT TO SCALE



ISOMETRIC VIEW



ISOMETRIC VIEW



SCHEDULE OF REINFORCEMENT														
LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (m)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER PB4L		13	-	75	1300	450					228.838	1	1.04	238
	TOTAL WEIGHT / COLUMN = 238 Kgs.													

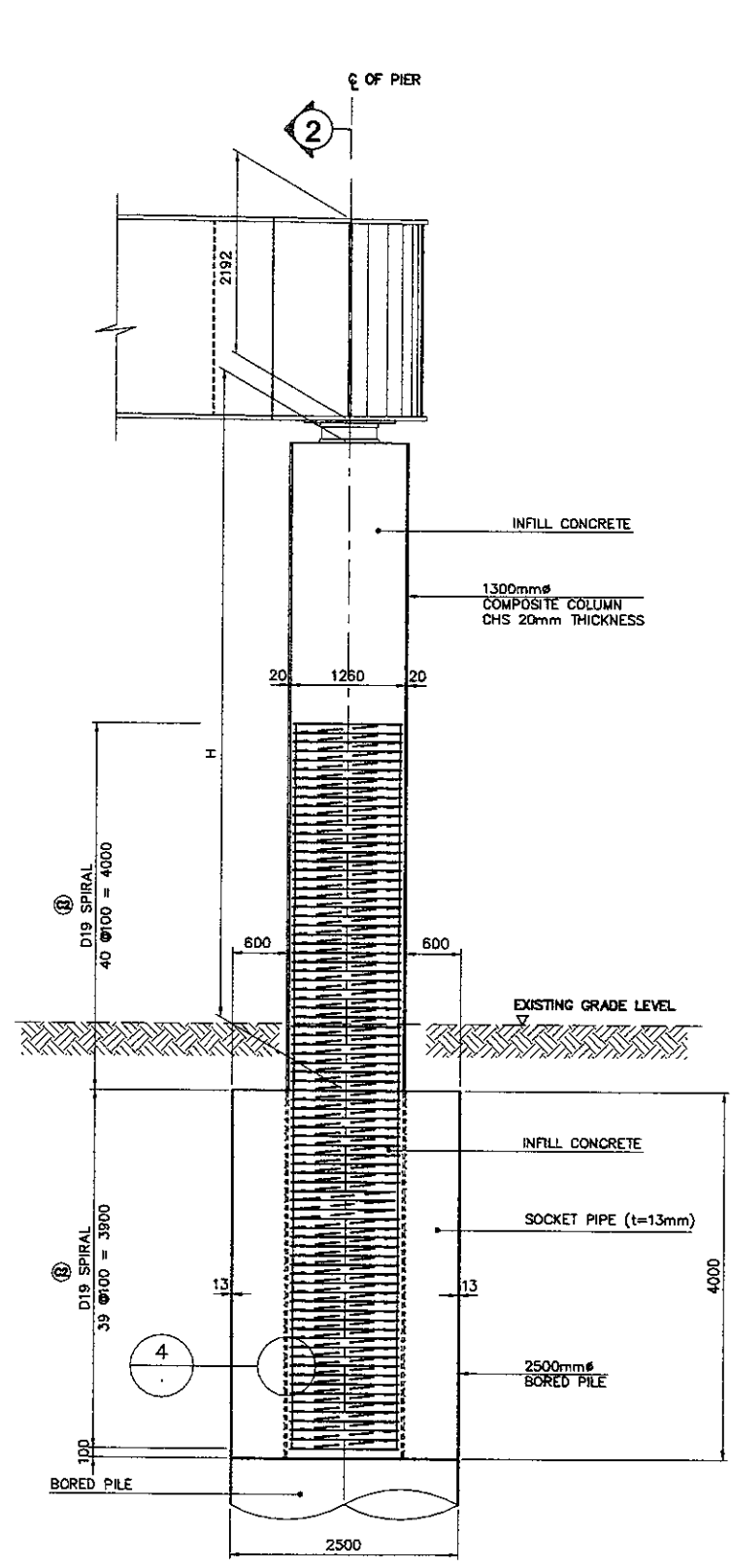
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $f_c' = 30$  MPa.
  - REINFORCING STEEL : YIELD STRENGTH = 390 N/mm<sup>2</sup>.

CONCRETE VOLUME (m <sup>3</sup> )	
PB4L	14.857

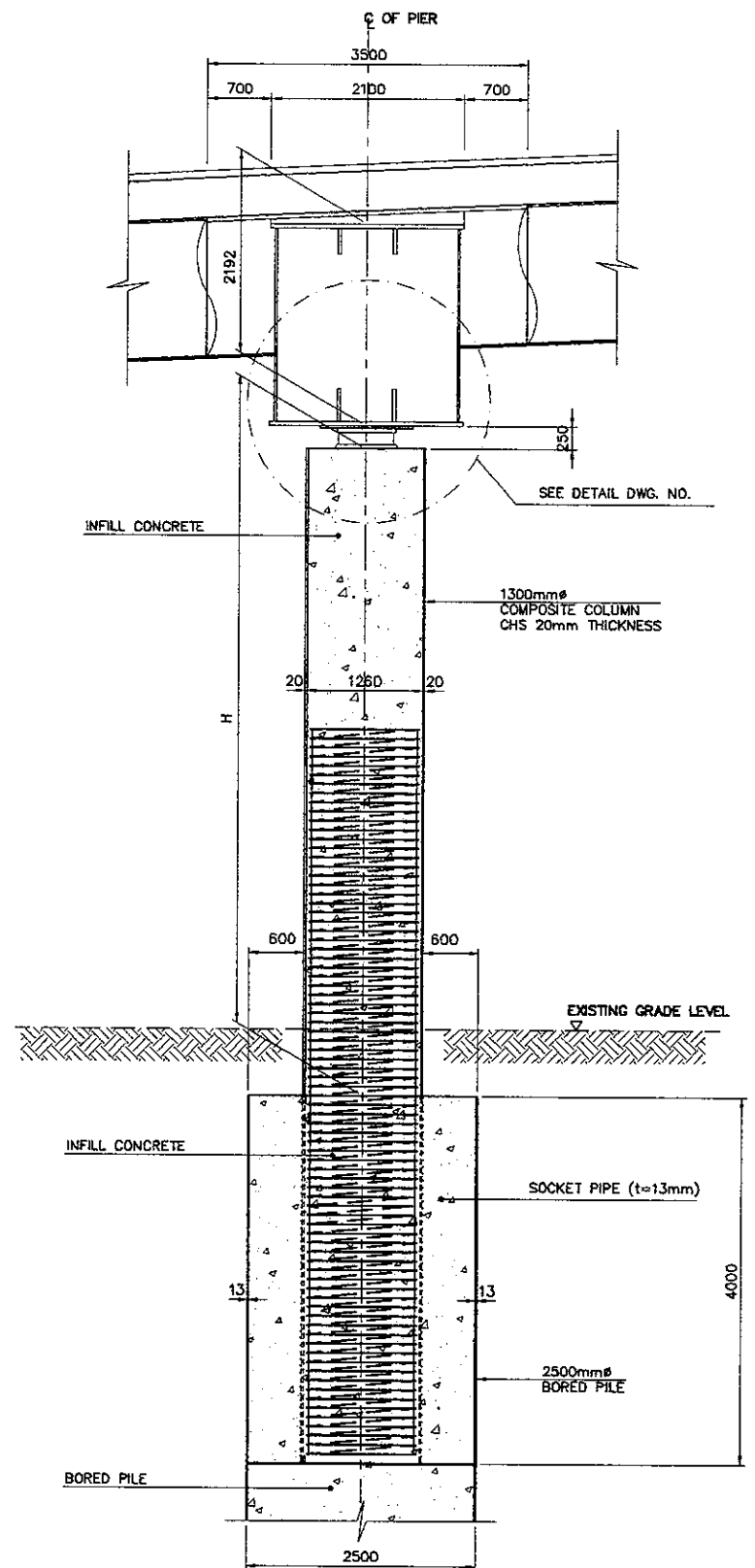
PIER NO.	DIMENSION(mm) OUT TO OUT				TOTAL LENGTH	REMARKS
	NO. OF PCS.	HEIGHT (H)	DIAMETER (MM)*	THICKNESS (MM)		
PB4L	1	7193	1300	20	11193	CORRUGATED

\* OUTSIDE DIAMETER OF COMPOSITE COLUMN

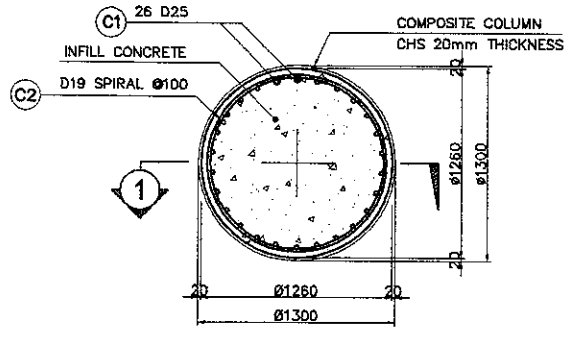
COMPOSITE COLUMN CASING DETAIL (PB4L)  
 SCALE AS SHOWN



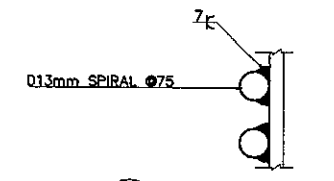
1 ELEVATION  
 SCALE 1:80



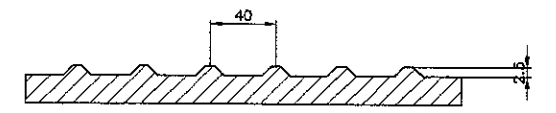
2 SECTION  
 SCALE 1:80



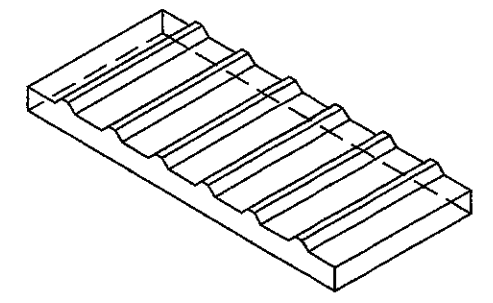
3 SECTION  
 SCALE 1:50



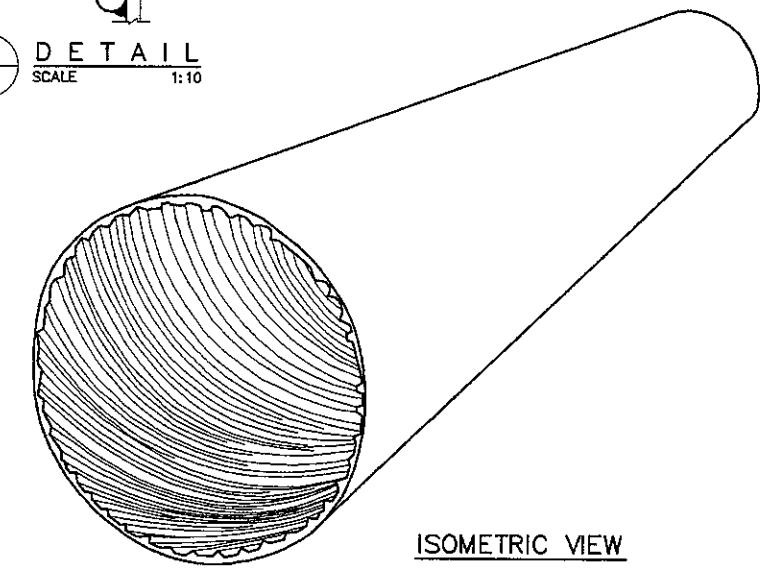
4 DETAIL  
 SCALE 1:10



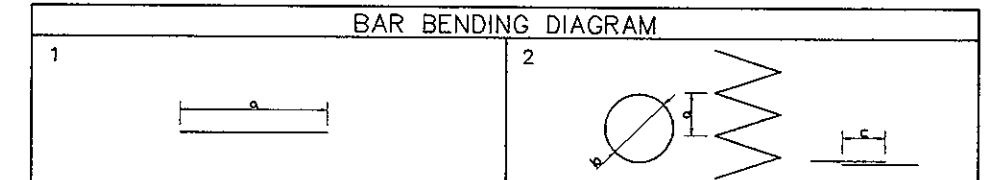
5 INNER RIB DETAIL  
 NOT TO SCALE



ISOMETRIC VIEW



ISOMETRIC VIEW



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (m)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER PB4R	OUTSIDE OF COLUMN													
		13	-		75	1300	450				228.838	1	1.04	238
	TOTAL WEIGHT / COLUMN = 238 Kgs.													
INSIDE OF COLUMN														
C1	25	1		7900						7.900	26	3.85	791	
C2	19	2		100	1180	450				307.811	1	2.23	686	
TOTAL WEIGHT / COLUMN = 1477 Kgs.														

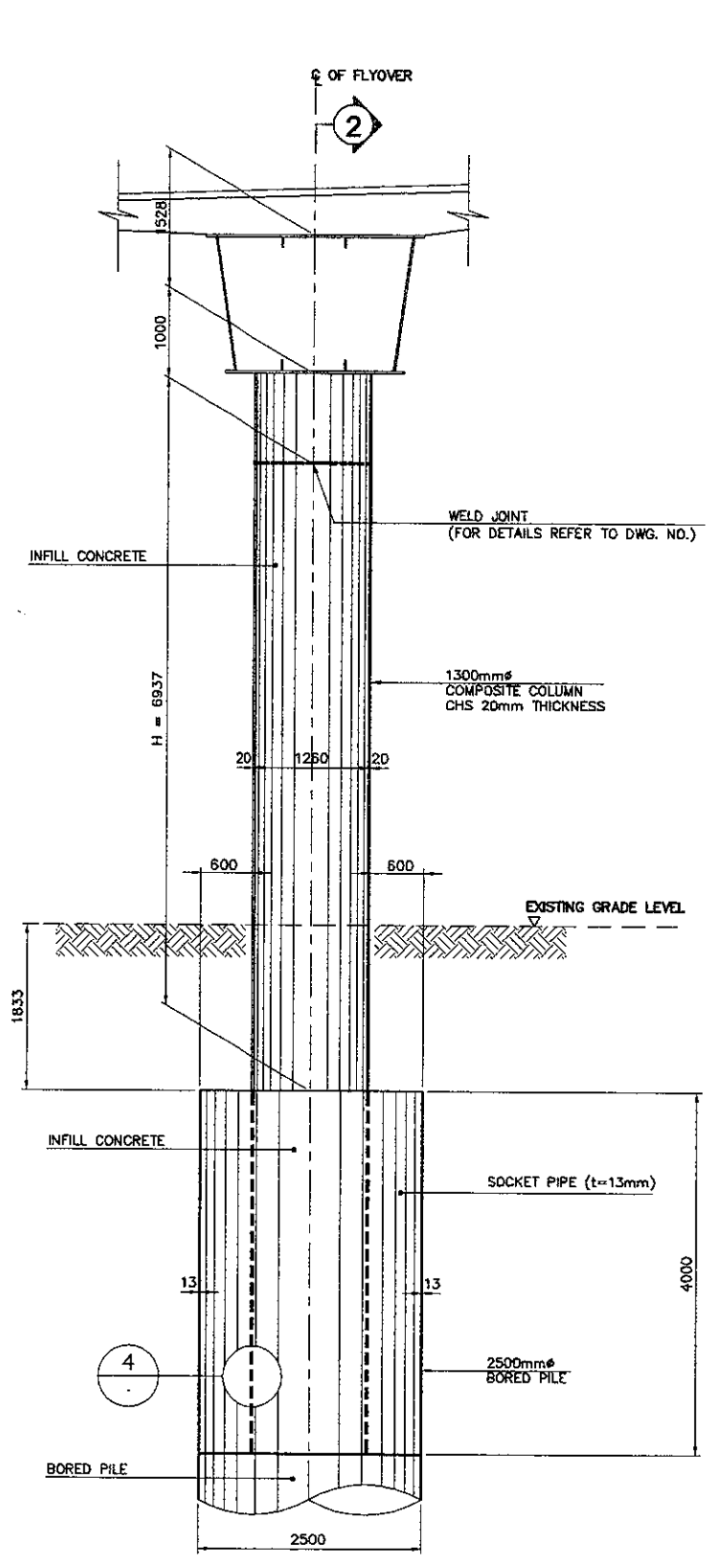
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $f_c' = 30$  MPa.
  - REINFORCING STEEL : YIELD STRENGTH = 390 N/mm<sup>2</sup>.

