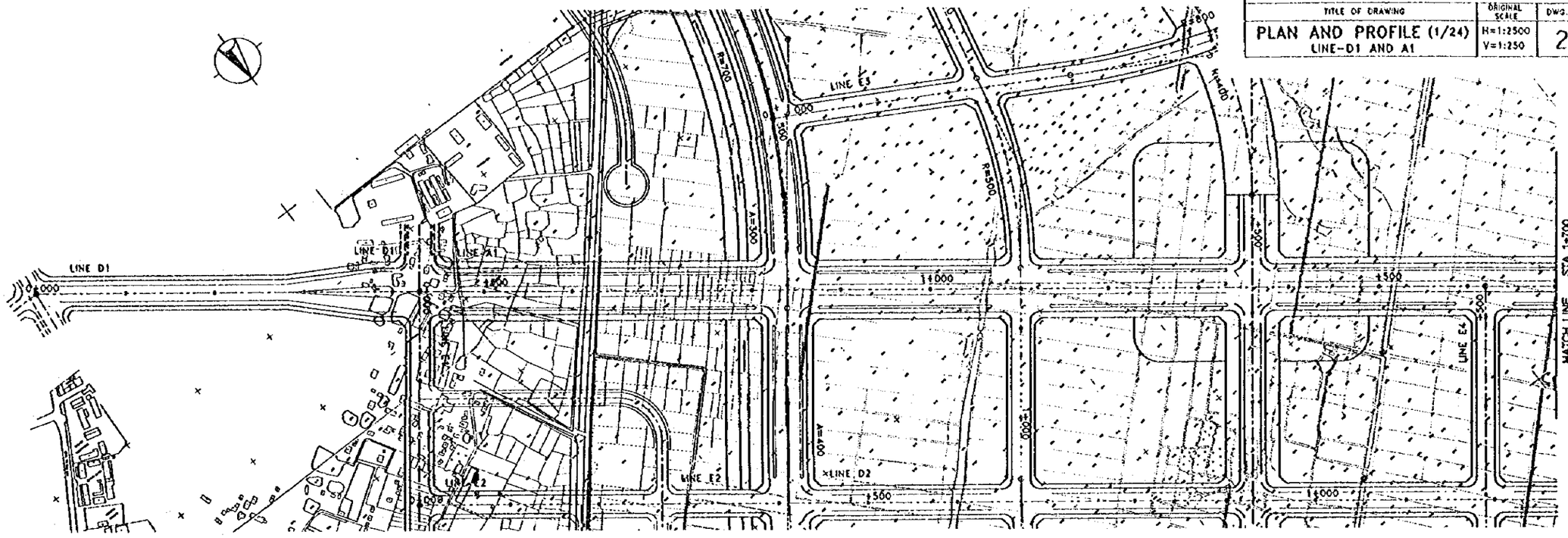
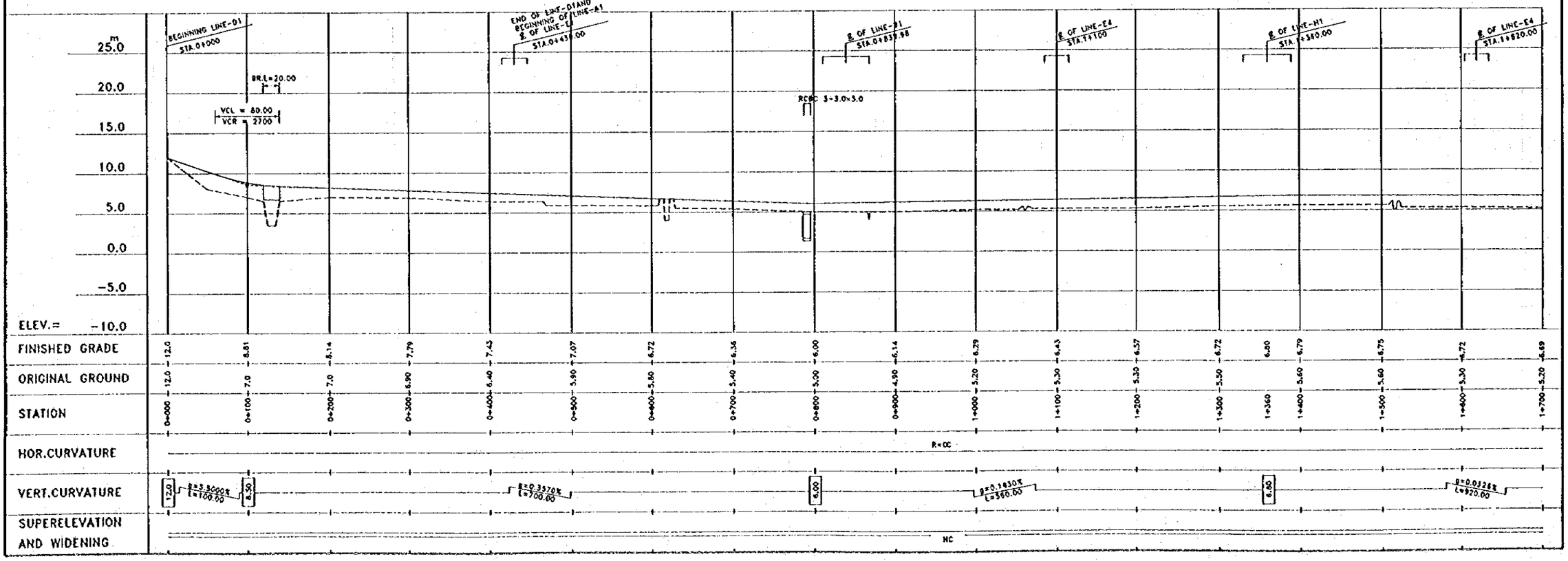
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

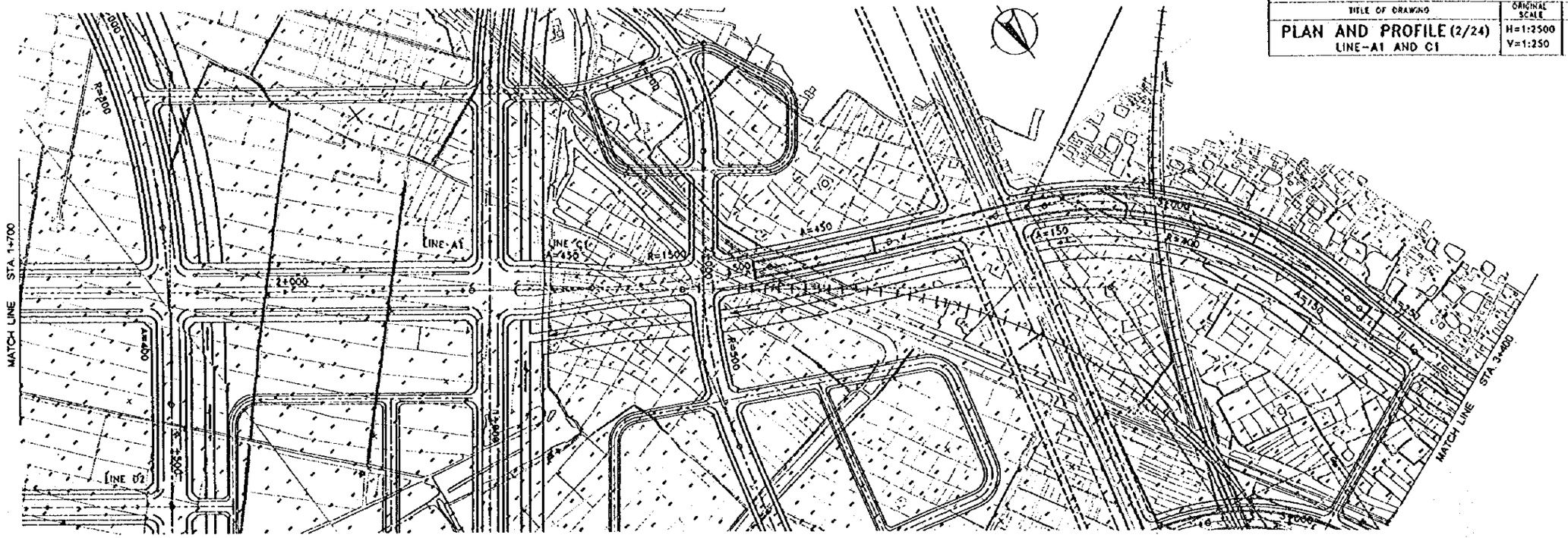
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (1/24) LINE-D1 AND A1	H=1:2500 V=1:250	27

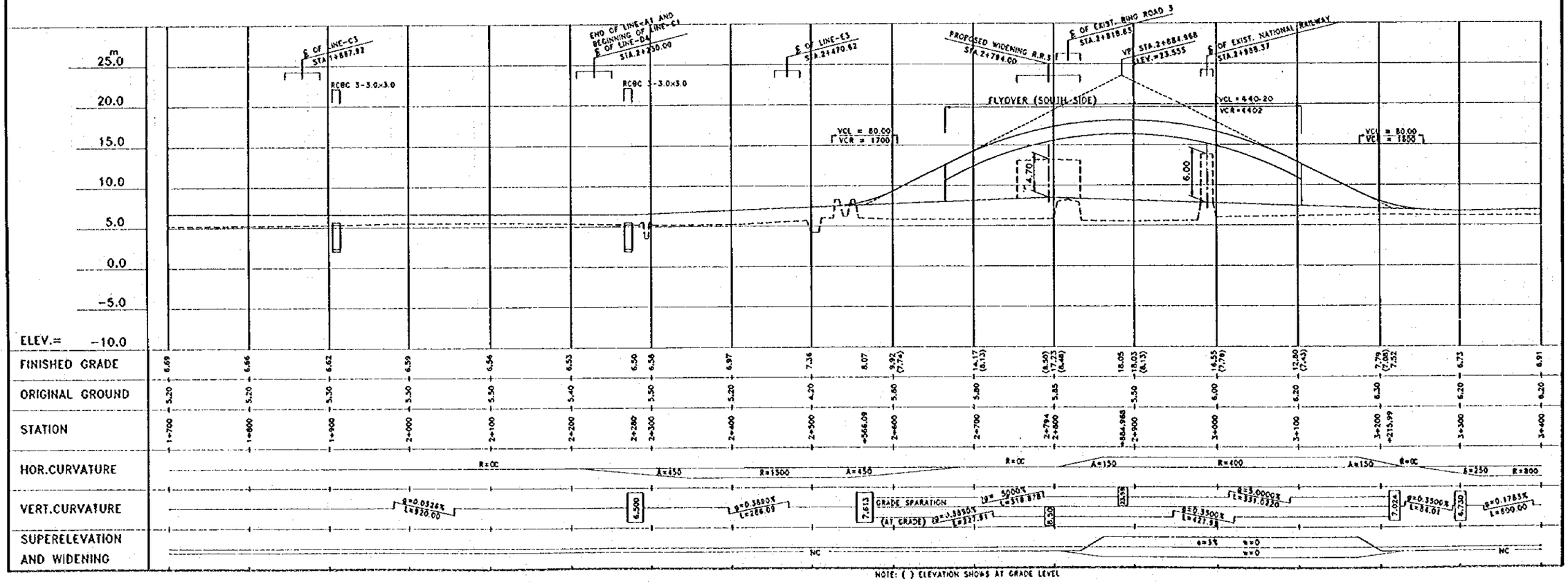




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (2/24) LINE-A1 AND C1	H=1:2500 V=1:250	28

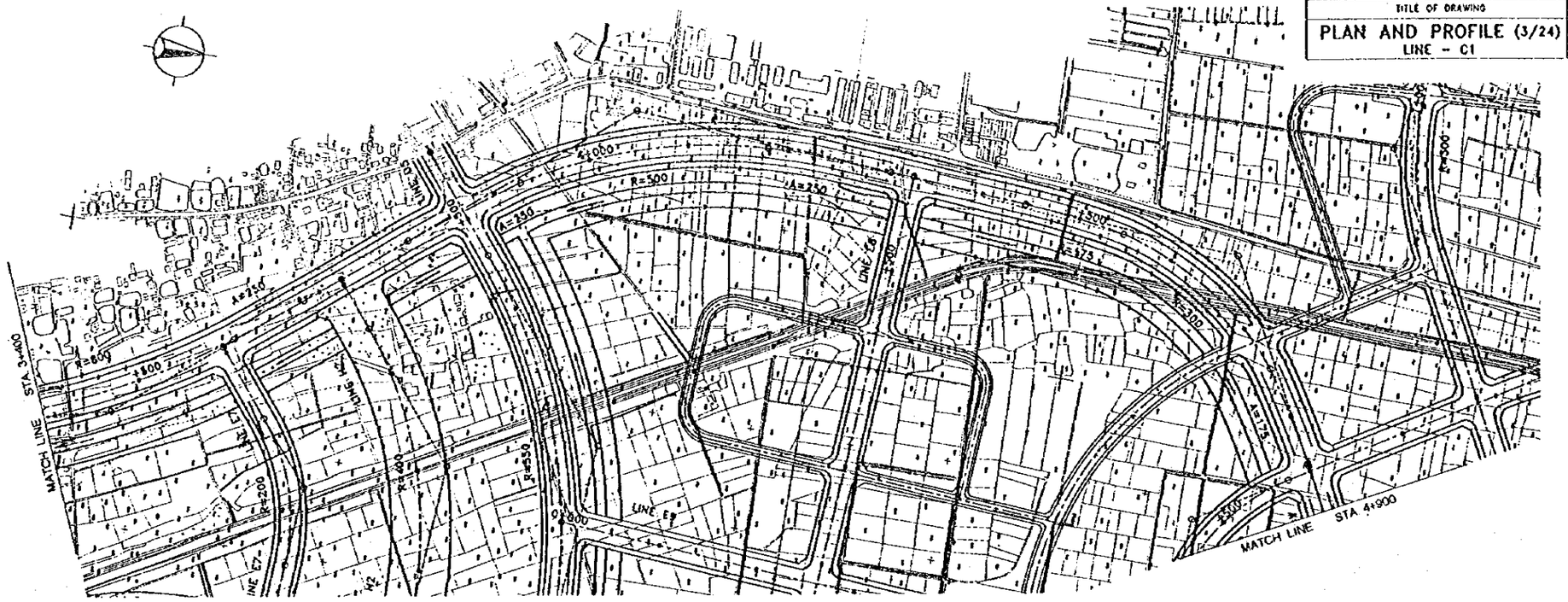


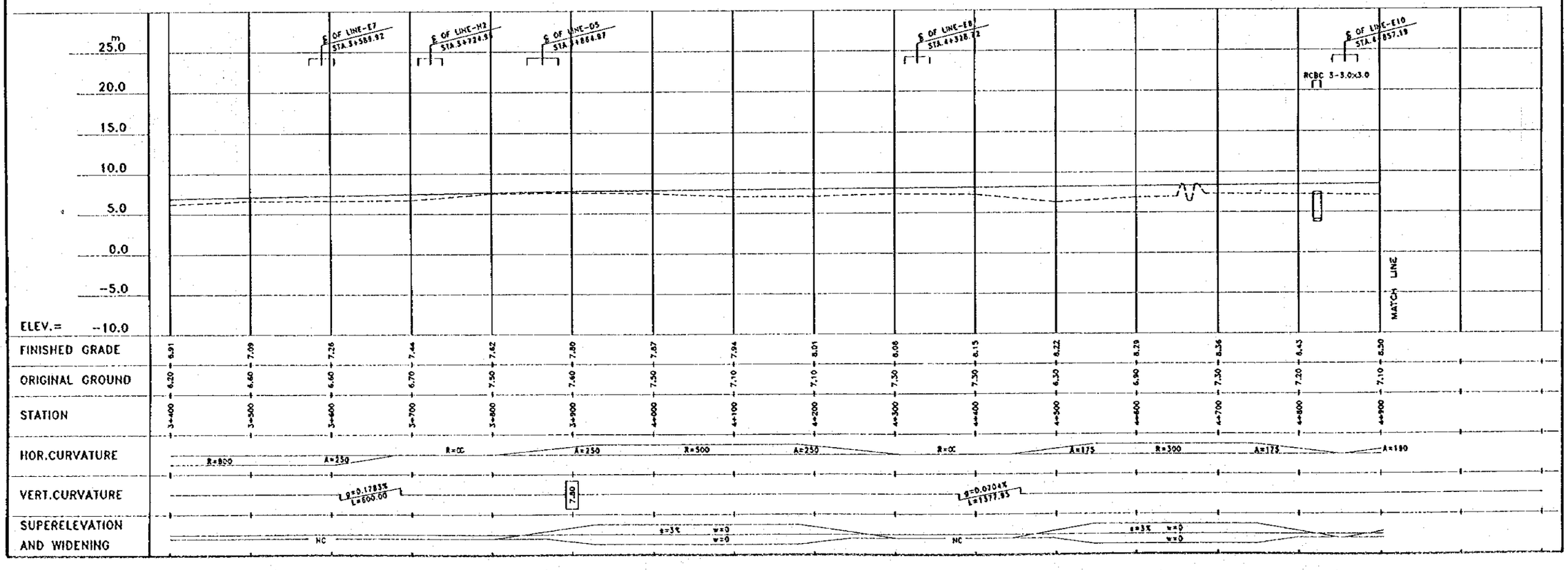


NOTE: ( ) ELEVATION SHOWS AT GRADE LEVEL

SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

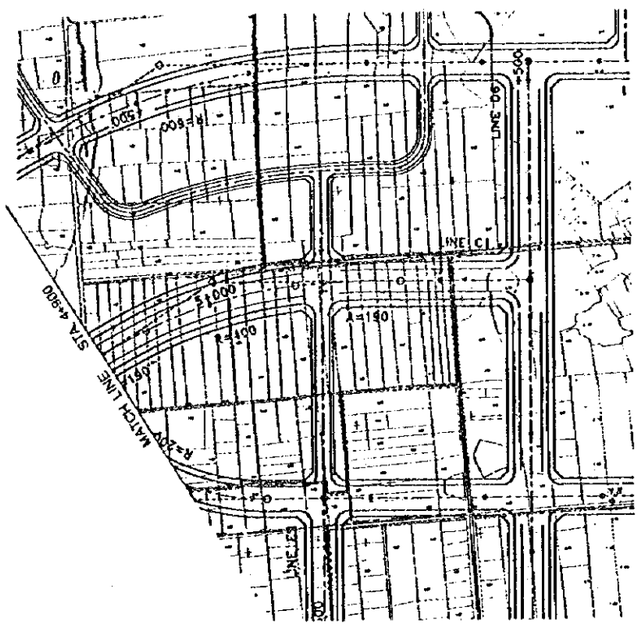
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (3/24) LINE - 01	H=1:2500 V=1:250	29

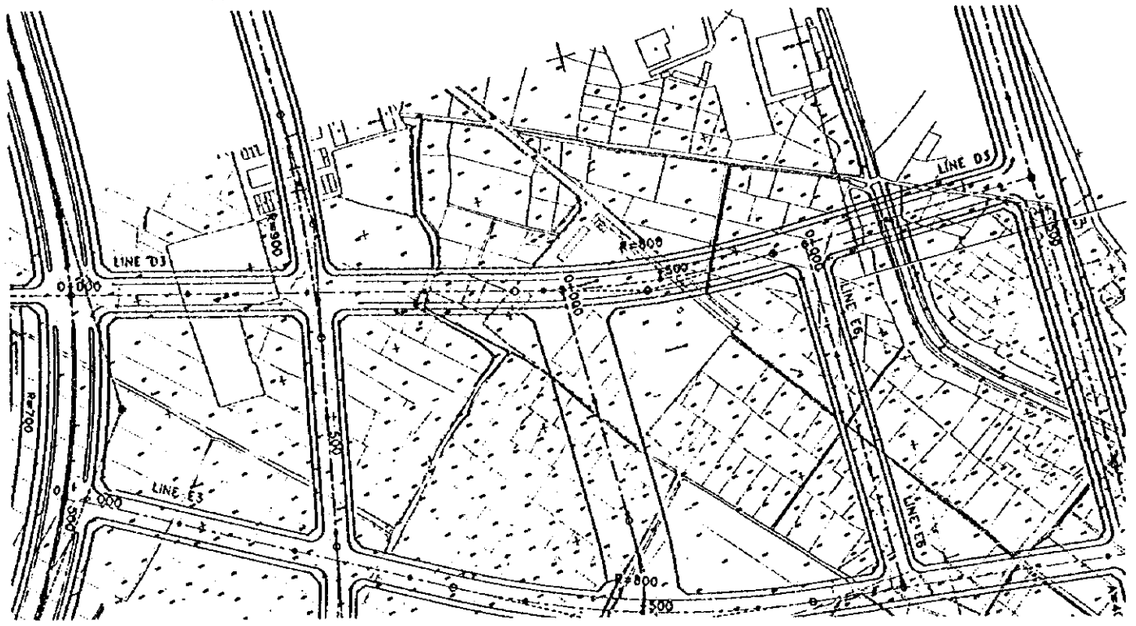


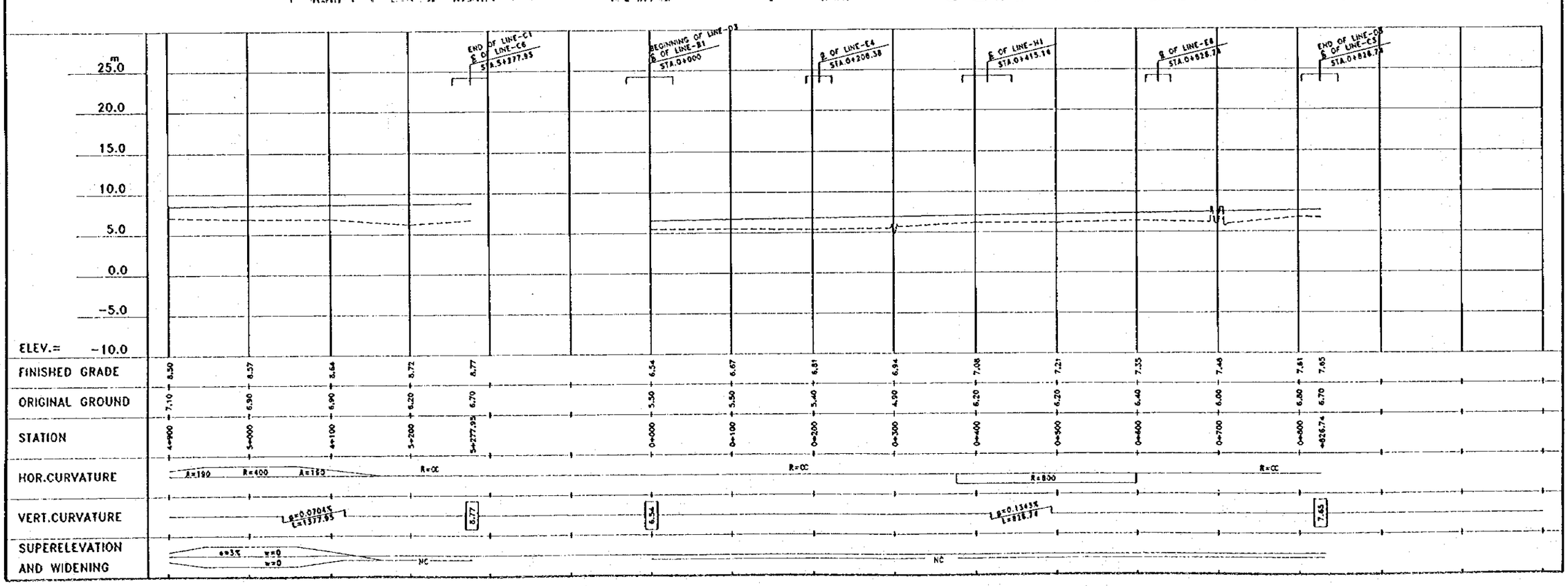


SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (4/24) LINE-C1 AND D3	H=1:2500 V=1:250	30

