

**THE DETAILED DESIGN STUDY
ON
THE OUTER CIRCULAR HIGHWAY
TO
THE CITY OF COLOMBO**

**FINAL REPORT
(FOR NORTHERN SECTION 1)**

**VOLUME VI - 1/3:
DRAWINGS - GENERAL**

8 of 10

February 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

Oriental Consultants Company Limited

Pacific Consultants International

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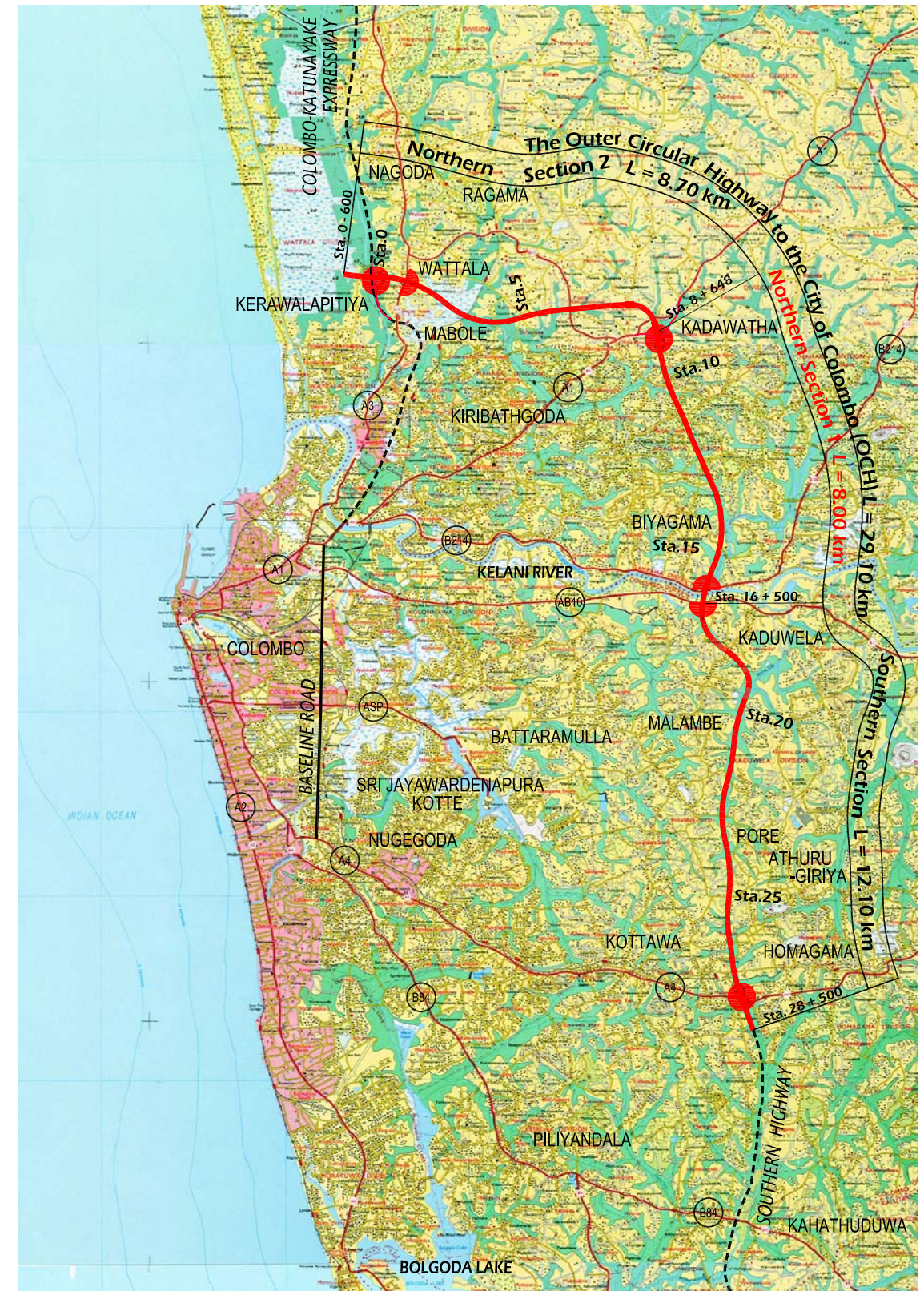
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A. GENERAL

LOCATION MAP FOR THE OUTER CIRCULAR HIGHWAY

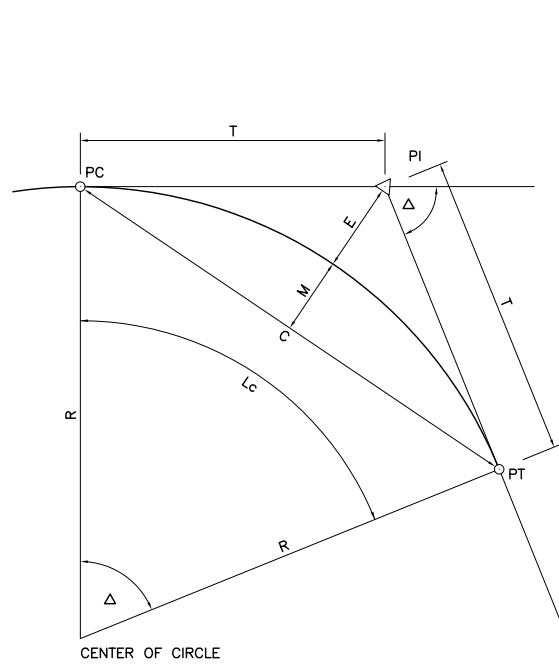


THE OUTER CIRCULAR HIGHWAY
L = 29.1 km



L E G E N D

Ground Control Points		Structures		Structures		Vegetation / Land Use	
G 10 21.651	GPS Control Points	HT	High Tension Line with Pylon or Pole	Step	Stone or Concrete Step	P	Paddy
BM 17 10.571	Benchmark	PS	Power Substation		Large Tree (More 1.5m Diameter)	Mar	Marshy
T 241	Traverse Point	EF	Electrical Transformer		Bo-Tree	Rb	Rubber
15.47	Spot Height	ECB	Electrical Cable Box		Manhole (Electricity)	Scr	Scrub/Bush
Topography		TB	Telephone Box		Manhole (Telecom)	Gn	Garden
	Intermediate Contour (0.5)	PB	Post BOX		Manhole (Drainage)	Cin	Cinnamon
	Index Contour (0m,2.5m,5m,7.5m....)	TS	Traffic Signal	WV	Water Valve	C	Coconut
	Supplemental Contour	LP	Lamp Post	FH	Fire Hydrant	Tea	Tea
	Contour Number	EP	Electric Post	VP	Vent Pipe	Pla. Cul	Plantation / Cultivated Land
	Steep Slope (Artificial)	TP	Telecom Post		Well (Earth)	F	Forest
	Rock/Outcrop	RDA	Road Boundary Stone		Well (Masonry)	Cem	Cemetery
Road/Railway/Stream		KP.MP	Kilometer / Mile Post		Well (Concrete)	Oa	Open Area
	Existing Road / Track / Footpath	SB	Sign Board	Buildings		Cy	Container Yard
	Side Walk		Bus Shelter		Tiled Roofed House		
	Railway		Wire Fence		Tiled Roofed Shop		
	Bridge		Hedges		Tiled Roofed Boutique		
	River/Stream		Water Pipe Line		Asbestos Roofed House		
	Irrigation Canal		Oil Pipe Line	Toilet	Toilet		
	Weir / Dam	WT	Water Tank		Shanties		
	Sluice Gate	OT	Oil Tank		Shed (Structure without wall)		
	Existing Pipe Culvert	Tow	Tower (Telecom.Bell.etc.)		Concrete Building		
	Existing Box Culvert		Boundary Wall (Masonry)		Under Construction		
	Drain of Road Side		Boundary Wall (Wooden)				
			Retaining Wall (Concrete)				



HORIZONTAL CURVE

FORMULA :

$$T = R \tan \frac{\Delta}{2}$$

$$LC = R \frac{T}{180} \Delta$$

$$C = 2R \sin \frac{\Delta}{2}$$

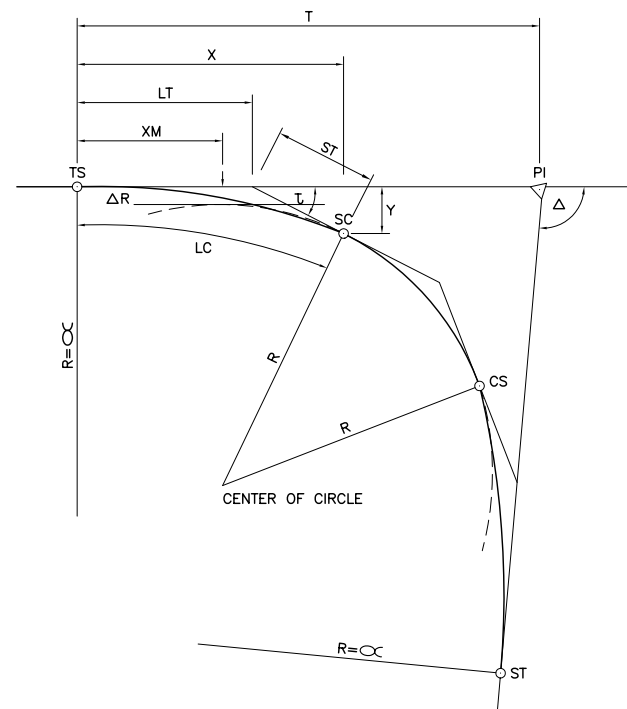
$$E = R(\sec \frac{\Delta}{2} - 1)$$

$$M = R(1 - \cos \frac{\Delta}{2})$$

LEGEND :

- PI = POINT OF INTERSECTION
- Δ = DEFLECTION ANGLE
- PC = POINT OF CURVATURE
- PT = POINT OF TANGENCY
- T = TANGENT DISTANCE
- R = RADIUS OF CURVE
- E = EXTERNAL DISTANCE
- M = MIDDLE ORDINATE
- C = LENGTH OF CHORD
- L = LENGTH OF CURVE
- Da = DEGREE OF CURVE (ARC DEFINITION)
- BP = BEGINNING POINT
- EP = END POINT

