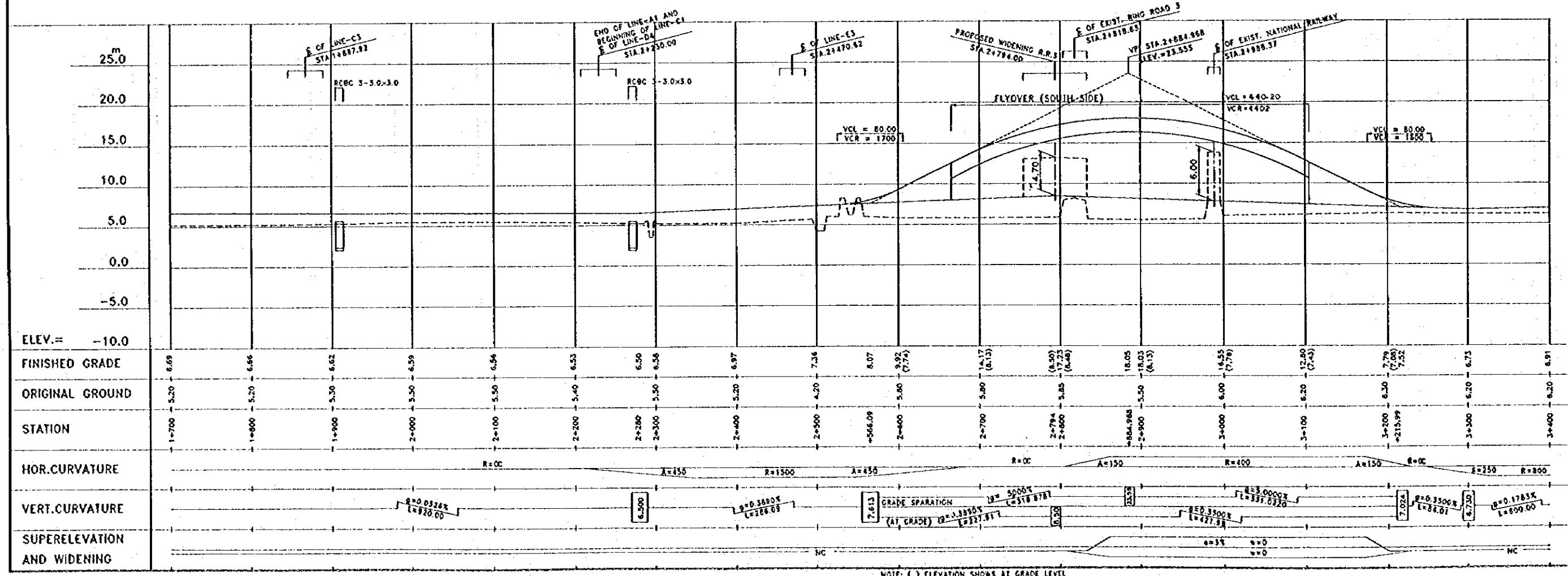
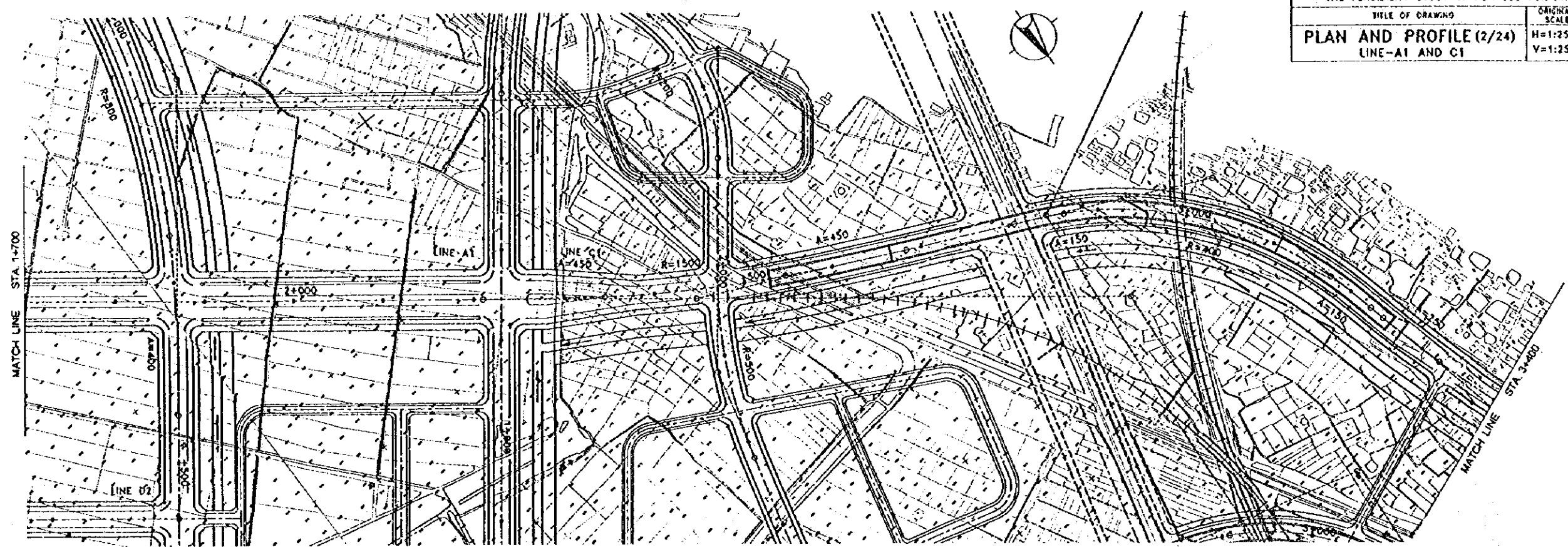
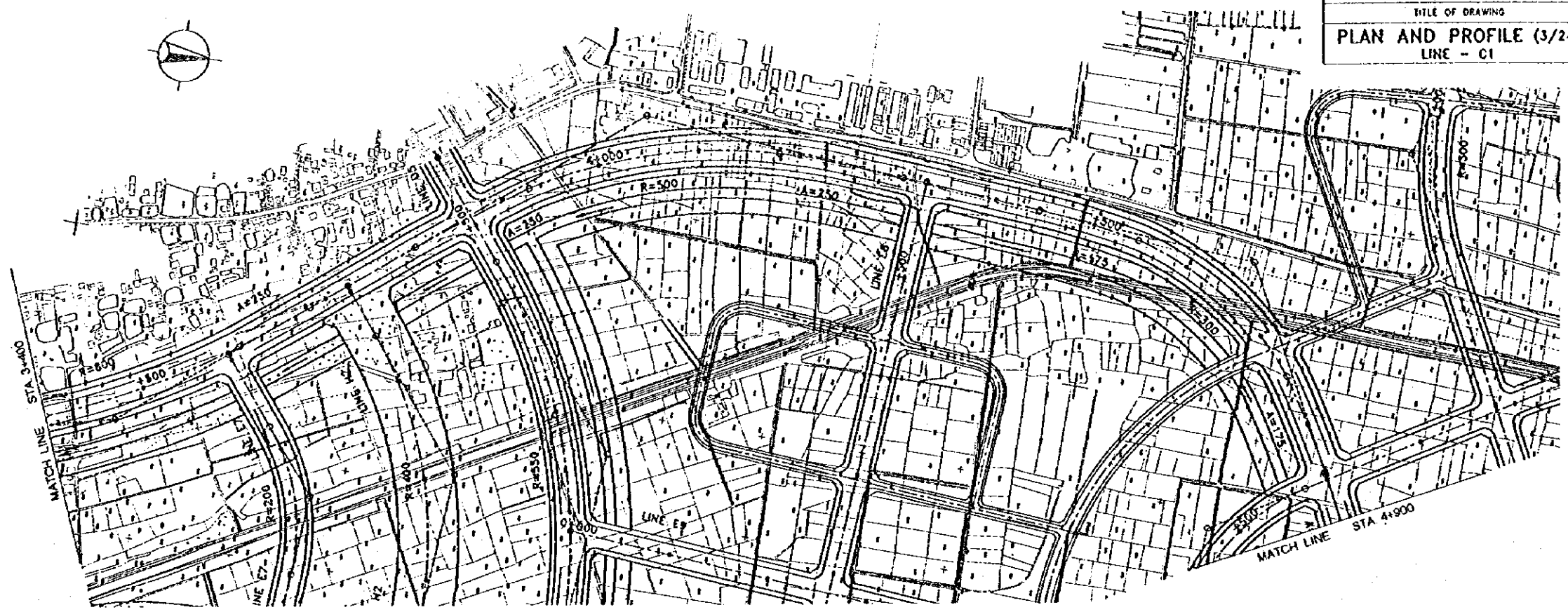
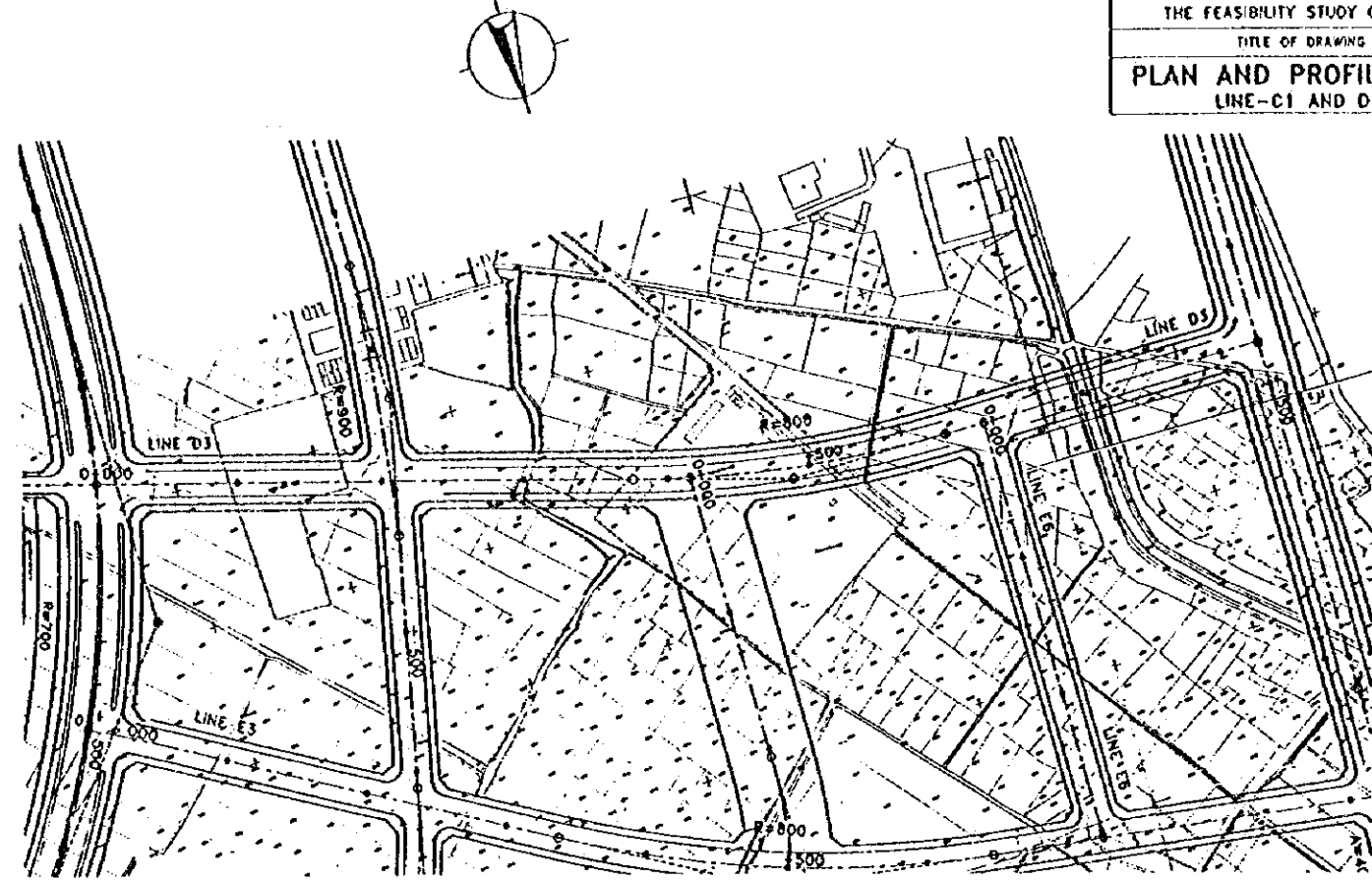
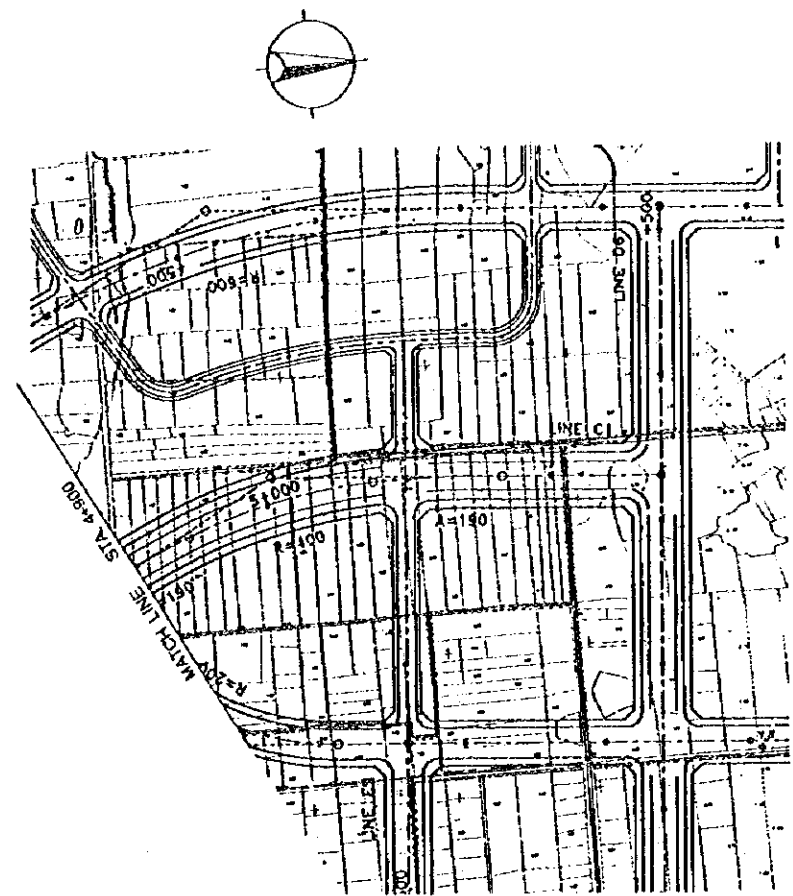


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ELEV. =	-10.0																			
FINISHED GRADE		12.0	8.81	6.14	7.79	7.43	7.07	6.72	6.36	6.00	6.14	6.29	6.43	6.57	6.72	6.80	6.79	6.75	6.72	6.89
ORIGINAL GROUND		12.0	7.0	7.0	6.90	6.40	5.90	5.80	5.40	5.00	4.90	5.20	5.30	5.50	5.50	5.60	5.60	5.60	5.30	5.20
STATION		0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700	0+800	0+900	1+000	1+100	1+200	1+300	1+360	1+400	1+500	1+600	1+700
HOR. CURVATURE		R=∞																		
VERT. CURVATURE		R=35000 L=700.00		R=33700 L=700.00			R=∞		R=18300 L=560.00			R=∞		R=32800 L=820.00						
SUPERELEVATION AND WIDENING		NC																		



NOTE: ( ) ELEVATION SHOWS AT GRADE LEVEL

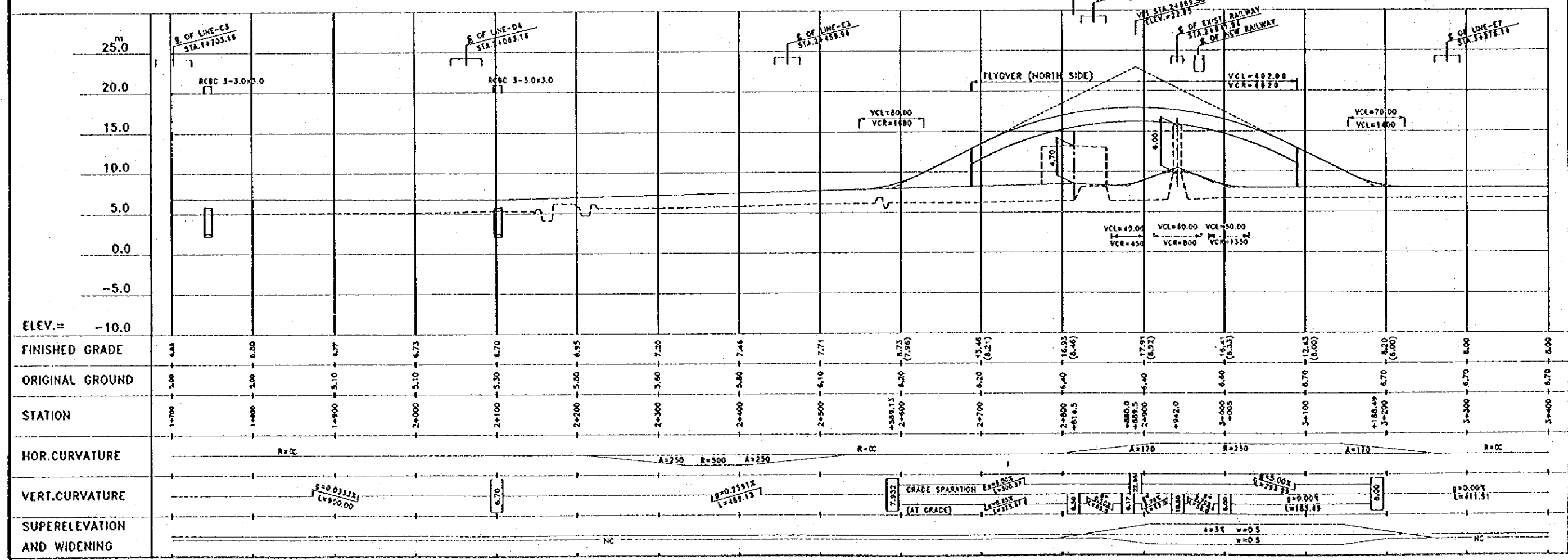
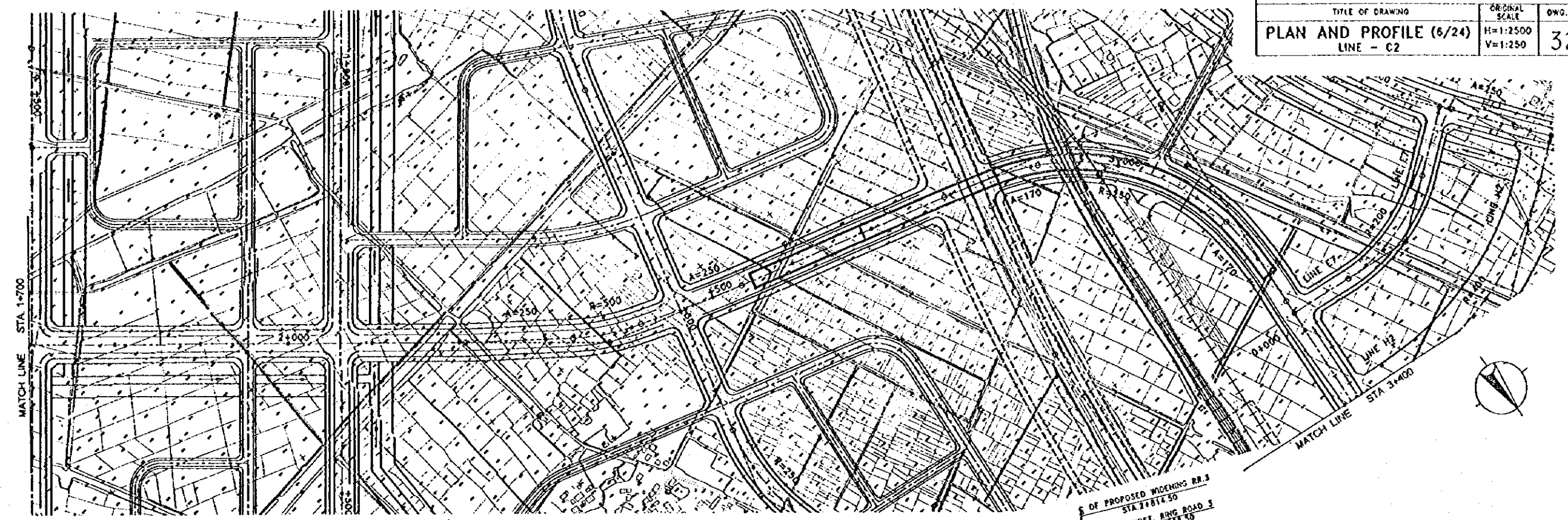




