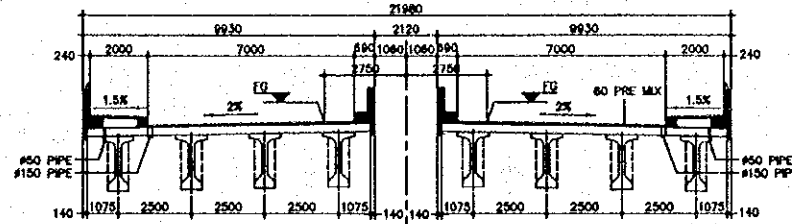


L. CANAL BRIDGE

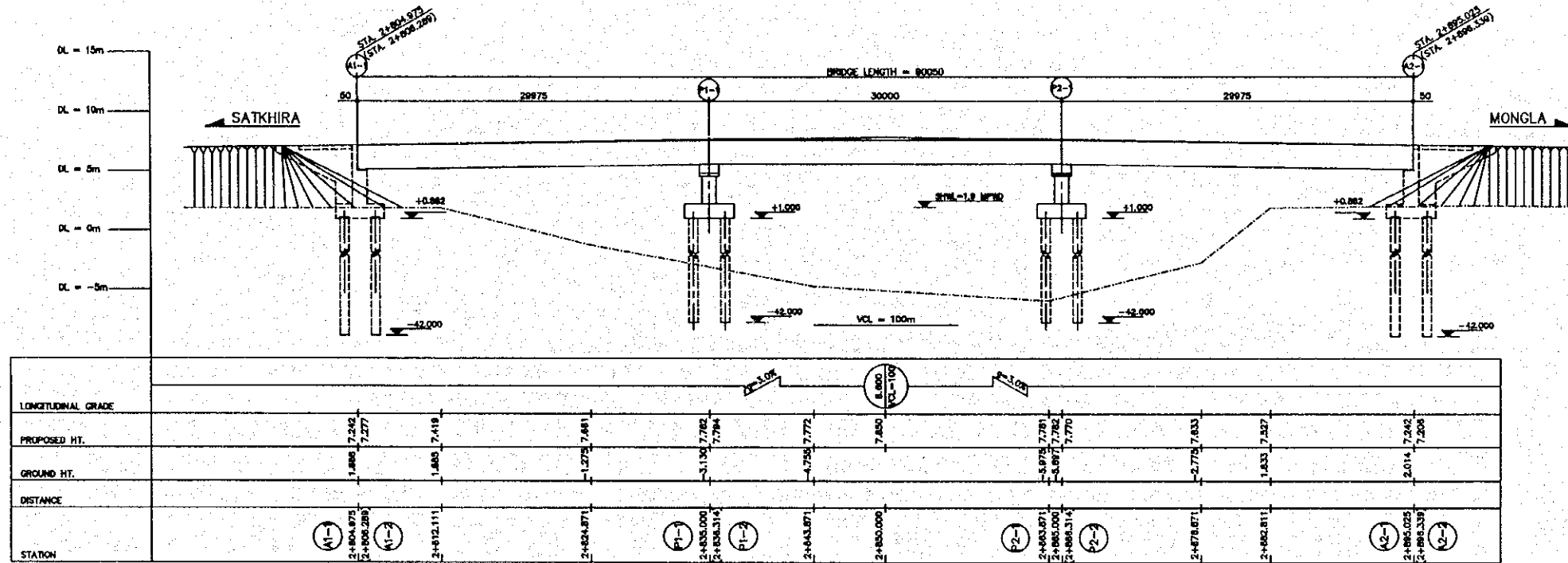
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT OF
HATIA BRIDGE

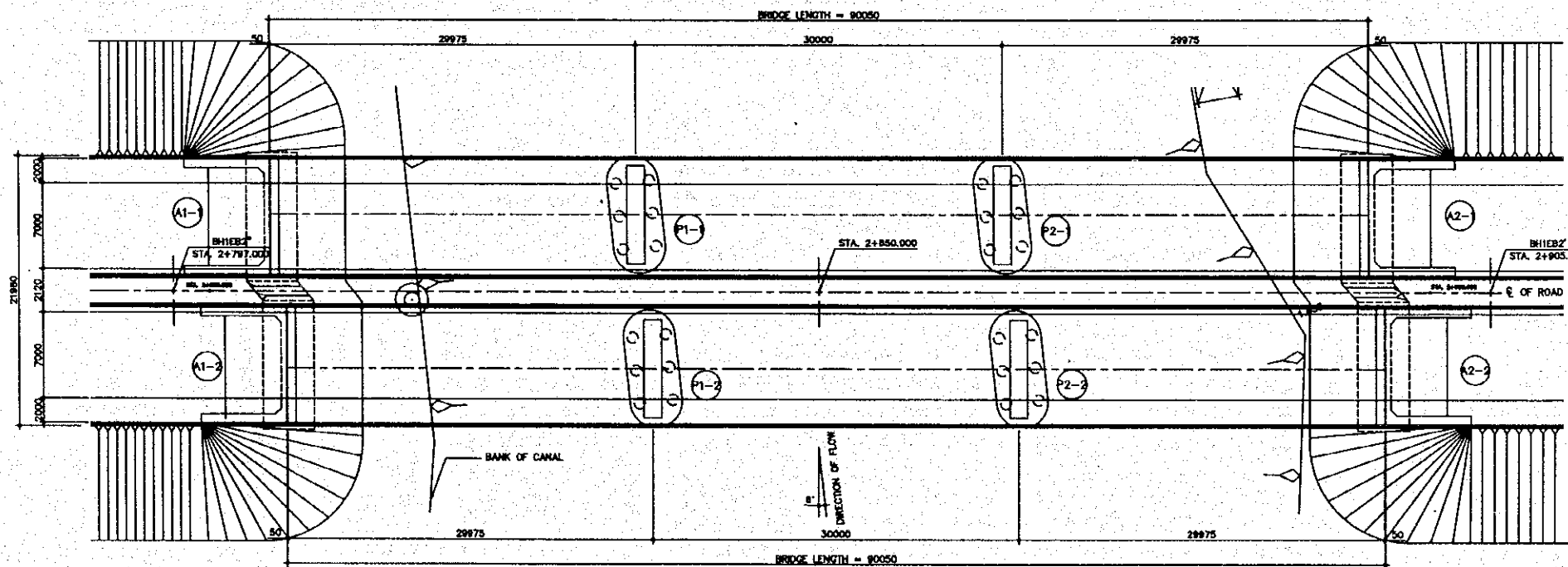
SCALE AS SHOWN SHEET NO. L-01



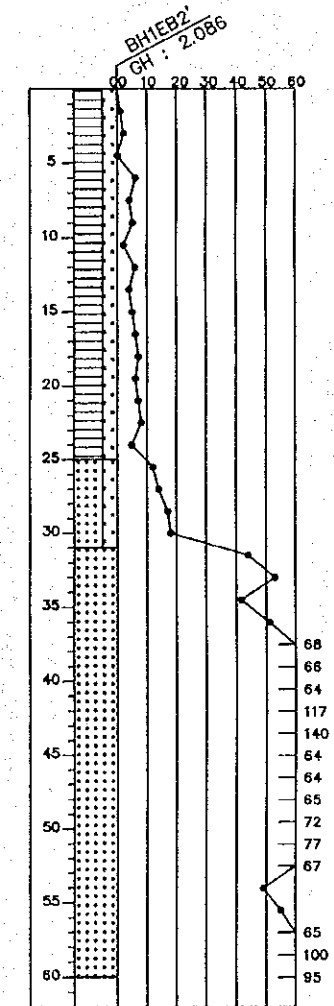
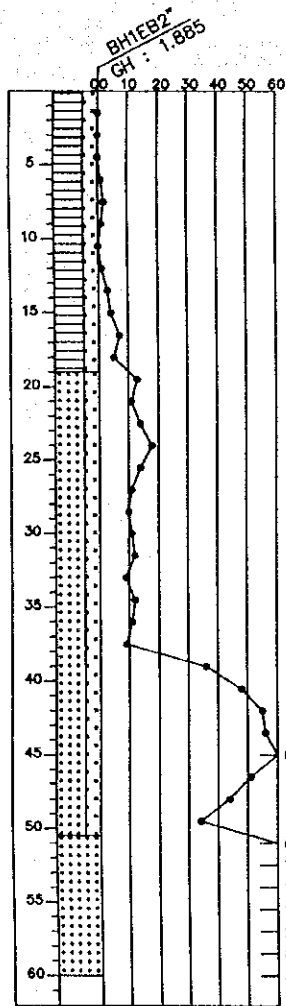
3 SUPER STRUCTURE SECTION
L-01 SCALE 1:125



1 ELEVATION
L-01 SCALE 1:250



2 PLAN
L-01 SCALE 1:250

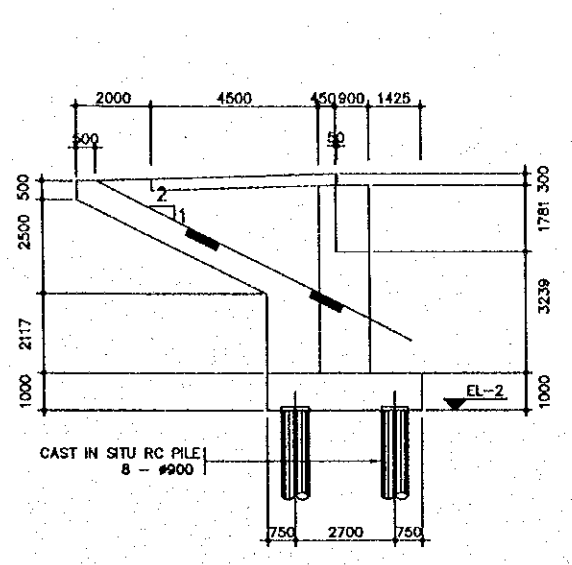


**THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)**

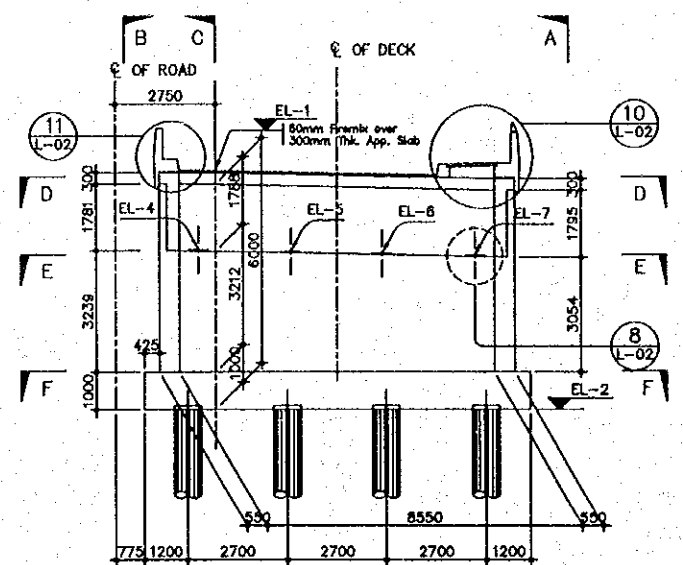
**GENERAL ARRANGEMENT & RC DETAIL
OF ABUTMENT AND APPROACH SLAB**

SCALE	SHEET NO.
AS SHOWN	L-02

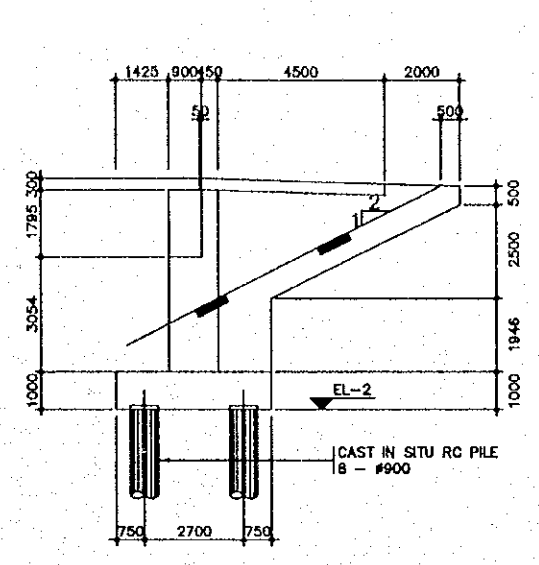
- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
 2. 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
 3. REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
 4. MINIMUM CLEAR COVER TO REINFORCEMENT :
 (a) PILE CAP, BOTTOM = 150mm, TOP AND SIDE = 65mm,
 (b) VERTICAL MEMBER = 65mm, APPROACH SLAB = 65mm.
 5. MINIMUM BEARING CAPACITY OF PILE : 2150 kN.



3 ELEVATION B-B
L-02 SCALE 1:100



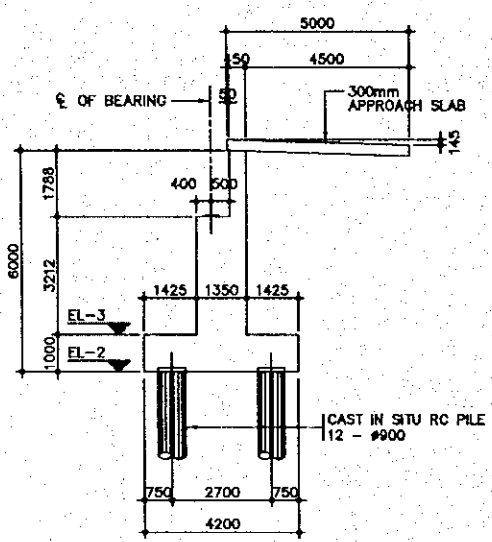
1 LONGITUDINAL ELEVATION
L-02 SCALE 1:100



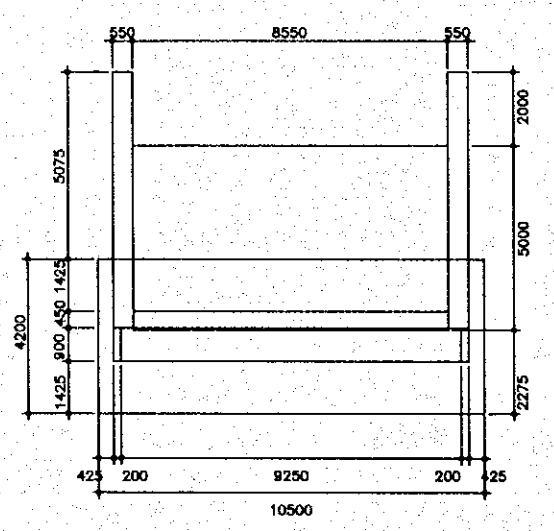
2 ELEVATION A-A
L-02 SCALE 1:100

TABLE SCHEDULE

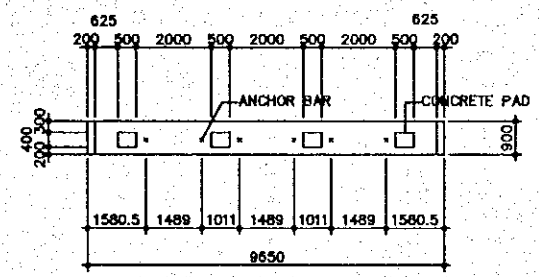
GRADE	A1 ABUTMENT		A2 ABUTMENT	
	A1-1	A1-2	A2-1	A2-2
EL-1	7.242	7.277	7.242	7.206
EL-2	0.882	0.917	0.882	0.846
EL-3	1.882	1.917	1.882	1.846
EL-4	5.134	5.168	5.134	5.098
EL-5	5.084	5.119	5.084	5.048
EL-6	5.034	5.069	5.034	4.998
EL-7	4.984	5.019	4.984	4.948



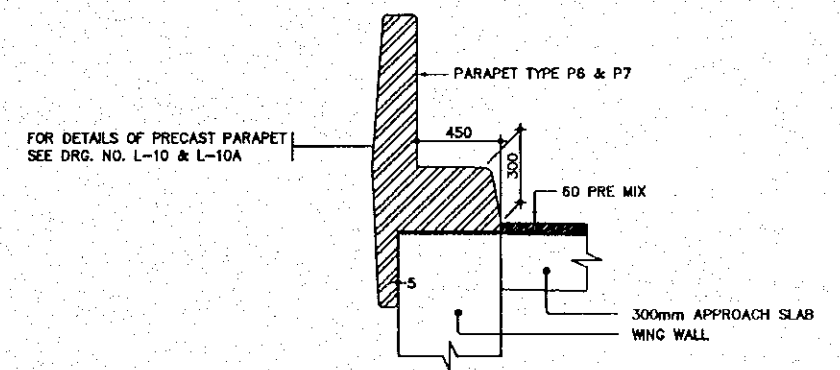
4 SECTION C-C
L-02 SCALE 1:100



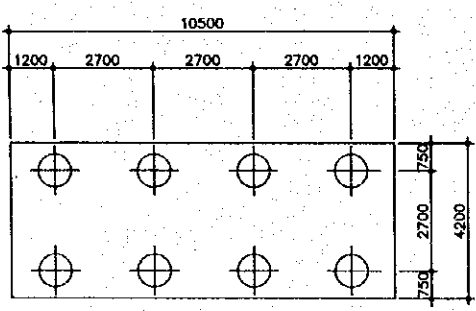
5 SECTION D-D
L-02 SCALE 1:100



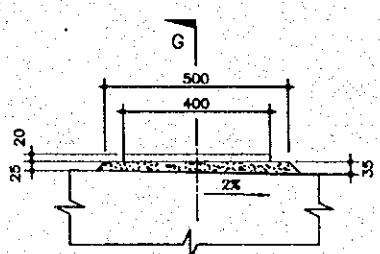
6 SECTION E-E
L-02 SCALE 1:100



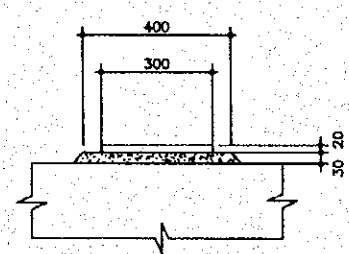
11 DETAIL
L-02 SCALE 1:20



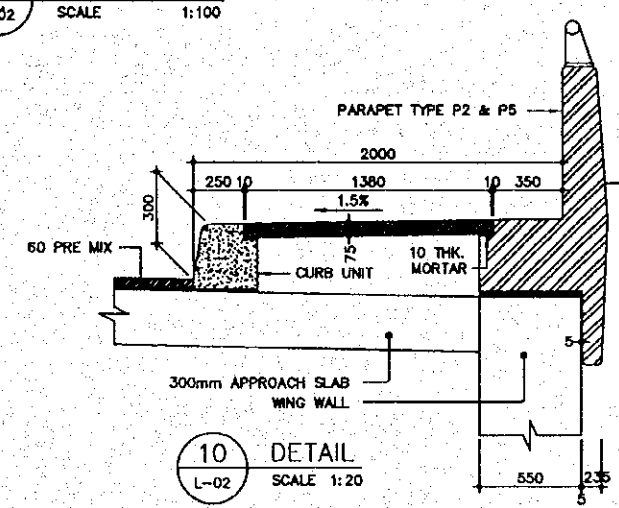
7 SECTION F-F
L-02 SCALE 1:100



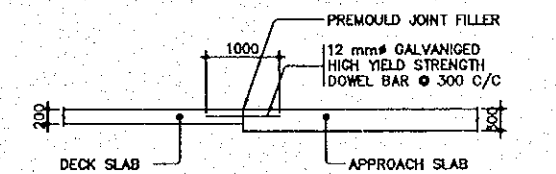
8 DETAIL
L-02 SCALE 1:10



9 SECTION G-G
L-02 SCALE 1:10



10 DETAIL
L-02 SCALE 1:20



12 JOINT DETAILS BETWEEN DECK AND APPROACH SLAB
L-02 SCALE 1:50

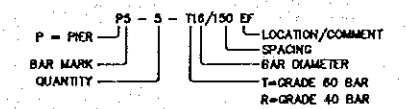
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPŞA IN KHULNA (PHASE 2)

REINFORCEMENT DETAILS
OF ABUTMENT

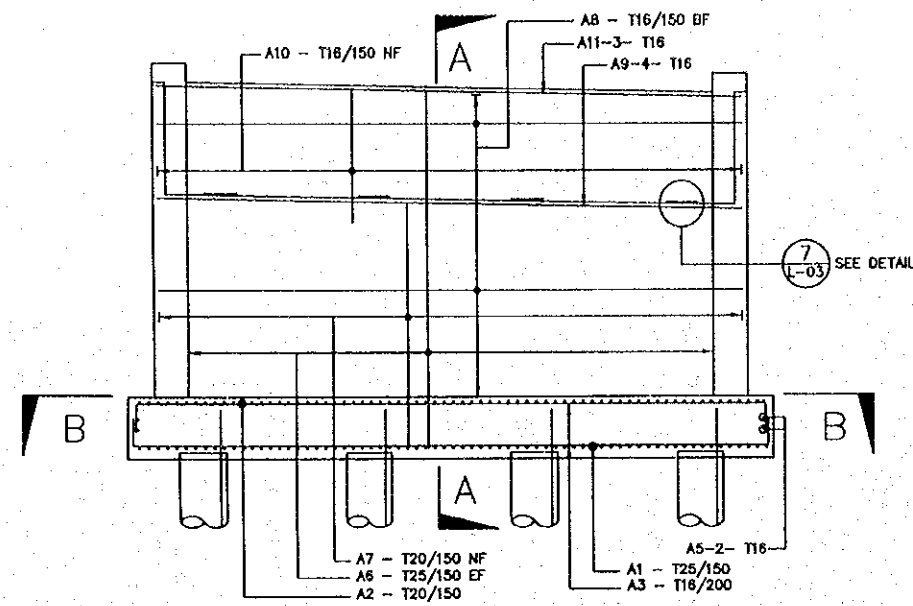
SCALE	SHEET NO.
AS SHOWN	L-03

NOTES :

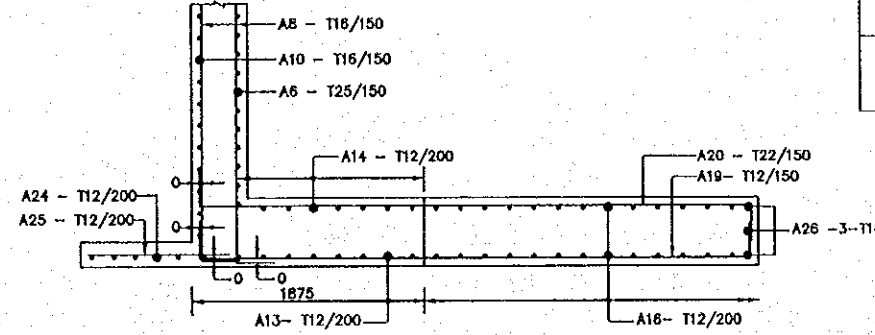
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
- REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A815) GRADE 60.
- NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
- MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) PILE CAP, BOTTOM = 150mm, TOP AND SIDE = 65mm,
(b) VERTICAL MEMBER, COLUMN = 65mm,
(c) PILE : STIRRUP = 90, PRIMARY BAR = 100.
- MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 60% SPLICE
32# = 1500mm, 28# = 1150mm, 25# = 925mm,
22# = 710mm, 20# = 630mm, 18# = 500mm, 12# = 380mm.
FOR 75 TO 100% SPLICE
32# = 1950mm, 28# = 1500mm, 25# = 1200mm,
22# = 930mm, 20# = 820mm, 18# = 660mm, 12# = 490mm.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN
ACCORDANCE WITH AASHTO ARTICLE 6.3.2, ASSUMING BAR TO BE FULLY STRESSED.
- KEY TO REINFORCEMENT NOMENCLATURE:



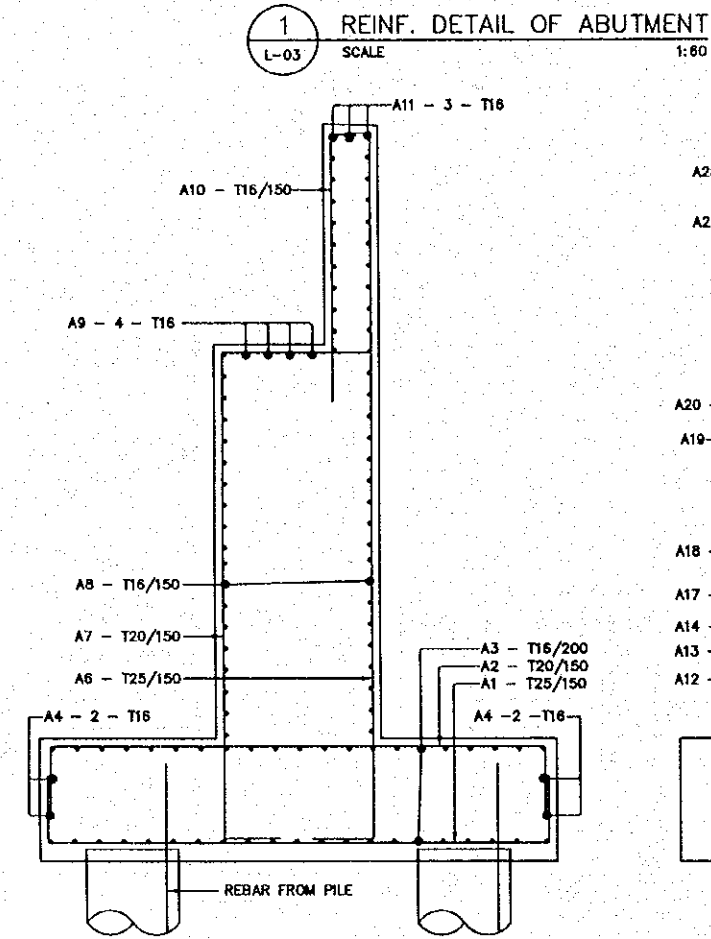
ABBREVIATION--
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERED LAP; ALT = ALTERNATE SPACING.



