

TABLE - 2**GEOHAZARD LOG OF 0+000 - 2+021 KM (PACKAGE-1) DUBAIR ROAD, DISTRICT
KOHISTAN LOWER, KP**

Sr. No.	Chainage (RD)		Segment Length (m)	Geohazard Constraints
	From	To		
1	0+000	0+150	150	Slope Failure/ Rockfall
2	0+150	0+190	40	Rock Slide/Debris Slide
3	0+200	0+220	20	Minor Debris Flow
4	0+260	0+270	10	Minor Debris Flow
5	0+485	0+680	195	Massive Landslide / Rockfall/ Rockslide
6	0+680	0+740	60	Unstable Slope / Extensive Vertical Cut
7	0+790	0+810	20	Minor Debris Flow
8	0+810	1+050	240	Slope Failure/ Rockfall
9	1+050	1+070	20	Minor Debris Flow
10	1+070	1+370	300	Slope Failure/ Rockfall
11	1+800	1+960	160	Dip Slope Failure

TABLE - 1

**GEOLOGIC LOG OF 0+000 - 2+021 KM DUBAIR ROAD, DISTRICT
KOHISTAN LOWER, KP**

Sr. No.	RD	Legend	Description
1	0+000-0+140	BrG1	Bedrock (Ripable / Can be removed by Jack Hammer)
2	0+140-0+240	Qa	Quaternary Aluvial Deposits
3	0+240-0+485	Qt	Terrace Deposits
4	0+485-0+630	Qsm	Slid Mass
5	0+630-1+120	BrG1	Bedrock (Blastable Rock)
6	1+120-1+370	BrG2	Bedrock (Ripable / Can be removed by Jack Hammer)
7	1+370-1+750	Qt	Terrace Deposits
8	1+750 - 1+950	BrG1	Bedrock (Blastable Rock)
9	1+950-2+000	Qf	Nala Bed Deposits / Flood Plain Deposits
10	2+000 - 2+021	Qa	Colluvial Deposists

DETAILED DESIGN AND CONSTRUCTION SUPERVISION/ IMPLEMENTATION OF LOCAL AREA DEVELOPMENT PROGRAM (LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND DOWNSTREAM FISHERIES PLANS

TABLE 03
GEOHAZARD MITIGATION LOG OF DUBAIR VALLEY ROAD, KOHISTAN LOWER, KP

Sr No.	RD	Type of Module (Refer to typical Modules for Slope Hazard Mitigation)	Land Acquisition for the Roadway and Slope Stability Measures (Width of Land Strip) (m)	Guideline For Excavation		REMARKS
				Cut	Fill	
1	0+000	II-A	10.5	50	50	SM Breast Wall Is not required
2	0+020	I	8.25	100-80	0-20	SM Breast Wall Is not required
3	0+040	III	22.5	60	40	SM Breast Wall Is not required
4	0+060	IV	18.0	30	70	SM Breast Wall Is not required
5	0+080	II	10.5	70	30	SM Breast Wall Is not required
6	0+100	I-A	11.5	100-80	0-20	SM Breast Wall Is not required
7	0+120	II	10.5	90	10	SM Breast Wall Is not required
8	0+140	II	10.5	90	10	SM Breast Wall Is not required
9	0+160	V	13.0	0	100	-
10	0+180	V	13.0	0	100	-
11	0+200	V	13.0	0	100	-
12	0+220	II	10.5	30	70	SM Breast Wall is Required H=2.5m
13	0+240	II	10.5	80	20	SM Breast Wall is Required H=2.5m
14	0+260	III	22.5	80	20	SM Breast Wall is Required H=2.5m
15	0+280	III	22.5	80	20	SM Breast Wall is Required H=2.5m
16	0+300	III	22.5	80	20	SM Breast Wall is Required H=2.5m
17	0+320	III	22.5	80	20	SM Breast Wall is Required H=2.5m
18	0+340	III	22.5	80	20	SM Breast Wall is Required H=2.5m
19	0+360	III	22.5	80	20	SM Breast Wall is Required H=2.5m
20	0+380	III	22.5	80	20	SM Breast Wall is Required H=2.5m
21	0+400	III	22.5	80	20	SM Breast Wall is Required H=2.5m
22	0+420	III	22.5	80	20	If hard bedrock not encountered as subgrade for SM Breast and Retaining Walls then the Gabion Walls Should be opted, SM Breast Wall is Required H=2.5m
23	0+440	V	13	0	100	-
24	0+460	V	13	0	100	-
25	0+480	I	11.5	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
26	0+500	Customized Solution			Landslide	
27	0+520					
28	0+540					
29	0+560					
30	0+580					
31	0+600					
32	0+620					
33	0+640					
34	0+660					

DETAILED DESIGN AND CONSTRUCTION SUPERVISION/ IMPLEMENTATION OF LOCAL AREA DEVELOPMENT PROGRAM (LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND DOWNSTREAM FISHERIES PLANS

TABLE 03
GEOHAZARD MITIGATION LOG OF DUBAIR VALLEY ROAD, KOHISTAN LOWER, KP

Sr No	PD	Type of Module (Refer to typical	Land Acquisition for the Roadway and Slope Stability Measures	Guideline For Excavation		REMARKS
35	0+680					
36	0+700	I	8.25	100	0	Move the roadway outwards toward the edge of Profile, SM Breast Wall Is not required
37	0+720	VI a	13	15	85	SM Breast Wall Is not required
38	0+740	VI a	13	0	100	SM Breast Wall Is not required
39	0+760	IV	18.0	100	0	Move the roadway outwards toward the edge of Profile, SM Breast Wall Is not required
40	0+780	IV	18.0	100	0	Move the roadway outwards toward the edge of Profile, SM Breast Wall Is not required
41	0+800	I-A	18.0	30	70	Move the roadway outwards toward the edge of Profile,SM Breast Wall Is not required
42	0+820	IV	18.0	100	0	SM Breast Wall Is not required
43	0+840	IV	18.0	100	0	SM Breast Wall Is not required
44	0+860	IV	18.0	100	0	SM Breast Wall Is not required
45	0+880	VI a	13	20-25	80-75	SM Breast Wall Is not required
46	0+900	VI a	13	20-25	80-75	SM Breast Wall Is not required
47	0+920	V	13	0	100	SM Breast Wall Is not required
48	0+940	I-A	18.0	100	0	SM Breast Wall and Outwards Toe Wall may not be required
49	0+960	IV	18	100	0	SM Breast Wall Is not required
50	0+980	IV	18	100	0	SM Breast Wall Is not required
51	1+000	IV	18	100	0	SM Breast Wall Is not required
52	1+020	IV	18	100	0	SM Breast Wall Is not required
53	1+040	I-A	11.5	100-80	0-20	SM Breast Wall Is not required
54	1+060	IV	18	80	20	SM Breast Wall Is not required
55	1+080	IV	18	80	20	SM Breast Wall Is not required
56	1+100	IV	18	80	20	SM Breast Wall Is not required
57	1+120	IV	18	100	0	SM Breast Wall Is not required
58	1+140	I	8.25	100-80	0-20	SM Breast Wall Is not required
59	1+160	I	8.25	100-80	0-20	SM Breast Wall Is not required
60	1+180	I	8.25	100-80	0-20	SM Breast Wall Is not required
61	1+200	I	8.25	100-80	0-20	SM Breast Wall Is not required
62	1+220	I	8.25	100-80	0-20	SM Breast Wall Is not required
63	1+240	I	8.25	100-80	0-20	SM Breast Wall Is not required
64	1+260	I	8.25	100-80	0-20	SM Breast Wall Is not required
65	1+280	VI a	13	60	40	SM Breast Wall Is not required
66	1+300	VI a	13	50	50	SM Breast Wall Is not required
67	1+320	VI a	13	50	50	SM Breast Wall Is not required
68	1+340	I	8.25	100-80	0-20	SM Breast Wall Is not required
69	1+360	I	8.25	100-80	0-20	SM Breast Wall Is not required
70	1+380	VI a	13	20-25	80-75	-

DETAILED DESIGN AND CONSTRUCTION SUPERVISION/ IMPLEMENTATION OF LOCAL AREA DEVELOPMENT PROGRAM (LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND DOWNSTREAM FISHERIES PLANS