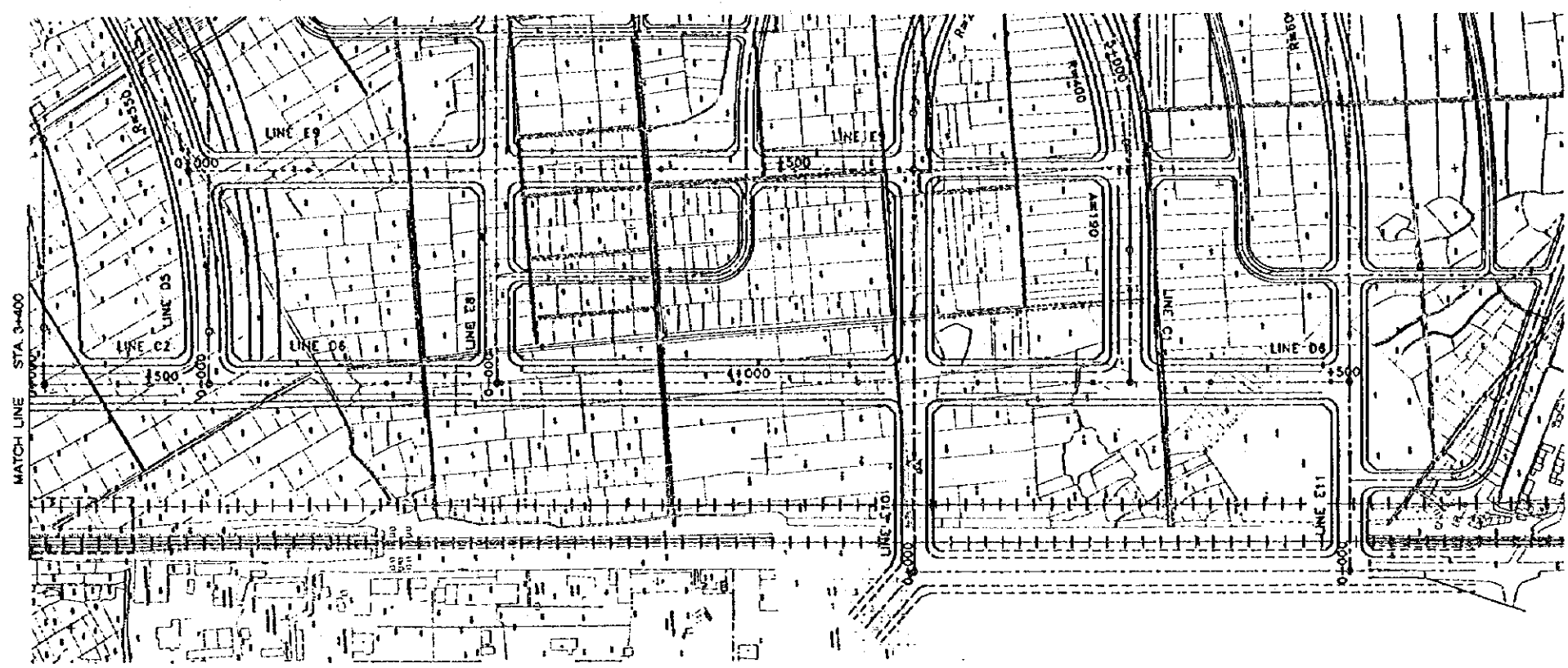
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FINISHED GRADE		8.50	8.37	8.64	8.72	8.77		6.54	6.67	6.81	6.94	7.08	7.21	7.35	7.46	7.61	7.65
ORIGINAL GROUND		7.10	6.90	6.90	6.20	6.70		5.50	5.50	5.40	4.90	6.20	6.20	6.40	6.00	6.90	6.70
STATION		4+900	5+000	4+100	5+200	5+277.95		0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700	0+800	0+826.74
HOR. CURVATURE		A=190 R=400 A=183				R=∞		R=∞				R=800			R=∞		
VERT. CURVATURE		L=0.07045 L=1377.95				6.77		6.54	L=0.1549 L=826.74				7.45				
SUPERELEVATION AND WIDENING		**3% w=0 w=0				NC		NC									







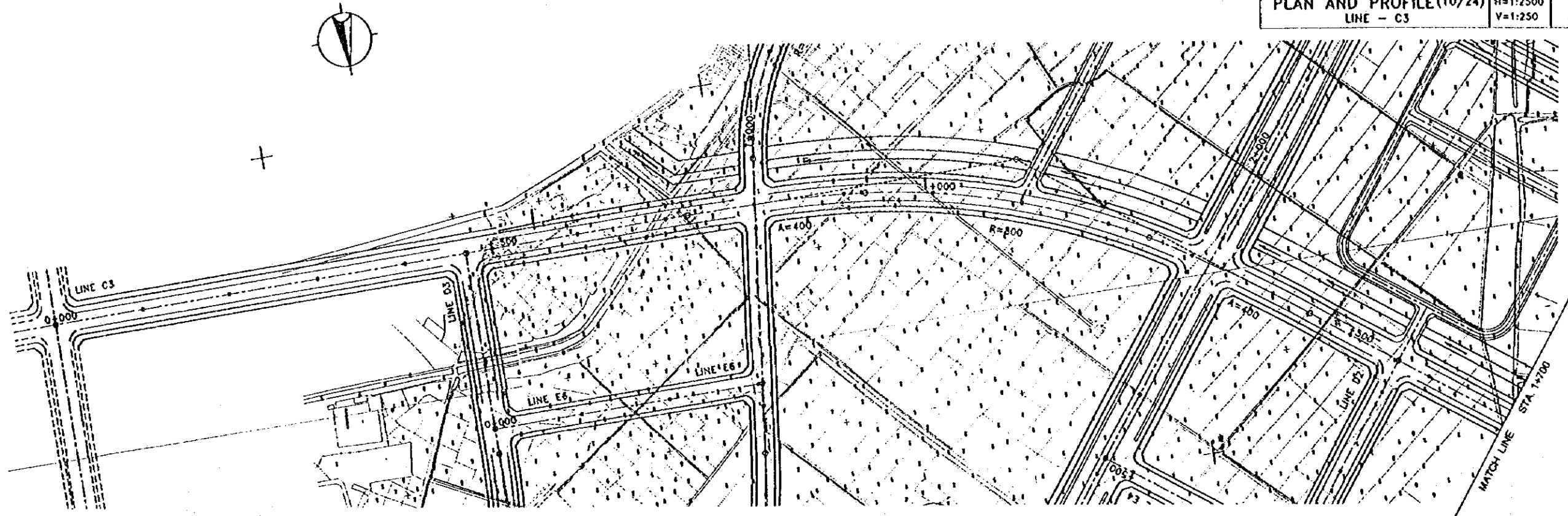
NOTE: ( ) ELEV. SHOWS AT GRADE LEVEL











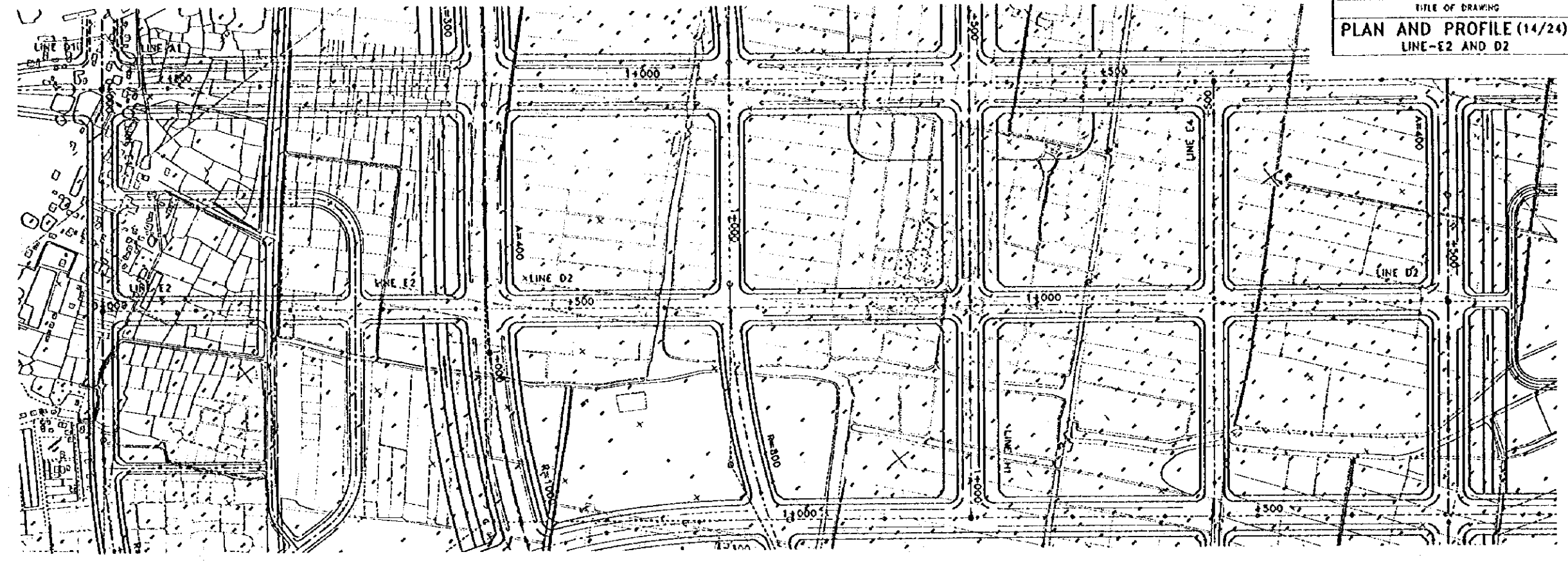
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FINISHED GRADE		7.80	7.77	7.75	7.70	7.67	7.65	7.60	7.57	7.53	7.50	7.28	7.07	6.85	6.63	6.47	6.21	6.75	6.79
ORIGINAL GROUND		7.60	7.30	7.30	7.30	7.00	7.10	6.50	6.00	6.50	6.40	6.00	5.50	5.40	5.30	5.20	5.20	5.20	4.5
STATION		0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700	0+800	0+900	1+000	1+100	1+200	1+300	1+400	1+500	1+600	1+700
HOR. CURVATURE		R=∞																	
VERT. CURVATURE		<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">R=0.0533X L=300.00</div> <div style="border: 1px solid black; padding: 2px;">R=0.3155X L=400.00</div> <div style="border: 1px solid black; padding: 2px;">R=0.0410X L=1000.00</div> </div>																	
SUPERELEVATION AND WIDENING		NC																	



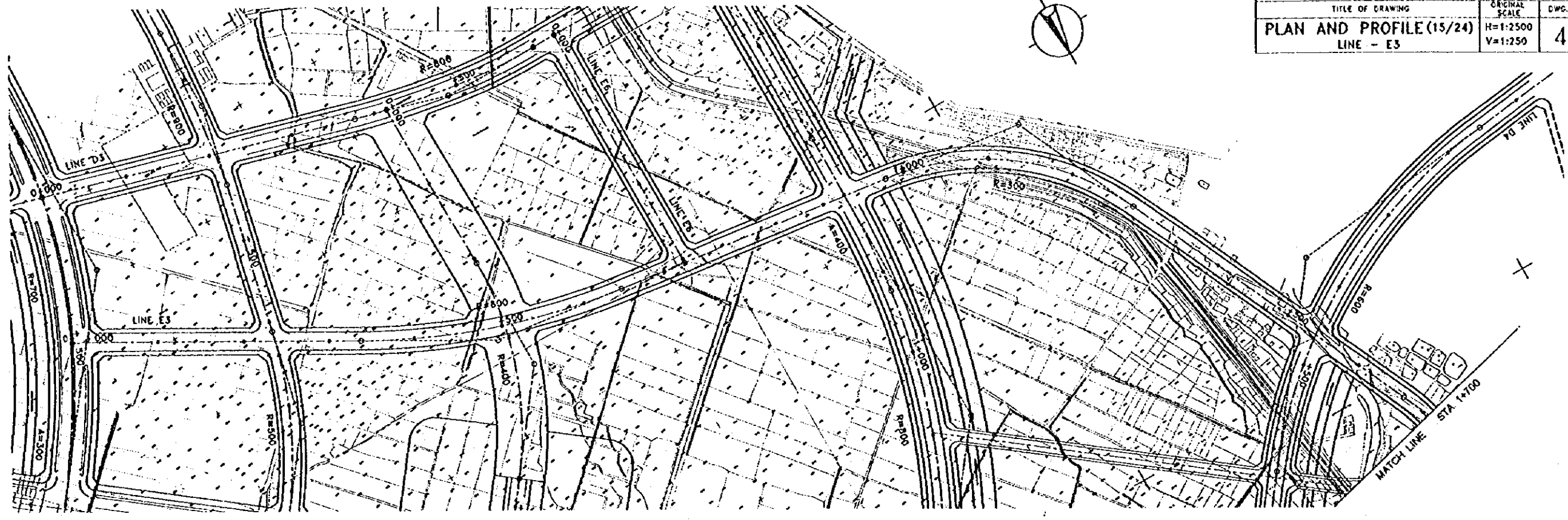


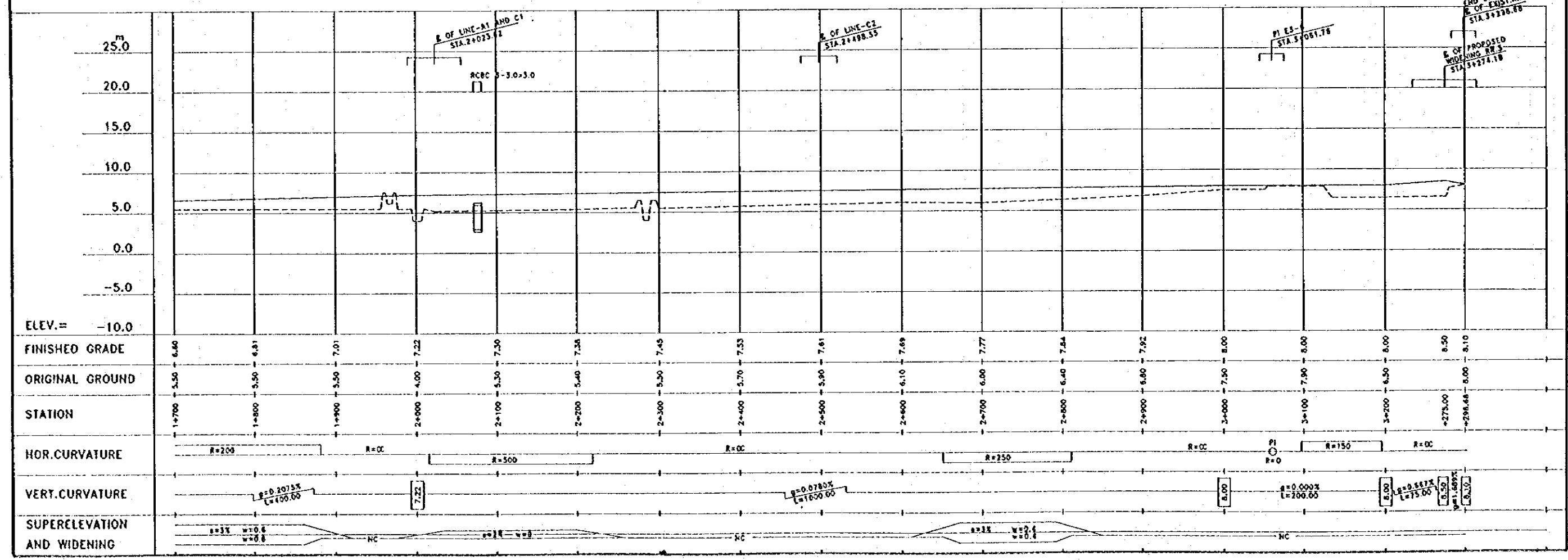
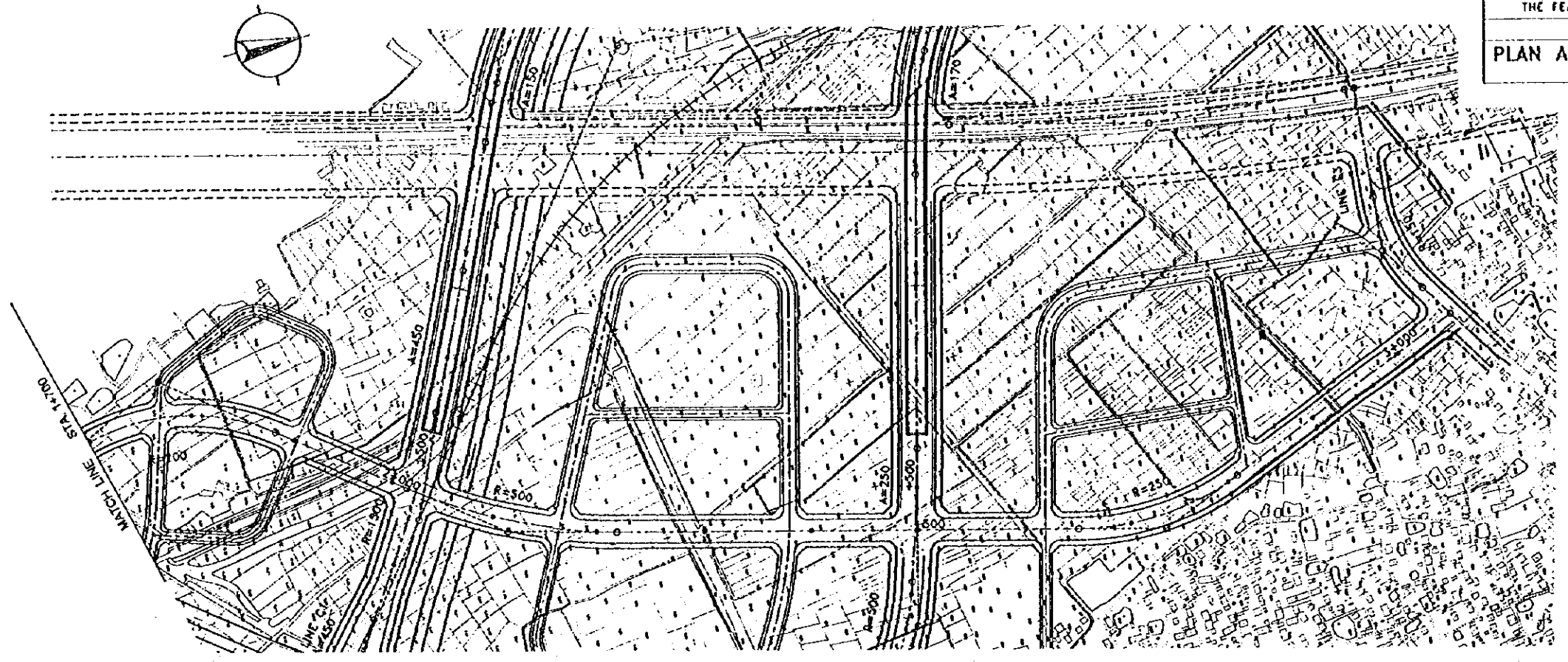