HORIZONTAL CURVE ELEMENT



SPIRAL CURVE

FORMULA :

$$l = \frac{180LC}{2\pi R}$$

$$X = LC(1 - \frac{LC^2}{40R^2} + \frac{LC^4}{3456R^4} - \frac{LC^6}{599040R^6} + \dots)$$

$$Y = \frac{LC^2}{6R} (1 - \frac{LC^2}{56R^2} + \frac{LC^4}{7040R^4} - \frac{LC^6}{1612800R^6} + \dots)$$

$$TL = X - Y \cos l$$

$$\Delta R = Y + R \cos l - R$$

$$XM = X - R \sin l$$

$$T = XM + (R + \Delta R) \tan \frac{\Delta}{2} \text{ (FOR EQUAL LC)}$$

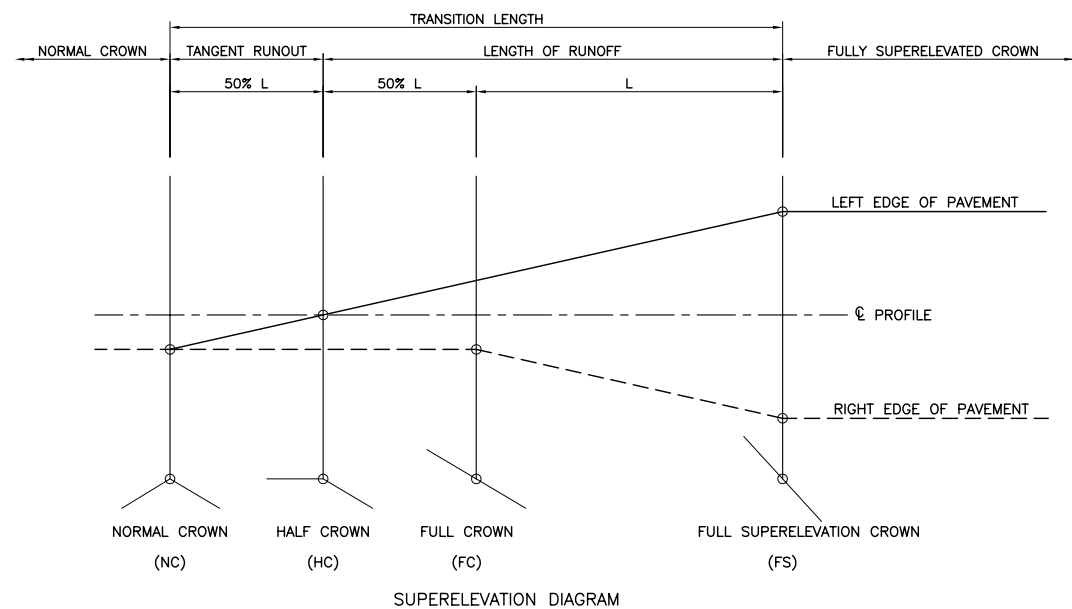
FOR DIFFERENT LC

$$T1 = XM1 + RT \tan \frac{\Delta}{2} + \frac{\Delta R2}{\sin \Delta} - \frac{\Delta R1}{\tan \Delta}$$

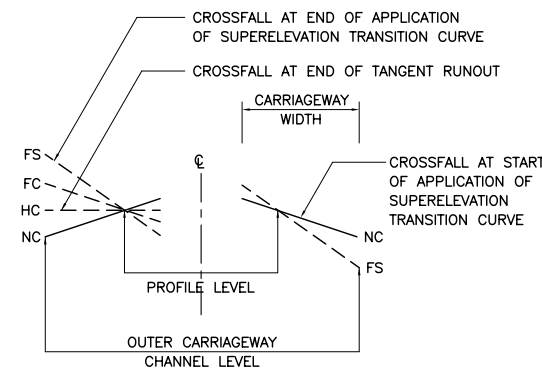
$$T2 = XM2 + RT \tan \frac{\Delta}{2} + \frac{\Delta R1}{\sin \Delta} - \frac{\Delta R2}{\tan \Delta}$$

LEGEND :

- PI = POINT OF INTERSECTION
- TS = TANGENT TO SPIRAL POINT
- SC = SPIRAL TO CURVE POINT
- CS = CURVE TO SPIRAL POINT
- ST = SPIRAL TO TANGENT POINT
- R = RADIUS OF CURVE
- Δ = TOTAL DELTA ANGLE
- LT = LONG TANGENT
- ST = SHORT TANGENT
- T = TOTAL TANGENT LENGTH
- X = THE DISTANCE, IN THE DIRECTION OF THE TANGENT, FROM THE BEGINNING OF THE SPIRAL TO THE END
- Y = THE DISTANCE, PERPENDICULAR TO THE TANGENT, FROM THE BEGINNING OF THE SPIRAL TO THE END
- ΔR = THE OFFSET OF THE TANGENT LINE TO THE PC OF THE SHIFTED CIRCULAR CURVE



SUPERELEVATION DIAGRAM



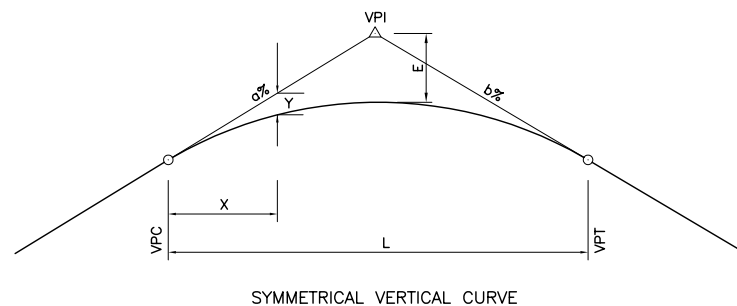
SUPERELEVATION ELEMENT

VALUES FOR DESIGN SUPERELEVATION RELATED TO DESIGN SPEED AND HORIZONTAL CURVATURE

DESIGN SPEED (V) = 80 Km/h	
R (m.)	E (%)
1680	NC
1400	3.0
1190	3.5
1030	4.0
900	4.5
790	5.0
710	5.5
LESS THAN 710	6.0

LEGEND :

- Emax = 8.0%
- NC = NORMAL CROWN SECTION
- R = RADIUS OF CURVE
- E = RATE OF SUPERELEVATION



SYMMETRICAL VERTICAL CURVE

FORMULA :

$$Y = \frac{(b-a)x^2}{200L}$$

$$E = \frac{(b-a)L}{800}$$

$$K = \frac{L}{(b-a)}$$

LEGEND :

- VPI = VERTICAL POINT OF INTERSECTION
- VPC = VERTICAL POINT OF CURVATURE
- VPT = VERTICAL POINT OF TANGENCY
- L = LENGTH OF CURVE
- K = K FACTOR
- E = EXTERNAL DISTANCE
- % = PERCENT GRADE
- (b-a) = ALGEBRAIC DIFFERENCE OF PERCENT GRADIENT

VERTICAL CURVE ELEMENT

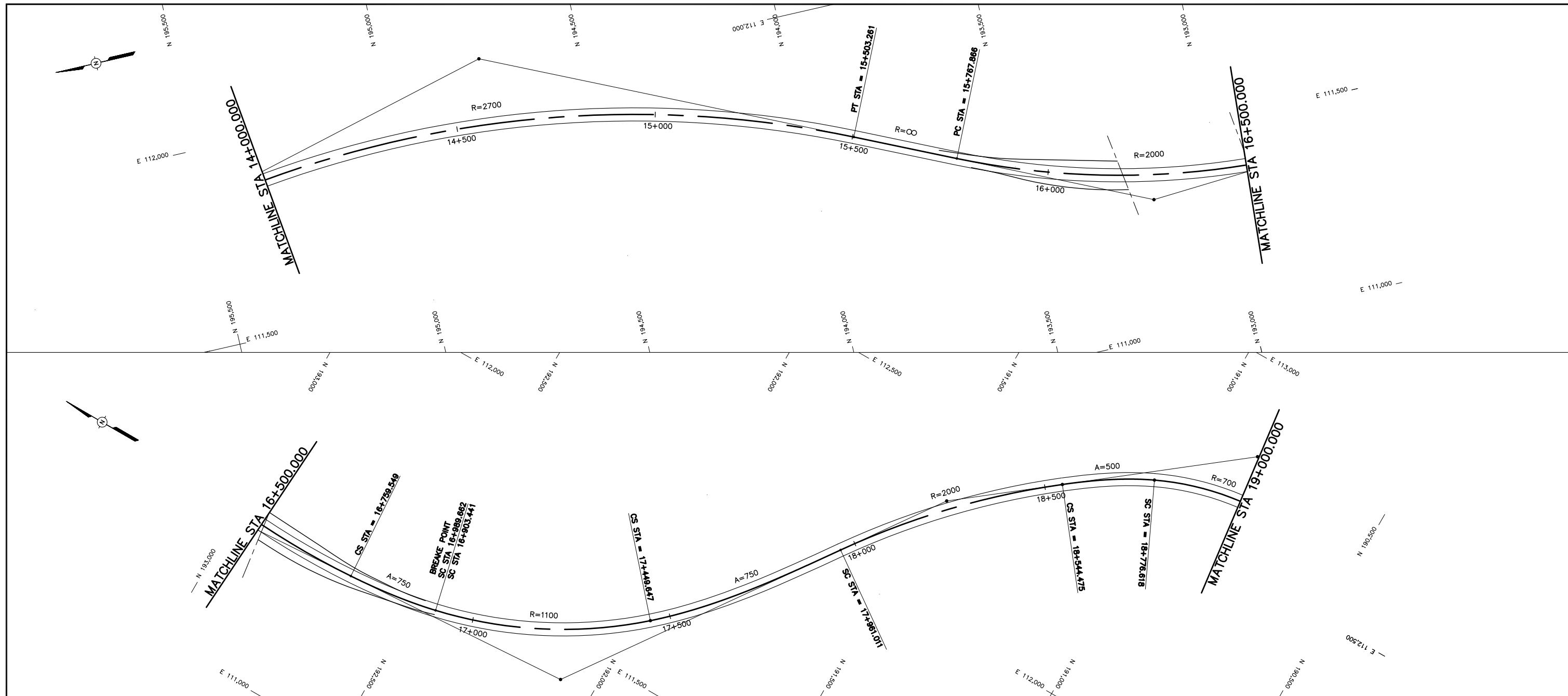
No	REVISION	DATE
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DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	A-03

B. ALIGNMENT LAYOUTS (MAIN CARRIAGEWAY)

ELEMENTS OF CURVE

POINT	STATION	COORDINATES		A	R
		EAST	NORTH		
SC	7+485.879	109,547.028	201,134.380	A=400	
CS	8+258.026	110,117.153	200,672.737		R=700
ST	8+486.597	110,169.148	200,450.436	A=400	
PC (BACK)	9+148.416	110,284.608	199,798.766		R=∞
PC (AHEAD)	9+251.304				
PRC	10+847.142	110,785.499	198,289.465		R=5,500
PRC	11+660.967	111,095.769	197,537.909		R=5,500
PRC	12+484.547	111,410.427	196,777.641		R=5,500
PCC	13+653.506	111,822.552	195,686.091		R=5,500
PT	15+503.261	111,663.500	193,879.286		R=2,700
PC	15+767.866	111,553.110	193,638.808		R=∞
CS	16+759.549	111,375.036	192,673.540		R=2,000
				A=750	

