

REINFORCEMENT SCHEDULE & ESTIMATED QUANTITIES FOR ONE (1) APPROACH SLAB

BAR BENDING DIAGRAM	R E I N F O R C E M E N T															
(DIMENSIONS ARE OUT TO OUT OF REBARS)	MARK	SIZE (mm)	QUANTITY	SPACING (mm)	SHAPE	BAR DIMENSIONS (mm)				Length per bar (m)	Total Length Per Bar (m)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)	Concrete (cu.m.)	Remarks
						a	b	c	d							
	AS 1	25	43	130	B	3,900	150	-	-	4.038	4.04	173.63	3.854	669	15.14	SPlicing IS BASED ON 12M COMMERCIAL LENGTH OF RSB
	AS 2	25	2	130	B	3,119	150	-	-	3.269	3.27	6.54	3.854	25		
	AS 3	20	7	295	A	5,781 AVE.	-	-	-	5.781 AVE.	5.78	40.47	2.466	100		
	AS 4	20	7	295	A	6,156	-	-	-	6.156	6.16	43.09	2.466	106		
	AS 5	20	1	As Shown	A	5,475	-	-	-	5.475	5.48	5.48	2.466	14		
	AS 6	16	6	295	A	5,821 AVE.	-	-	-	5.821 AVE.	5.82	34.93	1.579	55		
	AS 7	20	1	As Shown	A	6,156	-	-	-	6.156	6.16	6.16	2.466	15		
	AS 8	16	6	295	A	6,156	-	-	-	6.156	6.16	36.94	1.579	58		
	AS 9	16	19	300	B	3,888	150	-	-	4.038	4.04	76.72	1.579	121		
	AS 10	25	4	As Shown	C	2,324	1,589	-	-	3.913	3.91	15.65	3.854	60		
	AS 11	16	19	300	D	400	434 AVE.	219	625 AVE.	1.678 AVE.	1.68	31.88	1.579	50		
	AS 12	25	2	As Shown	A	6,156	-	-	-	6.156	6.16	12.31	3.854	47		
GRAND TOTAL														1,320	15.14	
GRADE 40														284		
GRADE 60														1,036		



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF AGRICULTURE
"PHILIPPINE RURAL DEVELOPMENT
PROJECT SCALE UP"
PROVINCE OF DAVAO DE ORO
MUNICIPALITY OF LAAK

PROJECT NO.: PRDP-SU-IB-R011-DDO-003-000-000-2023-FMB
SUBPROJECT TITLE: REHABILITATION OF FMR FROM KILAGDING
RECENIA - KIBAGIOU ROAD,
LAAK WITH BRIDGE COMPONENT
LOCATION: LAAK, DAVAO DE ORO

PREPARED BY:

DOMINADOR R. ALMEDILLA
OIC DIVISION HEAD - PDD

DESIGNED BY:

ABRAHAM T. TUNA, JR.
STRUCTURAL ENGINEER
A. SEAD - 2017 - 0102914 - 353A

CHECKED & REVIEWED BY:

RODERICK M. DIGAMON
PROVINCIAL ENGINEER

RECOMMENDING APPROVAL:

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CO - PPMIU

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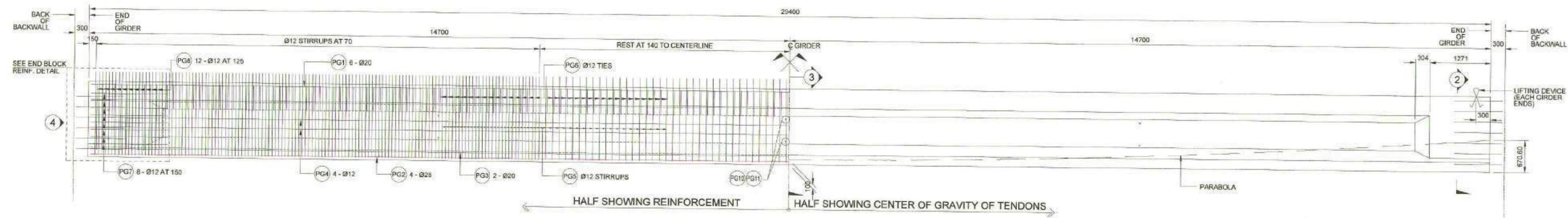
DOROTHY P. MONTEJO-GONZAGA
GOVERNOR

SHEET CONTENTS:
REINFORCEMENT SCHEDULE
& ESTIMATED QUANTITIES
FOR ONE (1) APPROACH SLAB

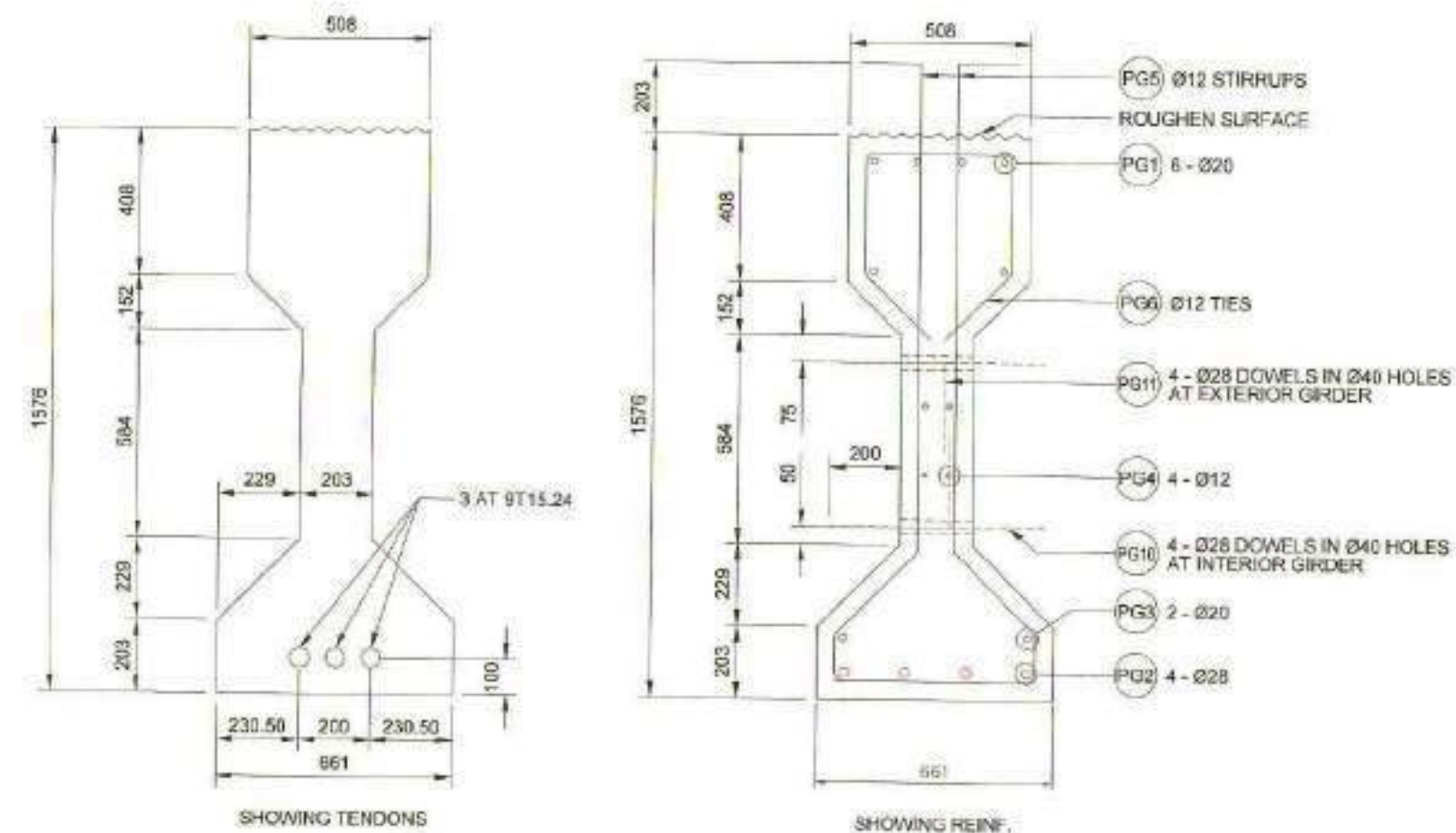
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NO OBJECTION