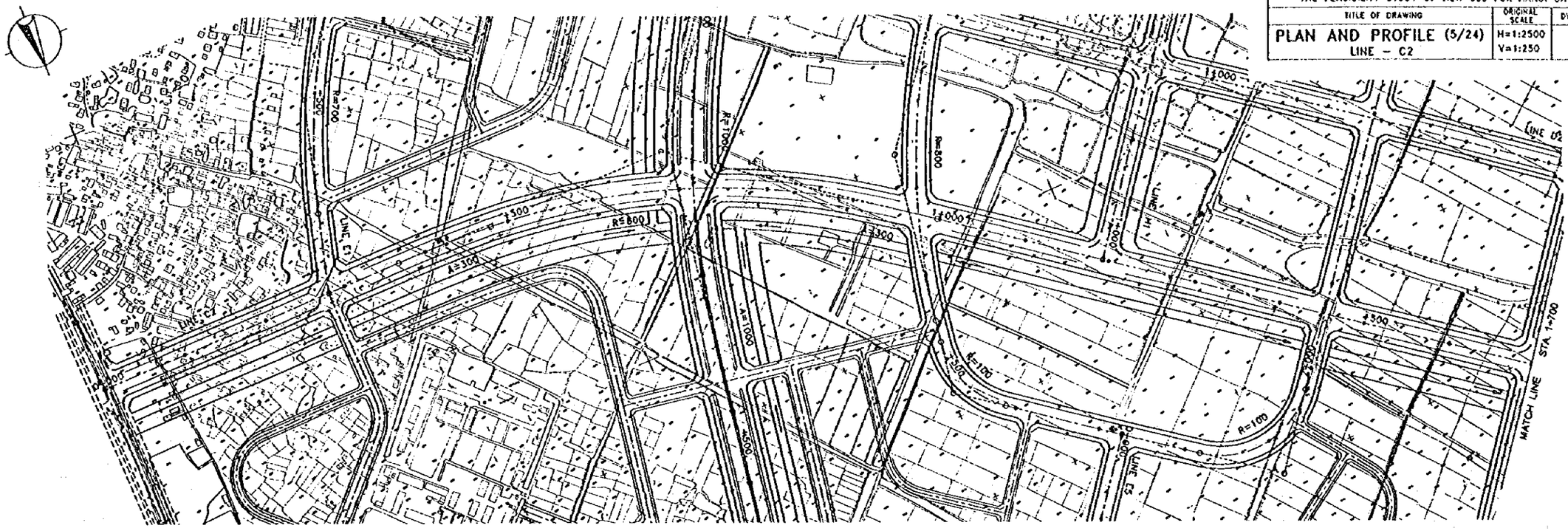


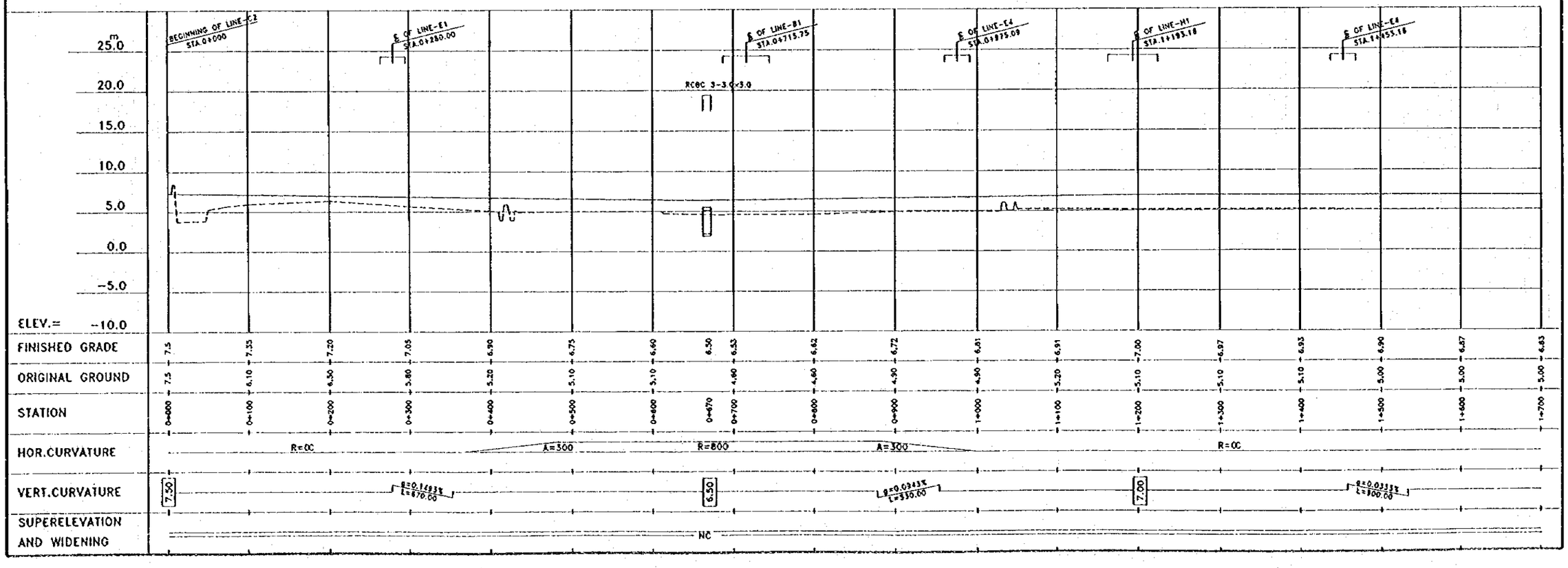


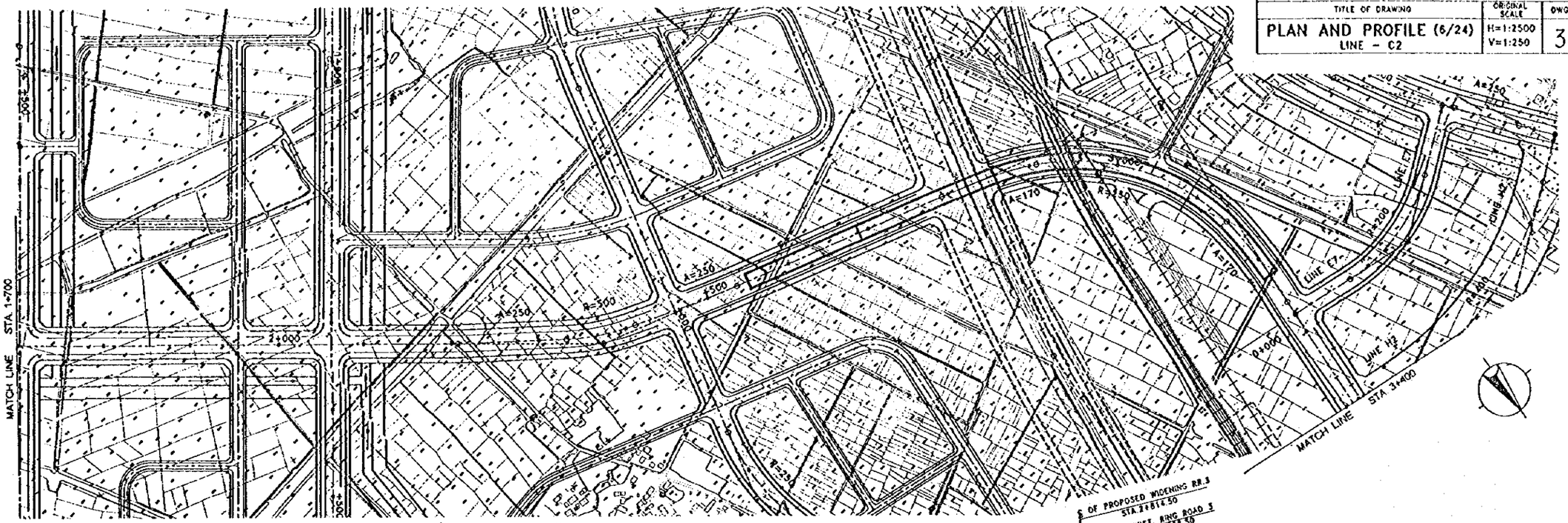


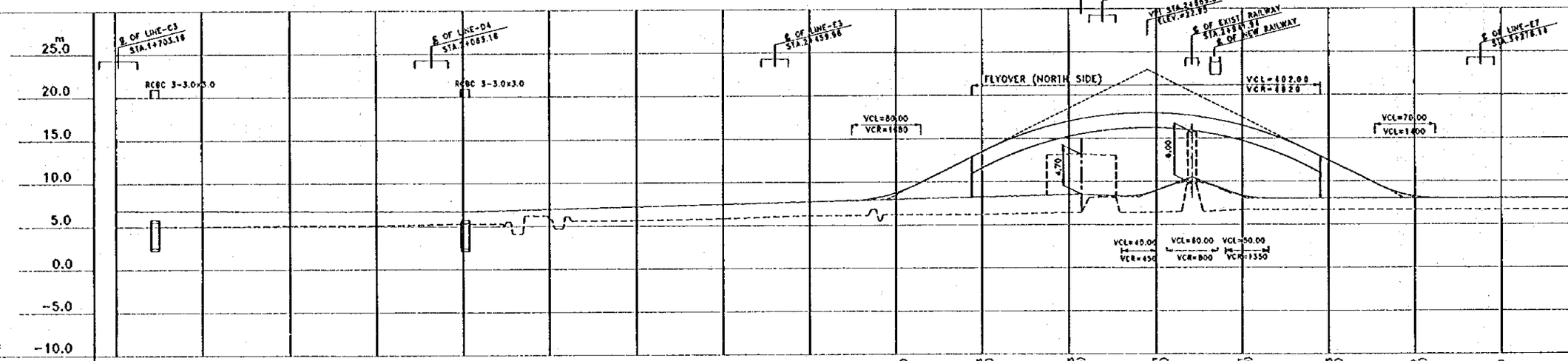
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (5/24) LINE – C2	H=1:2500 V=1:250	31









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THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (6/24) LINE - C2	H=1:2500 V=1:250	32

STATION	FINISHED GRADE	ORIGINAL GROUND
1+700	6.83	5.80
1+800	6.80	5.80
1+900	6.77	5.10
2+000	6.73	5.10
2+100	6.70	5.30
2+200	6.95	5.80
2+300	7.20	5.60
2+400	7.46	5.80
2+500	7.71	6.10
+589.13 2+600	8.73 (7.96)	6.20
2+700	13.46 (8.21)	6.20
2+800 +814.5	16.93 (8.46)	6.40
+880.0 +889.5 2+900	17.91 (8.92)	6.40
+942.0		
3+000 +005	16.41 (8.33)	6.60
3+100	12.43 (8.00)	6.70
+188.49 3+200	8.20 (8.00)	6.70
3+300	8.00	6.70
3+400	8.00	6.70

HOR.CURVATURE: R=∞ A=250 R=500 A=250 R=∞ A=170 R=250 A=170 R=∞

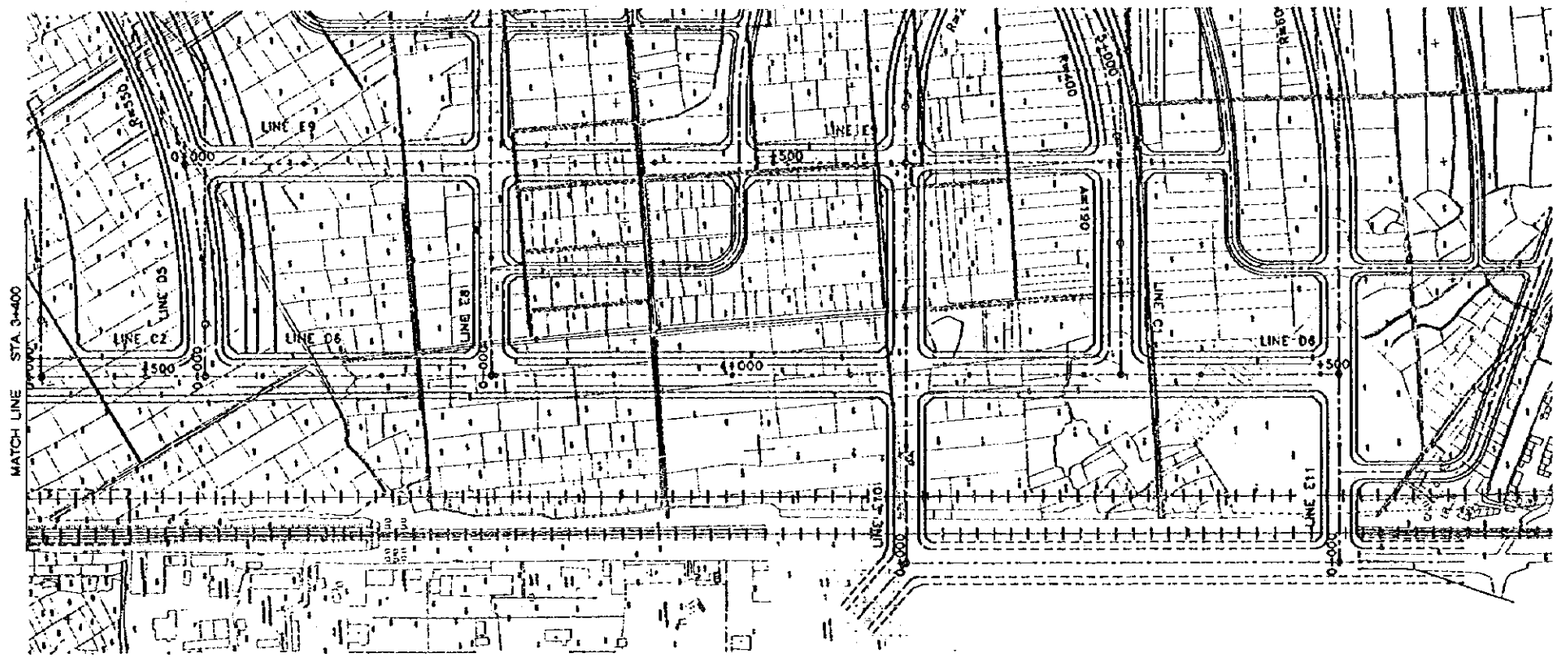
VERT.CURVATURE: g=0.0333% L=900.00 6.70 g=0.2591% L=489.13 7.932 GRADE SPARATION g=3.00% L=300.37 (AT GRADE) g=0.85% L=215.37 6.50 6.17 22.95 10.50 6.00 g=5.00% L=298.93 g=0.00% L=183.49 8.00 g=0.00% L=411.51

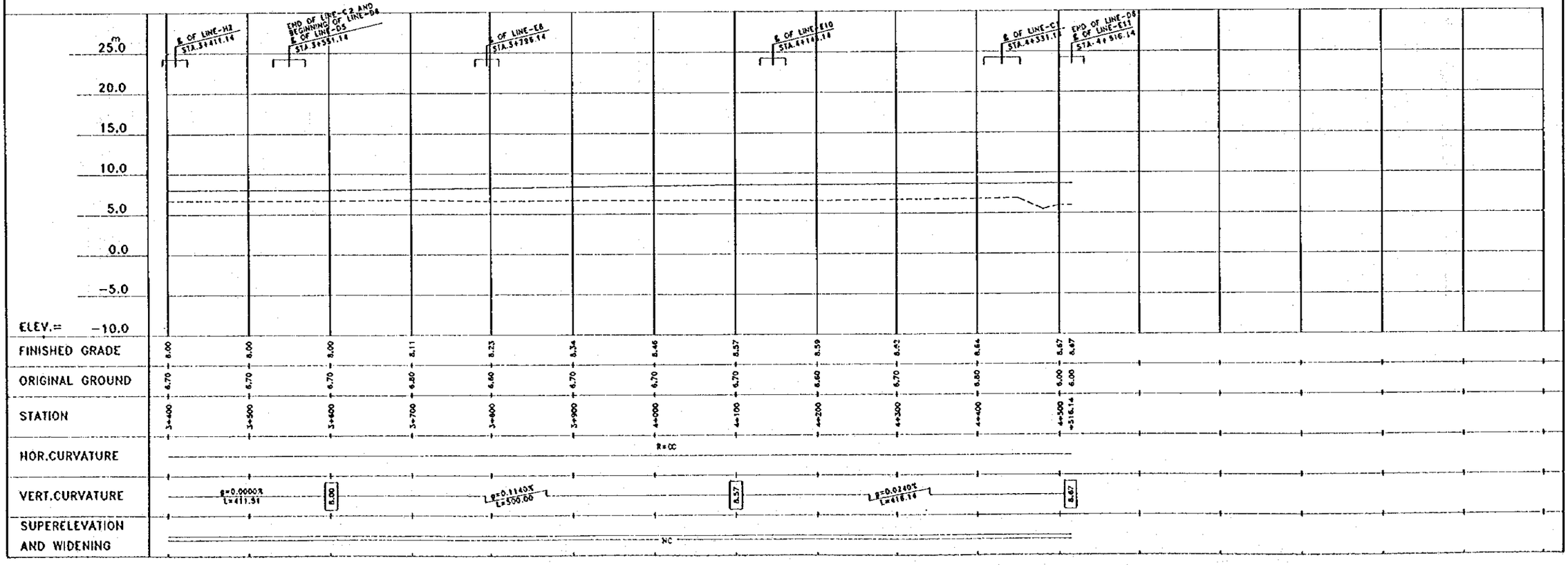
SUPERELEVATION AND WIDENING: NC e=3% w=0.5 w=0.5 NC

NOTE: ( ) ELEV. SHOWS AT GRADE LEVEL

SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

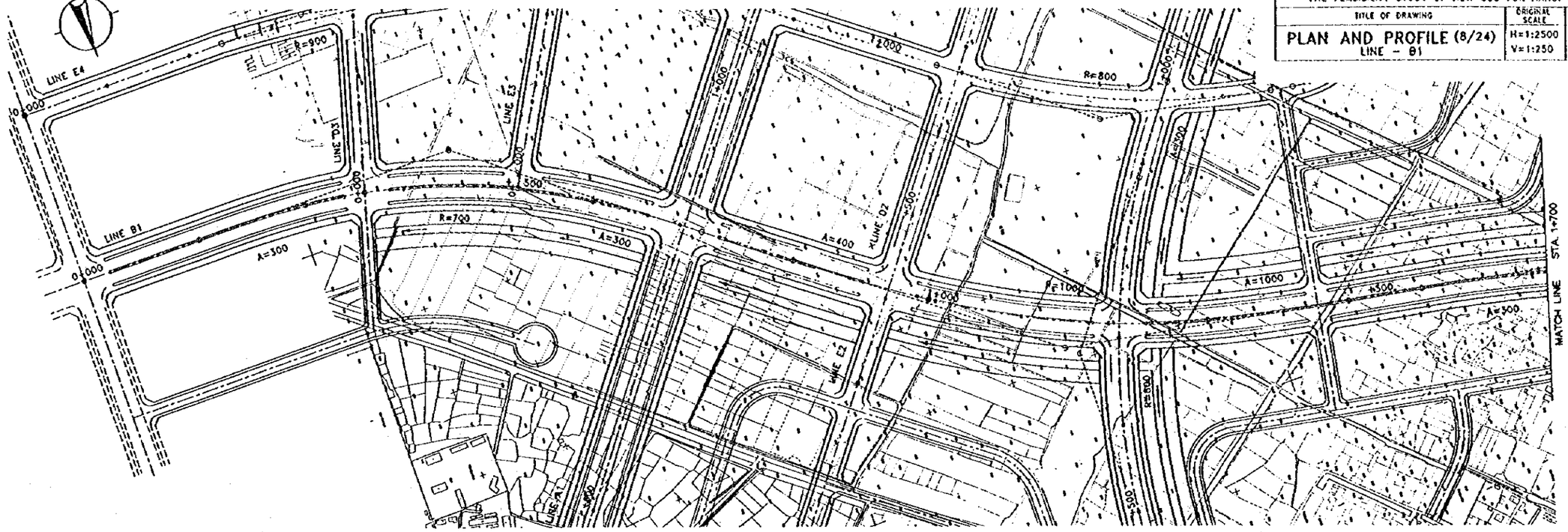
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (7/24) LINE-C2 AND D6	H=1:2500 V=1:250	33