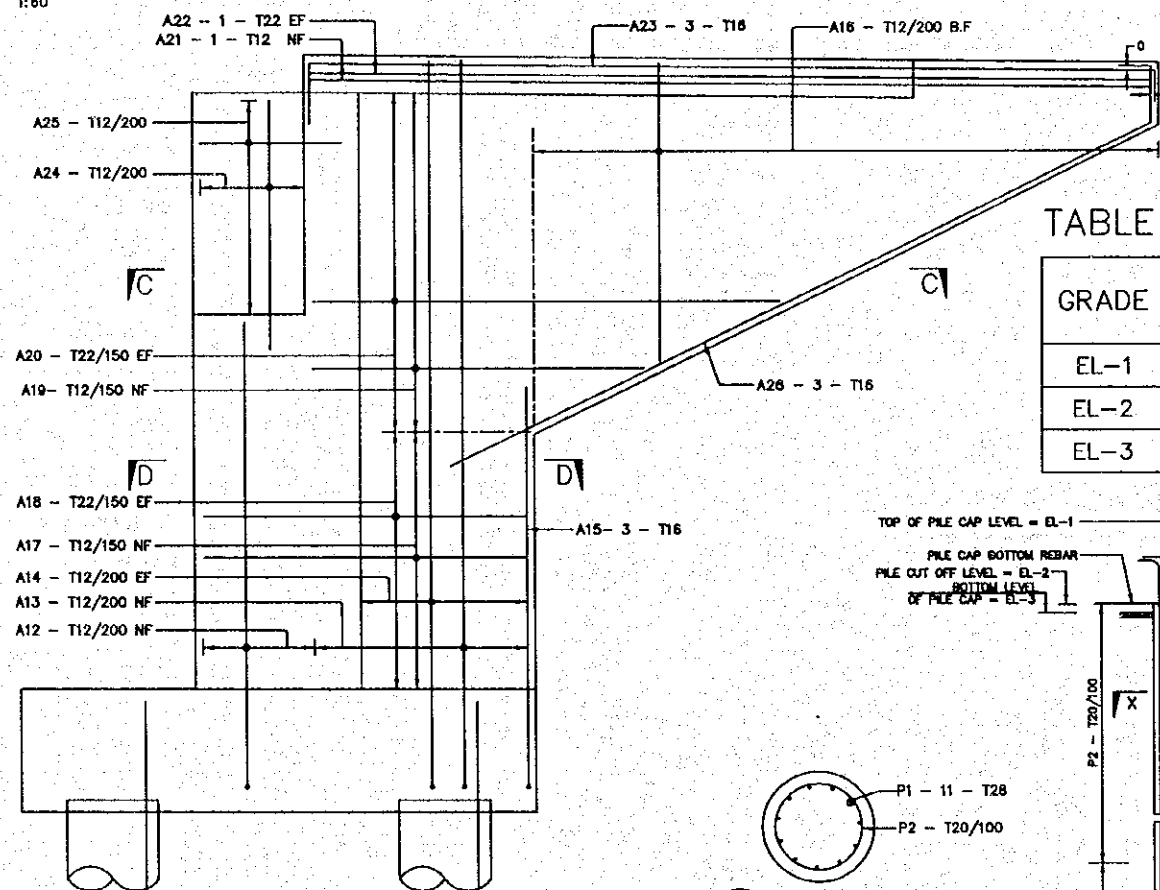
1 REINF. DETAIL OF ABUTMENT
L-03 SCALE 1:60



4 SEC. C-C
L-03 SCALE 1:30



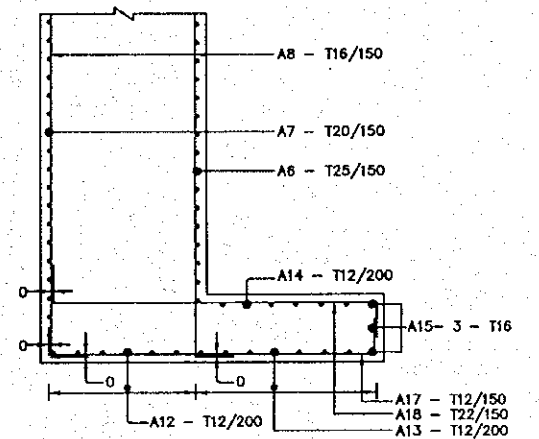
2 SECTION A-A
L-03 SCALE 1:30



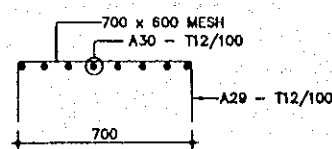
3 REINF. DETAIL OF WING WALL
L-03 SCALE 1:30

TABLE SCHEDULE

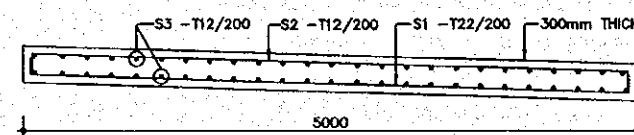
GRADE	A1 ABUTMENT		A2 ABUTMENT	
	A1-1	A1-2	A2-1	A2-2
EL-1	1.882	1.917	1.882	1.846
EL-2	0.982	1.017	0.982	0.946
EL-3	0.882	0.917	0.882	0.846



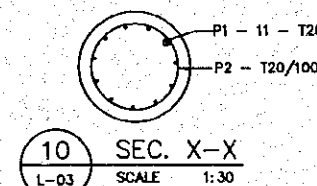
6 SEC. D-D
L-03 SCALE 1:30



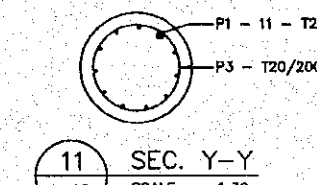
7 DETAIL
L-03 SCALE 1:15



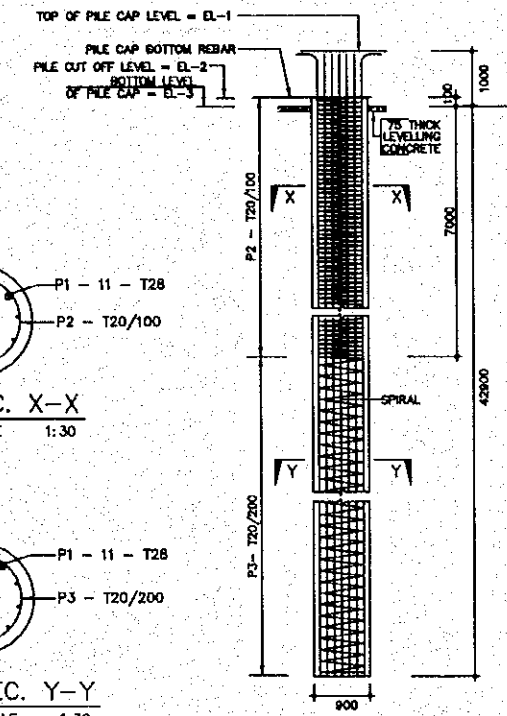
8 SECTIONAL REINFORCEMENT
DETAILS OF APPROACH SLAB
L-03 SCALE 1:30



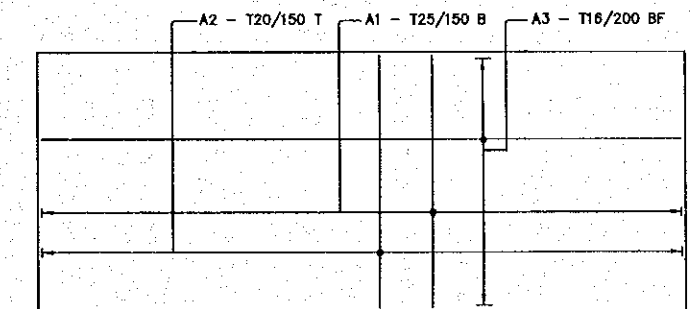
10 SEC. X-X
L-03 SCALE 1:30



11 SEC. Y-Y
L-03 SCALE 1:30



5 ABUTMENT PILE REINF. DETAILS
L-03 SCALE 1:60



9 SECTION B-B
L-03 SCALE 1:60

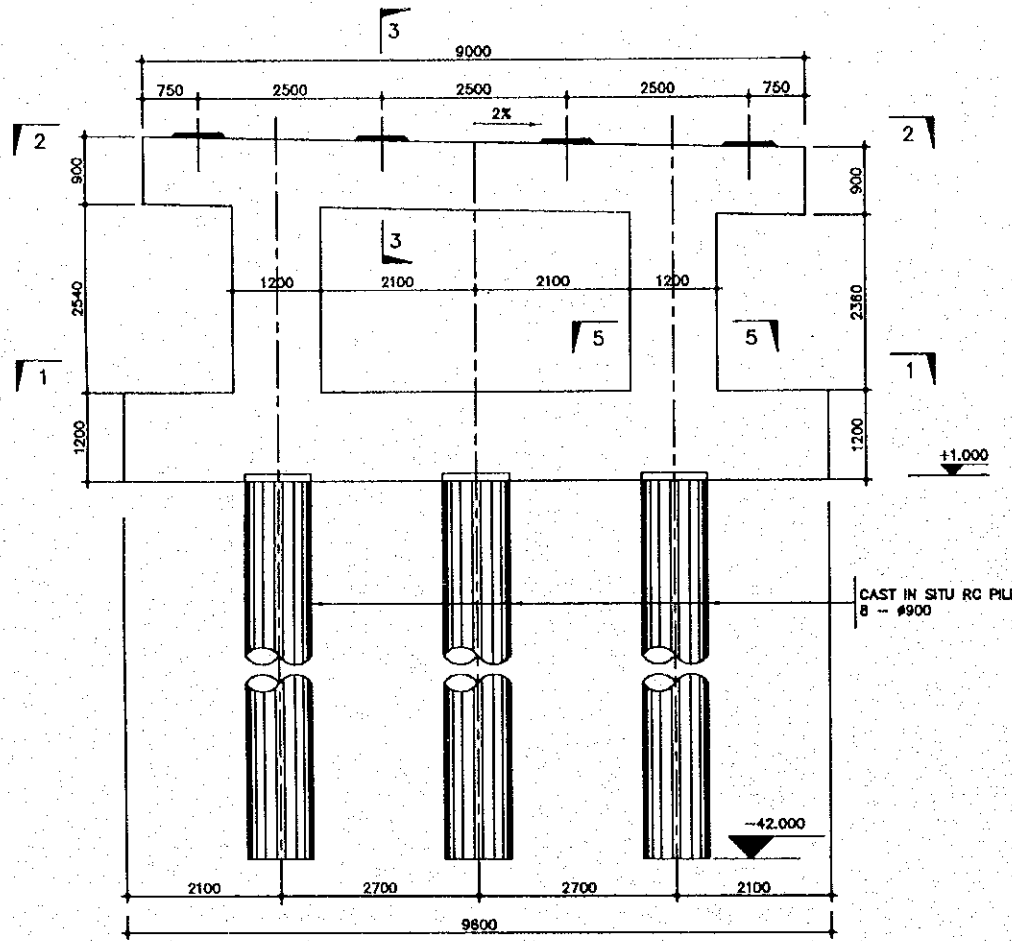
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT & RC DETAILS
OF PIERS OF HATIA BRIDGE

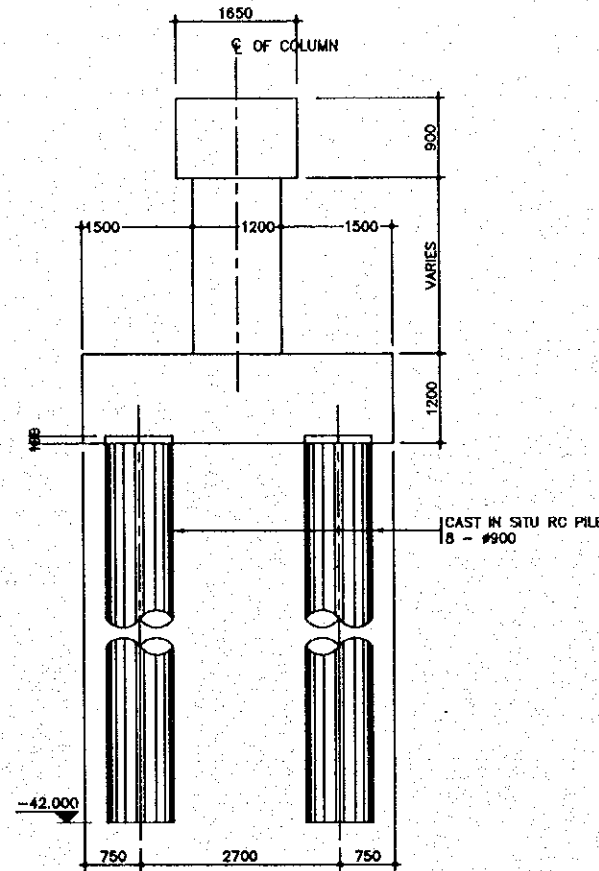
SCALE	SHEET NO.
AS SHOWN	L-04

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
2. 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
3. REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
4. MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) PILE CAP, BOTTOM = 150mm, TOP AND SIDE = 65mm,
(b) PILES = 100mm & OTHERS = 65mm

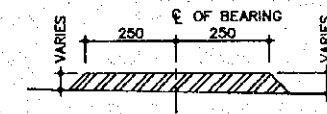


A FRONT ELEVATION OF PIER
L-04 SCALE 1:50

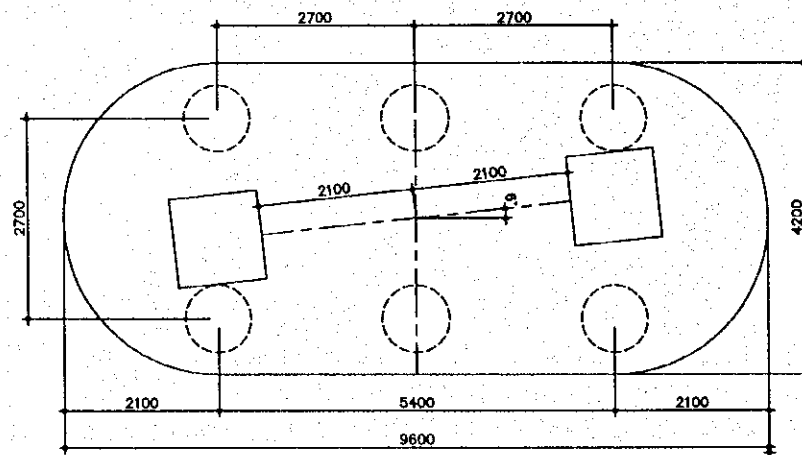


D SIDE ELEVATION OF PIER
L-04 SCALE 1:50

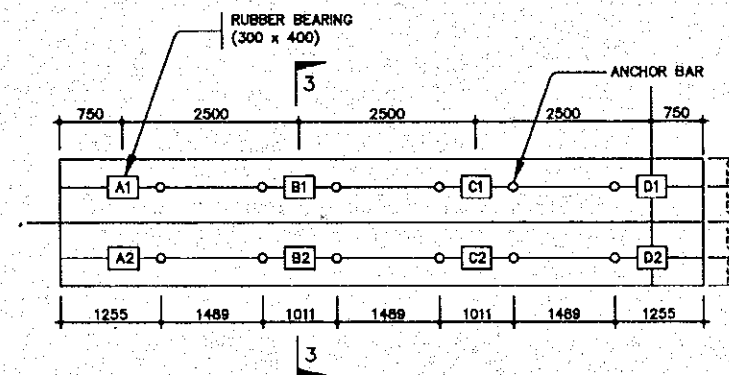
STRUCTURE NO	BEARING FOR INTERIOR SPAN				BEARING FOR EXTERIOR SPAN			
	A1	B1	C1	D1	A2	B2	C2	D2
P1-1	7.796	7.746	7.696	7.646	7.787	7.737	7.687	7.637
P2-1	7.796	7.746	7.696	7.646	7.787	7.737	7.687	7.637
P1-2	7.808	7.758	7.708	7.658	7.799	7.749	7.699	7.649
P2-2	7.784	7.734	7.684	7.634	7.775	7.725	7.675	7.625
ELEVATION ON BEARING PAD								
P1-1	5.673	5.623	5.573	5.523	5.658	5.606	5.556	5.506
P2-1	5.673	5.623	5.573	5.523	5.656	5.606	5.556	5.506
P1-2	5.685	5.635	5.585	5.535	5.668	5.618	5.568	5.518
P2-2	5.661	5.611	5.561	5.511	5.644	5.594	5.544	5.494



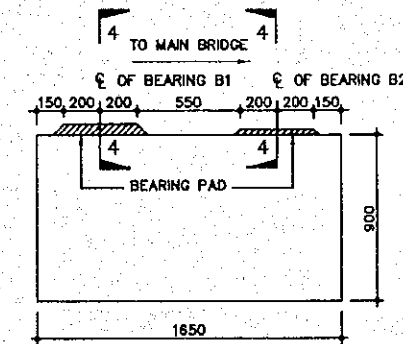
G SECTION 4-4
L-04 SCALE 1:10



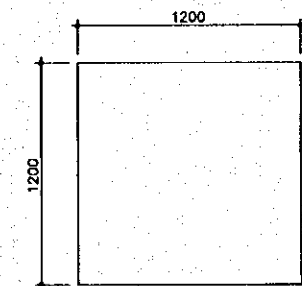
B SECTION 1-1
L-04 SCALE 1:50



C SECTION 2-2
L-04 SCALE 1:50



E SECTION 3-3
L-04 SCALE 1:20

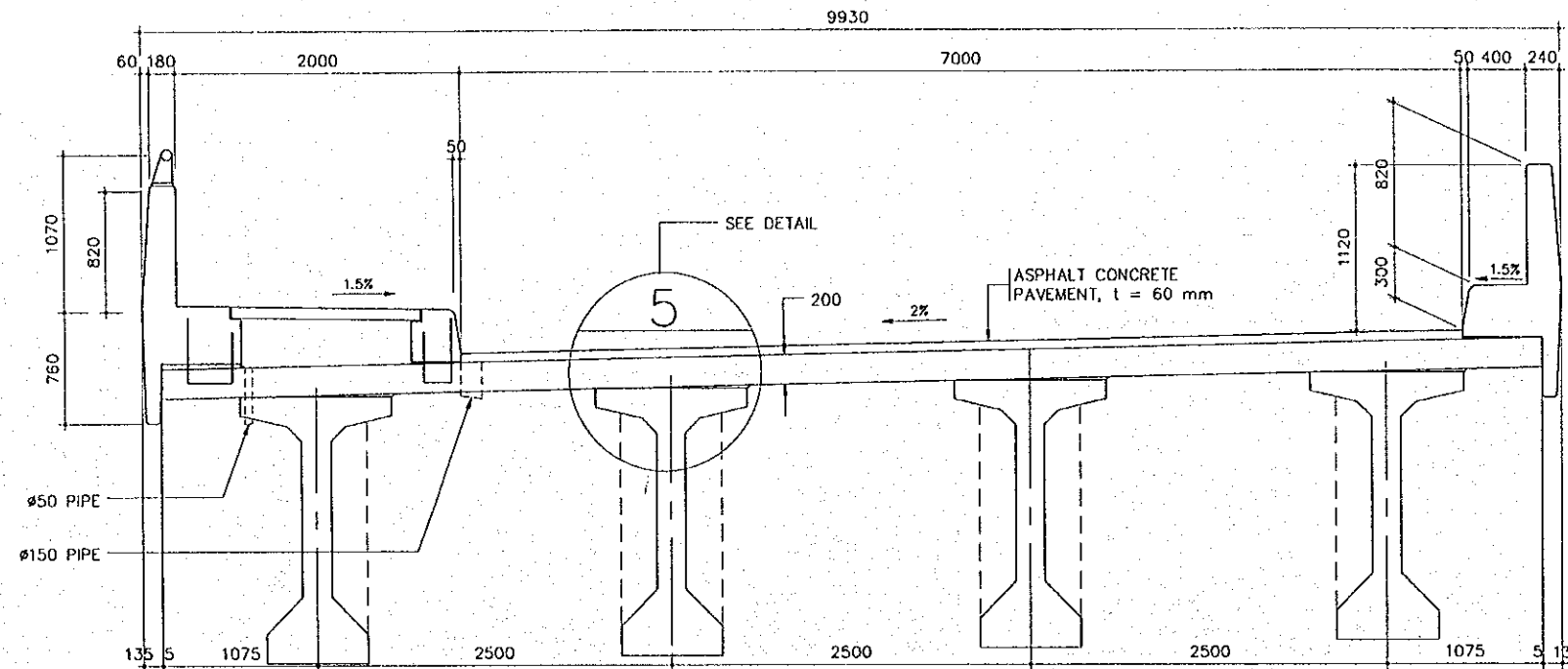


F SECTION 5-5
L-04 SCALE 1:20

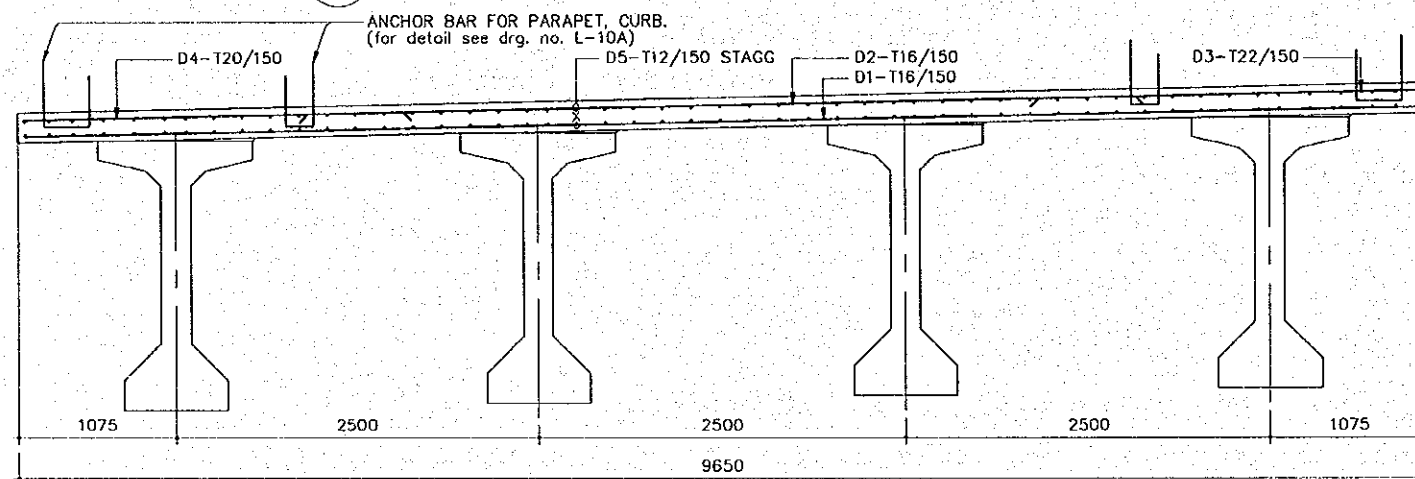
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT AND
RC DETAIL OF DECK

SCALE	SHEET NO.
AS SHOWN	L-06



1 BRIDGE DECK SECTION
L-06 SCALE 1:50



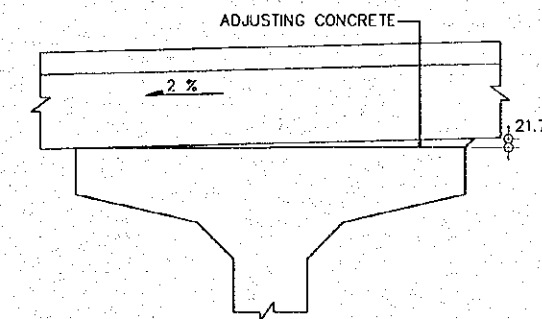
2 REINF. DETAILS OF DECK SLAB
L-06 SCALE 1:50

NOTES :

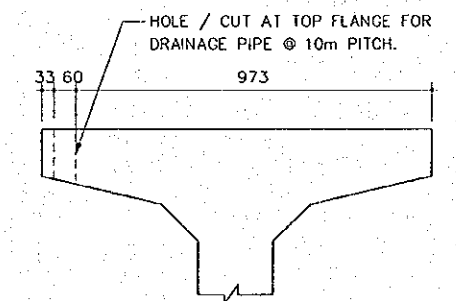
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
- REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
- NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
- MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) DECK SLAB: TOP = 50mm, BOTTOM = 40mm, SIDE = 40mm.
- MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
22 ϕ = 710mm, 20 ϕ = 630mm, 16 ϕ = 500mm, 12 ϕ = 380mm.
FOR 75 TO 100% SPLICE
22 ϕ = 930mm, 20 ϕ = 820mm, 16 ϕ = 660mm, 12 ϕ = 490mm.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASHTO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
- KEY TO REINFORCEMENT NOMENCLATURE:

ABBREVIATION: -
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERED LAP, ALT = ALTERNATE SPACING.