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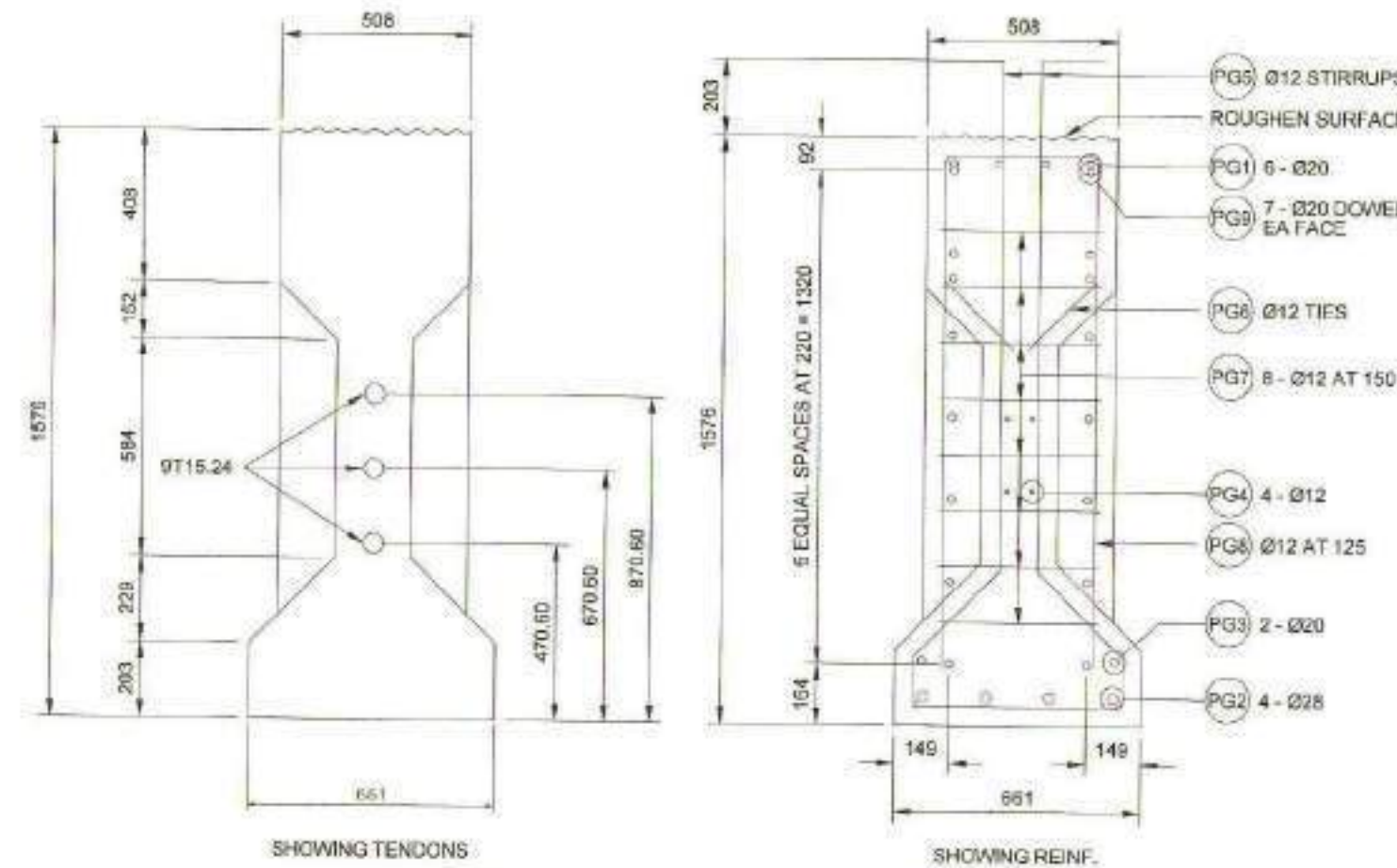
ENGR. MARC ANTHONY C. BUDDING, JR.
I-BUILD Component Head



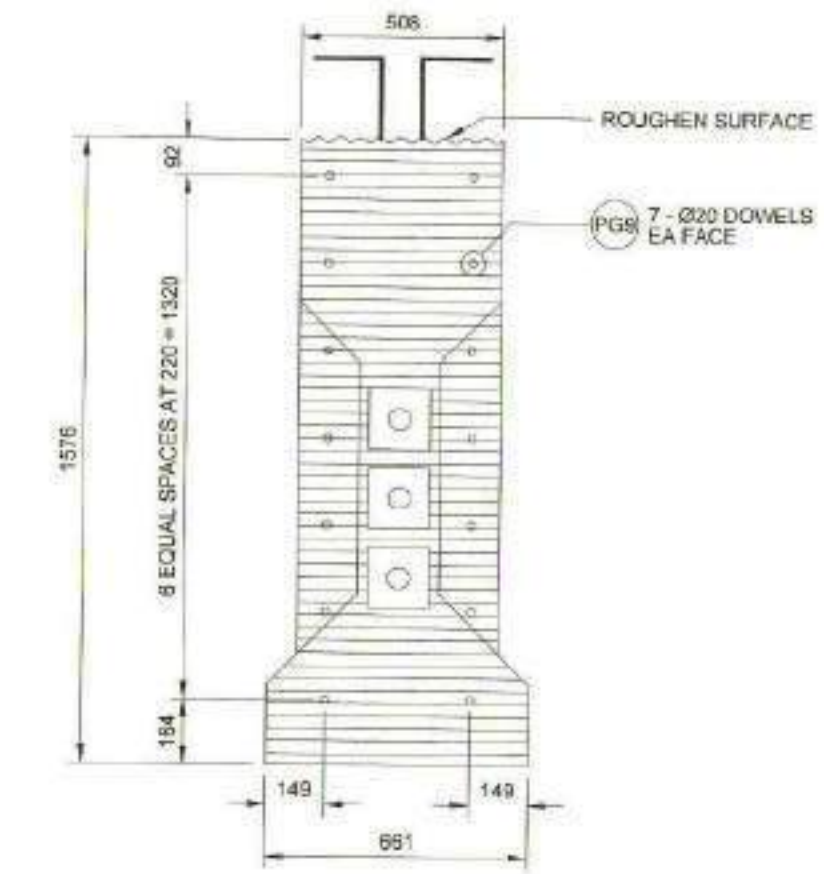
1 PRESTRESSED GIRDER ELEVATION
SCALE 1:50