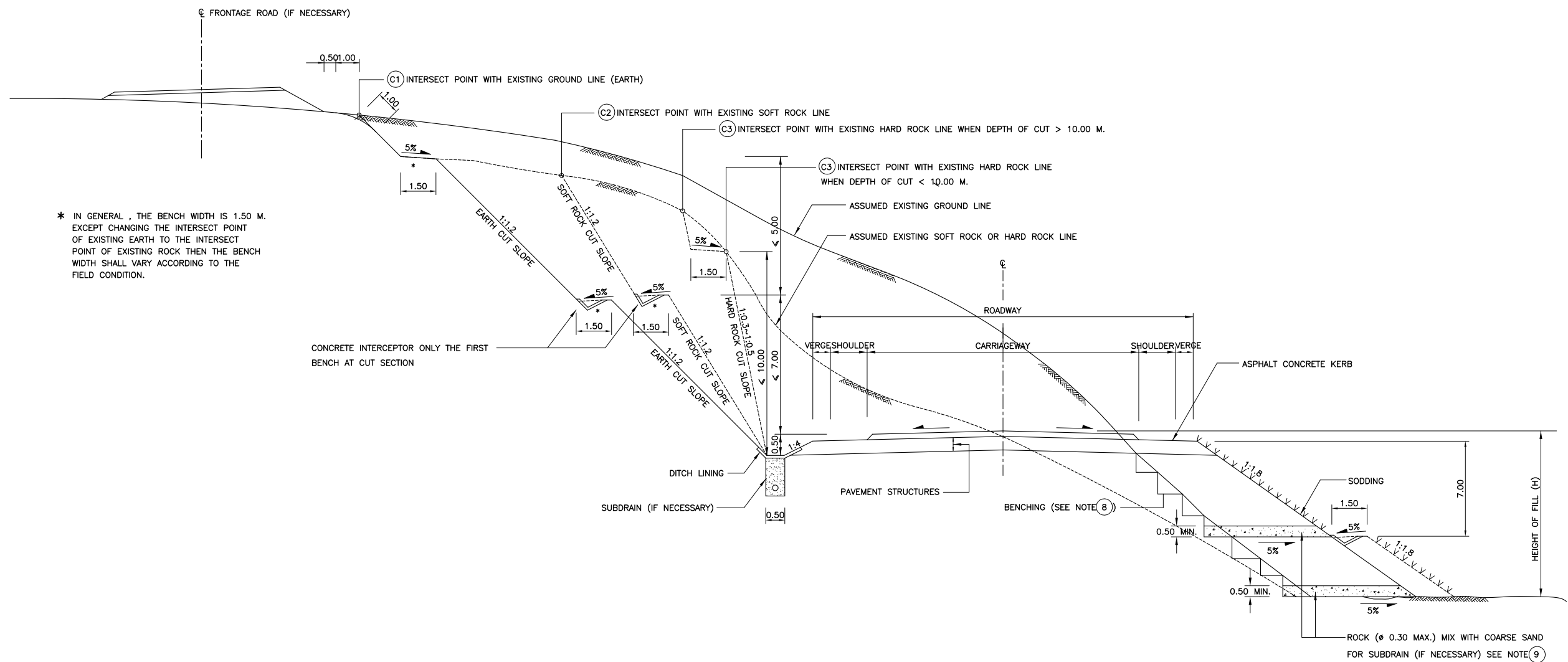


ALIGNMENT LAYOUT
SCALE 1 : 5000

No	REVISION	DATE

DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	B-03

C. TYPICAL CROSS SECTION
(MAIN CARRIAGEWAY)



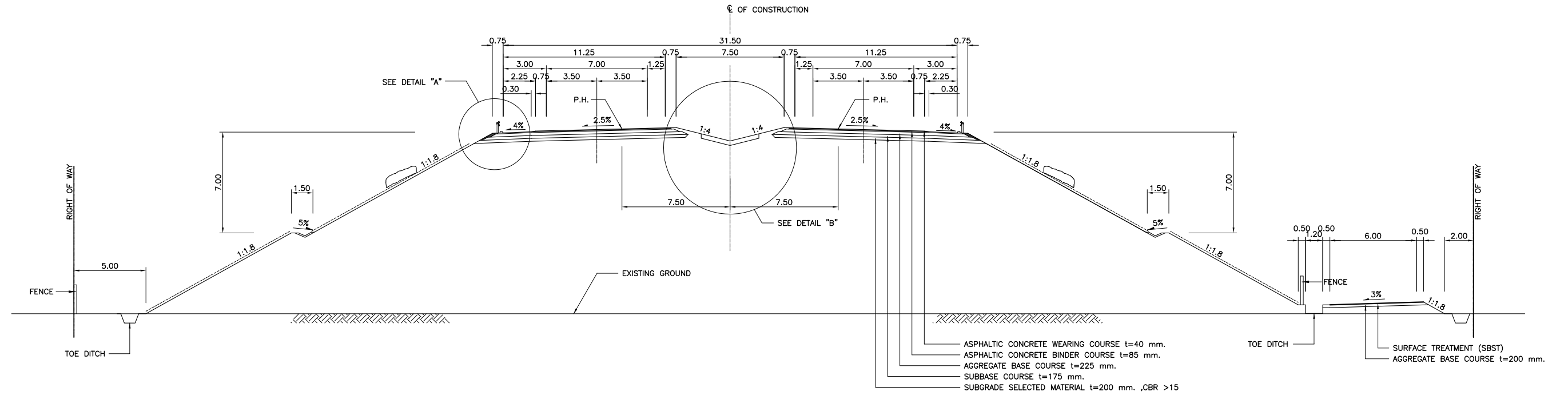
NOTES :

1. DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THE CROSS - SECTION OF CUT AND FILL HEREIN SHALL BE APPLIED ONLY WHEN THE DEPTH OF CUT IS OVER 7.50 METERS FROM THE BOTTOM OF THE SIDE DITCH , AND HILL SIDE FILL ALSO.
3. PAVEMENT STRUCTURES AND OTHER DETAILS WHICH ARE NOT SPECIFIED IN THIS DRAWING SHALL BE REFERED TO THAT IN THE TYPICAL CROSS - SECTION DRAWING.
4. THE PROCESS OF RIPPING AND EXPOSING THE CUT MATERIALS SHALL BE MEASURED AS FOLLOWS :
 - 4.1 IN CASE OF SOIL WITHOUT ANY ROCKS APPEAR ABOVE THE GROUND SURFACE , THE POINT (C1) IN THE DRAWING WILL BE THE INTERSECTING POINT BETWEEN THE SLOPE OF CUT AND THE EXISTING GROUND LINE SO THE EXCAVATION SHALL START FROM THIS POINT.
 - 4.2 AFTER THE EXCAVATION AS INDICATED IN SECTION 4.1 FOR A DISTANCE AND THE SOFT ROCK OR HARD ROCK WAS FOUND , THEN THE TOP POINT OF THE SLOPE SHALL BE CHANGED FROM POINT (C1) TO POINT (C2) OR (C3) AS INDICATED ON THE DRAWING THE BERM WIDTH OF BENCHING SHALL BE DIRECTED BY THE ENGINEER THE STABILITY OF THE CUT SLOPE SHOULD BE CAREFULLY CONSIDERED AND THE UNSUITABLE TOP SOIL MATERIALS SHALL BE REMOVED.
 - 4.3 THE CLASSIFICATION OF COMMON EXCAVATION(SOIL , SOFT ROCK) & HARD ROCK SHALL BE CONSIDERED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION AND ALSO SHALL BE AS DERECTED BY THE ENGINEER.
 - 4.4 THE QUANTITIES SHALL BE CALCULATED FROM THE CROSS - SECTION , SEPARATELY FOR COMMON EXCAVATION(SOIL , SOFT ROCK) & HARD ROCK.
IN CASE OF MIXED MATERIALS FOR EACH CROSS - SECTION , THEN THE NEGOTIATION BETWEEN THE OWNER AND THE CONTRACTOR SHOULD BE ARRANGED.

5. CONCRETE INTERCEPTOR ON CUT SLOPE SHALL BE CONSTRUCTED ON SILTY SAND , GRAVEL LATERITE , SOFT ROCK OR SHALE , BUT BE NOT NECESSARY ON SOLID ROCK AREA.
6. THE LONGITUDINAL SLOPE OF CONCRETE INTERCEPTOR IN NOTE 5 SHALL NOT BE LESS THAN 0.3 PERCENT.
7. THE INTERVAL OF 0.5 cm. WIDE MORTARED JOINT SHALL NOT BE MORE THAN 15.0 m. FOR THE CONCRETE INTERCEPTOR.
8. BENCHING SHALL BE REQUIRED ON EXISTING GROUND SLOPE OR EXISTING ROADBED IN THE PORTION OF EMBANKMENT. THE NUMBER OF STEPS FOR BENCHING DEPENDS UPON THE HEIGHT OF SLOPE. THE HEIGHT OF EACH STEP SHALL BE DIRECTED BY THE ENGINEER , AND THE WIDTH SHALL BE PERMITTED FOR COMPACTION EQUIPMENT , AND THE DENSITY OF THE COMPACTED MATERIAL SHALL BE NOT LESS THAN 95 PERCENT OF STANDARD PROCTOR.
9. BEFORE CONSTRUCTING PAVEMENT STRUCTURES, IF GROUND WATER SEEPAGE APPEARS ON CUT SLOPE OR HILL SIDE FILL AND SEEMS TO DAMAGE THE ROADWAY, THE SUBDRAIN AS SHOWN ON THE DRAWING SHALL BE APPLIED.
10. CONCRETE FOR INTERCEPTORS AND DITCH LIVING SHALL BE GRADE 20.