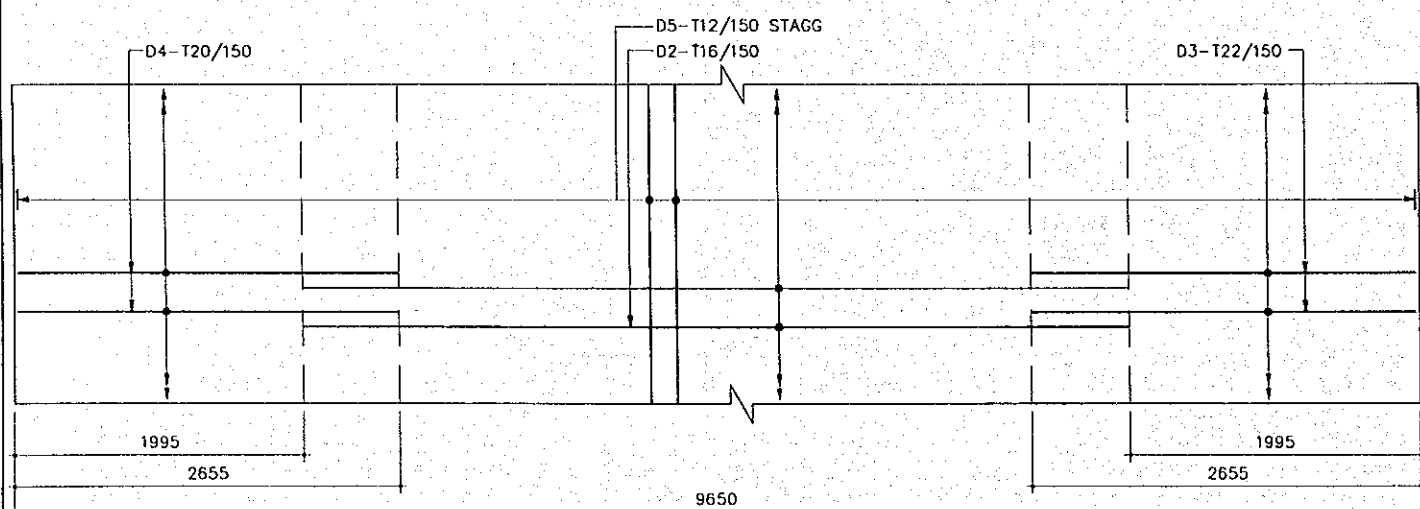
D	=	DECK SLAB
BAR MARK		
QUANTITY		
D5 - 5	-	T16/150 STAGG
		LOCATION/COMMENT
		SPACING
		BAR DIAMETER
		T=GRADE 60 BAR
		R=GRADE 40 BAR



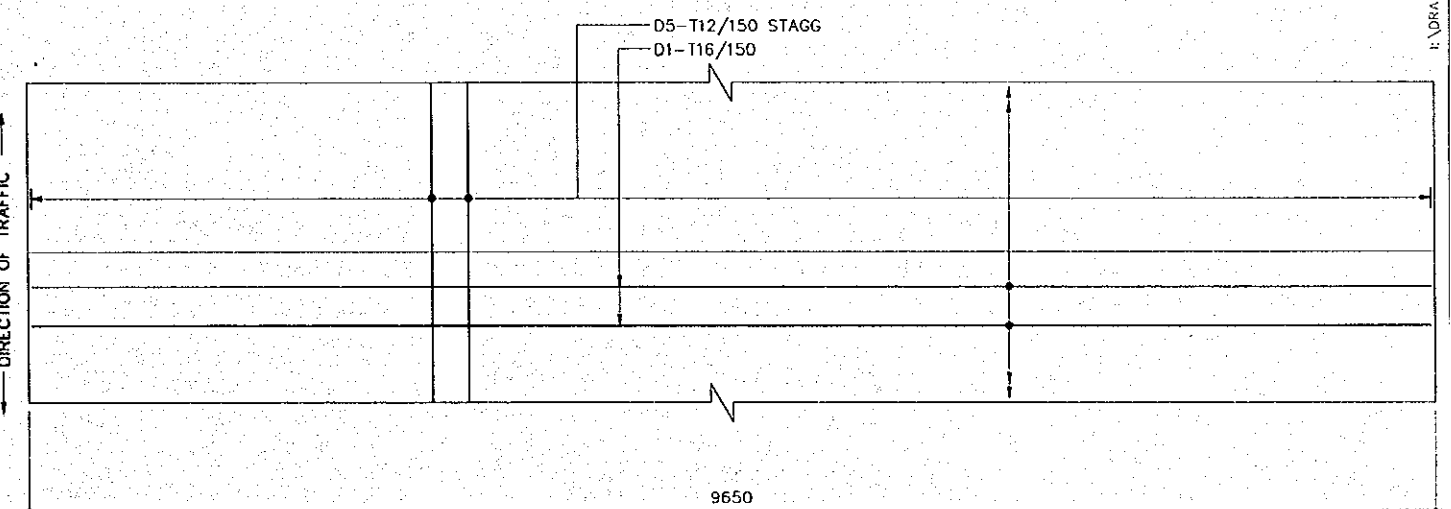
5 DETAIL '5'
L-06 SCALE 1:20



6 LOCATION OF HOLE AT TOP FLANGE FOR DRAINAGE PIPE
L-06 SCALE 1:20



3 PLAN OF TOP REINF. AT DECK SLAB
L-06 SCALE 1:50

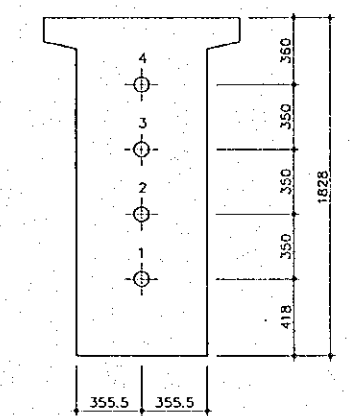
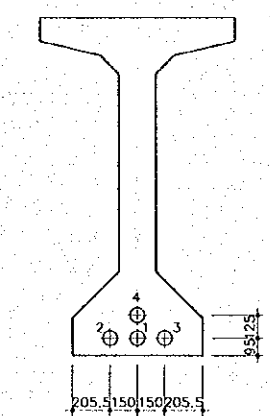
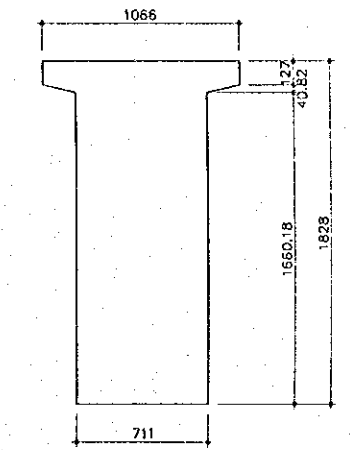
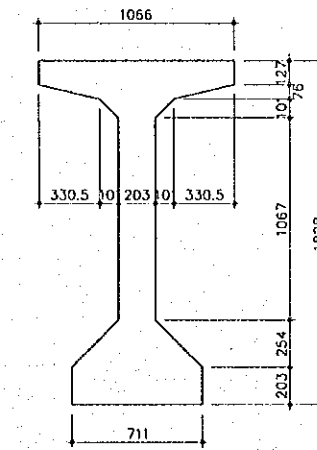
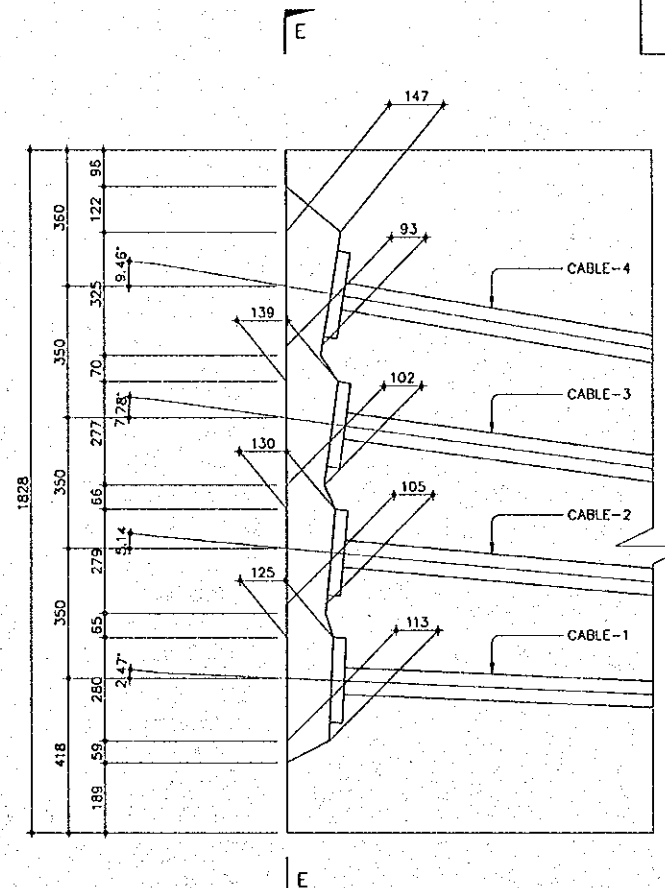
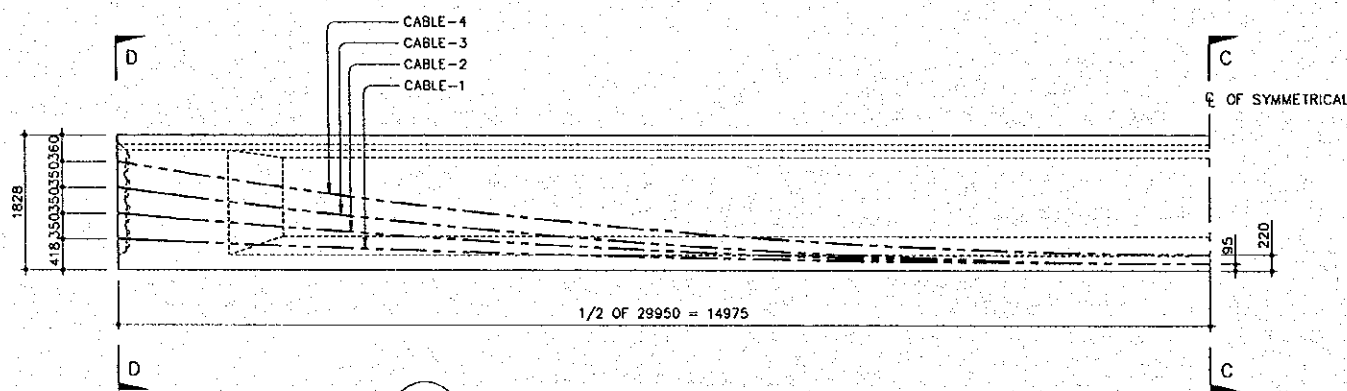
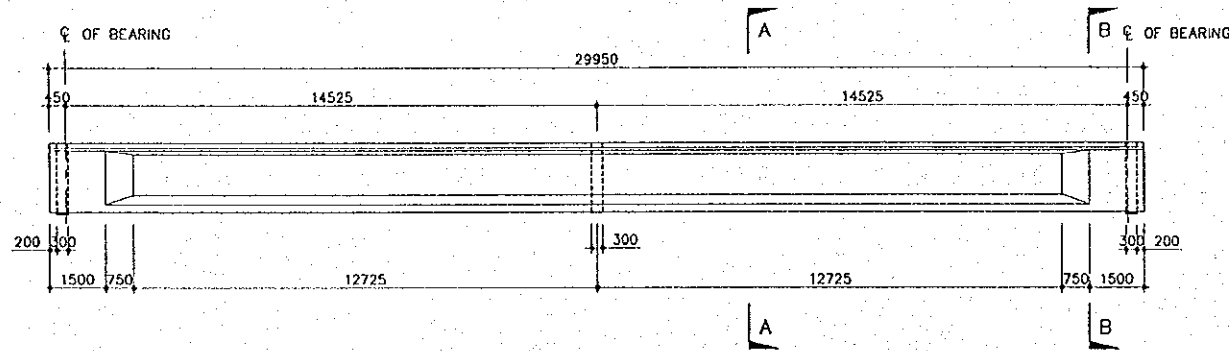


4 PLAN OF BOTTOM REINF. AT DECK SLAB
L-06 SCALE 1:50

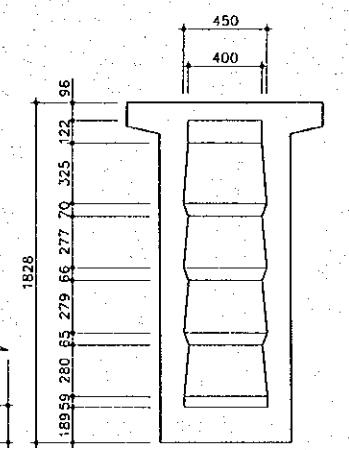
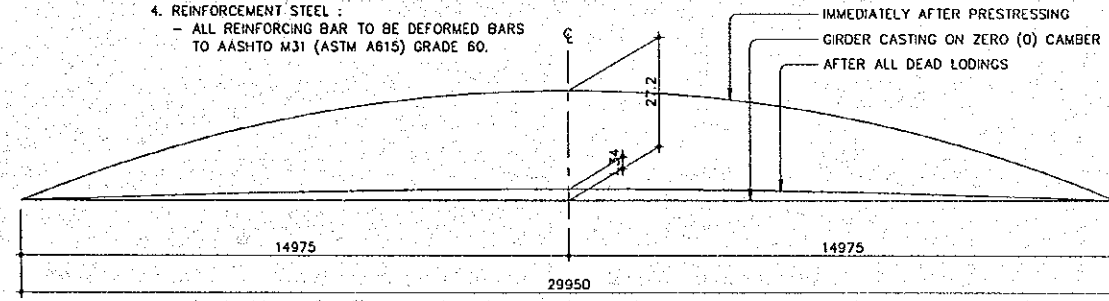
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

PRESTRESSED GIRDER DETAILS (1)

SCALE	SHEET NO.
AS SHOWN	L-07



- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
 - CONCRETE :
- MINIMUM CONCRETE COMPRESSIVE CYLINDER TEST FOR GIRDERS, 28 DAYS, $f_c = 35$ MPa.
TRANSFER OF PRESTRESS, $f_{ci} = 30$ MPa.
 - PRESTRESSING CABLE :
- USE UNCOATED SEVEN WIRE STRESS RELIEVED STRAND ASTM A416 GRADE 270, DIA. = 12.7mm.
- TENDON 1, 2 & 3 CONTAINS 12 STRANDS.
- TENDON 4 CONTAINS 8 STRANDS.
- MINIMUM DUCT INTERNAL DIAMETER = 55mm.
- ASSUMED JACK LOSS = 3 PERCENT.
- DESIGN JACKING STRESS WILL BE = 1377 MPa (after jack loss).
- AVERAGE DESIGN ELONGATION = 211mm, BASED ON
- ONE SIDE JACKING
- MODULUS OF ELASTICITY = 193053 MPa.
- WOBBLE CO-EFFICIENT = 0.00066
- CURVATURE CO-EFFICIENT = 0.25
 - REINFORCEMENT STEEL :
- ALL REINFORCING BAR TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.



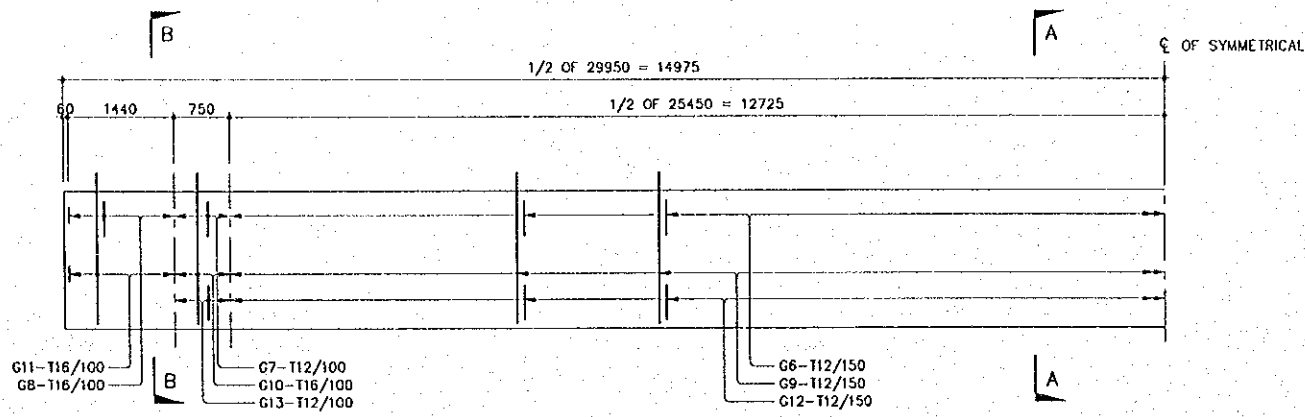
ELEVATION OF CABLE FROM SOFFIT OF GIRDER	CABLE NO.	DISTANCE FROM CENTER OF GIRDER															
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	14975
CABLE-1	95.0	96.4	100.8	108.0	118.0	131.0	146.9	165.6	187.2	211.7	239.0	269.3	302.4	338.4	377.3	418.0	
CABLE-2	95.0	98.0	107.0	122.0	143.0	170.0	203.0	242.1	287.1	338.1	395.1	458.1	527.2	602.2	683.2	768.0	
CABLE-3	95.0	99.6	113.2	136.1	168.0	209.0	259.2	318.5	387.0	464.5	551.2	647.0	751.9	866.0	989.1	1118.0	
CABLE-4	220.0	225.6	242.3	270.1	309.0	359.1	420.3	492.7	576.2	670.8	776.5	893.4	1021.4	1160.5	1310.8	1468.0	

10 CABLE ELEVATION
L-07 SCALE NTS

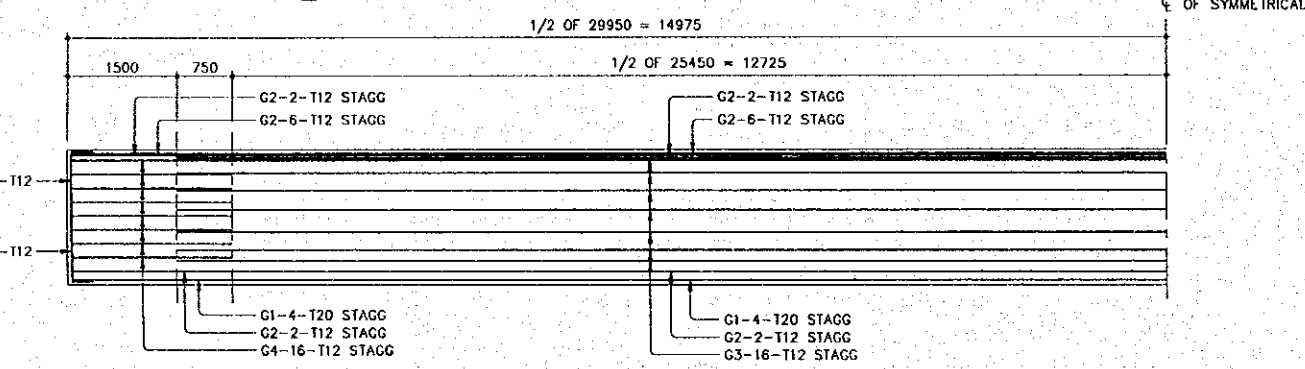
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

PRESTRESSED GIRDER DETAILS (2)

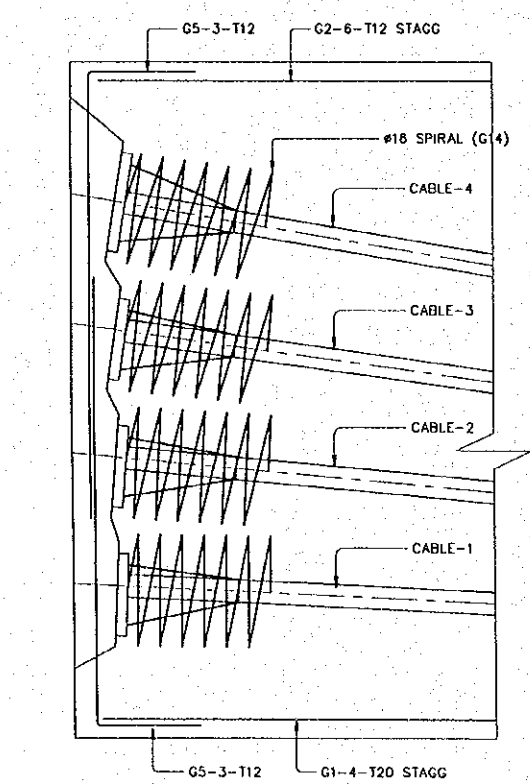
SCALE	SHEET NO.
AS SHOWN	L-08



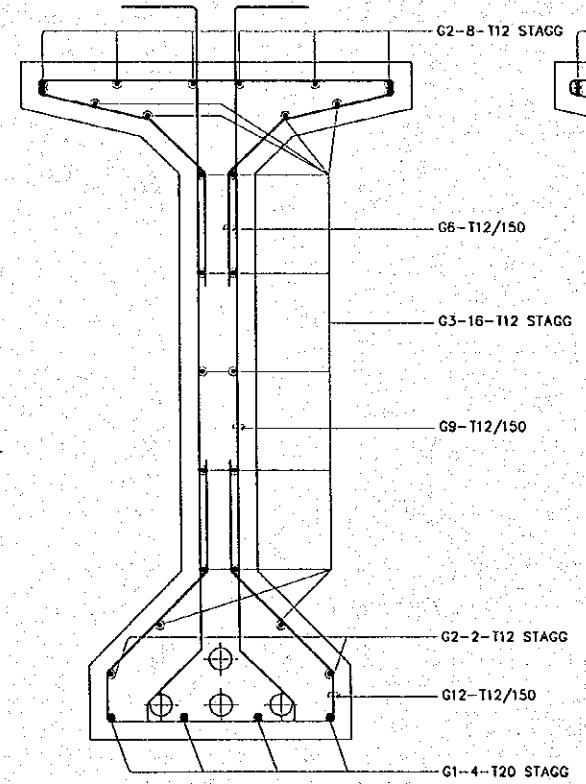
1 HALF ELEVATION OF GIRDER SHOWING VERTICAL NON-PRESTRESSED REINFORCEMENT
SCALE 1:50



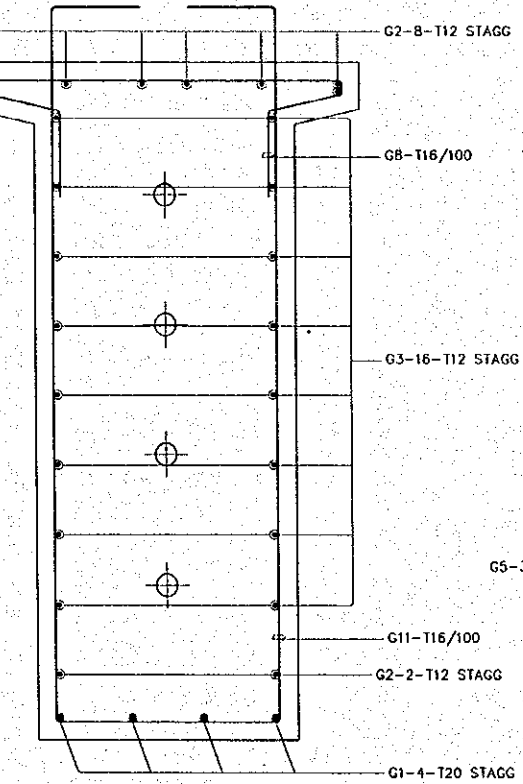
2 HALF ELEVATION OF GIRDER SHOWING HORIZONTAL NON-PRESTRESSED REINFORCEMENT
SCALE 1:50



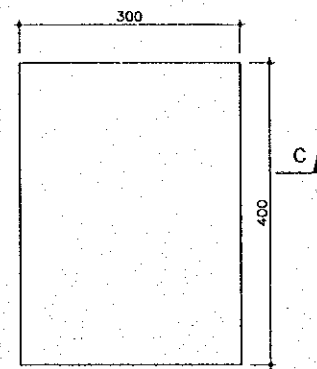
3 ELEVATION END BLOCK DETAIL
SCALE 1:10



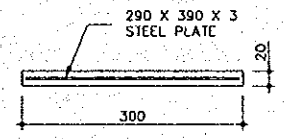
4 SECTION A-A
SCALE 1:10



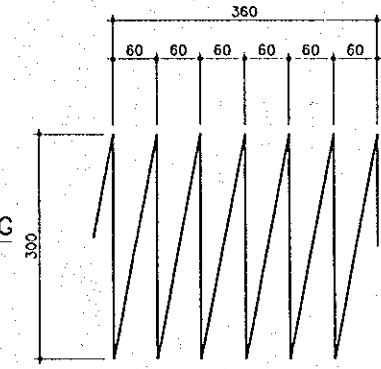
5 SECTION B-B
SCALE 1:10



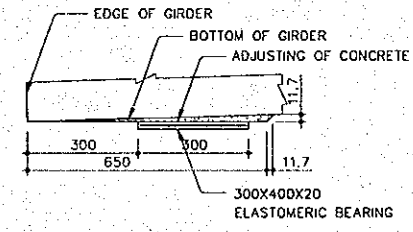
7 PLAN OF BEARING
SCALE 1:5



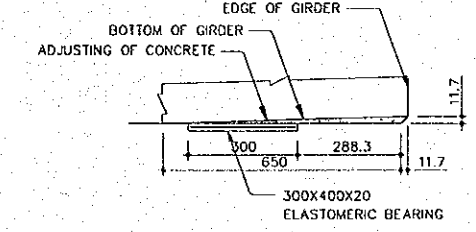
8 SECTION C-C
SCALE 1:5



9 #16 SPIRAL
SCALE 1:5



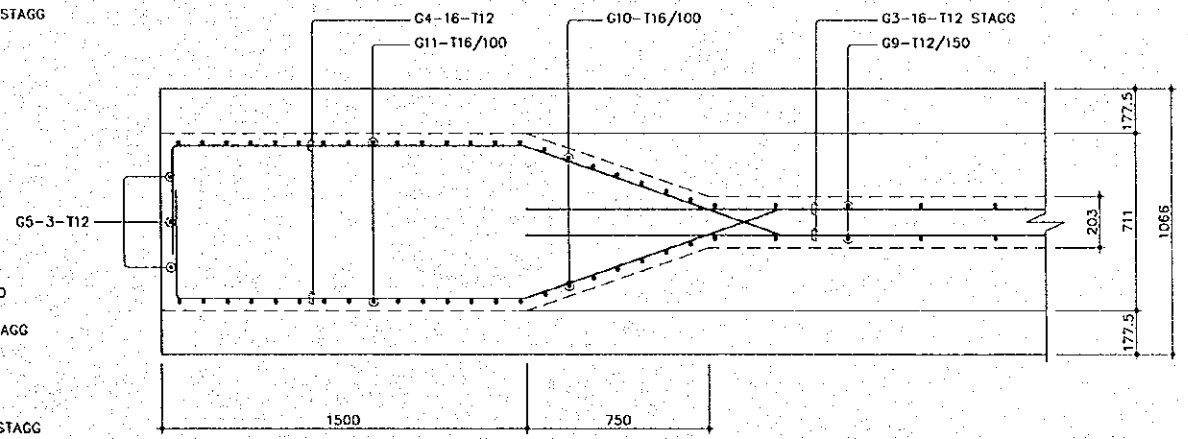
LOWER SIDE



UPPER SIDE

NOTE: FOR MIDDLE SPAN NO ADJUSTING CONCRETE NEEDED.