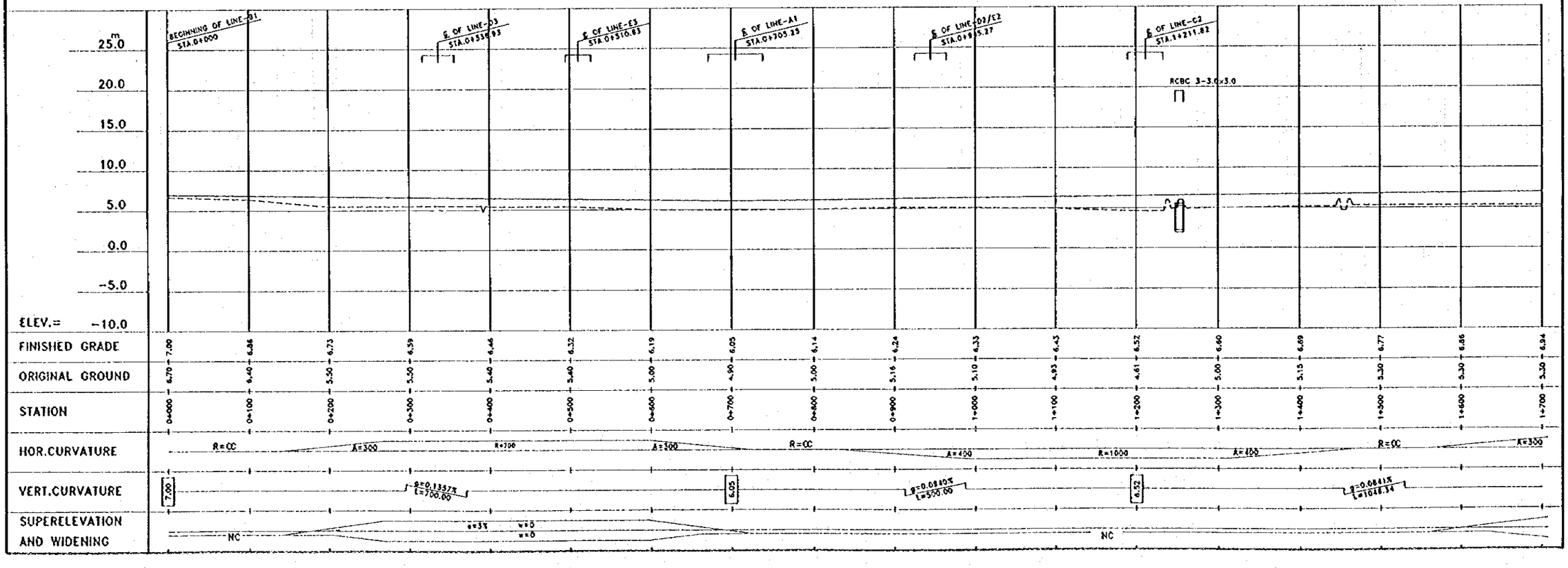




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

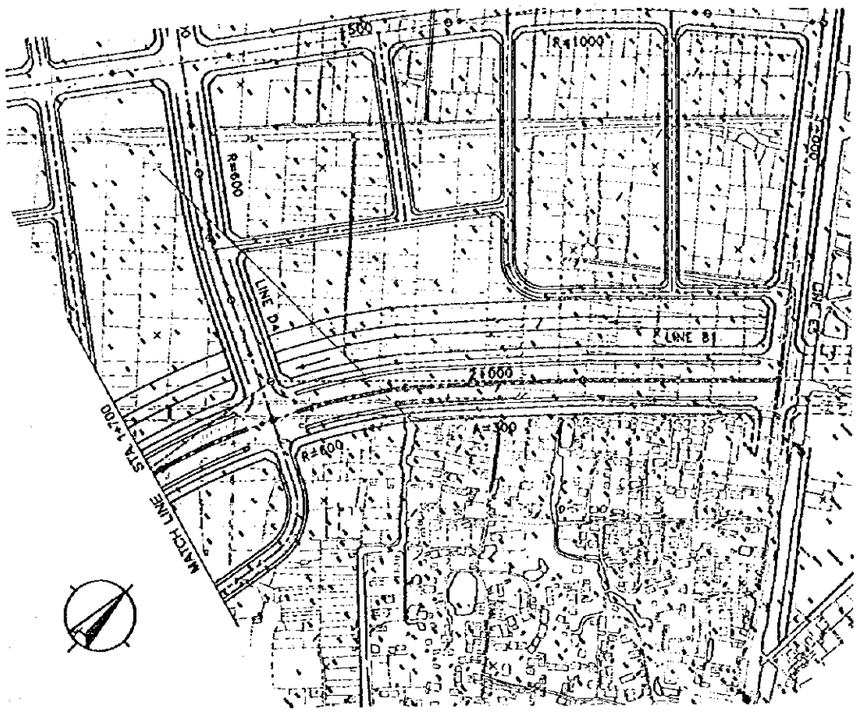
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (8/24) LINE – B1	H=1:2500 V=1:250	34

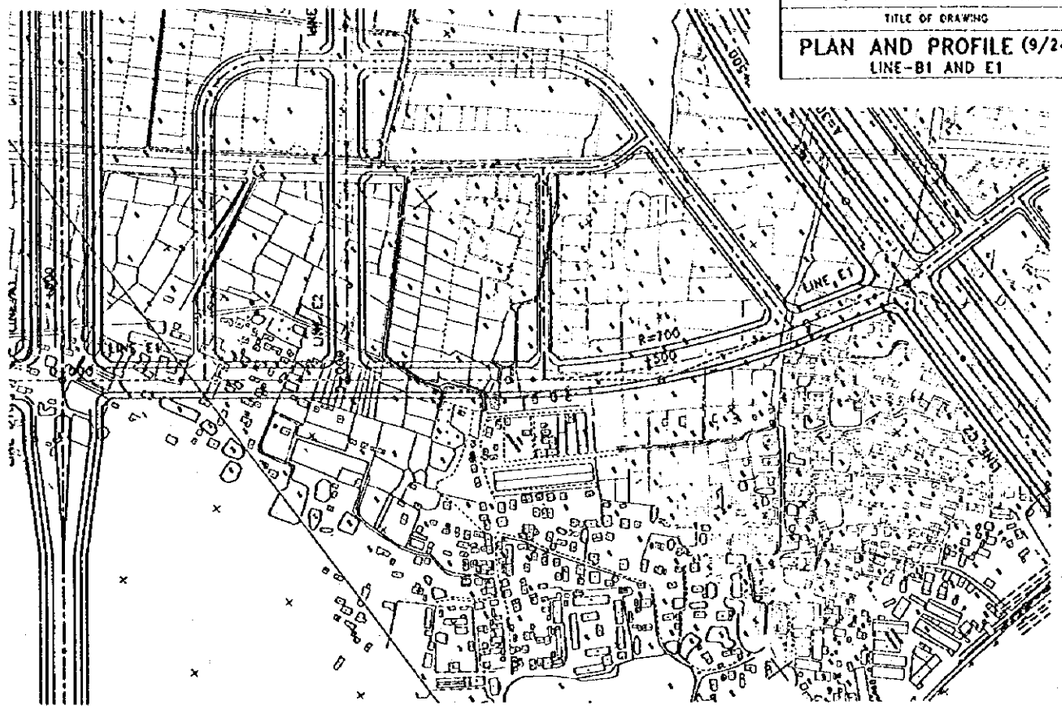


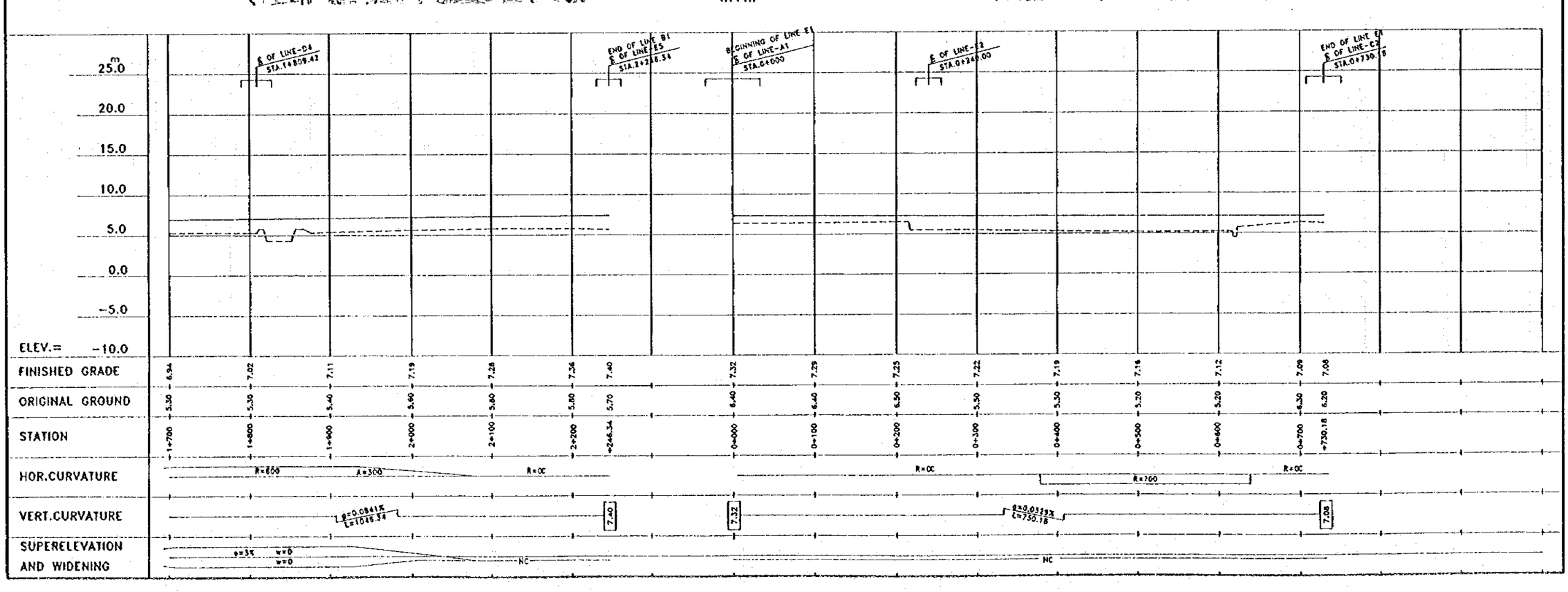


SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (9/24) LINE-B1 AND E1	H=1:2500 V=1:250	35

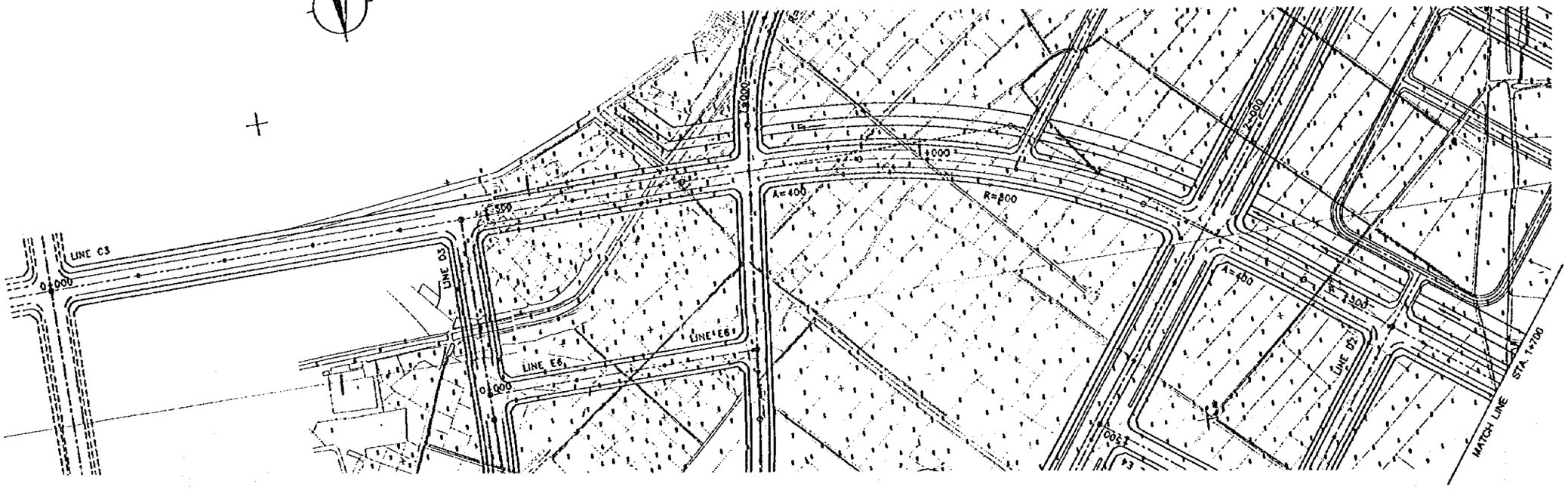


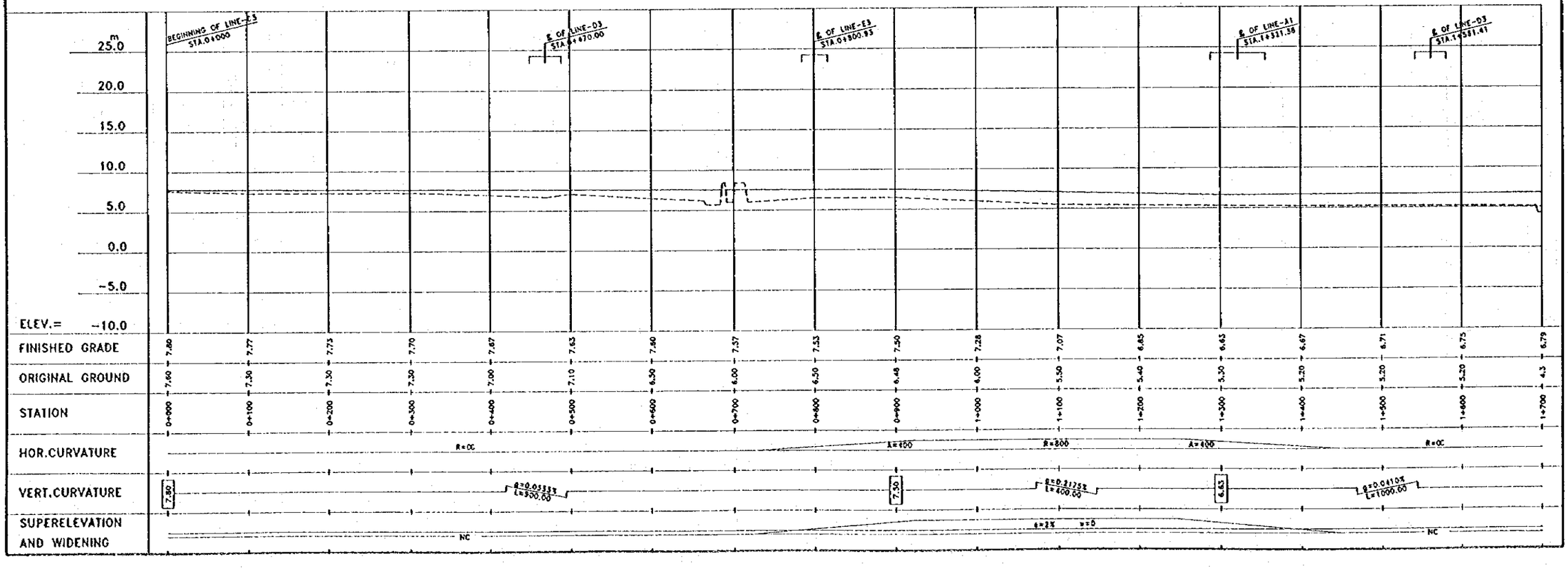




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

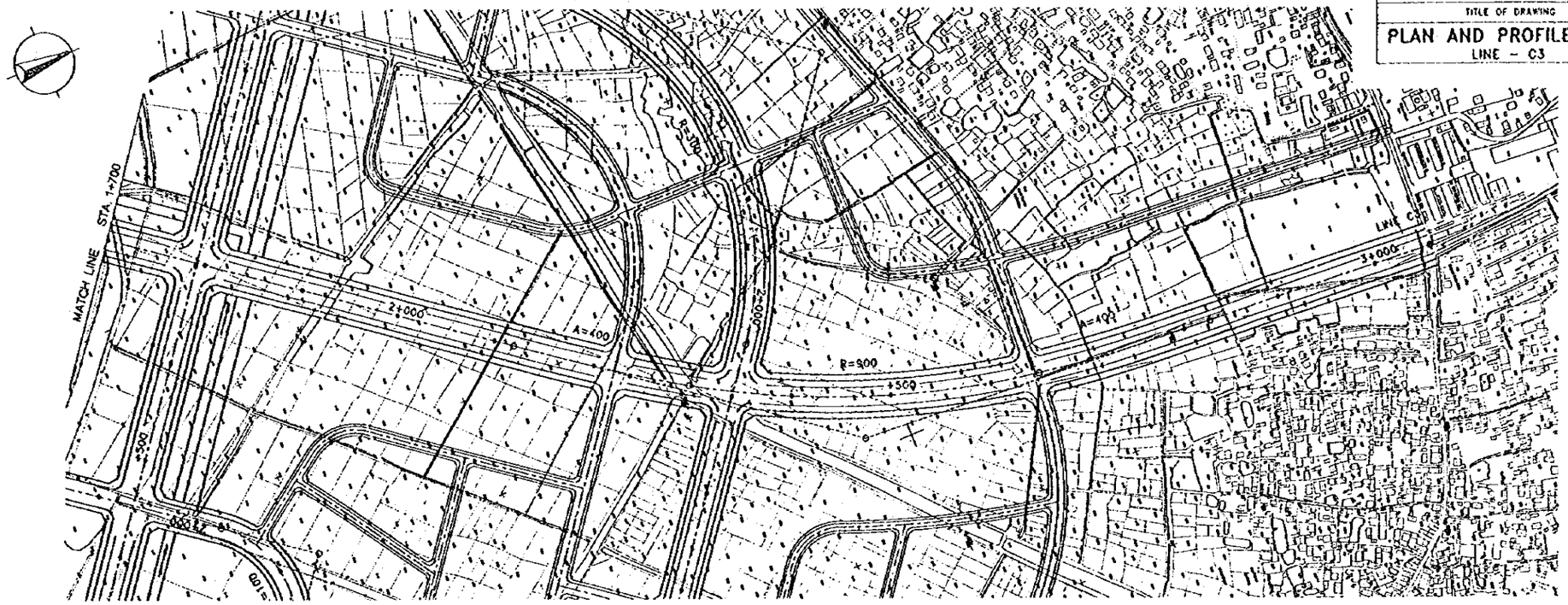
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE(10/24) LINE – C3	H=1:2500 V=1:250	36

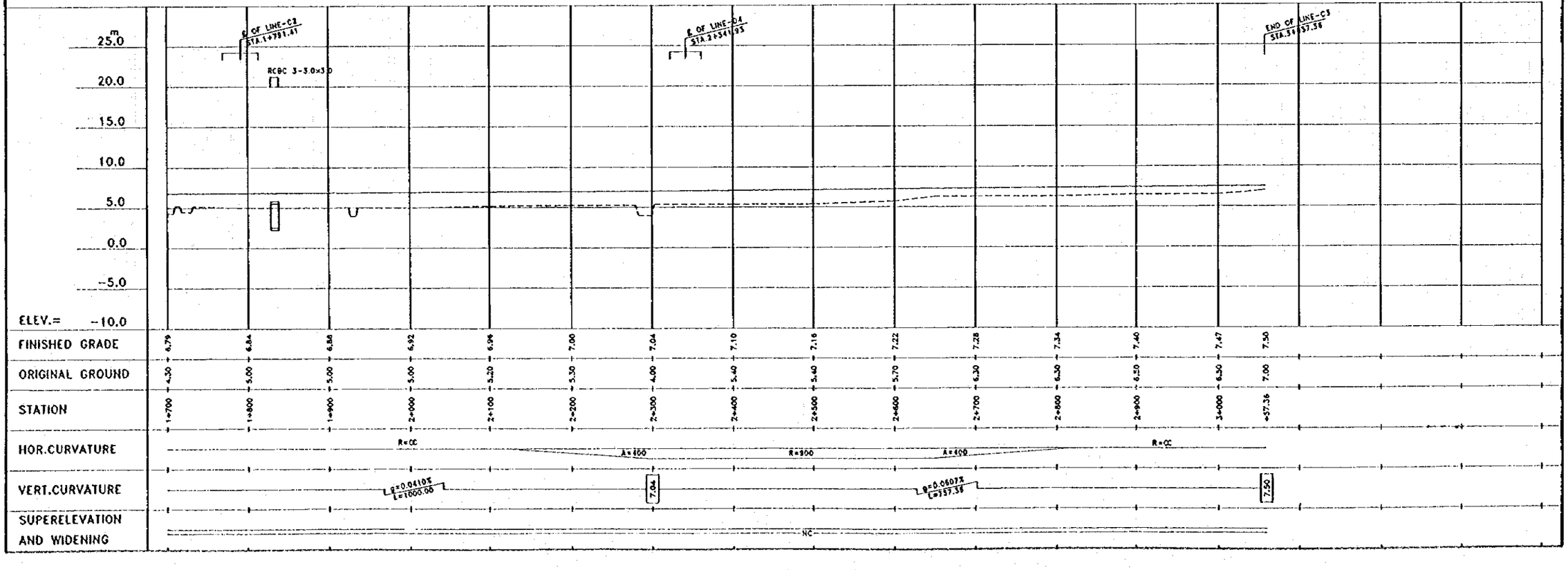




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

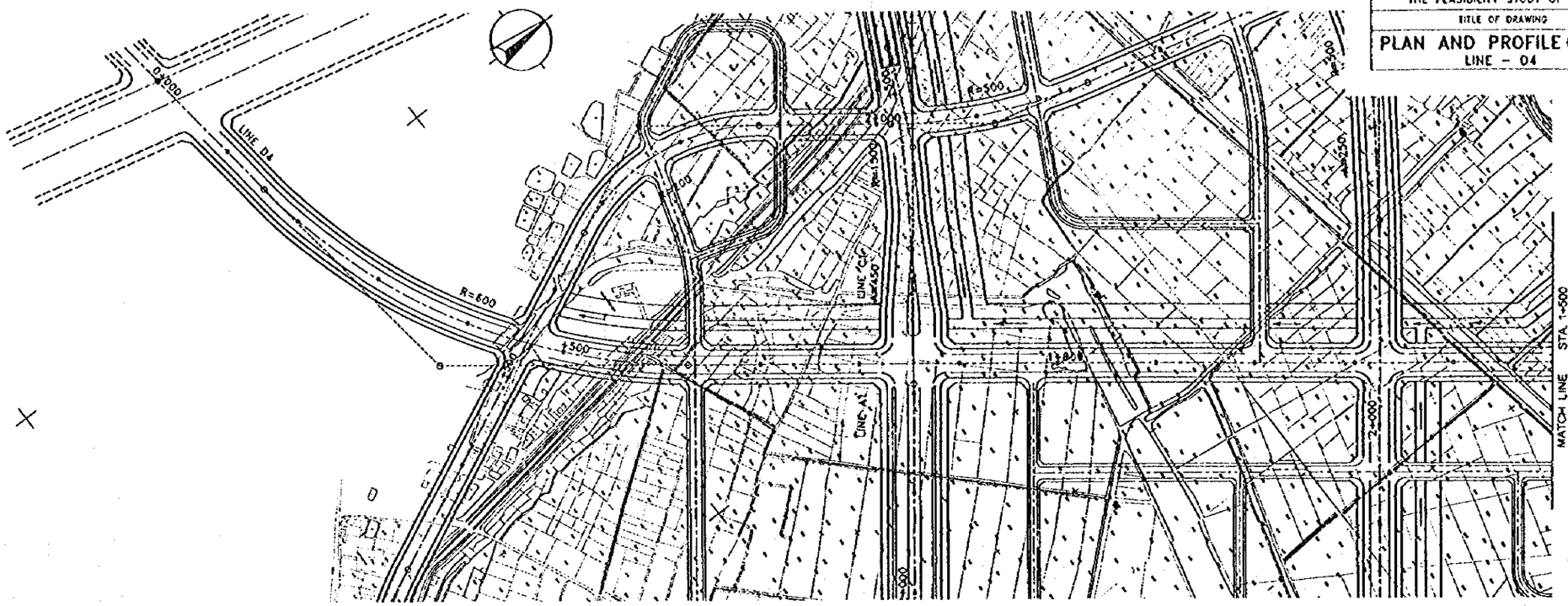
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (11/24) LINE - C3	H=1:2500 V=1:250	37