CONCRETE VOLUME (m <sup>3</sup> )	
PB4R	14.682

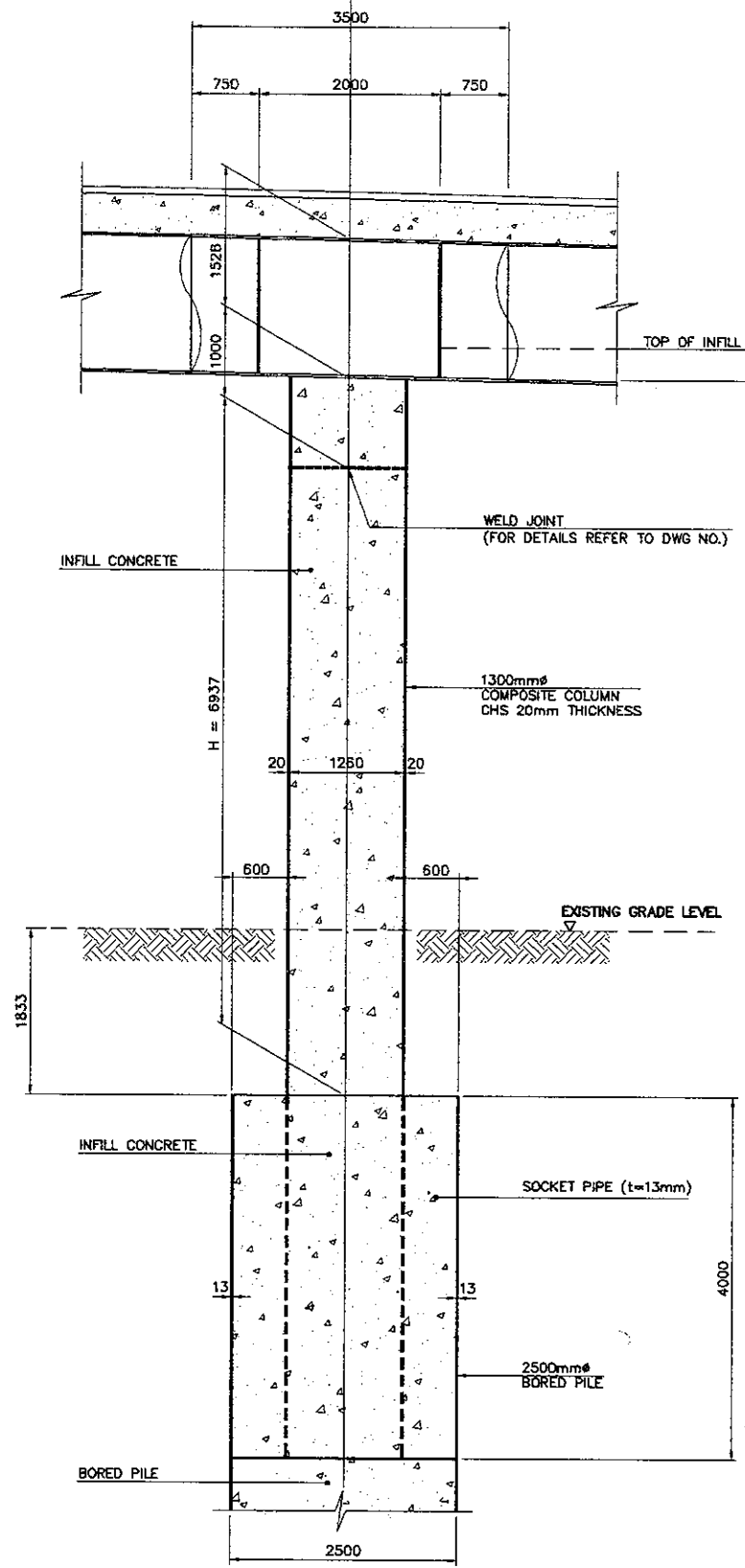
PIER NO.	DIMENSION (mm) OUT TO OUT				TOTAL LENGTH	REMARKS
	NO. OF PCS.	HEIGHT (H)	DIAMETER (MM)*	THICKNESS (MM)		
PB4R	1	7061	1300	20	11061	CORRUGATED

\* OUTSIDE DIAMETER OF COMPOSITE COLUMN

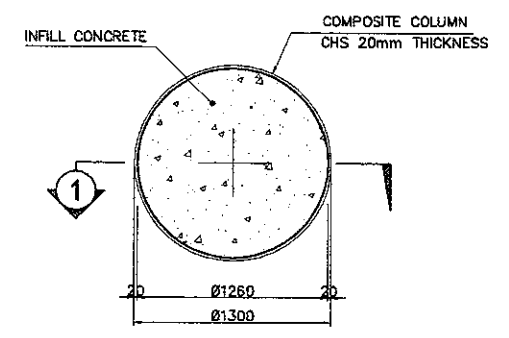
COMPOSITE COLUMN CASING DETAIL (PB4R)  
 SCALE AS SHOWN



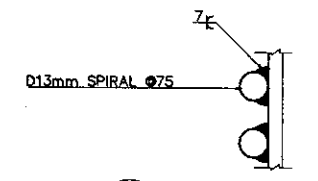
1 ELEVATION  
 SCALE 1:80



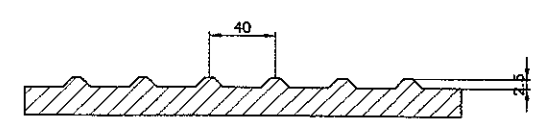
2 SECTION  
 SCALE 1:80



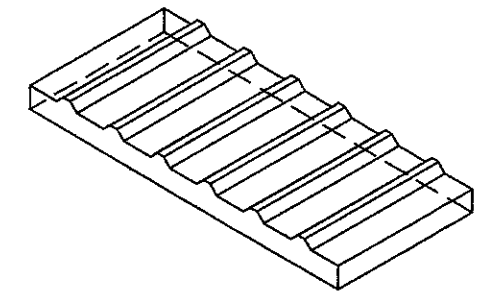
3 SECTION  
 SCALE 1:50



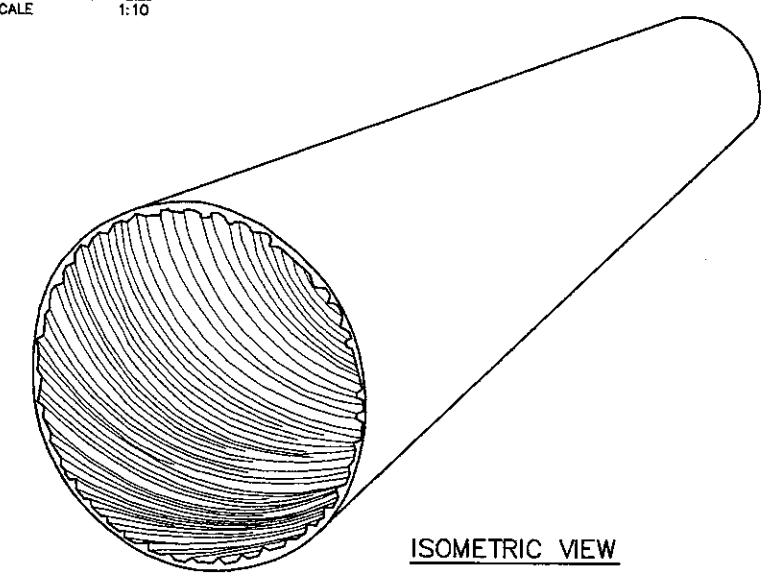
4 DETAIL  
 SCALE 1:10



5 INNER RIB DETAIL  
 NOT TO SCALE



ISOMETRIC VIEW



ISOMETRIC VIEW

BAR BENDING DIAGRAM

SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (m)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER PB5		13	-	75	1300	450					228.838	1	1.04	238
TOTAL WEIGHT / COLUMN = 238 Kgs.														

- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - CONCRETE :  $f_c' = 30$  MPa.
  - REINFORCING STEEL : YIELD STRENGTH = 390 N/mm<sup>2</sup>.

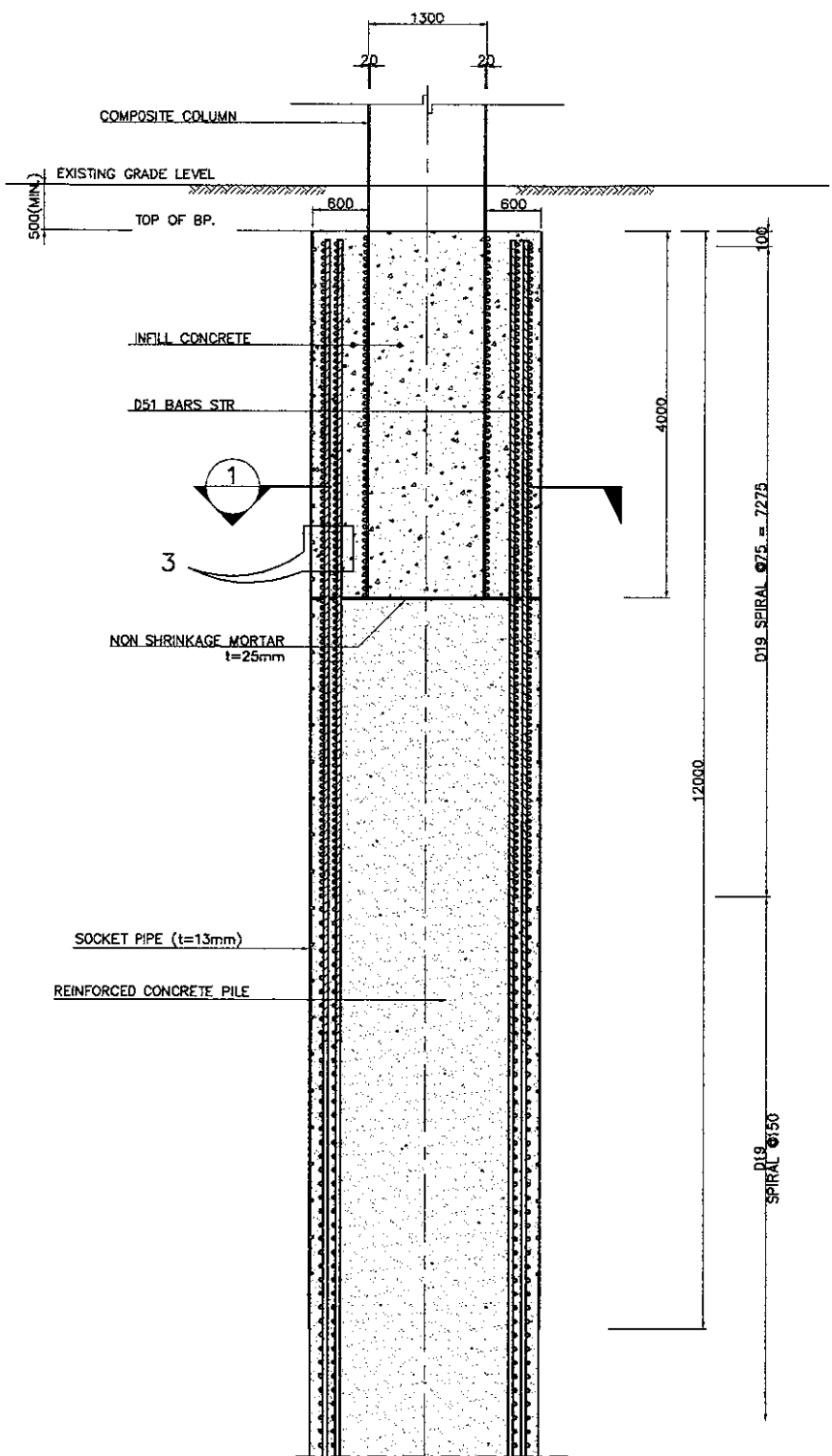
CONCRETE VOLUME (m <sup>3</sup> )	
PB5	15.321

PIER NO.	DIMENSION(mm) OUT TO OUT			TOTAL LENGTH	REMARKS
	NO. OF PCS.	HEIGHT (H)	DIAMETER (MM)* THICKNESS (MM)		
PB5	1	6937	1300 20	10.937	CORRUGATED

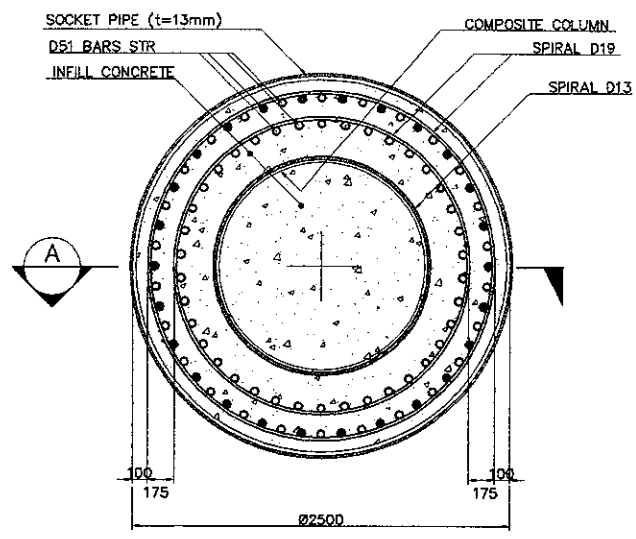
\* OUTSIDE DIAMETER OF COMPOSITE COLUMN

COMPOSITE COLUMN CASING DETAIL (PB5)  
 SCALE AS SHOWN

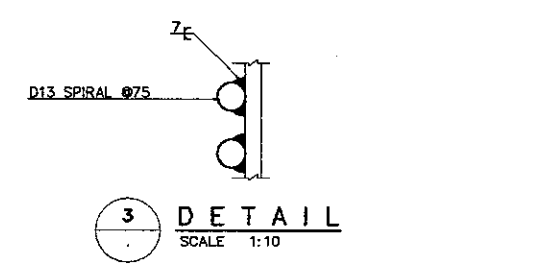
DESIGNED BY	CHECKED BY	SUBMITTED BY
Name A. GOURLEY	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date