No	REVISION	DATE

DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	C-01



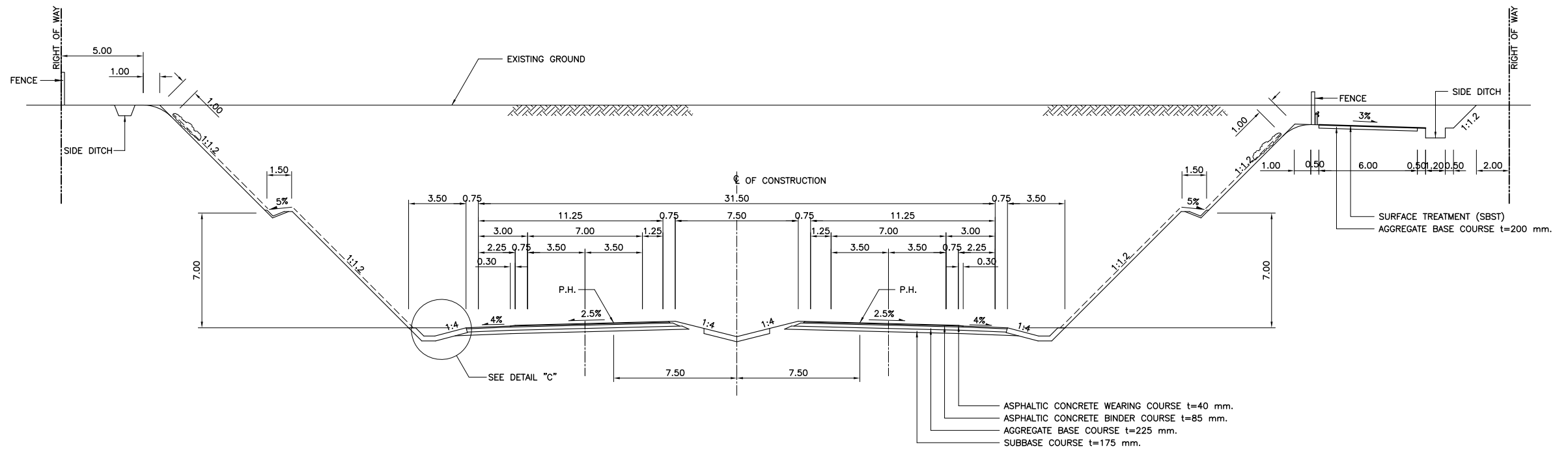
TYPICAL CROSS SECTION (EMBANKMENT)
SCALE 1:300

NOTES :

1. ALL DIMENSION ARE METERS UNLESS OTHERWISE INDICATED.
2. THE SLOPE RATIO SHALL BE DECIDED TAKING INTO ACCOUNT THE SOIL PROPERTIES.
3. DISTANCE FROM THE TOE OF SLOPE TO THE RIGHT OF WAY TO BE 5.00 m. EXCEPT 2.00 m. FROM THE RIGHT OF WAY AT THE FRONTAGE ROAD.
4. IN URBAN AND HIGHLY BUILT UP AREAS, DISTANCE FROM OUTER EDGE OF DRAIN, OUTER EDGE OF DIVISION CANAL OR TOE TO THE RIGHT OF WAY TO BE 0.50 m.

No	REVISION	DATE

DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	C-02



TYPICAL CROSS SECTION (CUT)
SCALE 1:300

NOTES :

1. ALL DIMENSION ARE METERS UNLESS OTHERWISE INDICATED.
2. THE SLOPE RATIO SHALL BE DECIDED TAKING INTO ACCOUNT THE SOIL PROPERTIES.
3. DISTANCE FROM THE EDGE OF ROUNDING AT THE TOP SLOPE TO THE RIGHT OF WAY TO BE 5.00 m. EXCEPT 2.00 m. FROM THE RIGHT OF WAY AT THE FRONTAGE ROAD
4. IN URBAN AND HIGHLY BUILT UP SECTIONS MINIMUM DISTANCE FROM THE EDGE OF THE ROUNDING AT THE TOP SLOPE TO THE RIGHT OF WAY TO BE 1.00 m.

THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHWAYS & ROAD DEVELOPMENT



JICA JAPAN INTERNATIONAL COOPERATION AGENCY

ORIENTAL CONSULTANTS COMPANY LIMITED
in association with
PACIFIC CONSULTANTS INTERNATIONAL

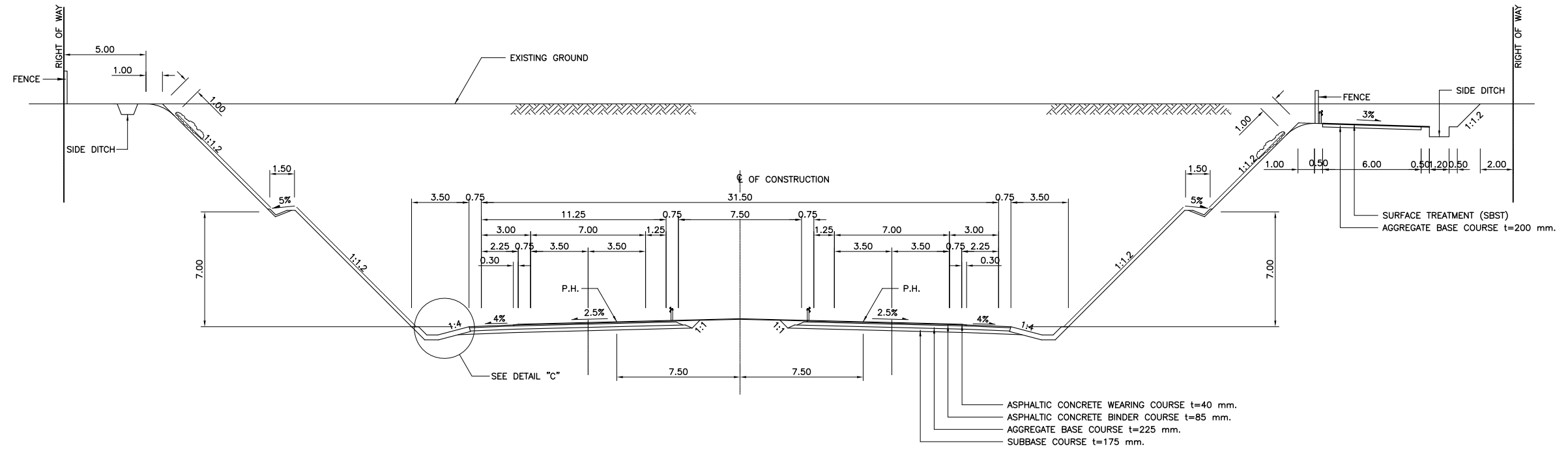


No	REVISION	DATE

COLOMBO OUTER CIRCULAR HIGHWAY PROJECT
(NORTHERN SECTION 1)

TYPICAL CROSS SECTION
FOR EXCAVATION

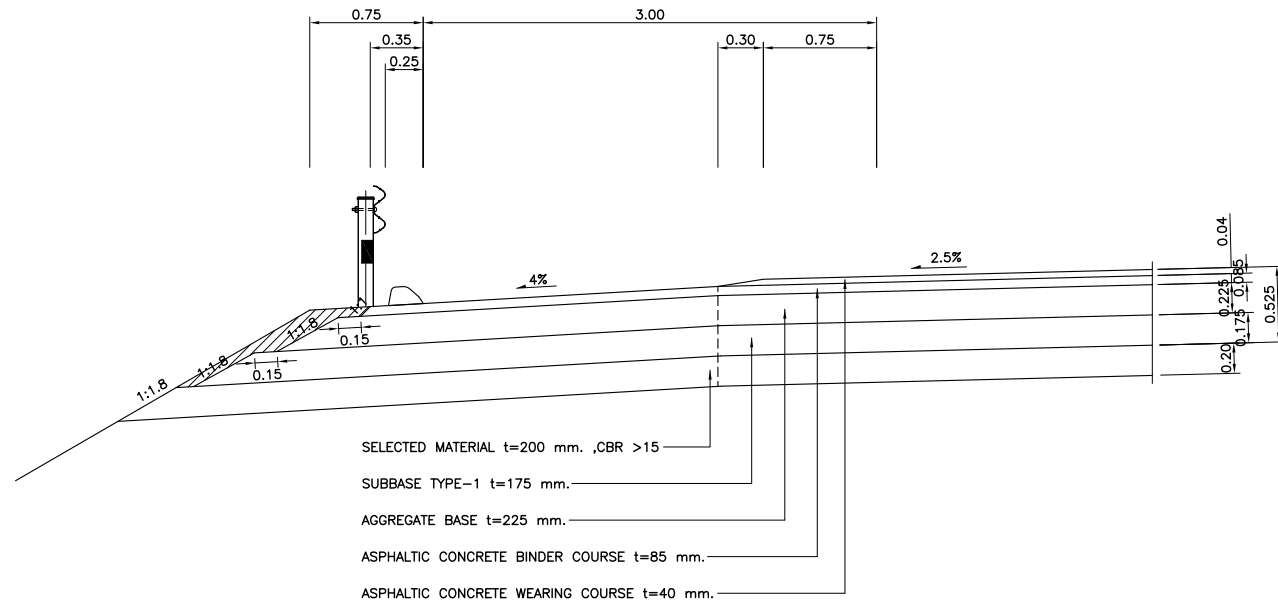
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	C-03



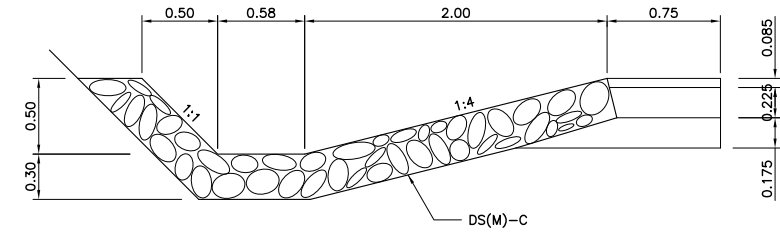
TYPICAL CROSS SECTION (CUT) AT OVERPASS BRIDGE
SCALE 1:300

NOTES :