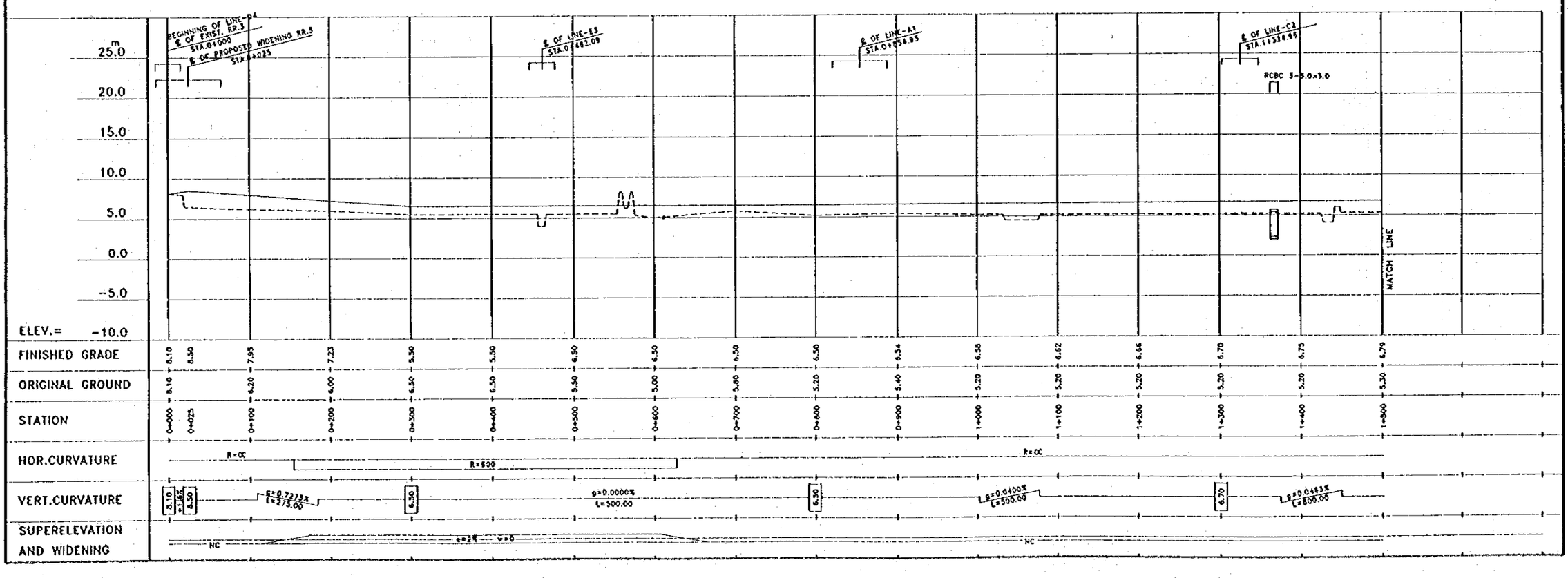




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

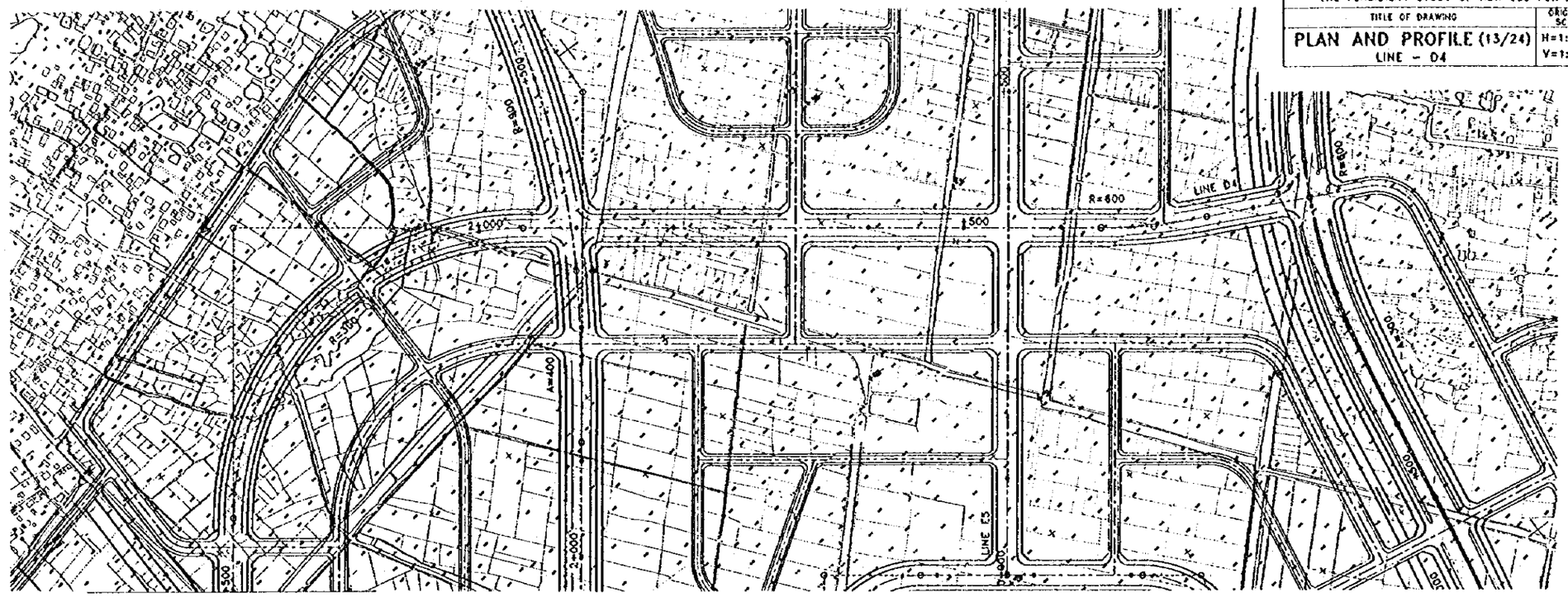
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (12/24) LINE – 04	H=1:2500 V=1:250	38

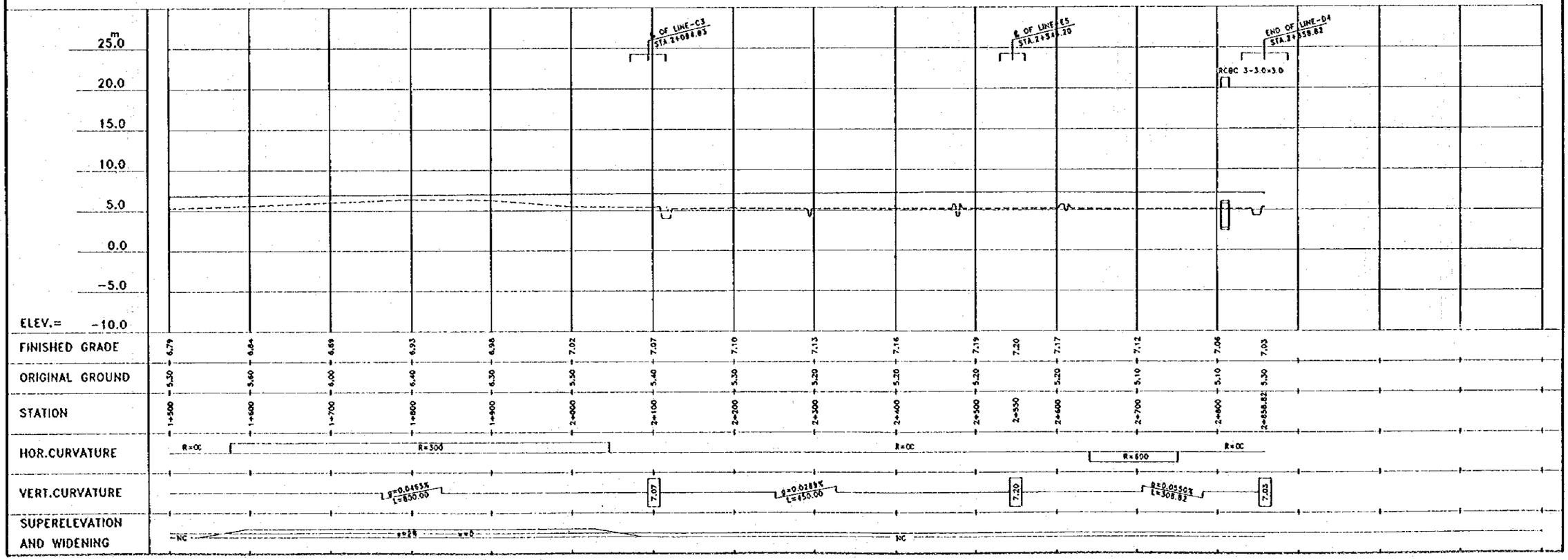




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (13/24) LINE - D4	H=1:2500 V=1:250	39





SOCIALIST REPUBLIC OF VIETNAM
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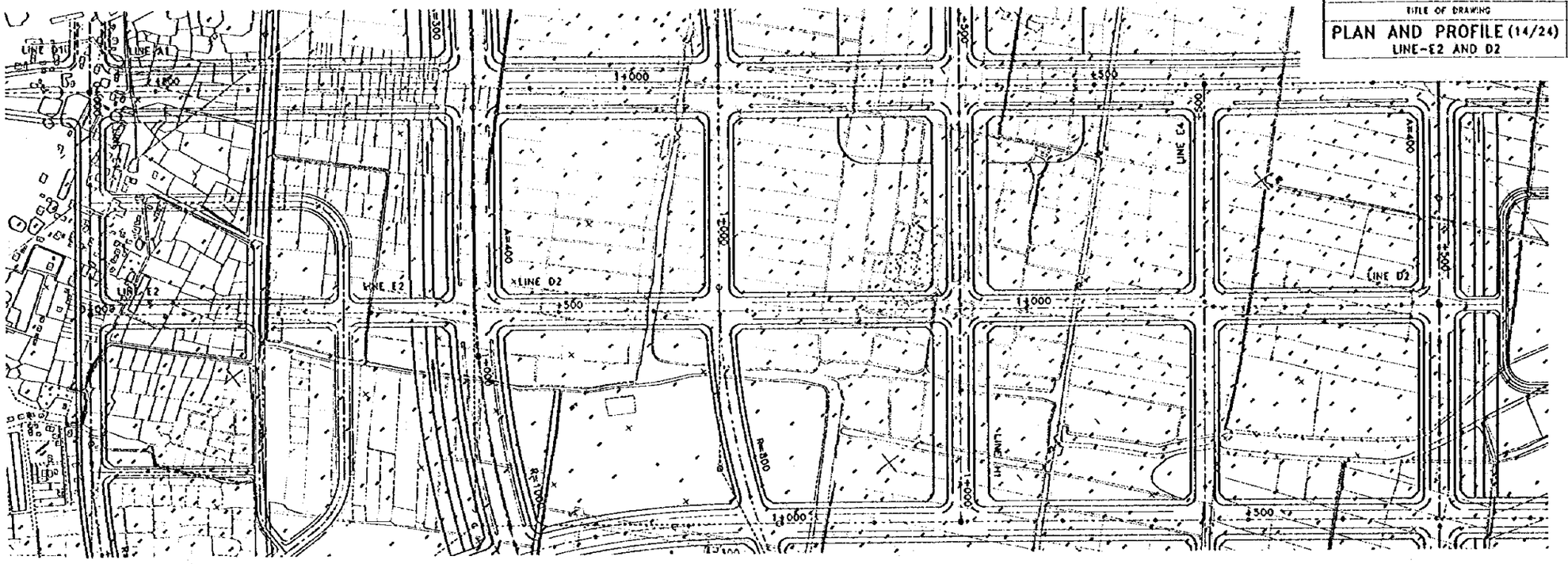
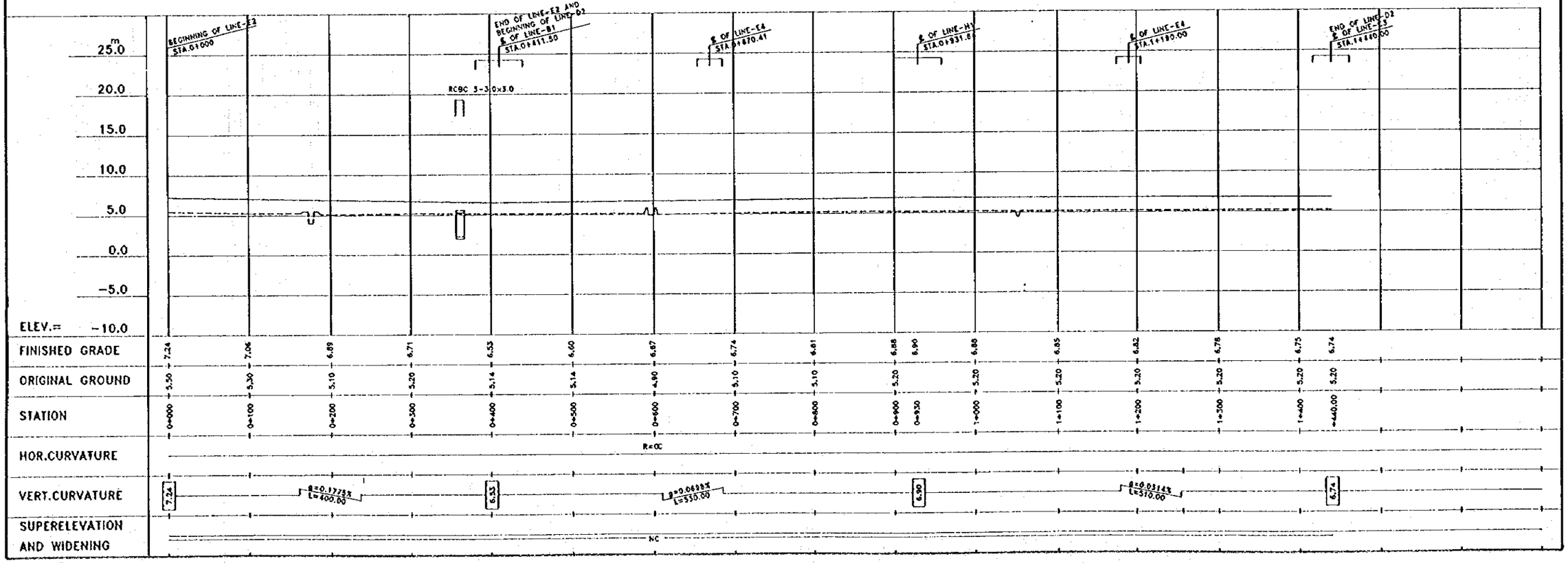
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (14/24) LINE-E2 AND D2	H=1:2500 V=1:250	40





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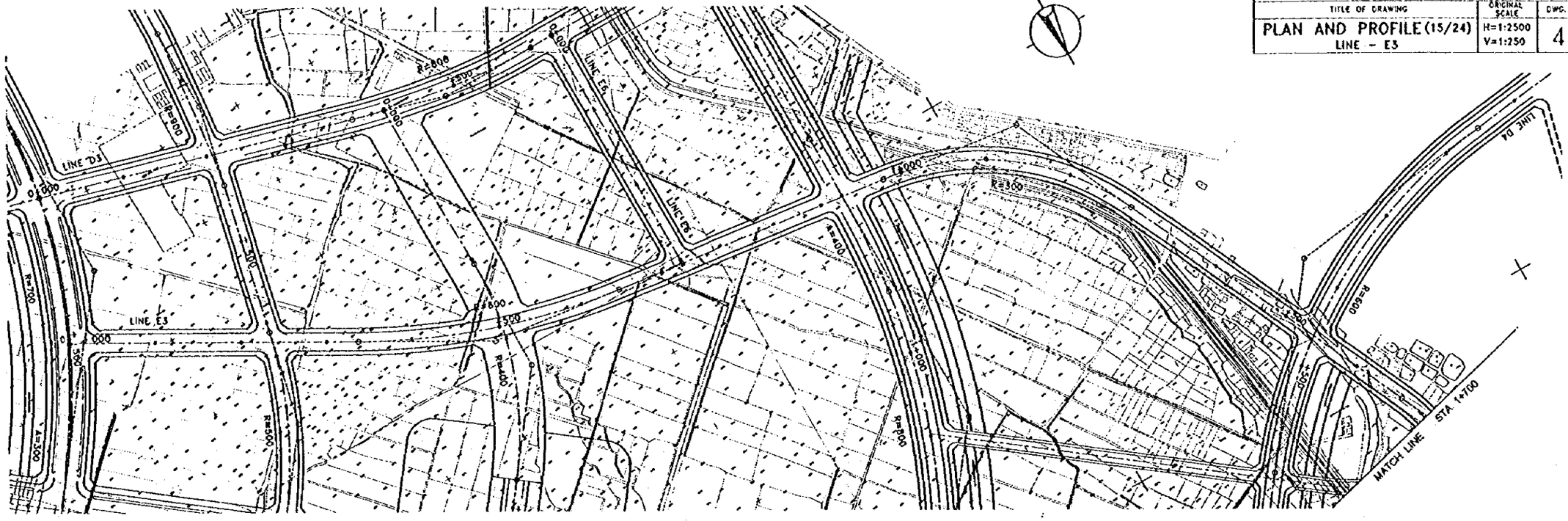
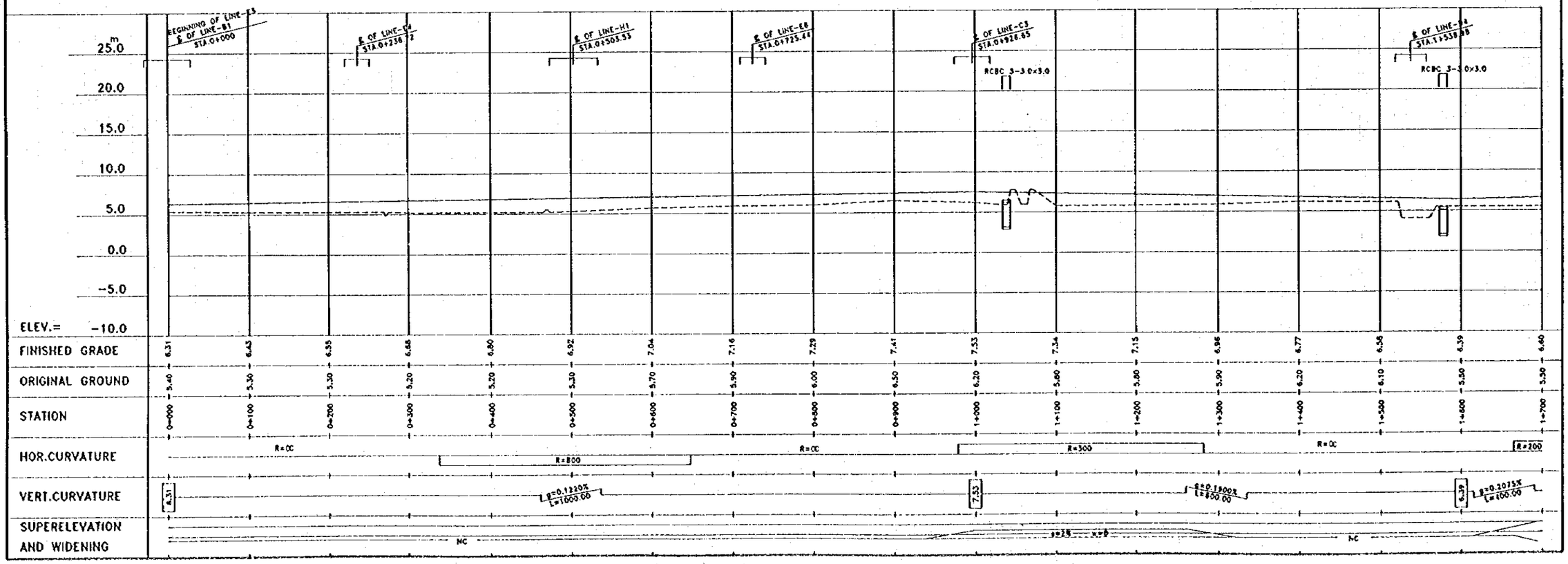
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