25.0	<div style="display: flex; justify-content: space-between; width: 100%;"> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">BEGINNING OF LINE-E2 STA. 0+000</div> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">END OF LINE-E2 AND BEGINNING OF LINE-D2 STA. 0+411.50</div> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">E OF LINE-E4 STA. 1+670.41</div> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">E OF LINE-H1 STA. 0+931.6</div> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">E OF LINE-E4 STA. 1+195.00</div> <div style="border: 1px solid black; padding: 2px; transform: rotate(-30deg); font-size: 8px;">END OF LINE-D2 E OF LINE-E2 STA. 1+440.00</div> </div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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FINISHED GRADE	7.24	7.06	6.88	6.71	6.53	6.40	6.27	6.14	6.01	5.88	5.74	5.61	5.48	5.35	5.22	5.09	4.96	4.83	4.70	4.57	4.44	4.31	4.18	4.05	3.92	3.79	3.66	3.53	3.40	3.27	3.14	3.01	2.88	2.75	2.62	2.49	2.36	2.23	2.10	1.97	1.84	1.71	1.58	1.45	1.32	1.19	1.06	0.93	0.80	0.67	0.54	0.41	0.28	0.15	0.02	-1.11	-1.24	-1.37	-1.50	-1.63	-1.76	-1.89	-2.02	-2.15	-2.28	-2.41	-2.54	-2.67	-2.80	-2.93	-3.06	-3.19	-3.32	-3.45	-3.58	-3.71	-3.84	-3.97	-4.10	-4.23	-4.36	-4.49	-4.62	-4.75	-4.88	-5.01	-5.14	-5.27	-5.40	-5.53	-5.66	-5.79	-5.92	-6.05	-6.18	-6.31	-6.44	-6.57	-6.70	-6.83	-6.96	-7.09	-7.22	-7.35	-7.48	-7.61	-7.74	-7.87	-8.00	-8.13	-8.26	-8.39	-8.52	-8.65	-8.78	-8.91	-9.04	-9.17	-9.30	-9.43	-9.56	-9.69	-9.82	-9.95	-10.08	-10.21	-10.34	-10.47	-10.60	-10.73	-10.86	-10.99	-11.12	-11.25	-11.38	-11.51	-11.64	-11.77	-11.90	-12.03	-12.16	-12.29	-12.42	-12.55	-12.68	-12.81	-12.94	-13.07	-13.20	-13.33	-13.46	-13.59	-13.72	-13.85	-13.98	-14.11	-14.24	-14.37	-14.50	-14.63	-14.76	-14.89	-15.02	-15.15	-15.28	-15.41	-15.54	-15.67	-15.80	-15.93	-16.06	-16.19	-16.32	-16.45	-16.58	-16.71	-16.84	-16.97	-17.10	-17.23	-17.36	-17.49	-17.62	-17.75	-17.88	-18.01	-18.14	-18.27	-18.40	-18.53	-18.66	-18.79	-18.92	-19.05	-19.18	-19.31	-19.44	-19.57	-19.70	-19.83	-19.96	-20.09	-20.22	-20.35	-20.48	-20.61	-20.74	-20.87	-21.00	-21.13	-21.26	-21.39	-21.52	-21.65	-21.78	-21.91	-22.04	-22.17	-22.30	-22.43	-22.56	-22.69	-22.82	-22.95	-23.08	-23.21	-23.34	-23.47	-23.60	-23.73	-23.86	-23.99	-24.12	-24.25	-24.38	-24.51	-24.64	-24.77	-24.90	-25.03	-25.16	-25.29	-25.42	-25.55	-25.68	-25.81	-25.94	-26.07	-26.20	-26.33	-26.46	-26.59	-26.72	-26.85	-26.98	-27.11	-27.24	-27.37	-27.50	-27.63	-27.76	-27.89	-28.02	-28.15	-28.28	-28.41	-28.54	-28.67	-28.80	-28.93	-29.06	-29.19	-29.32	-29.45	-29.58	-29.71	-29.84	-29.97	-30.10	-30.23	-30.36	-30.49	-30.62	-30.75	-30.88	-31.01	-31.14	-31.27	-31.40	-31.53	-31.66	-31.79	-31.92	-32.05	-32.18	-32.31	-32.44	-32.57	-32.70	-32.83	-32.96	-33.09	-33.22	-33.35	-33.48	-33.61	-33.74	-33.87	-34.00	-34.13	-34.26	-34.39	-34.52	-34.65	-34.78	-34.91	-35.04	-35.17	-35.30	-35.43	-35.56	-35.69	-35.82	-35.95	-36.08	-36.21	-36.34	-36.47	-36.60	-36.73	-36.86	-36.99	-37.12	-37.25	-37.38	-37.51	-37.64	-37.77	-37.90	-38.03	-38.16	-38.29	-38.42	-38.55	-38.68	-38.81	-38.94	-39.07	-39.20	-39.33	-39.46	-39.59	-39.72	-39.85	-39.98	-40.11	-40.24	-40.37	-40.50	-40.63	-40.76	-40.89	-41.02	-41.15	-41.28	-41.41	-41.54	-41.67	-41.80	-41.93	-42.06	-42.19	-42.32	-42.45	-42.58	-42.71	-42.84	-42.97	-43.10	-43.23	-43.36	-43.49	-43.62	-43.75	-43.88	-44.01	-44.14	-44.27	-44.40	-44.53	-44.66	-44.79	-44.92	-45.05	-45.18	-45.31	-45.44	-45.57	-45.70	-45.83	-45.96	-46.09	-46.22	-46.35	-46.48	-46.61	-46.74	-46.87	-47.00	-47.13	-47.26	-47.39	-47.52	-47.65	-47.78	-47.91	-48.04	-48.17	-48.30	-48.43	-48.56	-48.69	-48.82	-48.95	-49.08	-49.21	-49.34	-49.47	-49.60	-49.73	-49.86	-49.99	-50.12	-50.25	-50.38	-50.51	-50.64	-50.77	-50.90	-51.03	-51.16	-51.29	-51.42	-51.55	-51.68	-51.81	-51.94	-52.07	-52.20	-52.33	-52.46	-52.59	-52.72	-52.85	-52.98	-53.11	-53.24	-53.37	-53.50	-53.63	-53.76	-53.89	-54.02	-54.15	-54.28	-54.41	-54.54	-54.67	-54.80	-54.93	-55.06	-55.19	-55.32	-55.45	-55.58	-55.71	-55.84	-55.97	-56.10	-56.23	-56.36	-56.49	-56.62	-56.75	-56.88	-57.01	-57.14	-57.27	-57.40	-57.53	-57.66	-57.79	-57.92	-58.05	-58.18	-58.31	-58.44	-58.57	-58.70	-58.83	-58.96	-59.09	-59.22	-59.35	-59.48	-59.61	-59.74	-59.87	-60.00	-60.13	-60.26	-60.39	-60.52	-60.65	-60.78	-60.91	-61.04	-61.17	-61.30	-61.43	-61.56	-61.69	-61.82	-61.95	-62.08	-62.21	-62.34	-62.47	-62.60	-62.73	-62.86	-62.99	-63.12	-63.25	-63.38	-63.51	-63.64	-63.77	-63.90	-64.03	-64.16	-64.29	-64.42	-64.55	-64.68	-64.81	-64.94	-65.07	-65.20	-65.33	-65.46	-65.59	-65.72	-65.85	-65.98	-66.11	-66.24	-66.37	-66.50	-66.63	-66.76	-66.89	-67.02	-67.15	-67.28	-67.41	-67.54	-67.67	-67.80	-67.93	-68.06	-68.19	-68.32	-68.45	-68.58	-68.71	-68.84	-68.97	-69.10	-69.23	-69.36	-69.49	-69.62	-69.75	-69.88	-70.01	-70.14	-70.27	-70.40	-70.53	-70.66	-70.79	-70.92	-71.05	-71.18	-71.31	-71.44	-71.57	-71.70	-71.83	-71.96	-72.09	-72.22	-72.35	-72.48	-72.61	-72.74	-72.87	-73.00	-73.13	-73.26	-73.39	-73.52	-73.65	-73.78	-73.91	-74.04	-74.17	-74.30	-74.43	-74.56	-74.69	-74.82	-74.95	-75.08	-75.21	-75.34	-75.47	-75.60	-75.73	-75.86	-75.99	-76.12	-76.25	-76.38	-76.51	-76.64	-76.77	-76.90	-77.03	-77.16	-77.29	-77.42	-77.55	-77.68	-77.81	-77.94	-78.07	-78.20	-78.33	-78.46	-78.59	-78.72	-78.85	-78.98	-79.11	-79.24	-79.37	-79.50	-79.63	-79.76	-79.89	-80.02	-80.15	-80.28	-80.41	-80.54	-80.67	-80.80	-80.93	-81.06	-81.19	-81.32	-81.45	-81.58	-81.71	-81.84	-81.97	-82.10	-82.23	-82.36	-82.49	-82.62	-82.75	-82.88	-83.01	-83.14	-83.27	-83.40	-83.53	-83.66	-83.79	-83.92	-84.05	-84.18	-84.31	-84.44	-84.57	-84.70	-84.83	-84.96	-85.09	-85.22	-85.35	-85.48	-85.61	-85.74	-85.87	-86.00	-86.13	-86.26	-86.39	-86.52	-86.65	-86.78	-86.91	-87.04	-87.17	-87.30	-87.43	-87.56	-87.69	-87.82	-87.95	-88.08	-88.21	-88.34	-88.47	-88.60	-88.73	-88.86	-88.99	-89.12	-89.25	-89.38	-89.51	-89.64	-89.77	-89.90	-90.03	-90.16	-90.29	-90.42	-90.55	-90.68	-90.81	-90.94	-91.07	-91.20	-91.33	-91.46	-91.59	-91.72	-91.85	-91.98	-92.11	-92.24	-92.37	-92.50	-92.63	-92.76	-92.89	-93.02	-93.15	-93.28	-93.41	-93.54	-93.67	-93.80	-93.93	-94.06	-94.19	-94.32	-94.45	-94.58	-94.71	-94.84	-94.97	-95.10	-95.23	-95.36	-95.49	-95.62	-95.75	-95.88	-96.01	-96.14	-96.27	-96.40	-96.53	-96.66	-96.79	-96.92	-97.05	-97.18	-97.31	-97.44	-97.57	-97.70	-97.83	-97.96	-98.09	-98.22	-98.35	-98.48	-98.61	-98.74	-98.87	-99.00	-99.13	-99.26	-99.39	-99.52	-99.65	-99.78	-99.91	-100.04	-100.17	-100.30	-100.43	-100.56	-100.69	-100.82	-100.95	-101.08	-101.21	-101.34	-101.47	-101.60	-101.73	-101.86	-101.99	-102.12	-102.25	-102.38	-102.51	-102.64	-102.77	-102.90	-103.03	-103.16	-103.29	-103.42	-103.55	-103.68	-103.81	-103.94	-104.07	-104.20	-104.33	-104.46	-104.59	-104.72	-104.85	-104.98	-105.11	-105.24	-105.37	-105.50	-105.63	-105.76	-105.89	-106.02	-106.15	-106.28	-106.41	-106.54	-106.67	-106.80	-106.93	-107.06	-107.19	-107.32	-107.45	-107.58	-107.71	-107.84	-107.97	-108.10	-108.23	-108.36	-108.49	-108.62	-108.75	-108.88	-109.01	-109.14	-109.27	-109.40	-109.53	-109.66	-109.79	-109.92	-110.05	-110.18	-110.31	-110.44	-110.57	-110.70	-110.83	-110.96	-111.09	-111.22	-111.35	-111.48	-111.61	-111.74	-111.87	-112.00	-112.13	-112.26	-112.39	-112.52	-112.65	-112.78	-112.91	-113.04	-113.17	-113.30	-113.43	-113.56	-113.69	-113.82	-113.95	-114.08	-114.21	-114.34	-114.47	-114.60	-114.73	-114.86	-114.99	-115.12	-115.25	-115.38	-115.51	-115.64	-115.77	-115.90	-116.03	-116.16	-116.29	-116.42	-116.55	-116.68	-116.81	-116.94	-117.07	-117.20	-117.33	-117.46	-117.59	-117.72	-117.85	-117.98	-118.11	-118.24	-118.37	-118.50	-118.63	-118.76	-118.89	-119.02	-119.15	-119.28	-119.41	-119.54	-119.67	-119.80	-119.93	-120.06	-120.19	-120.32	-120.45	-120.58	-120.71	-120.84	-120.97	-121.10	-121.23	-121.36	-121.49	-121.62	-121.75	-121.88	-122.01	-122.14	-122.27	-122.40	-122.53	-122.66	-122.79	-122.92	-123.05	-123.18	-123.31	-123.44	-123.57	-123.70	-123.83	-123.96	-124.09	-124.22	-124.35	-124.48	-124.61	-124.74	-124.87	-125.00	-125.13	-125.26	-125.39	-125.52	-125.65	-125.78	-125.91	-126.04	-126.17	-126.30	-126.43	-126.56	-126.69	-126.82	-126.95	-127.08	-127.21	-127.34	-127.47	-127.60	-127.73	-127.86	-127.99	-128.12	-128.25	-128.38	-128.51	-128.64	-128.77	-128.90	-129.03	-129.16	-129.29	-129.42	-129.55	-129.68	-129.81	-129.94	-130.07	-130.20	-130.33	-130.46	-130.59	-130.72	-130.85	-130.98	-131.11	-131.24	-131.37	-131.50	-131.63	-131.76	-131.89	-132.02	-132.15	-132.28	-132.41	-132.54	-132.67	-132.80	-132.93	-133.06	-133.19	-133.32	-133.45	-133.58	-133.71	-133.84	-133.97	-134.10	-134.23	-134.36	-134.49	-134.62	-134.75	-134.88	-135.01	-135.14	-135.27	-135.40	-135.53	-135.66	-135.79	-135.92	-136.05	-136.18	-136.31	-13





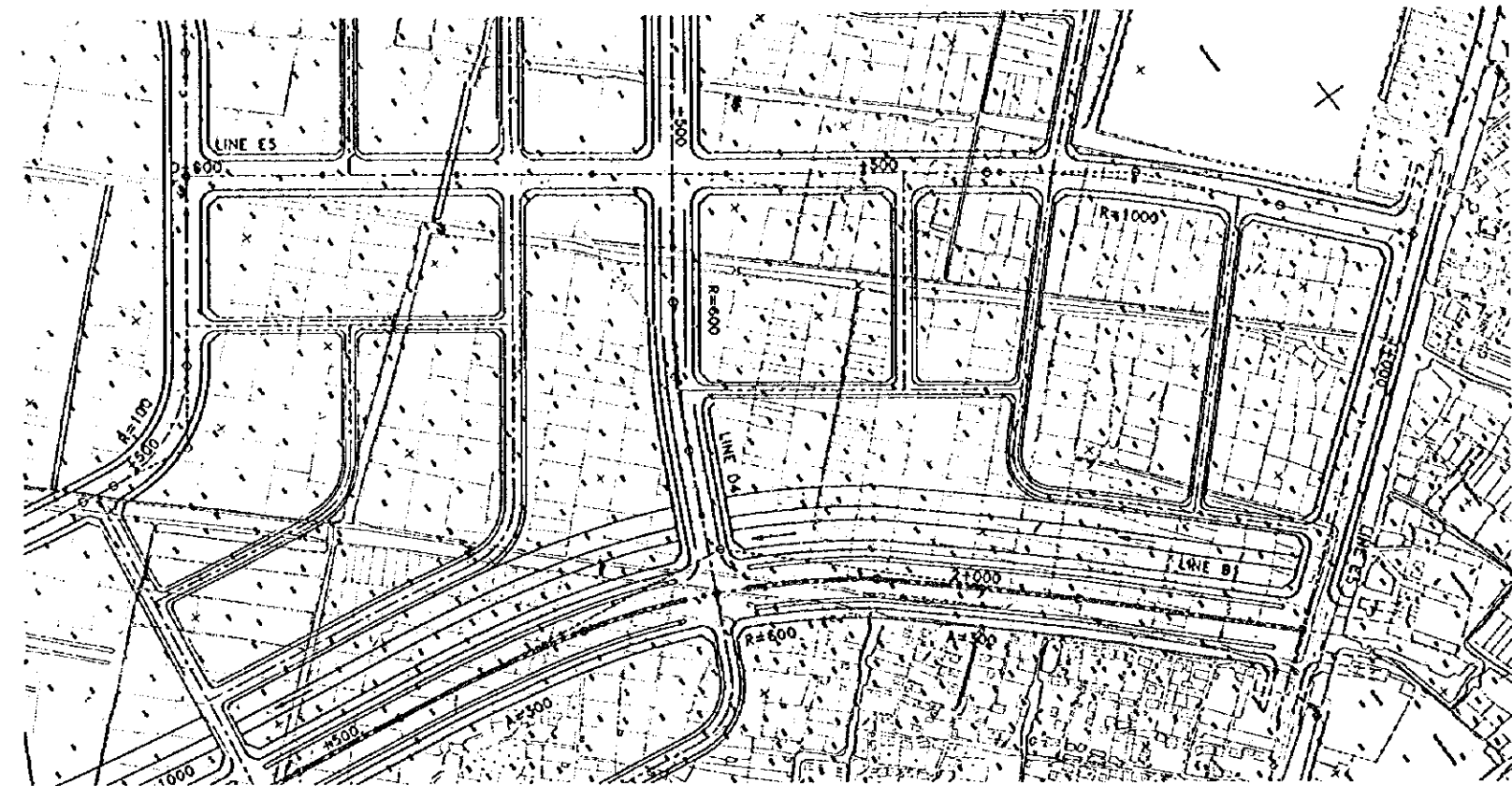
END OF LINE-E3  
 E. OF EXIST. RR. 3  
 STA. 3+238.89  
 E. OF PROPOSED  
 WIDENING RR. 3  
 STA. 3+274.18