TABLE 03
GEOHAZARD MITIGATION LOG OF DUBAIR VALLEY ROAD, KOHISTAN LOWER, KP

Sr No	PD	Type of Module (Refer to typical	Land Acquistion for the Roadway and Slope Stability Measures	Guideline For Excavation		REMARKS
71	1+400	VI b	15.5	20-25	80-75	SM Retaining Wall required H=varies, SM Breast Wall is required H=2.5-3m
72	1+420	VI b	15.5	50	50	SM Retaining Wall required H=varies, SM Breast Wall is required H=2.5-3m
73	1+440	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
74	1+460	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
75	1+480	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
76	1+500	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
77	1+520	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
78	1+540	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
79	1+560	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
80	1+580	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
81	1+600	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
82	1+620	I	8.25	100-80	0-20	SM Toe Wall is required 1.5 -2.0 m
83	1+640	VI b	15.5	20-25	80-75	SM Retaining Wall required H=varies, SM Breast Wall is required H=2.5-3m
84	1+660	I	8.25	100	0	SM Toe Wall is required 1.5 -2.0 m
85	1+680	I	8.25	100	0	SM Toe Wall is required 1.5 -2.0 m
86	1+700	I	8.25	100	0	SM Toe Wall is required 1.5 -2.0 m
87	1+720	II	10.5	80	20	SM Breast Wall is required H=2.5m
88	1+740	VI a	13	0	100	-
89	1+760	I	8.25	100	0	SM Breast Wall Is not required
90	1+780	I	8.25	100	0	SM Breast Wall Is not required
91	1+800	IV	18	50	50	SM Breast Wall Is not required
92	1+820	VI a	13	20-25	80-75	SM Breast Wall Is not required
93	1+840	III	22.5	50	50	SM Retaining Wall H=Varies, SM Breast Wall Is not required
94	1+860	III	22.5	30	70	SM Retaining Wall H=Varies, SM Breast Wall Is not required
95	1+880	III	22.5	30	70	SM Retaining Wall H=Varies, SM Breast Wall Is not required
96	1+900	III	22.5	20	80	SM Retaining Wall H=Varies, SM Breast Wall Is not required
97	1+920	VI b	15.5	50	50	SM Retaining Wall H=Varies, SM Breast Wall Is not required
98	1+940	VI b	13	50	50	SM Retaining Wall H=Varies, SM Breast Wall Is not required
99	1+960	VI b	13	25	75	SM Breast and Retaining Wall
100	1+980					Bridge
101	2+000					Bridge
102	2+020	V	13	0	100	SM Retaining Wall H=Varies

STRUCTURE DRAWINGS

1. GENERAL:

- 1.1 THESE NOTES ARE SPECIFIC TO DETAILED DESIGN AND CONSTRUCTION SUPERVISION / IMPLEMENTATIONS OF LOCAL AREA DEVELOPMENT PROGRAM (LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND DOWNSTREAM FISHERIES PLANS; NAMELY LADP IMPLEMENTATION CONSULTANTS (LADP-ICS) , SHOULD BE READ IN THE PROJECT SPECIFICATIONS, STRUCTURAL ENGINEERING DRAWINGS, RELEVANT CONTRACT CONDITIONS AND ENGINEER'S INSTRUCTIONS.
- 1.2 ALL DRAWINGS SHALL BE CO-ORDINATED WITH OTHER SPECIALTY DRAWINGS / DETAILS. ANY DISCREPANCY, ERROR OR RECTIFICATION IF REQUIRED, SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR NECESSARY APPROVAL.
- 1.3 ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METRES. UNLESS SPECIFIED OTHERWISE.
- 1.4 ALL ELEVATIONS SHOWN ON DRAWINGS ARE FINISHED SURFACE LEVELS UNLESS NOTED OTHERWISE.
- 1.5 ALL EXPOSED CONCRETE CORNERS, EDGES AND ANGLES SHALL BE CHAMFERED OR FILLETED 20mm x 20 mm UNLESS SPECIFIED OTHERWISE.
- 1.6 THE CONTRACTOR SHALL SUBMIT, COMPLETE METHODOLOGY FOR DIFFERENT WORK ITEMS LIKE EXCAVATION/BACKFILLING, DEWATERING/DRAINAGE, CONCRETING, LIFTING/LAUNCHING OF GIRDERS, AND JOINTS FOR APPROVAL OF ENGINEER.
- 1.7 SULPHATE RESISTING CEMENT SHALL BE USED WHERE REQUIRED, AND AS PER ENGINEER'S INSTRUCTIONS.
- 1.8 ALL FACES OF CONCRETE IN ABUTMENTS AND WING WALLS IN CONTACT WITH SOIL SHALL BE DAMP PROOFED WITH TWO COATS OF BITUMINOUS MATERIAL AT NO EXTRA COST.
- 1.9 ALL EXPOSED SURFACES SHALL HAVE CLASS 1 SURFACE FORM FINISH UNLESS SPECIFIED OTHERWISE.

2. DESIGN SPECIFICATIONS:

- 2.1 AASHTO LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES – 2012.
- 2.2 WEST PAKISTAN CODE OF PRACTICE FOR HIGHWAY BRIDGES –1967 (WHERE APPLICABLE)

3. LIVE LOADS:

- 3.1 THREE LANES OF CLASS 'B' LOADING, OF WEST PAKISTAN CODE OF PRACTICE FOR HIGHWAY BRIDGES– 1967 WHICHEVER GOVERNS.

4. MATERIALS:

- 4.1 ALL THE MATERIALS AND WORKMANSHIP SHALL BE ACCORDING TO THE AASHTO SPECIFICATIONS AND ASTM STANDARDS EXCEPT WHERE MODIFIED BELOW, OR IN PARTICULAR SPECIFICATIONS AND SPECIAL PROVISIONS" OF TENDER DOCUMENTS.

4.2 CONCRETE

CONCRETE CLASSIFICATION AND STRENGTHS SHALL BE AS PER TABLE GIVEN BELOW:

CONCRETE	CLASS	28 DAYS (15Cm X 30 Cm) CYLINDER STRENGTH Kg/Sq.Cm
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REINFORCED (CONCRETE BARRIER, APPROACH SLAB)	A1	210 (3,000 psi)
REINFORCED (DECK SLAB, CURTAIN WALL, CONCRETE PAD, PRE CAST REINFORCED CONCRETE BEAM, TRANSOM, ABUTMENT SEAT, BACK WALLS, FOUNDATION, WATER COURSE CULVERTS, DRAINAGE CULVERTS, AND RETAINING WALLS ETC.)	A2	280 (4,000 psi)
REINFORCED (PILES & PIERS)	A3	280 (4,000 psi)
LEAN-		105 (1,500 psi)

4.3 REINFORCEMENT

REINFORCING STEEL SHALL BE DEFORMED ROUND BARS OF INTERMEDIATE GRADE (GRADE 60) CONFORMING TO AASHTO M-31 (ASTM A-615) WITH MINIMUM YIELD STRENGTH OF 4,200 Kg/Sq.Cm (60,000 Psi).

4.4 STRUCTURAL STEEL

MAIN STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36 HAVING MINIMUM YIELD STRENGTH OF 2,500 Kg/Sq.Cm (36,000 psi). BOLTS AND NUTS SHALL CONFORM TO ASTM A-307 OR EQUIVALENT. WELDS SHALL CONFORM TO A.W.S (AMERICAN WELDING STANDARDS).

5. CONCRETE COVER:

THE MINIMUM COVER TO REINFORCEMENT SHALL BE AS UNDER UNLESS SPECIFIED OTHERWISE.

DECK SLAB	
TOP	40 mm
BOTTOM	25 mm
BARRIER	
TOP, BOTTOM & SIDES	30 mm
PILES	75 mm
PIER	40 mm
PRECAST BEAM	40 mm
APPROACH SLAB	
BOTTOM	50 mm
TOP	75 mm
FOUNDATION	
TOP	50 mm
BOTTOM & SIDES	75 mm
WALLS	
EARTH SIDE	50 mm
OTHER SIDE	40 mm
ABUTMENT SEAT	50 mm

MATERIAL FOR CONCRETE COVER

BAR SUPPORTS SHALL BE PRECAST MORTAR BLOCK, PLASTIC OR METAL SUPPORTS. MORTAR BLOCKS SHALL BE CONSTRUCTED AND CURED. THE MINIMUM COMPRESSIVE STRENGTH OF MORTAR USED FOR BLOCKS SHALL EQUAL THE MINIMUM COMPRESSIVE STRENGTH OF CONCRETE FOR THE STRUCTURE THEY ARE USED IN. MORTAR BLOCK SUPPORTS SHALL BE ATTACHED TO THE SUPPORTED BAR BY MEANS OF 16-GAUGE WIRE CAST IN THE CENTER OF EACH BLOCK.