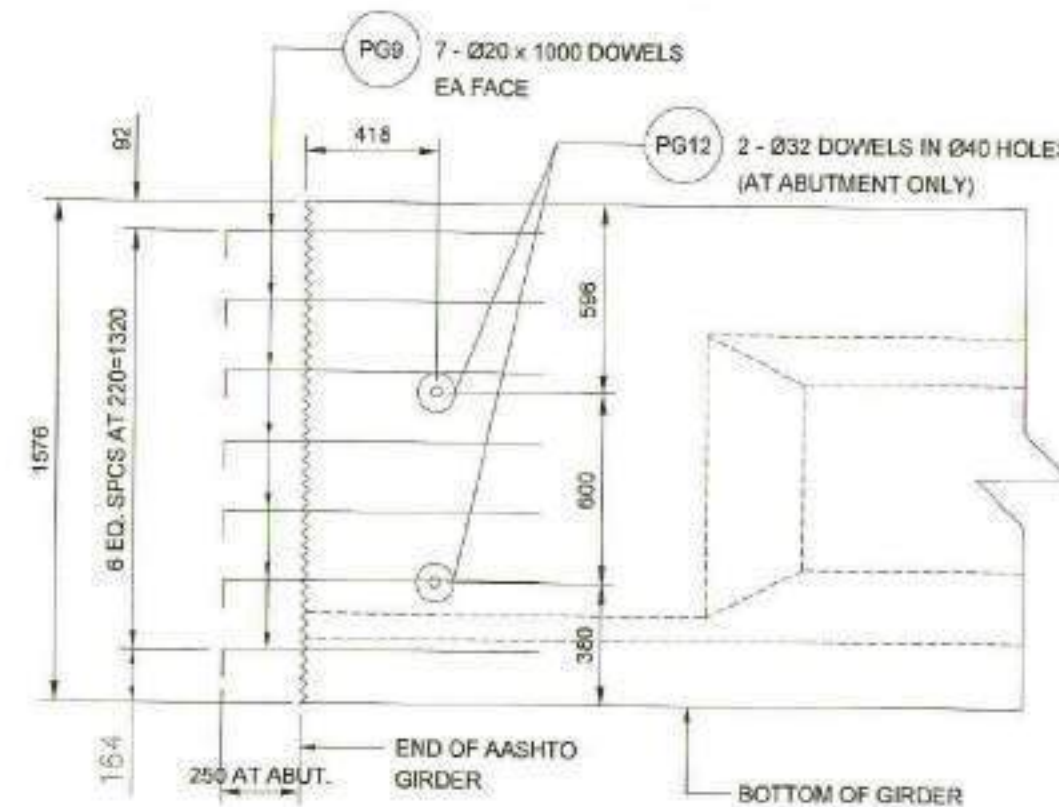
2 SECTION AT MIDSPAN
SCALE 1:20



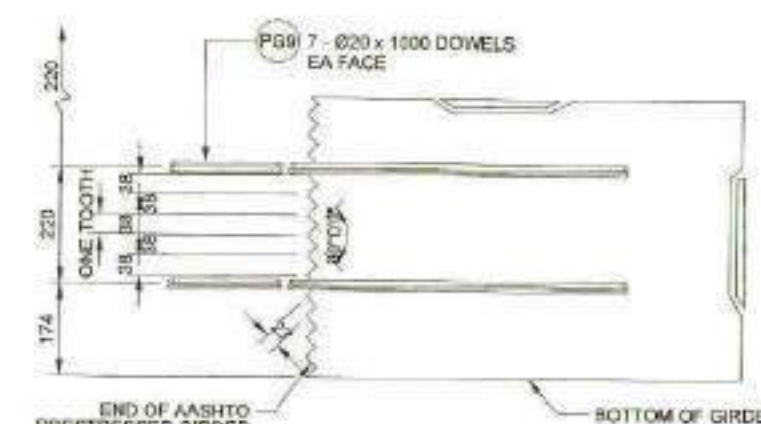
3 SECTION AT ENDS
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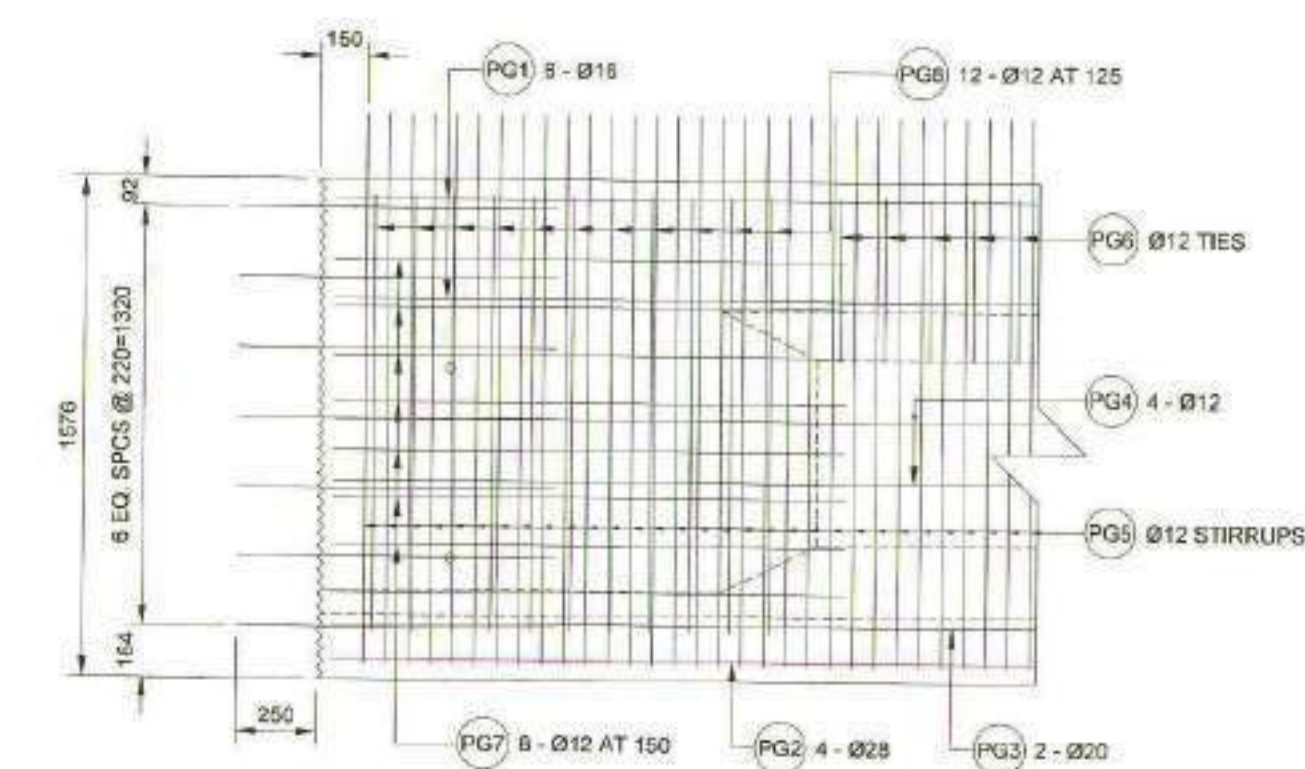
4 TOOTH AT END VIEW
SCALE 1:20



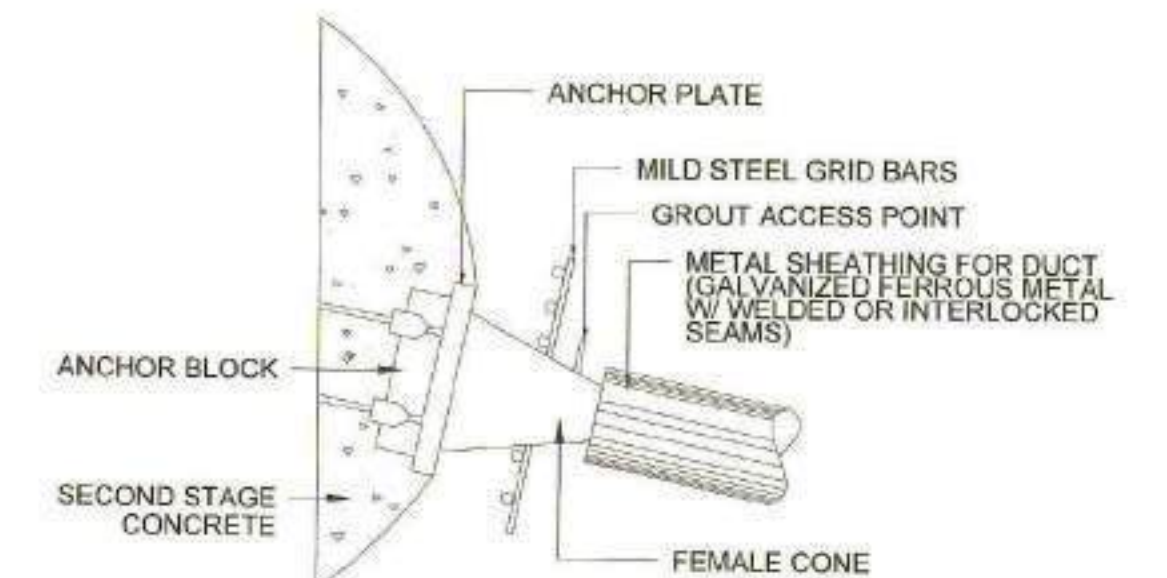
5 DOWELS AT END BLOCK
SCALE 1:25



6 TOOTH DETAIL
SCALE 1:10



7 END BLOCK REINFORCEMENT DETAIL
SCALE 1:25



STRESSING END DETAIL



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SHEET CONTENTS:
TYPICAL GIRDER DETAILS