ELEV. =	25.0																		
	20.0																		
	15.0																		
	10.0																		
	5.0																		
	0.0																		
	-5.0																		
	-10.0																		
FINISHED GRADE	7.00	6.94	6.91	6.87	6.82	6.72	6.62	6.50	6.37	6.49	6.60	6.72	6.75	6.78	6.81	6.87	6.84	7.00	
ORIGINAL GROUND	6.70	6.30	6.00	5.50	5.40	5.30	5.20	4.90	5.30	5.25	5.25	5.10	4.90	4.94	5.10	5.30	5.30	5.30	
STATION	0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700	0+800	0+900	1+000	1+100	1+200	1+300	1+400	1+500	1+600	1+700	
HOR. CURVATURE	R=∞		R=900			R=∞		R=500			R=∞		R=800			R=100			
VERT. CURVATURE	7.00	R=0.0450% L=450.00		6.82	R=0.1000% L=200.00		6.62	R=0.1250% L=200.00		6.37	R=0.1187% L=300.00		6.72	R=0.0300% L=300.00		6.81	R=0.0633% L=300.00		7.00
SUPERELEVATION AND WIDENING	NC																		







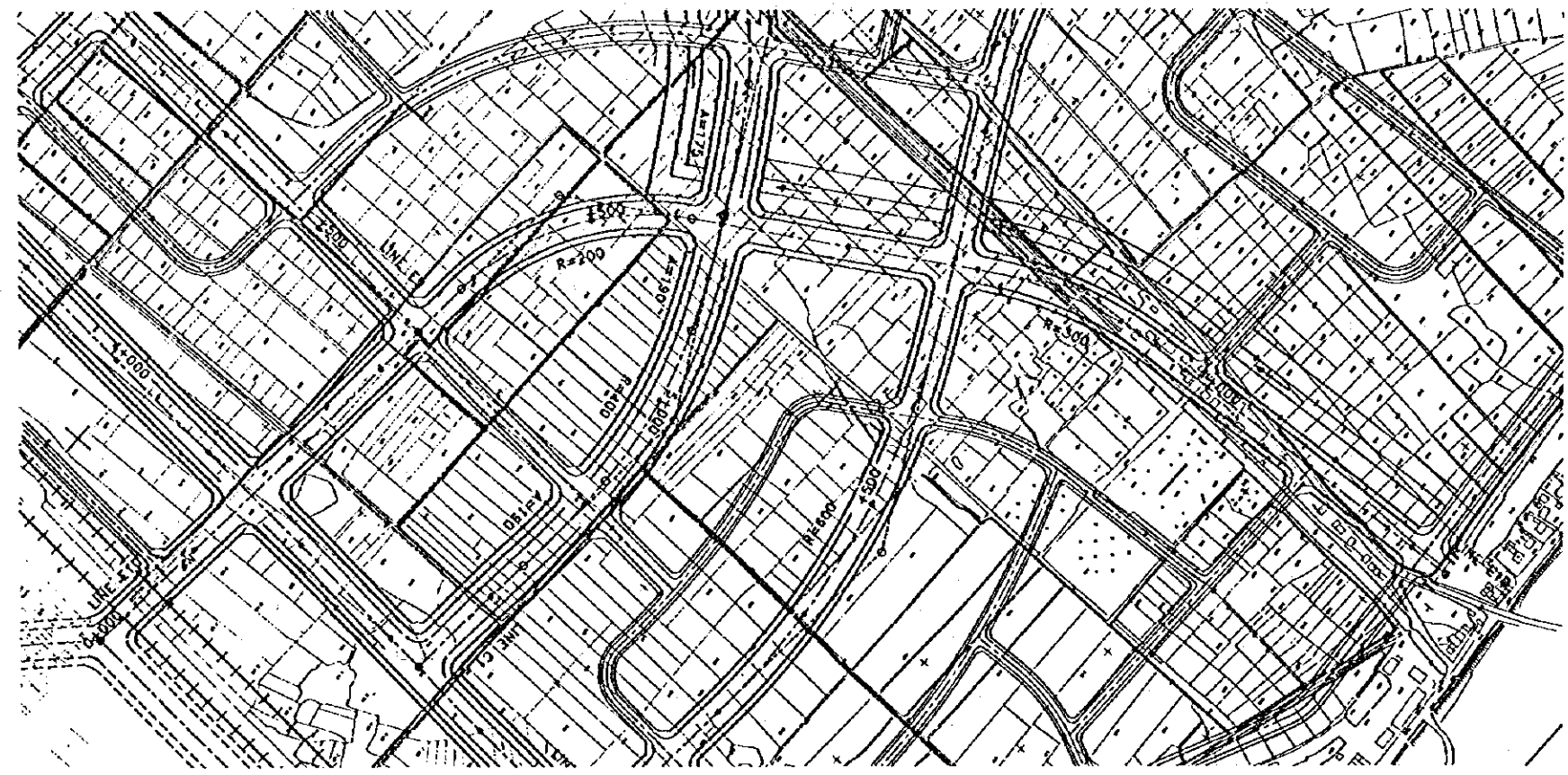
	m														
	25.0														
	20.0														
	15.0														
	10.0														
	5.0														
	0.0														
	-5.0														
ELEV.=	-10.0														
FINISHED GRADE		6.38	7.04	7.10	7.16	7.22	7.26	7.29	7.33	7.36	7.40	7.40	7.40	7.40	7.40
ORIGINAL GROUND		5.20	5.15	6.00	5.20	5.20	5.30	5.10	5.10	5.10	5.10	5.20	5.30	5.70	5.70
STATION		0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700	0+800	0+900	1+000	1+100	1+200	+213.93
HOR. CURVATURE		R=∞				R=1000				R=∞	PI	R=∞			
VERT. CURVATURE		5.28	L=0.0800% L=200.00		7.22	L=0.0560% L=500.00		7.40	g=0.000% L=315.93			7.40			
SUPERELEVATION AND WIDENING		NE													

RCBC 3-3.0x3.0







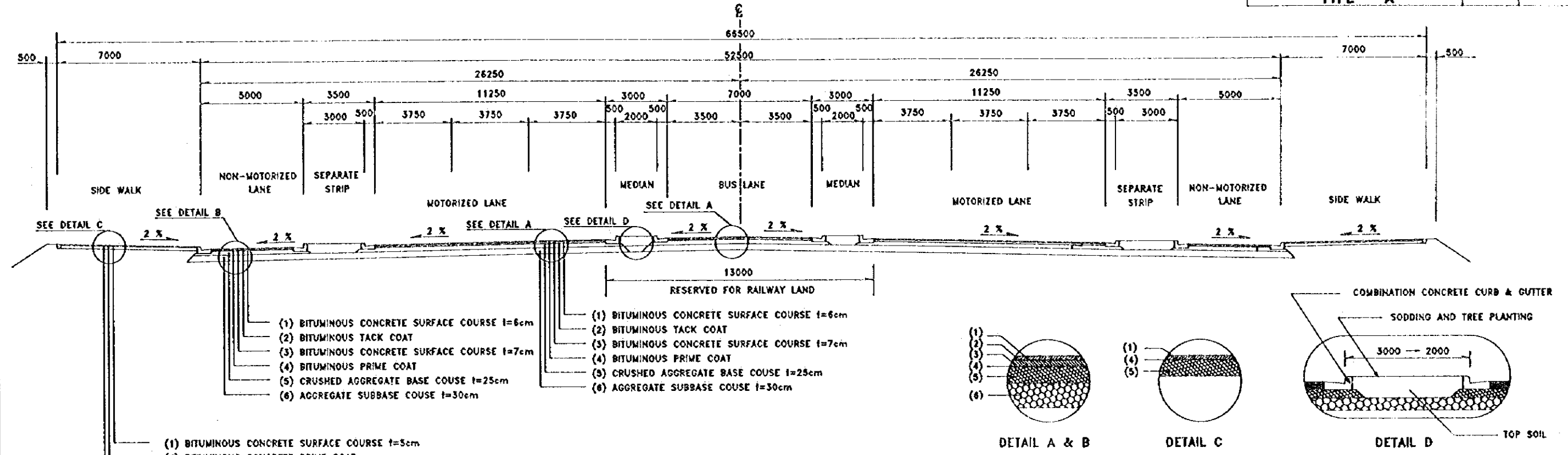




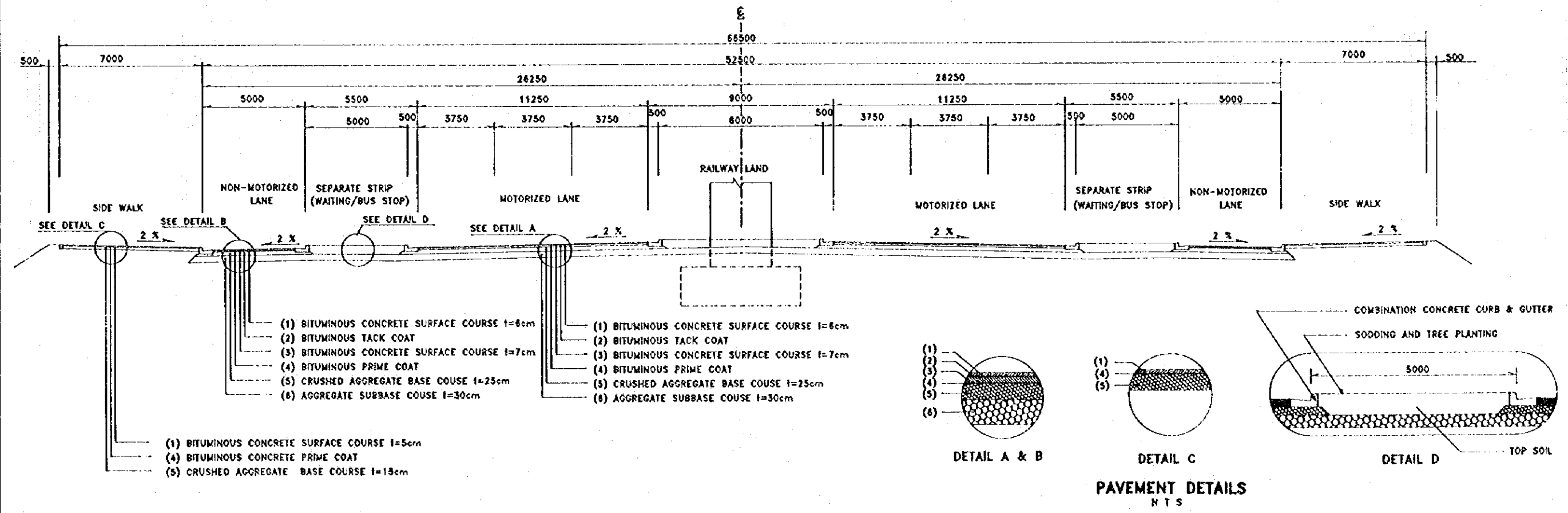


**TYPICAL CROSS SECTION TYPE - A**  
**TYPICAL CROSS SECTION MAIN ROAD OF ARTERIAL ROAD TYPE--1**  
**1. FIRST STAGE CONSTRUCTION**

SOCIALIST REPUBLIC OF VIETNAM THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	GRAPHICAL SCALE	DWG. No.
<b>TYPICAL CROSS SECTION TYPE - A</b>	1:100	<b>51</b>

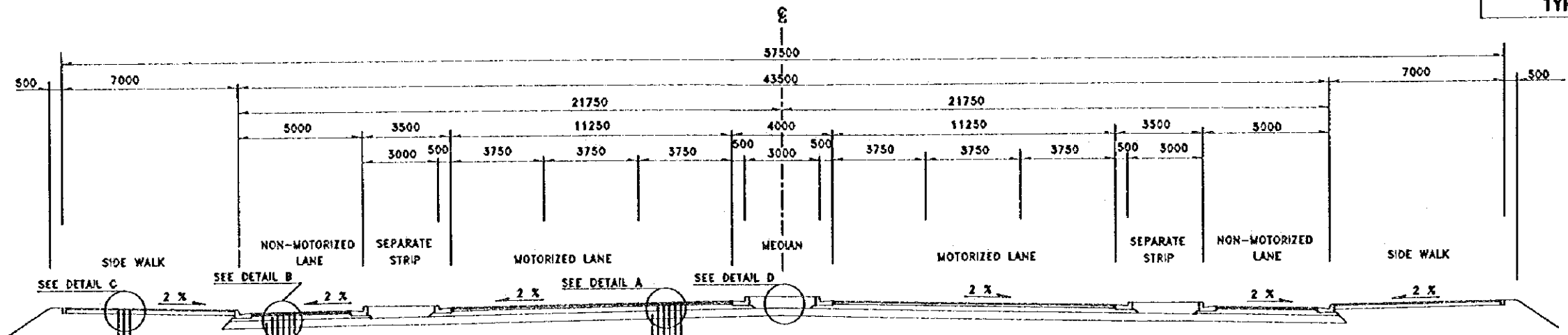


**TYPICAL CROSS SECTION MAIN ROAD OF ARTERIAL ROAD TYPE--1**  
**2. FUTURE STAGE CONSTRUCTION**



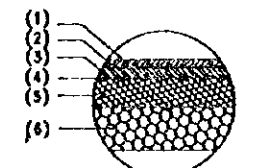
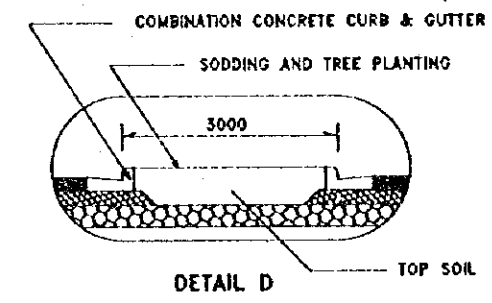
SOCIALIST REPUBLIC OF VIETNAM THE FEASIBILITY STUDY OF NEW C90 FOR HANOI CITY		
TITLE OF DRAWING	CROSS-SECTION SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE -- B AND C	1:100	52

**TYPICAL CROSS SECTION TYPE - B**  
ARTERIAL ROAD TYPE-2 (RING ROAD No.2)



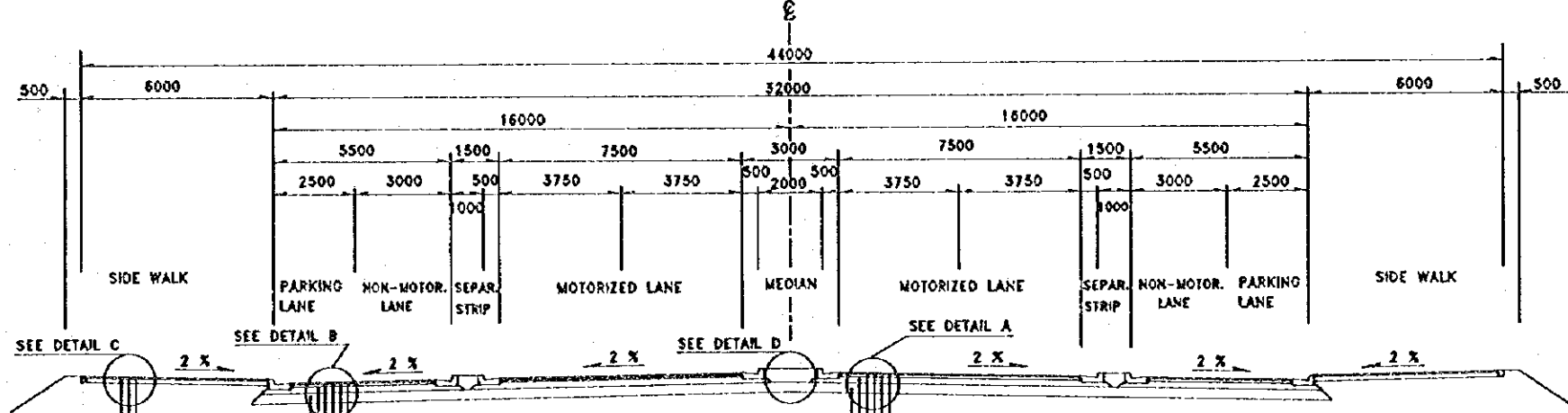
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=6cm
  - (2) BITUMINOUS TACK COAT
  - (3) BITUMINOUS CONCRETE SURFACE COURSE t=7cm
  - (4) BITUMINOUS PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COUSE t=25cm
  - (6) AGGREGATE SUBBASE COUSE t=30cm
- 
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
  - (4) BITUMINOUS CONCRETE PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COURSE t=15cm

- (1) BITUMINOUS CONCRETE SURFACE COURSE t=6cm
- (2) BITUMINOUS TACK COAT
- (3) BITUMINOUS CONCRETE SURFACE COURSE t=7cm
- (4) BITUMINOUS PRIME COAT
- (5) CRUSHED AGGREGATE BASE COUSE t=25cm
- (6) AGGREGATE SUBBASE COUSE t=30cm



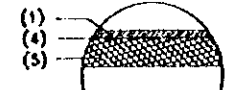
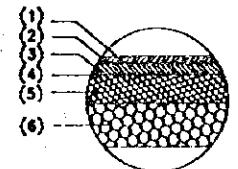
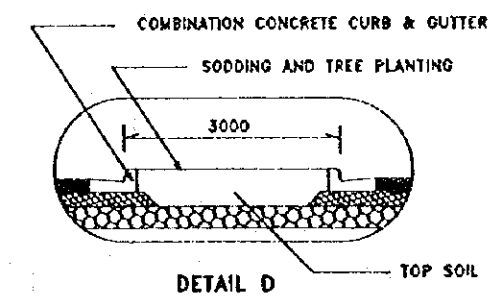
**PAVEMENT DETAILS**  
N T S

**TYPICAL CROSS SECTION TYPE - C**  
COLLECTOR ROAD TYPE-1



- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
  - (2) BITUMINOUS TACK COAT
  - (3) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
  - (4) BITUMINOUS PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COUSE t=25cm
  - (6) AGGREGATE SUBBASE COUSE t=30cm
- 
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
  - (4) BITUMINOUS CONCRETE PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COURSE t=15cm

- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (2) BITUMINOUS TACK COAT
- (3) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS PRIME COAT
- (5) CRUSHED AGGREGATE BASE COUSE t=25cm
- (6) AGGREGATE SUBBASE COUSE t=30cm