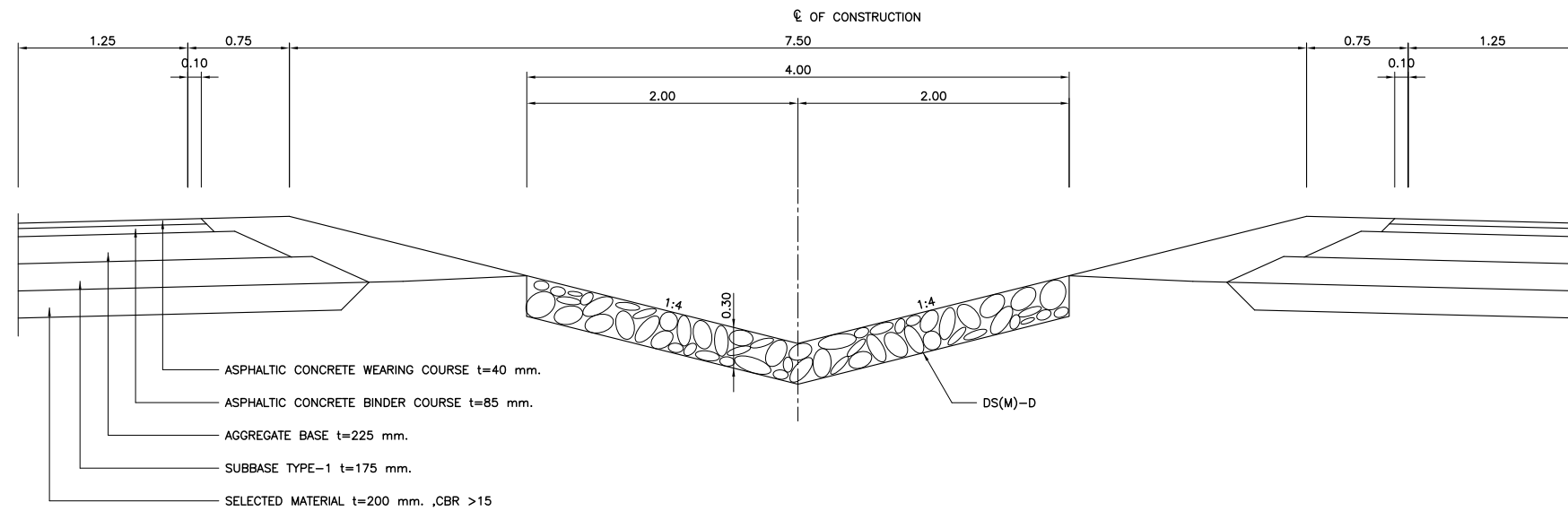
1. ALL DIMENSION ARE METERS UNLESS OTHERWISE INDICATED.
2. THE SLOPE RATIO SHALL BE DECIDED TAKING INTO ACCOUNT THE SOIL PROPERTIES.
3. DISTANCE FROM THE EDGE OF ROUNDING AT THE TOP SLOPE TO THE RIGHT OF WAY TO BE 5.00 m. EXCEPT 2.00 m. FROM THE RIGHT OF WAY AT THE FRONTAGE ROAD
4. IN URBAN AND HIGHLY BUILT UP SECTIONS MINIMUM DISTANCE FROM THE EDGE OF THE ROUNDING AT THE TOP SLOPE TO THE RIGHT OF WAY TO BE 1.00 m.



DETAIL "A"
SCALE 1:50



DETAIL "C"
SCALE 1:50

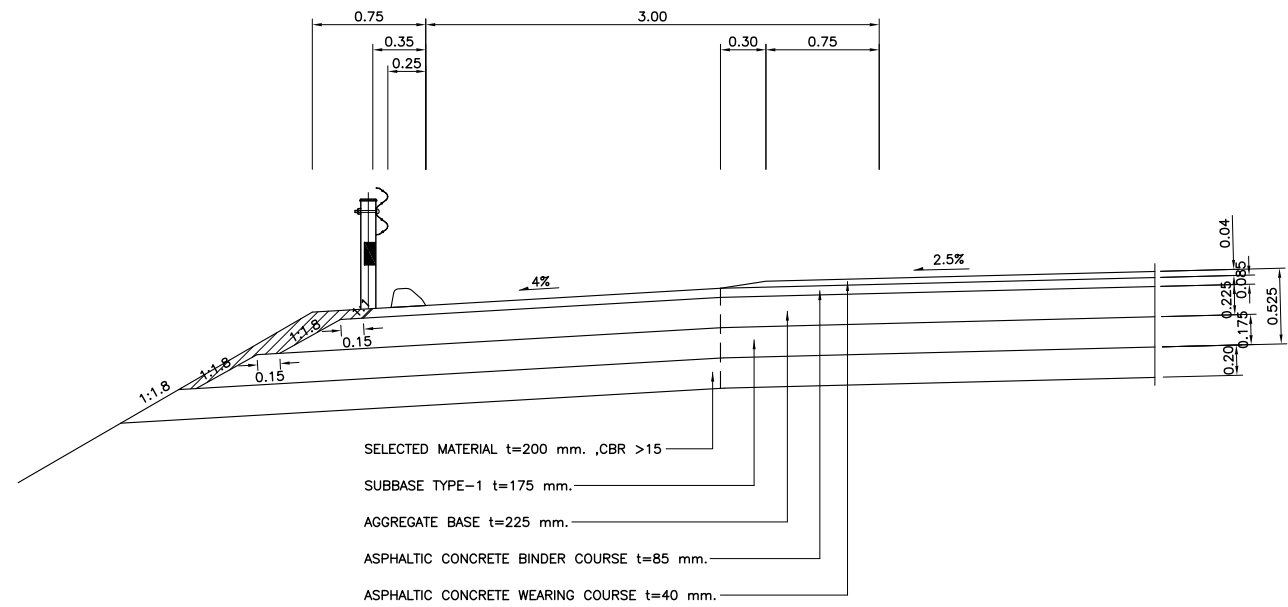


DETAIL "B"
SCALE 1:50

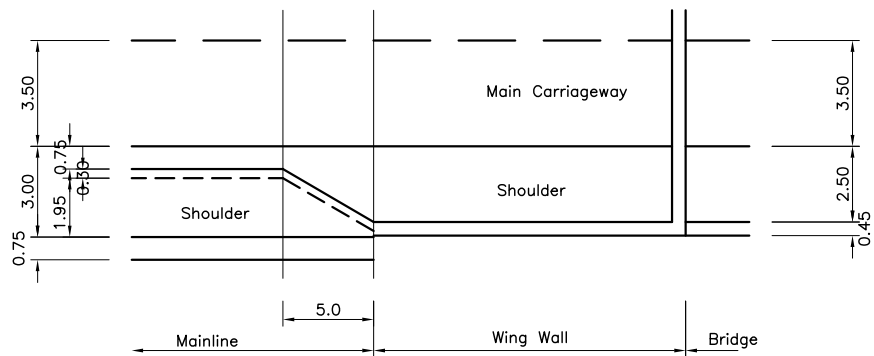
- NOTES :
1. ALL DIMENSION ARE METERS UNLESS OTHERWISE INDICATED.
 2. THE SLOPE RATIO SHALL BE DECIDED TAKING INTO ACCOUNT THE SOIL PROPERTIES.

No	REVISION	DATE

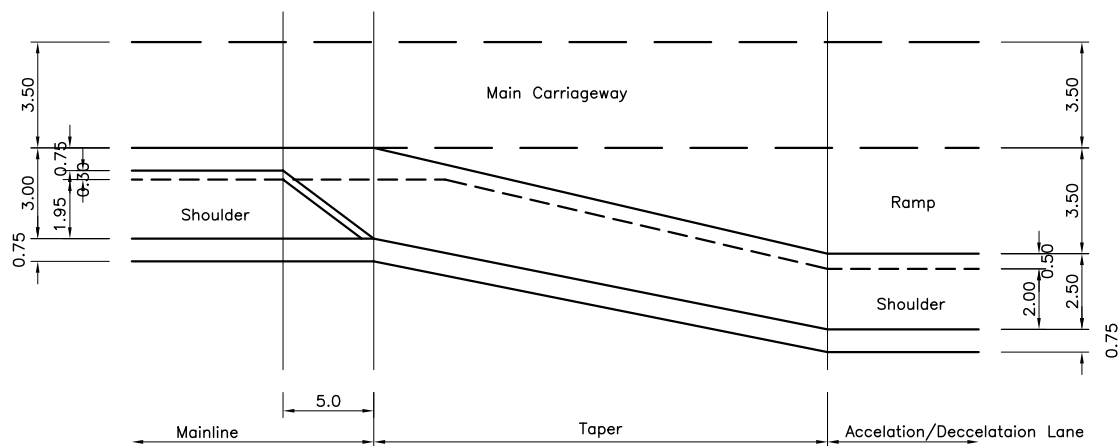
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DWG. NO.	C-05