10 ADJUSTING CONCRETE & BEARING AT BOTTOM GIRDERS (END SPANS) NEAR SUPPORT
SCALE 1:10



6 TYPICAL REINF. DETAIL OF GIRDER AT TAPER
SCALE 1:15

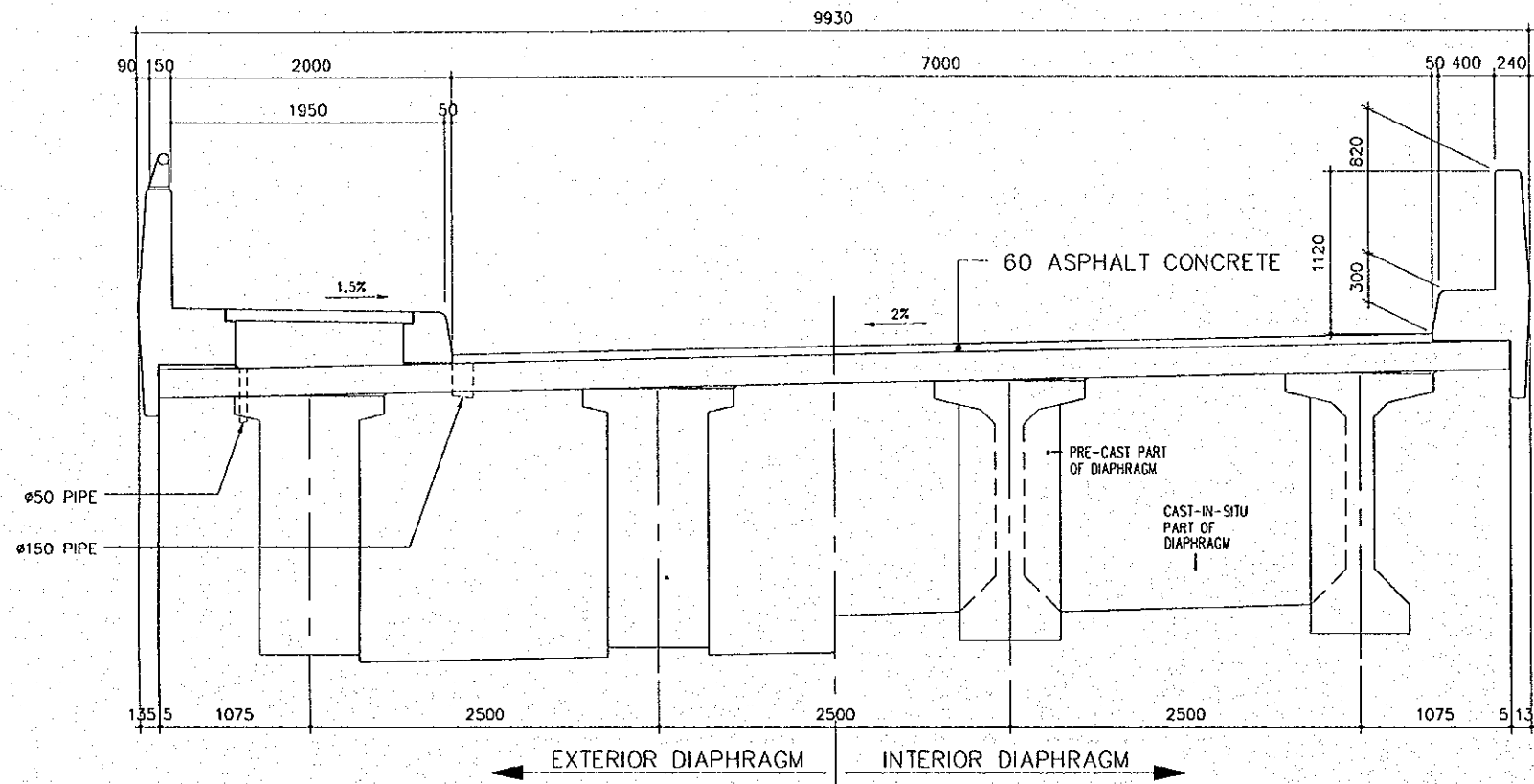
- NOTES :
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
 - NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
 - CONCRETE :
- MINIMUM CONCRETE COMPRESSIVE CYLINDER TEST FOR GIRDERS, 28 DAYS, $f_c = 35$ MPa.
TRANSFER OF PRESTRESS, $f_{ci} = 30$ MPa.
 - REINFORCING STEEL :
- ALL REINFORCING BAR TO BE DEFORMED BARS TO AASTHO M31 (ASTM A615) GRADE 60.
 - MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
 $20\phi = 630$ mm, $16\phi = 500$ mm, $12\phi = 380$ mm
FOR 75 TO 100% SPLICE
 $20\phi = 820$ mm, $16\phi = 660$ mm, $12\phi = 490$ mm
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASTHO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
 - MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) STIRRUP = 40mm
(b) PRIMARY BARS = 50mm
 - ELASTOMER TO BE USED IN BEARING SHALL BE OF SHORE HARDNESS OF 60 DUROMETER.
 - STEEL LAMINATES TO BE USED IN BEARING SHALL BE OF MADE OF MILD STEEL CONFORMING ASTM 136.
 - KEY TO REINFORCEMENT NOMENCLATURE:

KEY TO REINFORCEMENT NOMENCLATURE:
G=GIRDER
BAR MARK
QUANTITY
ABBREVIATION:--
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERED LAP; ALT = ALTERNATE SPACING.

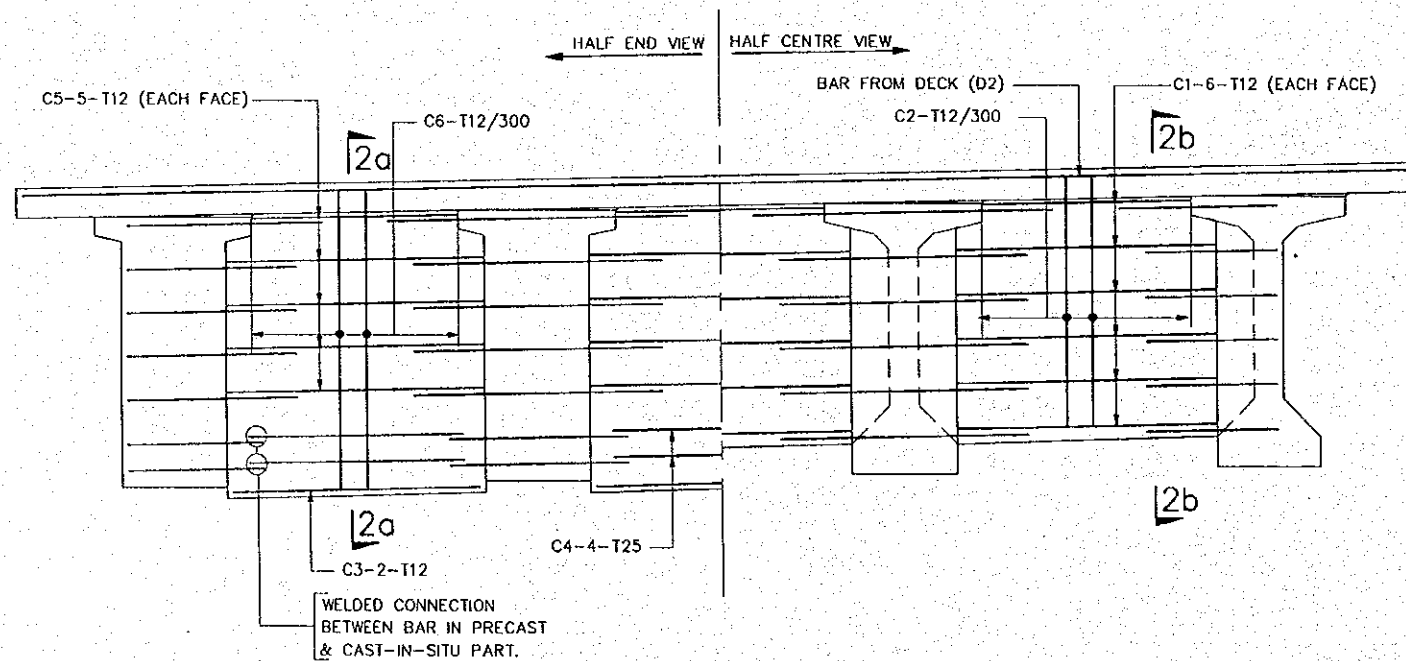
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT AND
RC DETAIL OF DIAPHRAGM

SCALE	SHEET NO.
AS SHOWN	L-09



1 DECK SECTION (AT DIAPHRAGM)
L-09 SCALE 1:25



2 ELEVATION REINF. DETAIL OF DIAPHRAGM EXCEPT DIAPHRAGM NEAR EXPANSION JOINT
L-09 SCALE 1:25

NOTES :

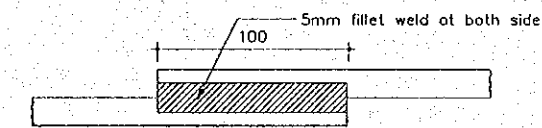
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
2. 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
3. REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
4. ULTIMATE STRENGTH OF WELDING MATERIAL SHALL BE 620 MPa.
5. NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
6. MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) STIRRUP = 40mm, b) PRIMARY BARS = 50mm.
7. MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
12φ = 380mm.
FOR 75 TO 100% SPLICE
12φ = 490mm.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASHTO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
8. KEY TO REINFORCEMENT NOMENCLATURE:

C = CROSS GIRDER (DIAPHRAGM)
BAR MARK
QUANTITY

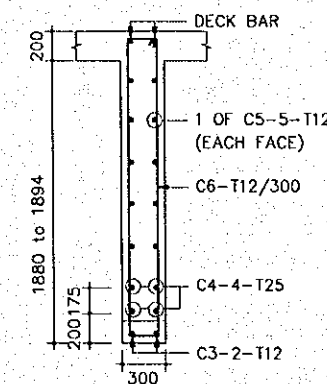
C6 - 6 - T12/300 STAGG
LOCATION/COMMENT
SPACING
BAR DIAMETER
T=GRADE 60 BAR
R=GRADE 40 BAR

ABBREVIATION:-

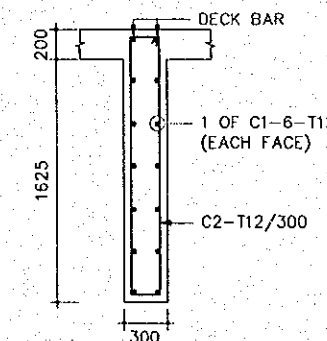
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERED LAP, ALT = ALTERNATE SPACING.



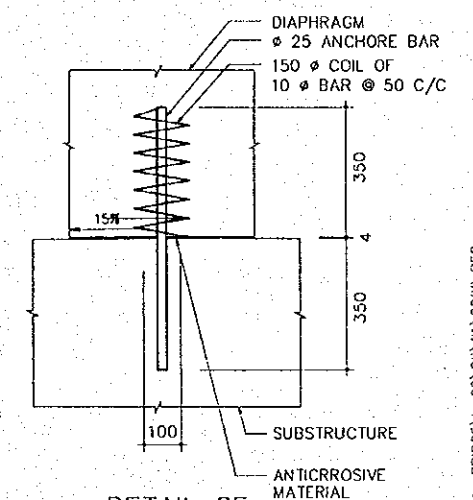
3 WELDED JOINT BETWEEN 25φ BAR
L-09 SCALE NTS



4 SECTION
L-09 SCALE 1:25



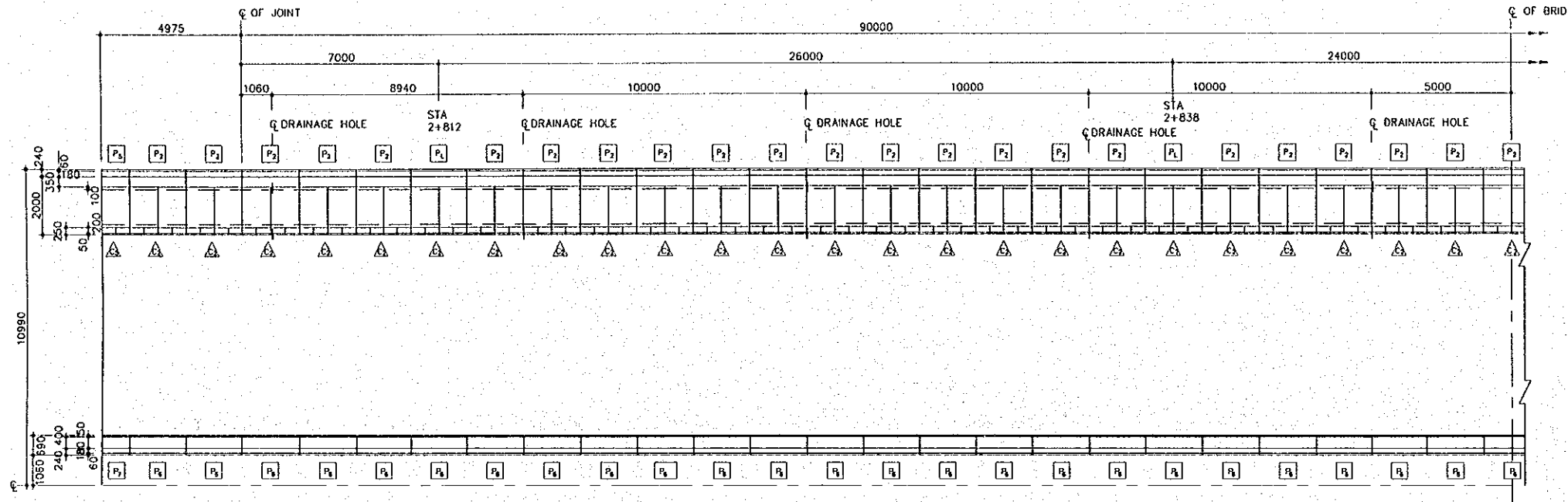
5 SECTION
L-09 SCALE 1:25



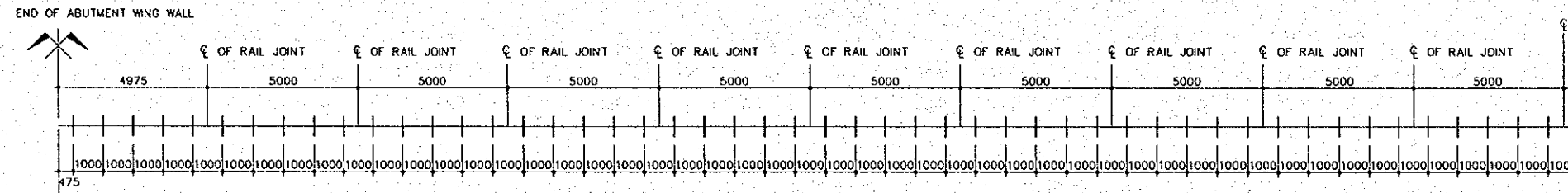
6 DETAIL OF ANCHOR BAR
L-09 SCALE 1:20

THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

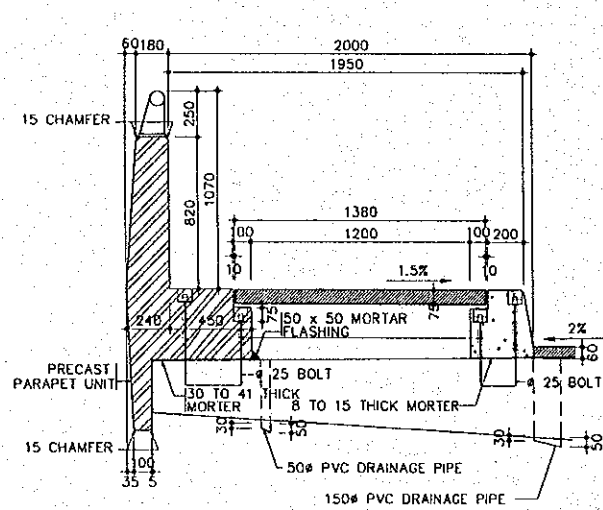
GENERAL ARRANGEMENT & RC DETAILS OF PARAPET & KERB UNIT (SHEET 1 OF 2)	SCALE AS SHOWN	SHEET NO. L-10
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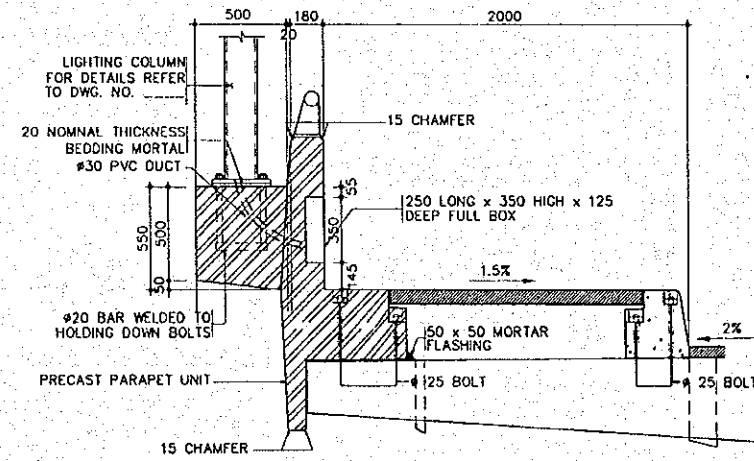
1 LAYOUT PLAN OF DECK FINISHING OF BRIDGE
L-10 SCALE 1:100



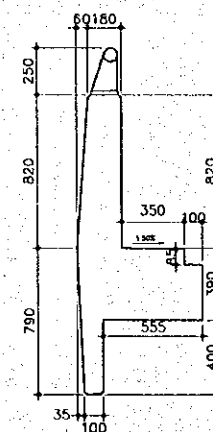
2 KEY PLAN SHOWING LOCATION OF RAILING POSTS AND JOINTS
L-10 SCALE 1:100



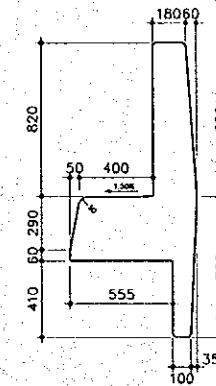
3 TYPICAL DETAILS OF PARAPET & SIDE WALK
L-10 SCALE 1:20



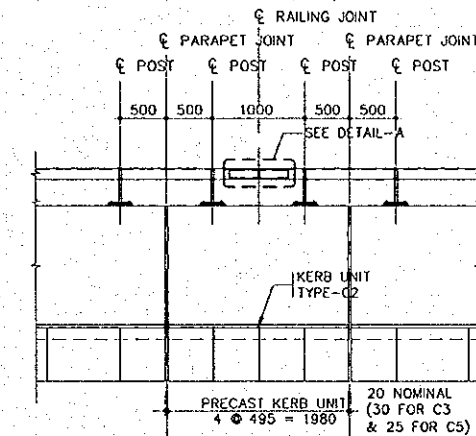
4 PARAPET DETAILS AT LIGHTING COLUMN SUPPORTWALK
L-10 SCALE 1:20



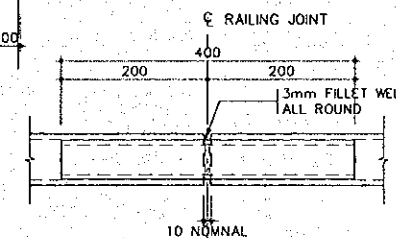
5 PARAPET P2 (TYPICAL) (P2 & P5)
L-10 SCALE 1:20



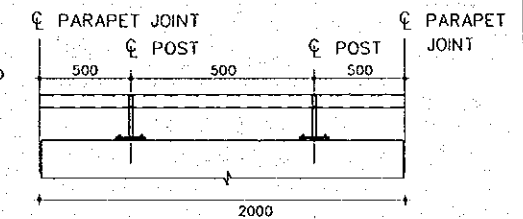
6 PARAPET (TYPICAL) (P6 & P7)
L-10 SCALE 1:20



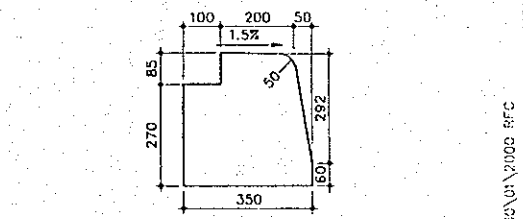
8 ELEVATION ON TYPICAL LENGTH OF PARAPET
L-10 SCALE 1:40



9 DETAIL-A
L-10 SCALE 1:05



10 ELEVATION ON PARAPET P5 (4 NOS)
L-10 SCALE 1:20



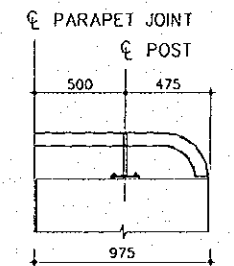
11 ELEVATION ON PARAPET P2 (98 NOS)
L-10 SCALE 1:20

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRG. NO. L-01.