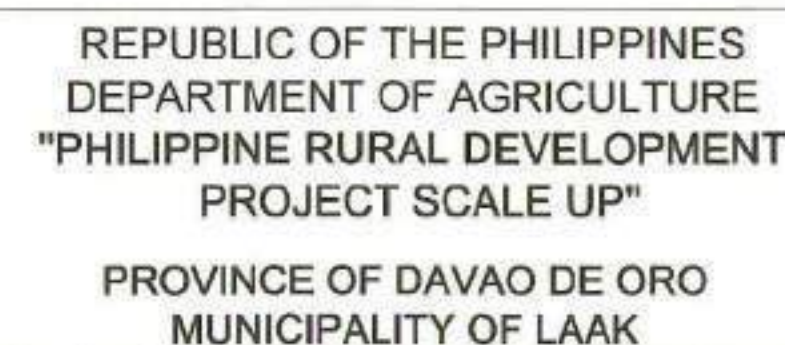
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SHEET NO. 102

- 1.) POST-TENSIONING STEEL TENDONS SHALL BE USED IN THE POST-TENSIONED DESIGNS. ALL NECESSARY ADDITIONAL DETAILS INCLUDING THOSE FOR END ANCHORAGES, METHODS TO BE EMPLOYED AND PROCEDURES TO BE FOLLOWED, SHALL BE AS APPROVED BY THE ENGINEERS. A PORTION OF THE TENDONS SHALL BE DRAPPED LONGITUUDINALLY IN PARABOLIC POSITIONS, ALL TENDONS SHALL BE PLACED SO THAT THEIR CENTER OF GRAVITY WILL BE AT THE POSITION SHOWN ON PLANS. THE TOTAL POST-TENSION FORCE AFTER LOSSES REQUIRED AT MIDSPAN SHALL BE PROVIDED AS CALLED FOR IN THE VARIOUS DESIGNS. THE REQUIRED FORCES AFTER LOSSES SHALL BE OBTAINED BY APPLYING INITIAL TENSILE FORCES OF SUFFICIENT MAGNITUDE TO ALLOW FOR ALL SUBSEQUENT LOSSES, INCLUDING THOSE FOR ELASTIC SHORTENING, SHRINKAGE, CREEP, RELAXATION, FRICTION, AND EFFICIENCY OF END ANCHORAGES. AFTER SECURING THE END ANCHORAGES ALL TENDONS SHALL BE PRESSURE GROUTED IN THEIR CONDUITS IN ACCORDANCE WITH 'SPECIFICATIONS'
- 2.) CONCRETE FOR GIRDER SHALL BE A MINIMUM STRENGTH OF 48.3 N/mm² (7000 PSI) AT THE AGE OF 28 DAYS.
- 3.) CONCRETE FOR CAST-IN-PLACE SLAB HAVE A MINIMUM STRENGTH 21.0 N/mm² (3,000 PSI) AT THE AGE OF 28 DAYS.
- 4.) THE CONTRACTOR MAY PROPOSE ANY ALTERNATIVE TENSION SIZE AND LAYOUT AND SUBJECT SHALL MEET THE APPROVAL OF THE ENGINEER.
- 5.) THE REQUIRED STRENGTH OF CONCRETE AT THE TIME OF TENSIONING SHALL BE 38.64 MPa (5,600 PSI) A GRID CONSISTING OF 12 MM DIA. BARS AT 100 CENTERS IN BOTH DIRECTIONS SHALL BE PLACED NEAR EACH ANCHORAGE OF THE POST-TENSIONING SYSTEM. POST TENSIONING FORCES SHOWN BELOW COMPUTED FOR TENDONS JACKED SIMULTANEOUSLY AT BOTH ENDS, FRICTIONS COEFFICIENTS ARE $K = 0.00001066$ AND $U = 0.25$ WITH AN ANCHORAGE DEFORMATION OF 3mm.
- 6.) HANDLING PRESTRESSED CONCRETE BEAMS: THE BEAMS SHALL BE MAINTAINED IN AN UPRIGHT POSITION AND SHALL BE LIFTED BY SUITABLE DEVICES PROVIDED AT THE ENDS OF THE BEAMS ATTENTION IS DIRECTED TO THE INCREASED DIFFICULTY OF LIFTING BEAMS WITHOUT END BLOCKS THE CONTRACTORS PROPOSED LIFTING DETAILS SHOULD BE GIVEN CAREFUL CONSIDERATION BEFORE BEING SUBMITTED ON SHOP DRAWING FOR APPROVAL. THE USE OF HOLES FOR LIFTING PURPOSES WILL NOT BE PERMITTED.
- 7.) CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER THE CALCULATED ELONGATION OF THE PRESTRESSING TENDONS CORRESPONDING TO THE REQUIRED JACKING FORCES.
- 8.) GROUTING AND FINISHING AFTER PRESTRESSING
GROUTING OF TENDONS SHALL BEGIN WITHIN 24 HOURS AFTER PRESTRESSING UNLESS OTHERWISE APPROVED BY THE ENGINEER. IMMEDIATELY PRIOR TO GROUTING, ALL DUCTS SHALL BE FLUSHED OUT WITH CLEAN WATER FOLLOWED BY COMPRESSED AIR UNTIL ALL LOOSE PARTICLES ARE REMOVED. GROUT SHALL THEN BE INJECTED BY MEANS OF A PUMP. AN EVEN SLOW CONTINUOUS FLOW OF GROUT SHALL BE MAINTAINED UNTIL THE DUCTS IS COMPLETELY FILLED PURE GROUT ISSUED FROM ALL VENTS AND FLOW FROM OTHER END AND ALL ENTRAPPED AIR HAS BEEN EXPELLED. THE GROUT PRESSURE SHALL THEN BE HELD AT 10.0 LBIN² (7 KG/CM²) FOR AT LEAST ONE MINUTE AFTER WHICH END SHALL BE PLUGGED. THE QUANTITY OF GROUT AVAILABLE FOR IMMEDIATE USE SHALL BE SUCH AS TO ENABLE THE GROUTING OF A WHOLE DUCT WITHOUT INTERRUPTION. STRANDS SHALL NOT BE CUT OR BENT UNTIL SEVEN DAYS AFTER GROUTING THE TENDONS SHALL BE CUT TO GIVE, WHEN RECESSES ARE CONCRETED, A MINIMUM OF 25mm COVER.

SPAN LENGTH (M)	AASHTO GIRDER TYPE	F (kN)	JACKING FORCE PER GIRDER (kN)
30.00	IV-B	4,008	4,786



STRUCTURE COMPONENT		CONCRETE VOLUME (m ³)	REINF. SCHEDULE AND ESTIMATED QUANTITIES FOR ONE(1) GIRDER													
			MARK	SIZE (mm)	QTY.	SPACING (mm)	SHAPE	BAR DIMENSIONS (mm)					LENGTH (m)	TOTAL LENGTH	UNIT WEIGHT	TOTAL WEIGHT
								a	b	c	d	e				
PCDG TYPE IV-B L=30m	18.66	PG1	20	8	AS SHOWN	A	28300	-	-	-	-	28.300	175.80	2.466	434	
		PG2	28	4	AS SHOWN	A	28300	-	-	-	-	28.300	117.20	4.833	586	
		PG3	20	2	AS SHOWN	A	28300	-	-	-	-	28.300	58.60	2.466	145	
		PG4	12	4	AS SHOWN	A	28300	-	-	-	-	28.300	117.20	0.888	104	
		PG5	12	169	AS SHOWN	C	170	1368	324	132	561	2.955	673.61	0.888	776	
		PG6	12	169	AS SHOWN	E	432	337	260	-	-	1.802	301.16	0.888	267	
		PG7	12	16	150	D	432	1300	350	-	-	2.082	33.31	0.888	30	
		PG8	12	24	125	B	408	1372	-	-	-	3.152	75.65	0.888	67	
		PG9	20	28	AS SHOWN	A	1000	-	-	-	-	1.000	28.00	2.466	69	
		PG10	28	4	AS SHOWN	A	603	-	-	-	-	0.803	3.82	4.833	17	
		PG11	28	4	AS SHOWN	F	250	400	-	-	-	0.850	3.90	4.833	19	
		PG12	32	2	AS SHOWN	A	810	-	-	-	-	0.910	3.64	6.313	23	
													TOTAL	2.917		