DETAIL OF PAVEMENT



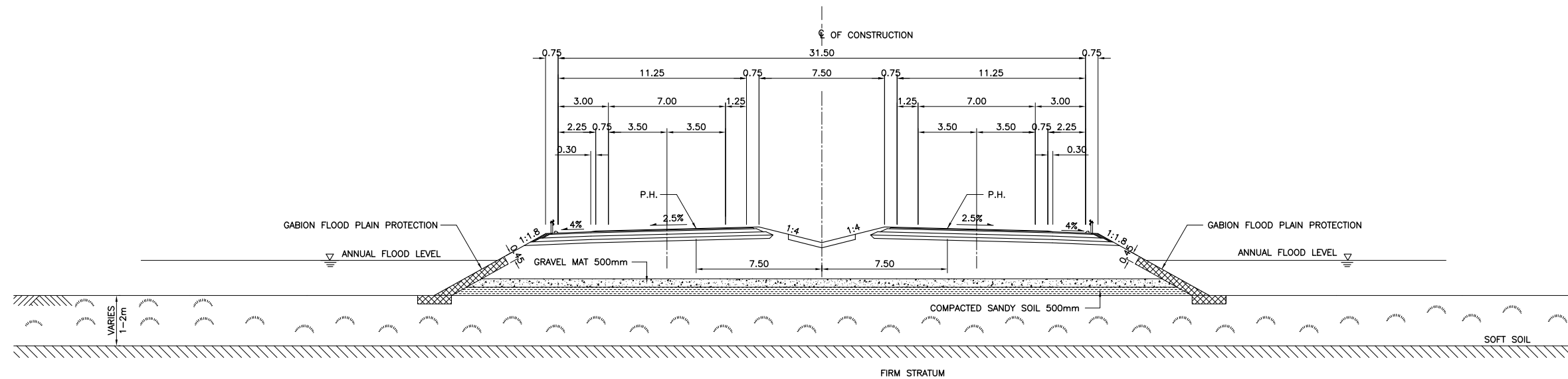
DETAIL OF SHOULDER AT BRIDGE END



DETAIL OF SHOULDER AT TAPER END

LIST OF SUPERELEVATION AND SURFACEDOWN RUN-OFF

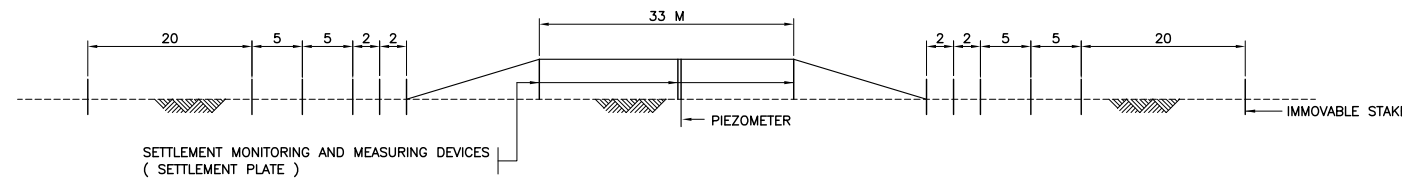
SHOULDER SURFACE DOWN	LEFT		STATION No.	LEFT		SHOULDER SURFACE DOWN
	SHOULDER	CARRIAGEWAY		CARRIAGEWAY	SHOULDER	
DOWN	-2.000	6.000	8 + 200.000	-6.000	-6.000	DOWN
	-2.000	6.000	8 + 260.000	-6.000	-6.000	
	-2.000	4.000	8 + 334.286	-4.000	-4.000	
	-3.500	2.500	8 + 390.000	-2.500	-4.000	
	-4.000	2.000	8 + 400.000			
NORMAL	-4.000	-2.500	8 + 440.000	-2.500	-4.000	
			8 + 490.000			
			8 + 520.000			
			8 + 525.000			
	-2.500	-2.500	8 + 615.000	-2.500	-2.500	
			8 + 620.000			
			8 + 625.000			
			8 + 630.000			
DOWN	-4.000	-2.500	8 + 985.000	-2.500	-4.000	
			9 + 040.000			
			9 + 045.000			
			9 + 130.000			
			9 + 135.000			
NORMAL	-4.000	0.000	13 + 600.000	-2.500	-4.000	
			13 + 650.000			
			13 + 690.000			
			13 + 740.000			
DOWN	-4.000	2.500	13 + 700.000	-2.500	-2.500	
	-3.500	2.500	13 + 740.000			
NORMAL	2.500	2.500	13 + 745.000	-2.500	-2.500	
	2.500	2.500	14 + 080.000	-2.500	-2.500	
DOWN	-3.500	2.500	14 + 085.000	-2.500	-4.000	
	-3.500	2.500	15 + 080.000	-2.500	-4.000	
NORMAL	2.500	2.500	15 + 085.000	-2.500	-2.500	
	2.500	2.500	15 + 460.000			
	0.000	0.000	15 + 510.000			
	-1.000	-1.000	15 + 530.000			
DOWN	-4.000	-1.250	16 + 535.000	-2.500	-4.000	
			15 + 560.000			
			15 + 680.000			
			15 + 685.000			
			15 + 710.000			
NORMAL	-4.000	-2.500	15 + 725.000	-1.750	-4.000	
			15 + 730.000	-1.500	-4.000	
			15 + 760.000	0.000	-4.000	
			15 + 800.000	2.000	-4.000	
	-2.500	-2.500	15 + 810.000	2.500	-3.500	
			15 + 880.000	2.500	-3.500	
			15 + 885.000	2.500	2.500	
			16 + 535.000	2.500	2.500	
-4.000	-2.500	16 + 540.000	2.500	-4.000		



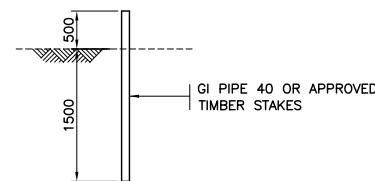
1
SCALE 1:300
TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT
TYPE - A GRAVEL MAT

NOTES :

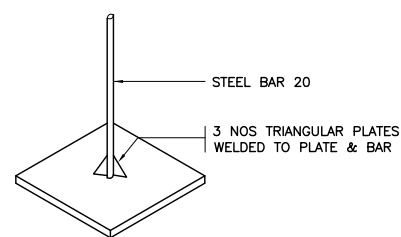
1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED AND PROPOSED BY THE CONTRACTOR AND AGREED BY THE ENGINEER.



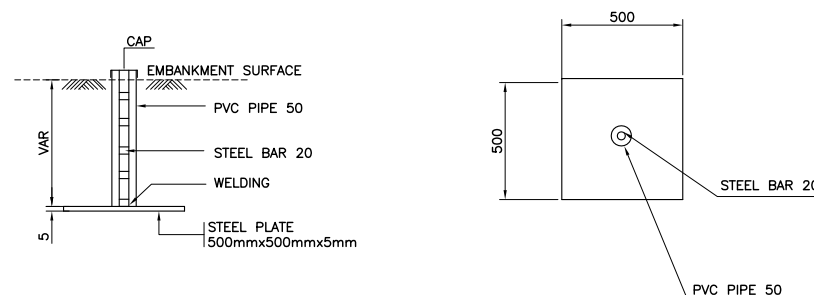
A
SCALE NTS
LINE & LEVEL OF SETTLEMENT PLATE AND GROUND SURFACE DISPLACEMENT STAKES



STABILITY MONITORING DEVICE
(GROUND SURFACE DISPLACEMENT STAKES)



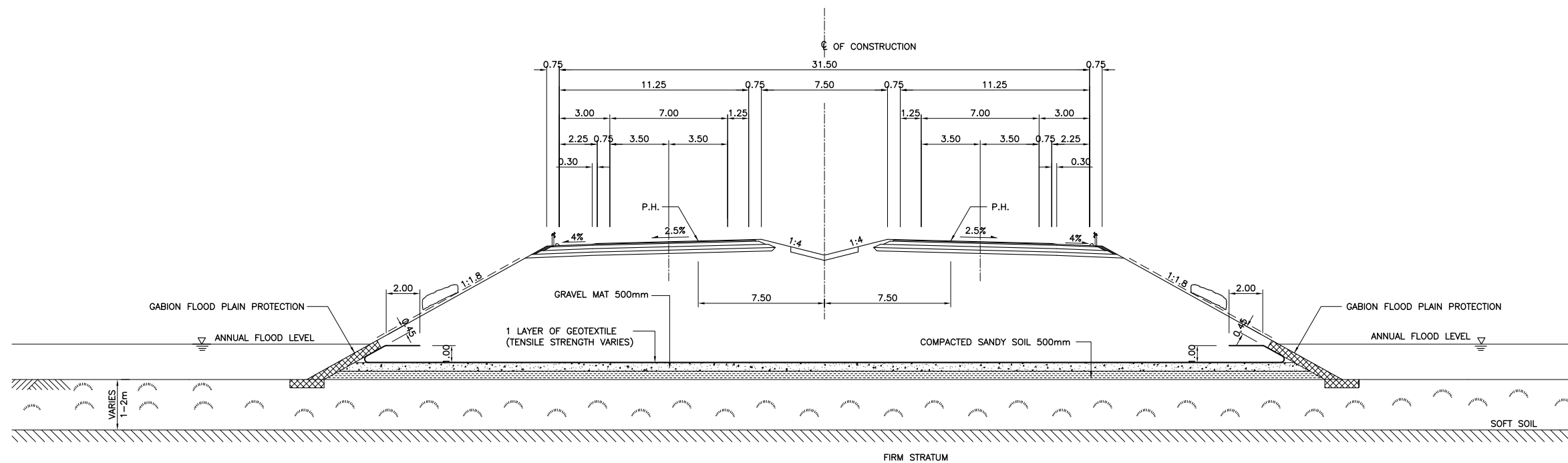
C
SCALE NTS
DETAIL



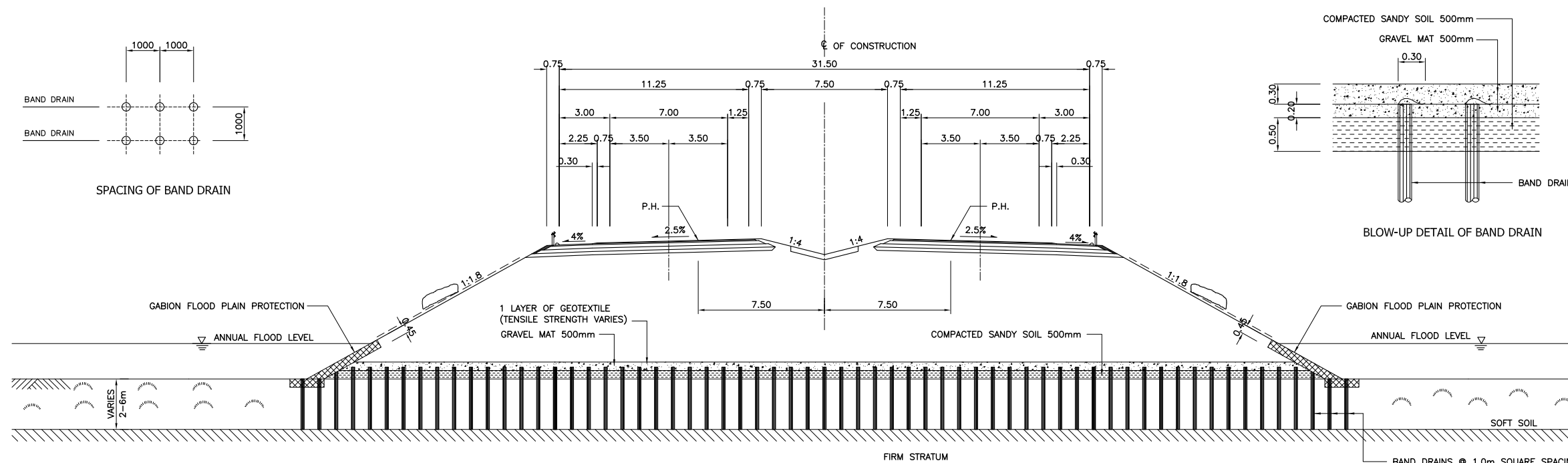
B
SCALE NTS
SETTLEMENT MONITORING & MEASURING DEVICES (SETTLEMENT PLATE)

NOTES :

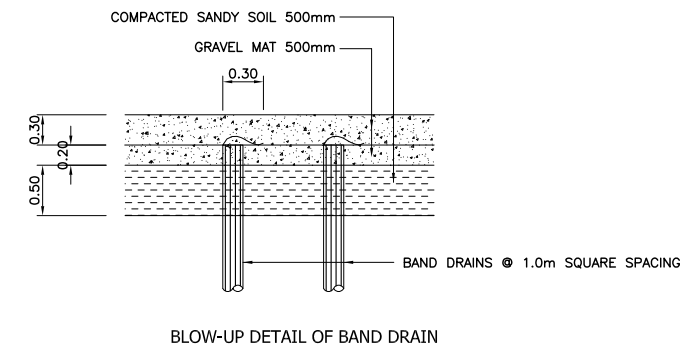
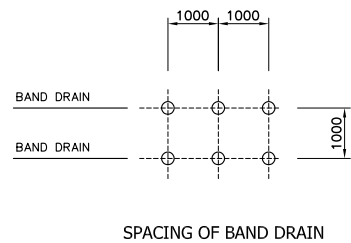
1. SETTLEMENT MONITORING DEVICE SHALL BE INSTALLED IN INTERVALS DISTANCE OF 50 m.
2. SLIDING MONITORING DEVICE SHALL BE INSTALLED AT INTERVALS DISTANCE OF 50 m.
3. ALL DIMENSIONS IN MILLIMETRES.