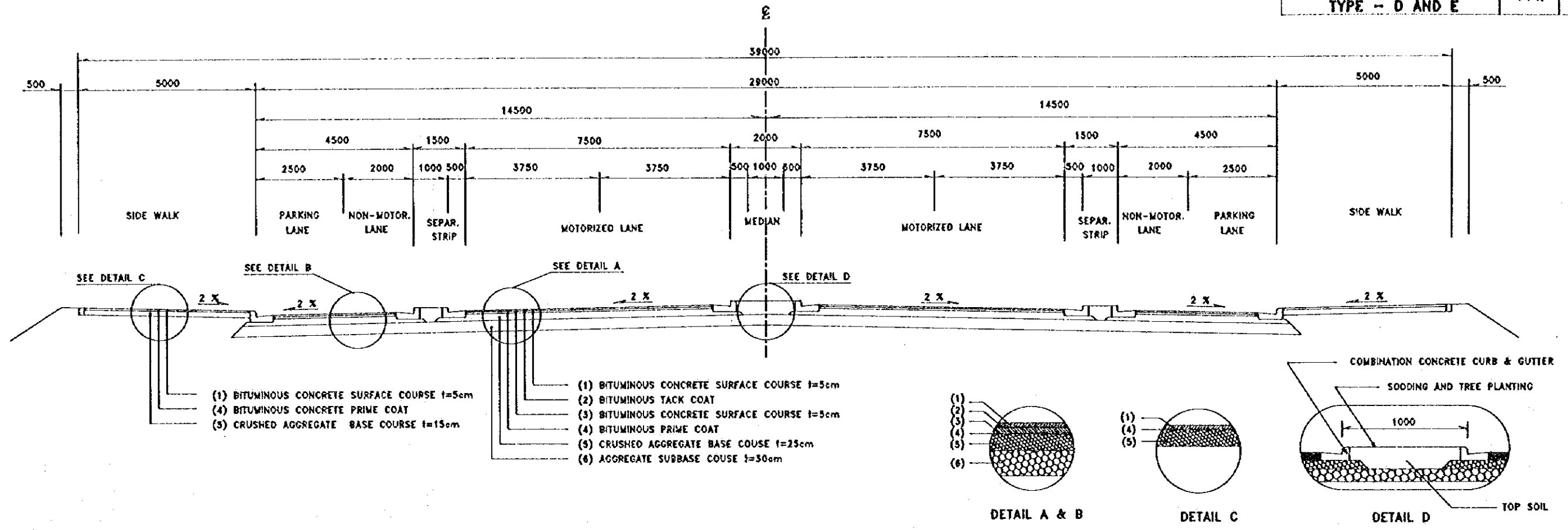


**PAVEMENT DETAILS**  
N T S

### TYPICAL CROSS SECTION TYPE - D

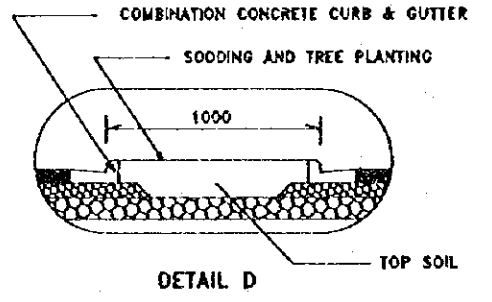
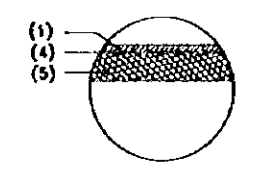
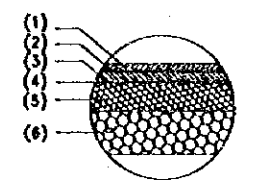
COLLECTOR ROAD TYPE-2

SOCIALIST REPUBLIC OF VIETNAM THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE - D AND E	1 : 40	53



- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS CONCRETE PRIME COAT
- (5) CRUSHED AGGREGATE BASE COURSE t=15cm

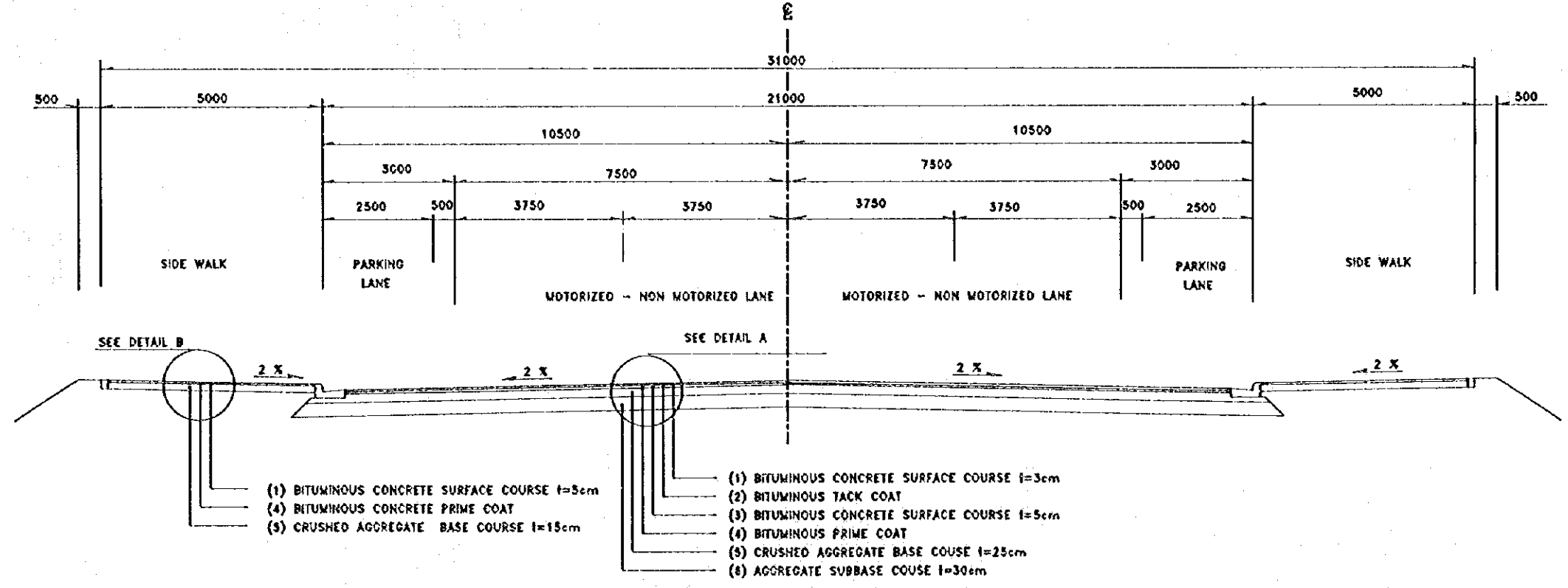
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (2) BITUMINOUS TACK COAT
- (3) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS PRIME COAT
- (5) CRUSHED AGGREGATE BASE COURSE t=25cm
- (6) AGGREGATE SUBBASE COURSE t=30cm



PAVEMENT DETAILS  
N T S

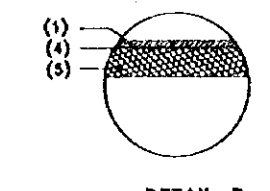
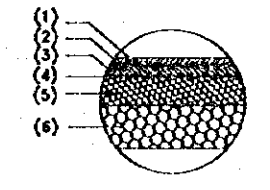
### TYPICAL CROSS SECTION TYPE - E

COLLECTOR ROAD TYPE-3



- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS CONCRETE PRIME COAT
- (5) CRUSHED AGGREGATE BASE COURSE t=15cm

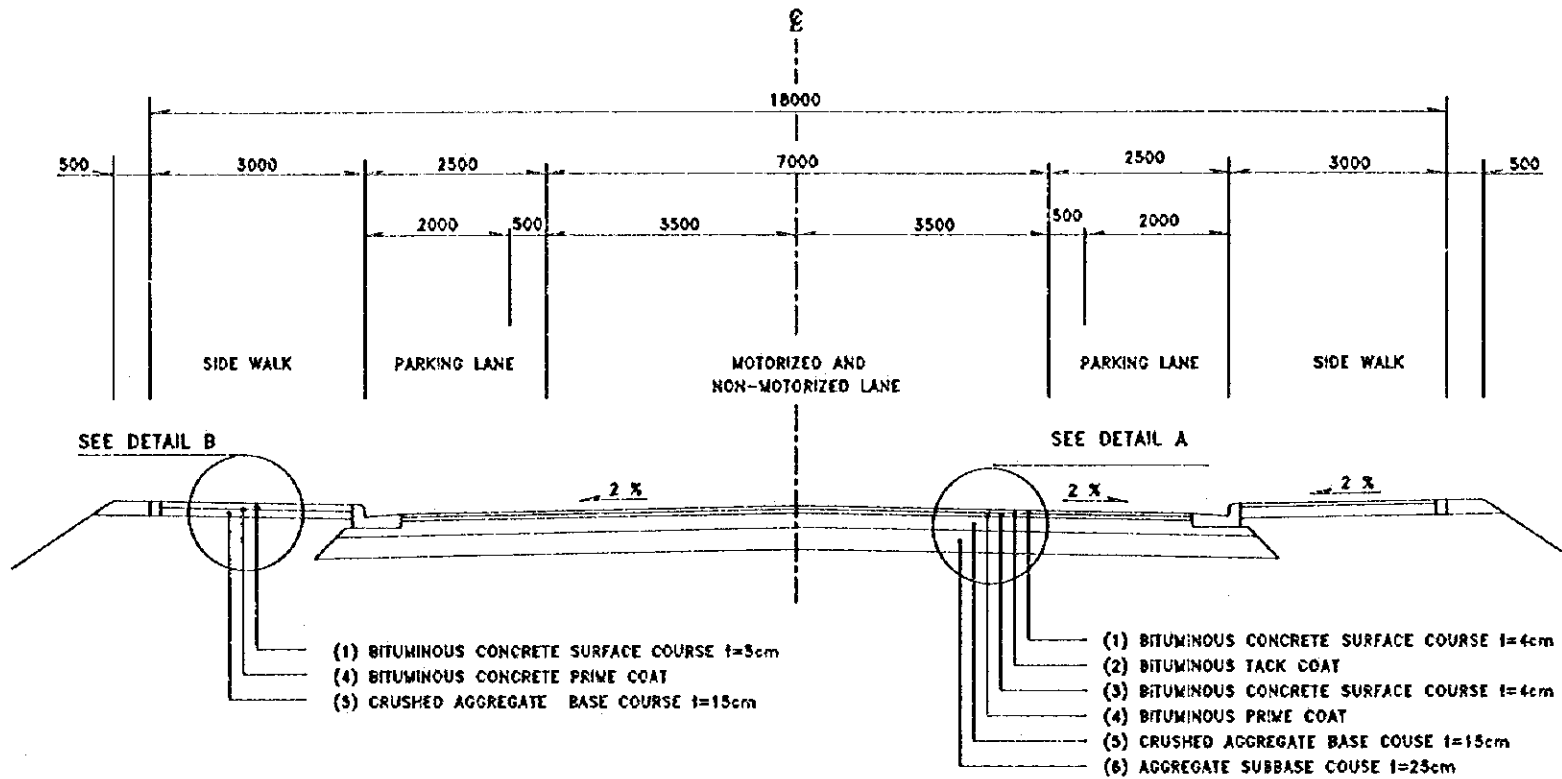
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (2) BITUMINOUS TACK COAT
- (3) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS PRIME COAT
- (5) CRUSHED AGGREGATE BASE COURSE t=25cm
- (6) AGGREGATE SUBBASE COURSE t=30cm



PAVEMENT DETAILS  
N T S

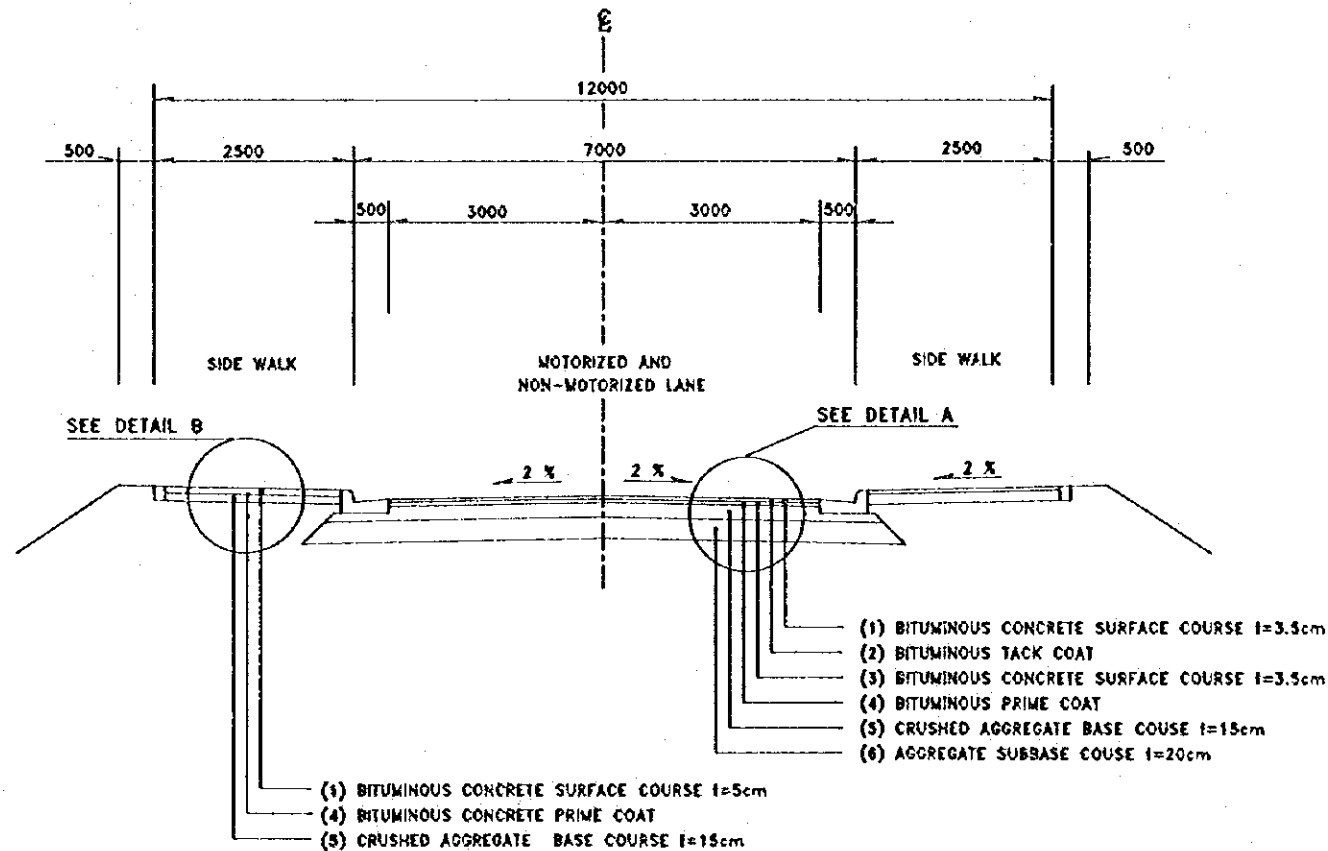
**TYPICAL CROSS SECTION TYPE -- F**

FEEDER ROAD TYPE-1

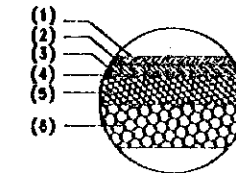


**TYPICAL CROSS SECTION TYPE -- G**

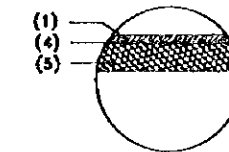
FEEDER ROAD TYPE-2



SOCIALIST REPUBLIC OF VIETNAM		
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE -- F AND G	1:50	54

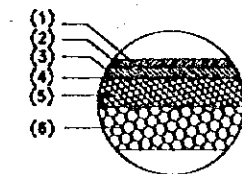


DETAIL A

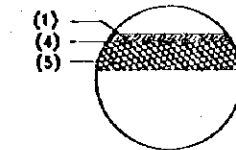


DETAIL B

PAVEMENT DETAIL  
N T S



DETAIL A



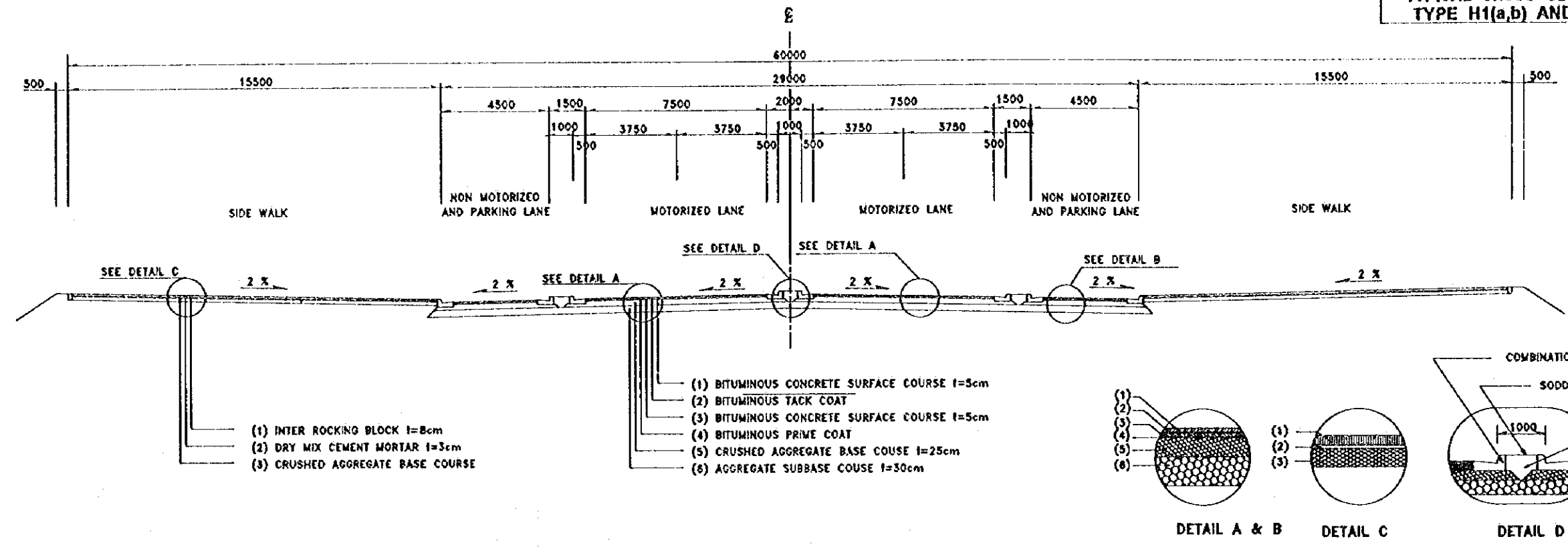
DETAIL B

PAVEMENT DETAIL  
N T S



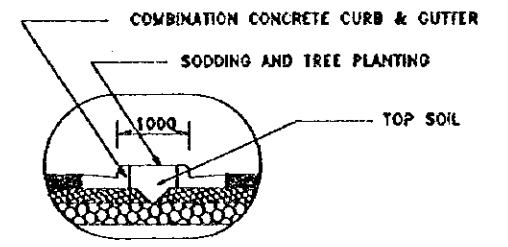
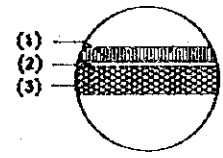
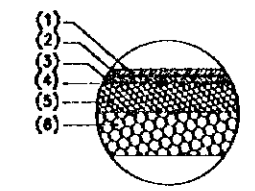
**TYPICAL CROSS SECTION TYPE -- H1a**  
 COMBINED COLLECTOR ROAD AND PEDESTRIAN ROAD

SOCIALIST REPUBLIC OF VIETNAM		
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
<b>TYPICAL CROSS SECTION TYPE H1(a,b) AND H2</b>	1:100	<b>55</b>