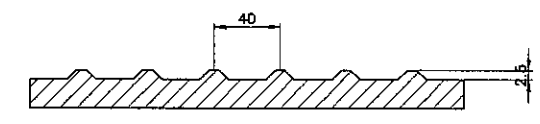
**A SECTION**  
 SCALE 1:100



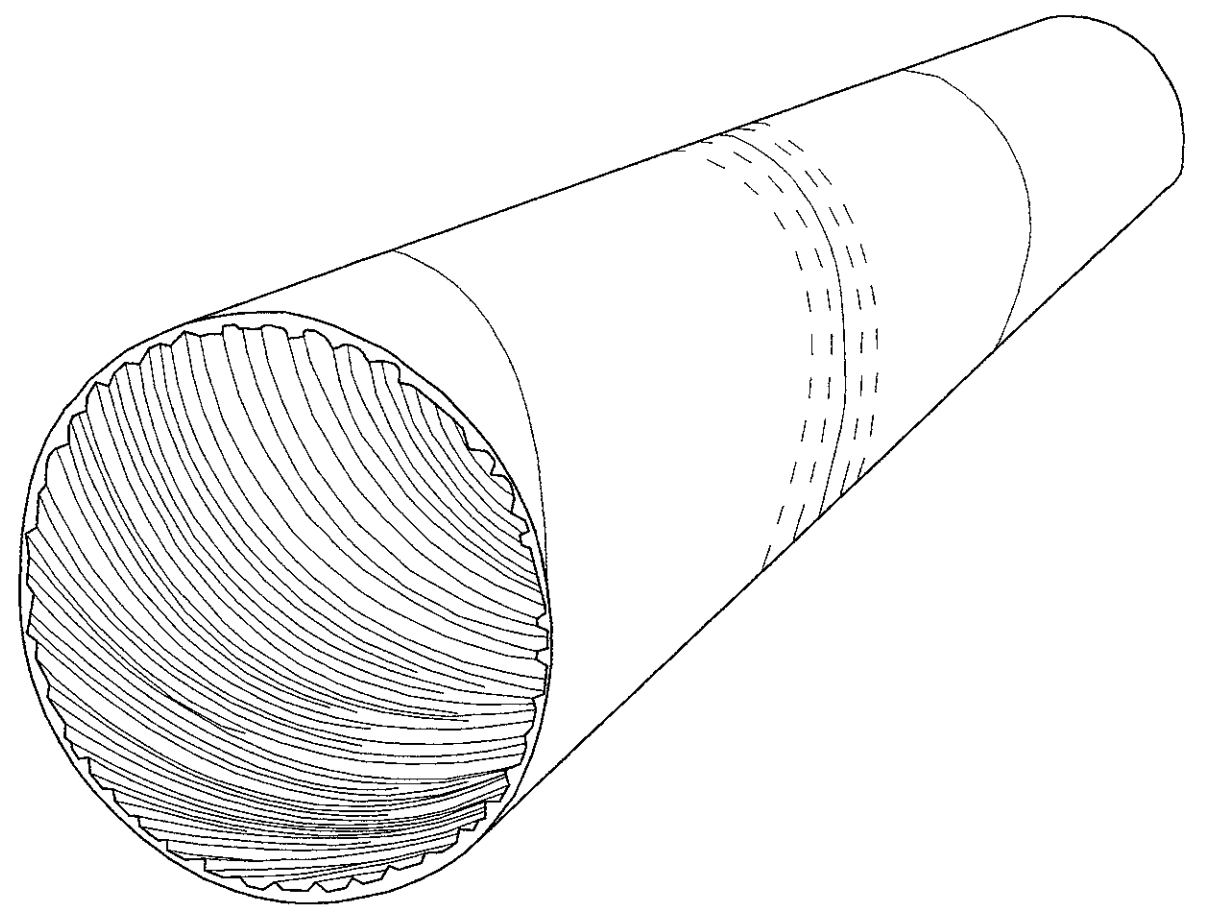
**1 SECTION**  
 SCALE 1:50



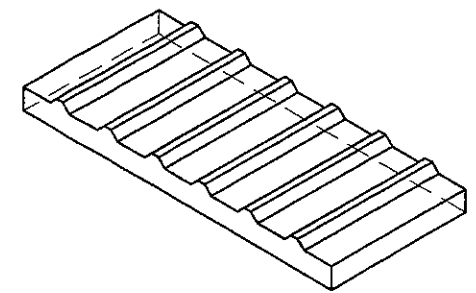
**3 DETAIL**  
 SCALE 1:10



**4 INNER RIB DETAIL**  
 NOT TO SCALE



**ISOMETRIC VIEW**



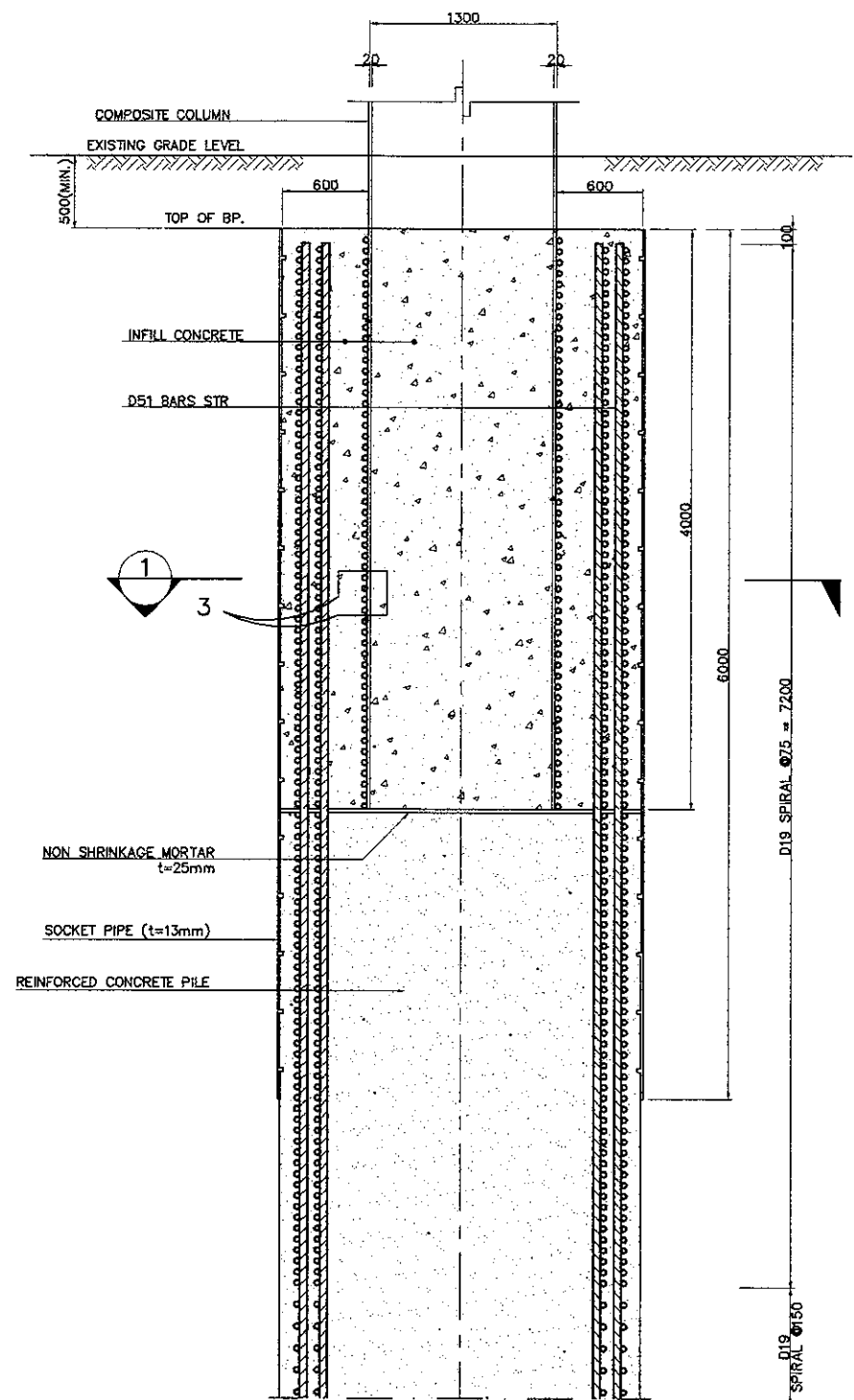
**ISOMETRIC VIEW**

PIER NO.	NO. OF PCS.	DIMENSION(mm) OUT TO OUT			REMARKS
		LENGTH (M)	DIAMETER (MM)*	THICKNESS (MM)	
P5	1	12	2500	13	CORRUGATED

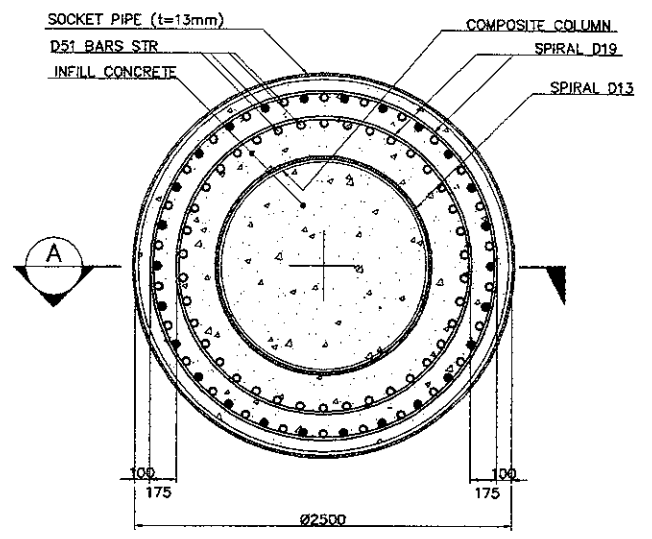
\* OUTSIDE DIAMETER OF CONCRETE PILE CAST-IN DRILLED HOLE

NOTE :  
 1. ALL DIMENSION ARE IN MILIMETERS

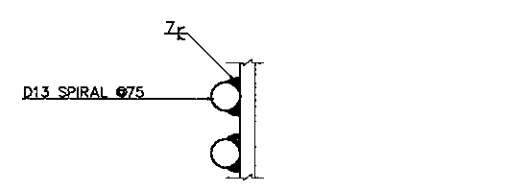
**COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER P10, P11)**  
 SCALE AS SHOWN



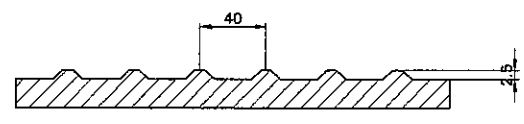
**A SECTION**  
 SCALE 1:50



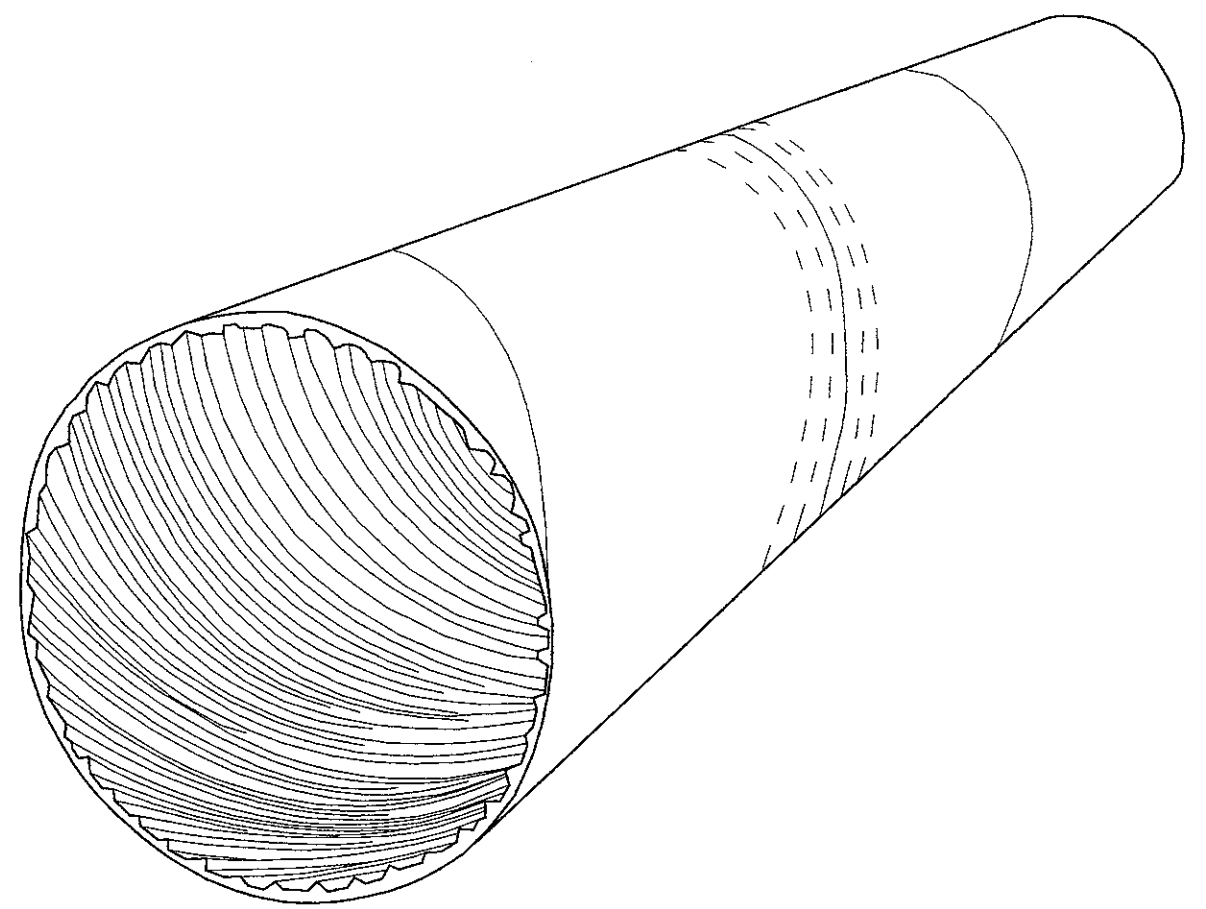
**1 SECTION**  
 SCALE 1:50



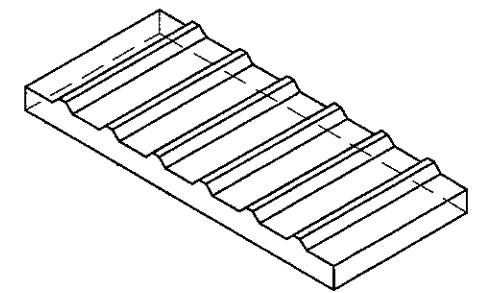
**3 DETAIL**  
 SCALE 1:10



**4 INNER RIB DETAIL**  
 NOT TO SCALE



**ISOMETRIC VIEW**



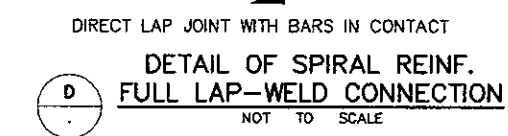
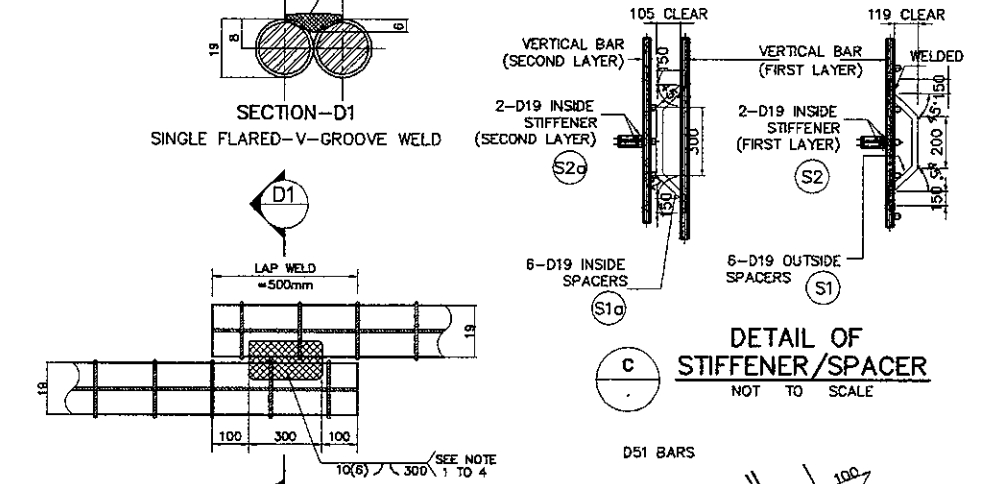
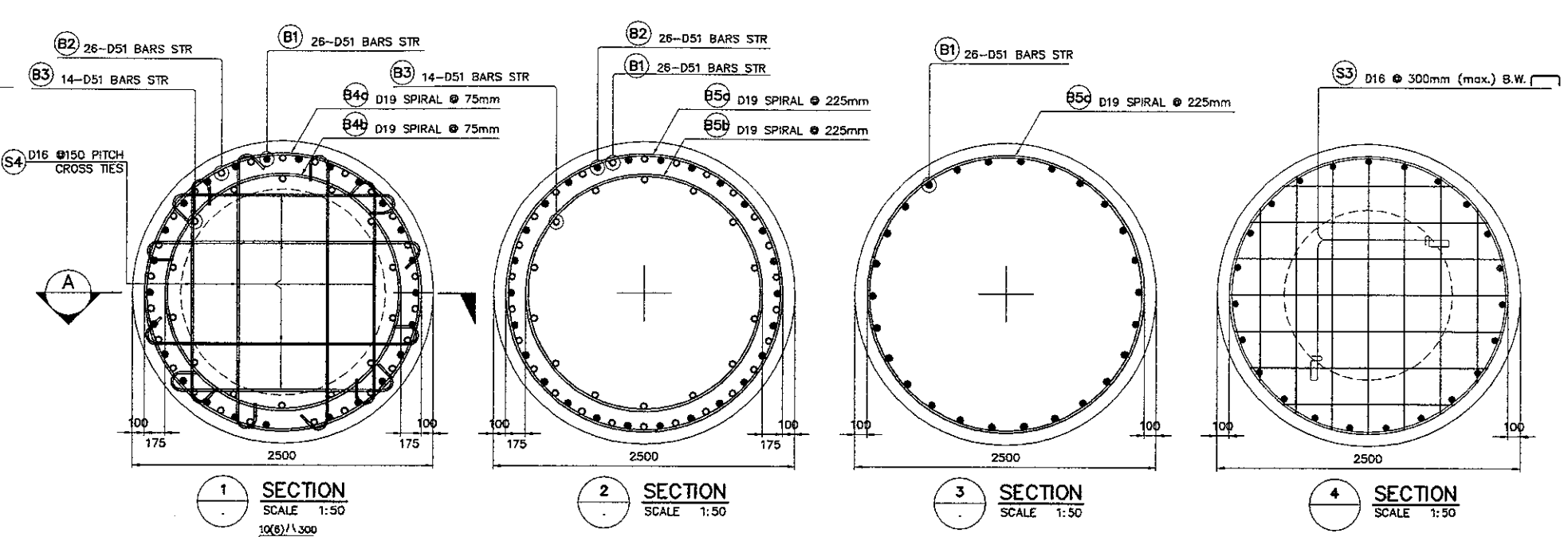
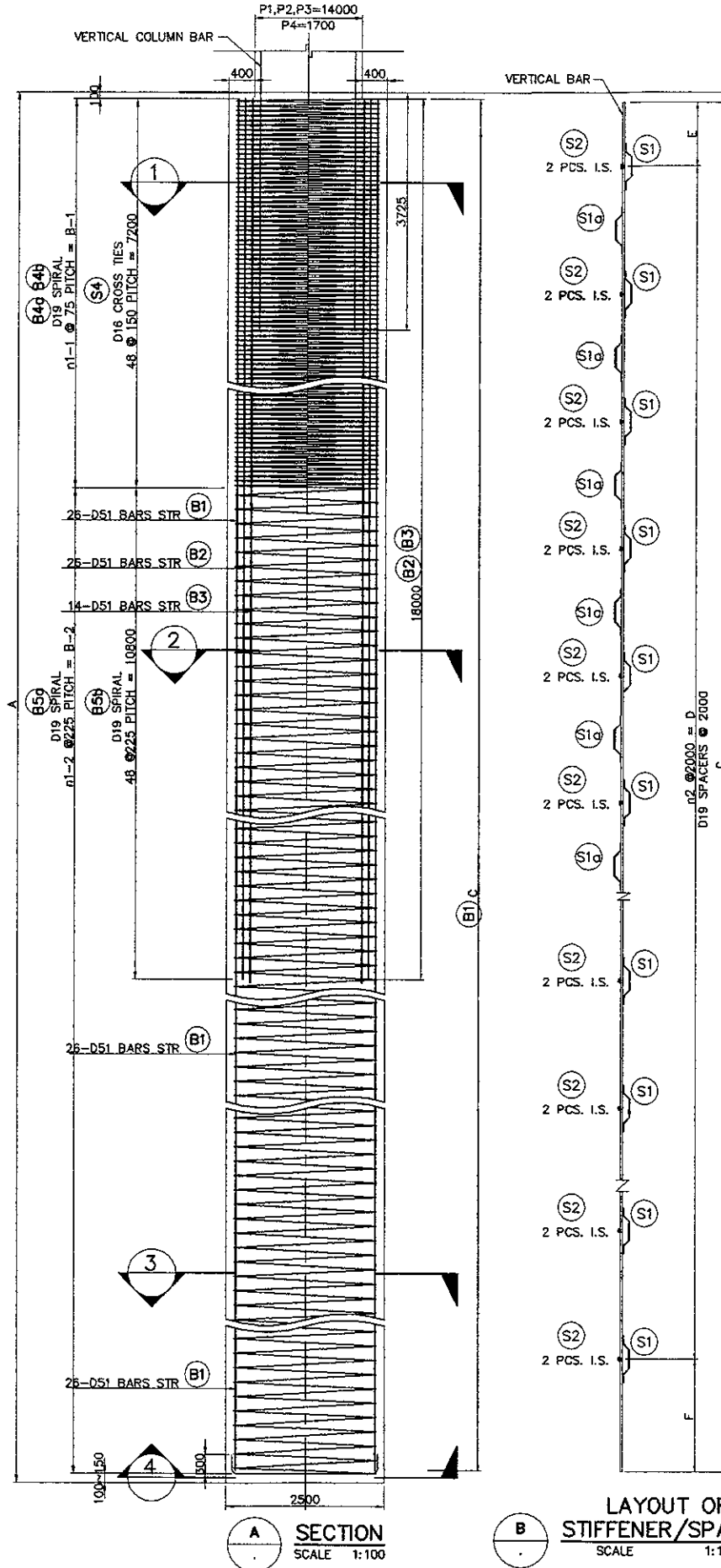
**ISOMETRIC VIEW**

PIER NO.	NO. OF PCS.	DIMENSION(mm) OUT TO OUT			REMARKS
		LENGTH (M)	DIAMETER (MM)*	THICKNESS (MM)	
PB4L	1	6	2500	13	CORRUGATED
PB4R	1	6	2500	13	CORRUGATED
PB5	1	6	2500	13	CORRUGATED

\* OUTSIDE DIAMETER OF CONCRETE PILE CAST-IN DRILLED HOLE

NOTE :  
 1. ALL DIMENSION ARE IN MILIMETERS.