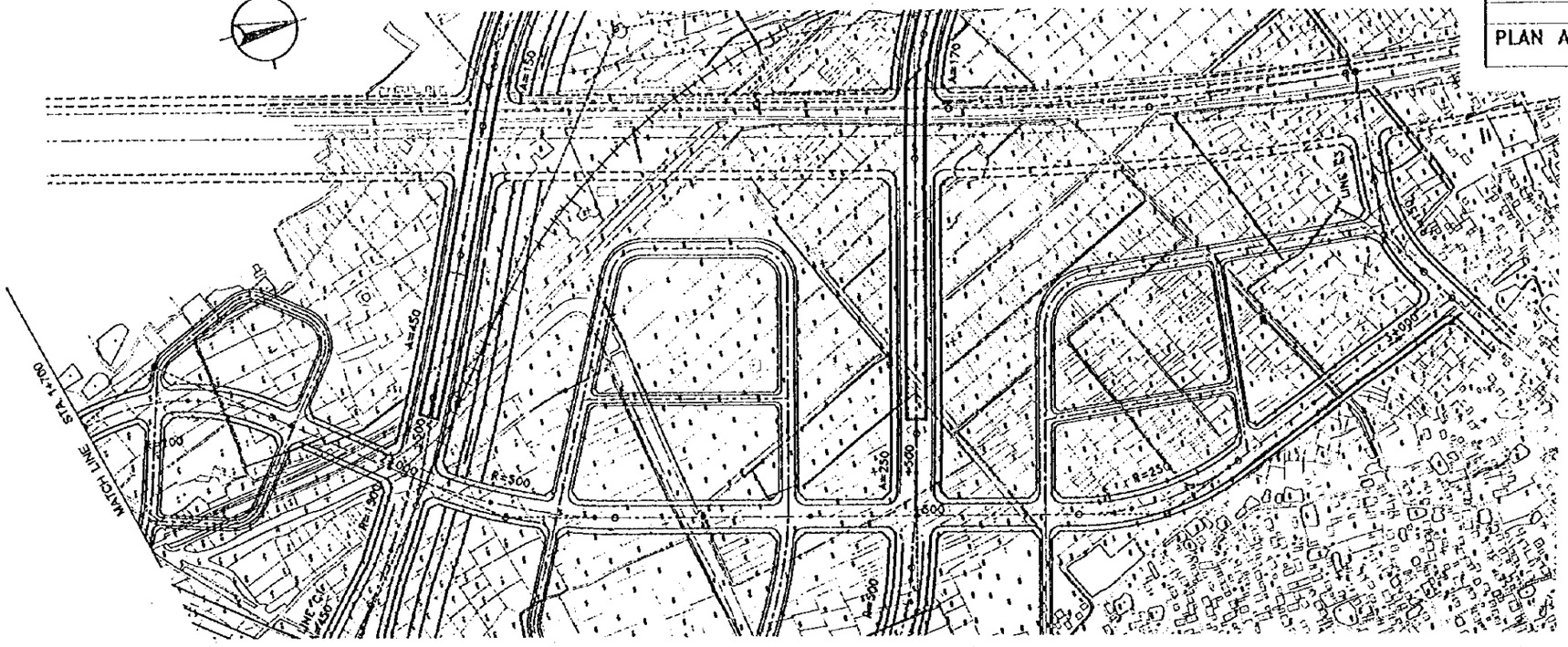
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (15/24) LINE - E3	H=1:2500 V=1:250	41





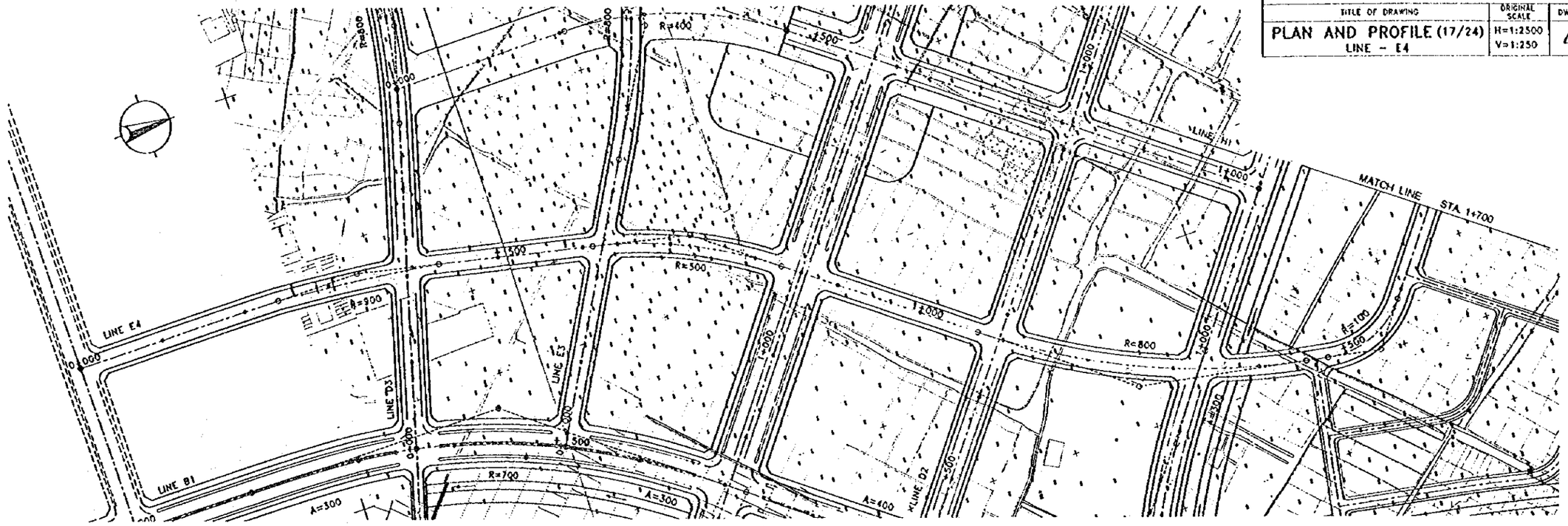
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

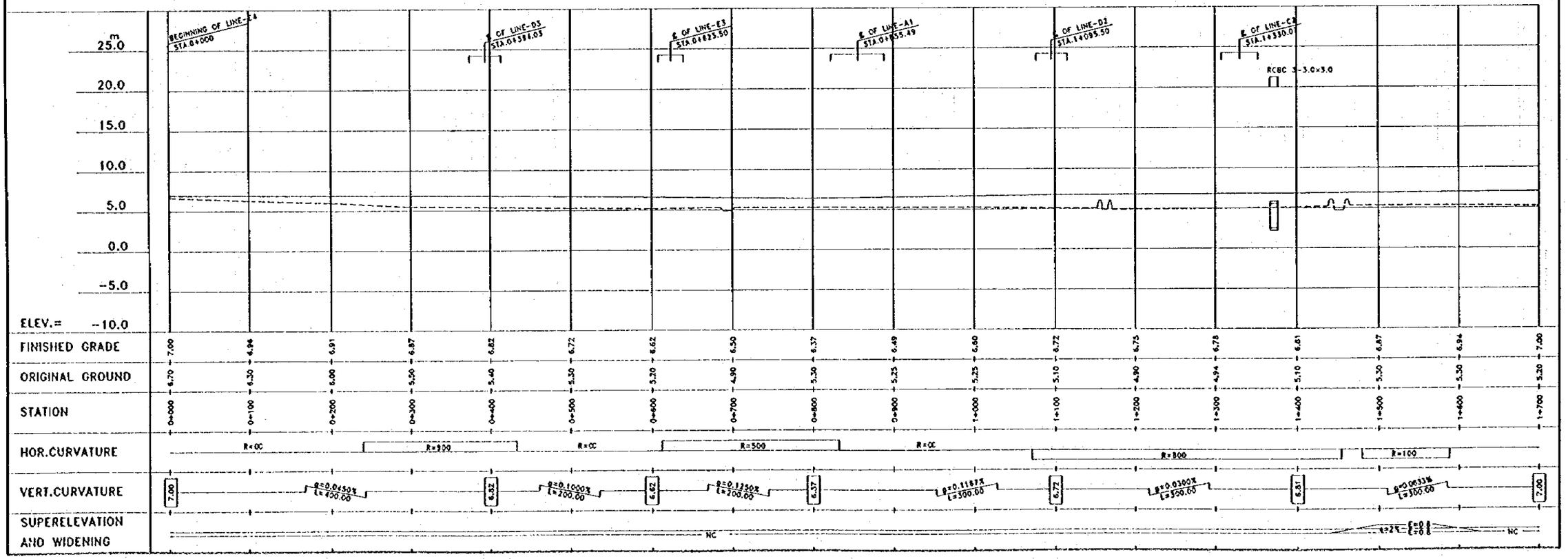
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (16/24) LINE – E3	H=1:2500 V=1:250	42



SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

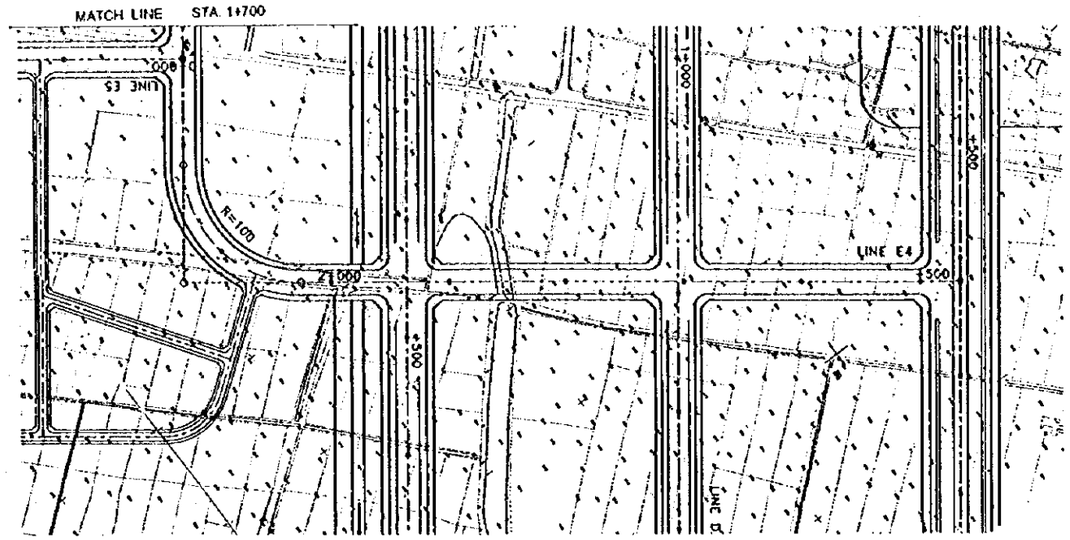
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (17/24) LINE - E4	H=1:2500 V=1:250	43

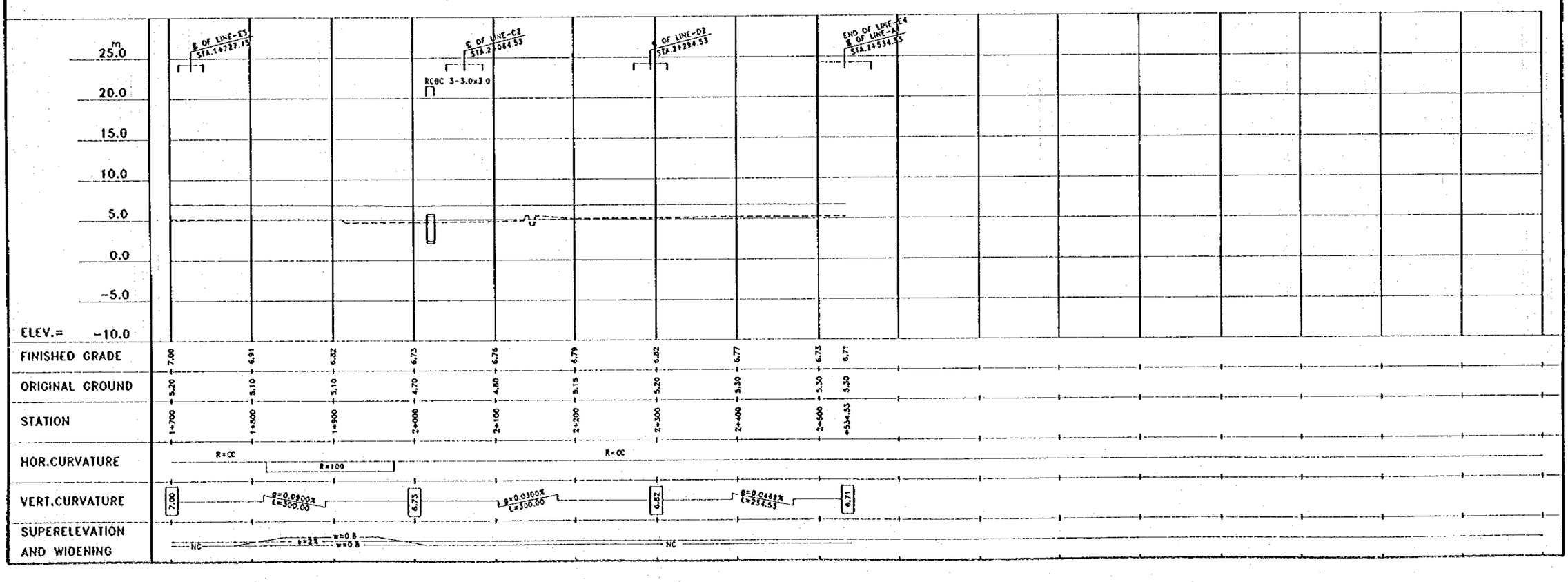




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (18/24) LINE – E4	H=1:2500 V=1:250	44





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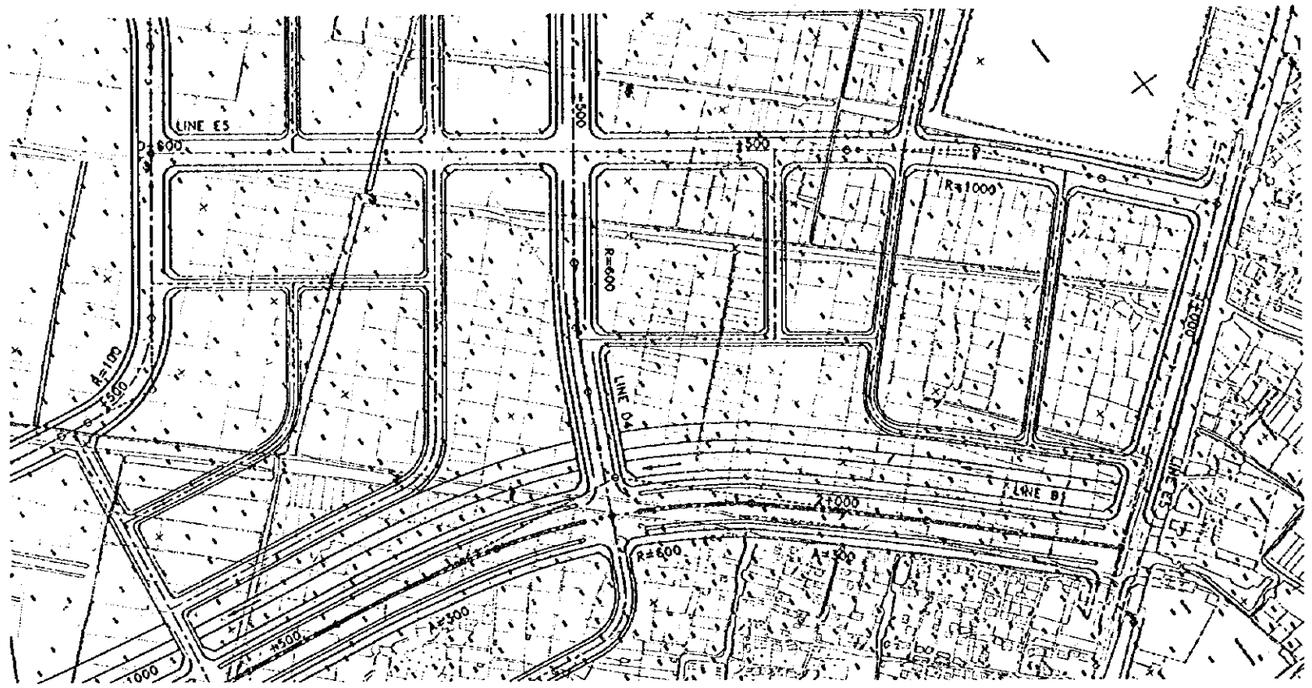
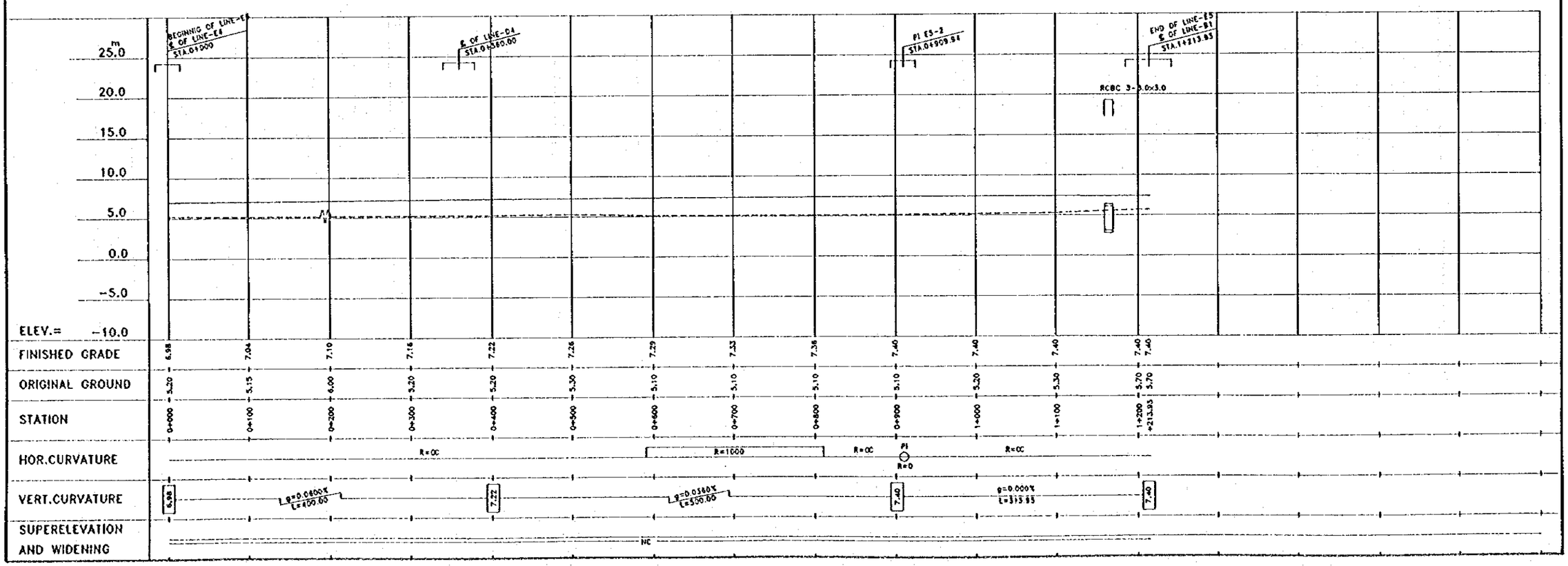
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

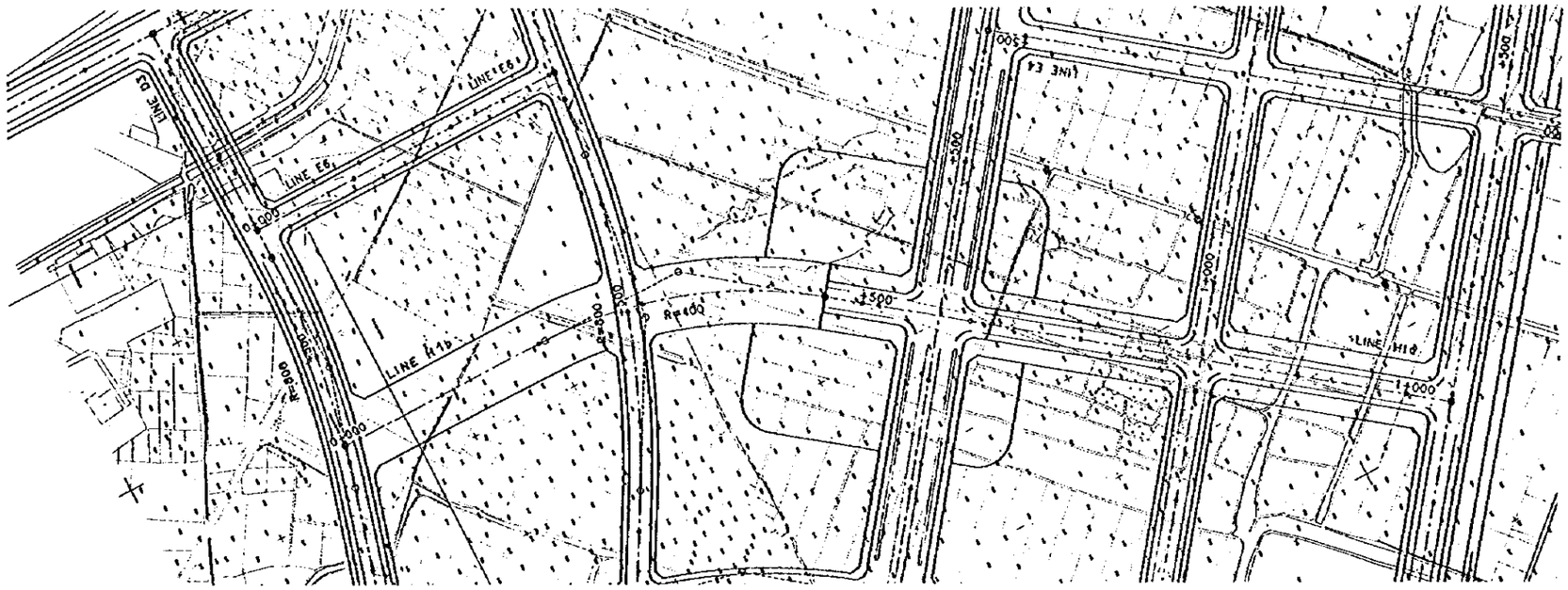
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (19/24) LINE – E5	H=1:2500 V=1:250	45