LEGEND :

- P PARAPET WITHOUT LIGHTING COLUMN SUPPORT
- P_L PARAPET WITH LIGHTING COLUMN SUPPORT
- C KERB

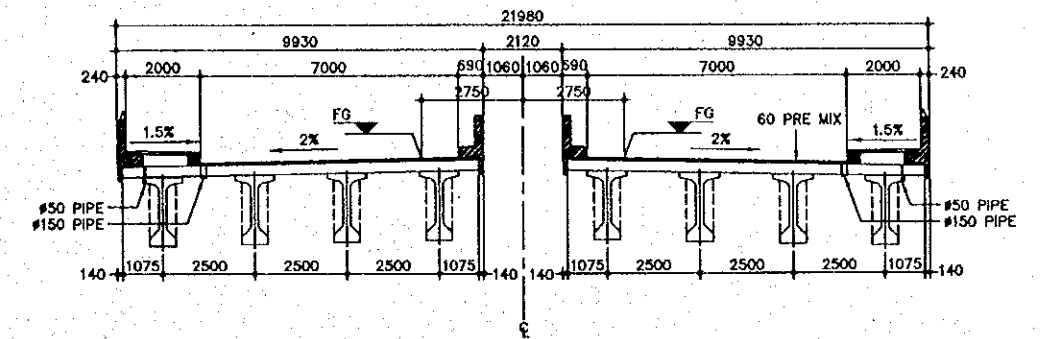
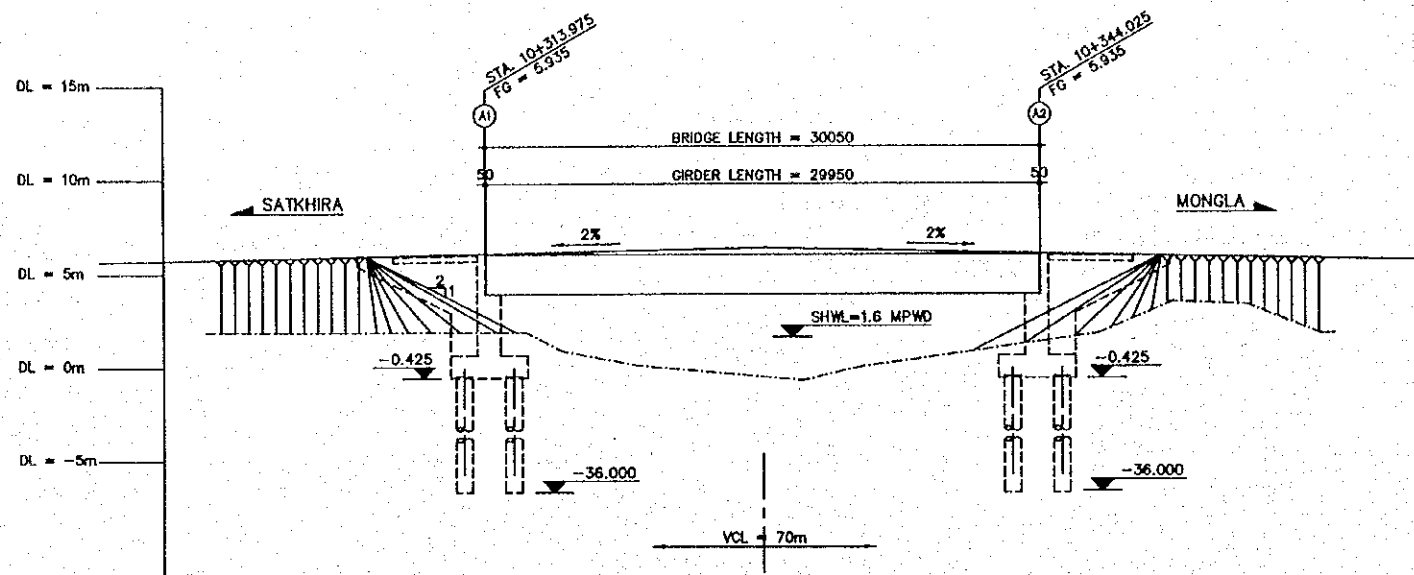


10 ELEVATION ON PARAPET P5 (4 NOS)
L-10 SCALE 1:20

THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT OF
MOLONGHATA BRIDGE

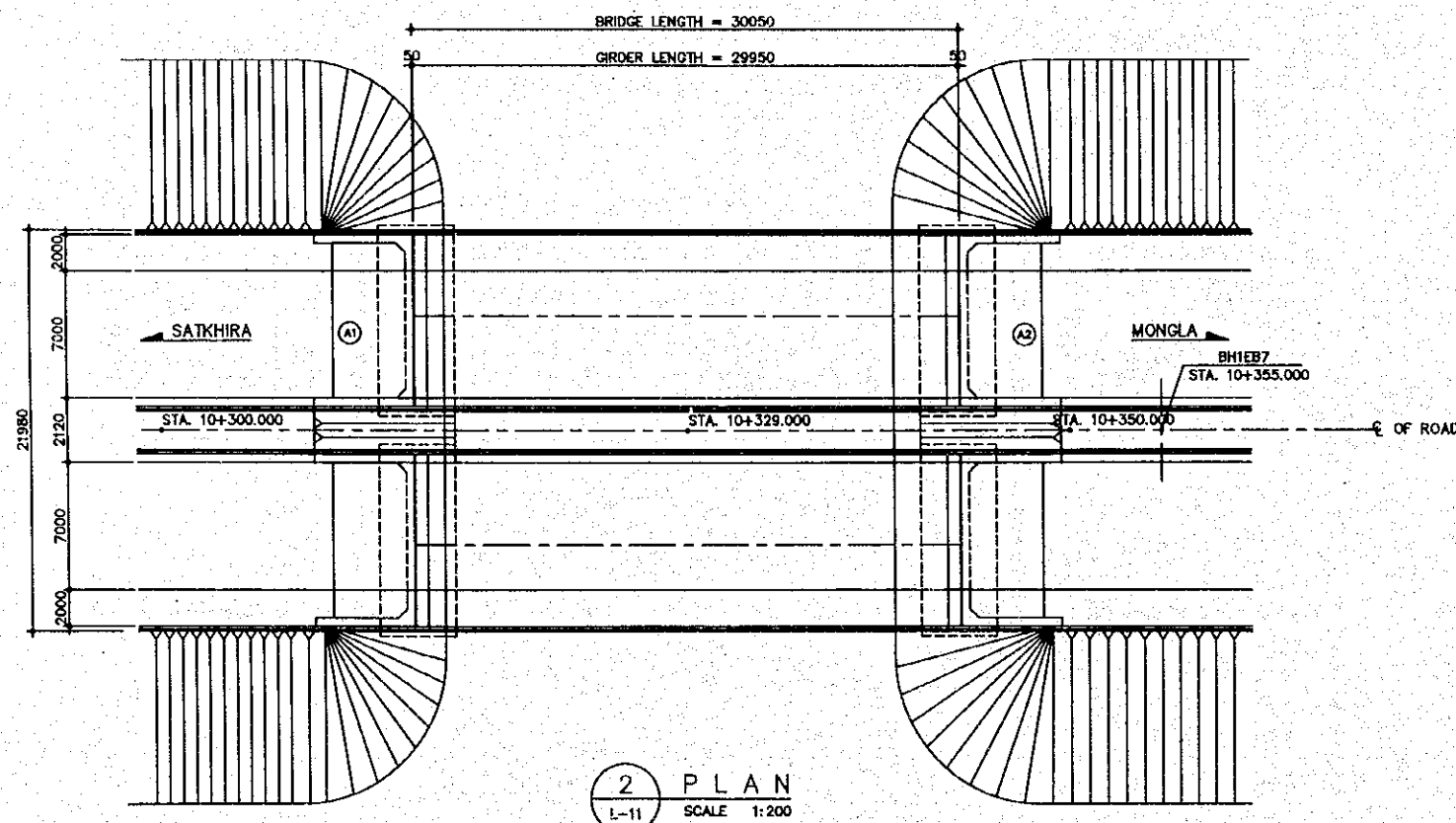
SCALE	SHEET NO.
AS SHOWN	L-11



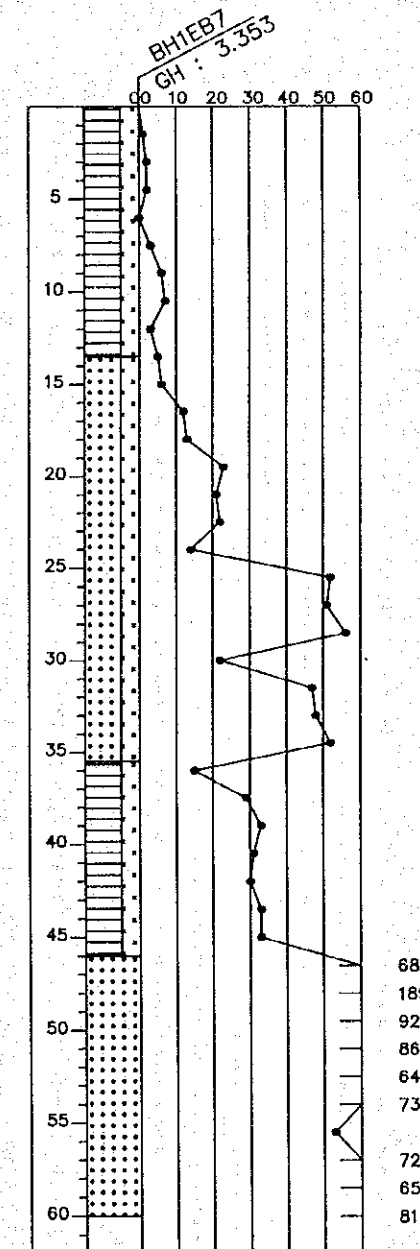
3 SUPER STRUCTURE SECTION
L-11 SCALE 1:100

LONGITUDINAL GRADE	PROPOSED HT.	GROUND HT.	DISTANCE	STATION
				10+313.975
	1.867 5.935	1.863 5.953		10+316.159
		0.583 9.566		10+318.159
		-0.088 5.987		10+322.159
		-0.509 6.000		10+329.000
		-0.987 5.999		10+331.159
		-0.003 5.992		10+334.159
		1.369 5.935		10+344.025
		1.803 5.908		10+347.159
		3.488 5.880		10+351.159
		3.333 5.804		10+355.159
		1.788 5.740		10+358.159

1 ELEVATION
L-11 SCALE 1:200



2 PLAN
L-11 SCALE 1:200



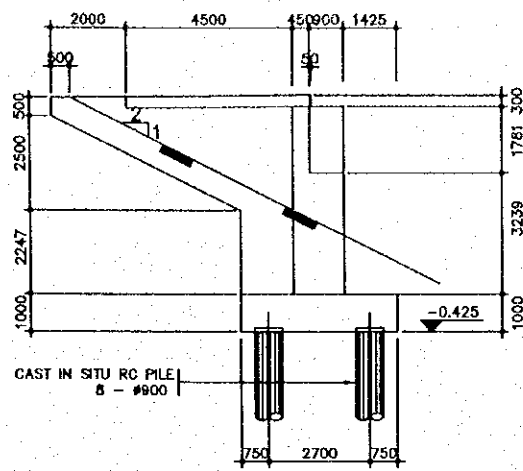
68
189
92
86
64
73
72
65
81

THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

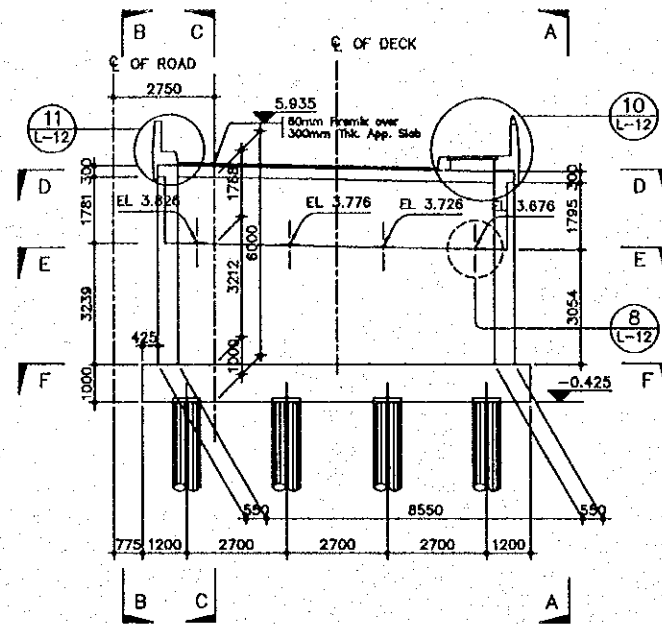
GENERAL ARRANGEMENT & RC DETAIL OF ABUTMENT AND APPROACH SLAB	SCALE	SHEET NO.
	AS SHOWN	L-12

NOTES :

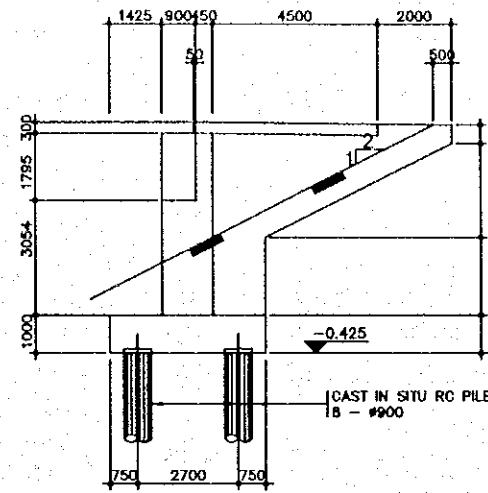
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
2. 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
3. REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
4. MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) PILE CAP, BOTTOM = 150mm, TOP AND SIDE = 65mm,
(b) VERTICAL MEMBER = 65mm, APPROACH SLAB = 65mm.
5. MINIMUM BEARING CAPACITY OF PILE : 1000 kN.



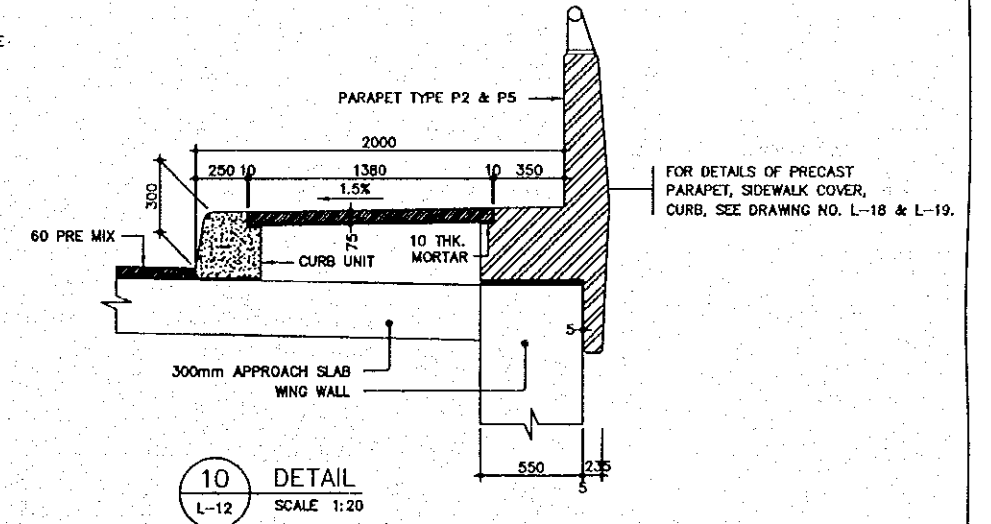
3 ELEVATION B-B
SCALE 1:100



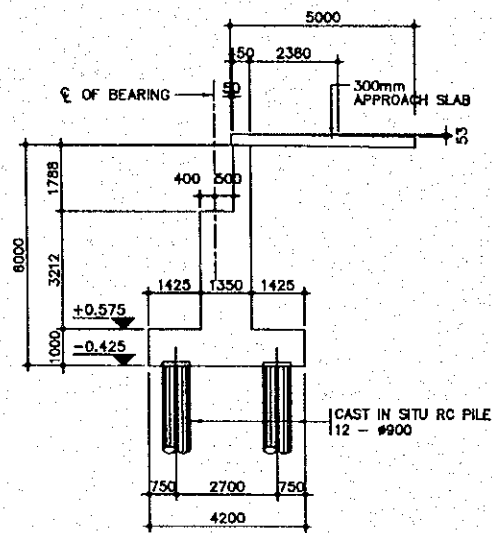
1 LONGITUDINAL ELEVATION
SCALE 1:100



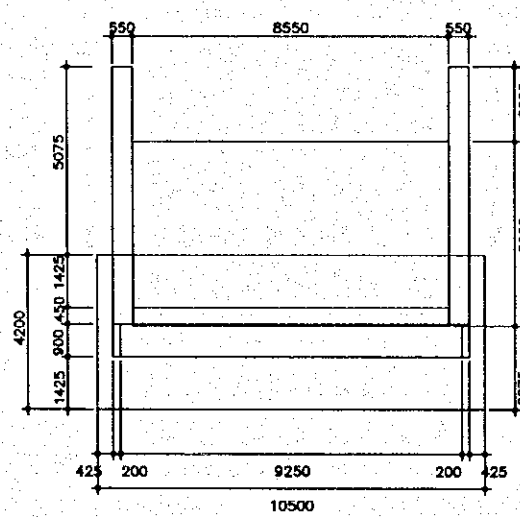
2 ELEVATION A-A
SCALE 1:100



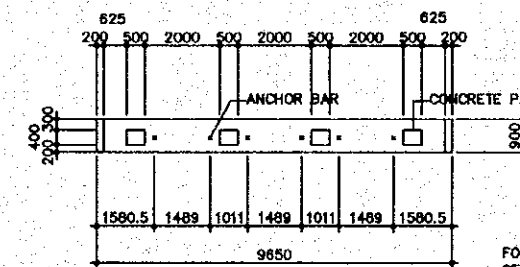
10 DETAIL
SCALE 1:20



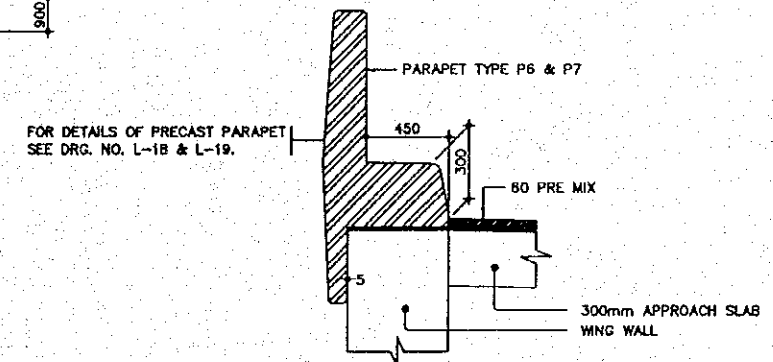
4 SECTION C-C
SCALE 1:100



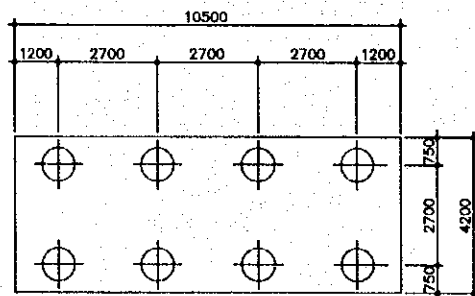
5 SECTION D-D
SCALE 1:100



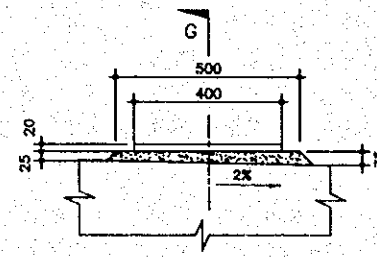
6 SECTION E-E
SCALE 1:100



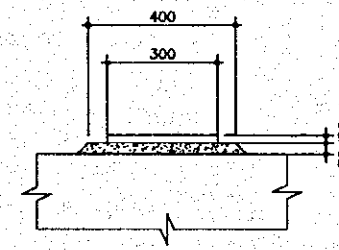
11 DETAIL
SCALE 1:20



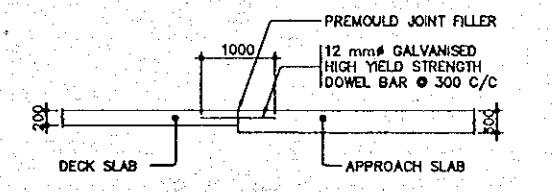
7 SECTION F-F
SCALE 1:100



8 DETAIL
SCALE 1:10



9 SECTION G-G
SCALE 1:10



12 JOINT DETAILS BETWEEN DECK AND APPROACH SLAB
SCALE 1:50

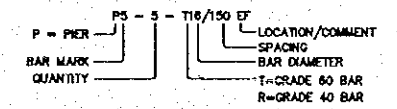
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

REINFORCEMENT DETAILS
OF ABUTMENT

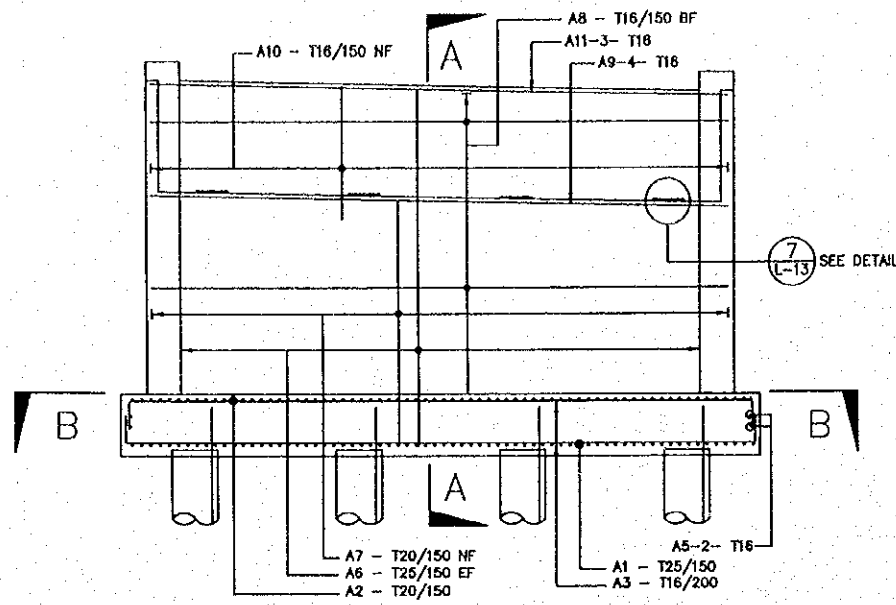
SCALE	SHEET NO.
AS SHOWN	L-13

NOTES :

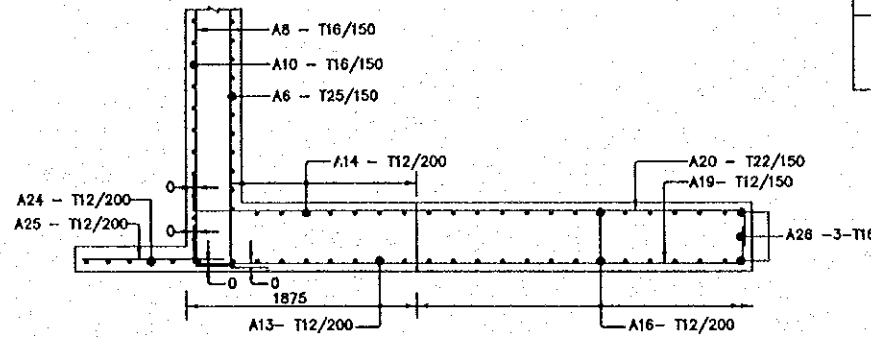
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
- REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
- NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
- MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) PILE CAP, BOTTOM = 150mm, TOP AND SIDE = 65mm,
(b) VERTICAL MEMBER, COLUMN = 65mm.
(c) PILE : STIRRUP = 90, PRIMARY BAR = 100.
- MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
32# = 1500mm, 28# = 1150mm, 25# = 925mm,
22# = 710mm, 20# = 630mm, 18# = 500mm, 12# = 380mm.
FOR 75 TO 100% SPLICE
32# = 1950mm, 28# = 1500mm, 25# = 1200mm,
22# = 930mm, 20# = 820mm, 18# = 660mm, 12# = 490mm.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN
ACCORDANCE WITH AASHTO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
- KEY TO REINFORCEMENT HOMEOGLATURE:



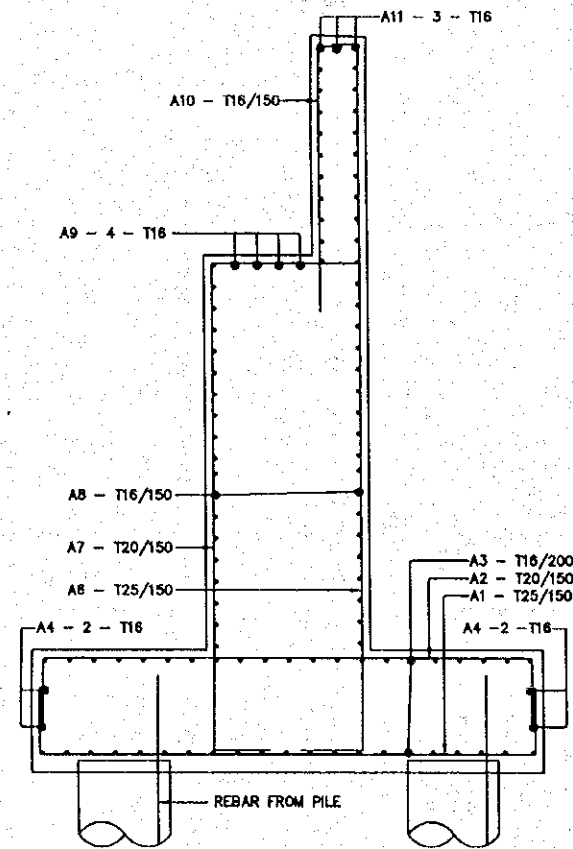
ABBREVIATION:-
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERED LAP; ALT = ALTERNATE SPACING.