**COMPOSITE COLUMN SOCKET TYPE CONNECTION (PIER PB4L, PB4R & PB5)**  
 SCALE AS SHOWN



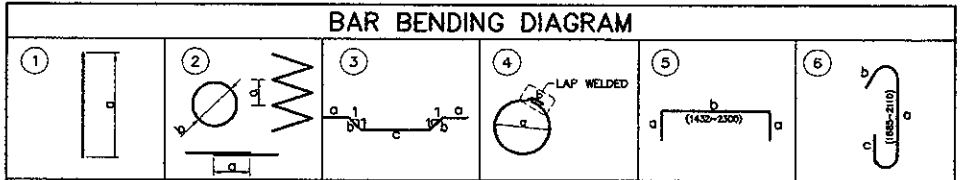
- NOTES ON LAP-WELD CONNECTION :**
- SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  - WELDING SHOULD CONFORM TO AWS (D1.4) \*STRUCTURAL WELDING CODE REINFORCED STEEL.\*
  - USE ELECTRODE E90XX.
  - CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.

BORED PILE TYPE	BP-MF1
SIZE (mm)	2500
MAIN BARS	SIZE (mm) 51 NO. OF LAYERS 2.0 NO. OF PCS. (1) S2 NO. OF PCS. (2) 14
SPIRAL	SIZE (mm) 19 NO. / SET

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  - CONCRETE :  $f_c' = 30\text{MPa}$
  - REINFORCING STEEL=  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

LOCATION	DIMENSION										
	A (mm)	B-1 (mm)	B-2 (mm)	C (mm)	D (mm)	E (mm)	F (mm)	n1-1	n1-2	n2 (S1)	n2 (S1a)
P1,P3,P4	20000	7200	12375	19800	18000	1000	800	96	56	9	8
P2	22000	7200	14400	21600	20000	1000	600	96	64	10	8

**BORED PILE REINF. DETAILS (PIER P1, P2, P3, P4)**  
 SCALE AS SHOWN

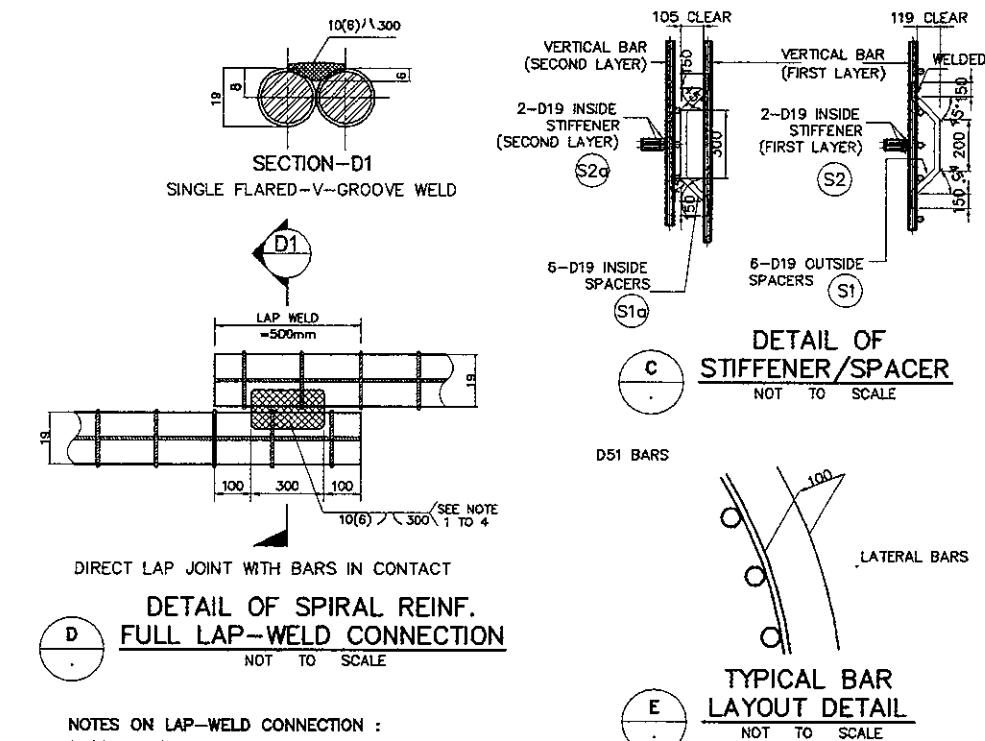
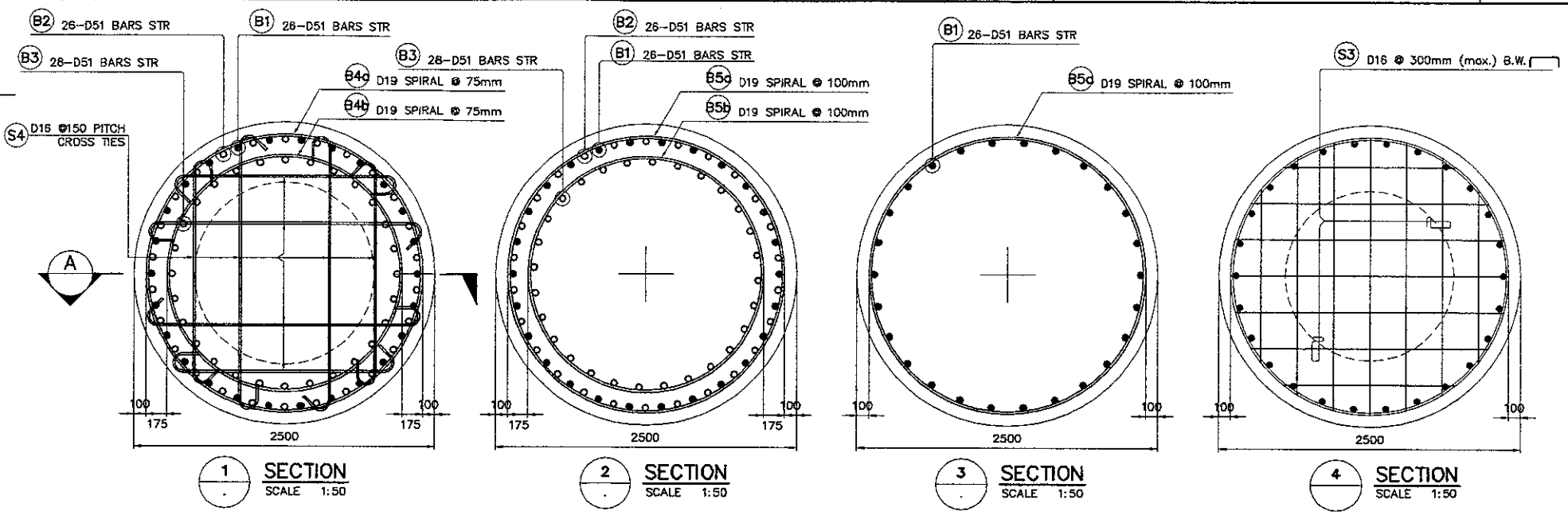
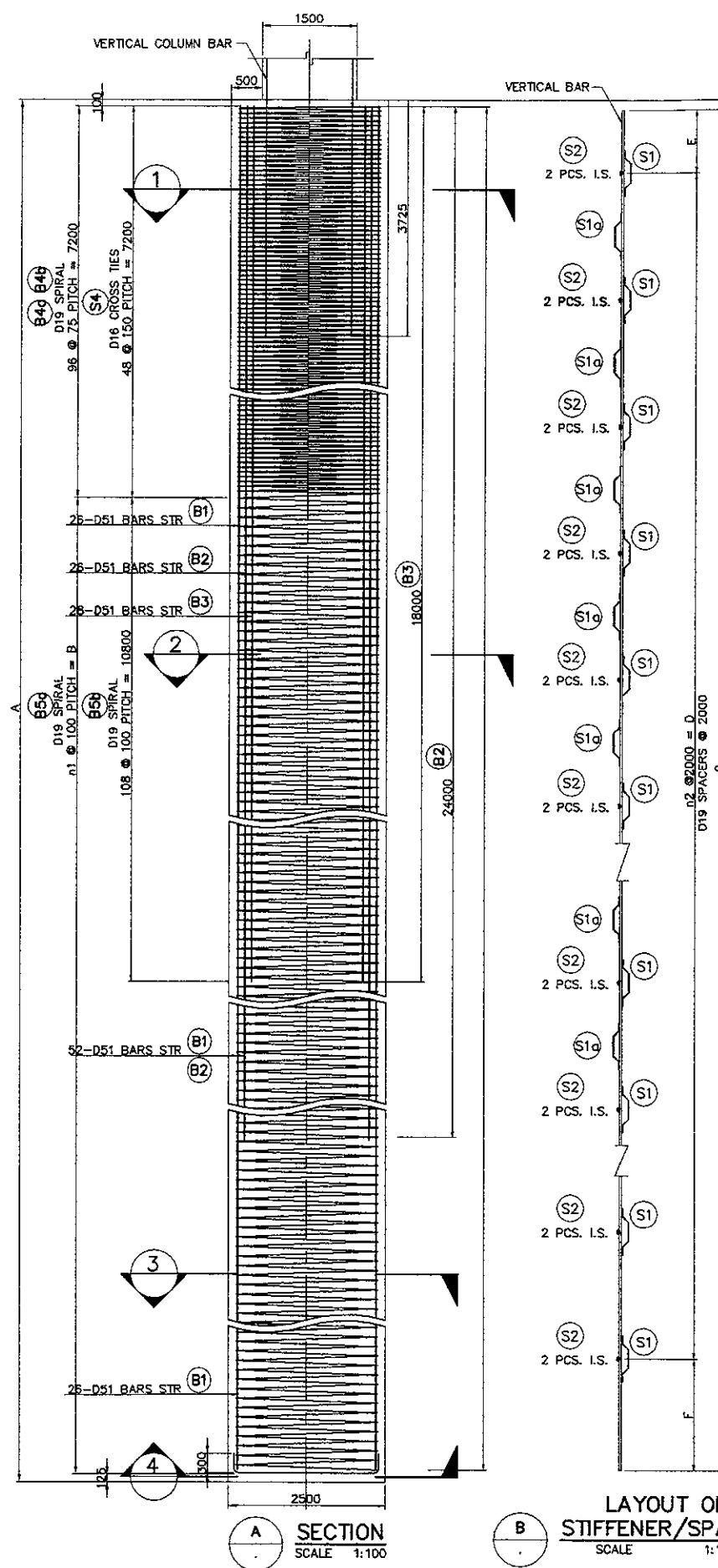


**SCHEDULE OF REINFORCEMENT**

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER P1,P3,P4, DIA = 2500 mm L = 20000 mm	B1	51	1	19800							19800	26	15.90	8185
	B2	51	1	18000							18000	26	15.90	7441
	B3	51	1	18000							18000	14	15.90	4007
	B4a	19	2	75	2300	500					721812	1	2.23	1610
	B4b	19	2	75	1950	500					611808	1	2.23	1364
	B5a	19	2	225	2300	500					420932	1	2.23	939
	B5b	19	2	225	1950	500					305904	1	2.23	682
	S1	19	3	150	170	250					890	60	2.23	119
	S1a	19	3	150	150	350					950	48	2.23	102
	S2	19	4	2160	170						8952	20	2.23	310
S2a	19	4	1810	170						5853	16	2.23	209	
S3	16	5	150	1865						2165	14	1.58	48	
S4	16	6	1895	316	380					4106	392	1.58	2543	
											TOTAL WEIGHT FOR / PILE = 27,559 Kgs.		TOTAL VOLUME CONCRETE = 98.17 m <sup>3</sup>	
PIER P2, DIA = 2500 mm L = 20000 mm	B1	51	1	21600							21600	26	15.90	8929
	B2	51	1	18000							18000	26	15.90	7441
	B3	51	1	18000							18000	14	15.90	4007
	B4a	19	2	75	2300	500					721812	1	2.23	1610
	B4b	19	2	75	1950	500					611808	1	2.23	1364
	B5a	19	2	225	2300	500					481208	1	2.23	1073
	B5b	19	2	225	1950	500					305904	1	2.23	682
	S1	19	3	150	170	250					890	66	2.23	131
	S1a	19	3	150	150	350					950	48	2.23	102
	S2	19	4	2160	170						6952	22	2.23	341
S2a	19	4	1810	170						5853	16	2.23	209	
S3	16	5	150	1865						2165	14	1.58	48	
S4	16	6	1895	316	380					4106	392	1.58	2543	
											TOTAL WEIGHT FOR / PILE = 28,480 Kgs.		TOTAL VOLUME CONCRETE = 107.99 m <sup>3</sup>	

THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.



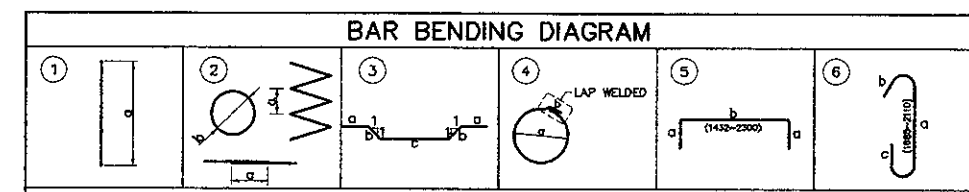


- NOTES ON LAP-WELD CONNECTION :**
- SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  - WELDING SHOULD CONFORM TO AWS (D1.4) \*STRUCTURAL WELDING CODE REINFORCED STEEL\*
  - USE ELECTRODE E90XX.
  - CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  - CONCRETE :  $f_c' = 30MPa$
  - REINFORCING STEEL=  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

LOCATION	DIMENSION								
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	n1	n2 (S1)	n2 (S1a)
P5	27000	19600	26800	24000	1000	1800	196	12	8
P6	22000	14600	21800	20000	1000	800	146	10	8

**BORED PILE REINF. DETAILS (PIER P5 & P6)**  
 SCALE AS SHOWN



**SCHEDULE OF REINFORCEMENT**

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)
				a	b	c	d	e	f				
PIER P5 DIA = 2500 mm L = 27000 mm	B1	51	1	26800						26800	26	15.90	11079
	B2	51	1	24000						24000	26	15.90	9922
	B3	51	1	18000						18000	28	15.90	8014
	B4a	19	2	75	2300	500				721812	1	2.23	1610
	B4b	19	2	75	1950	500				611808	1	2.23	1364
	B5a	19	2	100	2300	500				1473512	1	2.23	3286
	B5b	19	2	100	1950	500				688284	1	2.23	1535
	S1	19	3	150	170	250				890	78	2.23	155
	S1a	19	3	150	150	350				950	48	2.23	102
	S2	19	4	2180	170					6952	26	2.23	403
	S2a	19	4	1810	170					5853	16	2.23	209
	S3	16	5	150	1865					2165	14	1.58	48
S4	16	6	1895	316	380				4106	392	1.58	2543	
<b>TOTAL WEIGHT FOR / PILE = 40,269 Kgs.</b>											<b>TOTAL VOLUME CONCRETE = 132.53 m<sup>3</sup></b>		
PIER P6 DIA = 2500 mm L = 22000 mm	B1	51	1	21800						21800	26	15.90	9012
	B2	51	1	21800						21800	26	15.90	9012
	B3	51	1	18000						18000	28	15.90	8013
	B4a	19	2	75	2300	500				721812	1	2.23	1610
	B4b	19	2	75	1950	500				611808	1	2.23	1364
	B5a	19	2	100	2300	500				1097412	1	2.23	2447
	B5b	19	2	100	1950	500				688284	1	2.23	1535
	S1	19	3	150	170	250				890	66	2.23	131
	S1a	19	3	150	150	350				950	48	2.23	102
	S2	19	4	2180	170					6952	22	2.23	341
	S2a	19	4	1810	170					5853	16	2.23	209
	S3	15	5	150	1865					2165	14	1.58	48
S4	16	6	1895	316	380				4106	392	1.58	2543	
<b>TOTAL WEIGHT FOR / PILE = 36,358 Kgs.</b>											<b>TOTAL VOLUME CONCRETE = 107.99 m<sup>3</sup></b>		

THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

BORED PILE TYPE		BP-MF2
SIZE (mm)		D2500
MAIN BARS	SIZE (mm)	51
	NO. OF LAYERS	2.0
	NO. OF PCS. (1)	52
SPIRAL	NO. OF PCS. (2)	28
	SIZE (mm)	19
	NO. / SET	



DESIGNED BY	CHECKED BY	SUBMITTED BY
Name: A. GOURLEY	Name: T. OKUMURA	Name: M. KIUCHI
Sign	Sign	Sign
Date	Date	Date