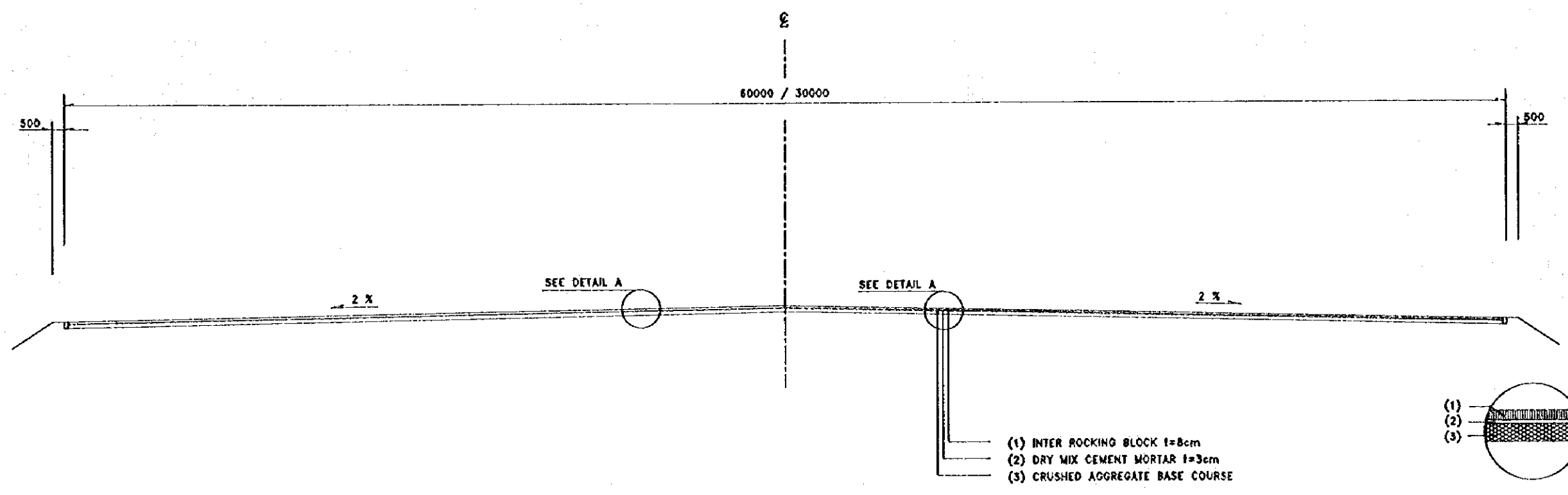
- (1) INTER ROCKING BLOCK t=8cm
- (2) DRY MIX CEMENT MORTAR t=3cm
- (3) CRUSHED AGGREGATE BASE COURSE

- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (2) BITUMINOUS TACK COAT
- (3) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
- (4) BITUMINOUS PRIME COAT
- (5) CRUSHED AGGREGATE BASE COURSE t=25cm
- (6) AGGREGATE SUBBASE COURSE t=30cm

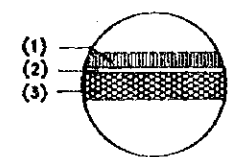


**PAVEMENT DETAILS**  
N T S

**TYPICAL CROSS SECTION TYPE -- H1b/H2**  
 PEDESTRIAN ROAD



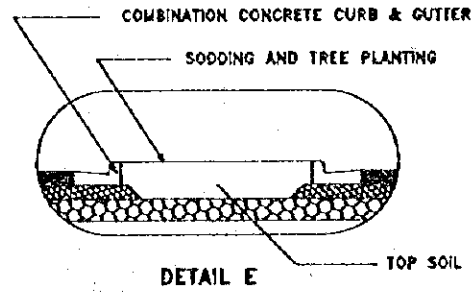
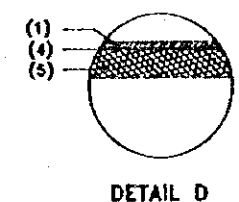
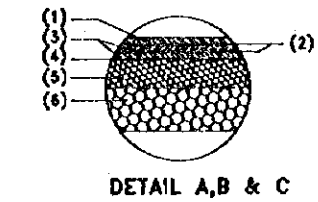
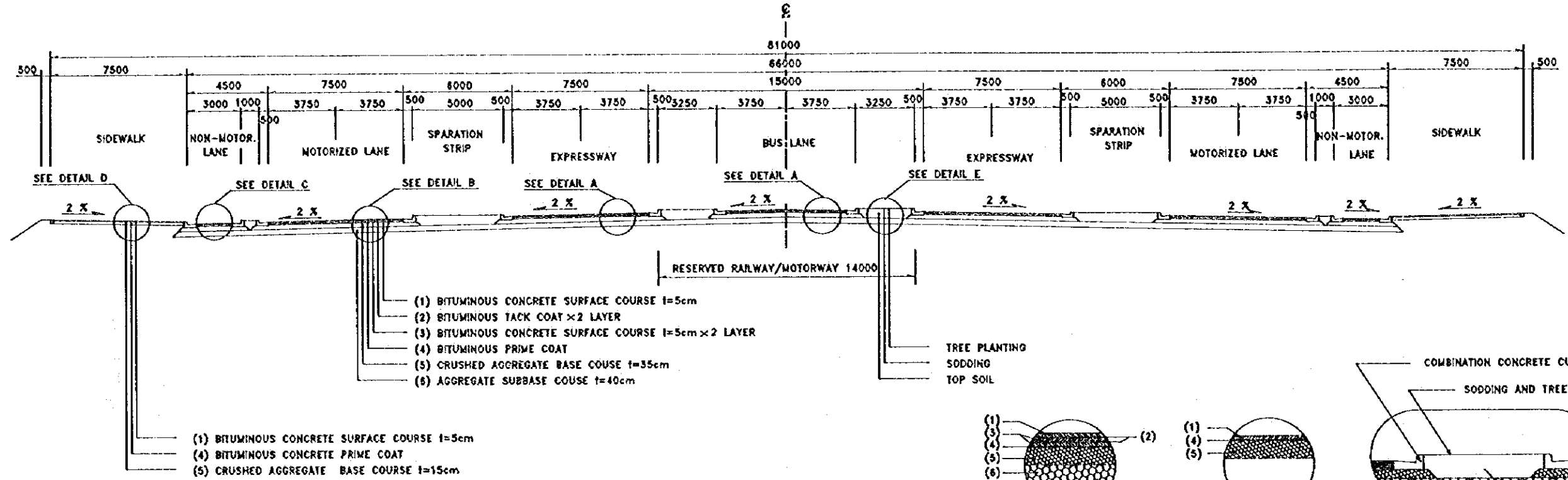
- (1) INTER ROCKING BLOCK t=8cm
- (2) DRY MIX CEMENT MORTAR t=3cm
- (3) CRUSHED AGGREGATE BASE COURSE



**DETAIL A**  
**PAVEMENT DETAILS**  
 N T S

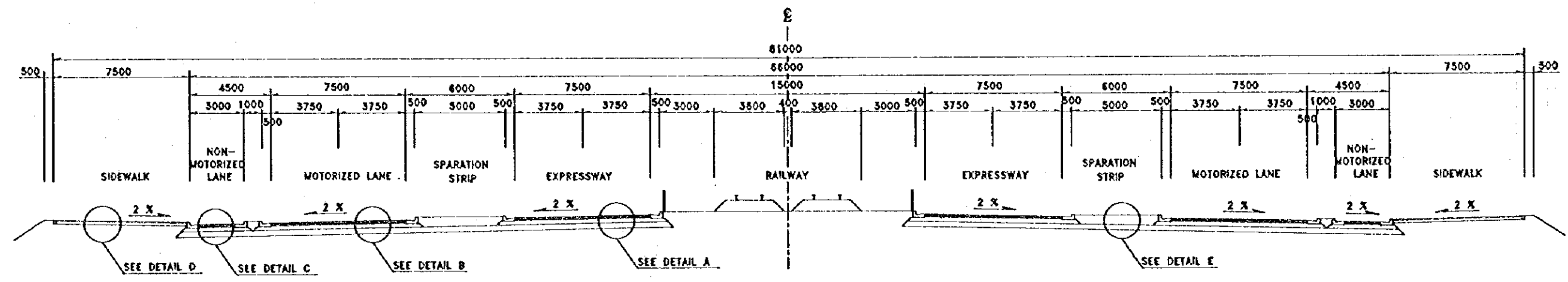
### TYPICAL CROSS SECTION RING ROAD NO.3 SOUTH SECTION

#### COMBINED BUS LANE



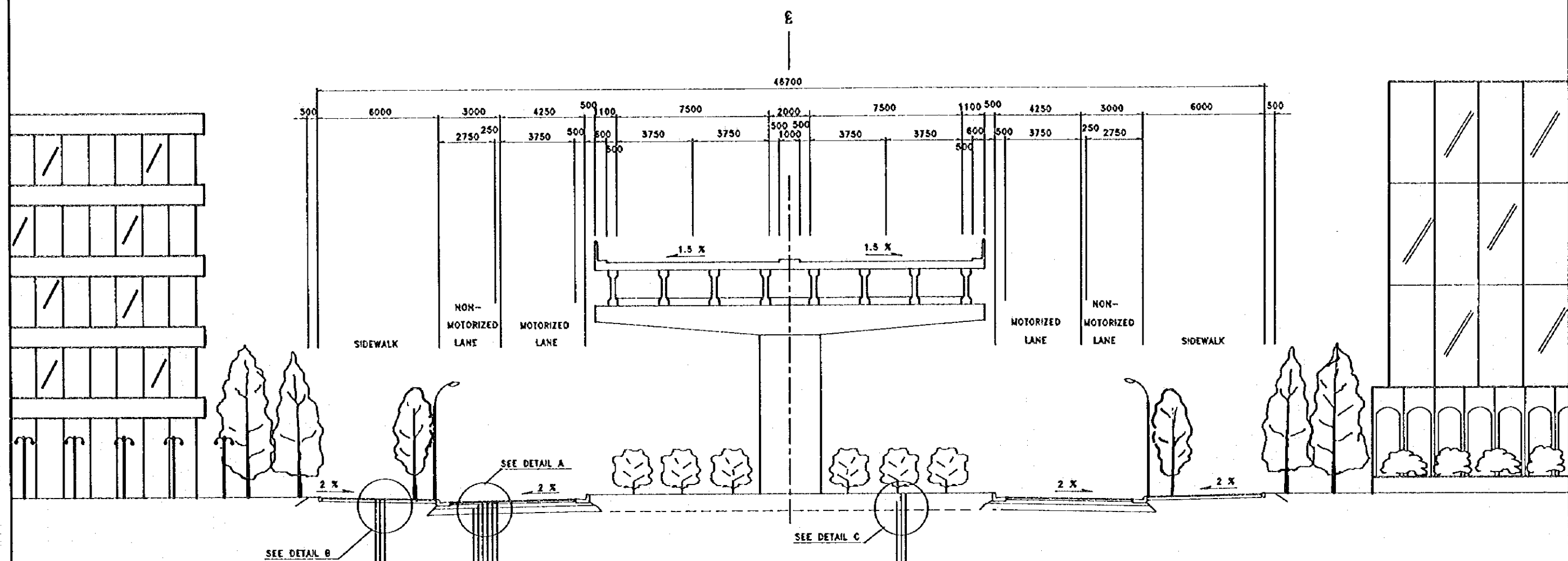
PAVEMENT DETAILS  
N I S

#### COMBINED RAILWAY TRANSIT



SOCIALIST REPUBLIC OF VIETNAM		
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE-CE (WITH FLYOVER)	1:100	57

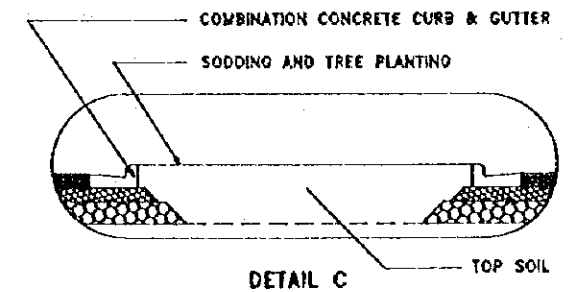
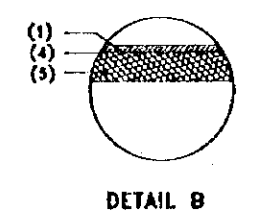
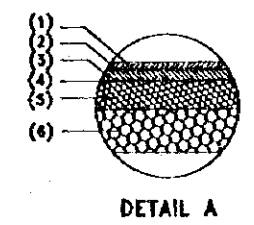
**TYPICAL CROSS SECTION TYPE-CE**  
**FLYOVER AT RING ROAD NO.3 AND NATIONAL RAILWAY CROSSING**



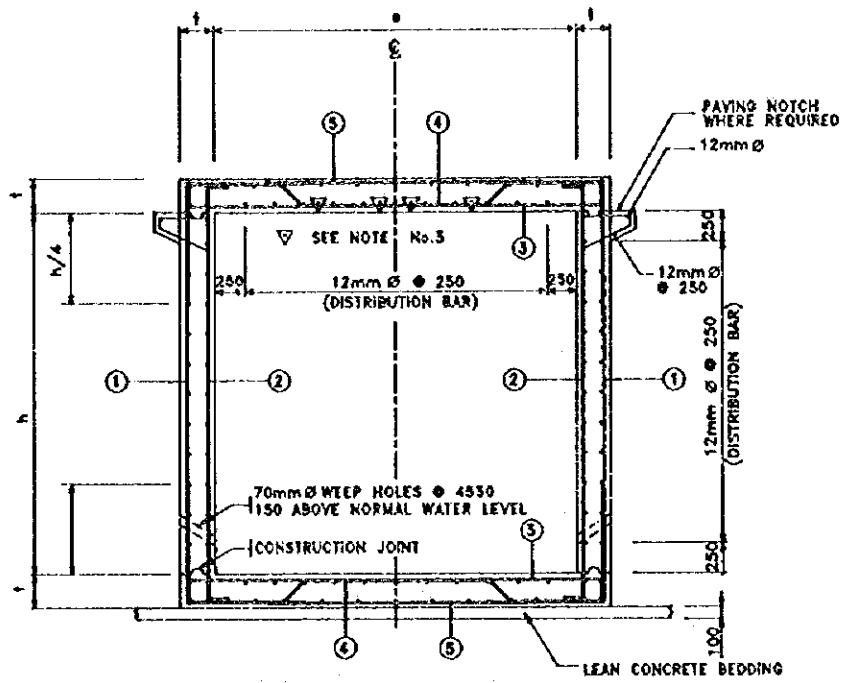
- SEE DETAIL A
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=6cm
  - (2) BITUMINOUS TACK COAT
  - (3) BITUMINOUS CONCRETE SURFACE COURSE t=7cm
  - (4) BITUMINOUS PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COURSE t=25cm
  - (6) AGGREGATE SUBBASE COURSE t=30cm
- SEE DETAIL B
- (1) BITUMINOUS CONCRETE SURFACE COURSE t=5cm
  - (4) BITUMINOUS CONCRETE PRIME COAT
  - (5) CRUSHED AGGREGATE BASE COURSE t=15cm

SEE DETAIL C

- TREE PLANTING
- SODDING
- TOP SOIL

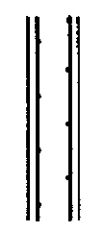


**PAVEMENT DETAILS**  
N T S

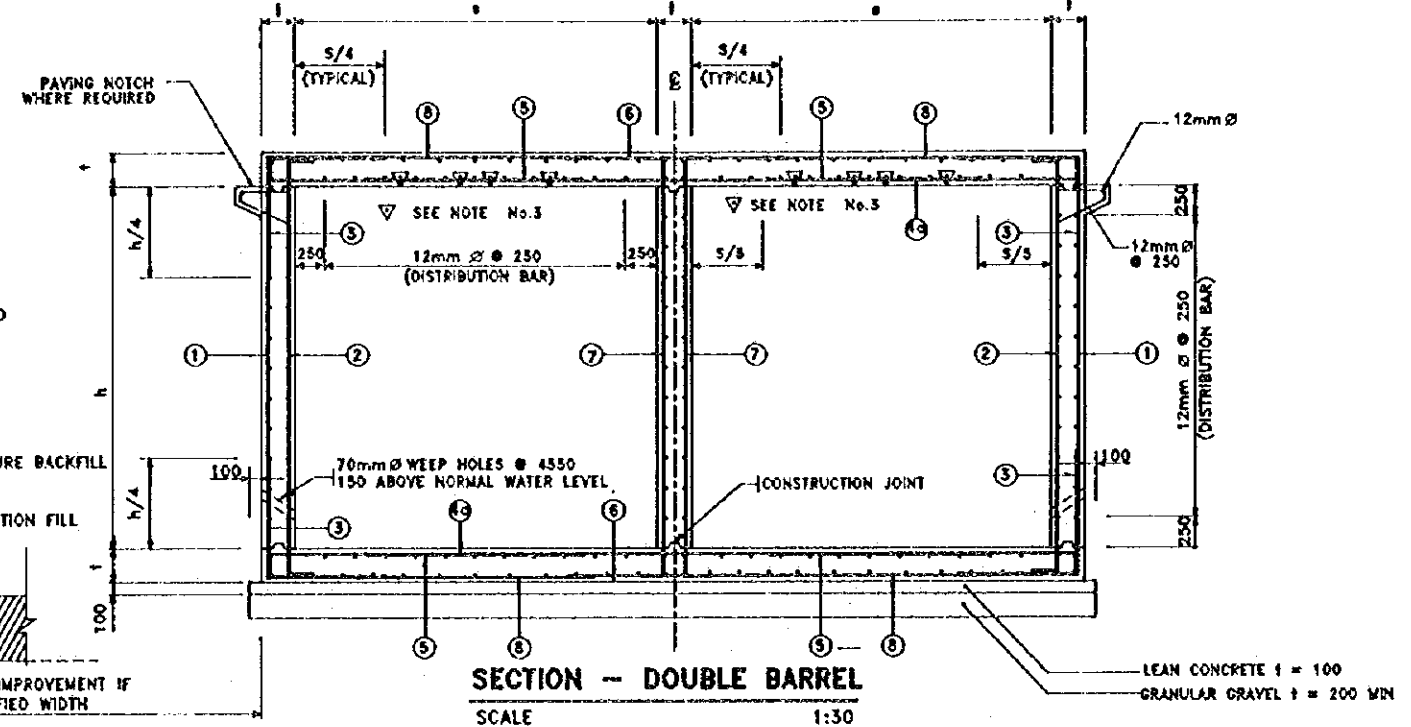
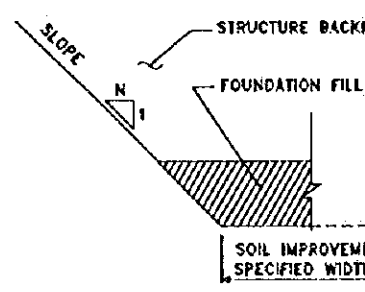


**SECTION - SINGLE BARREL**  
SCALE 1:30

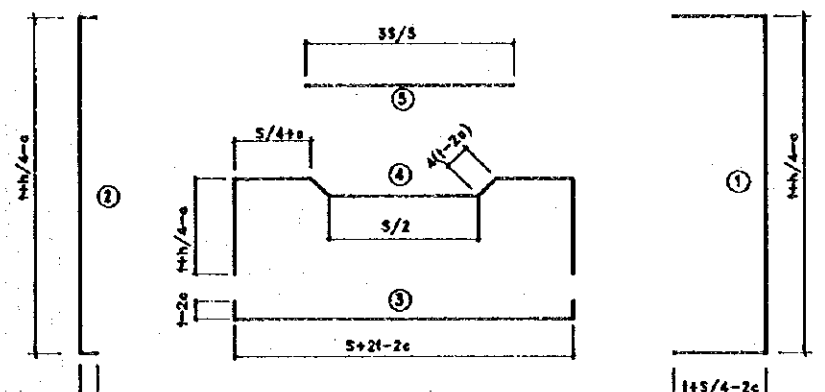
**NOTE:**  
FOR WALL THICKNESS LESS THAN 240,  
STAGGER HORIZONTAL REINFORCEMENT  
AS SHOWN