6. FOUNDATIONS:

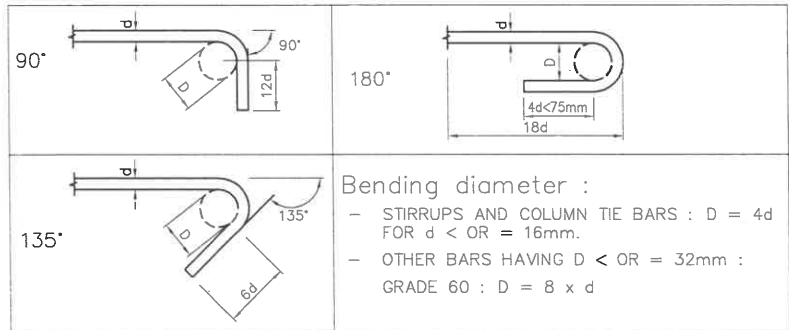
- 6.1 ALL THE EXCAVATION FOR OPEN FOUNDATIONS / BOX CULVERTS SHALL BE SUBJECTED TO INSPECTION BY THE ENGINEER PRIOR TO POURING OF CONCRETE.
- 6.2 THE LENGTH OF PILES ARE TENTATIVE. PILE DESIGN SHALL BE EXECUTED ON THE BASIS OF SOIL EXPLORATORY BORING BY THE CONTRACTOR AND SHALL BE FINALIZED AFTER RESULTS OF THE PILE LOAD TEST.
- 6.3 ALL ABUTMENT PILES SHALL BE CAST AFTER CONSTRUCTION OF ROAD EMBANKMENT.
- 6.4 PILE LOAD TEST:
ONE/TWO PILES SHOULD BE CAST, AS SHOWN ON DRAWINGS AND AT LOCATION DIRECTED BY THE ENGINEER, FOR PILE LOAD TEST. PILE SHALL BE TESTED UPTO 3 TIMES OF THE DESIGN LOAD. PILE LOAD TESTS SHALL BE CARRIED OUT AS PER ASTM DESIGNATION D 1143-87 AND TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. CONSTRUCTION OF WORKING PILES SHALL COMMENCE AFTER COMPLETION AND INTERPRETATION OF TEST RESULTS.
- 6.5 PILE CONCRETING WILL BE CONTINUED WITH IMMERSED TREMIE UNTIL THE INITIAL BATCH OF CONTAMINATED CONCRETE HAS OVER FLOWN AND THE PILE CONCRETE SURFACE IS ATLEST 600mm ABOVE THE FINAL CUT-OFF LEVEL THIS EXTRA LENGHT OF CONCRETE SUBSEQUENTLY BE CUT-OFF AFTER MINIMUM 3 DAYS TO ACHIEVE A UNIFORM SOUND CONCRETE BED.PILE ONCE REJECTED BY THE ENGINEER SHALL NOT BE ALLOWED FOR ANY TESTING BY CONTRACTOR TO PROVE ITS STABILITY FOR PERMANENT WORK. ADDITIONAL REQUIRED PILES DUE TO SUCH REJECTION BE DONE BY CONTRACTOR AT HIS OWN COST. IF TREMIE IS WITHDRAW PREMATURELY BEFORE FINAL BATCH OF CONCRETE OR IS STUCK IN WET CONCRETE, THE PILE WILL BE REJECTED. HOWEVER THE ENGINEER AT SITE WILL GIVE APPROVAL OF SUCH REJECTIONS.
- 6.6 BEHIND THE ABUTMENT AND WING WALLS, COMPACTED GRANULAR BACKFILL SHALL BE PLACED IN LAYERS OF THICKNESS APPROPRIATE TO THE COMPACTION EQUIPMENT ENSURING A MINIMUM IN SITU COMPACTION OF 95% MODIFIED PROCTOR.

7. JOINTS:

- 7.1 THE CONTRACTOR SHALL SUBMIT COMPLETE LAYOUT AND DETAILS OF ALL CONSTRUCTION JOINTS FOR APPROVAL OF THE ENGINEER.
- 7.2 CONCRETE IN DECK SLAB SHALL BE PLACED IN FULL WIDTH. NO CONSTRUCTION JOINT SHALL BE PERMITTED. DIAPHRAGMS AND DECK
- 7.3 CONCRETE FOR THE BARRIERS AND SIDEWALKS SHALL BE PLACED NO SOONER THAN 20 DAYS AFTER PLACING OF CONCRETE IN THE DECK SLAB.

8. BAR BENDING SCHEDULE

DETAILED BAR BENDING SCHEDULE SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED FOR ENGINEER'S APPROVAL.
LAP LENGTHS AND STANDARD HOOKS SHALL BE AS GIVEN BELOW:



9. CANAL LINING WORKS:

- 9.1 IF THE EXISTING LINING OF THE CANAL IS BEING DAMAGED DURING CONSTRUCTION OF BRIDGE, THE DAMAGED PORTION MUST BE RESTORED AS PER ORIGINAL DESIGN IN CLASS 'A' BRICK WORK.

10. TENDER DOCUMENTS, DRAWINGS & CONSTRUCTION DRAWINGS:

- 10.1 TENDER DRAWINGS ISSUED WITH TENDER DOCUMENTS ARE TO APPRAISE THE BIDDERS OF THE GENERAL NATURE & FAIR IDEA OF THE WORK TO PREPARE BOQ & TENDER DOCUMENTS. ENGINEER SHALL ISSUE THE DETAILED CONSTRUCTION DRAWINGS & SUCH FIELD SKETCHES FROM TIME TO TIME AS NECESSARY FOR THE EASE OF CONSTRUCTION.
- 10.2 THE CONTRACTOR SHALL CHECK ALL CONSTRUCTION DRAWINGS AND CONTRACT DOCUMENTS CAREFULLY AS SOON AS PRACTICABLE AFTER RECEIPT THERE OF, AND SHALL PROMPTLY ADVICE THE ENGINEER'S REP OF ANY ERRORS OR OMISSIONS THERE IN PRIOR TO START OF ANY CONSTRUCTION ACTIVITIES.

11. SCAFFOLDING:

ALL SCAFFOLDING SHALL BE DESIGNED BY THE CONTRACTOR & THE TRAFFIC MOVEMENT UNDERNEATH SUCH SCAFFOLDING MAY REMAIN UNOBSTRUCTED.

12. LAUNCHING OF PRECAST R.C.C BEAMS

CONTRACTOR SHALL SUBMIT ITS WORK STATEMENT FOR LIFTING THE PRECAST R.C.C BEAMS TO THE ENGINEER FOR ITS APPROVAL LIFTING OF PRECAST R.C.C BEAMS SHOULD BE DONE DURING NIGHT TIME AND OFF DAYS TO AVOID TRAFFIC DISTURBANCE.

13. METAL WORK:

- 13.1 MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- 13.2 ALL WELDED CONSTRUCTION UNLESS OTHERWISE NOTED.
- 13.3 ALL STEEL TO BE PAINTED OR GALVANIZED AS DIRECTED BY THE ENGINEER.
- 13.4 ALL SHEAR EDGES TO BE GROUND SMOOTH.
- 13.5 ALL WELDS SHALL BE 6mm CONTINUOUS FILLET WELD, E70XX ELECTRODE UNLESS OTHERWISE NOTED ON DRAWING.

14. LIST OF SYMBOLS AND ABBREVIATIONS:

Ao	=	THEORETICAL ELONGATION OF PRESTRESSING TENDON
B	=	BOTTOM
Ø	=	BORE HOLE
C. JT.	=	CONSTRUCTION JOINT
C	=	CENTRELINE
C/C	=	CENTER TO CENTER
DIA.	=	DIAMETER
EXP. JT.	=	EXPANSION JOINT
E.F	=	EACH FACE
ELE.	=	ELEVATION
F.F	=	FAR FACE
G.I	=	GALVANIZED IRON
GUTS	=	GUARANTEED ULTIMATE TENSILE STRENGTH (OF PRESTRESSING CABLES)
ID	=	INTERNAL DIAMETER
I.F	=	INNER FACE
m	=	METER
mm	=	MILLIMETER
N.F	=	NEAR FACE
N.S.L	=	NATURAL SURFACE LEVEL
P.G.L	=	PROFILE GRADE LEVEL
SYM.	=	SYMMETRICAL
T	=	TOP
TH.	=	THICK
TYP.	=	TYPICAL
θ	=	SKEW ANGLE IN DEGREES

TABLE NO.1

(i) SPLICE LENGTH IN TENSION

(a) TOP BARS										
Bar Size	SPLICE LENGTH mm									
fc' Kg/cm ²	#3	#4	#5	#6	#7	#8	#9	#10	#11	
210	710	945	1180	1410	2060	2355	2645	2940	3240	
280	610	820	1020	1225	1780	2040	2995	2550	2805	

(b) OTHER BARS

Bar Size fc' Kg/cm ²	SPLICE LENGTH mm									
	#3	#4	#5	#6	#7	#8	#9	#10	#11	
210	550	730	905	1085	1590	1815	2035	2265	2490	
280	475	630	790	945	1375	1570	1765	1960	2160	