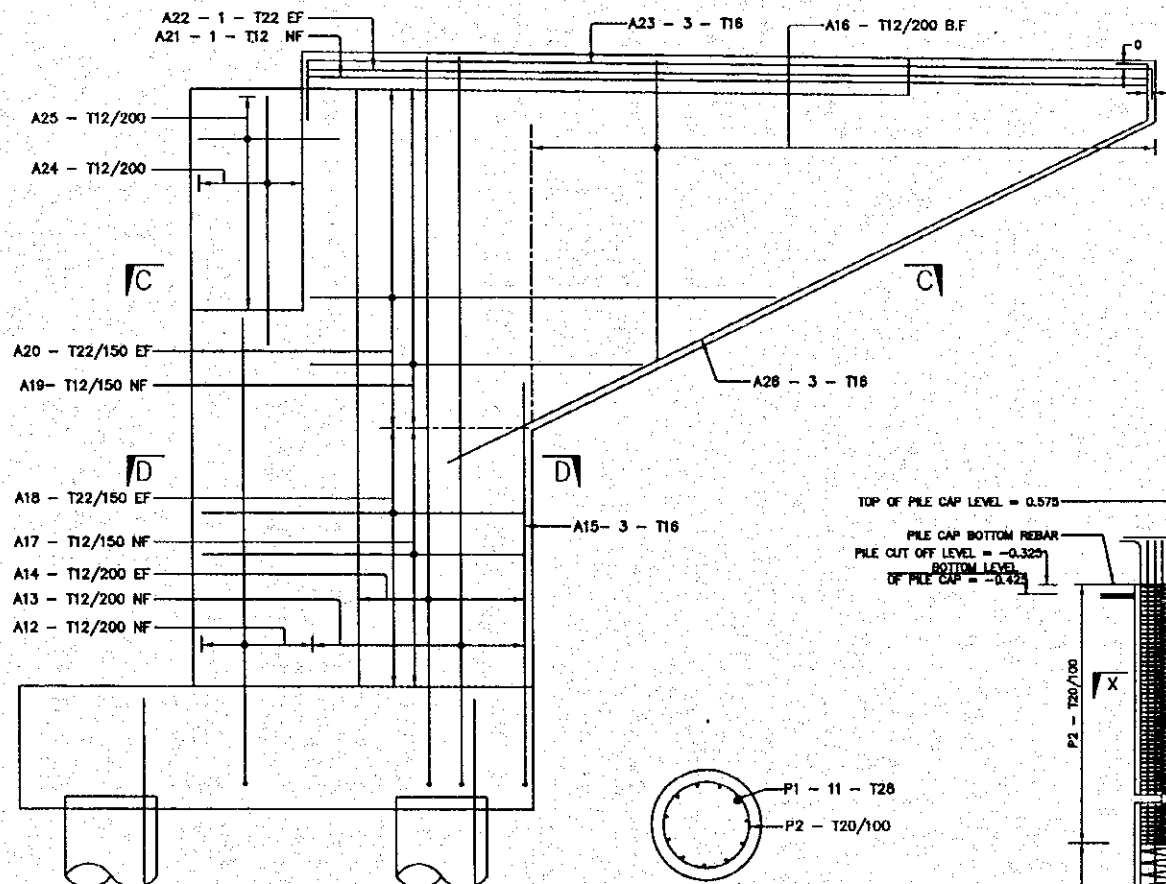
1 REINF. DETAIL OF ABUTMENT
L-13 SCALE 1:60



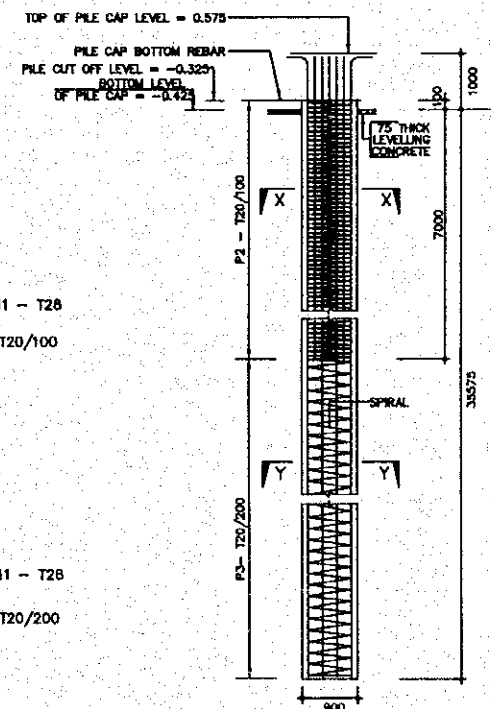
4 SEC. C-C
L-13 SCALE 1:30



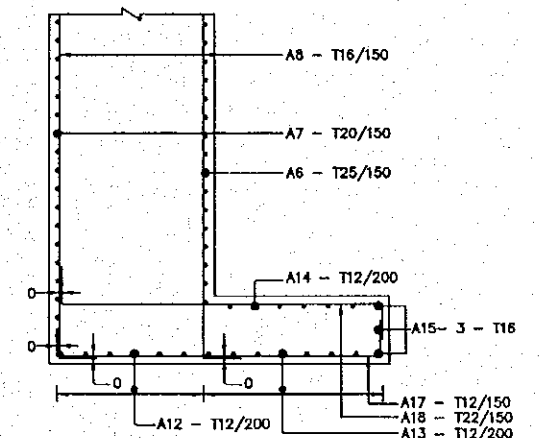
2 SECTION A-A
L-13 SCALE 1:30



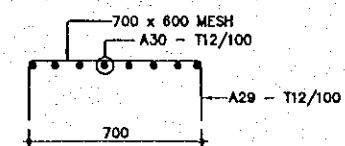
3 REINF. DETAIL OF WING WALL
L-13 SCALE 1:30



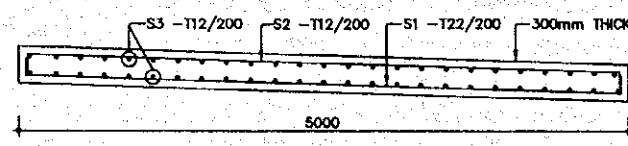
5 ABUTMENT PILE REINF. DETAILS
L-13 SCALE 1:60



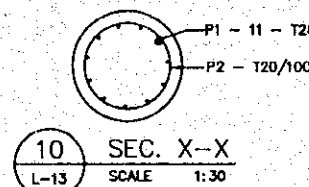
6 SEC. D-D
L-13 SCALE 1:30



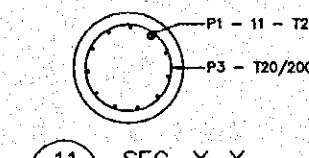
7 DETAIL
L-13 SCALE 1:15



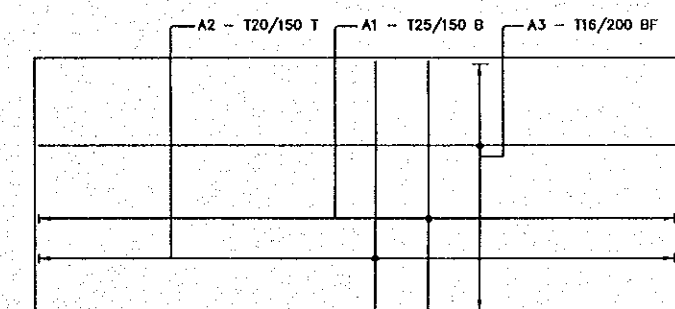
8 SECTIONAL REINFORCEMENT
DETAILS OF APPROACH SLAB
L-13 SCALE 1:30



10 SEC. X-X
L-13 SCALE 1:30



11 SEC. Y-Y
L-13 SCALE 1:30



9 SECTION B-B
L-13 SCALE 1:60

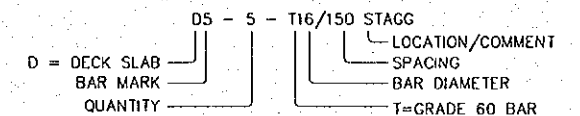
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT AND
RC DETAIL OF DECK

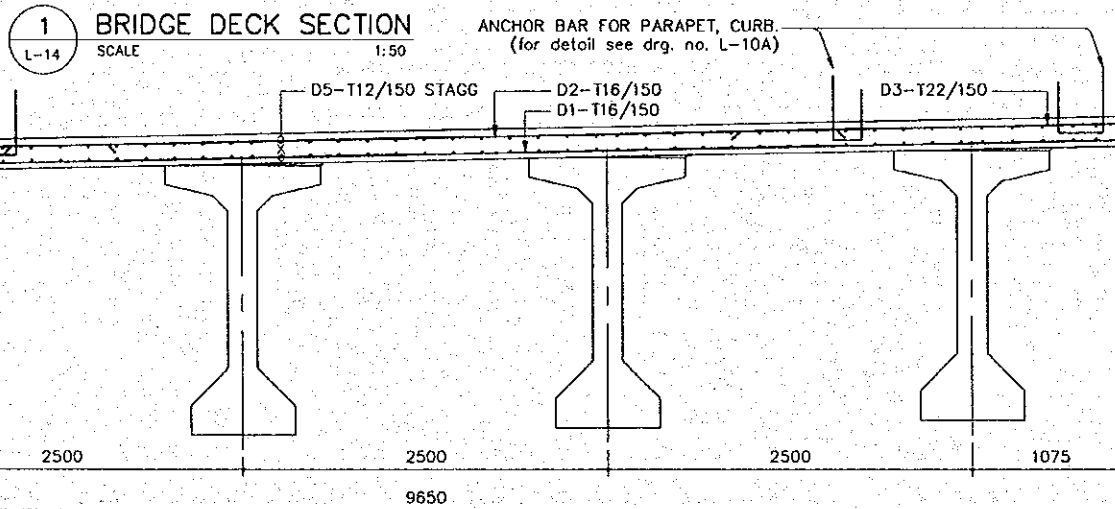
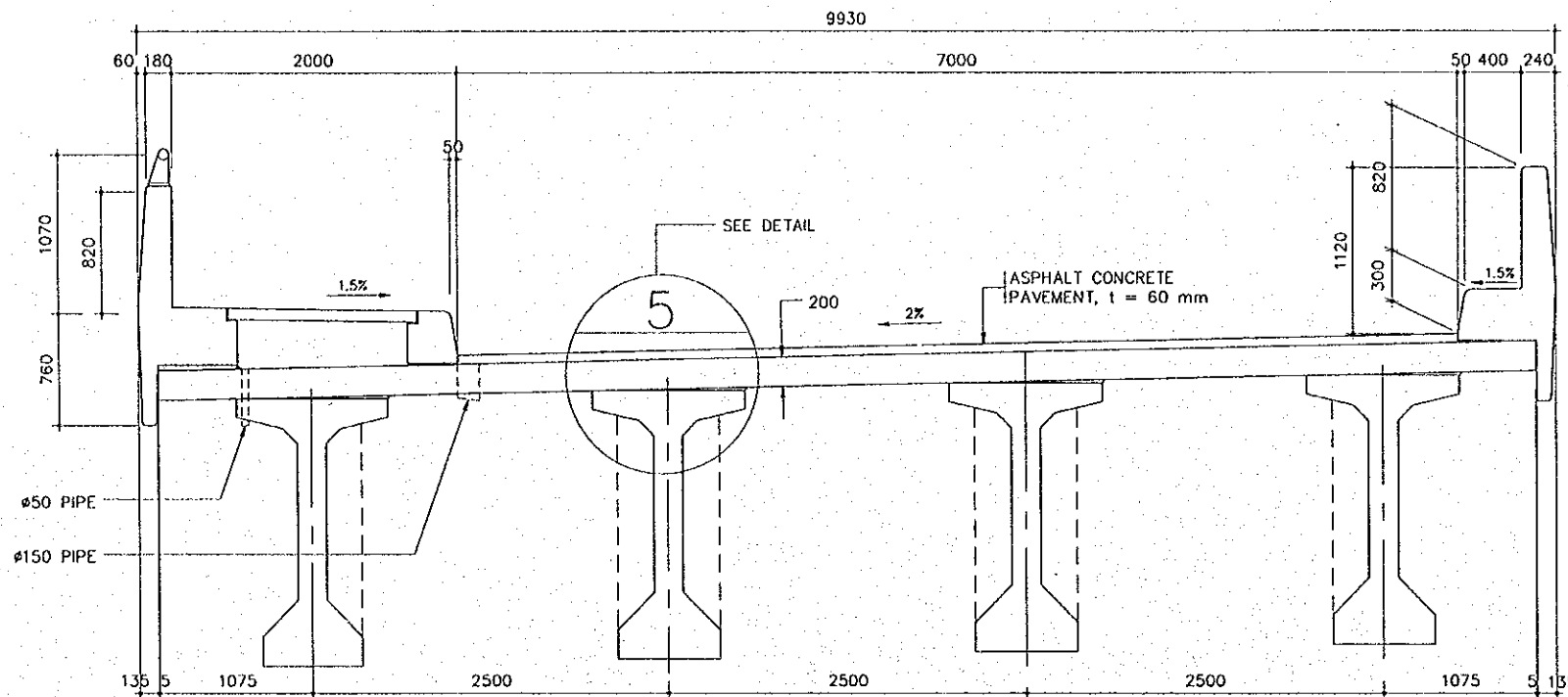
SCALE	SHEET NO.
AS SHOWN	L-14

NOTES :

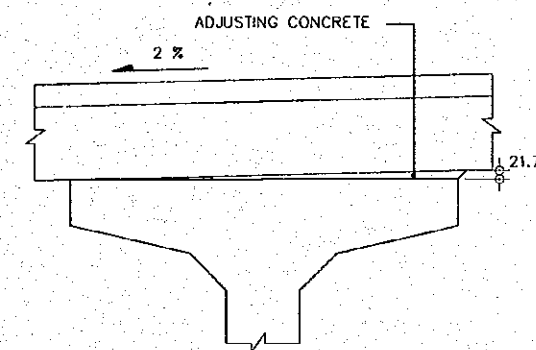
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
2. 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
3. REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
5. NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
6. MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) DECK SLAB: TOP = 50mm, BOTTOM = 40mm, SIDE = 40mm.
7. MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
22 ϕ = 710mm, 20 ϕ = 630mm, 16 ϕ = 500mm, 12 ϕ = 380mm.
FOR 75 TO 100% SPLICE
22 ϕ = 930mm, 20 ϕ = 820mm, 16 ϕ = 660mm, 12 ϕ = 490mm.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASHTO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
8. KEY TO REINFORCEMENT NOMENCLATURE:



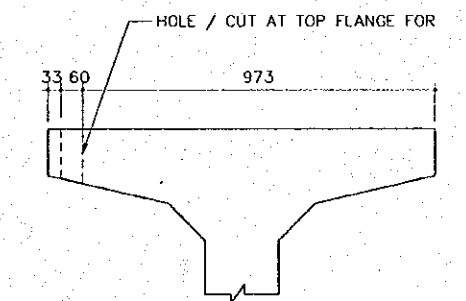
ABBREVIATION:-
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERD LAP, ALT = ALTERNATE SPACING.



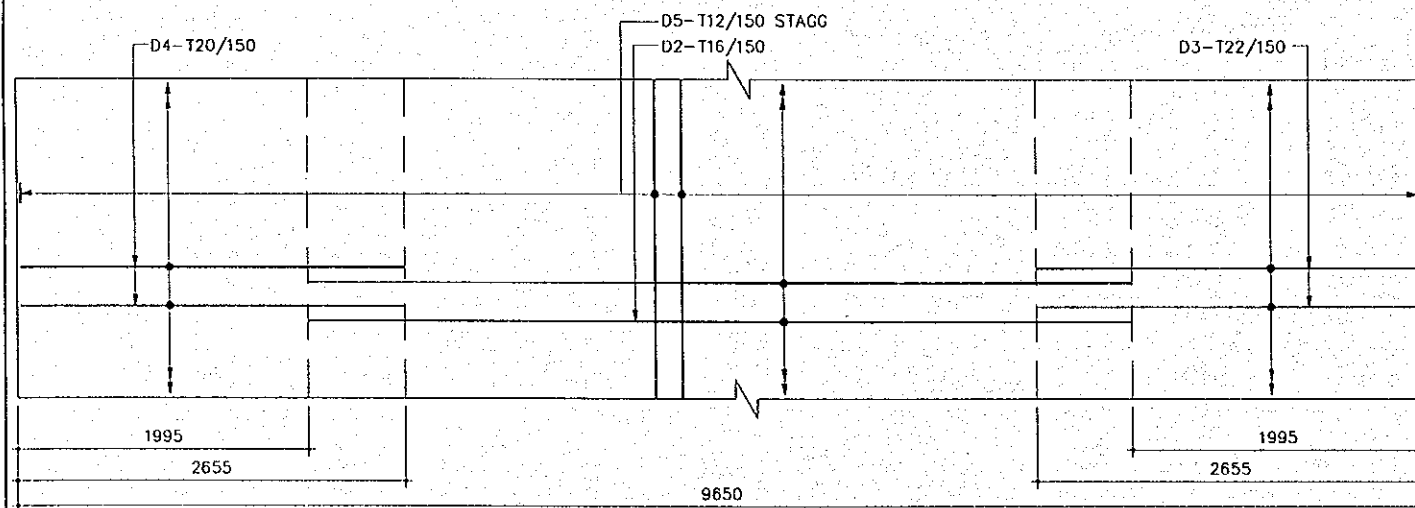
2 REINF. DETAILS OF DECK SLAB
SCALE 1:50



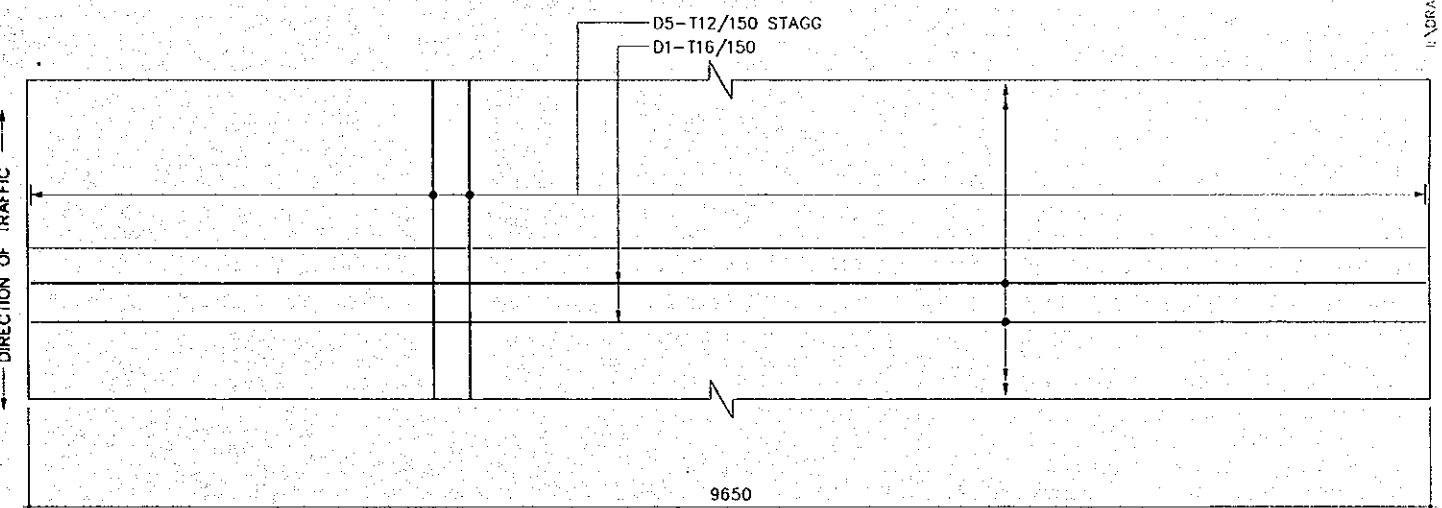
5 DETAIL '5'
SCALE 1:20



6 LOCATION OF HOLE AT TOP FLANGE FOR DRAINAGE PIPE
SCALE 1:20



3 PLAN OF TOP REINF. AT DECK SLAB
SCALE 1:50



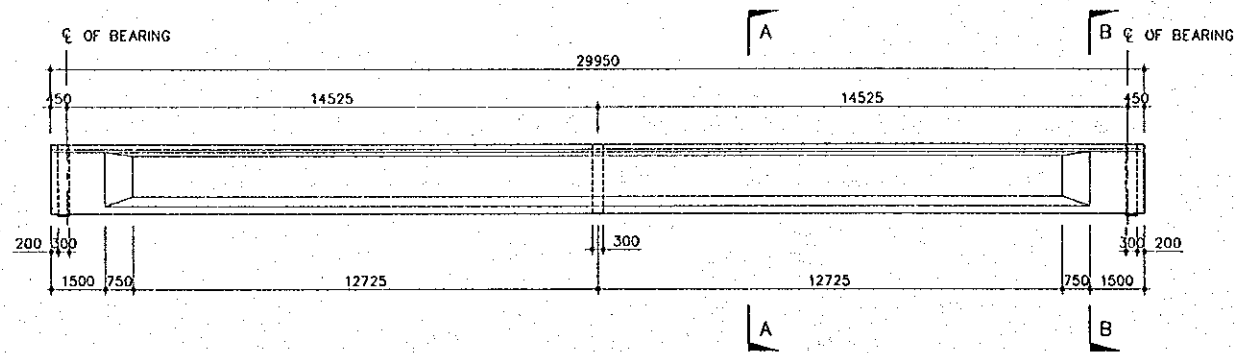
4 PLAN OF BOTTOM REINF. AT DECK SLAB
SCALE 1:50

I:\DRAWINGS\CANAL BRIDGE\14\2000\2000.RFC

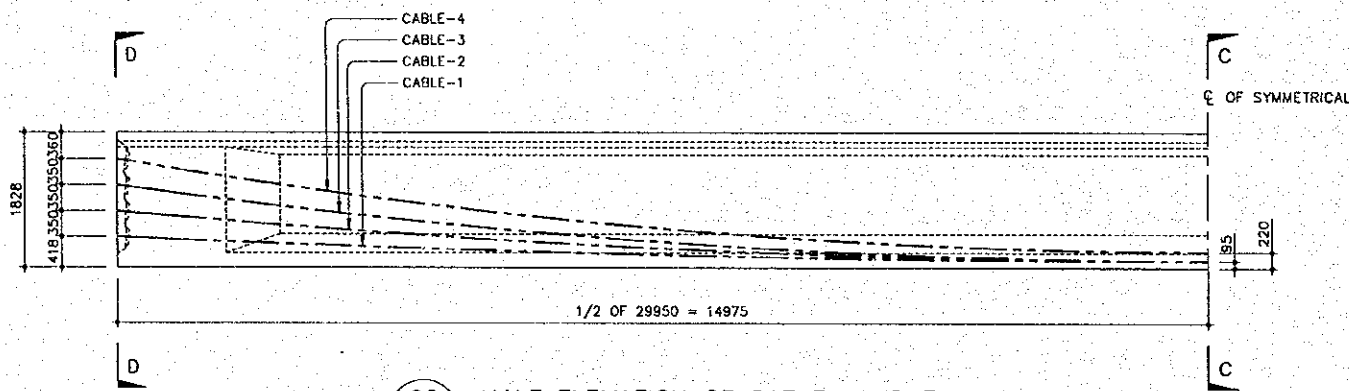
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

PRESTRESSED GIRDER DETAILS (1)

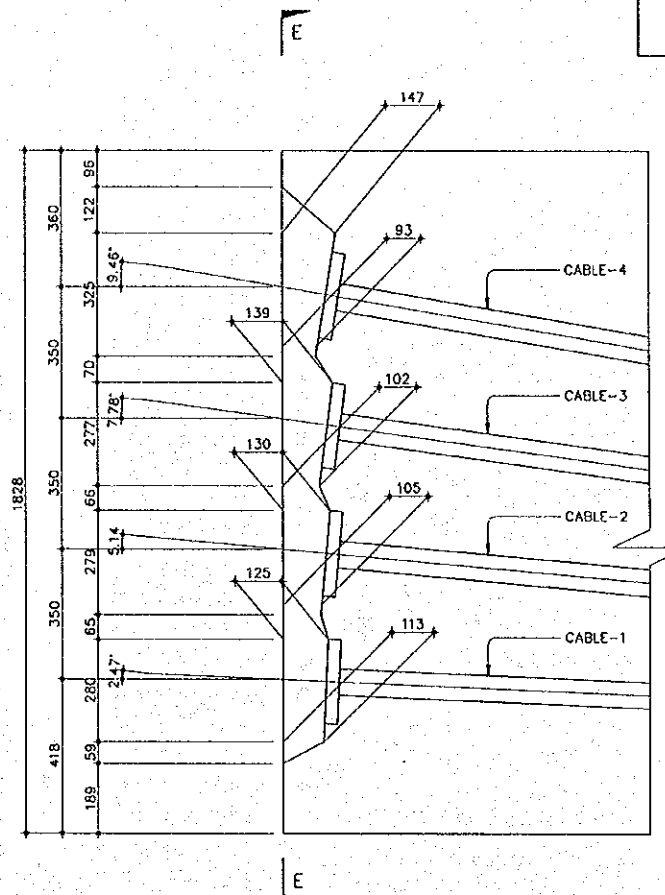
SCALE AS SHOWN SHEET NO. L-15



01 GENERAL ELEVATION OF ALL GIRDER EXCEPT (2)
L-15 SCALE 1:100



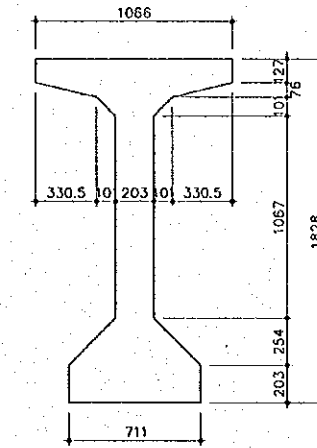
02 HALF ELEVATION OF CABLE LAYOUT
L-15 SCALE 1:50



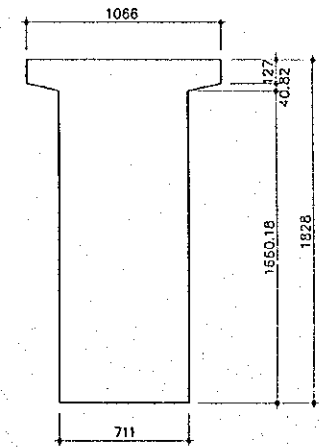
03 END RECESSES DIMENSIONS
L-15 SCALE 1:10

NOTES :

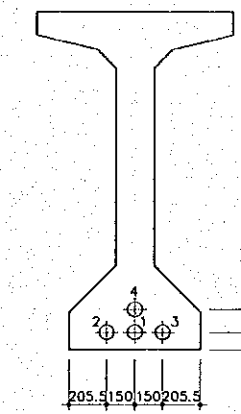
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- CONCRETE :
- MINIMUM CONCRETE COMPRESSIVE CYLINDER TEST FOR GIRDERS, 28 DAYS, $f_c = 35$ MPa.
TRANSFER OF PRESTRESS, $f_{ci} = 30$ MPa.
- PRESTRESSING CABLE :
- USE UNCOATED SEVEN WIRE STRESS RELIEVED STRAND ASTM A416 GRADE 270, DIA. = 12.7mm.
- TENDON 1, 2 & 3 CONTAINS 12 STRANDS.
- TENDON 4 CONTAINS 8 STRANDS.
- MINIMUM DUCT INTERNAL DIAMETER = 55mm.
- ASSUMED JACK LOSS = 3 PERCENT.
- DESIGN JACKING STRESS WILL BE = 1377 MPa (after jack loss).
- AVERAGE DESIGN ELONGATION = 211mm, BASED ON
- ONE SIDE JACKING
- MODULUS OF ELASTICITY = 193053 MPa.
- WOBBLE CO-EFFICIENT = 0.00065
- CURVATURE CO-EFFICIENT = 0.25
- REINFORCEMENT STEEL :
- ALL REINFORCING BAR TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.