REPUBLIC OF INDONESIA  
 MINISTRY OF PUBLIC WORKS  
 DIRECTORATE GENERAL OF HIGHWAYS

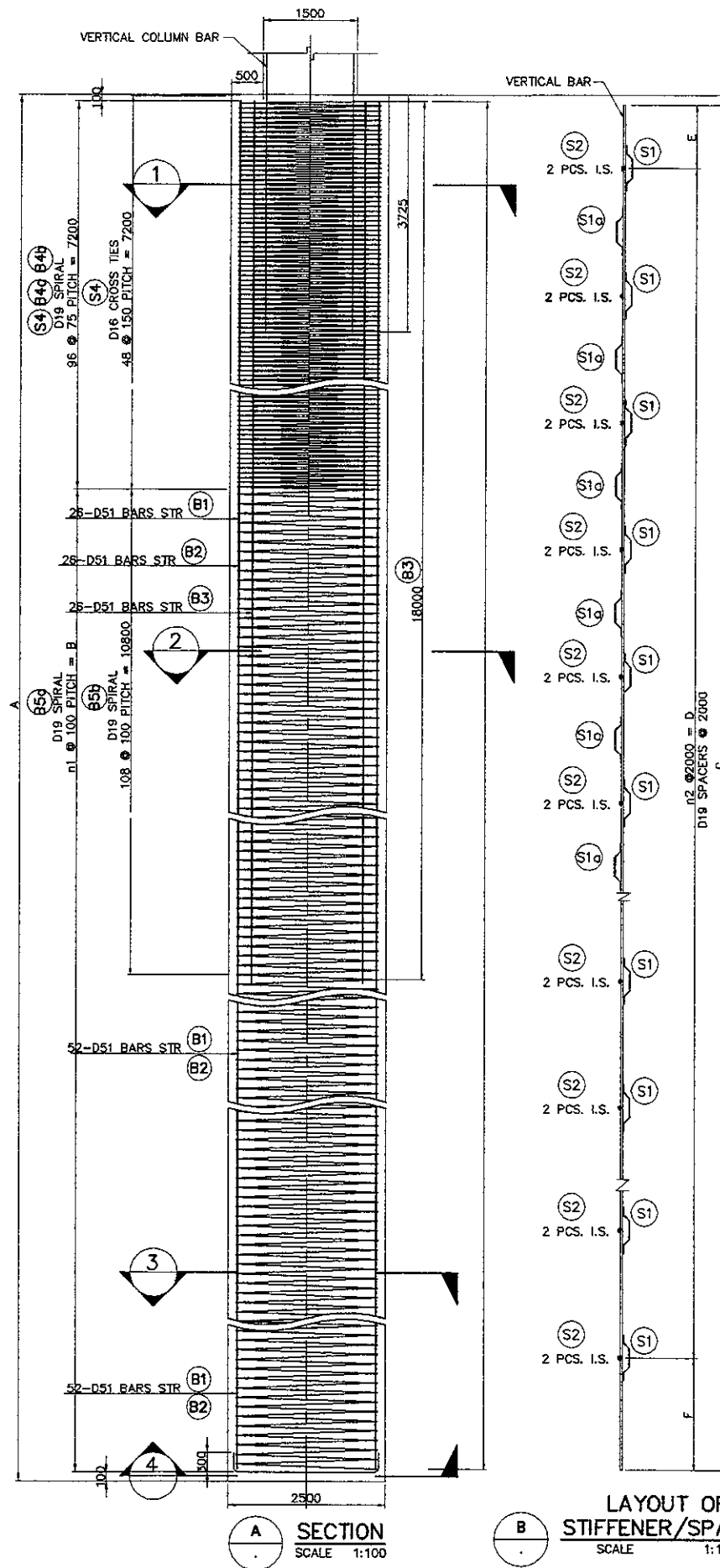
APPROVED BY: Ir. HERRY VAZA M, Eng. Sc  
 NIP. : 110038400

PROJECT AND LOCATION :  
 DETAILED DESIGN STUDY OF  
 NORTH JAVA CORRIDOR FLYOVER PROJECT  
 MERAK FLYOVER - CONTRACT PACKAGE 1  
 (MERAK - BALARAJA)  
 BANTEN PROVINCE

SCALE :  
 1 : 50  
 1 : 100  
 FULL SIZE A3

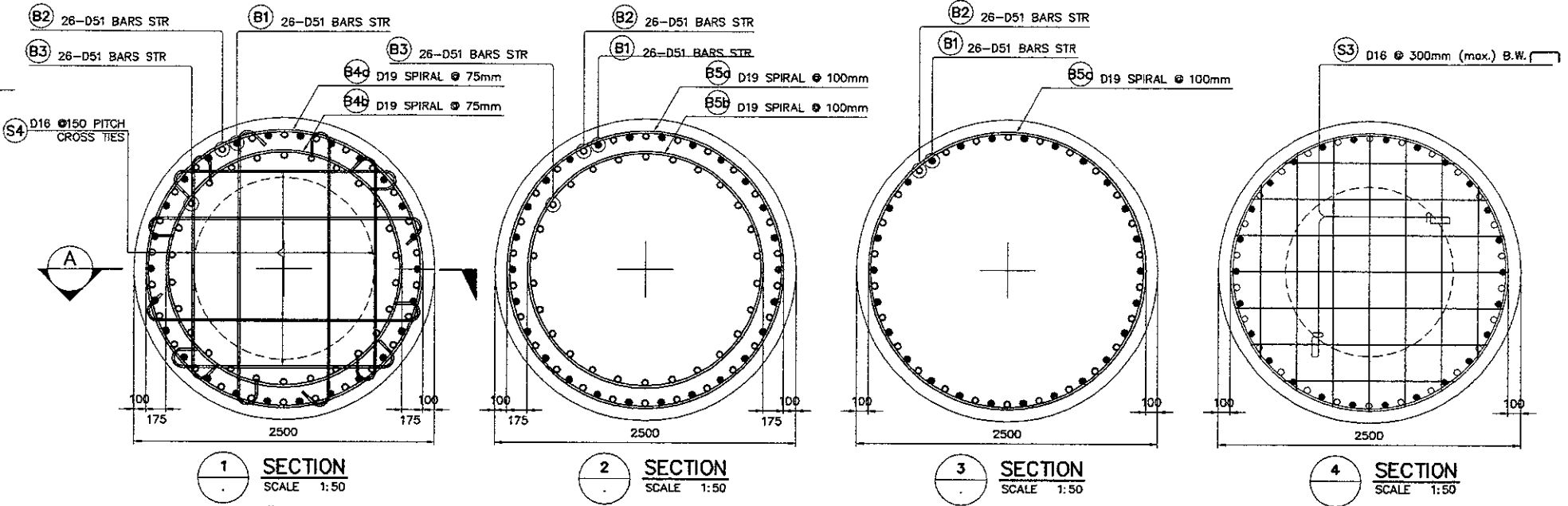
DRAWING TITLE :  
**BORED PILE REINF. DETAILS (PIER P7)**

DRAWING NO :  
**MSB-075**  
 SHEET NO :  
 75 / 94



**A SECTION**  
 SCALE 1:100

**B LAYOUT OF STIFFENER/SPACER**  
 SCALE 1:100

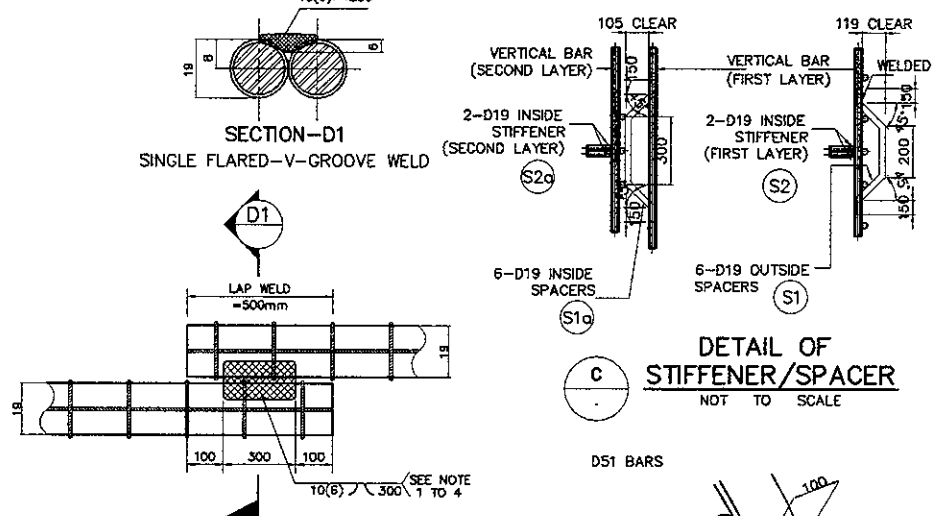


**1 SECTION**  
 SCALE 1:50

**2 SECTION**  
 SCALE 1:50

**3 SECTION**  
 SCALE 1:50

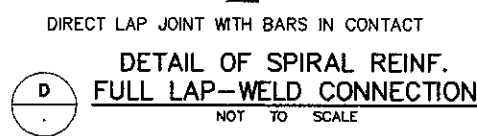
**4 SECTION**  
 SCALE 1:50



**SECTION-D1**  
 SINGLE FLARED-V-GROOVE WELD

**DETAIL OF STIFFENER/SPACER**  
 NOT TO SCALE

**TYPICAL BAR LAYOUT DETAIL**  
 NOT TO SCALE

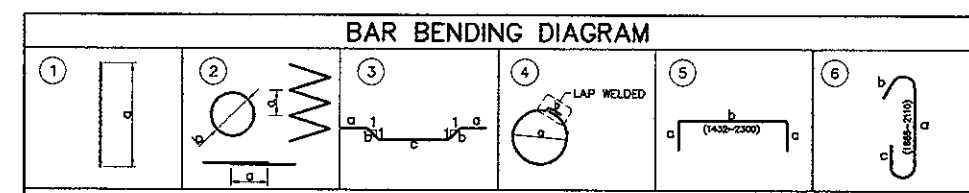


**DETAIL OF SPIRAL REINF. FULL LAP-WELD CONNECTION**  
 NOT TO SCALE

- NOTES ON LAP-WELD CONNECTION :**
1. SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  2. WELDING SHOULD CONFORM TO AWS (D1.4) \*STRUCTURAL WELDING CODE REINFORCED STEEL\*
  3. USE ELECTRODE E90XX.
  4. CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.
- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETERS.
  2. BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  3. CONCRETE : F<sub>c</sub>' = 30MPa
  4. REINFORCING STEEL =  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

BORED PILE TYPE		BP-MF3
SIZE (mm)	D2500	
MAIN BARS	SIZE (mm)	51
	NO. OF LAYERS	2.0
	NO. OF PCS. (1)	52
	NO. OF PCS. (2)	26
SPIRAL	SIZE (mm)	19
	NO. / SET	

LOCATION	DIMENSION						n1	n2 (S1)	n2 (S1a)
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)			
P7	22000	14500	21800	20000	1000	800	146	10	8

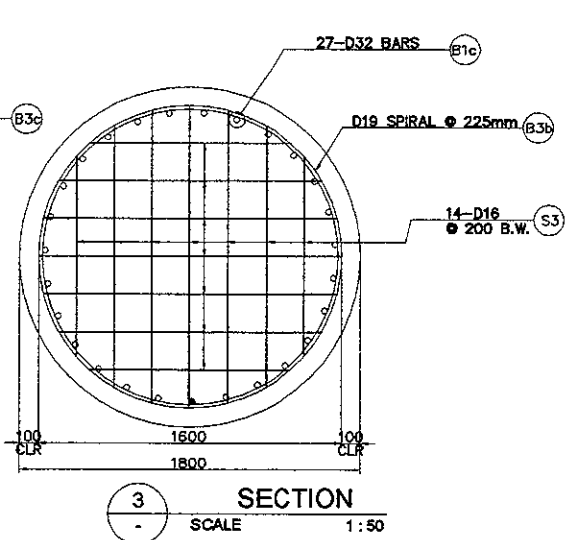
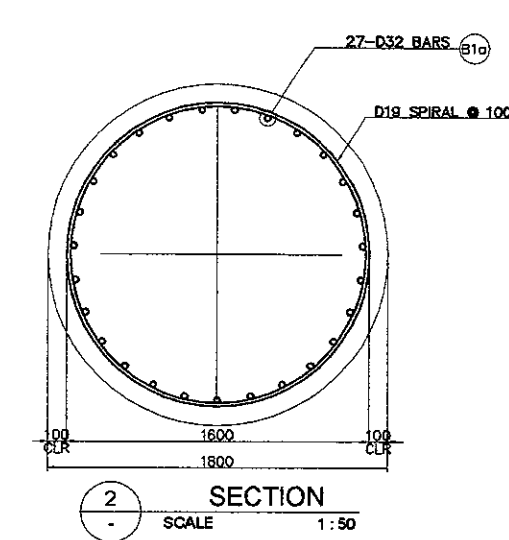
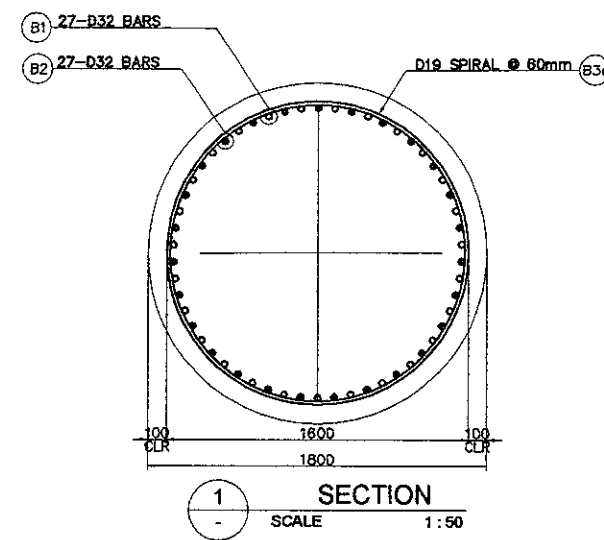
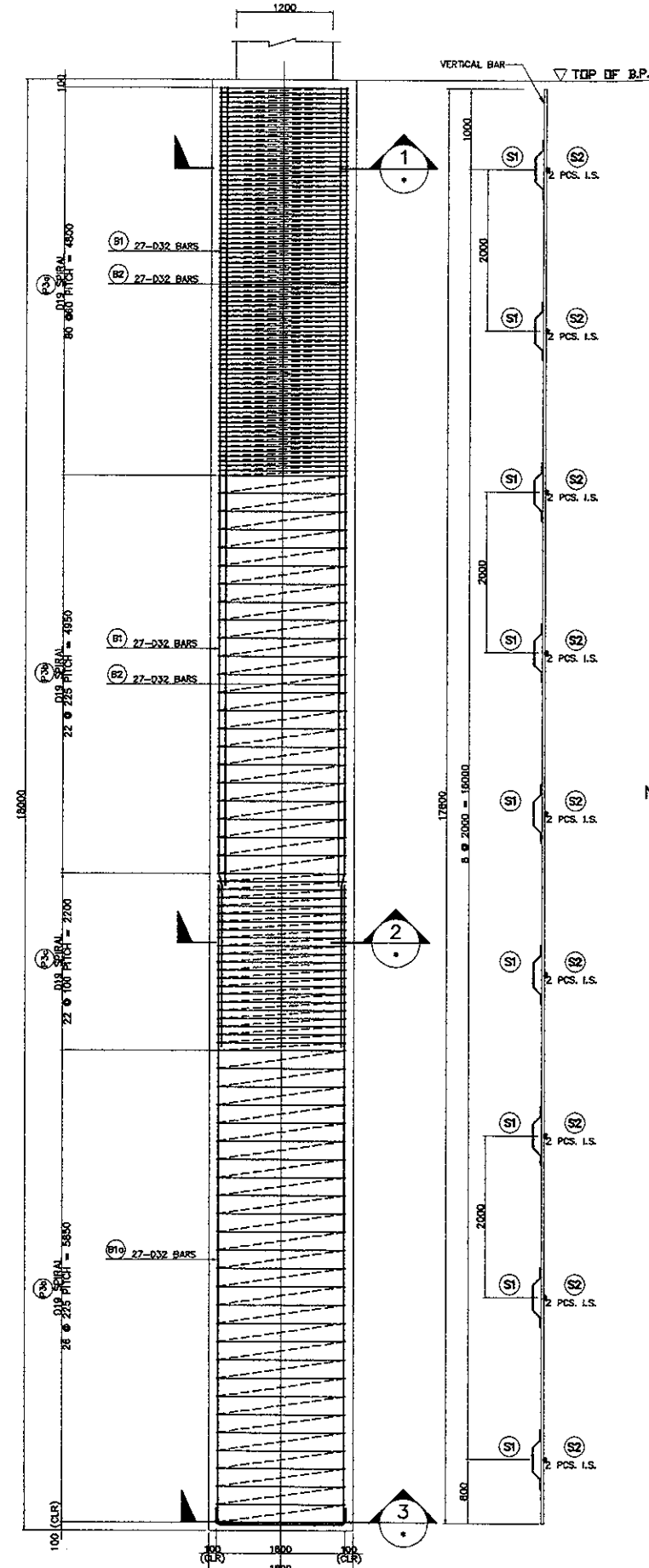


**BAR BENDING DIAGRAM**

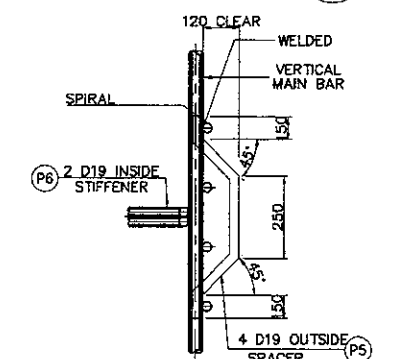
LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)
				a	b	c	d	e	f				
PIER P7 DIA = 2500 mm L = 22000 mm	B1	51	1	21800						21800	26	15.90	9012
	B2	51	1	21800						21800	26	15.90	9012
	B3	51	1	18000						18000	26	15.90	7441
	B4a	19	2	75	2300	500				721812	1	2.23	1610
	B4b	19	2	75	1950	500				611808	1	2.23	1384
	B5a	19	2	100	2300	500				1097412	1	2.23	2447
	B5b	19	2	100	1950	500				688284	1	2.23	1535
	S1	19	3	150	170	250				890	66	2.23	131
	S1a	19	3	150	150	350				950	48	2.23	102
	S2	19	4	2160	170					6952	22	2.23	341
	S2a	19	4	1810	170					5853	16	2.23	209
	S3	16	5	150	1865					2165	14	1.58	48
S4	16	6	1895	316	380				4106	392	1.58	2543	
TOTAL WEIGHT FOR / PILE = 35,795 Kgs.											TOTAL VOLUME CONCRETE = 107.99 m <sup>3</sup>		

THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

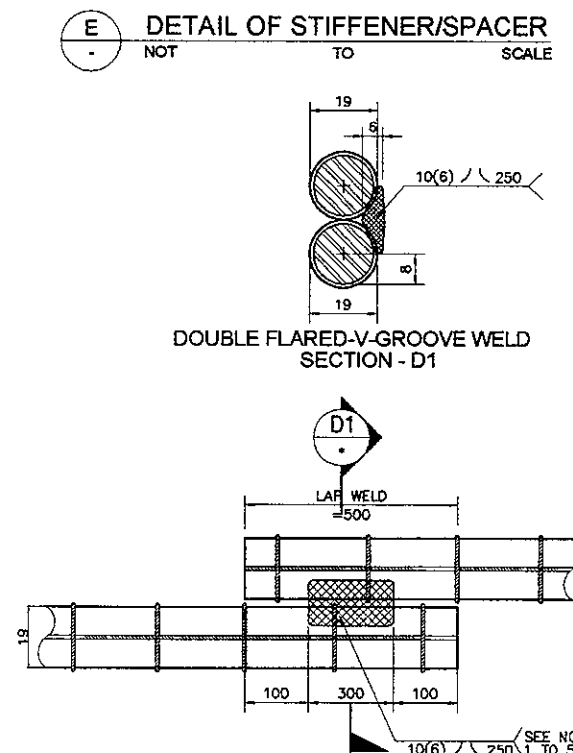
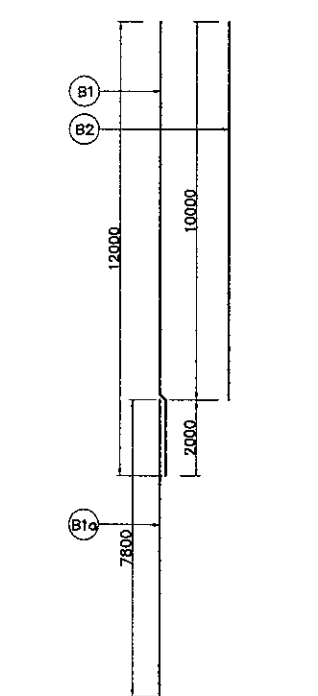
**BORED PILE REINF. DETAILS (PIER P7)**  
 SCALE AS SHOWN



BORED PILE TYPE	BP-MF..
SIZE (mm)	D1800
MAIN BARS	
SIZE (mm)	32
NO. OF LAYERS	1
NO. OF PCS.	54
SPIRAL	
SIZE (mm)	19
NO. / SET	

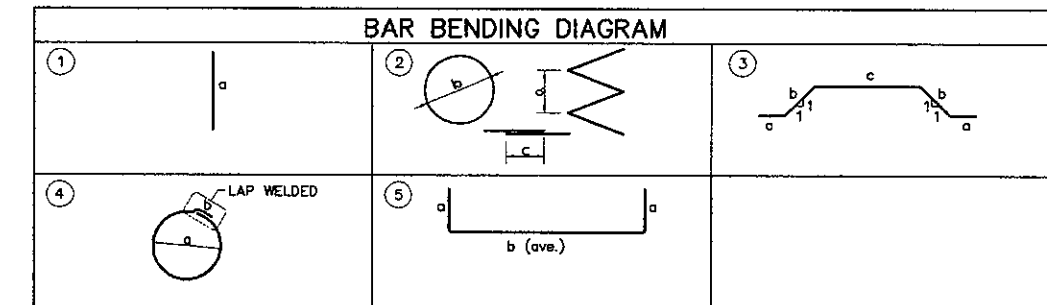


NOTE : SPIRAL PITCH SHALL BE 100mm AT SPLICE LOCATION.



- NOTES ON LAP-WELD CONNECTION :
1. SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  2. WELDING SHOULD CONFORM TO AWS (D1.4) "STRUCTURAL WELDING CODE REINFORCED STEEL"
  3. USE ELECTRODE E90XX.
  4. CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.

- NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETERS.
  2. BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  3. CONCRETE :  $f_c' = 30\text{MPa}$
  4. REINFORCING STEEL = D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

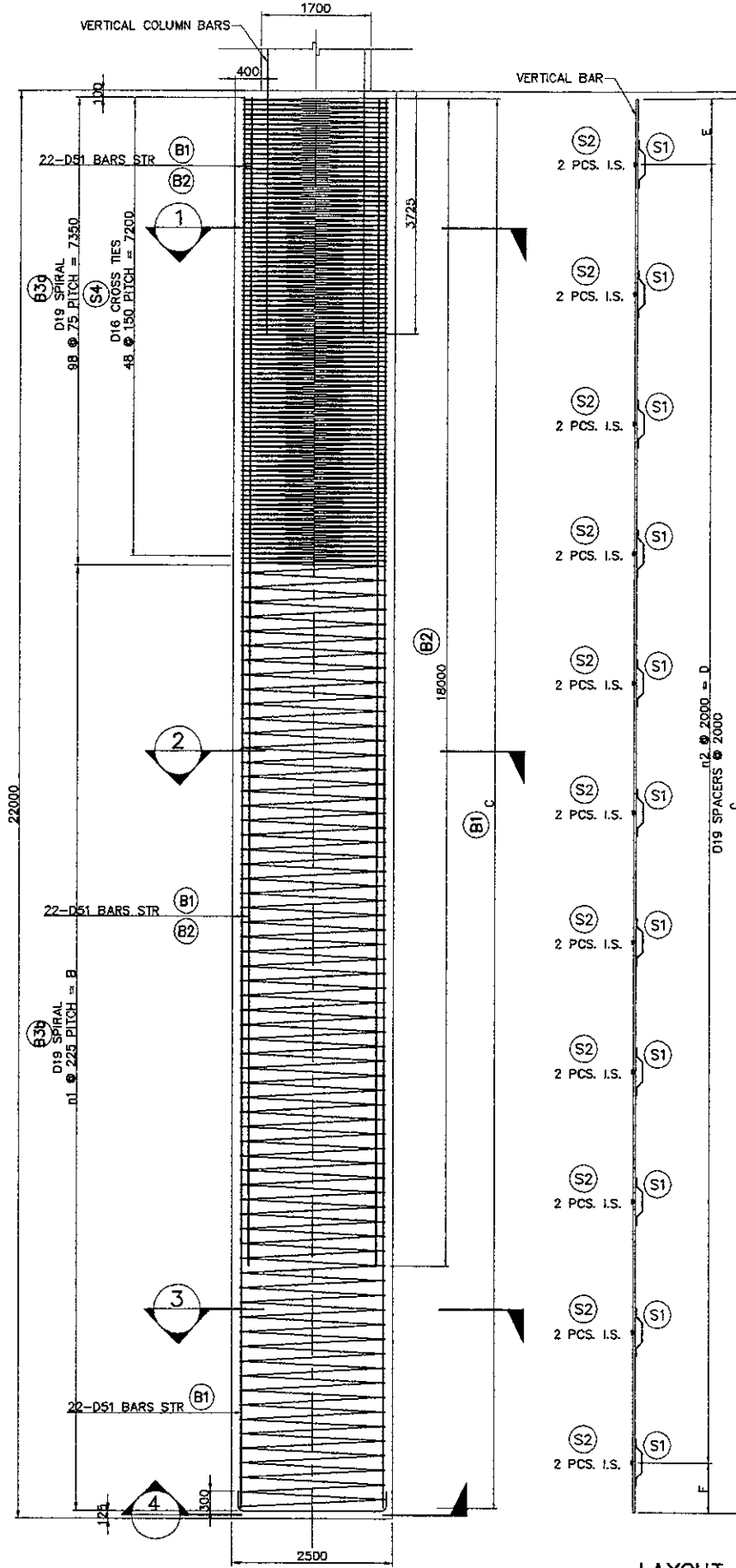


LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	VOLUME CONCRETE (kg)
				a	b	c	d	e	f					
PIER P8, D=1800 L=18000	B1	32	1	12000						12000	27	6.31	2044	45.81
	B1a	32	1	7800						7800	27	6.31	1329	
	B2	32	1	10000						10000	27	6.31	1704	
	B3a	19	2	60	1800	500				418920	1	2.23	934	
	B3b	19	2	100	1600	500				120528	1	2.23	269	
	B3c	19	2	225	1600	500				245652	1	2.23	548	
	S1	19	3	150	170	250				890	36	2.23	71	
	S2	19	4	2000	170					12730	18	2.23	511	
	S3	16	5	190	1395					1695	14	1.58	37	
TOTAL WEIGHT PER PILE =												7,448 Kgs		

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

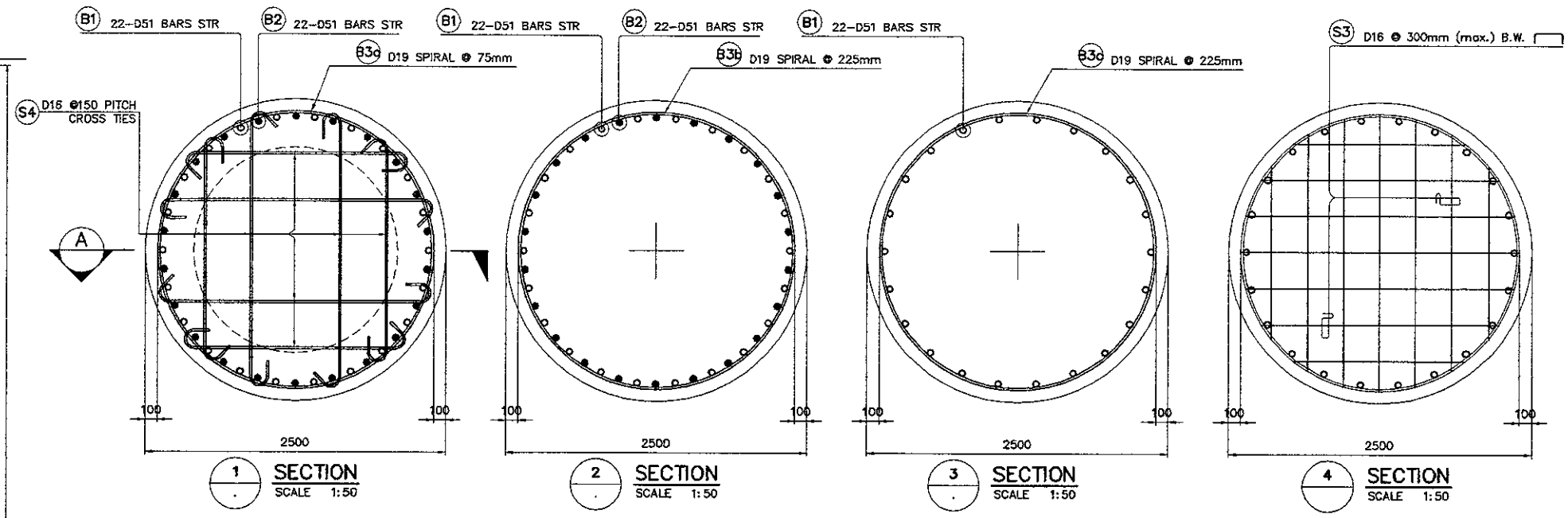
A ELEVATION SCALE 1:100  
 B LAYOUT OF STIFFENER SCALE 1:100

1 BORED PILE REINF. DETAILS FOR PIER P8 (Ø1800mm) SCALE AS SHOWN



**A SECTION**  
 SCALE 1:100

**B LAYOUT OF STIFFENER/SPACER**  
 SCALE 1:100

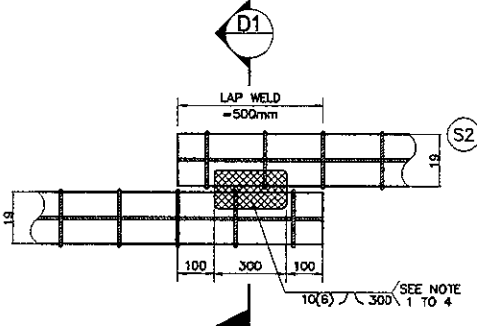
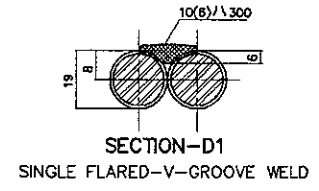


**1 SECTION**  
 SCALE 1:50

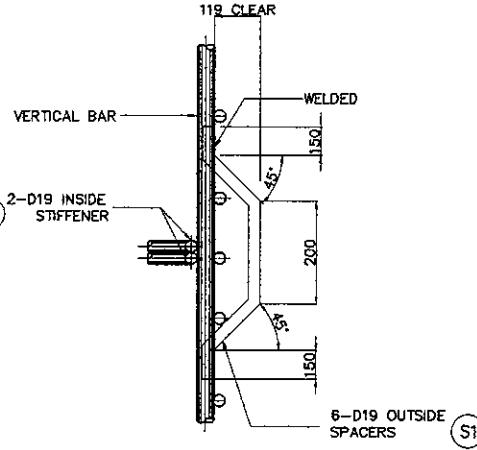
**2 SECTION**  
 SCALE 1:50

**3 SECTION**  
 SCALE 1:50

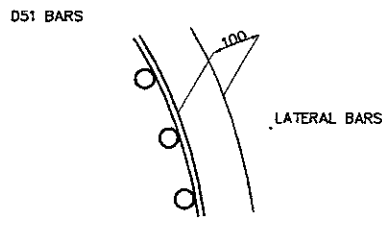
**4 SECTION**  
 SCALE 1:50



**D**  
 NOT TO SCALE



**C**  
 NOT TO SCALE

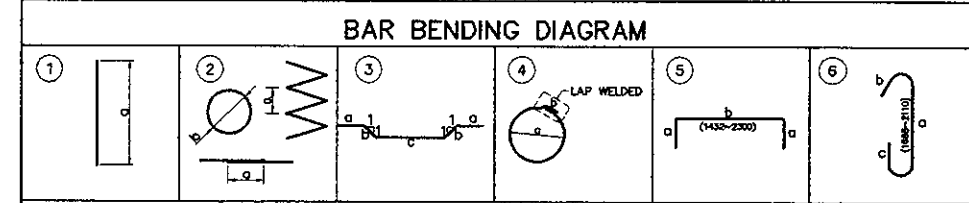


**E**  
 NOT TO SCALE

- NOTES ON LAP-WELD CONNECTION :
- SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  - WELDING SHOULD CONFORM TO AWS (D1.4)  
 \*STRUCTURAL WELDING CODE REINFORCED STEEL\*
  - USE ELECTRODE E90XX.
  - CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  - CONCRETE :  $F_c' = 30MPa$
  - REINFORCING STEEL=  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

BORED PILE TYPE	BP-MF2	
SIZE (mm)	D2500	
MAIN BARS	SIZE (mm)	51
	NO. OF LAYERS	1.0
	NO. OF PCS.	44
SPIRAL	SIZE (mm)	19
	NO. / SET	

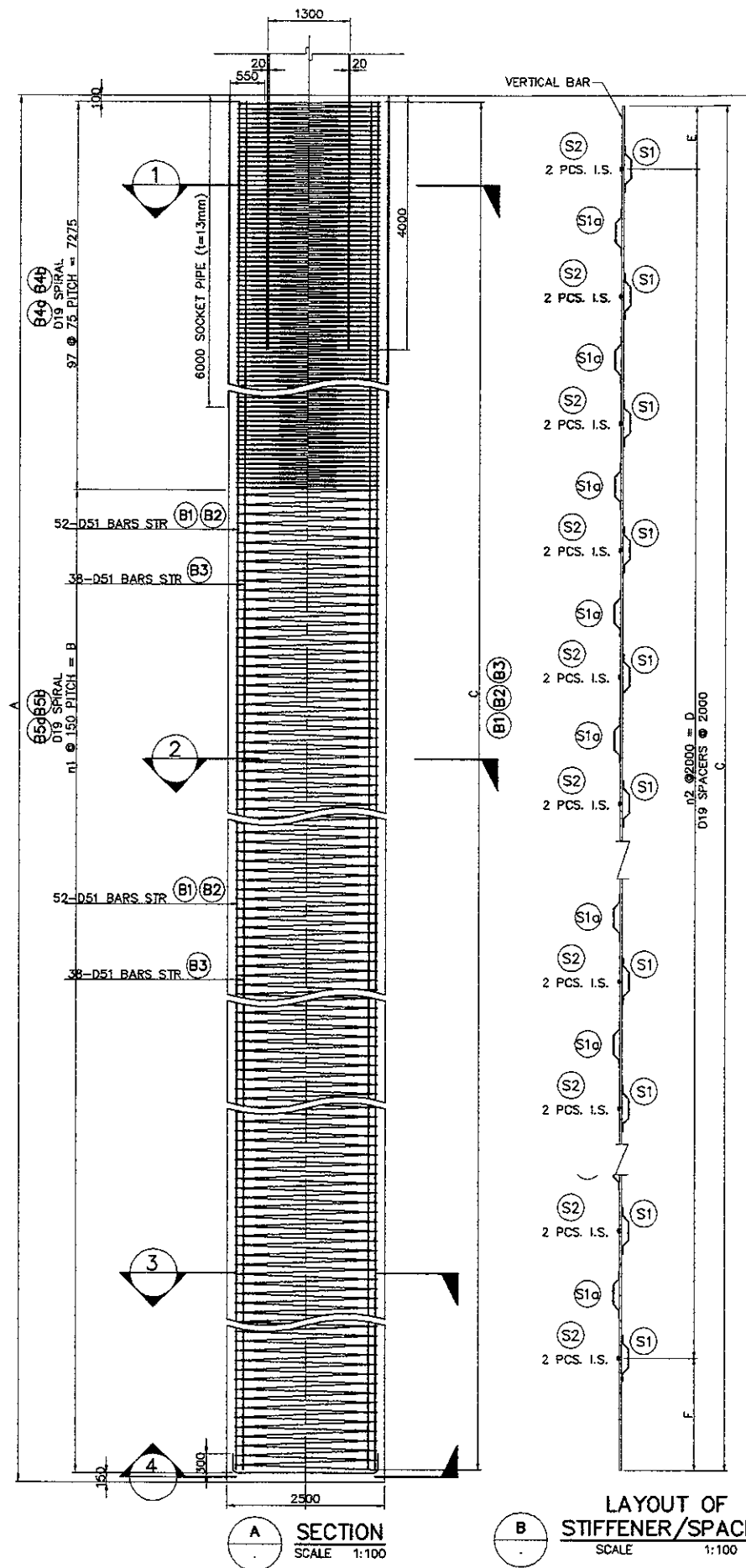
LOCATION	DIMENSION							
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	n1	n2
P9	22000	14400	21750	20000	1000	750	64	10



LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)
				a	b	c	d	e	f				
PIER P9 DIA = 2500mm L = 22000 mm	B1	51	1	21750						21750	22	15.90	7608
	B2	51	1	18000						18000	22	15.90	6296
	B3a	19	2	75	2300	500				736756	1	2.23	1643
	B3b	19	2	225	2300	500				481208	1	2.23	1073
	S1	19	3	150	170	250				890	68	2.23	131
	S2	19	4	2160	170					6952	22	2.23	341
	S3	16	5	150	1865					2165	14	1.58	48
	S4	16	6	1895	316	380				4106	392	1.58	2543
TOTAL WEIGHT FOR / PILE = 19,584 Kgs.											VOLUME CONCRETE = 107.99 M3		

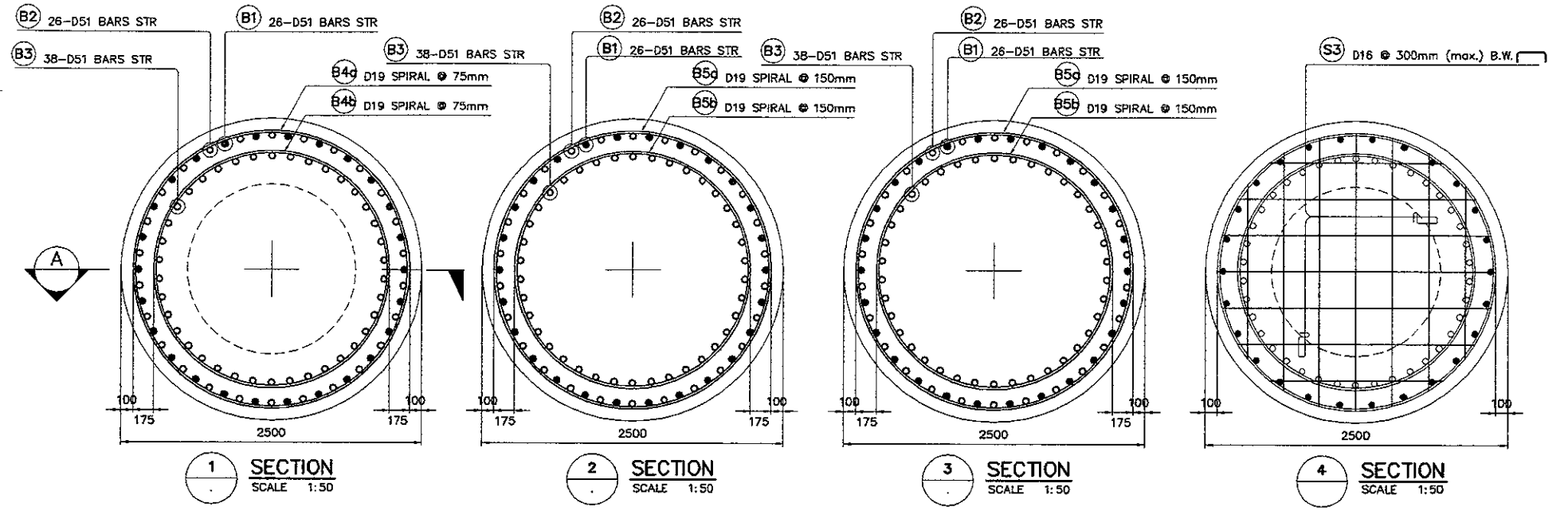
THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

**BORED PILE REINF. DETAILS (PIER P9)**  
 SCALE AS SHOWN



**A SECTION**  
SCALE 1:100

**B LAYOUT OF STIFFENER/SPACER**  
SCALE 1:100

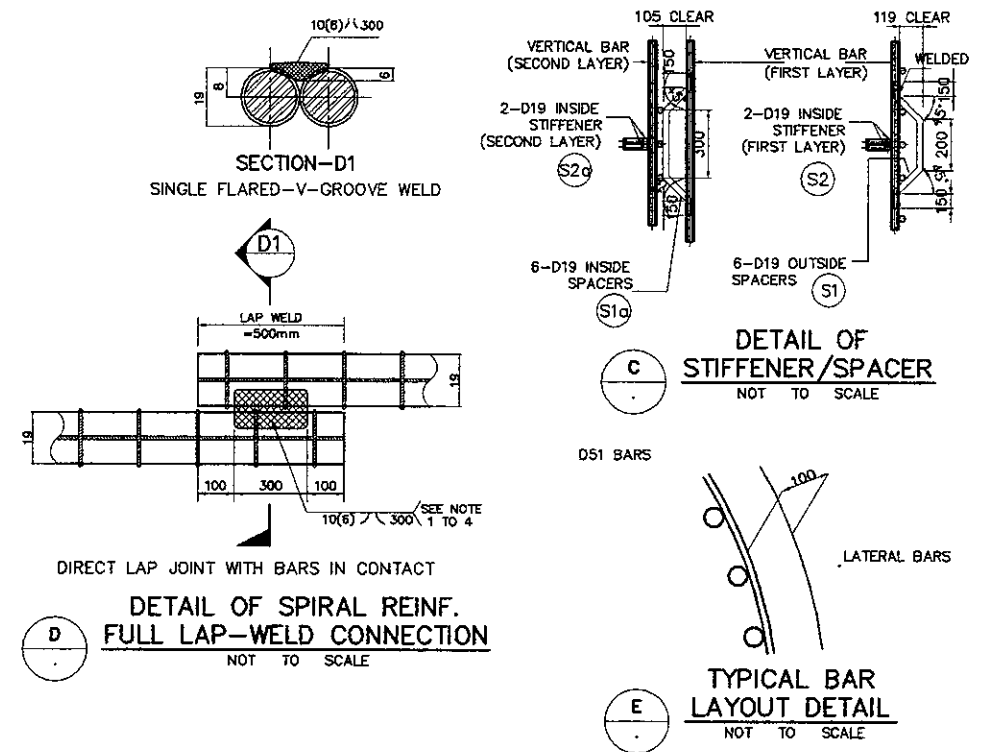


**1 SECTION**  
SCALE 1:50

**2 SECTION**  
SCALE 1:50

**3 SECTION**  
SCALE 1:50

**4 SECTION**  
SCALE 1:50



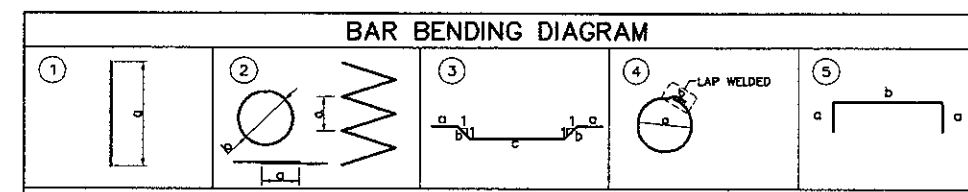
**D DETAIL OF SPIRAL REINF. FULL LAP-WELD CONNECTION**  
NOT TO SCALE

**C DETAIL OF STIFFENER/SPACER**  
NOT TO SCALE

**E TYPICAL BAR LAYOUT DETAIL**  
NOT TO SCALE

**NOTES ON LAP-WELD CONNECTION :**  
1. SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)  
2. WELDING SHOULD CONFORM TO AWS (D1.4) \*STRUCTURAL WELDING CODE REINFORCED STEEL\*  
3. USE ELECTRODE E90XX.  
4. CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.

**NOTES :**  
1. ALL DIMENSIONS ARE IN MILLIMETERS.  
2. BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.  
3. COMPOSITE COLUMN SOCKET TYPE CONNECTION SEE DWG. NO. MSB-071  
4. CONCRETE :  $F_c' = 30 \text{ MPa}$   
5. REINFORCING STEEL=  
D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>



**SCHEDULE OF REINFORCEMENT**

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	WEIGHT (kg)
				a	b	c	d	e	f				
PIER P0, P11 DIA = 2500 mm L = 24000 mm	B1	51	1	23775						23775	26	15.90	9829
	B2	51	1	23775						23775	26	15.90	9829
	B3	51	1	23775						23775	38	15.90	14365
	B4a	19	2	75	2300	500				729034	1	2.23	1626
	B4b	19	2	75	1950	500				618431	1	2.23	1379
	B5a	19	2	150	2300	500				826920	1	2.23	1844
	B5b	19	2	150	1950	500				701530	1	2.23	1564
	S1	19	3	150	170	250				890	72	2.23	143
	S2	19	4	2160	170					6952	24	2.23	372
	S2a	19	4	1810	170					5853	20	2.23	261
	S3	16	5	150	1865					2165	14	1.58	48
	TOTAL WEIGHT FOR / PILE = 41,386 Kgs.												
TOTAL VOLUME CONCRETE = 117.81 m <sup>3</sup>													

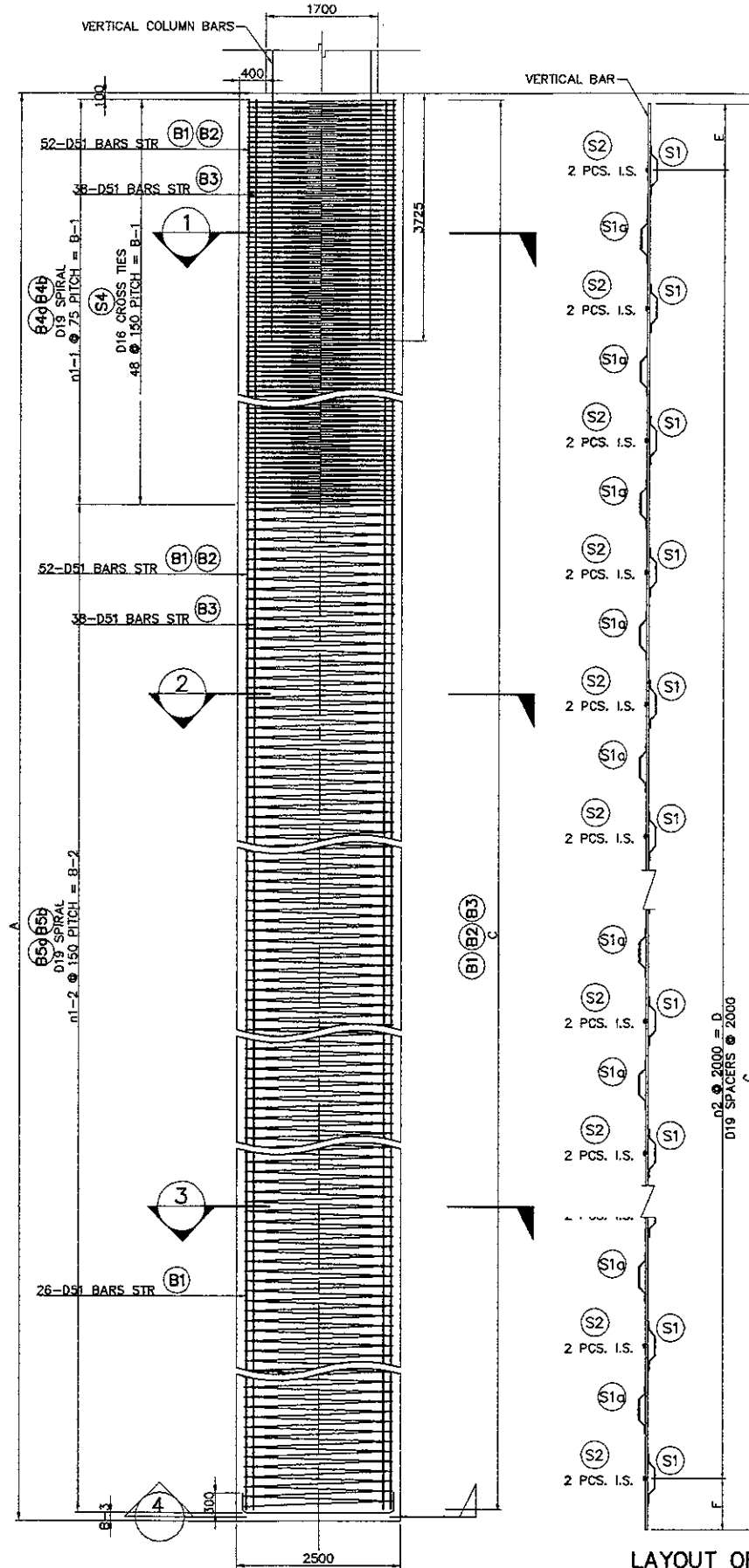
THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

BORED PILE TYPE		BP-GF4
SIZE (mm)		D2500
MAIN BARS	SIZE (mm)	51
	NO. OF LAYERS	2.0
	NO. OF PCS. (1)	52
SPIRAL	NO. OF PCS. (2)	38
	SIZE (mm)	19
	NO. / SET	

LOCATION	DIMENSION						n1	n2 (S1)	n2 (S1a)
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)			
P10, P11	24000	16500	23775	22000	1000	775	110	11	10

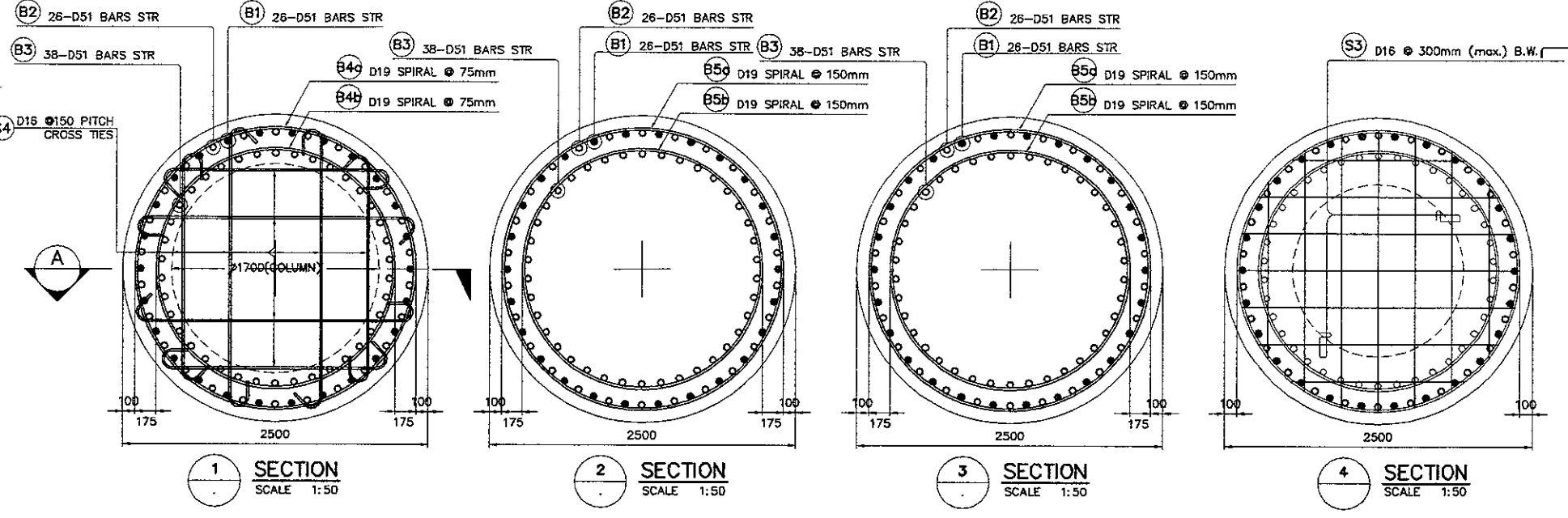
**BORED PILE REINF. DETAILS (PIER P10 & P11)**  
SCALE AS SHOWN

DESIGNED BY	CHECKED BY	SUBMITTED BY
Name A. GOURLEY	Name T. OKUMURA	Name M. KIUCHI
Sign	Sign	Sign
Date	Date	Date