(ii) SPLICE LENGTH IN COMPRESSION

SPLICE LENGTH (mm) IN COMPRESSION (Fy=4220Kg/cm ²)									
Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11
Splice Length	300	380	480	575	670	765	860	955	1050

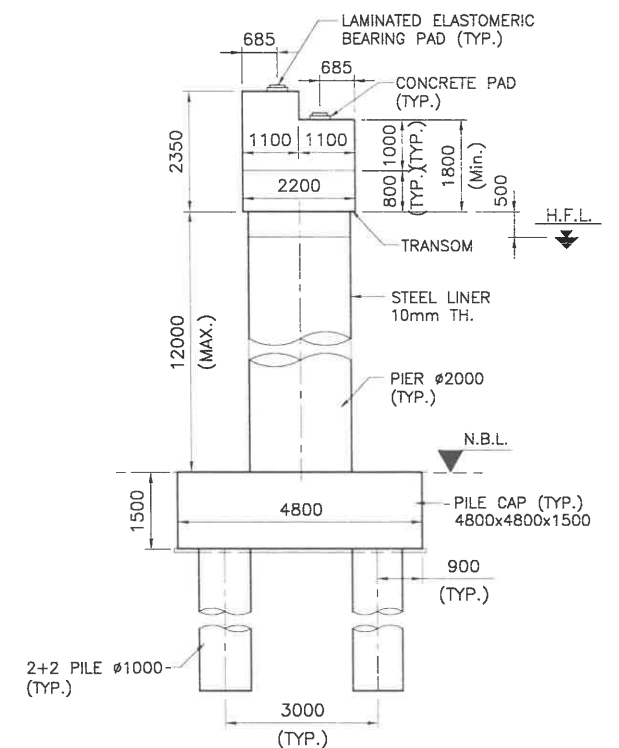
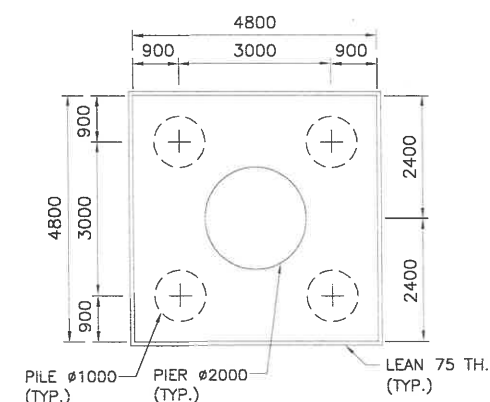
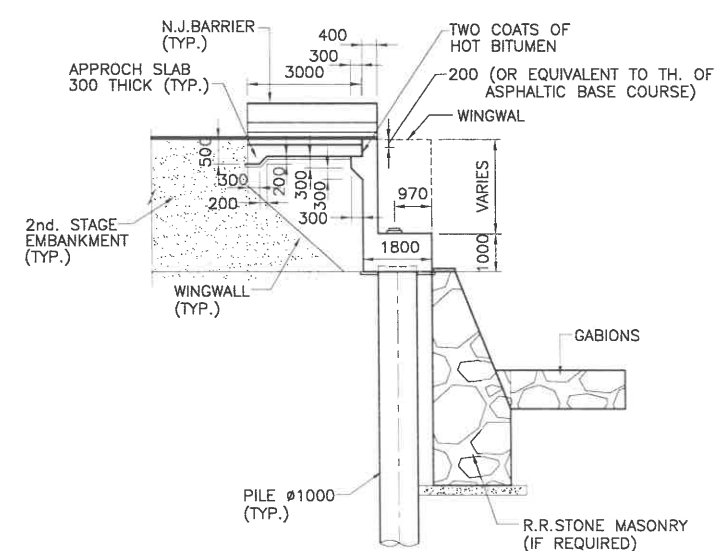
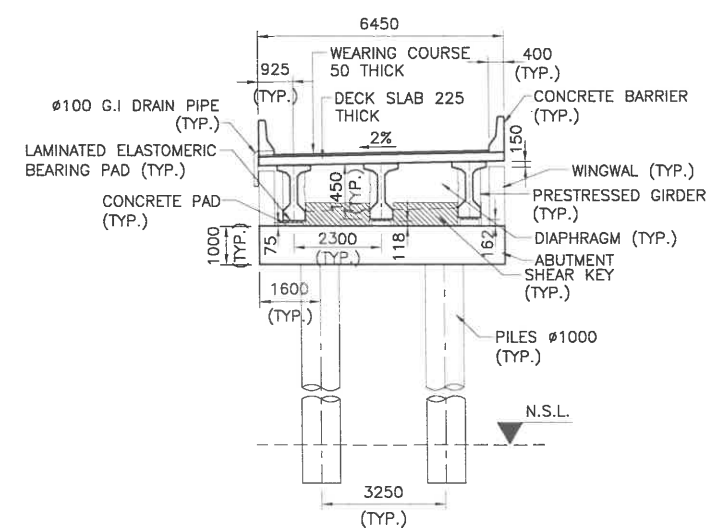
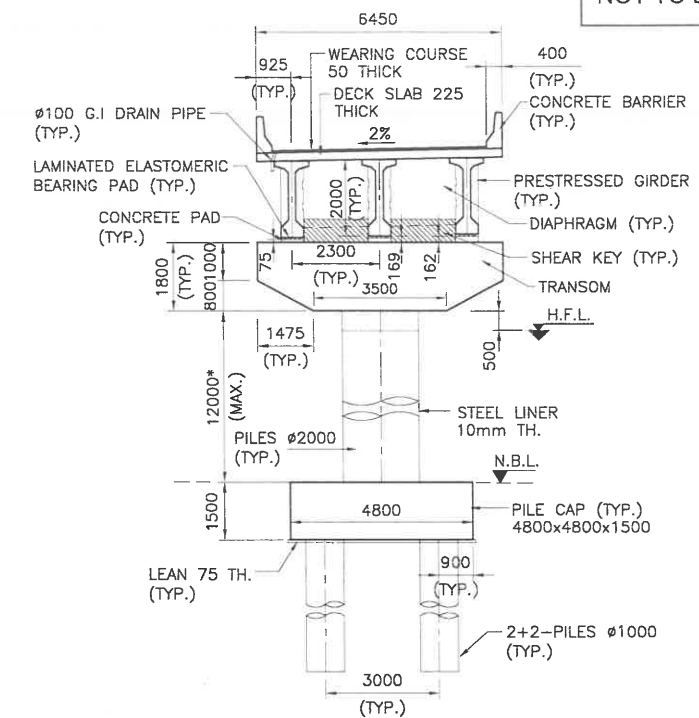
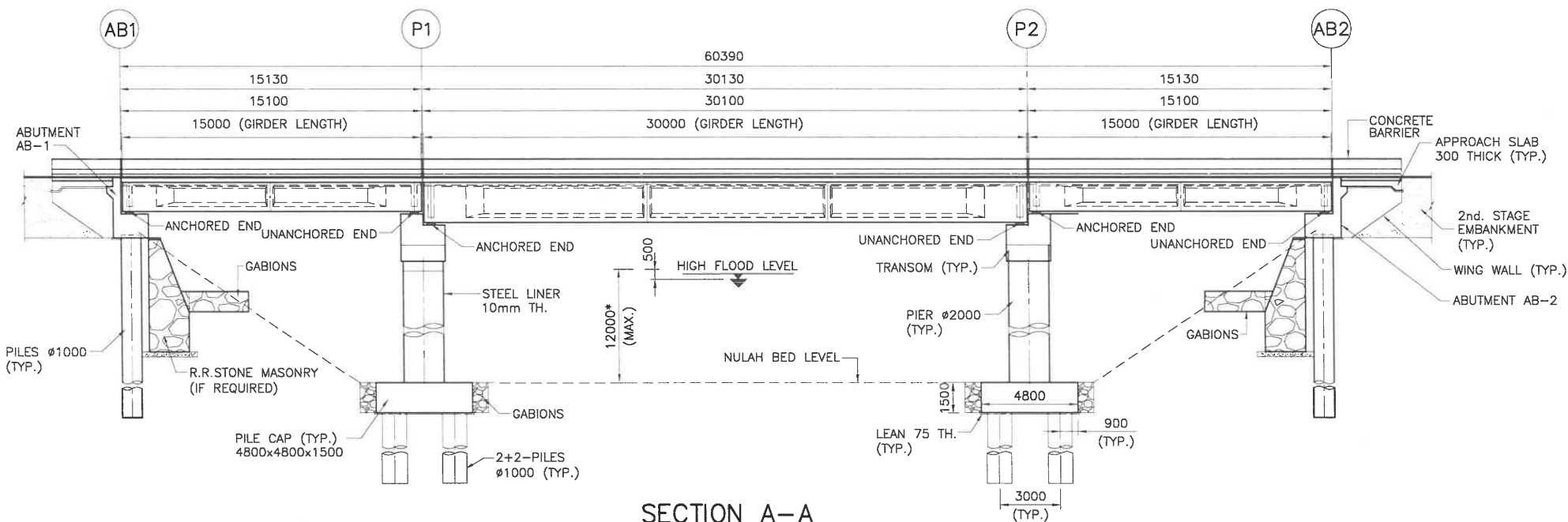
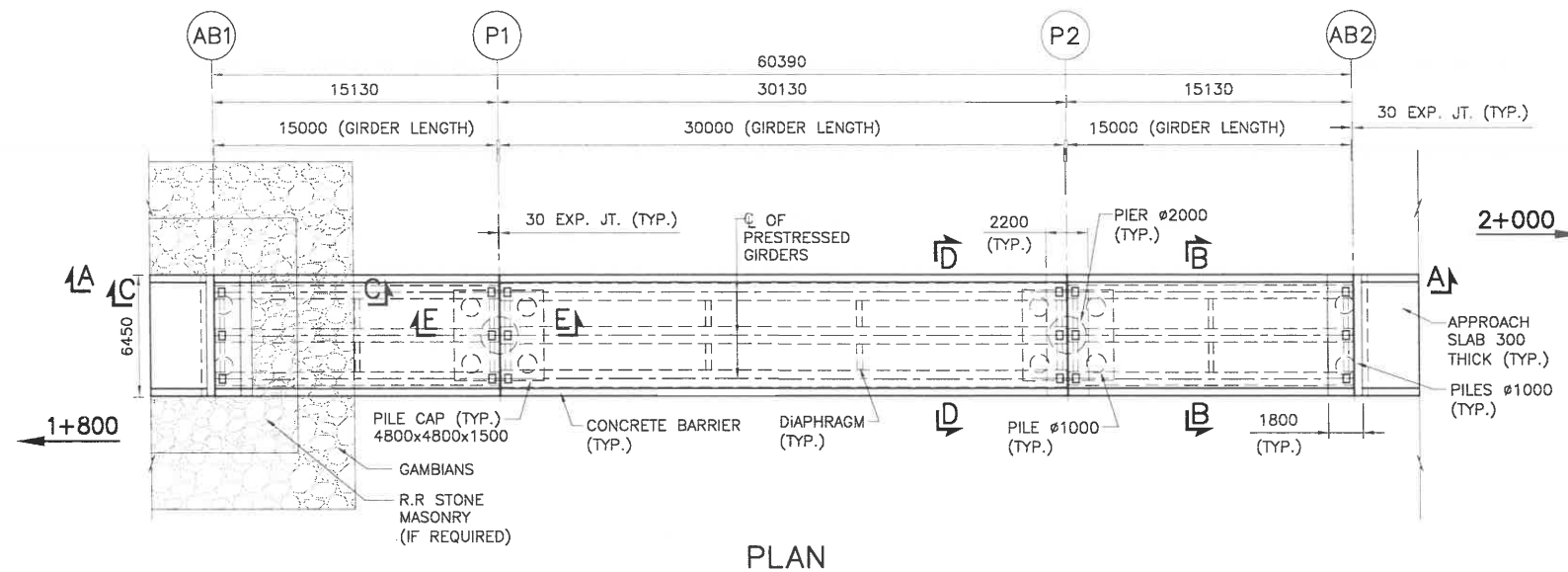
(iii) EMBEDMENT LENGTH IN TENSION