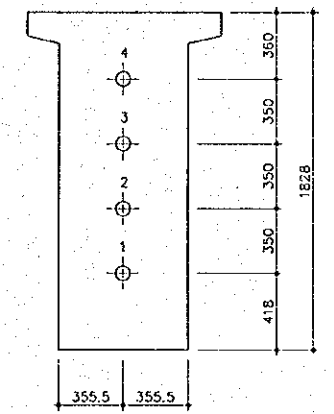
04 SECTION A-A
L-15 SCALE 1:20



05 SECTION B-B
L-15 SCALE 1:20



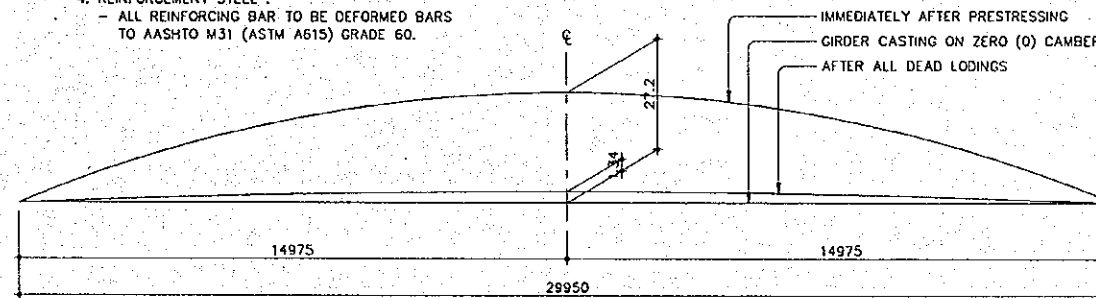
06 SECTION C-C
L-15 SCALE 1:20



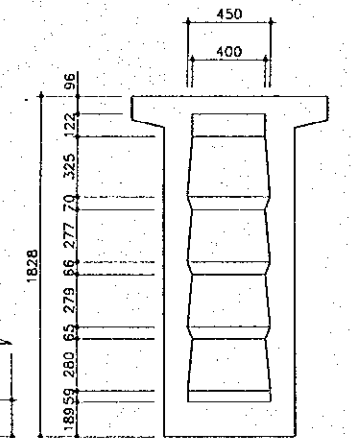
07 SECTION D-D
L-15 SCALE 1:20

ELEVATION OF CABLE FROM SOFFIT OF GIRDER	CABLE NO.	DISTANCE FROM CENTER OF GIRDER															
		0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	14975
CABLE-1	95.0	96.4	100.8	108.0	118.0	131.0	146.9	165.6	187.2	211.7	239.0	269.3	302.4	338.4	377.3	418.0	
CABLE-2	95.0	98.0	107.0	122.0	143.0	170.0	203.0	242.1	287.1	338.1	395.1	458.1	527.2	602.2	683.2	768.0	
CABLE-3	95.0	99.6	113.2	136.1	168.0	209.0	259.2	318.5	387.0	464.5	551.2	647.0	751.9	866.0	989.1	1118.0	
CABLE-4	220.0	225.6	242.3	270.1	309.0	359.1	420.3	492.7	576.2	670.8	776.5	893.4	1021.4	1160.5	1310.8	1468.0	

10 CABLE ELEVATION
L-15 SCALE NTS



09 CAMBER DIAGRAM
L-15 SCALE NTS



08 SECTION E-E
L-15 SCALE 1:20

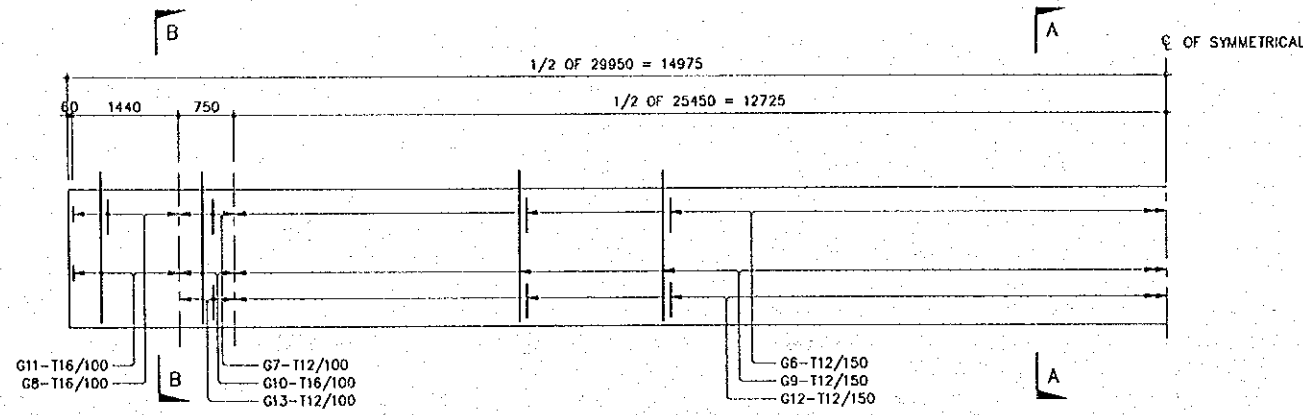
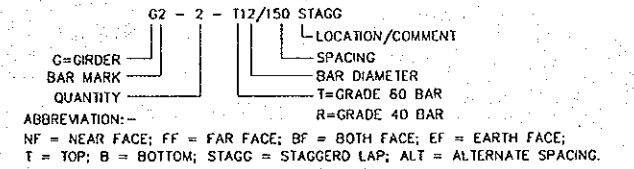
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

PRESTRESSED GIRDER DETAILS (2)

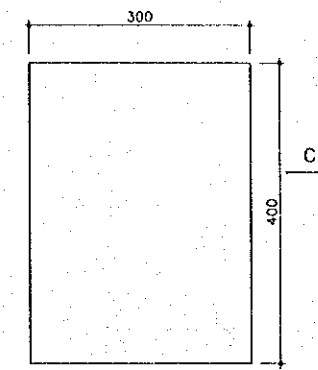
SCALE	SHEET NO.
AS SHOWN	L-16

NOTES :

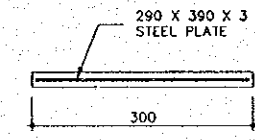
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
- CONCRETE :
- MINIMUM CONCRETE COMPRESSIVE CYLINDER TEST FOR GIRDERS.
28 DAYS, $f_c = 35 \text{ MPa}$.
TRANSFER OF PRESTRESS, $f_{ci} = 30 \text{ MPa}$.
- REINFORCING STEEL :
- ALL REINFORCING BAR TO BE DEFORMED BARS TO AASTHO M31 (ASTM A615) GRADE 60.
- MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
 $20\phi = 630\text{mm}$, $16\phi = 500\text{mm}$, $12\phi = 380\text{mm}$
FOR 75 TO 100% SPLICE
 $20\phi = 820\text{mm}$, $16\phi = 660\text{mm}$, $12\phi = 490 \text{ mm}$
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASTHO ARTICLE 8.32, ASSUMING BAR TO BE FULLY STRESSED.
- MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) STIRRUP = 40mm
(b) PRIMARY BARS = 50mm
- ELASTOMER TO BE USED IN BEARING SHALL BE OF SHORE HARDNESS OF 60 DUROMETER.
- STEEL LAMINATES TO BE USED IN BEARING SHALL BE MADE OF MILD STEEL CONFORMING ASTM 136.
- KEY TO REINFORCEMENT NOMENCLATURE:



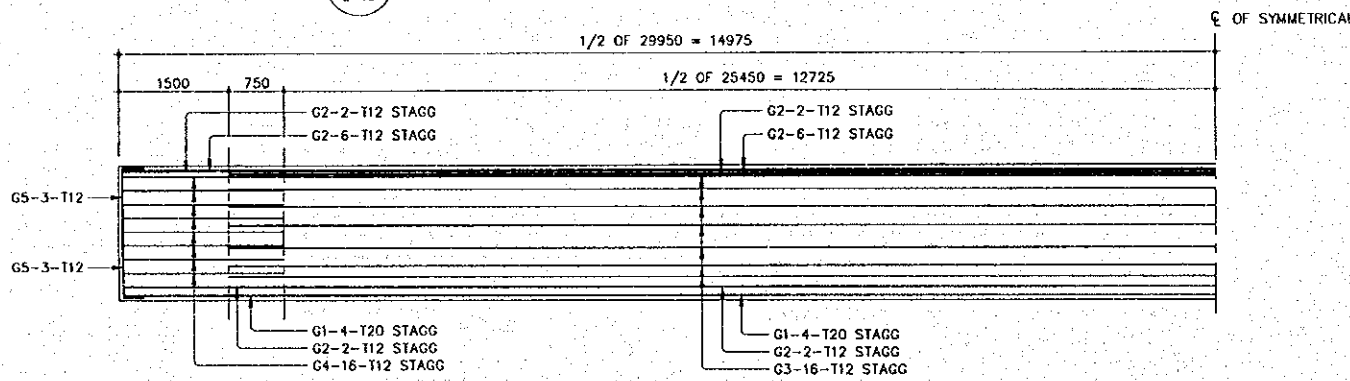
1 HALF ELEVATION OF GIRDER SHOWING VERTICAL NON-PRESTRESSED REINFORCEMENT
L-16 SCALE 1:50



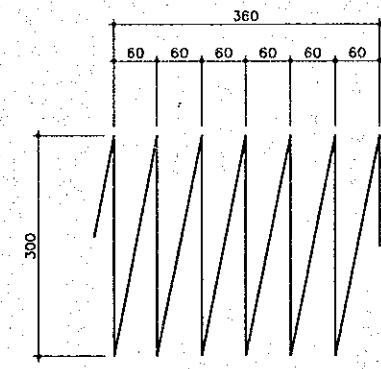
7 PLAN OF BEARING
L-16 SCALE 1:5



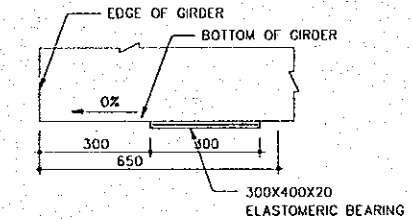
8 SECTION C-C
L-16 SCALE 1:5



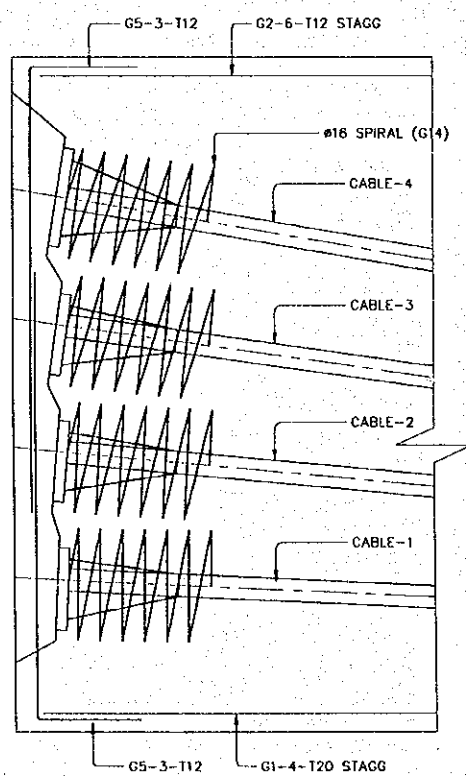
2 HALF ELEVATION OF GIRDER SHOWING HORIZONTAL NON-PRESTRESSED REINFORCEMENT
L-16 SCALE 1:50



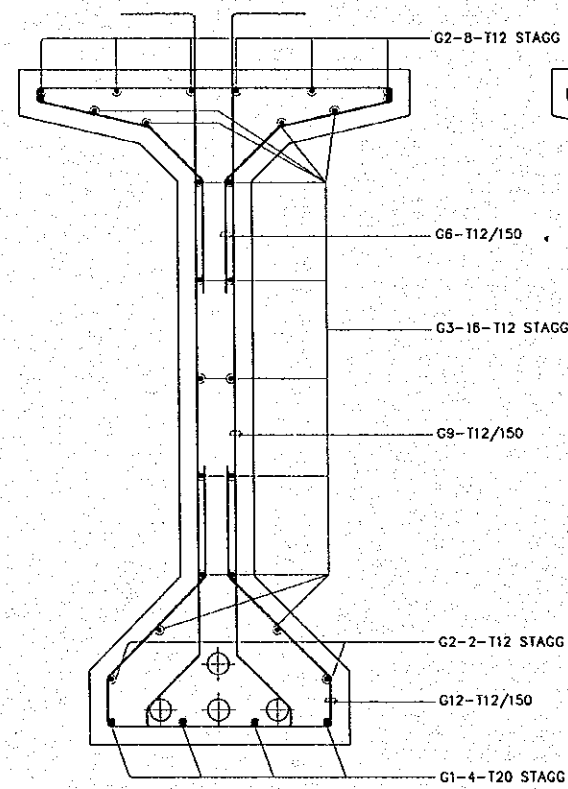
9 Ø16 SPIRAL
L-16 SCALE 1:5



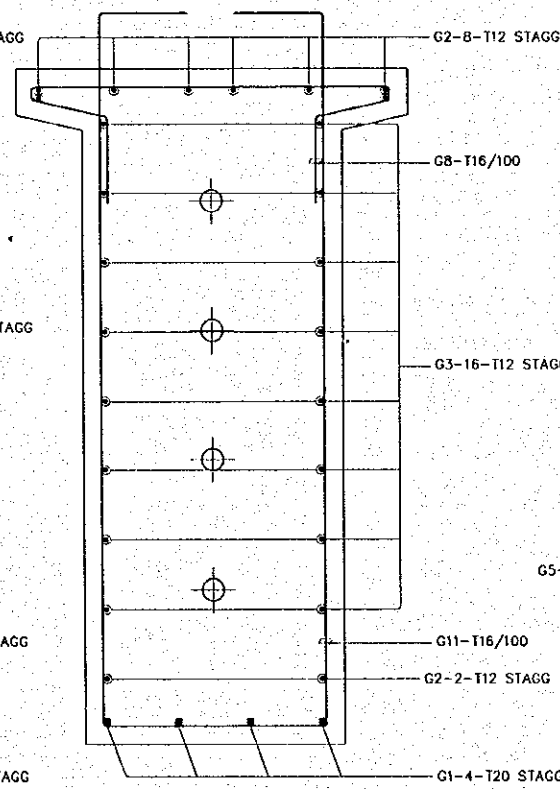
10 POSITION OF BEARING AT BOTTOM OF GIRDER
L-16 SCALE 1:10



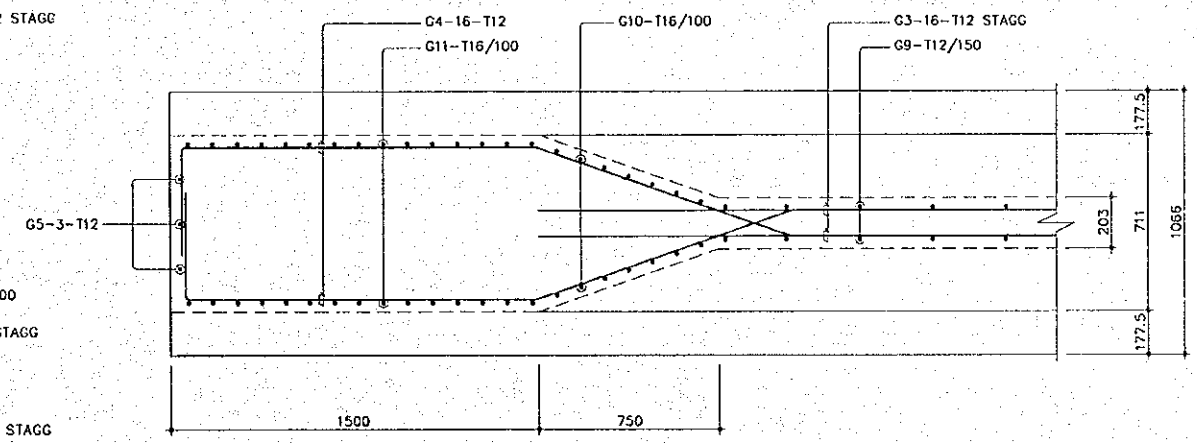
3 ELEVATION END BLOCK DETAIL
L-16 SCALE 1:10



4 SECTION A-A
L-16 SCALE 1:10



5 SECTION B-B
L-16 SCALE 1:10

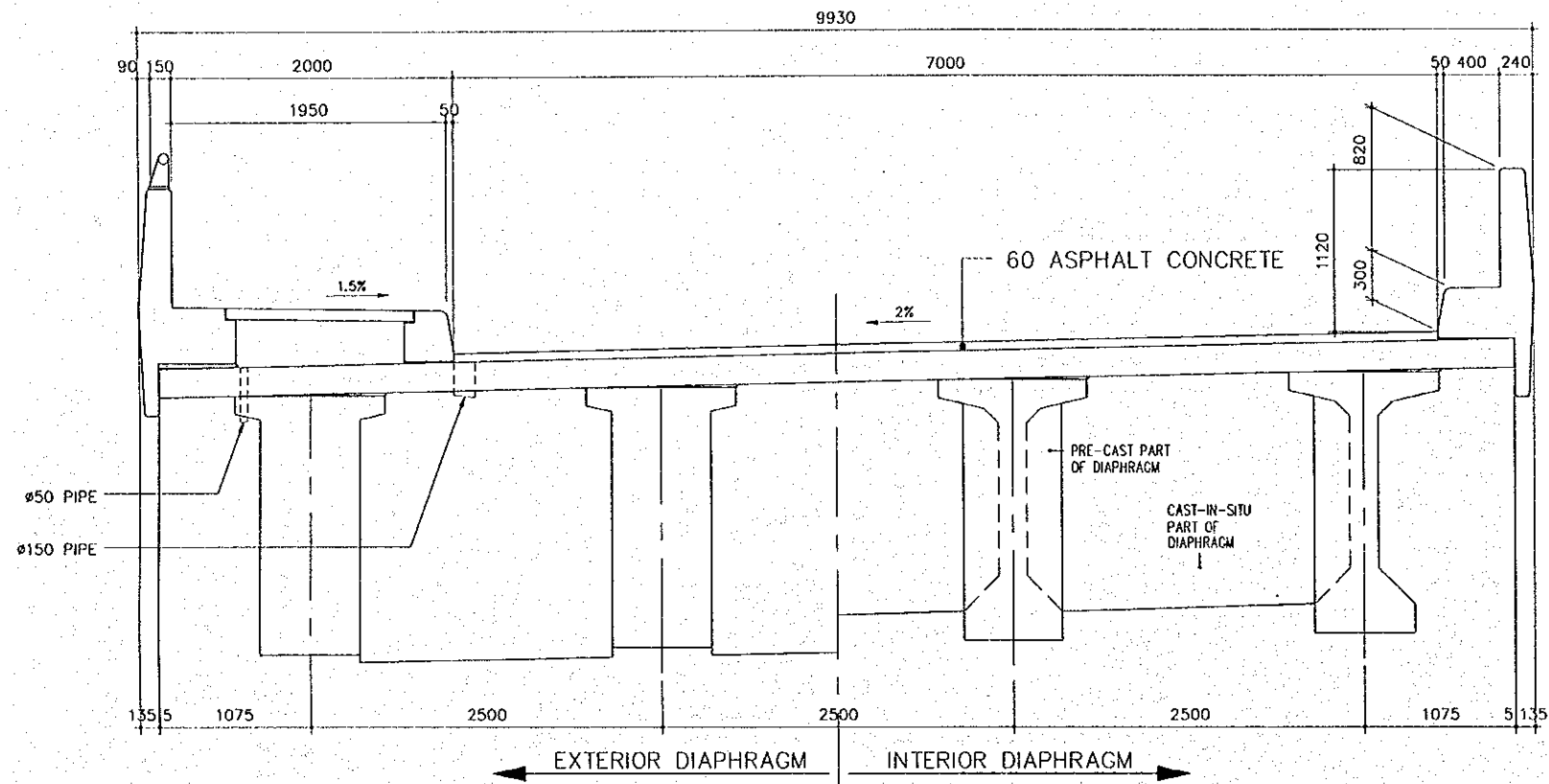


6 TYPICAL REINF. DETAIL OF GIRDER AT TAPER
L-16 SCALE 1:15

THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT AND
RC DETAIL OF DIAPHRAGM

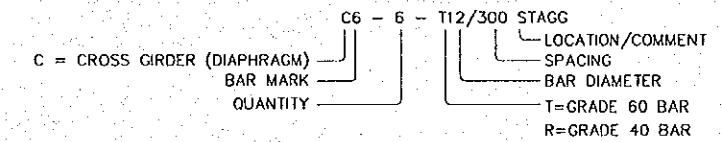
SCALE	SHEET NO.
AS SHOWN	L-17



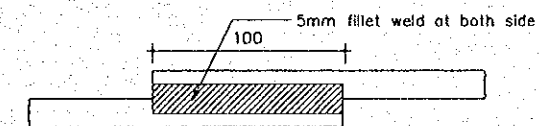
1 DECK SECTION (AT DIAPHRAGM)
L-17 SCALE 1:25

NOTES :

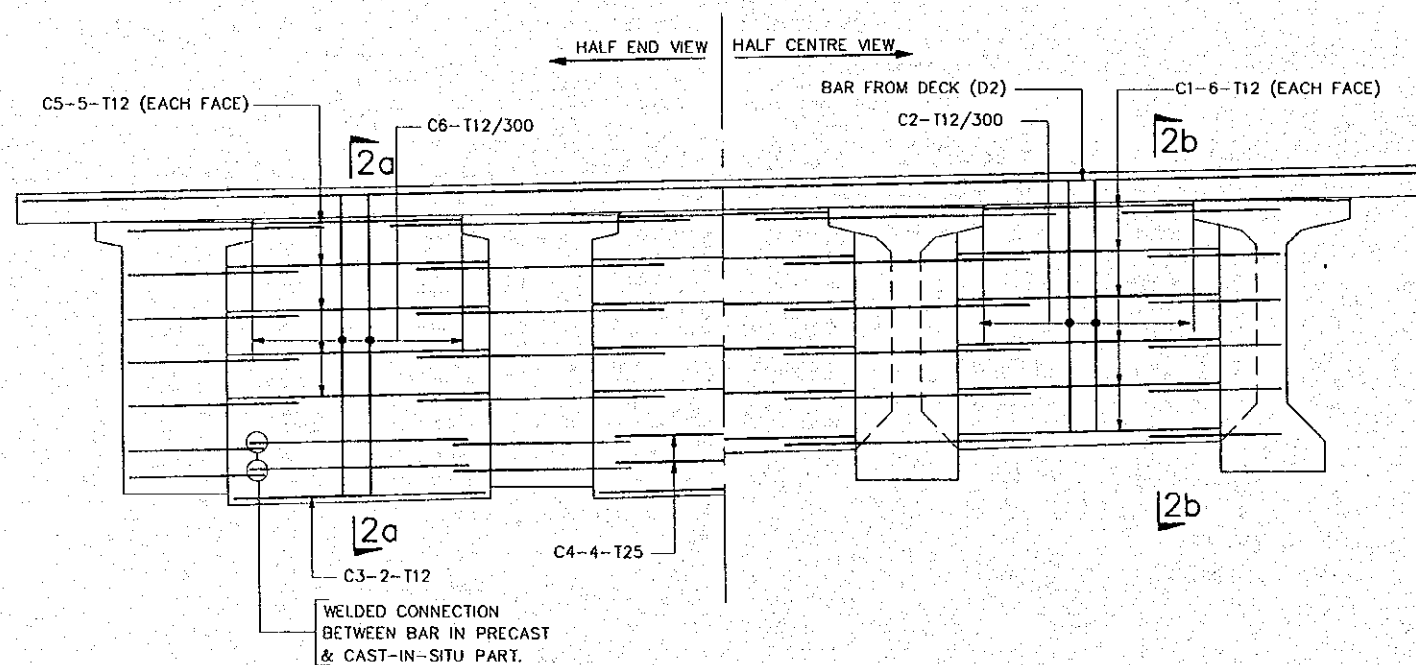
- ALL DIMENSIONS ARE IN MILLIMETER UNLESS MENTIONED OTHERWISE.
- 28 DAYS CYLINDER STRENGTH OF CONCRETE SHALL BE 30 MPa.
- REINFORCEMENT TO BE DEFORMED BARS TO AASHTO M31 (ASTM A615) GRADE 60.
- ULTIMATE STRENGTH OF WELDING MATERIAL SHALL BE 620 MPa.
- NOT ALL REINFORCEMENT ARE NECESSARILY SHOWN IN ANY VIEW.
- MINIMUM CLEAR COVER TO REINFORCEMENT :
(a) STIRRUP = 40mm, (b) PRIMARY BARS = 50mm.
- MINIMUM LAP LENGTHS TO BE AS FOLLOW :
FOR 50% SPLICE
 $12\phi = 380\text{mm}$.
FOR 75 TO 100% SPLICE
 $12\phi = 490\text{mm}$.
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN ACCORDANCE WITH AASHTO ARTICLE B.32, ASSUMING BAR TO BE FULLY STRESSED.
- KEY TO REINFORCEMENT NOMENCLATURE:



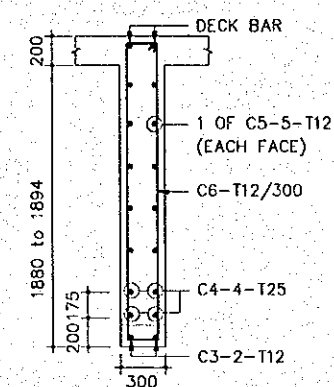
ABBREVIATION: -
NF = NEAR FACE; FF = FAR FACE; BF = BOTH FACE; EF = EARTH FACE;
T = TOP; B = BOTTOM; STAGG = STAGGERD LAP, ALT = ALTERNATE SPACING.