1
TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT
TYPE - B GRAVEL MAT AND 1 LAYER OF GEOTEXTILE
SCALE 1:300

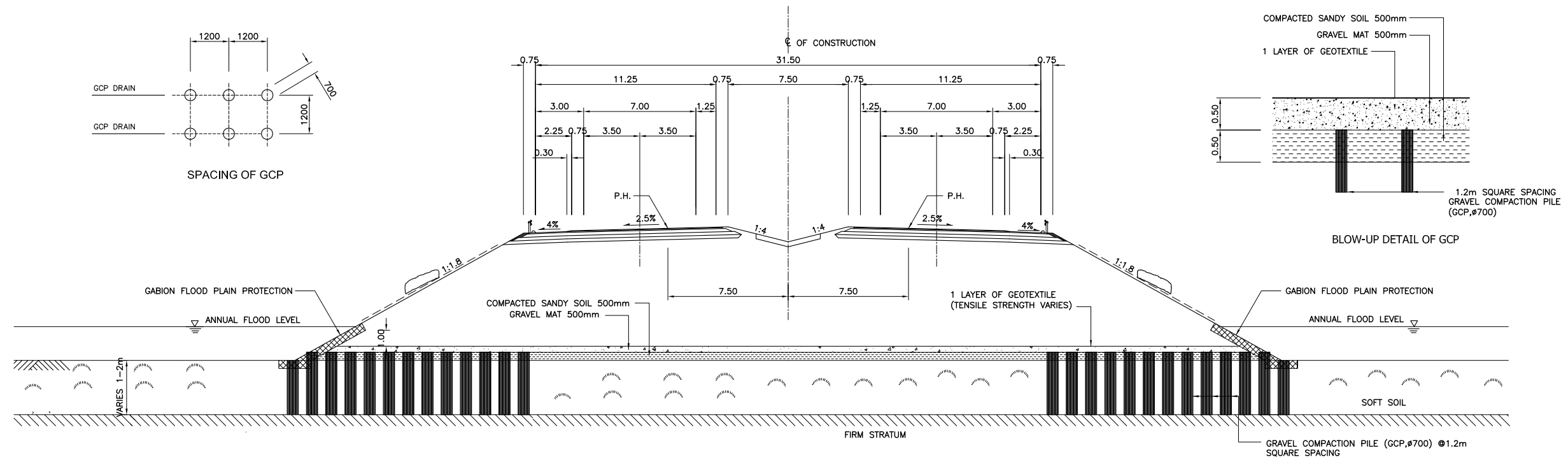


2
TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT
TYPE - C GRAVEL MAT, 1 LAYER OF GEOTEXTILE AND BAND DRAINS
SCALE 1:300



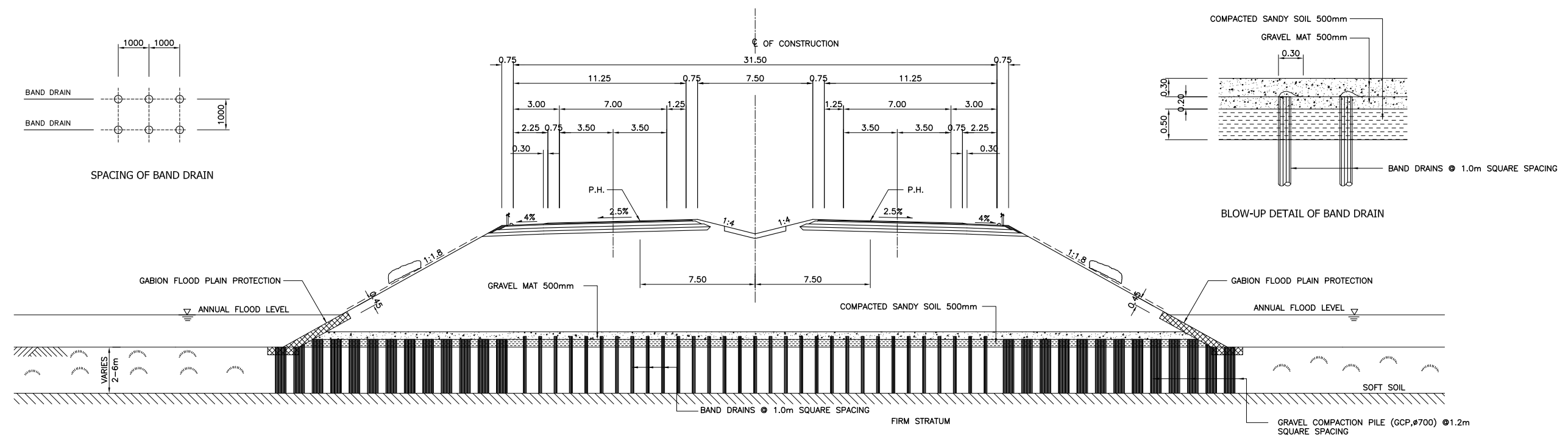
NOTES :

1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED AND PROPOSED BY THE CONTRACTOR AND AGREED BY THE ENGINEER.



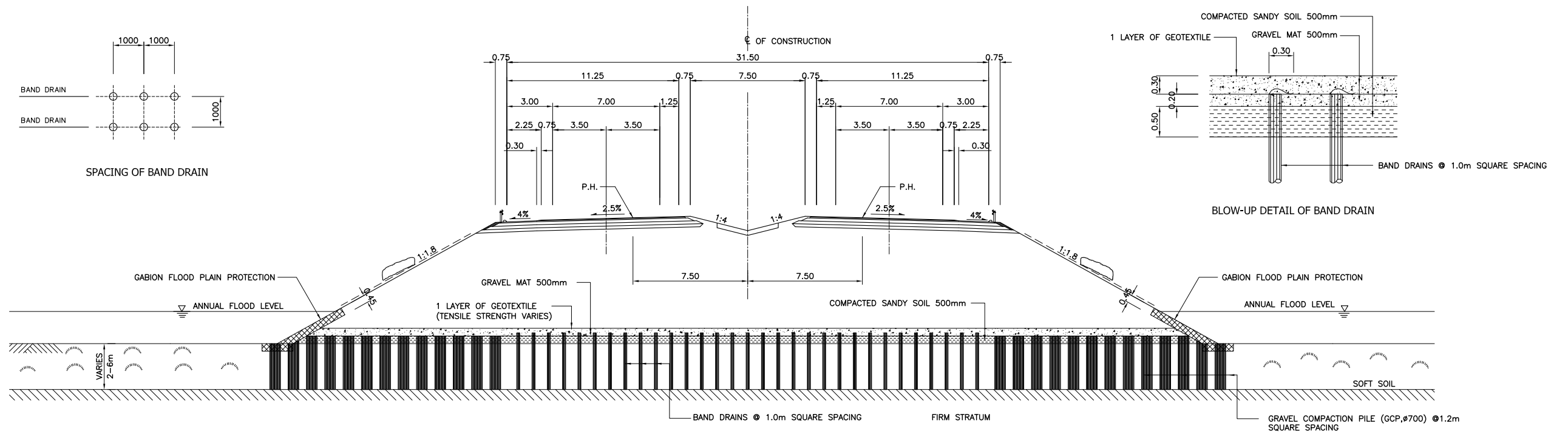
2
-
SCALE 1:300
TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT TYPE - D
GRAVEL MAT, 1 LAYER OF GEOTEXTILE AND GRAVEL COMPACTION PILE

NOTES :
1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED AND PROPOSED BY THE CONTRACTOR AND AGREED BY THE ENGINEER.

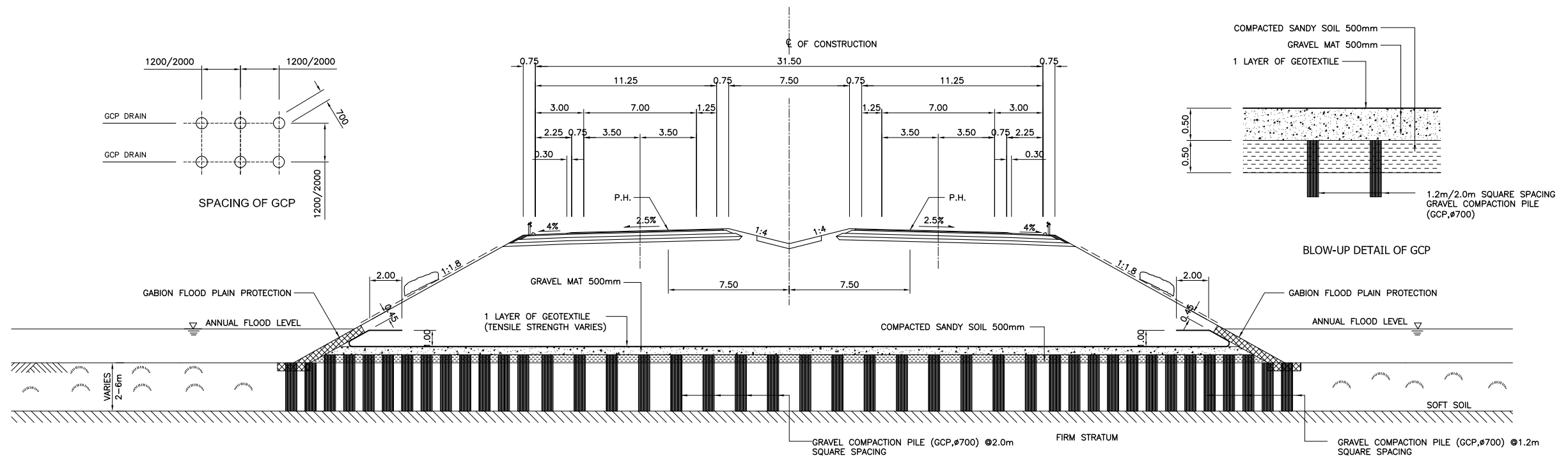


2
-
SCALE 1:300
TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT TYPE - E
GRAVEL MAT, BAND DRAINS AND GRAVEL COMPACTION PILE

NOTES :
1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED AND PROPOSED BY THE CONTRACTOR AND AGREED BY THE ENGINEER.