(a) TOP BARS										
Bar Size fc' Kg/cm ²	SPLICE LENGTH mm									
	#3	#4	#5	#6	#7	#8	#9	#10	#11	
210	545	730	910	1090	1590	1820	2050	2310	2565	
280	475	630	785	945	1360	1555	1755	1975	2190	

(b) OTHER BARS

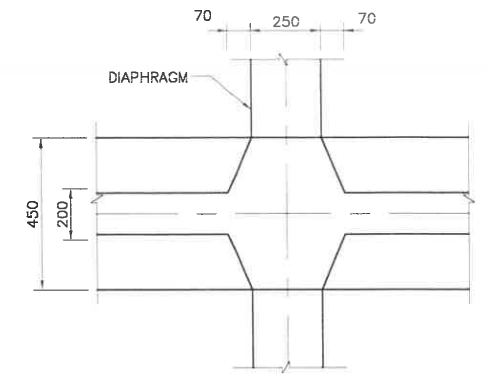
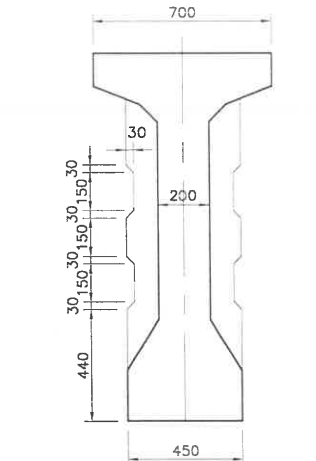
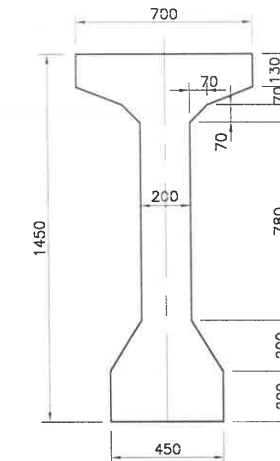
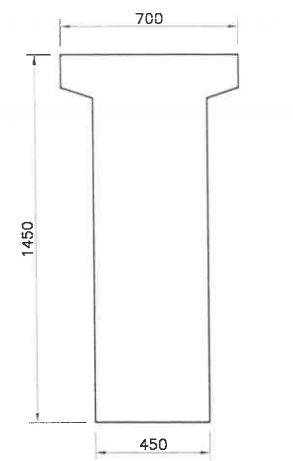
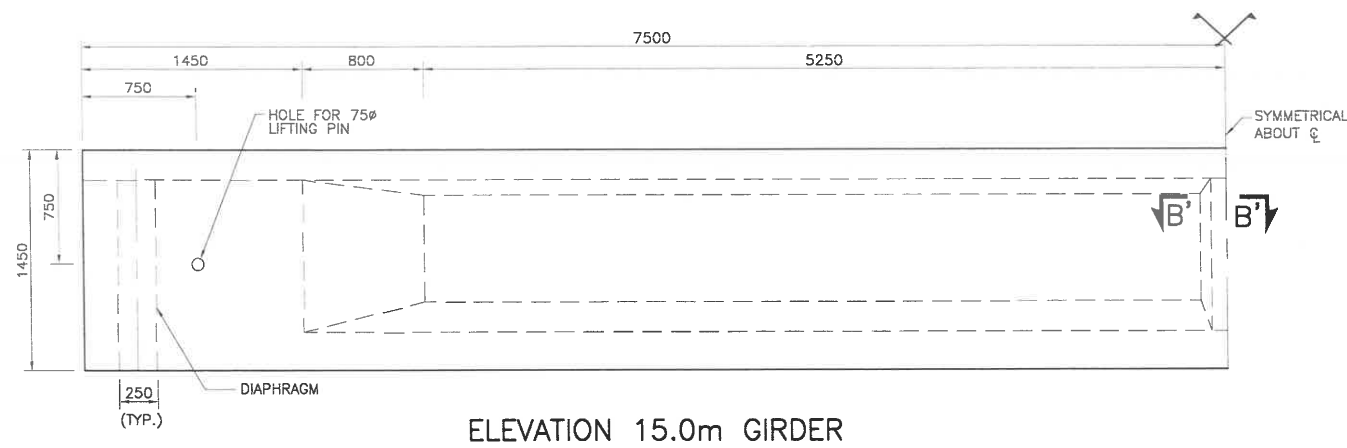
Bar Size fc' Kg/cm ²	SPLICE LENGTH mm									
	#3	#4	#5	#6	#7	#8	#9	#10	#11	
210	420	560	700	840	1225	1400	1580	1775	1970	
280	365	485	605	725	1045	1195	1350	1520	1685	

TENDER DRAWING
NOT TO BE USED FOR CONSTRUCTION



NOTES:

1. FOR GENERAL NOTES REFER DRG. NO. P1G001.
2. WORK THIS DRAWING IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
4. * HEIGHT OF PIER WILL BE CONFIRMED FROM PLAN AND PROFILE DRAWING.