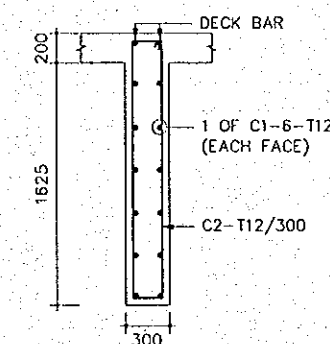
3 WELDED JOINT BETWEEN 25 ϕ BAR
L-17 SCALE NTS



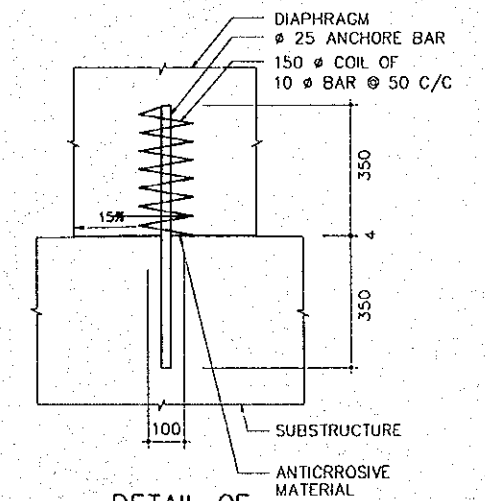
2 ELEVATION REINF. DETAIL OF DIAPHRAGM EXCEPT DIAPHRAGM NEAR EXPANSION JOINT
L-17 SCALE 1:25



4 SECTION
L-17 SCALE 1:25



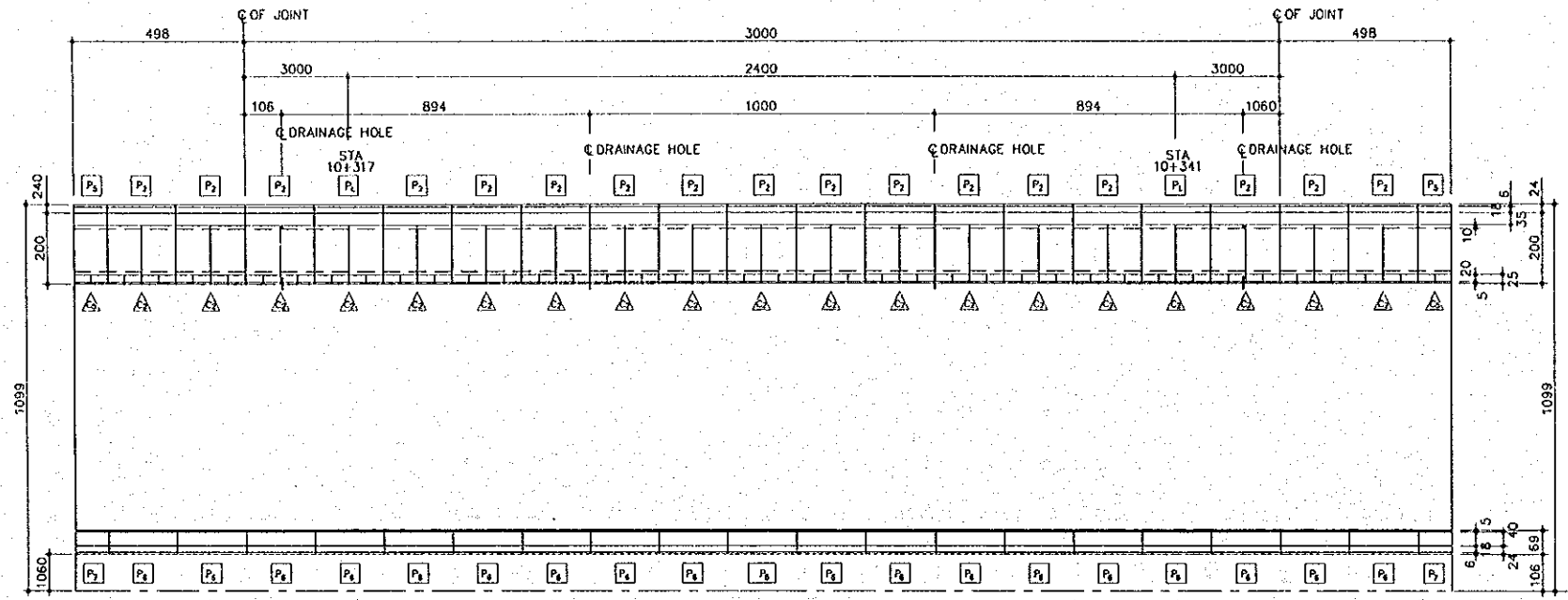
5 SECTION
L-17 SCALE 1:25



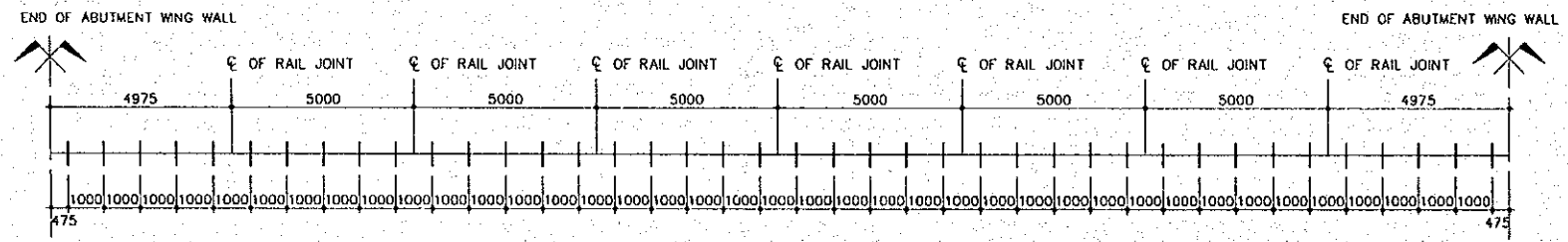
6 DETAIL OF ANCHOR BAR
L-17 SCALE 1:20

**THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)**

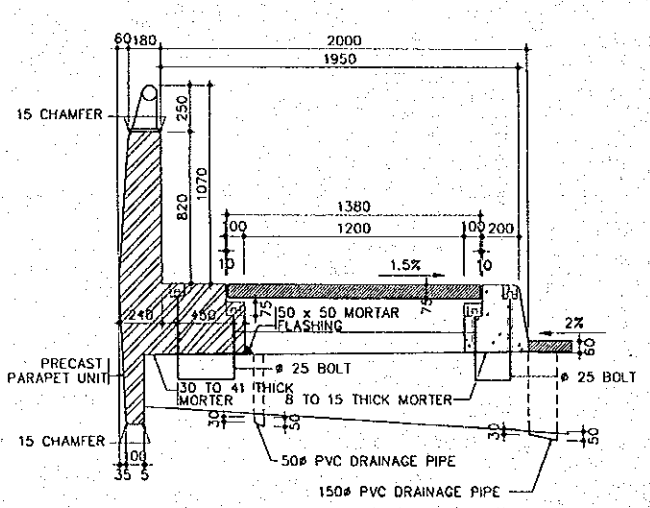
GENERAL ARRANGEMENT & RC DETAILS OF PARAPET & KERB UNIT (1 OF 2)	SCALE AS SHOWN	SHEET NO. L-18
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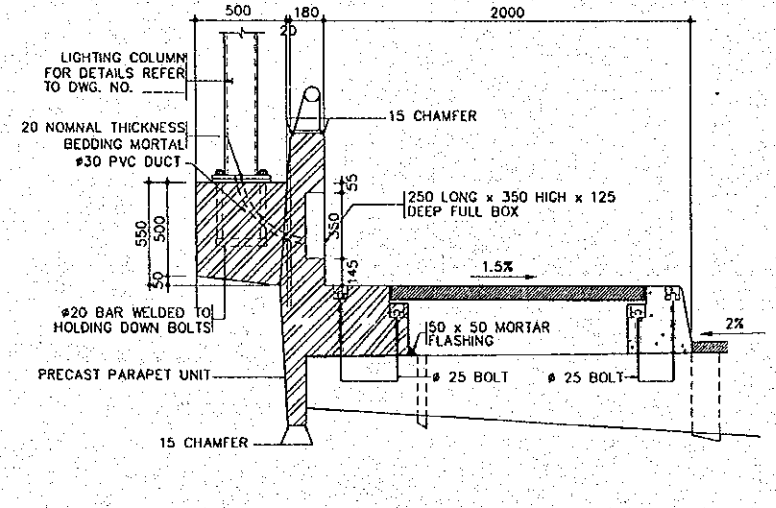
1 LAYOUT PLAN OF DECK FINISHING OF BRIDGE
L-18 SCALE 1:100



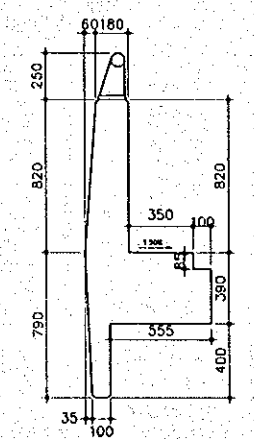
2 KEY PLAN SHOWING LOCATION OF RAILING POSTS AND JOINTS
L-18 SCALE 1:100



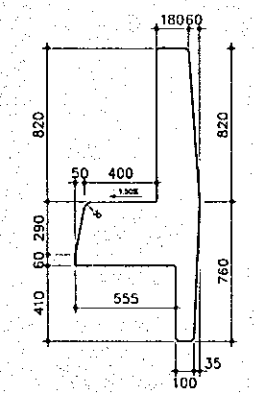
3 TYPICAL DETAILS OF PARAPET & SIDE WALK
L-18 SCALE 1:20



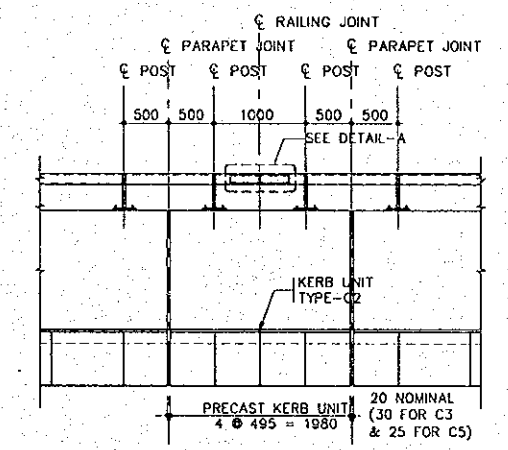
4 PARAPET DETAILS AT LIGHTING COLUMN SUPPORT WALK
L-18 SCALE 1:20



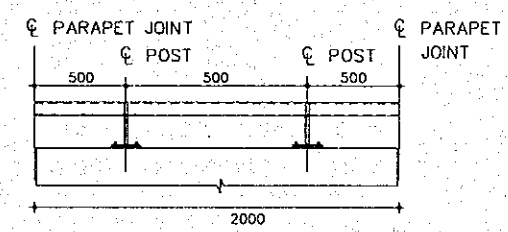
5 PARAPET P2 (TYPICAL) (P2 & P5)
L-18 SCALE 1:20



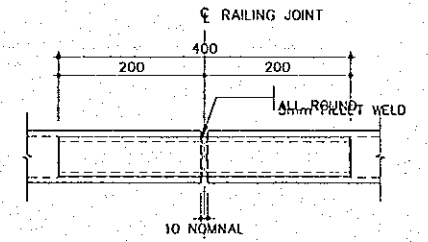
6 PARAPET (TYPICAL) (P6 & P7)
L-18 SCALE 1:20



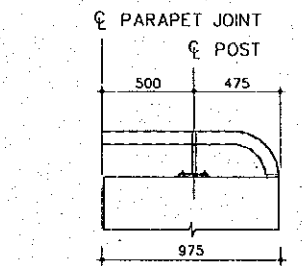
8 ELEVATION ON TYPICAL LENGTH OF PARAPET
L-18 SCALE 1:40



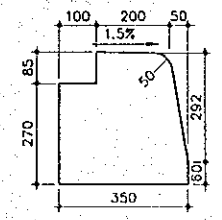
10 ELEVATION ON PARAPET P2 (98 NOS)
L-18 SCALE 1:20



9 DETAIL-A
L-18 SCALE 1:05



11 ELEVATION ON PARAPET P5 (4 NOS)
L-18 SCALE 1:20



7 KERB C2 (TYPICAL)
L-18 SCALE 1:10

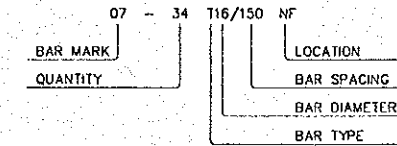
THE STUDY ON CONSTRUCTION OF THE BRIDGE
OVER THE RIVER RUPSA IN KHULNA (PHASE 2)

GENERAL ARRANGEMENT & RC DETAILS OF PARAPETS & KERB UNITS (SHEET 2 OF 2)	SCALE AS SHOWN	SHEET NO. L-19
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NOTES :

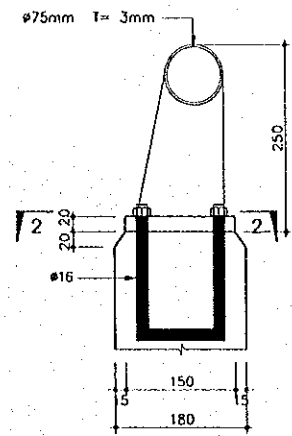
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. L-11
- UNLESS SHOWN OTHERWISE, GRADES OF CONCRETE TO BE
PRECAST PARAPET AND KERB UNITS CLASS 40/20
IN SITU CONCRETE CLASS 30/20
- ALL EXTERNAL EDGES TO HAVE 15x15 CHAMFER UNLESS NOTED OTHERWISE.
- CLEAR 20 NOMINAL GAP TO BE LEFT BETWEEN ADJACENT PARAPET UNITS.
DRY JOINTS TO BE PROVIDED BETWEEN KERB UNITS WITHIN LENGTH OF
PARAPET UNITS.
- ALL STEELWORK TO BE AASHTO DESIGNATION M270 GRADE 50
(ASTM A 709 GRADE 50), GALVANIZED IN ACCORDANCE WITH THE SPECIFICATION.
- ROILING FIXING BOLTS TO BE IN ACCORDANCE WITH ASTM A 307, GALVANIZED
IN ACCORDANCE WITH THE SPECIFICATION.
- ALL HOLDING DOWN BOLTS TO BE HIGH STRENGTH TO AASHTO M164 (ASTM A 25),
GALVANIZED IN ACCORDANCE WITH THE SPECIFICATION.
- DIMENSIONS MARKED * ARE PROVISIONAL ONLY AND SHOULD BE ADJUSTED TO SUIT
DECK EXPANSION JOINT USED.
- REINFORCEMENT TO BE DEFORMED BAR TO AASHTO M31
(ASTM A615) GRADE 40 OR 60 AS NOTED.
- MINIMUM CONCRETE COVER TO REINFORCEMENT TO BE 30mm TO
KERB UNITS AND 50mm ELSEWHERE, UNLESS NOTED OTHERWISE.
- MINIMUM LAP LENGTH TO AS FOLLOWS UNLESS SHOWN OTHERWISE.
32 ϕ = 1500mm 16 ϕ = 550mm
25 ϕ = 950mm 12 ϕ = 400mm
20 ϕ = 850mm 10 ϕ = 350mm
LAP LENGTH BASED ON SMALLEST DIAMETER BAR AND CALCULATED IN
ACCORDANCE WITH AASHTO ARTICLE 8.32, ASSUMING BAR TO BE
FULLY STRESSED.
- REINFORCEMENT TO BE ANCHORED USING DEVELOPMENT LENGTHS
CALCULATED IN ACCORDANCE WITH AASHTO ARTICLE 8.25, ASSUMING
BAR TO BE FULLY STRESSED.

13. KEY TO REINFORCEMENT NOMENCLATURE :

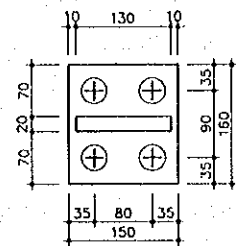


T = GRADE 60 BARS
R = GRADE 40 BARS

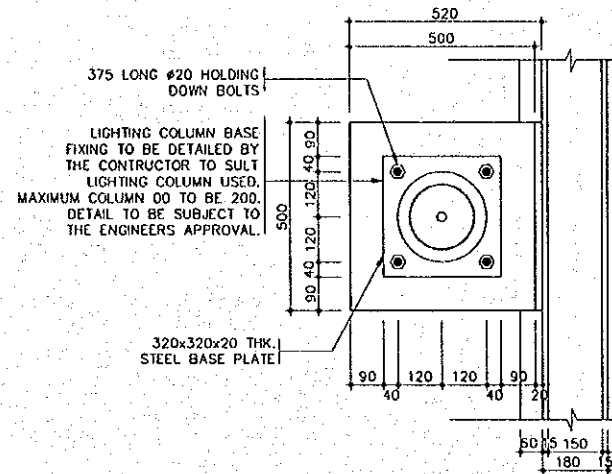
14. PARAPETS, KERB, FOOTWAYS ARE TYPICAL. THEY ARE VARIED IN LENGTH.



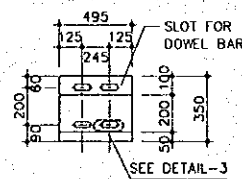
01 SEC. OF RAILING POST
L-19 SCALE 1:05



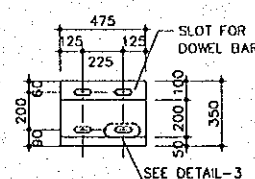
02 SECTION 2-2
L-19 SCALE 1:05



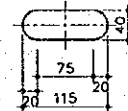
06 PLAN OF LIGHTING COLUMN BASE
L-19 SCALE 1:10



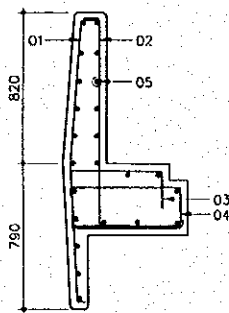
03 PLAN OF KERB UNIT TYPE-C2
L-19 SCALE 1:20



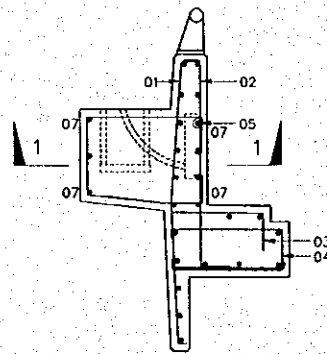
04 PLAN OF KERB UNIT TYPE-C5
L-19 SCALE 1:20



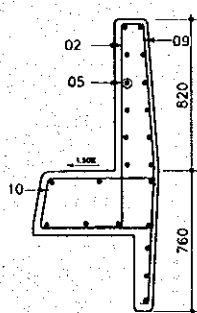
05 DETAIL - 3
L-19 SCALE 1:05



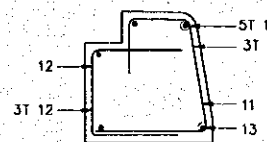
07 RC DETAILS OF (PARAPET P2)
L-19 SCALE 1:20



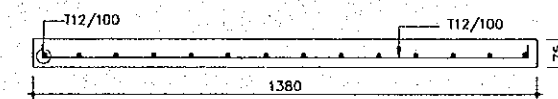
08 RC DETAILS AT LIGHTING COLUMN SUPPORT
L-19 SCALE 1:20



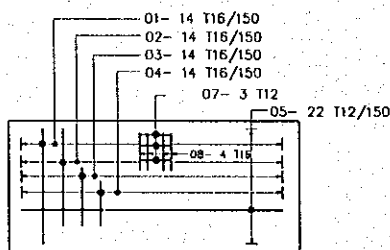
09 RC DETAILS OF PARAPET (P6)
L-19 SCALE 1:20



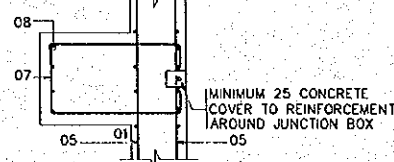
10 RC DETAILS OF KERB (C2)
L-19 SCALE 1:20



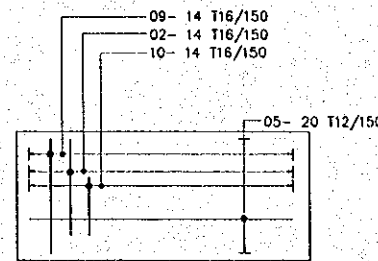
11 SECTION B-B
L-19 SCALE 1:10



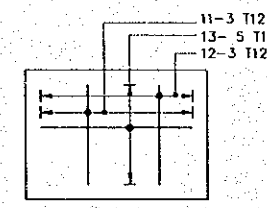
12 ELEVATION ON PARAPET UNIT TYPE (P2)
L-19 SCALE 1:20



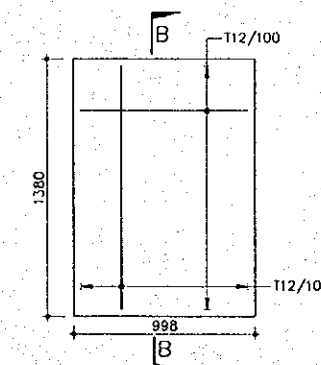
13 SECTION 1-1
L-19 SCALE 1:20



14 ELEVATION ON PARAPET UNIT TYPE (P6)
L-19 SCALE 1:20



15 PLAN OF KERB UNIT TYPE (C2)
L-19 SCALE 1:20



16 RC PLAN OF FOOTWAY (TYPICAL) (OVER C2 & P2)
L-19 SCALE 1:20