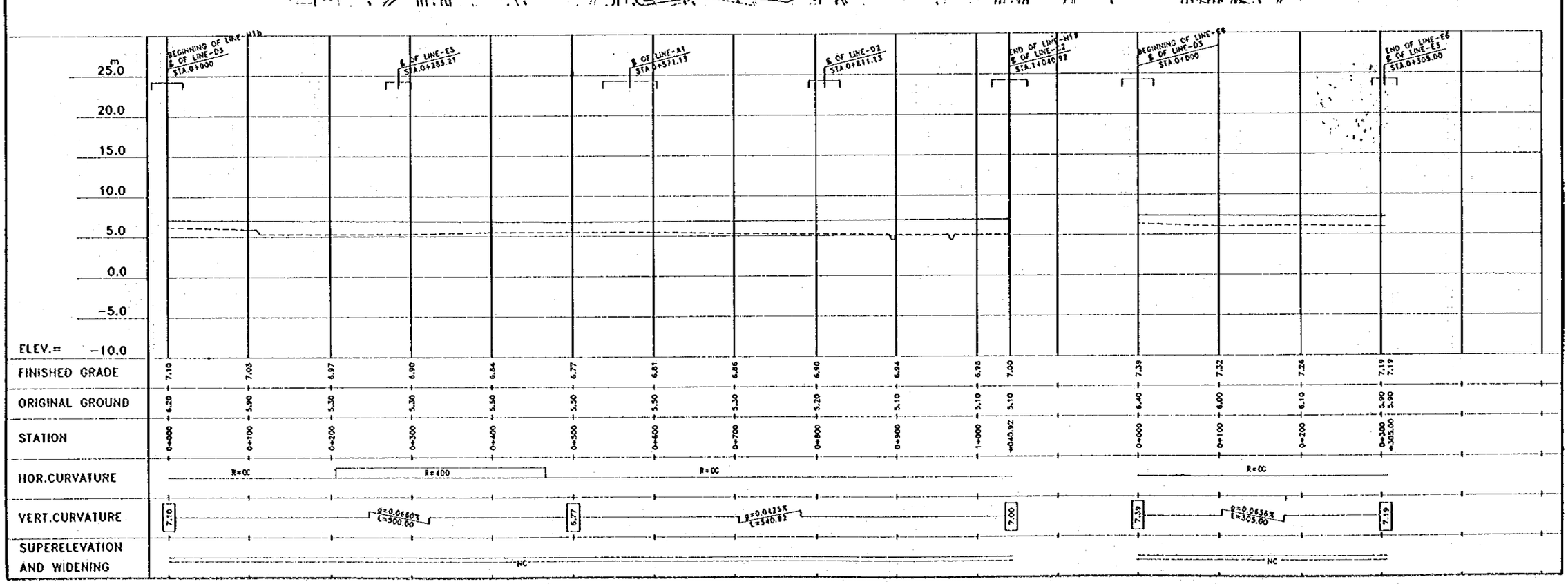




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

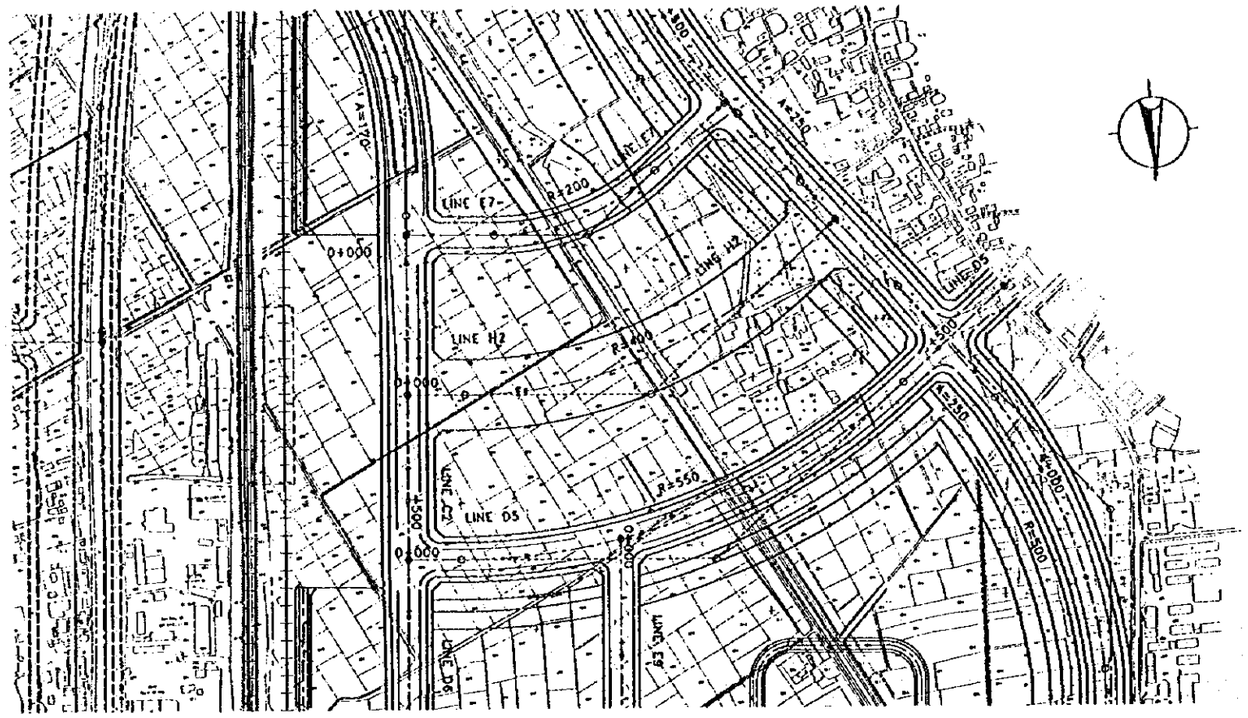
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (20/24) LINE-H1(a,b) AND E6	H=1:2500 V=1:250	46

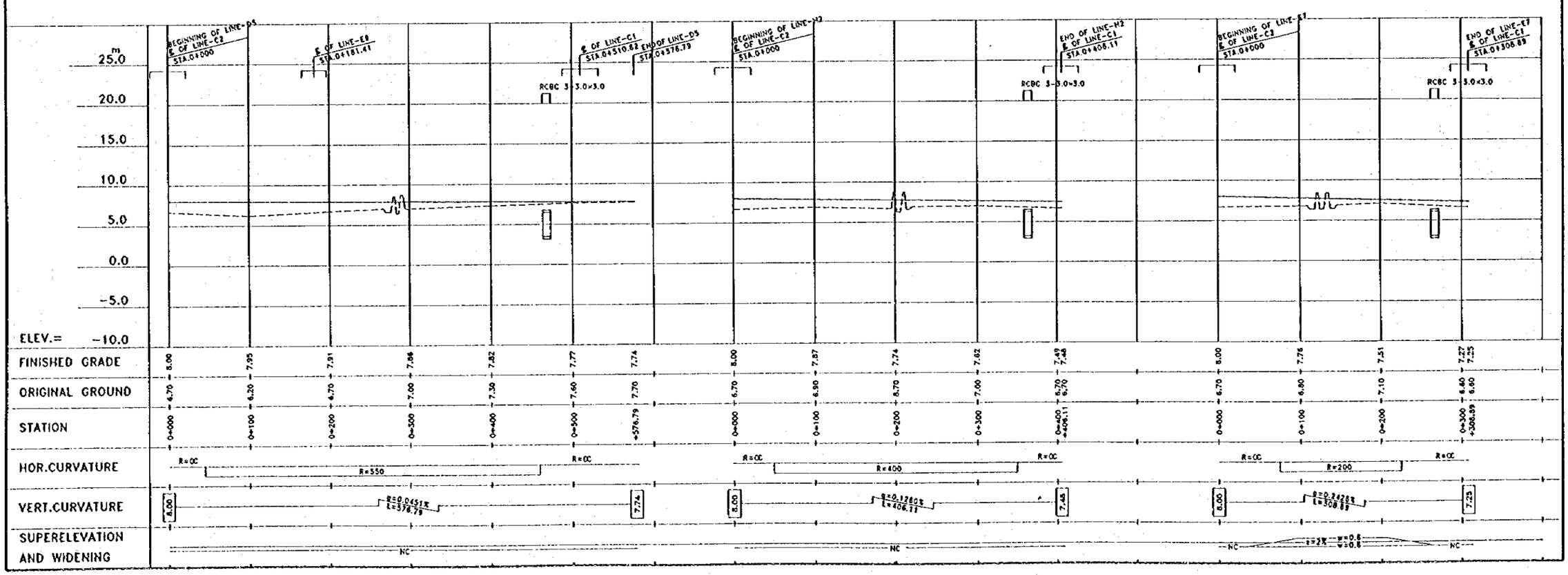




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

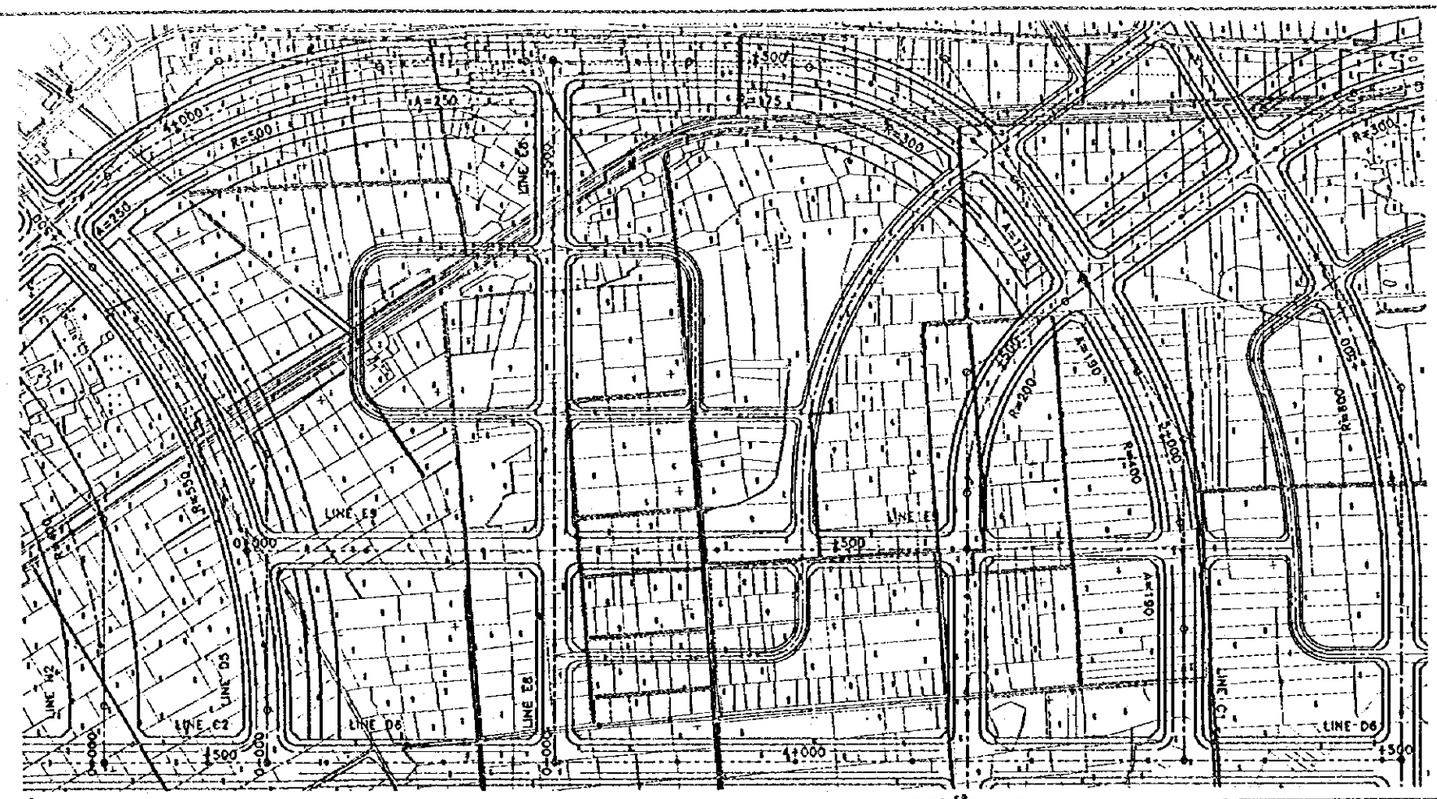
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (21/24) LINE-D5, H2 AND E7	H=1:2500 V=1:250	47

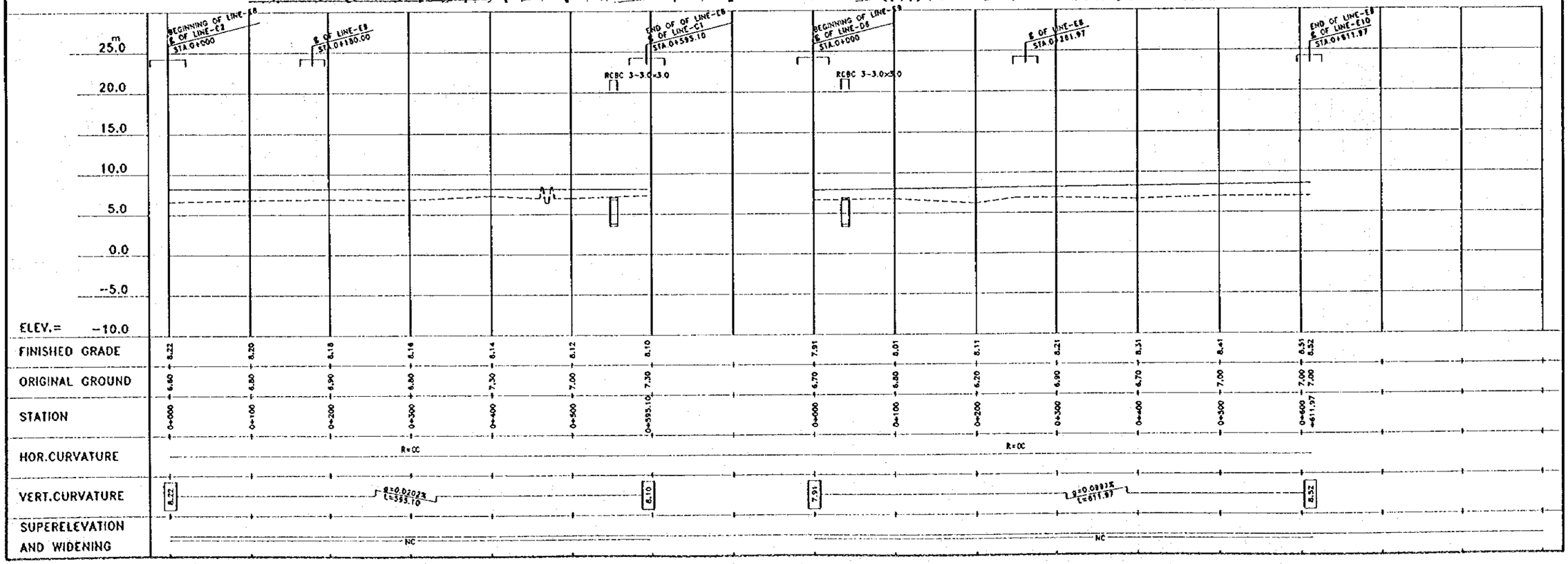




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

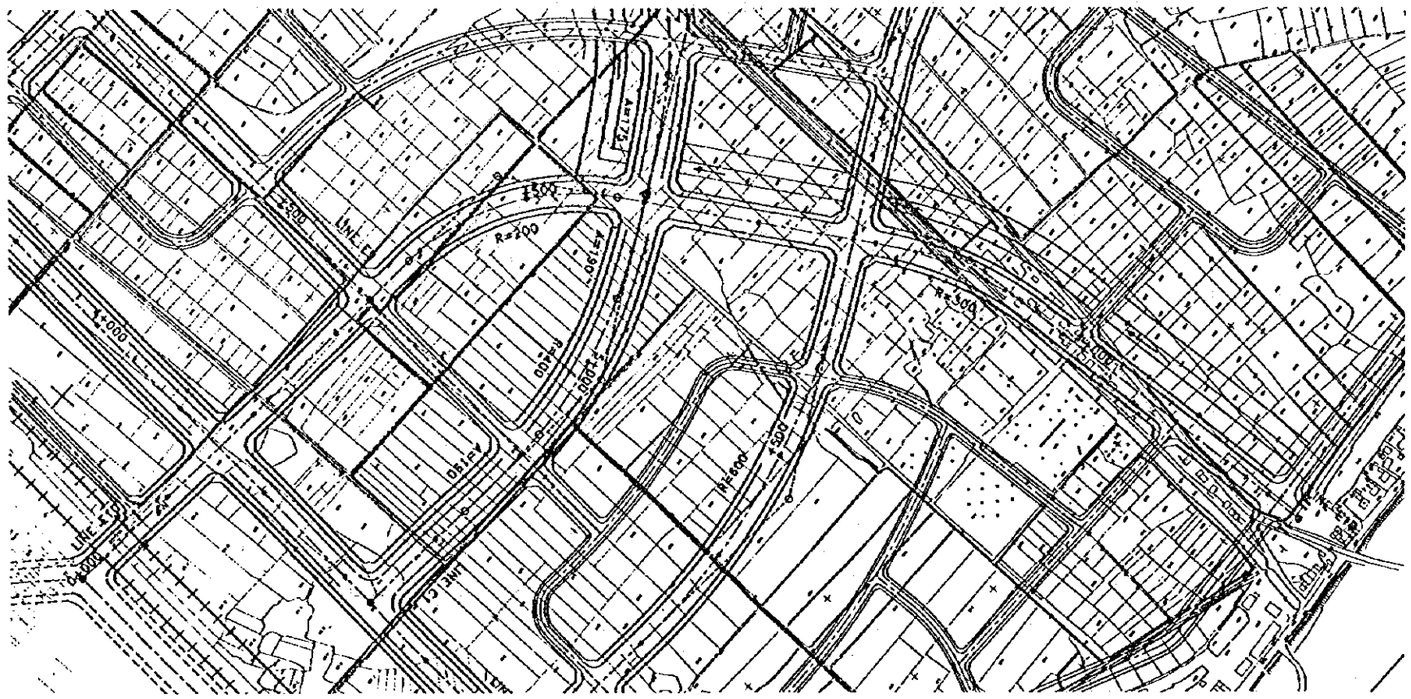
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (22/24) LINE-E8 AND E9	H=1:2500 V=1:250	48

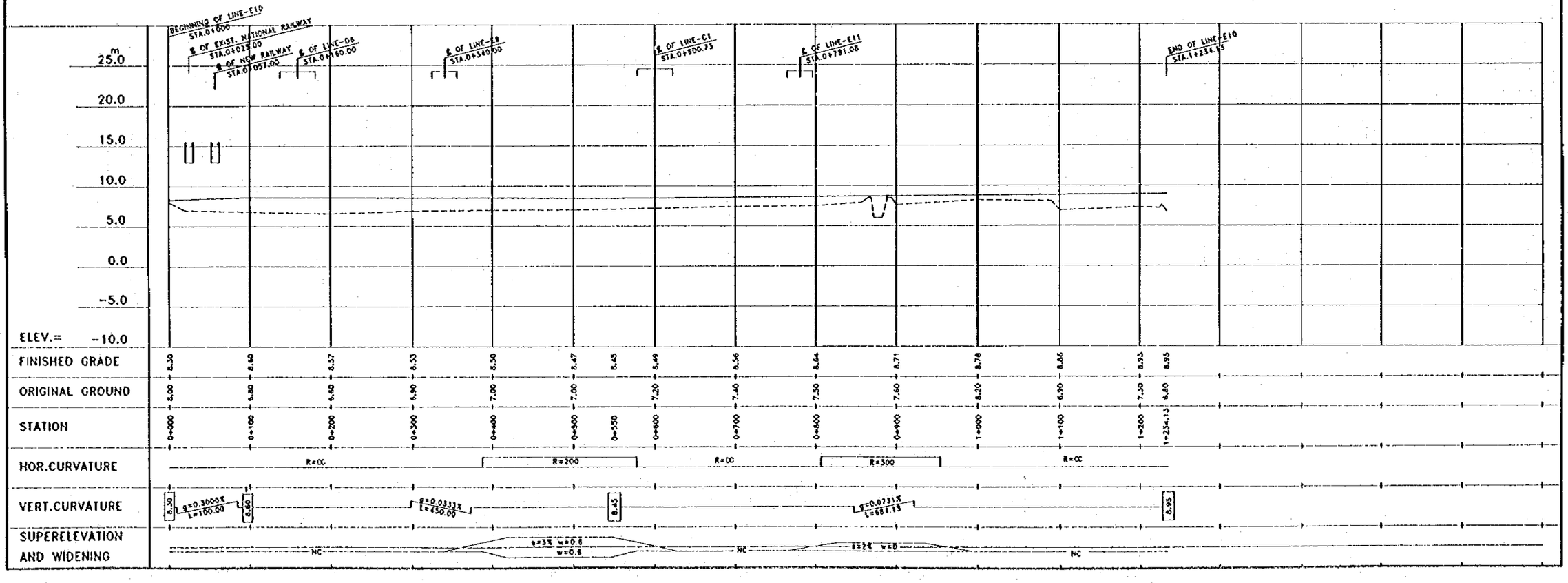




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

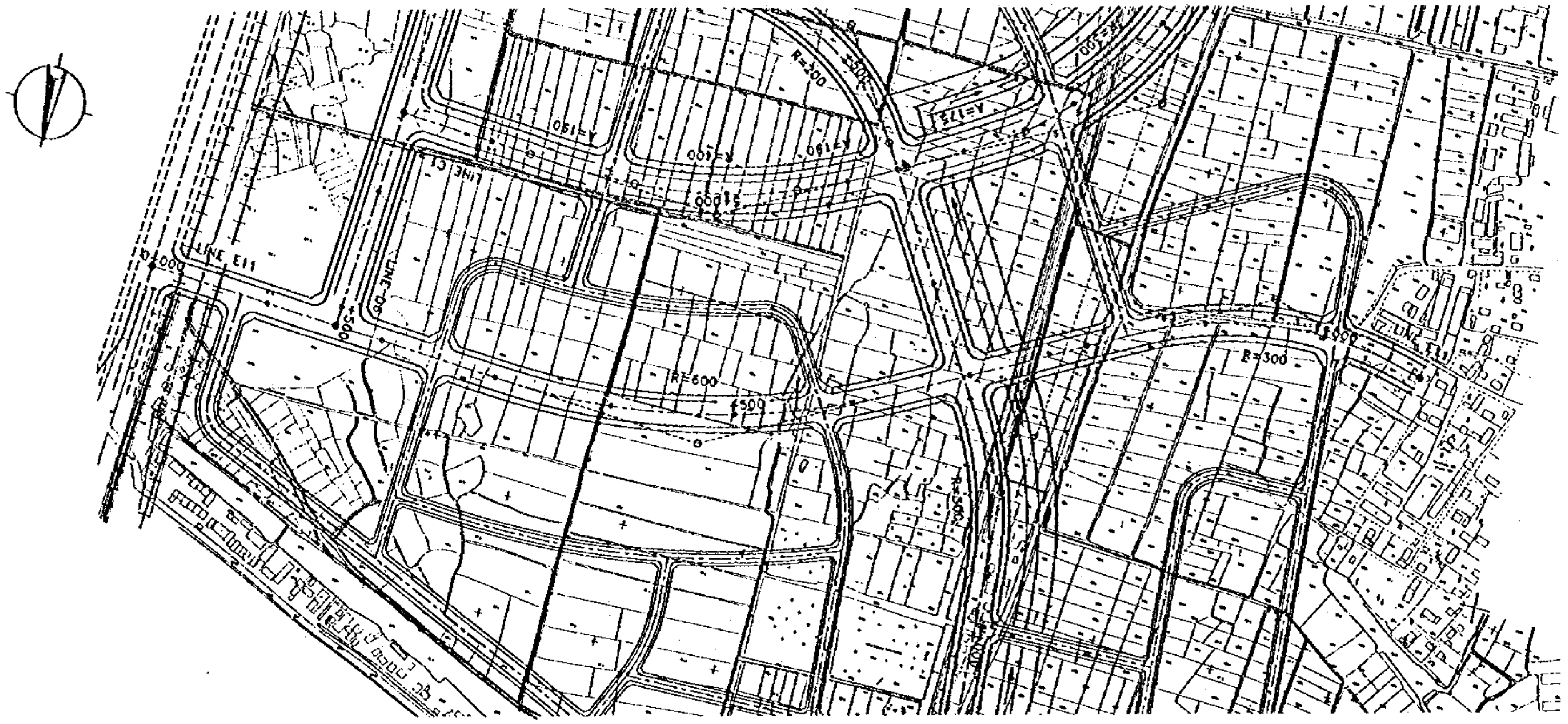
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (23/24) LINE - E10	H=1:2500 V=1:250	49