SECTIONAL PLAN B'-B'
SCALE 1:15

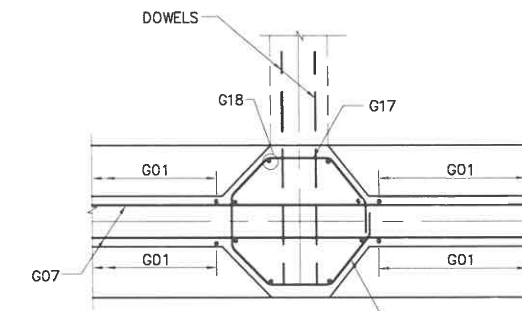
END VIEW OF GIRDER

SECTION AT MIDSPAN

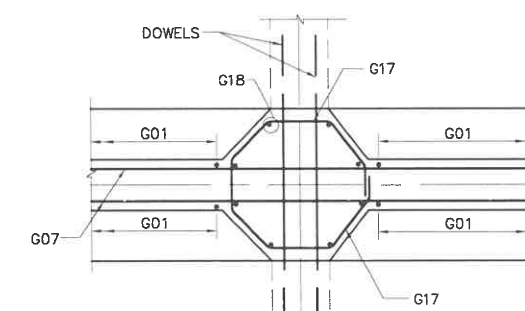
SECTION AT DIAPHRAGM

REINFORCEMENT
SCHEDULE

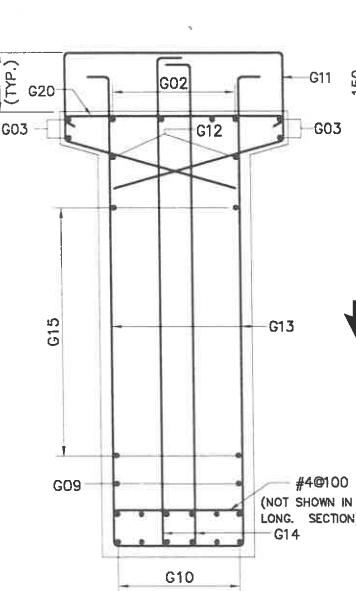
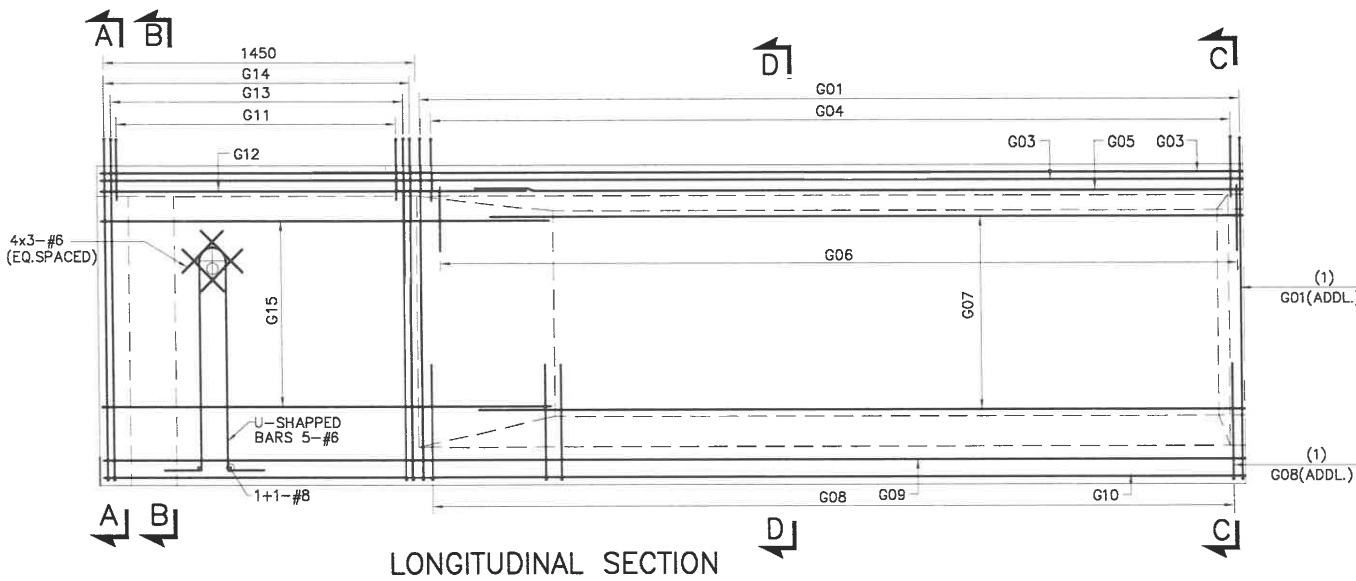
MARK	BAR DIA. @ SPACING
G01	#4@130
G02	4-#6
G03	2#6(E.F)
G04	#4@130
G05	#6(E.F)
G06	#4@130
G07	4-#6(E.F)
G08	#4@130
G09	#6(E.F)
G10	7+7-#10
G11	#4@100
G12	#6(E.F)
G13	#4@100
G14	#4@100
G15	4-#6(E.F)
G17	#4@50
G18	8-#4
G19	#4@130
G20	#4@100
G21	#4@200



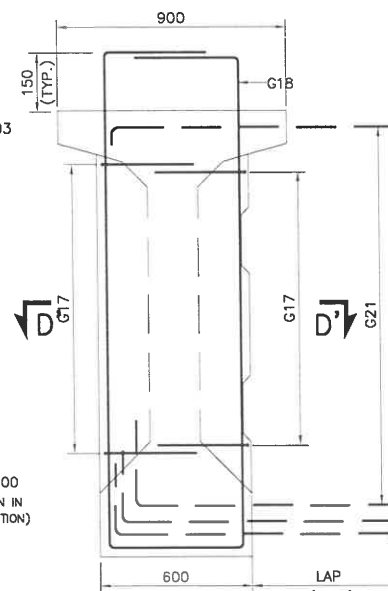
SECTIONAL PLAN D'-D'
(FOR EXTERIOR GIRDER)
SCALE 1:15



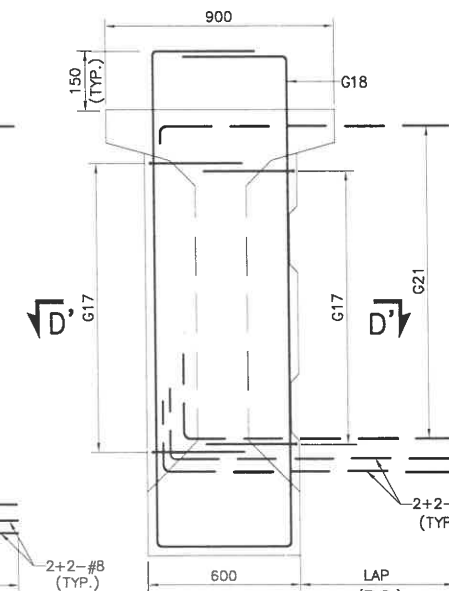
SECTIONAL PLAN D-D
(FOR INTERIOR GIRDER)
SCALE 1:15