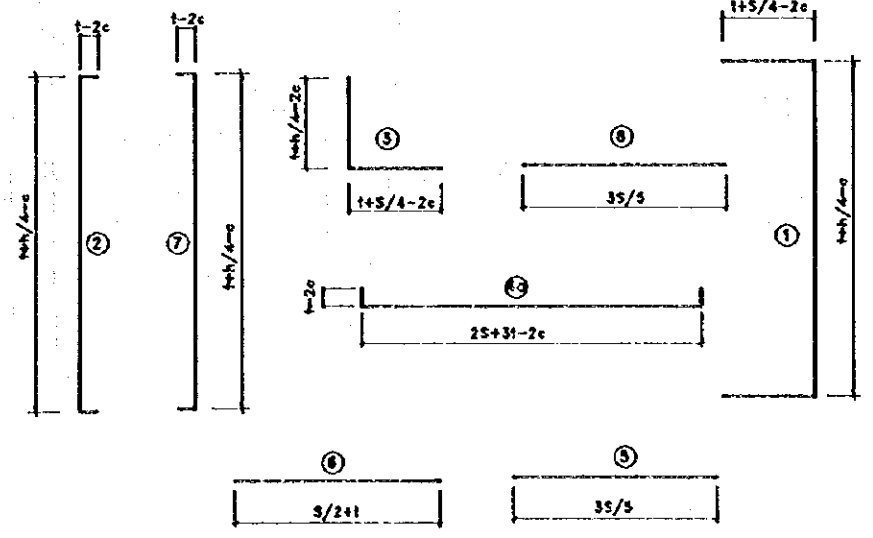
**NOTE:**  
SOIL IMPROVEMENT DEPTH,  
WIDTH AND SLOPE (1:N) SHOULD  
BE SHOWN ON THE DETAIL  
DRAWING OR INSTRUCTED BY  
THE ENGINEER IF REQUIRED



**SECTION - DOUBLE BARREL**  
SCALE 1:30



**BAR DIAGRAMS--SINGLE BARREL**  
NOT TO SCALE

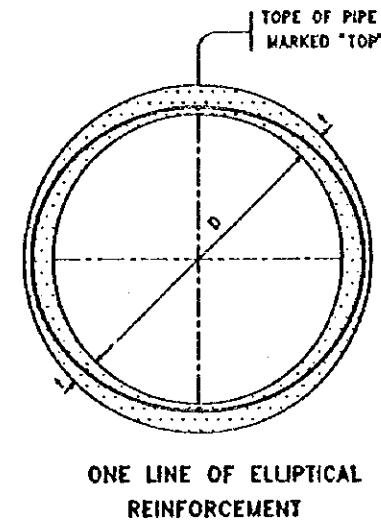
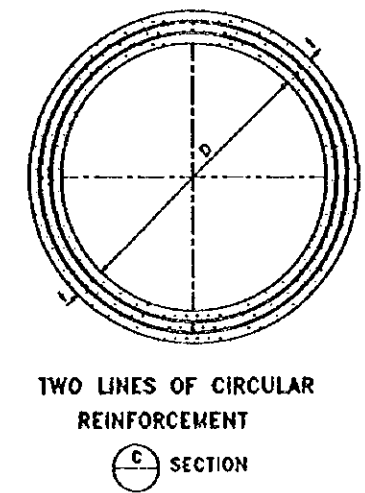
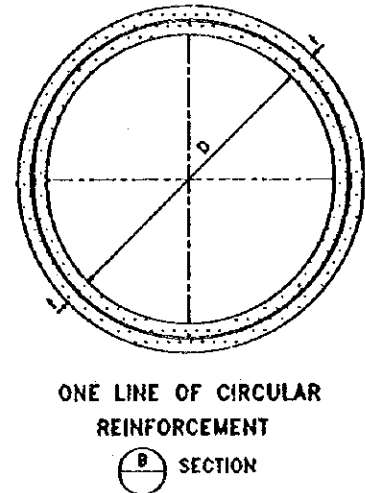
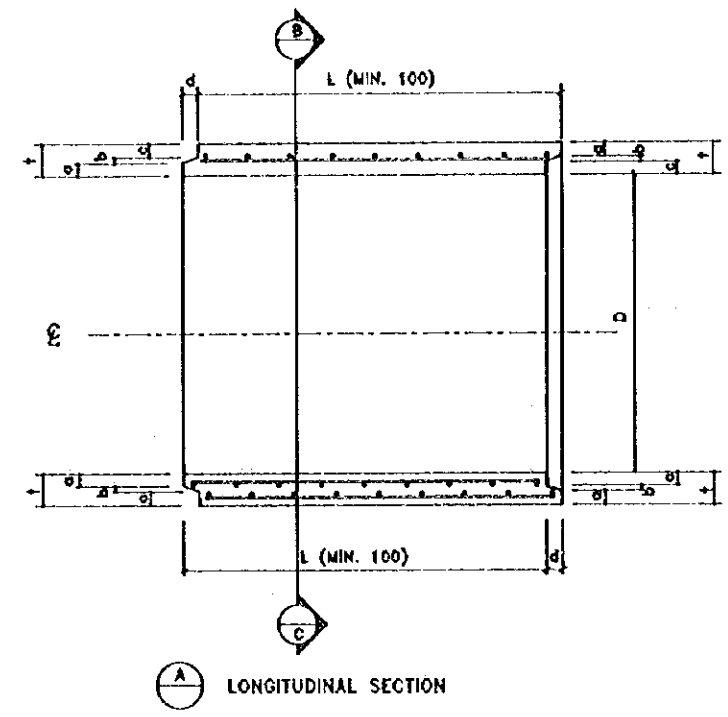


**BAR DIAGRAMS--DOUBLE BARREL**  
NOT TO SCALE

CLEAR SPAN S	HEIGHT h	SINGLE BARREL BOX CULVERT										DOUBLE BARREL BOX CULVERT									
		BAR 1	BAR 2	BAR 3	BAR 4	BAR 5	BAR 1	BAR 2	BAR 3	BAR 4	BAR 5	BAR 6	BAR 7	BAR 8							
		Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING	Ø	SPACING
1000	1000	180	12 300	12 300	12 300	12 300	12 300	12 300	12 300	180	12 300	18 300	12 300	12 300	12 300	20 200	12 300	12 300	12 300	12 300	
	1250	180	12 300	12 300	12 300	12 300	12 300	12 300	12 300	180	12 300	18 300	12 300	12 300	12 300	20 200	12 300	12 300	12 300	12 300	
	1500	180	12 300	12 300	12 300	12 300	12 300	12 300	12 300	180	12 300	18 300	12 300	12 300	12 300	20 200	12 300	12 300	12 300	12 300	
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	1500	180	12 300	12 240	12 300	12 240	12 240	12 300	12 300	180	12 300	18 300	12 300	12 300	12 300	20 200	12 300	12 300	12 200	12 200	

**NOTES:** 1. FOR BOXES WITH SPAN OR HEIGHT LESS THAN ANY OF THOSE SHOWN IN THE TABLE, USE NEXT GREATER SIZE BOX CONCRETE DIMENSIONS AND REINFORCEMENT, MAKE NECESSARY CHANGES IN BAR LENGTHS AND QUANTITIES.

2. CONCRETE CLEAR COVER SHALL BE 50mm...(c)  
3. THE FILL LESS THAN 0.6m NECESSITATES AN ADDITIONAL REBARS...(▽)  
4. LAP LENGTH OF BAR SHALL NOT BE LESS THAN 40 BAR DIAMETER.



(1) REINFORCED CONCRETE PIPE CULVERTS

INTERNAL DESIGNATED DIAMETER (mm)	WALL THICKNESS (mm)	REINFORCEMENT, CM <sup>2</sup> /M OF PIPE					
		CLASS II R C P			CLASS III R C P		
		D-LOAD TO PRODUCE a 0.3mm CRACK 50.0			D-LOAD TO PRODUCE a 0.3mm CRACK 65.0		
		D-LOAD TO PRODUCE THE ULTIMATE LOAD 75.0			D-LOAD TO PRODUCE THE ULTIMATE LOAD 100.0		
		CONCRETE STRENGTH 27.6 MPa			CONCRETE STRENGTH 27.6 MPa		
CIRCULAR REINFORCEMENT		ELLIPTICAL REINFORCEMENT	CIRCULAR REINFORCEMENT		ELLIPTICAL REINFORCEMENT		
INNER CAGE		OUTER CAGE	INNER CAGE	OUTER CAGE			
300	44	1.5			1.5		
375	47	1.5			1.5		
450	50	1.5			1.5		1.5
500	57	2.5			3.0		2.3
600	63	2.8			3.6		3.0
675	66	3.2			3.8		3.4
750	69	3.2			4.0		3.6
825	72	3.4			4.4		4.2
900	75	3.0	1.8	3.2	4.4	2.6	4.7
1000	88	3.4	2.0	3.8	5.3	3.2	5.9
1200	100	4.5	2.7	4.9	6.8	4.1	7.5
1350	113	5.3	3.2	5.9	8.0	4.8	8.9
1500	125	6.4	3.8	7.0	9.3	5.6	10.4
1650	138	7.4	4.4	8.3	10.6	6.4	11.6
1800	150	8.7	5.2	9.5	12.1	7.3	13.3
1950	163	9.7	5.8	10.8	13.5	8.1	15.0
2000	175	10.8	6.5	12.1	15.2	9.1	16.8
2250	188	12.1	7.3	13.3	17.1	10.3	19.1
2400	200	13.1	7.9	14.6	19.7	11.8	21.8

NOTE : FOR CLASS III R.C.P, CONCRETE STRENGTH = 34.5 MPa  
WHEN D ≥ 1950 mm

(2) DESIGN REQUIREMENTS OF REINFORCED CONCRETE PIPE CULVERTS

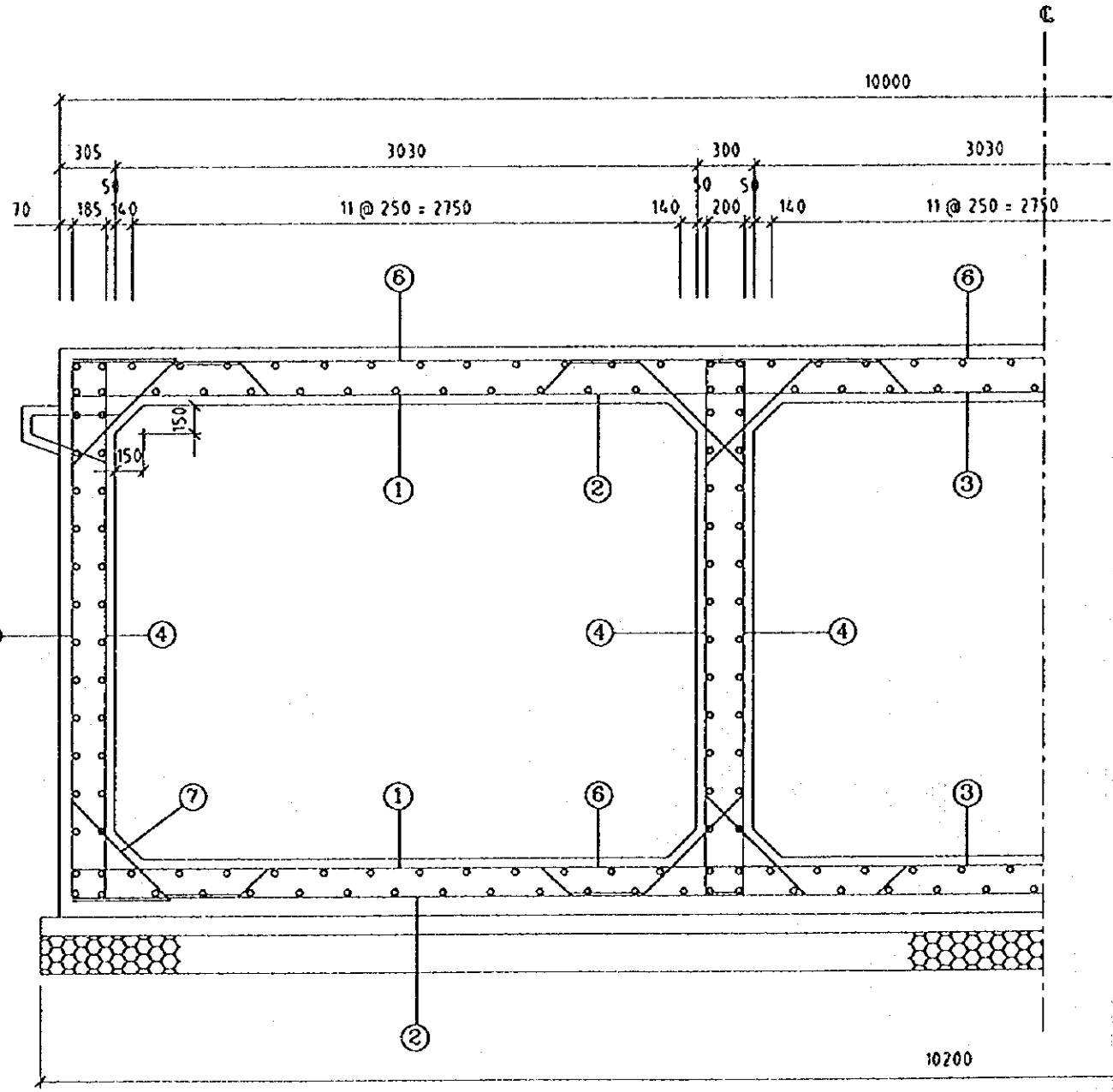
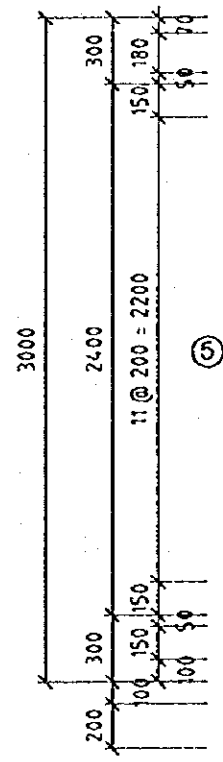
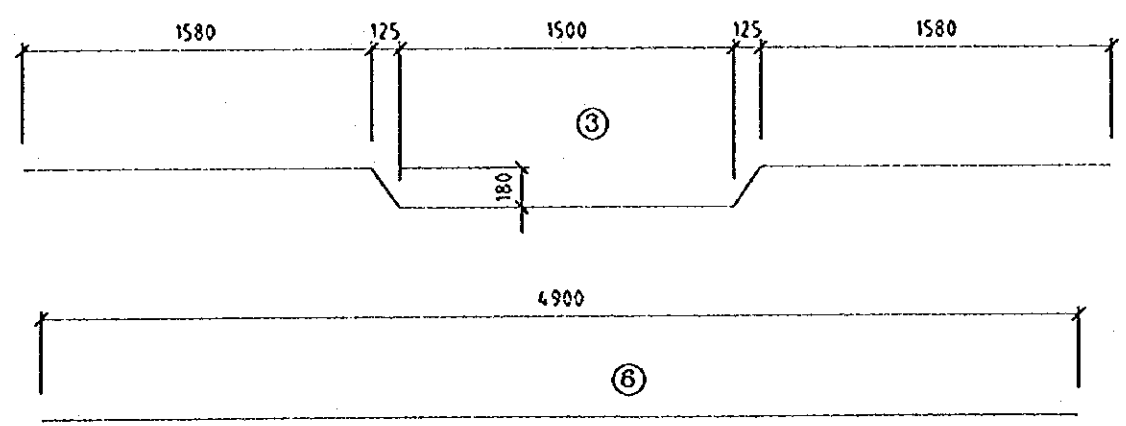
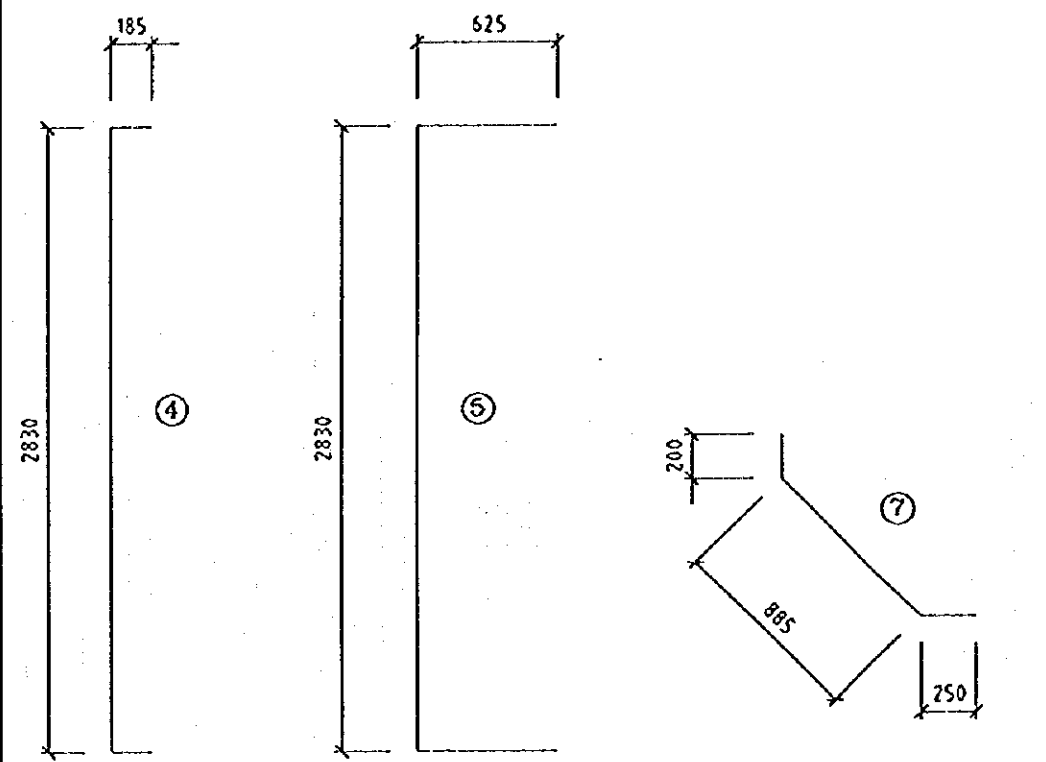
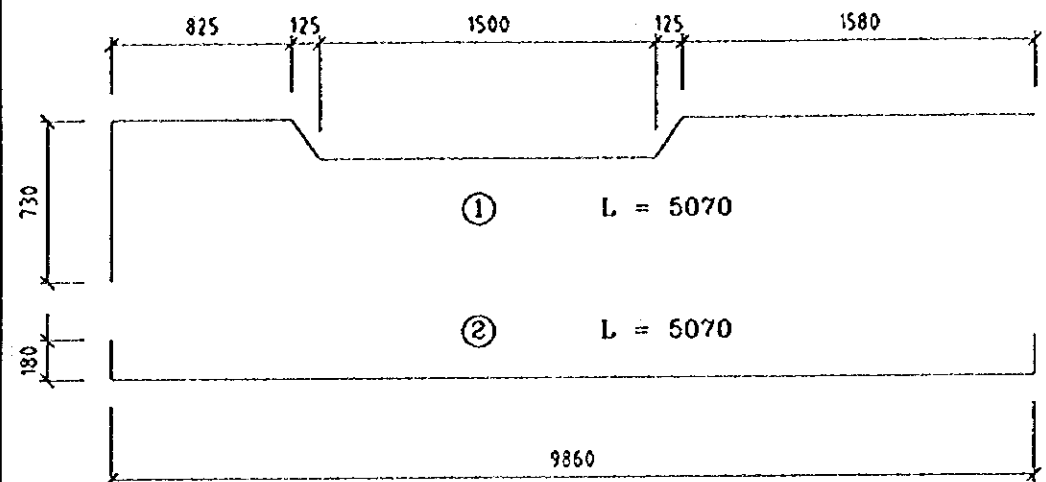
R C P CULVERT CLASS	INSIDE DIAMETER D (mm)	WALL THICKNESS T (mm)	PIPE END DETAILS (CM)			
			a	b	c	d
CLASS II & III	300	44	17	7	20	30
	375	47	18	7	22	30
	450	50	19	8	23	30
	500	57	22	10	25	40
	600	63	24	10	29	40
	675	66	26	10	30	45
	750	69	28	10	31	45
	825	72	28	13	31	45
	900	75	29	15	31	45
	1000	88	35	15	38	45
	1200	100	40	15	45	50
	1350	113	44	20	49	55
	1500	125	48	25	52	60
	1650	138	53	25	60	60
	1800	150	57	30	63	65
	1950	163	62	35	66	65
2000	175	66	40	69	70	
2250	188	71	45	72	70	
2400	200	76	50	74	75	