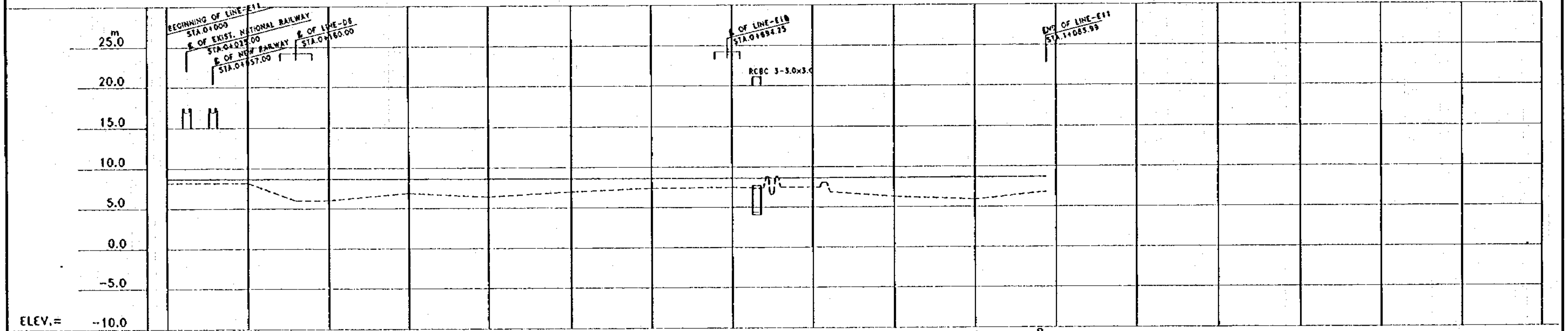




SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
PLAN AND PROFILE (24/24) LINE - E11	H=1:2500 V=1:250	50





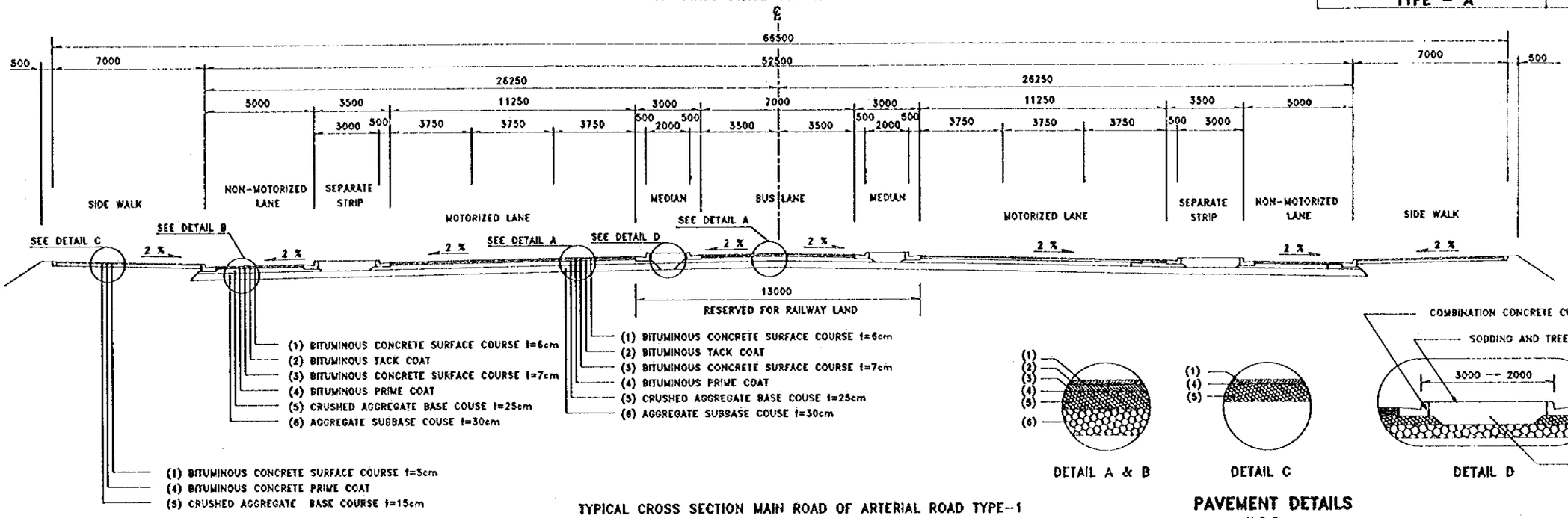
FINISHED GRADE	8.70	8.68	8.67	8.65	8.64	8.62	8.61	8.60	8.61	8.63	8.66	8.68	8.70
ORIGINAL GROUND	8.20	8.20	6.00	6.90	6.40	7.00	7.40		7.50	7.50	6.30	5.90	6.80
STATION	0+000	0+100	0+200	0+300	0+400	0+500	0+600	+650.00	0+700	0+800	0+900	1+000	1+085.99
HOR.CURVATURE		R=∞			R=600				R=∞		R=300		R=∞
VERT.CURVATURE	8.70			g=0.0154% L=650.00				8.60		g=0.0229% L=435.99			8.70
SUPERELEVATION AND WIDENING				NC							e=2% w=0		NC

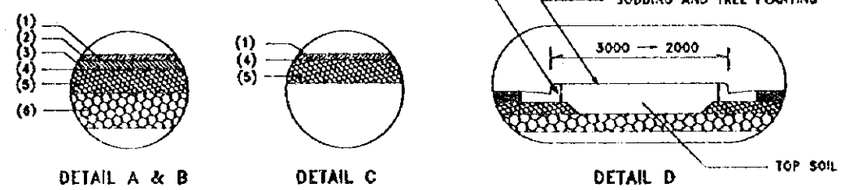
TYPICAL CROSS SECTION TYPE -- A

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

TYPICAL CROSS SECTION MAIN ROAD OF ARTERIAL ROAD TYPE--1

1. FIRST STAGE CONSTRUCTION

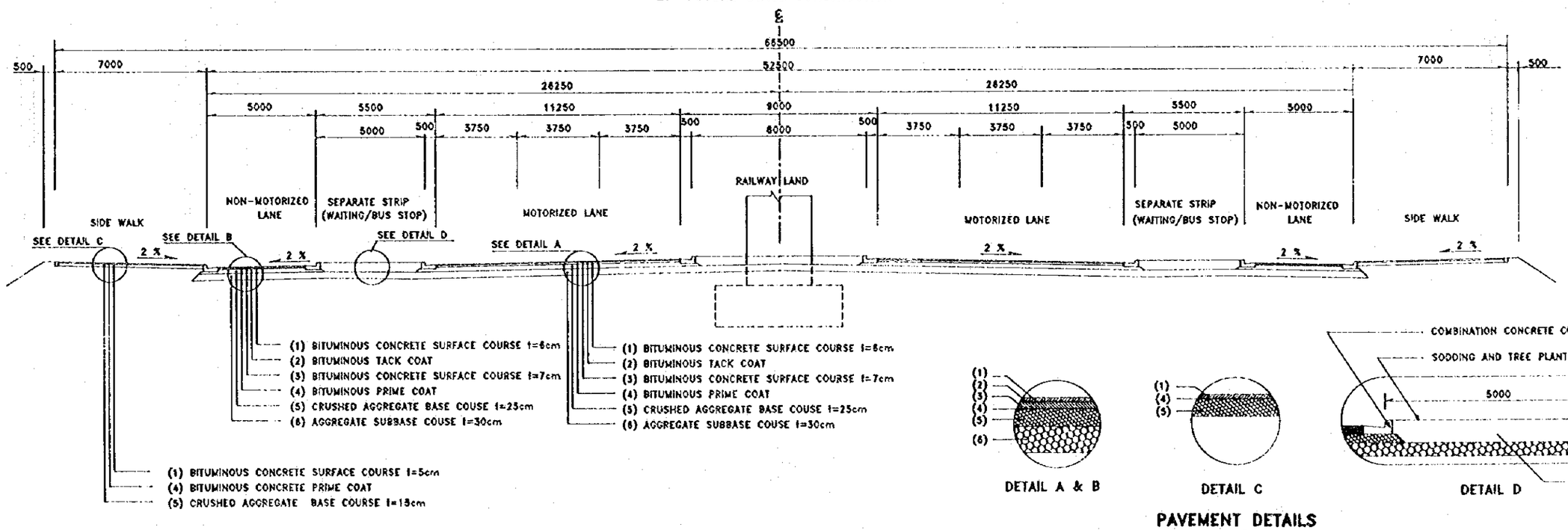


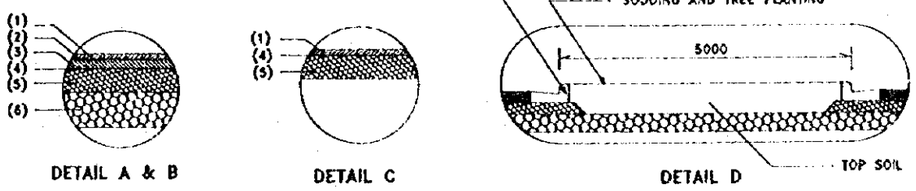


PAVEMENT DETAILS
N T S

TYPICAL CROSS SECTION MAIN ROAD OF ARTERIAL ROAD TYPE--1

2. FUTURE STAGE CONSTRUCTION





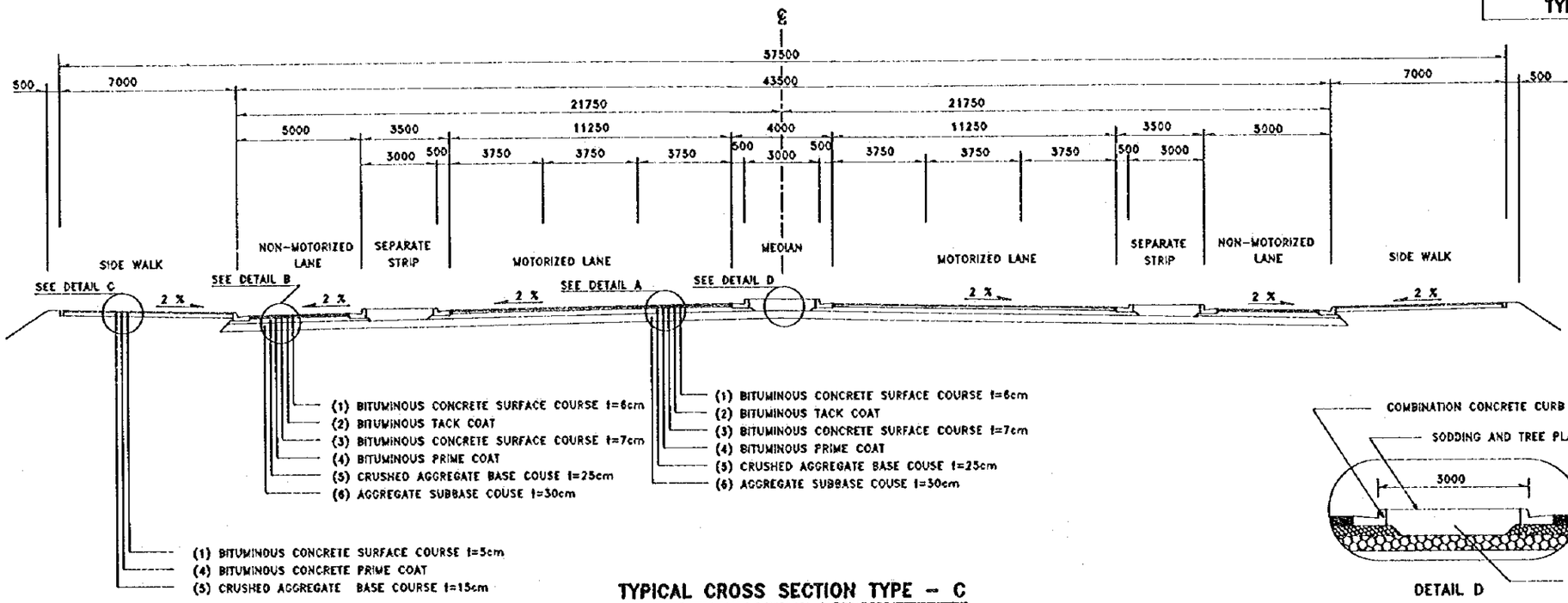
PAVEMENT DETAILS
N T S

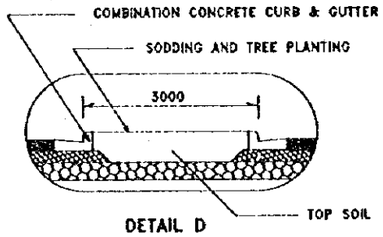
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE -- B AND C	1:100	52

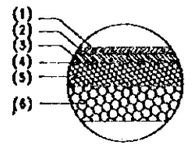
TYPICAL CROSS SECTION TYPE – B

ARTERIAL ROAD TYPE-2 (RING ROAD No.2)

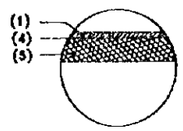




DETAIL D



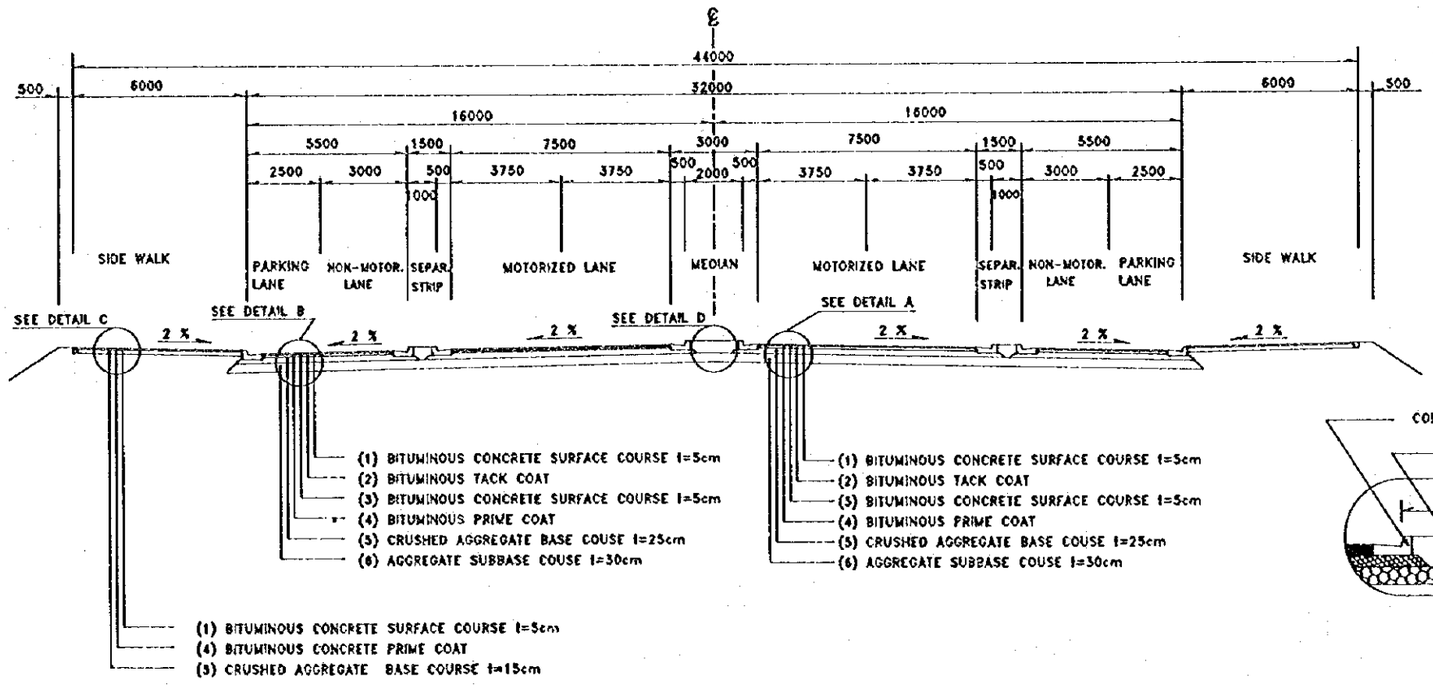
DETAIL A & B

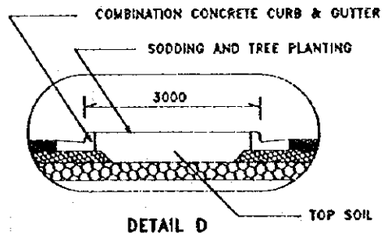


DETAIL C

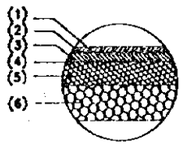
TYPICAL CROSS SECTION TYPE – C

COLLECTOR ROAD TYPE-1

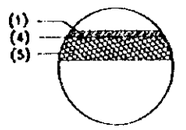




DETAIL D



DETAIL A & B



DETAIL C

PAVEMENT DETAILS
N T S

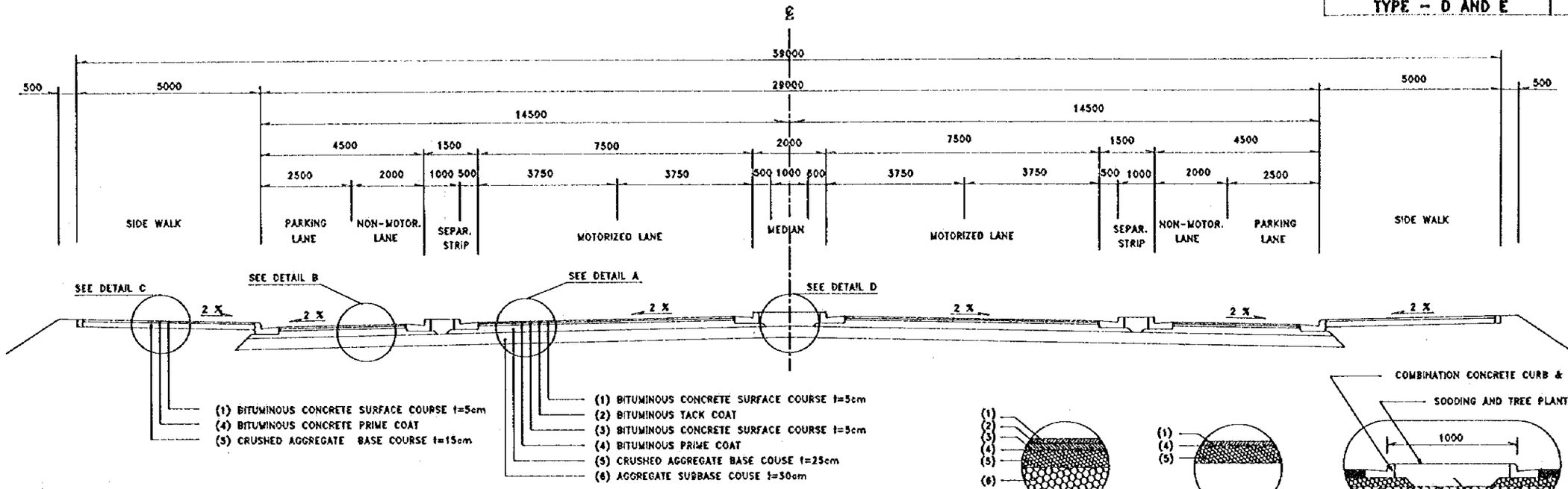
PAVEMENT DETAILS
N T S

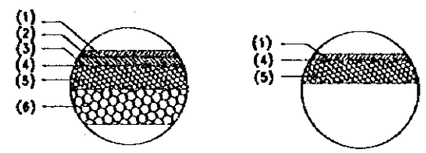
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE – D AND E	1 : 60	53