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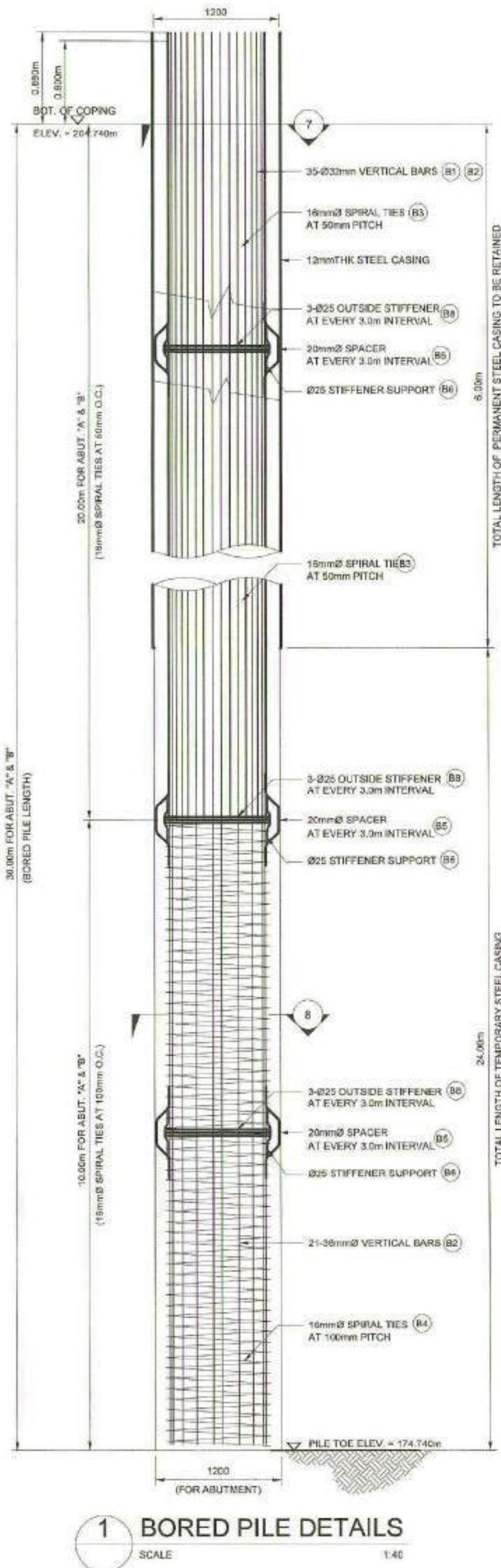
RECOMMENDING APPROVAL:
 ALICIA M. GRACIADAS CO - PPMIU

SHEET CONTENTS:

GIRDER DESIGN GUIDE
AND QUANTITIES

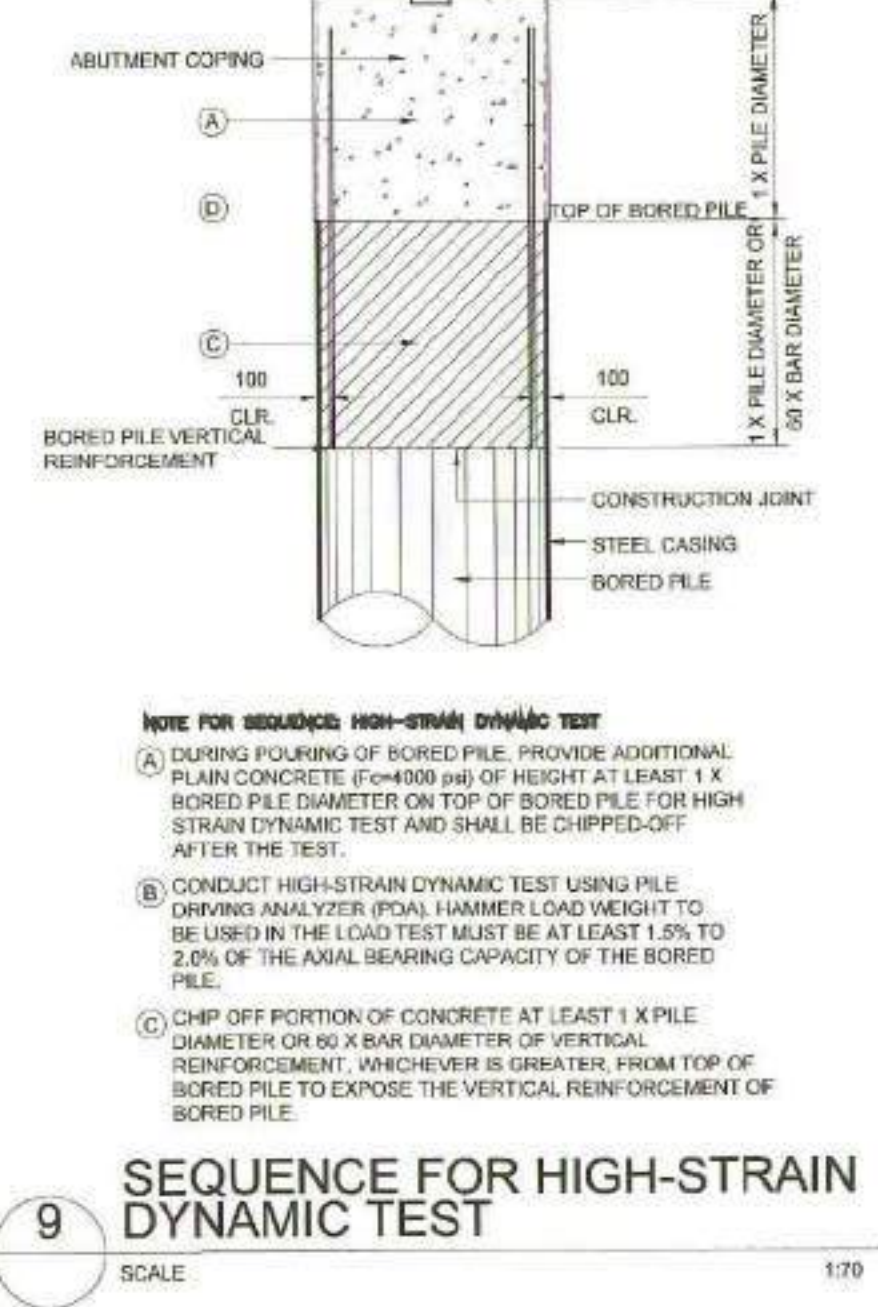
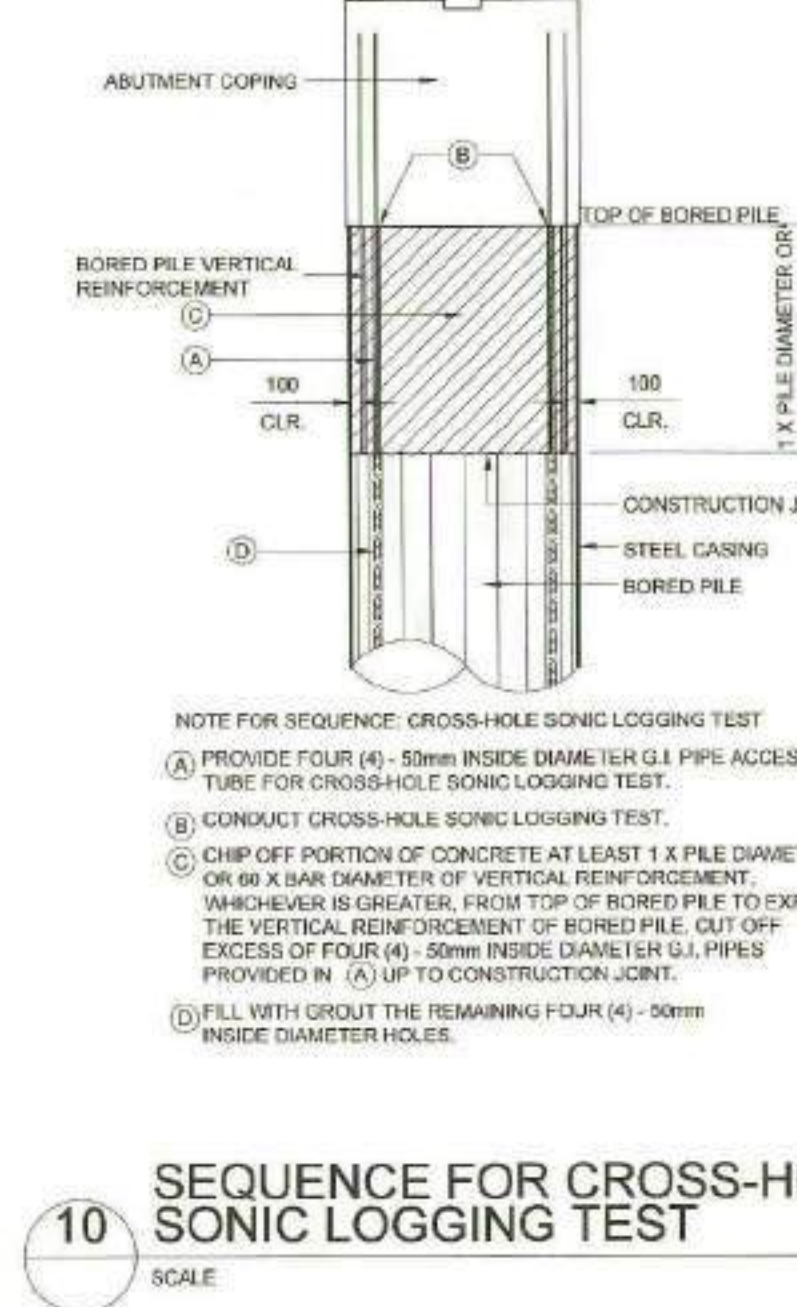
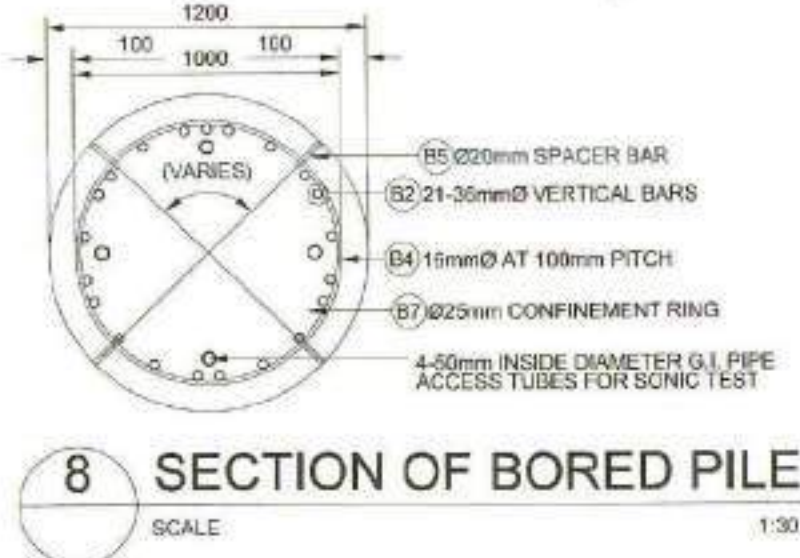
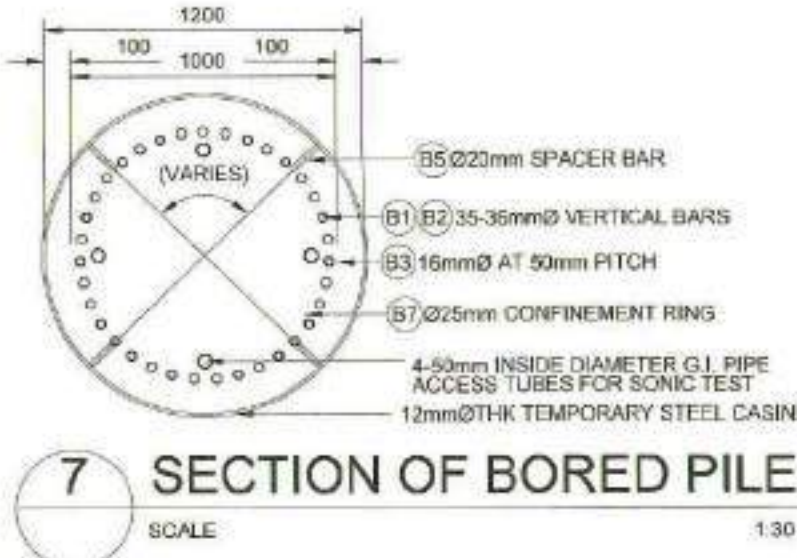
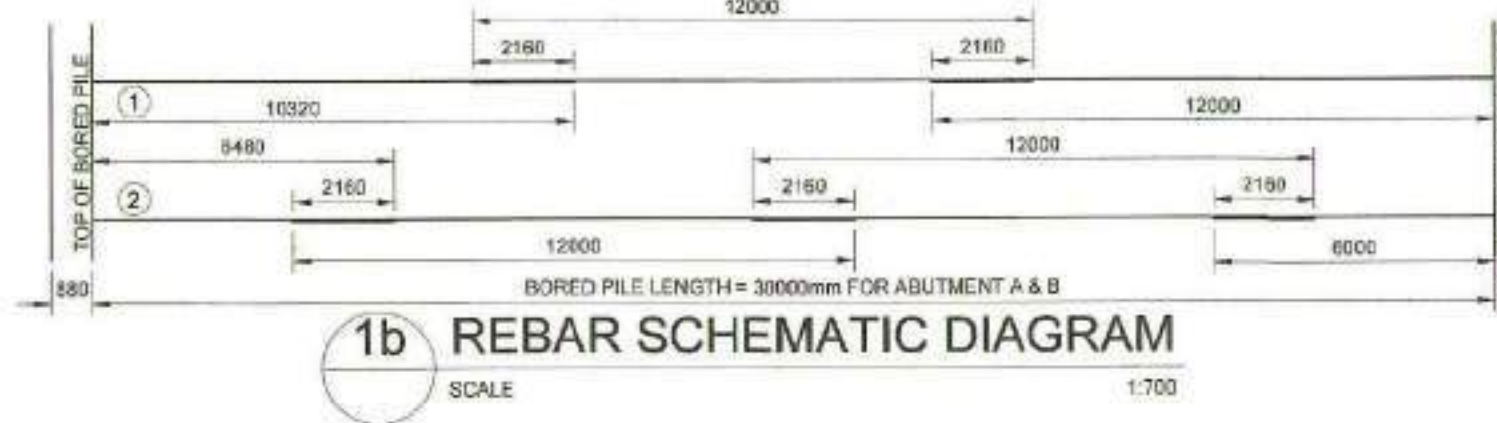
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REINFORCEMENT SCHEDULE AND ESTIMATED QUANTITIES FOR ABUTMENT ONE (1) BORED PILE ONLY