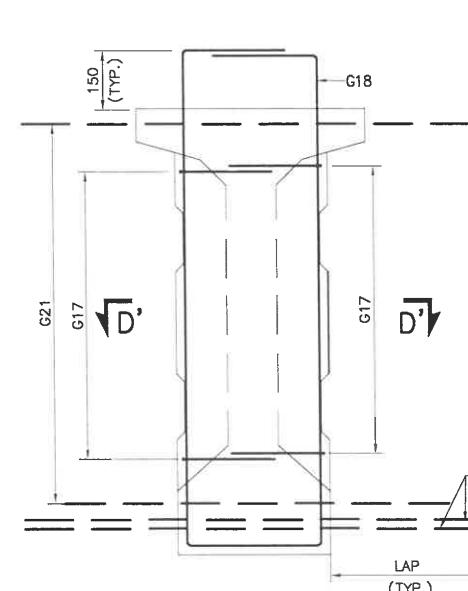
SECTION A-A
SCALE 1:15



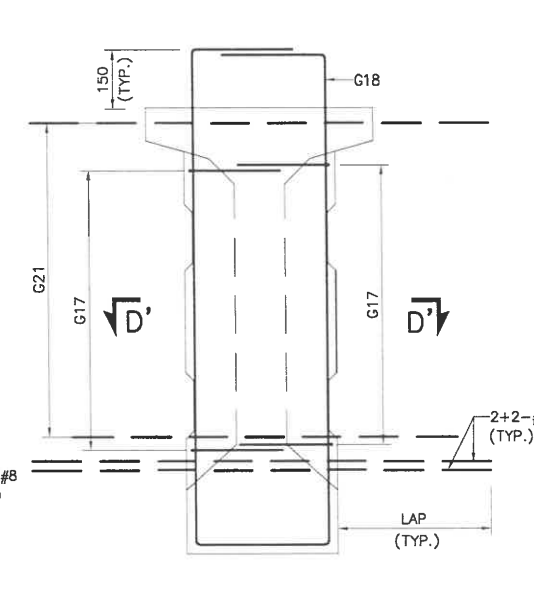
SECTION B-B
(FOR EXTERIOR GIRDER)
(EXTERIOR DIAPHRAGM)
SCALE 1:15



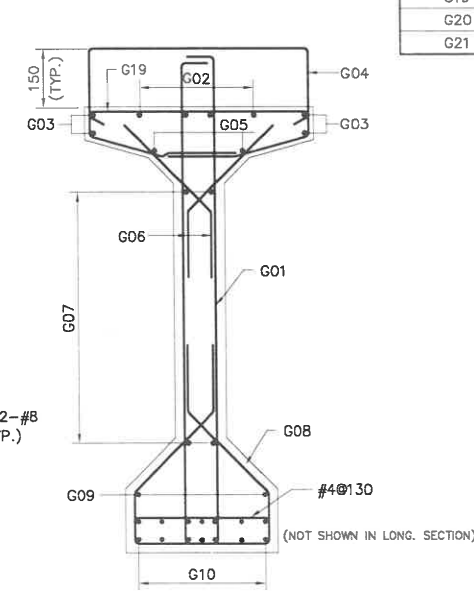
SECTION C-C
(FOR EXTERIOR GIRDER)
(INTERIOR DIAPHRAGM)
SCALE 1:15



SECTION B-B
(FOR INTERIOR GIRDER)
(EXTERIOR DIAPHRAGM)
SCALE 1:15



SECTION C-C
(FOR INTERIOR GIRDER)
(INTERIOR DIAPHRAGM)
SCALE 1:15



SECTION D-D
SCALE 1:15

NOTES:

- FOR GENERAL NOTES REFER DRAWING No. P1G001.
- ALL CONCRETE SHALL BE OF 5000 Psi CYLINDRICAL STRENGTH.
- REINFORCEMENT FOR CONCRETE SHALL BE DEFORMED ROUND BARS OF (GRADE 60) CONFORMING TO AASHTO M-31(ASTM A-615) WITH MINIMUM YIELD STRENGTH OF 4200 Kg/Sq.Cm (60,000psi).

CLIENT
**WATER AND POWER
DEVELOPMENT AUTHORITY
(WAPDA)**

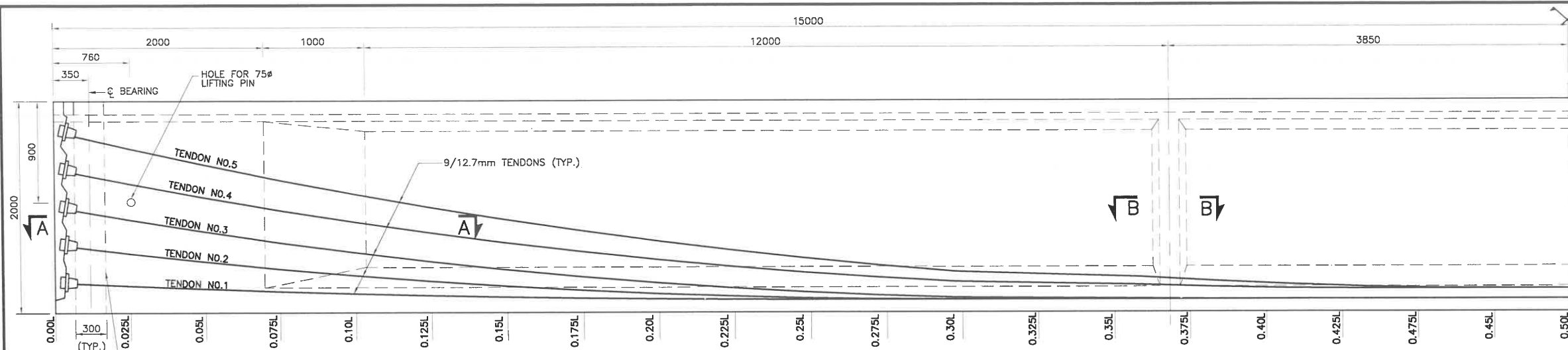
CONSULTANT
**NATIONAL ENGINEERING SERVICES
PAKISTAN (PVT.) LTD.**
HEAD OFFICE:- NESPAK HOUSE, I-C, BLOCK-N,
MODEL TOWN EXTENSION, LAHORE, PAKISTAN.

04				DRAWN	WARIS
03				SUBMITTED	
02				RECOMMENDED	
01				CHD./VER.	
REV.	DATE	DESCRIPTION	APPROVED	APPROVED	

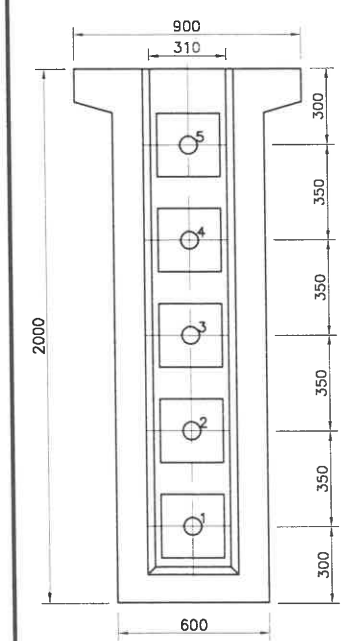
PROJECT
DETAILED DESIGN AND CONSTRUCTION SUPERVISION /
IMPLEMENTATIONS OF LOCAL AREA DEVELOPMENT PROGRAM
(LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND
DOWNSTREAM FISHERIES PLANS;
NAMELY LADP IMPLEMENTATION CONSULTANTS (LADP-ICS)

15.0m R.C.C GIRDER
CONC. OUTLINE & REINFORCEMENT DETAILS
BRIDGE AT CH. 1+990 km.
DATE JULY, 2026
DRAWING No. 4520/102/TD/P1G102
REV.

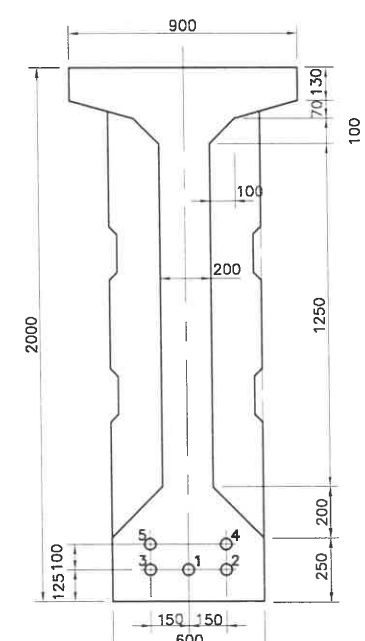
SCALE
1 : 25
REV.