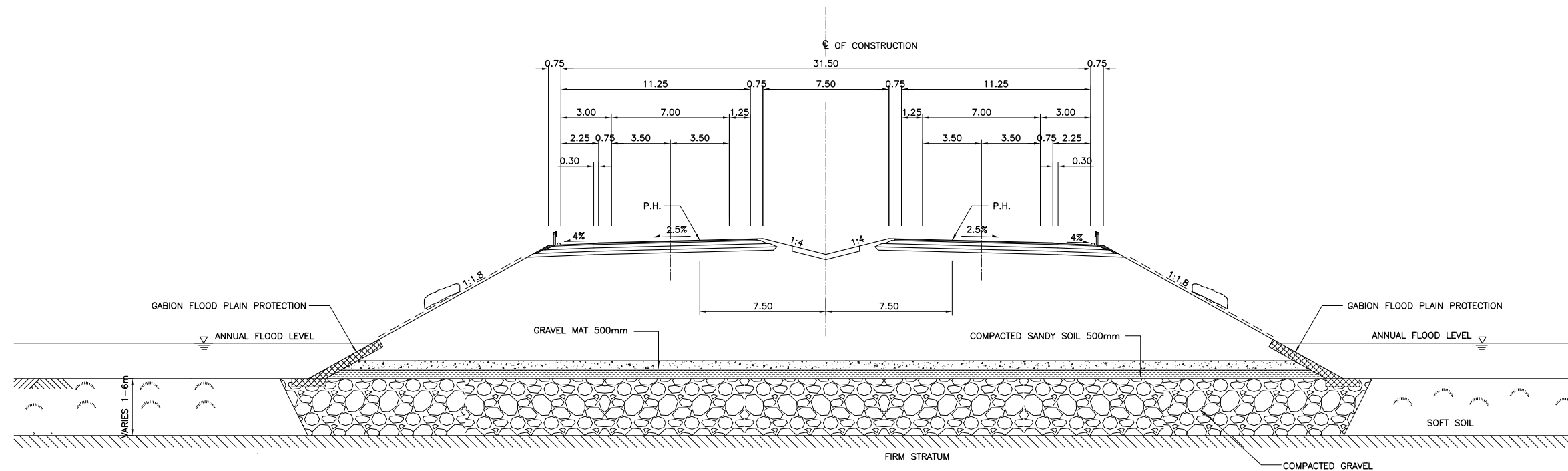


2 TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT TYPE - F
GRAVEL MAT, 1 LAYER OF GEOTEXTILE, BAND DRAINS AND GRAVEL COMPACTION PILE
SCALE 1:300



1 TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT TYPE - G
GRAVEL MAT, 1 LAYER OF GEOTEXTILE AND GRAVEL COMPACTION PILE (WHOLE AREA)
SCALE 1:300

- NOTES :
1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED AND PROPOSED BY THE CONTRACTOR AND AGREED BY THE ENGINEER.

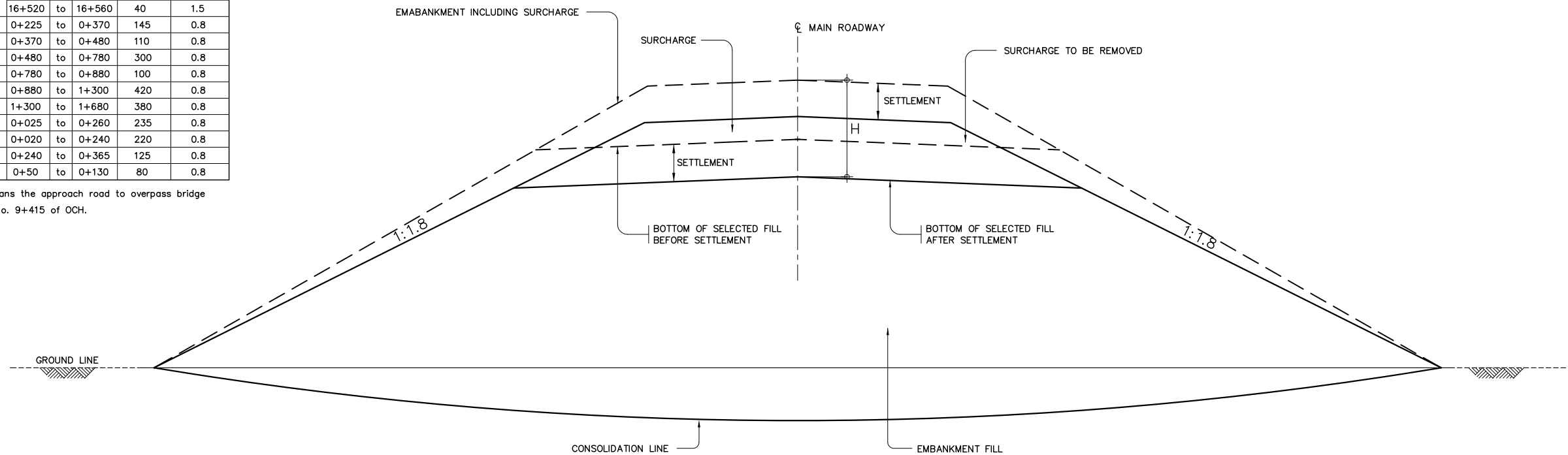


1 TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT
 TYPE - H REPLACEMENT BY EXCAVATION (INCLUDING BOX CULVERT PORTION)
 SCALE 1:300

NOTES :
 1. THE CONTRACTOR SHALL REVIEW THE SOIL PROFILE DRAWINGS AND PLAN THE REQUIRED ADDITIONAL SOIL INVESTIGATION IN COOPERATION WITH THE ENGINEER. THE REQUIRED SOFT GROUND TREATMENT INCLUDING TRIAL AREAS SHALL BE PLANNED

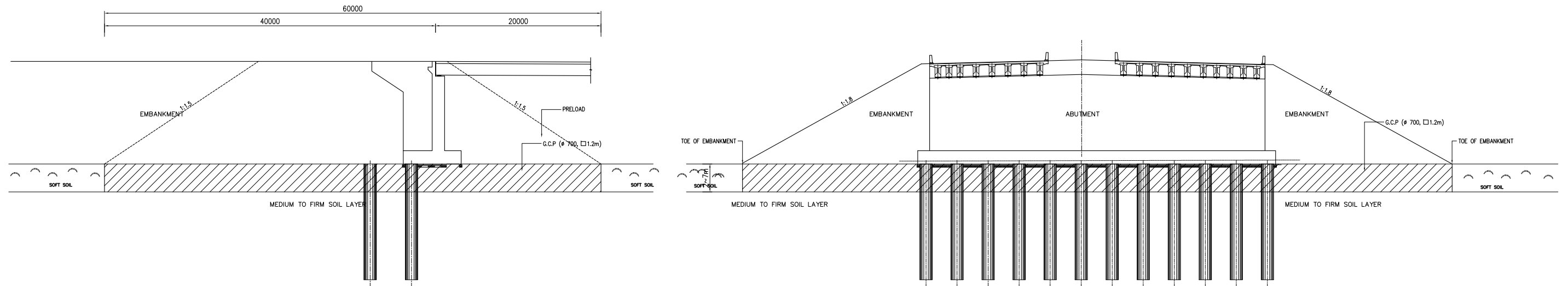
ROAD	SEC.NO.	STA. NO.		DISTANCE (m)	SURCHARGE H (m)
		Start	End		
OCH	1	8+200	to 8+330	130	0.8
	2	8+330	to 8+460	130	0.8
	3	8+460	to 8+608	148	0.8
		8+608	to 8+668	60	0.8
	4	9+330	to 9+365	200	0.8
	5	9+700	to 9+900	200	0.8
	6	10+460	to 10+800	340	0.8
	7	10+800	to 10+930	130	0.8
	8	11+660	to 11+800	140	0.8
	9	11+800	to 11+930	130	0.8
	10	12+000	to 12+080	80	0.8
	11	12+235	to 12+395	160	0.8
	12	12+700	to 12+825	125	1.5
	13	12+890	to 13+250	360	1.5
	14	13+250	to 13+350	100	1.5
	15	13+350	to 13+775	425	1.5
	16	14+050	to 14+250	200	1.5
	17	14+280	to 14+410	130	1.5
	18	14+600	to 14+650	50	1.5
	19	15+060	to 15+115	55	1.5
20	15+495	to 15+610	115	1.5	
	16+520	to 16+560	40	1.5	
A1 Bypass	21	0+225	to 0+370	145	0.8
	22	0+370	to 0+480	110	0.8
	23	0+480	to 0+780	300	0.8
	24	0+780	to 0+880	100	0.8
	25	0+880	to 1+300	420	0.8
	26	1+300	to 1+680	380	0.8
Ramp-1	27	0+025	to 0+260	235	0.8
Ramp-4	28	0+020	to 0+240	220	0.8
	29	0+240	to 0+365	125	0.8
Approach	30	0+50	to 0+130	80	0.8

* "Approach" means the approach road to overpass bridge at the Sta. No. 9+415 of OCH.

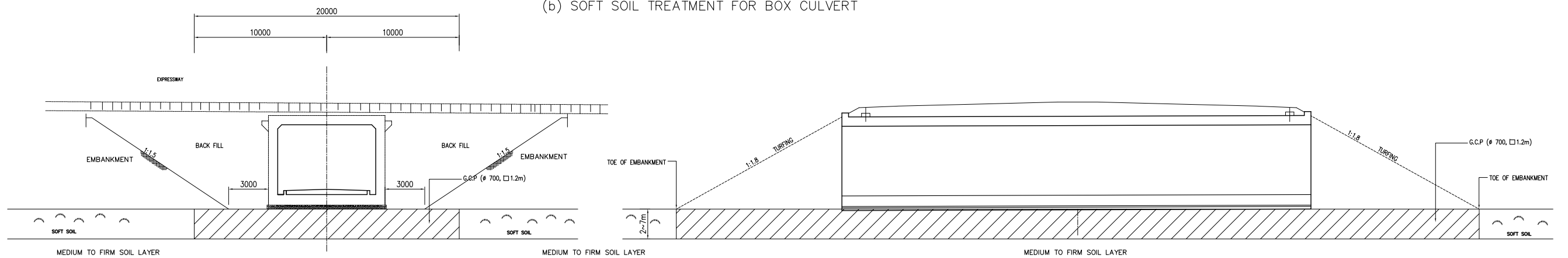


TYPICAL CROSS SECTION FOR SOFT GROUND TREATMENT (SURCHARGE)
SCALE NTS

(a) SOFT SOIL TREATMENT FOR ABUTMENT OF VIADUCTS



(b) SOFT SOIL TREATMENT FOR BOX CULVERT



D. PLAN AND PROFILE