STRUCTURE COMPONENT	BOREDPILE DIAMETER (m)	CONCRETE VOLUME (m ³)	MARK	SIZE (mm Ø)	QTY.	SPACING (mm)	SHAPE	REINFORCEMENT BAR DIMENSIONS (mm)				LENGTH PER BAR (m)	LAP LENGTH (m)	TOTAL LENGTH/BAR (m)	TOTAL LENGTH (m)	UNIT WEIGHT (kg/m)	TOTAL WEIGHT (kg)		
								a	b	c	d								
BOREDPILE	1.200	33.93	B1	36	14	AS SHOWN	(A)	20.880	300	-	-	21.180	2.16	23.340	326.76	7.991	2,611		
			B2	36	21	AS SHOWN	(A)	30.880	300	-	-	31.180	4.32	35.500	745.50	7.991	5,957		
			B3	16	1	AS SHOWN	(B)	600	90	-	-	1,046.751	90.24	1,136.991	1,136.99	1.579	1,800		
			B4	16	1	AS SHOWN	(B)	800	100	-	-	251.526	21.12	272.646	272.65	1.579	431		
			B5	20	40	AS SHOWN	(D)	150	160	200	-	0.820	-	0.820	32.80	2.466	81		
			B6	25	40	AS SHOWN	(D)	100	50	100	-	0.400	-	0.400	16.00	3.854	62		
			B7	25	10	AS SHOWN	(C)	900	-	-	-	2.827	-	2.827	28.27	3.854	109		
			B8	25	30	AS SHOWN	(C)	1,000	-	-	-	3.142	-	3.142	94.25	3.854	363		
			SUB-TOTAL																11,414
			GRADE 60																2,231
GRADE 40																9,183			



NOTES:

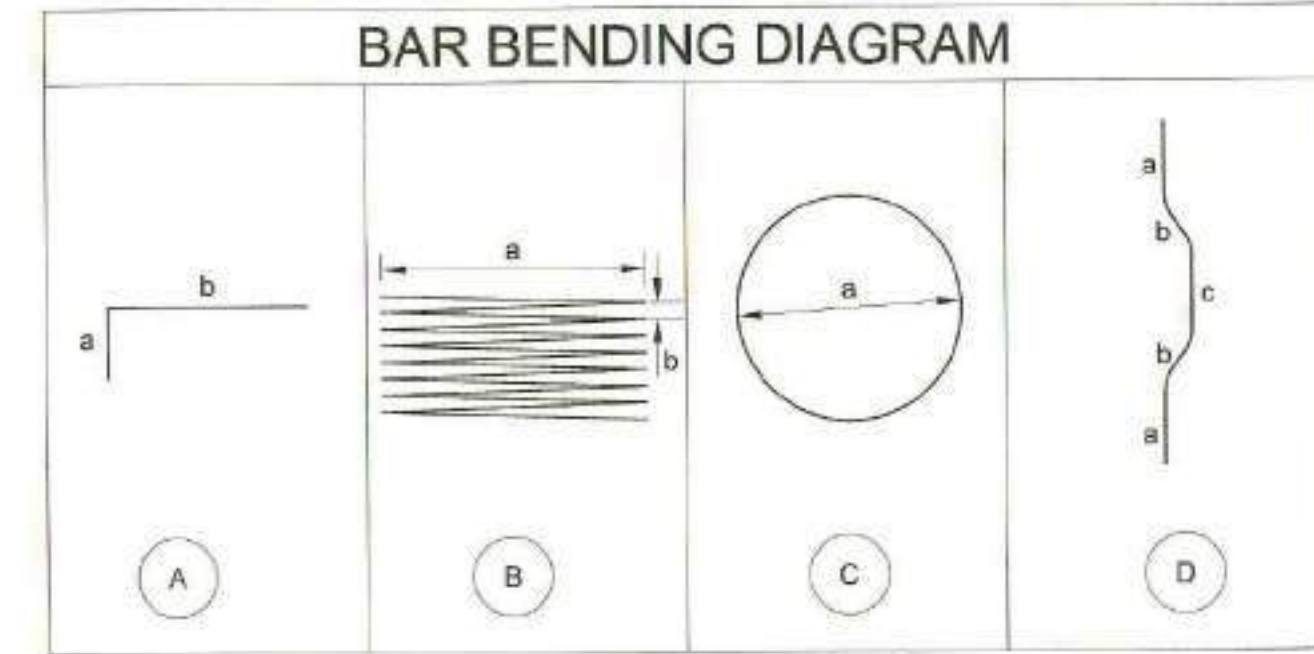
- 1) CONCRETE SHALL BE CAST IN ONE POURING FOR THE FULL LENGTH OF EACH PILE BY THE USE OF TREMIE. BOTTOM OF DRILLED HOLE SHALL BE CLEANED AND FREE OF DEBRIS OR ANY LOOSE MATERIALS BEFORE POURING OF CONCRETE.
- 2) THE SPlicing OF MAIN REINFORCING BAR SHALL BE 60 X BAR DIAMETER AND THE SEQUENCE OF PLACEMENT SHALL BE DONE ALTERNATELY, IT MAY BE BUNDLED OR NOT.
- 3) CONFINEMENT RING AND SPACERS EVERY 3000mm
- 4) CUT-OFF LENGTH: 880mm
- 5) LAP SPLICE FOR SPIRAL MIN. 960mm
- 6) SPIRAL PITCH AT LOCATION OF SPlicing SHALL BE AT MAXIMUM OF 75mm
- 7) USE BENTONITE SLURRY TO STABILIZE SOIL WALL DURING DRILLING AND CONCRETE POURING

MATERIALS

- 1) CONCRETE SHALL BE CLASS "A" WITH $f_c=14\text{MPa}$ (4000psi) AT 28 DAYS AND WITH 20mm MAXIMUM COARSE AGGREGATE
- REINFORCING STEEL BARS SHALL BE GRADE 60 ($f_y=414\text{MPa}$), DEFORMED TYPE