**A SECTION**  
 SCALE 1:100

**B LAYOUT OF STIFFENER/SPACER**  
 SCALE 1:100

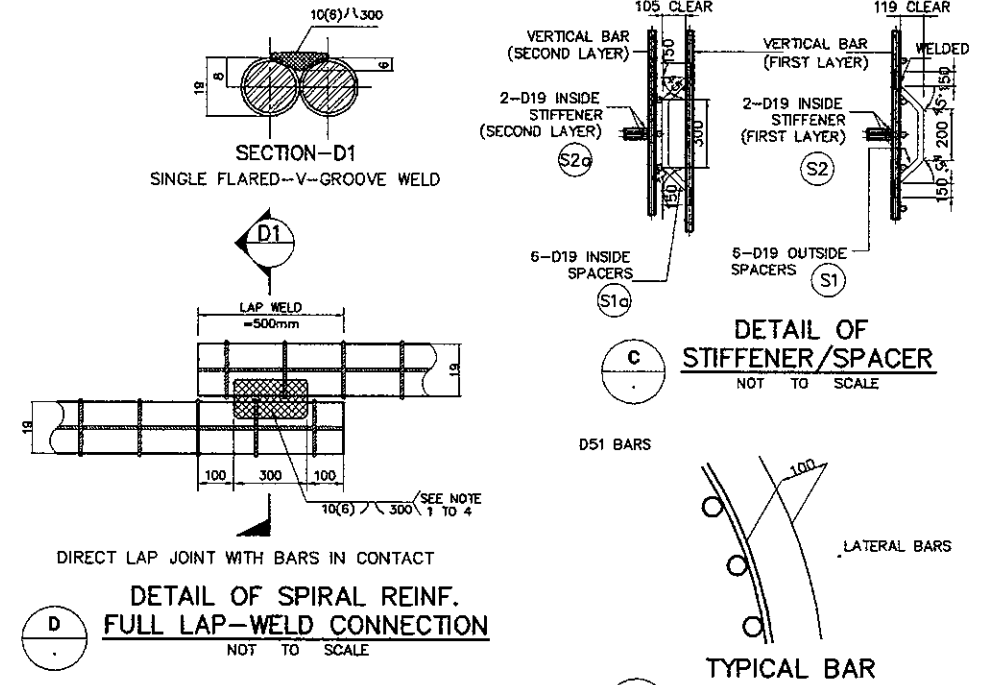


**1 SECTION**  
 SCALE 1:50

**2 SECTION**  
 SCALE 1:50

**3 SECTION**  
 SCALE 1:50

**4 SECTION**  
 SCALE 1:50



**SECTION-D1**  
 SINGLE FLARED-V-GROOVE WELD

**DETAIL OF STIFFENER/SPACER**  
 NOT TO SCALE

**DETAIL OF SPIRAL REINF. FULL LAP-WELD CONNECTION**  
 NOT TO SCALE

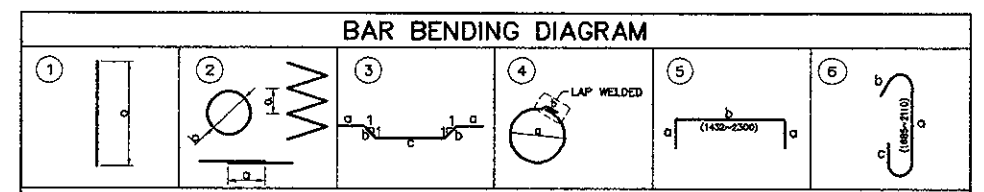
**TYPICAL BAR LAYOUT DETAIL**  
 NOT TO SCALE

- NOTES ON LAP-WELD CONNECTION :**
- SPIRAL REINFORCEMENT ARE LAP-WELD CONNECTED (FLARED-V-GROOVE TYPE)
  - WELDING SHOULD CONFORM TO AWS (D1.4)  
 \*STRUCTURAL WELDING CODE REINFORCED STEEL\*
  - USE ELECTRODE E90XX.
  - CARE SHOULD BE TAKEN NOT TO DAMAGE THE COLUMN MAIN BARS DURING WELDING.

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETERS.
  - BORED PILE MAIN BARS ARE PROVIDED WITHOUT ANY SPLICE. HOWEVER SPLICING OF MAIN BARS BY MECHANICAL COUPLERS ARE ALLOWED WITH PERMISSION FROM THE STRUCTURAL ENGINEER.
  - CONCRETE :  $F_c' = 30\text{MPa}$
  - REINFORCING STEEL=  
 D51 : YIELD STRENGTH = 345 N/mm<sup>2</sup>  
 OTHERS : YIELD STRENGTH = 390 N/mm<sup>2</sup>

BORED PILE TYPE		BP-GF4
SIZE (mm)		D2500
MAIN BARS	SIZE (mm)	51
	NO. OF LAYERS	2.0
	NO. OF PCS. (1)	52
	NO. OF PCS. (2)	38
SPIRAL	SIZE (mm)	19
	NO. / SET	

LOCATION	DIMENSION											
	A (mm)	B-1 (mm)	B-2 (mm)	B-3 (mm)	C (mm)	D (mm)	E (mm)	F (mm)	n1-1	n1-2	n2 (S1)	n2 (S1a)
P12 (L)	24000	7275	16500	125	23775	22000	1000	775	97	110	11	10
P12 (R)	40000	7200	32550	150	39750	38000	1000	750	96	217	19	18

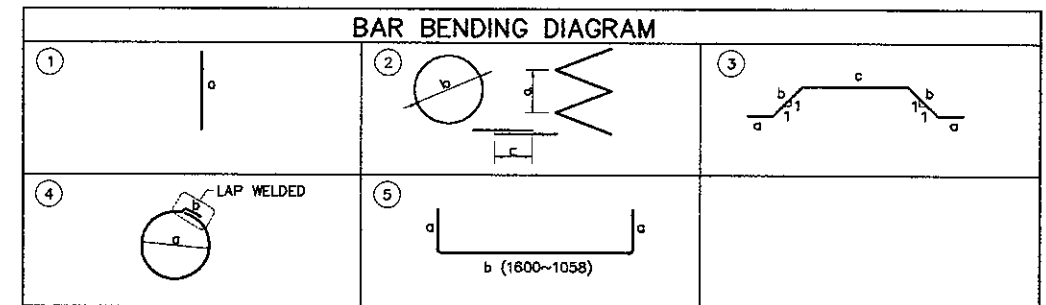
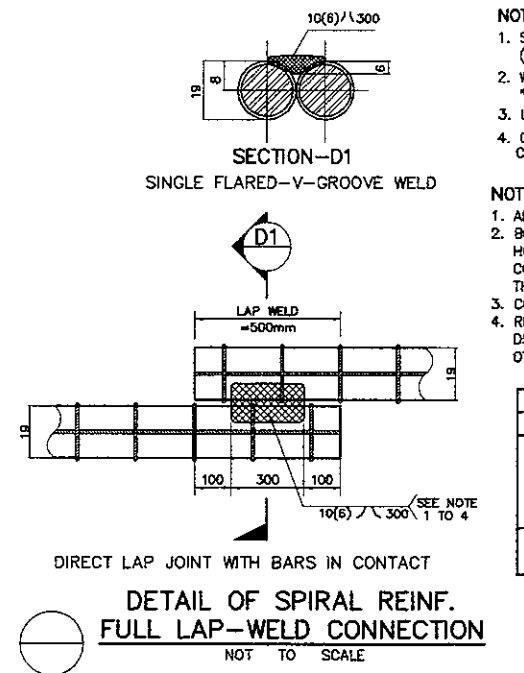
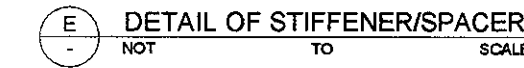
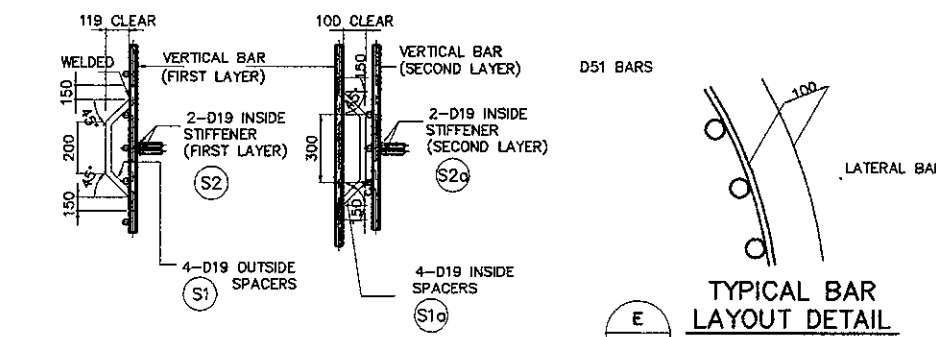
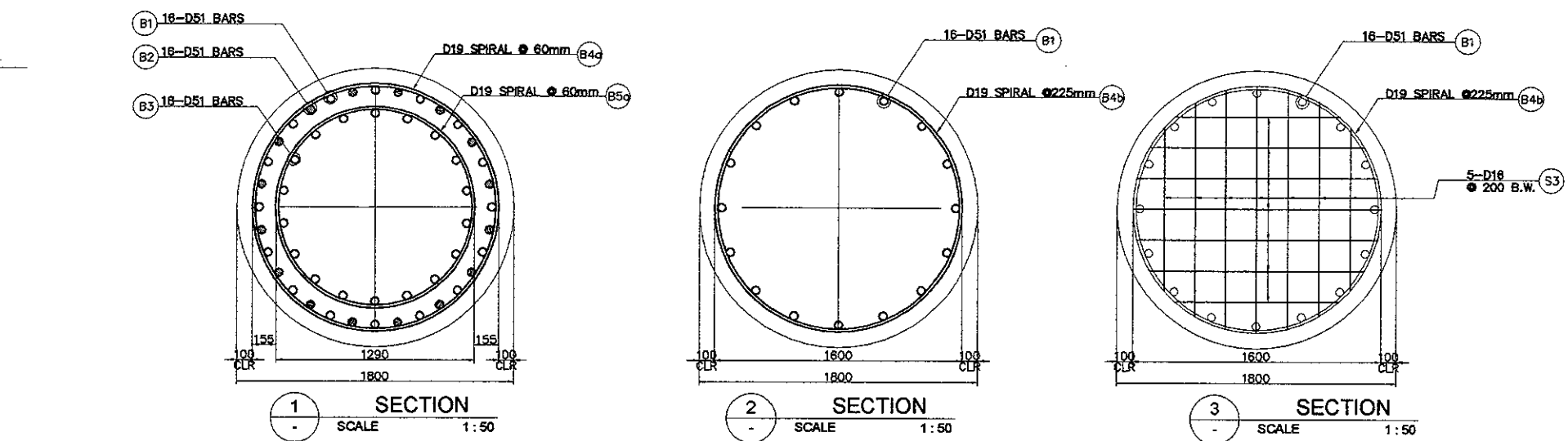
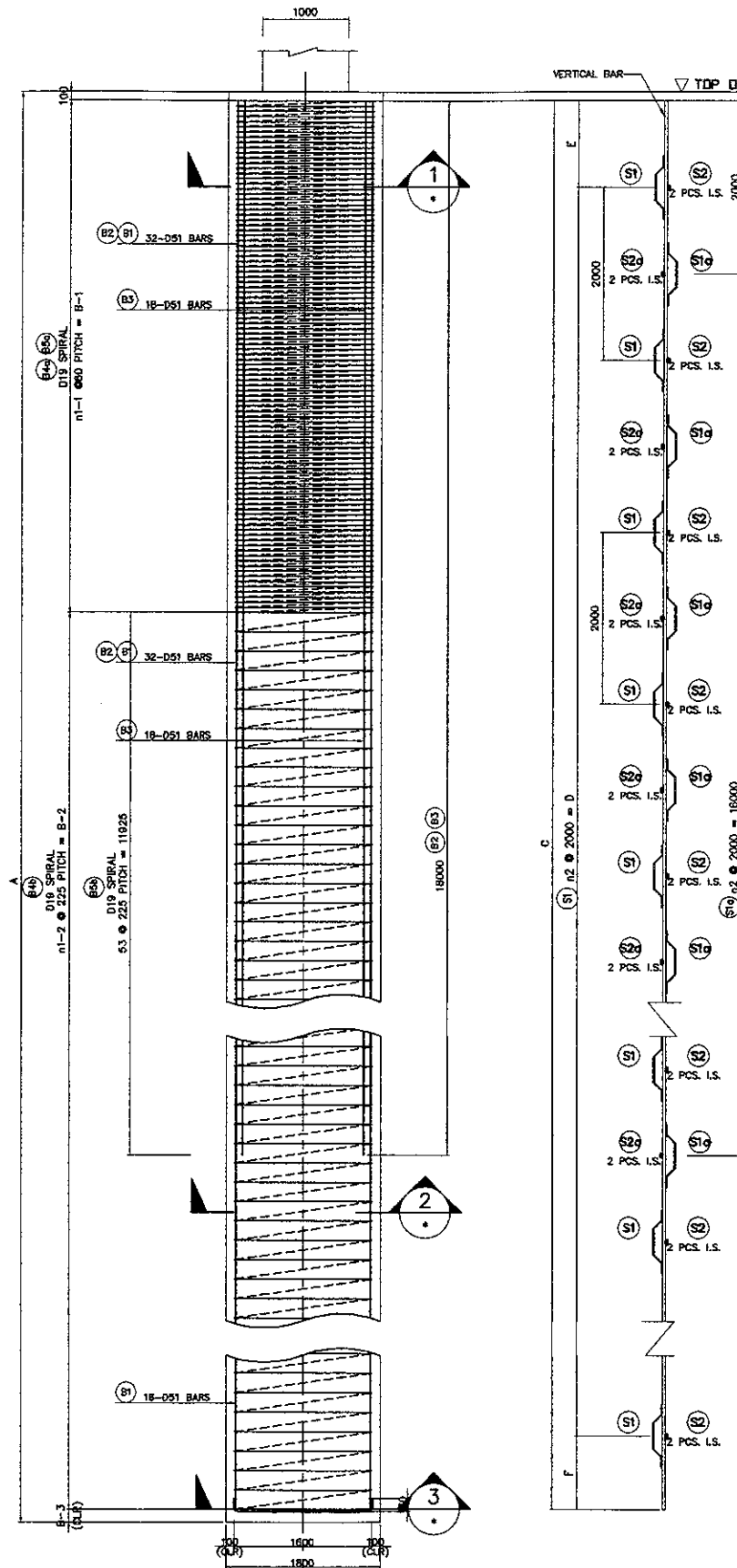


LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION(mm) OUT TO OUT						LENGTH (mm)	NO. REQD.	UNIT WEIGHT (kg/m)	WEIGHT (kg)	
				a	b	c	d	e	f					
PIER P12 LEFT, DIA = 2500 mm L = 24000 mm	B1	51	1	23775						23775	26	15.90	9829	
	B2	51	1	23775						23775	26	15.90	9829	
	B3	51	1	23775						23775	38	15.90	14365	
	B4a	19	2	75	2300	500				729034	1	2.23	1626	
	B4b	19	2	75	1950	500				618431	1	2.23	1379	
	B5a	19	2	150	2300	500				826920	1	2.23	1844	
	B5b	19	2	150	1950	500				701530	1	2.23	1564	
	S1	19	3	150	170	250				890	72	2.23	143	
	S1a	19	3	150	150	350				950	60	2.23	127	
	S2	19	4	2160	170					6952	24	2.23	372	
	S2a	19	4	1810	170					5853	20	2.23	261	
	S3	16	5	150	1865					2165	14	1.58	48	
	S4	16	6	1895	316	380				4106	392	1.58	2543	
	<b>TOTAL WEIGHT FOR / PILE = 43,929 Kgs.</b>											<b>TOTAL VOLUME CONCRETE = 117.81 m<sup>3</sup></b>		
	PIER P12 RIGHT, DIA = 2500 mm L = 40000 mm	B1	51	1	39750						39750	26	15.90	16433
		B2	51	1	39750						39750	26	15.90	16433
B3		51	1	39750						39750	38	15.90	24017	
B4a		19	2	75	2300	500				721812	1	2.23	1610	
B4b		19	2	75	1950	500				609308	1	2.23	1359	
B5a		19	2	150	2300	500				1631674	1	2.23	3639	
B5b		19	2	150	1950	500				1383191	1	2.23	3085	
S1		19	3	150	170	250				890	120	2.23	238	
S1a		19	3	150	150	350				950	108	2.23	229	
S2		19	4	2160	170					6952	40	2.23	620	
S2a		19	4	1810	170					5853	36	2.23	470	
S3		16	5	150	1865					2165	14	1.58	48	
S4		16	6	1895	316	380				4106	392	1.58	2543	
<b>TOTAL WEIGHT FOR / PILE = 70,722 Kgs.</b>											<b>TOTAL VOLUME CONCRETE = 196.35 m<sup>3</sup></b>			

THE SCHEDULE OF REINFORCEMENT SHOWN ON THE BAR BENDING DIAGRAM TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

**BORED PILE REINF. DETAILS (PIER P12 LEFT & RIGHT)**  
 SCALE AS SHOWN





**SCHEDULE OF REINFORCEMENT**

LOCATION	BAR MARK	SIZE (mm)	BEND TYPE	DIMENSION (mm) OUT TO OUT						LENGTH (mm)	NO. REQ'D.	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)	VOLUME CONCRETE (kg)	
				a	b	c	d	e	f						
PIER P13, D=1800 L=28000	B1	51	1	27765							27765	18	15.90	7063	71.26
	B2	51	1	18000							18000	16	15.90	4579	
	B3	51	1	18000							18000	18	15.90	5152	
	B4a	19	2	60	1600	500					517876	1	2.23	1155	
	B4b	19	2	225	1600	500					507828	1	2.23	1132	
	B5a	19	2	60	1290	500					418009	1	2.23	932	
	B5b	19	2	225	1290	500					226112	1	2.23	504	
	S1	19	3	150	170	250					890	56	2.23	111	
	S1a	19	3	150	150	350					950	32	2.23	68	
	S2	19	4	1460	170						4754	28	2.23	297	
	S2a	19	4	1150	170						3781	16	2.23	135	
	S3	16	5	150	1330						1630	14	1.58	36	
	<b>TOTAL WEIGHT PER PILE =</b>												<b>21,165 Kgs</b>		

THE REINFORCEMENT SHOWN ON THIS TABLE IS FOR REFERENCE ONLY. THE CONTRACTOR SHOULD CHECK AND VERIFY ALL DIMENSIONS, SIZES AND QUANTITIES OF REINFORCEMENT.

**DIMENSION**

LOCATION	A (mm)	B-1 (mm)	B-2 (mm)	B-3 (mm)	C (mm)	D (mm)	E (mm)	F (mm)	n1-1	n1-2	n2 (S1)	n2 (S1a)
P13	28000	5940	21825	135	27765	26000	1000	765	99	97	13	8

**1 BORED PILE REINF. DETAILS FOR PIER P13 (Ø1800mm)**  
 SCALE AS SHOWN