**GENERAL NOTES :**

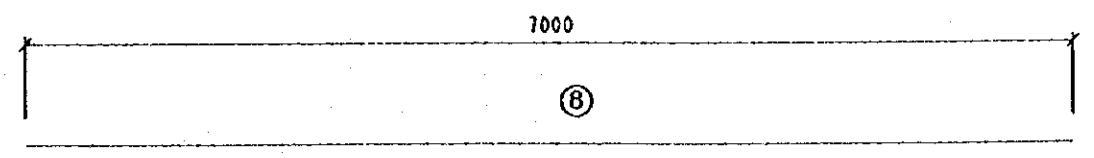
- SPECIFICATIONS :
- AASHTO DESIGNATION : M 170 M-83  
ASTM DESIGNATION : C 78 M-90a
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
  2. REINFORCED CONCRETE PIPE CULVERT.
    - 2.1 CEMENT CONTENT USED FOR CONCRETE MIX SHALL BE LESS THAN 335 KG PER CUBIC METER OF CONCRETE.
    - 2.2 REINFORCEMENT SHALL CONSIST OF WIRE CONFORMING TO AASHTO M32 OR M225, OR OF BARS OF GRADE 300 STEEL CONFORMING TO AASHTO M31 M.
    - 2.3 WHEN ONE LINE OF CIRCULAR REINFORCEMENT IS USED, IT SHALL BE PLACED FROM 35 TO 50 PERCENT OF THE WALL THICKNESS FROM THE INNER SURFACE OF THE PIPE
    - 2.4 IN PIPE HAVING TWO LINES OF CIRCULAR REINFORCEMENT, EACH LINE SHALL BE SO PLACED THAT THE PROTECTIVE COVERING OF CONCRETE OVER THE CIRCUMFERENTIAL REINFORCEMENT IN THE WALL OF THE PIPE SHALL BE 25mm.
    - 2.5 IN PIPE HAVING ELLIPTICAL REINFORCEMENT WITH WALL THICKNESSES 63mm OR GREATER, THE REINFORCEMENT IN THE WALL OF THE PIPE SHALL BE SO PLACED THAT THE PROTECTIVE COVERING OF CONCRETE OVER THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 25mm FROM THE INNER SURFACE OF THE PIPE AT THE VERTICAL DIAMETER AND 25mm FROM THE OUTER SURFACE OF THE PIPE AT THE HORIZONTAL DIAMETER. IN PIPE HAVING ELLIPTICAL REINFORCEMENT WITH WALL THICKNESSES LESS THAN 63mm, THE PROTECTIVE COVERING SHALL BE 19mm AT THE VERTICAL AND HORIZONTAL DIAMETERS.
    - 2.6 LONGITUDINAL REINFORCEMENT SPACING FOR PIPE SIZE 300mm Ø OR SMALLER IN DIAMETER SHALL BE A MINIMUM OF 4 - 4 mm Ø BARS OR 8 - 4mm Ø BARS FOR PIPES 600mm OR LARGER.
  3. CULVERT JOINTS SHALL BE MORTARED AS SHOWN ON THE DRAWING WITH CEMENT MORTAR (1:2 BY VOLUME).
  4. CULVERT LENGTH (L) SHALL BE 100cm UNLESS OTHERWISE SPECIFIED
  5. REINFORCED CONCRETE PIPE CULVERT CLASS III SHALL BE USED UNDER ROADWAY PAVEMENT
  6. REINFORCED CONCRETE PIPE CULVERT CLASS II SHALL BE USED IN ANY PLACE OTHER THAN UNDER PAVEMENT



SOCIALIST REPUBLIC OF VIET NAM		
THE FEASIBILITY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No
STANDARD REINFORCED CONCRET BOX CULVERT (2)	AS SHOWN	60



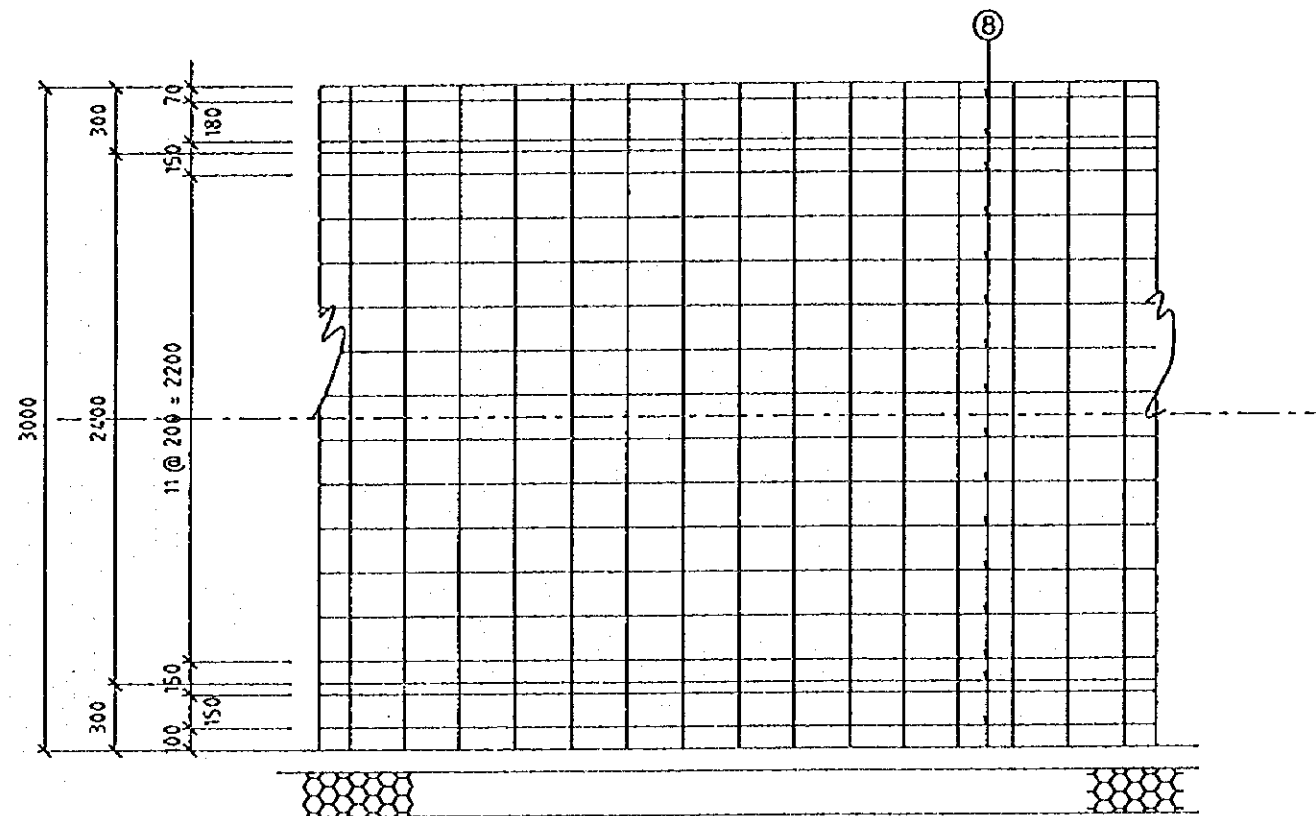
DETAIL OF CROSS SECTION  
SCALE 1:30



SOCIALIST REPUBLIC OF VIET NAM		
THE FEASIBILITY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No
STANDARD REINFORCED CONCRETE BOX CULVERT (3)	AS SHOWN	61

LENGTH OF CULVERT L

⊙ 250

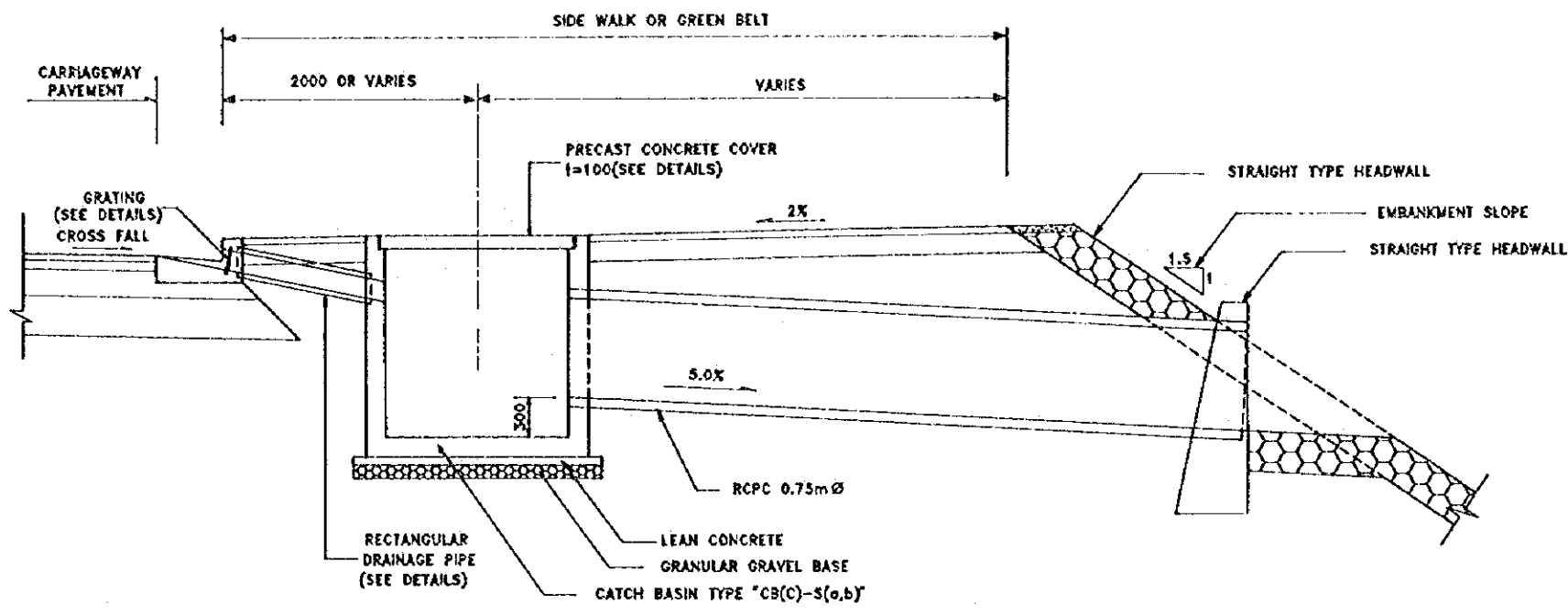


QUANTITY OF ONE METER REINFORCEMENT BAR

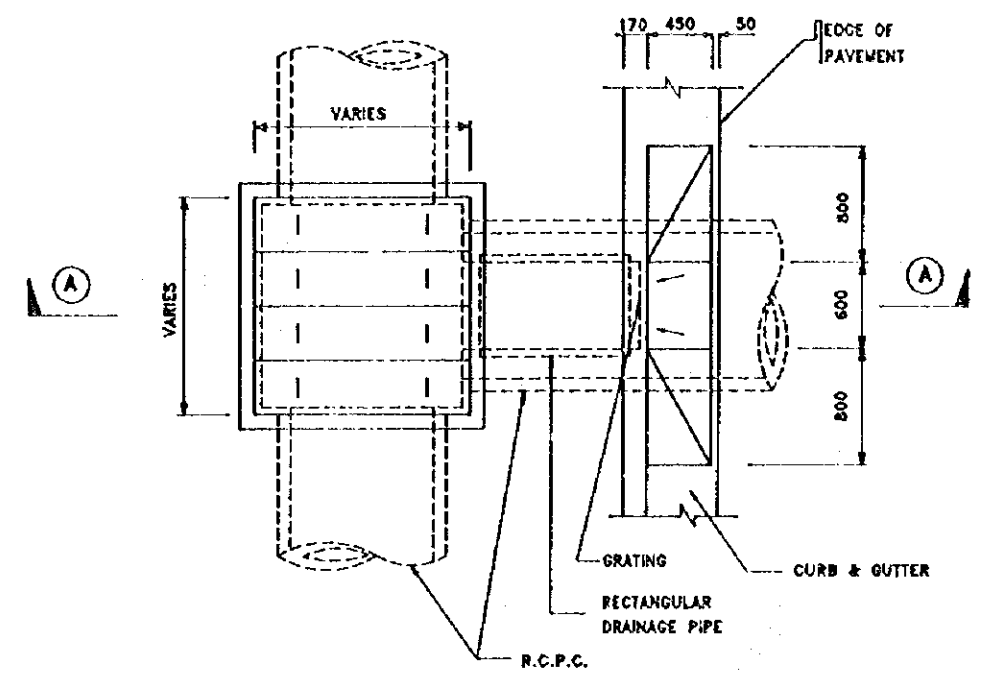
	D	L <sub>(m)</sub>	n	w	ΣW (kg)
①	D20	5.070	16	2.64	214.2
②	D20	10.22	4	2.64	107.9
③	D20	5.10	8	2.64	107.7
④	D16	3.20	24	1.56	119.8
⑤	D20	4.08	8	2.64	86.2
⑥	D20	4.90	16	2.64	207.0
⑦	D16	1.330	48	1.56	99.6
⑧	D20	1.00	226	2.64	596.6
					1539 <sup>kg/m</sup>

CONCRETE (class A)	9.039 <sup>m<sup>3</sup>/m</sup>
LEAN CONCRETE	1.04 <sup>m<sup>3</sup>/m</sup>
BROKEN STONE	2.08 <sup>m<sup>3</sup>/m</sup>

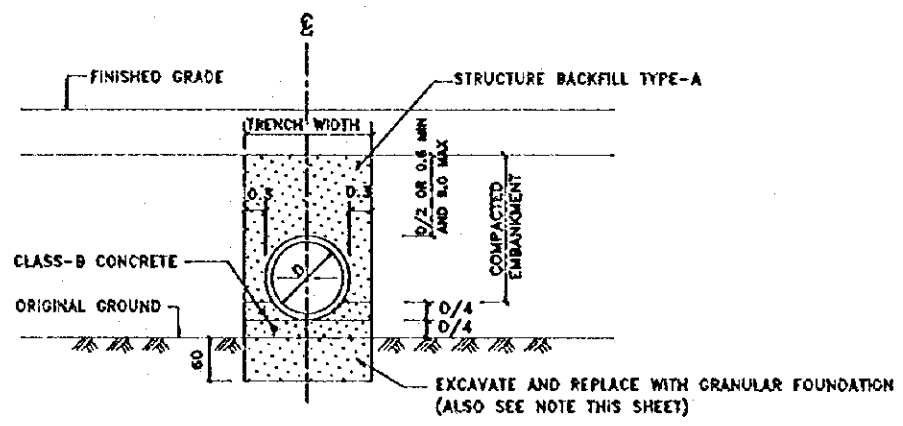
SOCIALIST REPUBLIC OF VIETNAM		
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE	ORIGINAL SCALE	DWG. No.
<b>ROAD DRAINAGE</b>	1:200	62



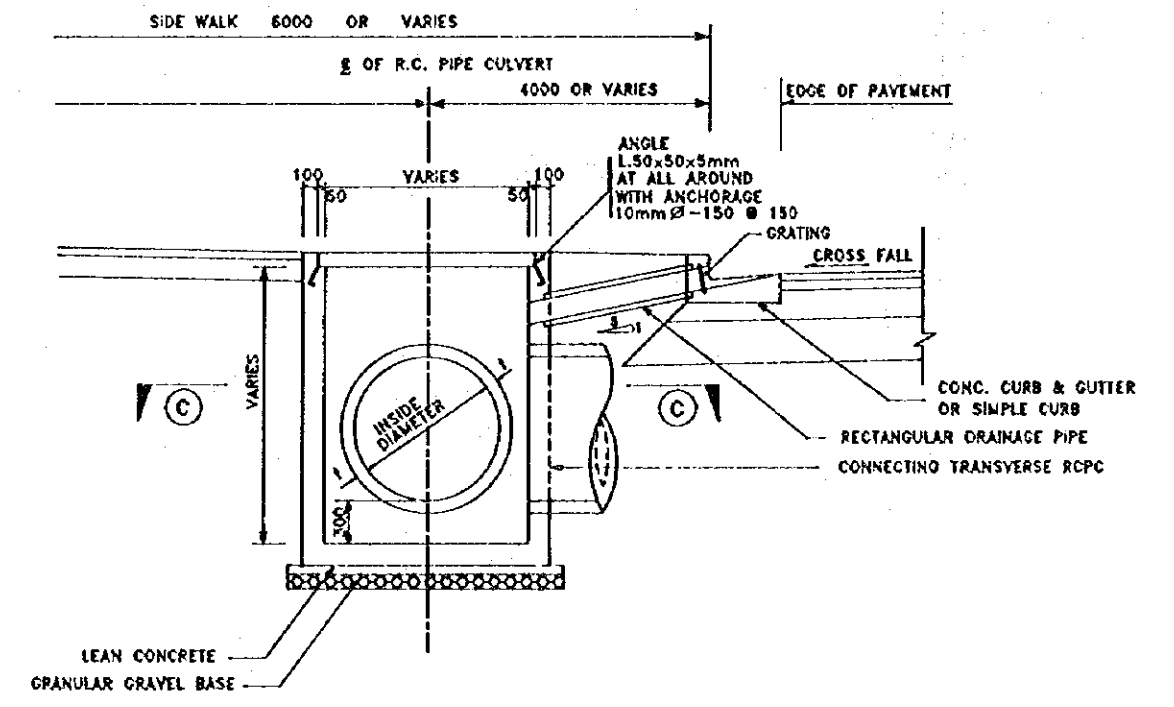
**TYPICAL CULVERT ELEVATION ON THE SIDE WALK**  
NOT TO SCALE



**PLAN**  
NOT TO SCALE



**CONCRETE CRADLE BEDDING**



**SECTION A - A**