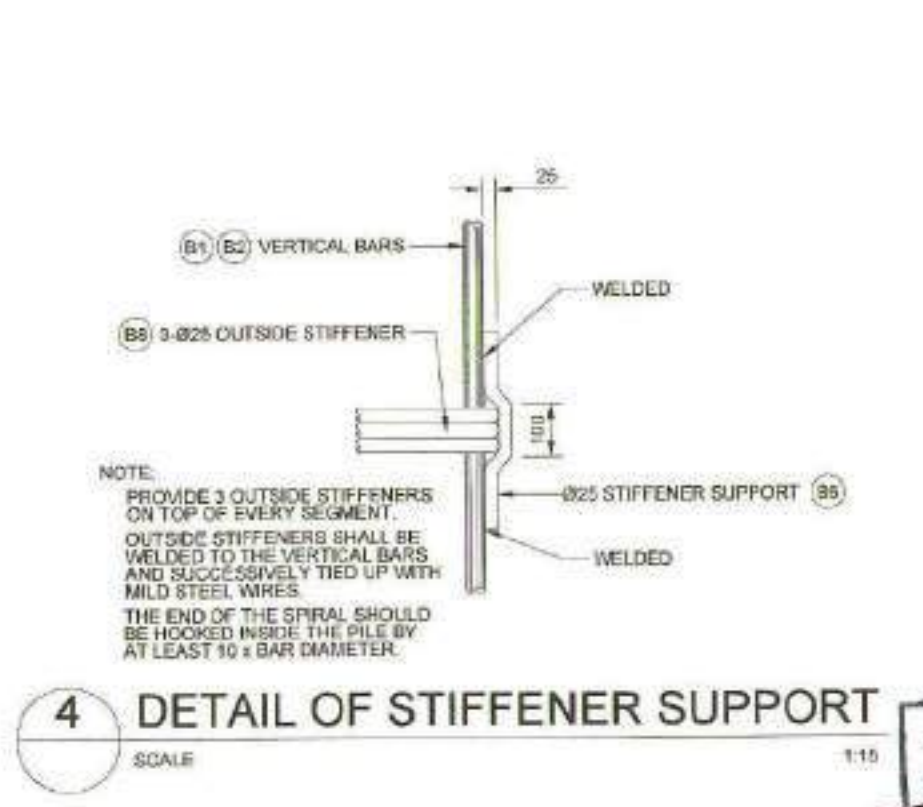
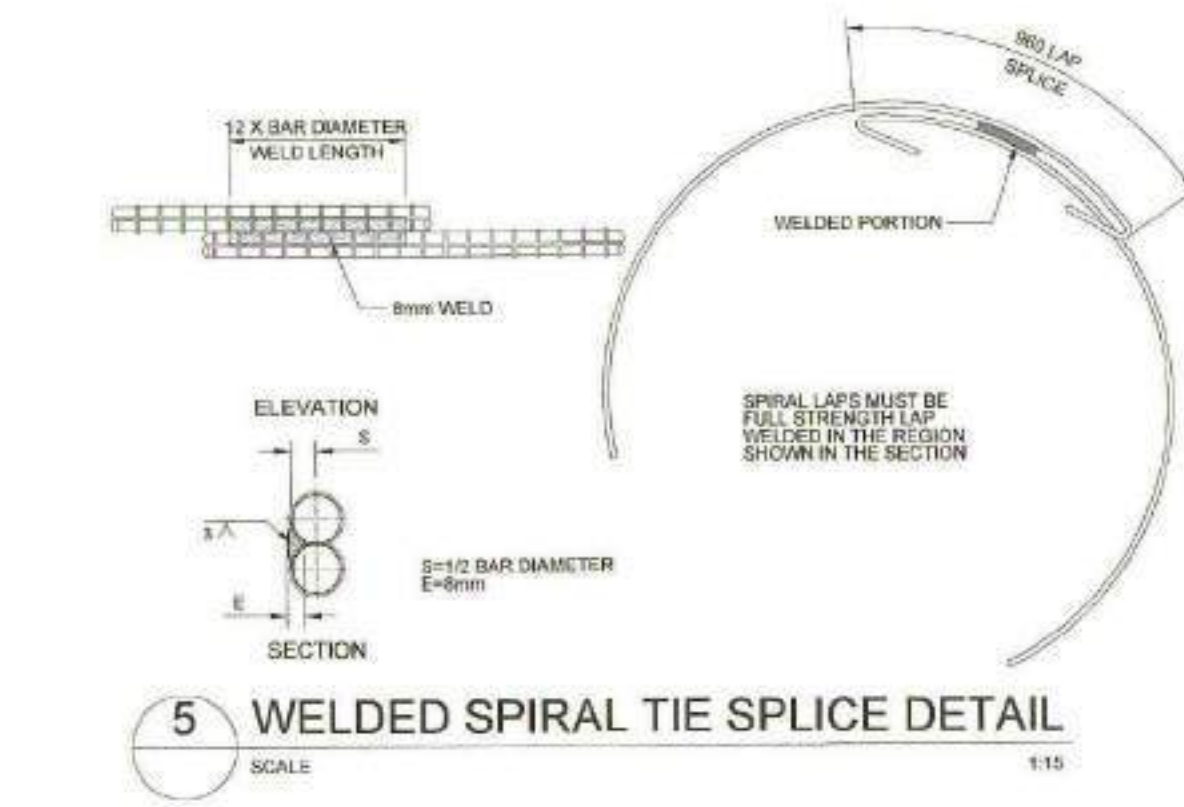
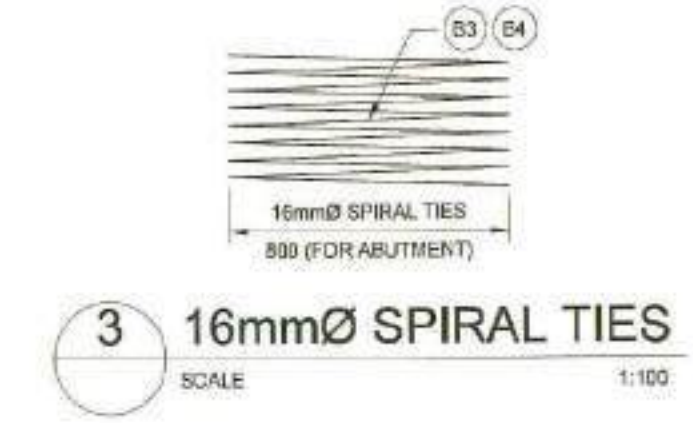
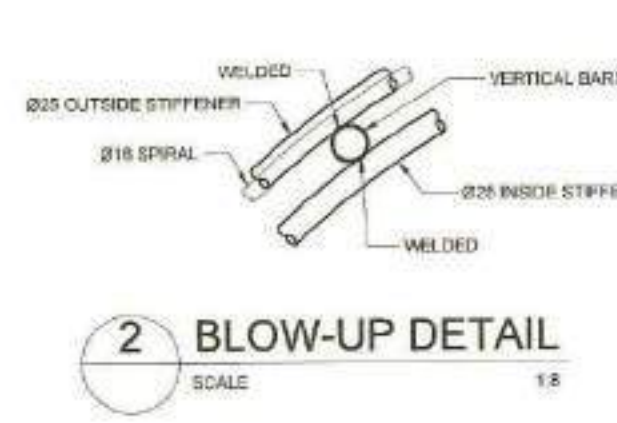
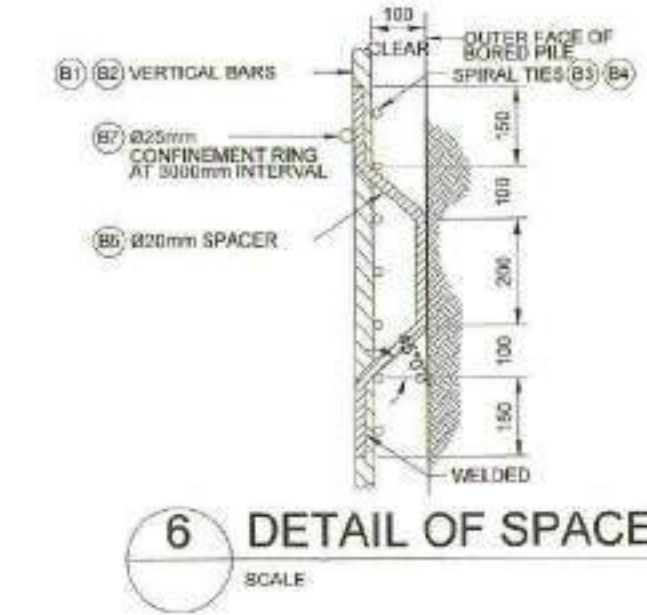
COLUMN AND BORED PILE SCHEDULE

MARK	COLUMN DIAMETER (mm)	COLUMN LENGTH (mm)	BORED PILE LENGTH (mm)	BORED PILE DIMENSION (mm)	PILE TOE ELEVATION (m)	Pu AXIAL LOAD (KN)
ABUT "A"	-	-	30,000	1,200	180.972	4,700
ABUT "B"	-	-	30,000	1,200	180.972	4,700



TEST PILE PREPARATION

PILES INTENDED FOR SONIC LOGGING TEST ARE INSTALLED WITH 50mm INSIDE DIAMETER G.I. PIPE ACCESS TUBES AT QUADRANT LOCATION. MINIMUM THICKNESS OF THE TUBE IS ABOUT 5mm. THESE TUBES ARE PREPLACED AS ATTACHED TO THE REINFORCING CAGE PRIOR TO CONCRETING. THE TUBES ARE INSTALLED CONTINUOUSLY FROM BOTTOM TO THE TOP OF THE PILE AND PARALLEL TO EACH OTHER. THE BOTTOM ENDS OF THE TUBES ARE PROVIDED WITH SEALED CAP OR PLUGGED TO AVOID INTRUSION AND CONTAMINATION OF CONCRETE DURING POURING AND VIBRATION. THE TUBES ARE FITTED WITH ROBUST COUPLINGS FOR EXTENSION TO ENSURE THAT THEY REMAIN WATERTIGHT AND TO PREVENT SLURRY AND GROUT INGRESS DURING POURING AND CURING OF THE CONCRETE. THE TOP OF THE TUBES ARE PLUGGED OR SECURED TO PREVENT ENTRY OF FOREIGN OBJECTS, WHICH COULD BLOCK THE TUBES PRIOR TO TESTING.



RPC XI
NO OBJECTION
SIGNATURE:
BUILD Component Head



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SHEET CONTENTS: 1.20M Ø BORED PILE DETAIL
BORED PILE QUANTITY & SEQUENCE
FOR TEST (FOR ABUTMENTS)

SHEET NO. 45
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