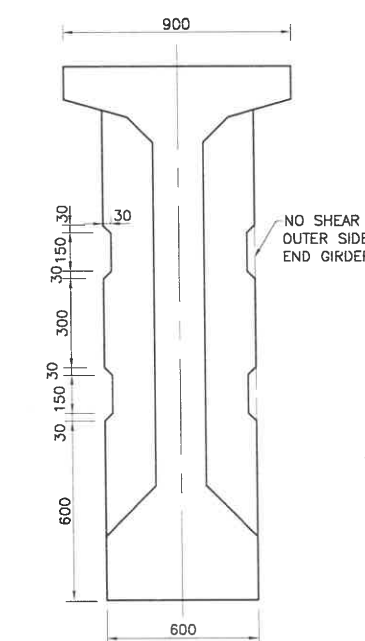
ELEVATION (Tendon Profile) 30.0m GIRDER



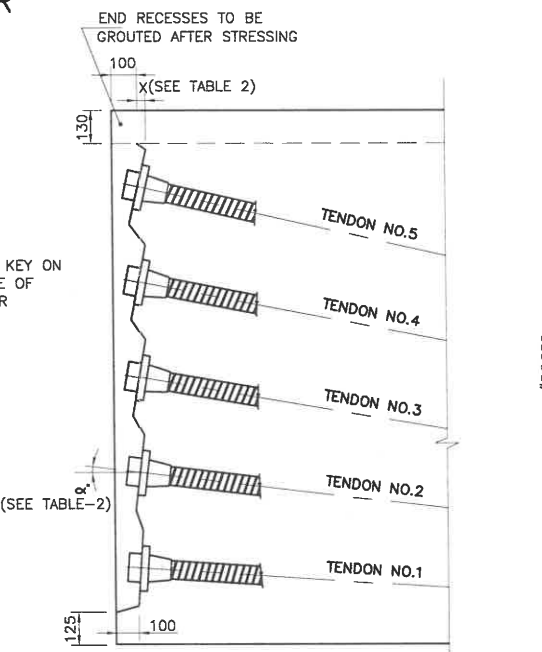
END VIEW OF GIRDER
SCALE 1:15



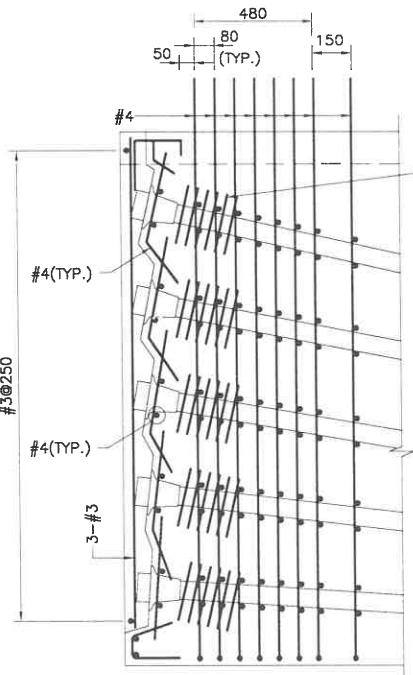
SECTION AT MIDSPAN
SCALE 1:15



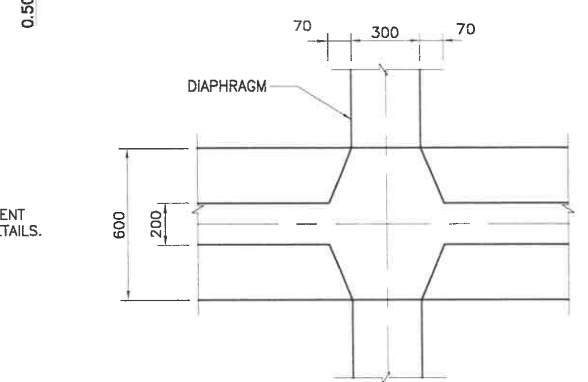
SECTION AT DIAPHRAGM
SCALE 1:15



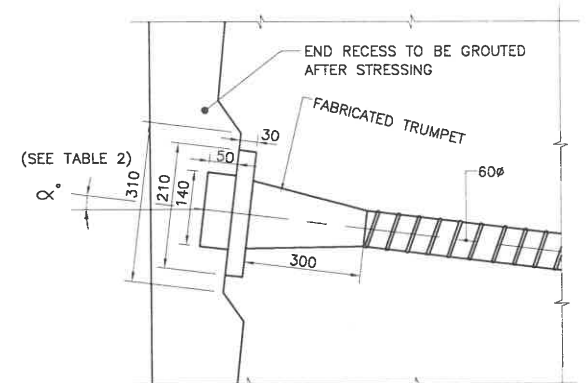
DETAIL OF ANCHORAGE RECESSES
SCALE 1:15



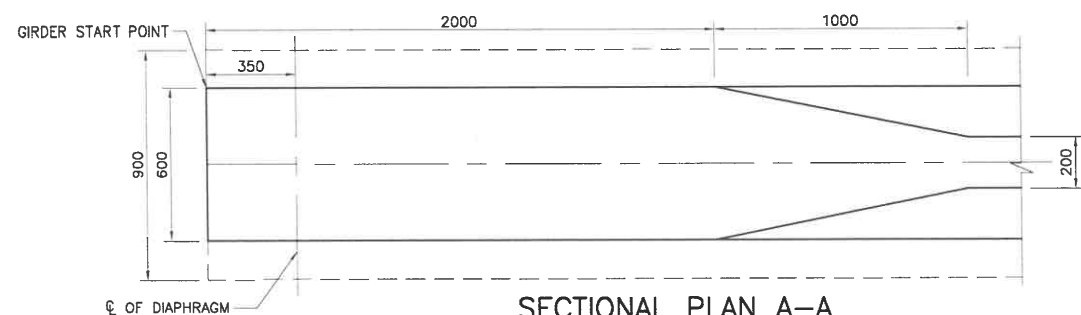
BURSTING REINF. DETAIL
SCALE 1:15



SECTIONAL PLAN B-B
SCALE 1:15



TYPICAL DETAIL
(ANCHORAGE RECESS)



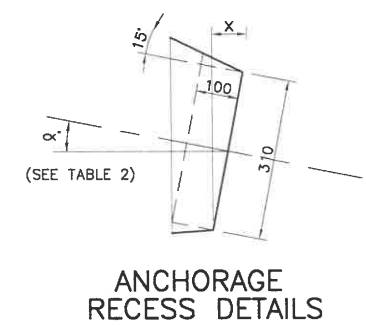
SECTIONAL PLAN A-A
SCALE 1:15

TABLE-1

TENDON NO.		DATA FOR GIRDER																				EXTENSION AT EACH END (mm)	SEQUENCE OF STRESSING	
		END 0.00	0.025L	0.05L	0.075L	0.10L	0.125L	0.15L	0.175L	0.20L	0.225L	0.25L	0.275L	0.30L	0.325L	0.35L	0.375L	0.40L	0.425L	0.45L	0.475L			0.50L
1	Z	300	283	267	251	237	223	211	199	188	178	169	160	153	146	141	136	132	129	127	125	125	97	A
	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2	Z	650	599	550	504	461	420	382	347	314	284	256	231	209	159	172	158	146	137	130	126	125	96	B
	Y	0	0	0	0	0	0	0	0	0	0	10	20	40	60	80	100	120	130	140	145	150		
3	Z	1000	915	834	757	685	617	554	495	440	390	344	302	265	232	204	180	160	145	134	127	125	95	C
	Y	0	0	0	0	0	0	0	0	0	-5	-10	-20	-40	-60	-80	-100	-120	-130	-140	-145	-150		
4	Z	1350	1240	1136	1038	945	858	776	700	630	565	506	453	405	363	326	295	270	250	236	228	225	95	D
	Y	0	0	0	0	0	0	0	0	0	0	0	5	15	30	60	90	115	130	140	145	150		
5	Z	1700	1556	1420	1291	1169	1055	948	848	756	671	594	524	461	406	358	317	284	258	240	229	225	94	E
	Y	0	0	0	0	0	0	0	0	0	0	0	-5	-15	-30	-60	-90	-115	-130	-140	-145	-150		

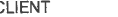
TABLE-2

ANCHORAGE RECESS DATA		
TENDON NO.	ANGLE α°	X (mm)
1	1' 21' 00"	7
2	4' 02' 59"	22
3	6' 44' 58"	37
4	8' 40' 40"	47
5	11' 22' 39"	62



NOTES:

- FOR GENERAL NOTES REFER DRAWING No. P1G001.
- THE FOLLOWING VALUES HAVE BEEN ASSUMED IN THE CALCULATION OF THEORETICAL ELONGATION/EXTENSION (A_0) OF TENDONS:
MODULUS OF ELASTICITY, $E=198,8447 \text{ Kg/Sq.Cm (28,300 ksi)}$
COEFFICIENT OF CURVATURE FRICTION= 0.20 PER RADIAN
WOBBLE FRICTION COEFFICIENT= 0.00656 PER METER
ANY DEVIATION FROM THE ABOVE VALUES SHALL BE REPORTED TO THE ENGINEER.
- STRESSING SHALL BE STOPPED AS SOON AS ONE OF THE FOLLOWING CONDITIONS IS FULFILLED:
-STRESS REACHES 0.75 TIMES GUARANTEED ULTIMATE TENSILE STRENGTH (GUTS)
-ACTUAL ELONGATION/EXTENSION REACHES $1.067 A_0$
-IF AT 0.75 GUTS ACTUAL ELONGATION IS STILL BELOW $0.95 A_0$ STRESSING SHALL BE PROCEEDED UPTO MAXIMUM OF 0.80 GUTS.
-IN THE EVENT OF NON-CONFORMANCE OF ABOVE, THE CABLE MAY BE REPLACED.
- TENDON EXTENSION GIVEN IN TABLE IS FOR THE JACKING END.
- STRESSING OF GIRDERS SHOULD BE DONE FROM BOTH ENDS.
- ALL PRESTRESSED CONCRETE SHALL BE 5000 psi CYLINDER STRENGTH.

CLIENT		CONSULTANT		04			DRAWN		WARIS		PROJECT		30.0m PRESTRESSED GIRDER CONC.OUTLINE & PRESTRESSING DETAILS BRIDGE AT CH. 1+990 km.		SCALE			
 WATER AND POWER DEVELOPMENT AUTHORITY (WAPDA)		 NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.		03			SUBMITTED				DETAILED DESIGN AND CONSTRUCTION SUPERVISION / IMPLEMENTATIONS OF LOCAL AREA DEVELOPMENT PROGRAM (LADP) PUBLIC HEALTH, LIVELIHOOD DEVELOPMENT AND DOWNSTREAM FISHERIES PLANS; NAMELY LADP IMPLEMENTATION CONSULTANTS (LADP-ICS)		DATE JULY, 2026		DRAWING No. 4520/102/TD/P1G103		REV. 1 : 15 	
				02			RECOMMENDED											
				01			CHD./VER.											
				REV.			DATE		DESCRIPTION									
		HEAD OFFICE:- NESPAK HOUSE, I-C, BLOCK-N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN.																