TYPICAL CROSS SECTION TYPE – D

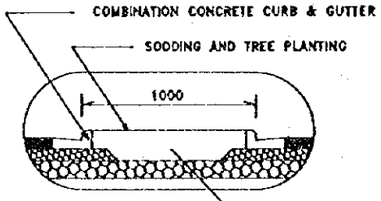
COLLECTOR ROAD TYPE–2





DETAIL A & B

DETAIL C



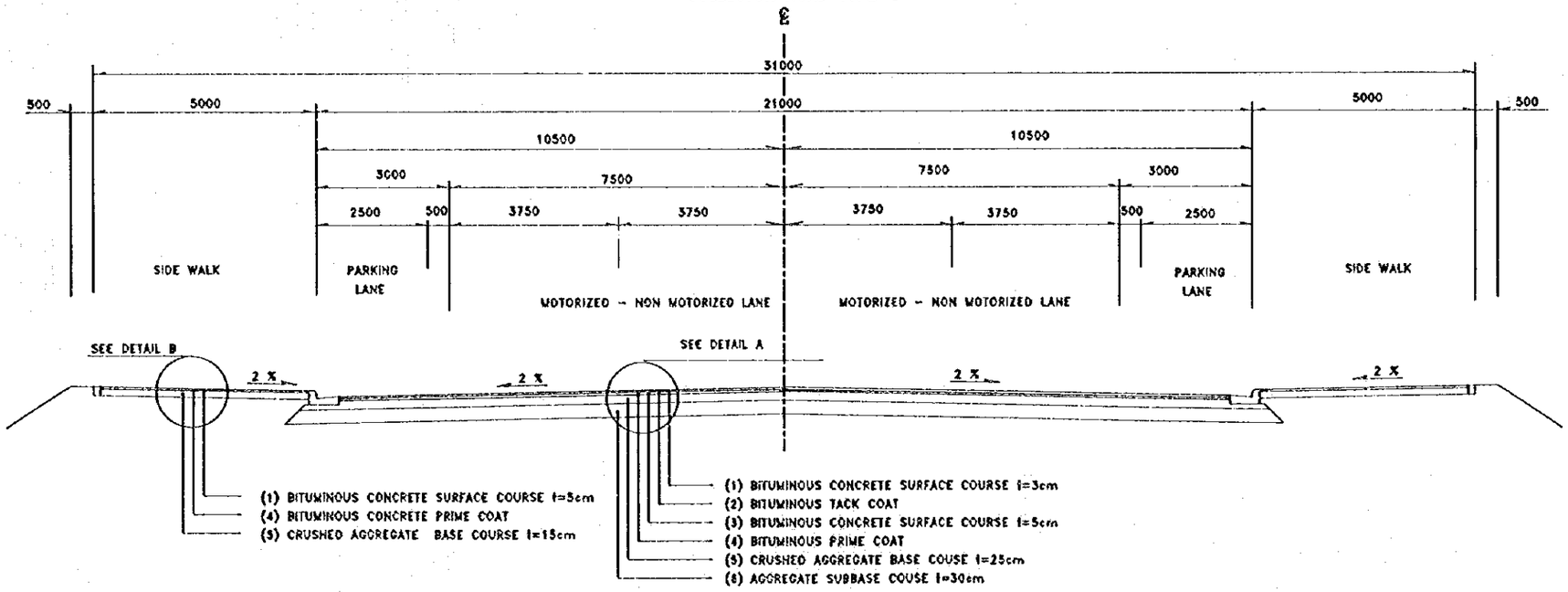
DETAIL D

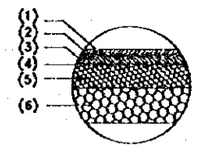
PAVEMENT DETAILS

N T S

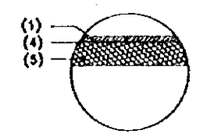
TYPICAL CROSS SECTION TYPE – E

COLLECTOR ROAD TYPE–3





DETAIL A



DETAIL B

PAVEMENT DETAILS

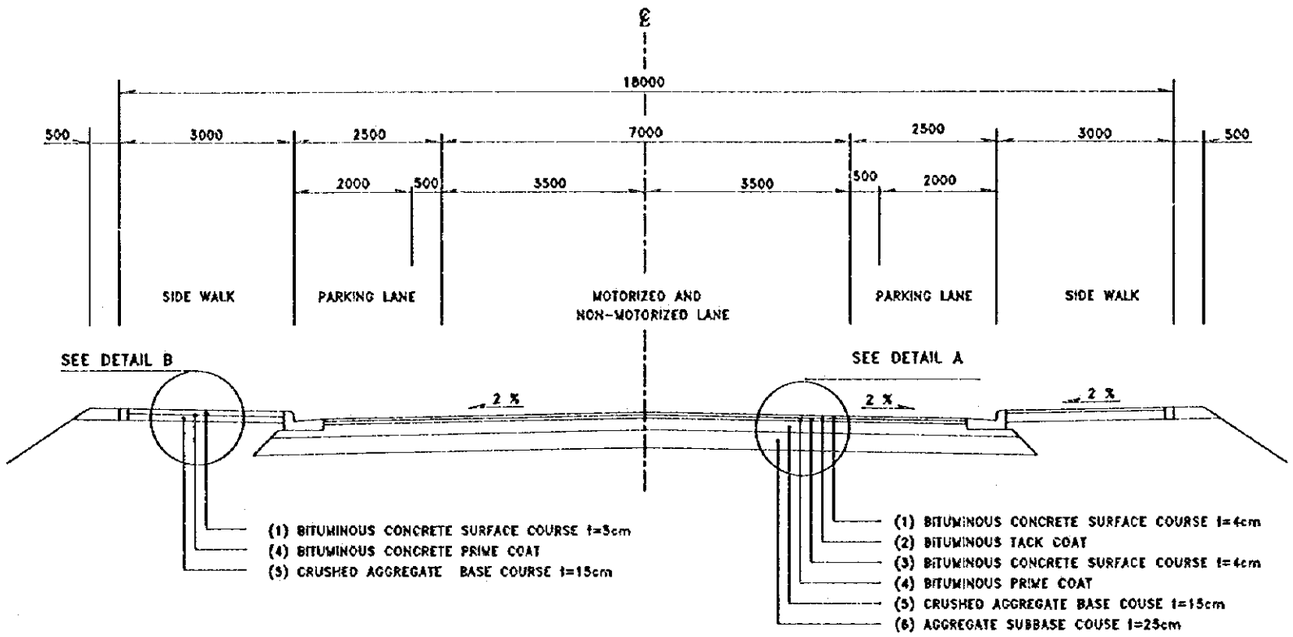
N T S

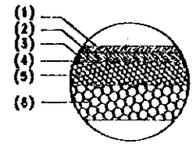
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION TYPE -- F AND G	1:50	54

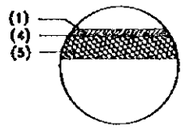
TYPICAL CROSS SECTION TYPE -- F

FEEDER ROAD TYPE--1





DETAIL A

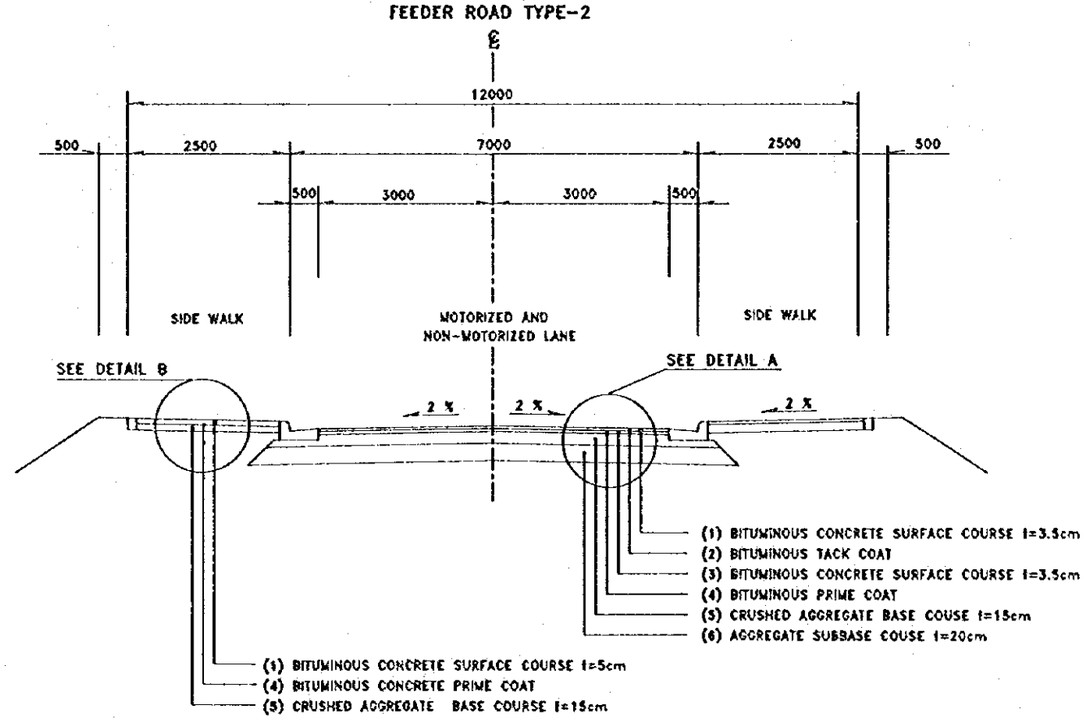


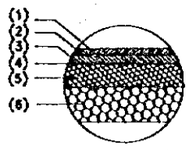
DETAIL B

PAVEMENT DETAIL
N T S

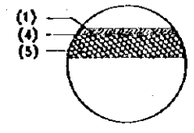
TYPICAL CROSS SECTION TYPE -- G

FEEDER ROAD TYPE--2





DETAIL A



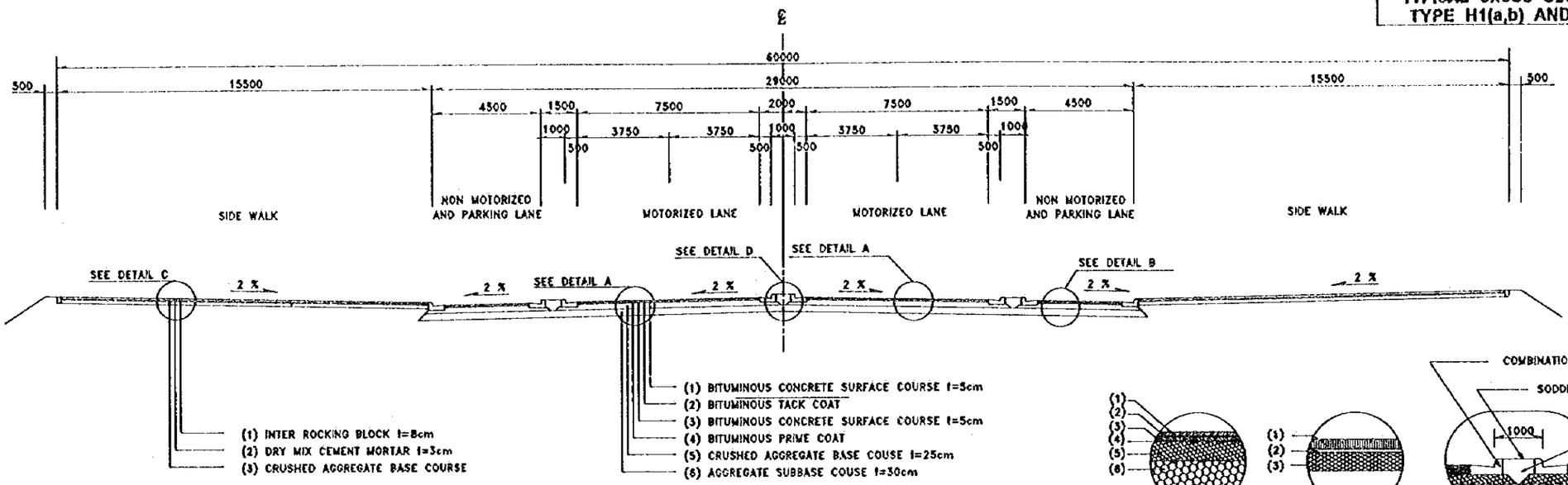
DETAIL B

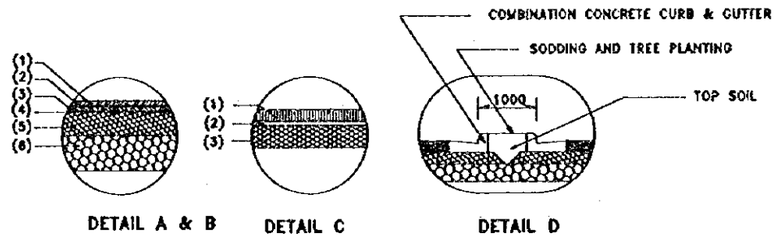
PAVEMENT DETAIL
N T S

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

TYPICAL CROSS SECTION TYPE -- H1a

CONBINED COLLECTOR ROAD AND PEDISTRIAN ROAD





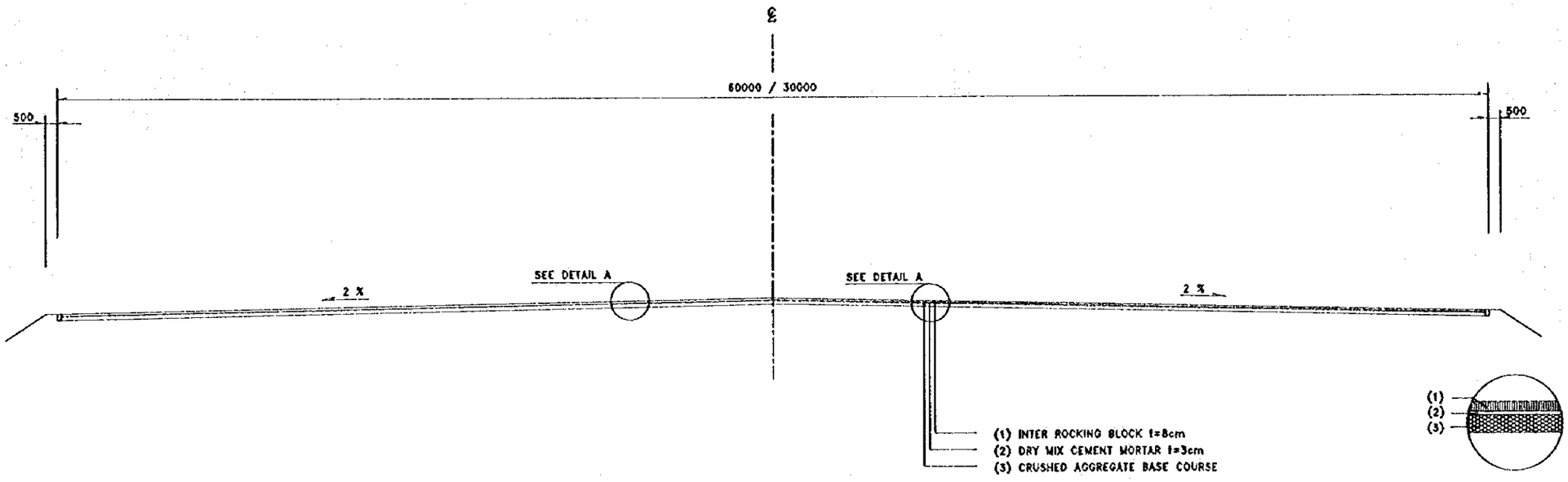
DETAIL A & B DETAIL C DETAIL D

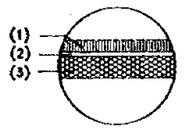
PAVEMENT DETAILS

N T S

TYPICAL CROSS SECTION TYPE -- H1b / H2

PEDISTRIAN ROAD





DETAIL A

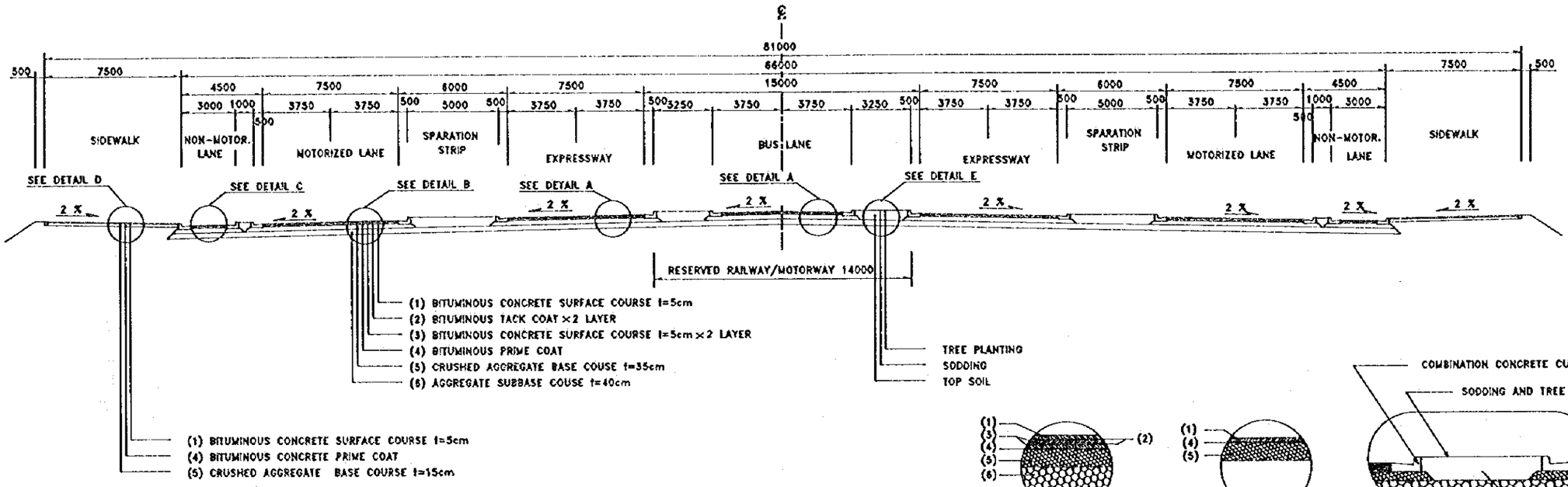
PAVEMENT DETAILS

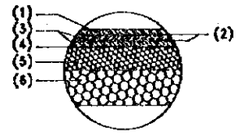
N T S

SOCIALIST REPUBLIC OF VIETNAM THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
TYPICAL CROSS SECTION RING ROAD NO.3 SOUTH SECTION	1:100	56

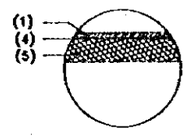
TYPICAL CROSS SECTION RING ROAD NO.3 SOUTH SECTION

CONBINED BUS LANE

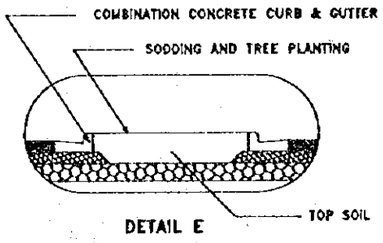




DETAIL A,B & C



DETAIL D

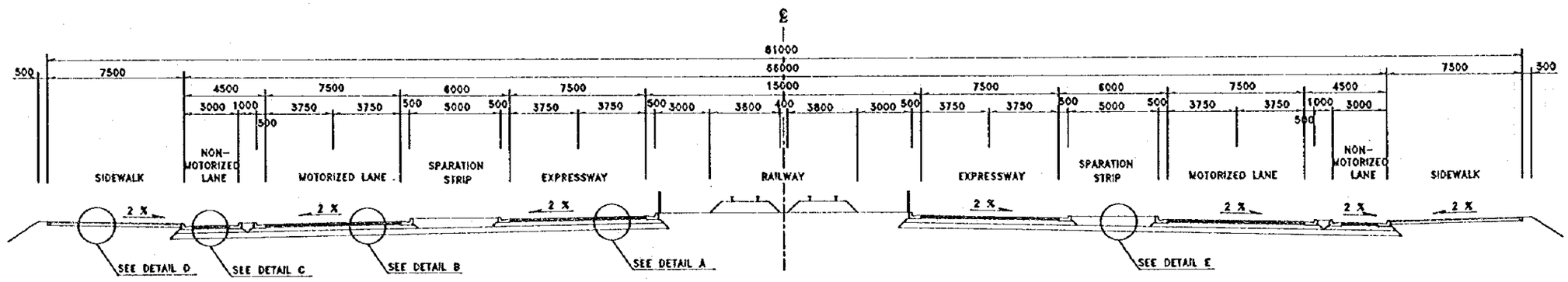


DETAIL E

PAVEMENT DETAILS

N T S

CONBINED RAILWAY TRANSIT

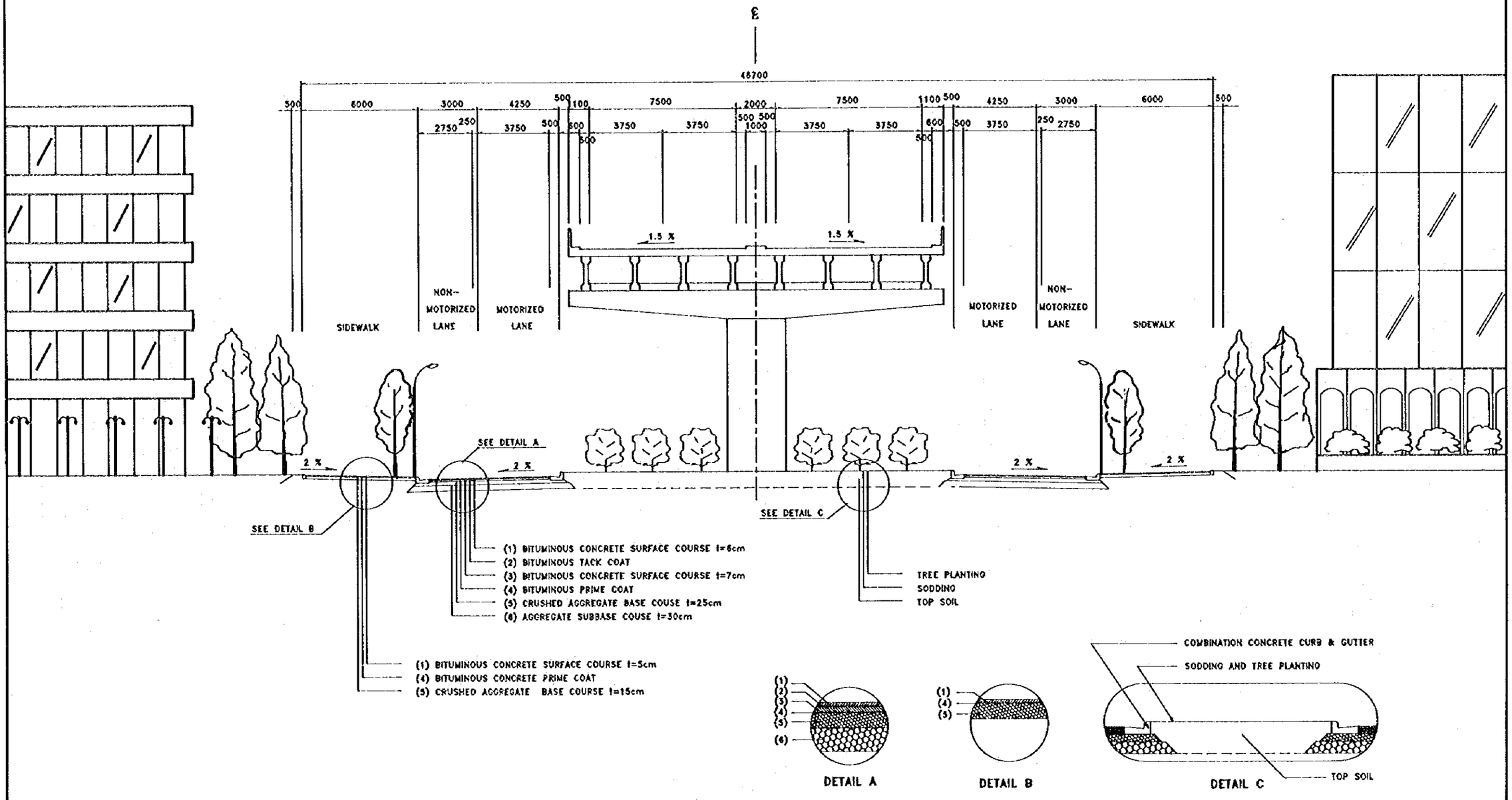


SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

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

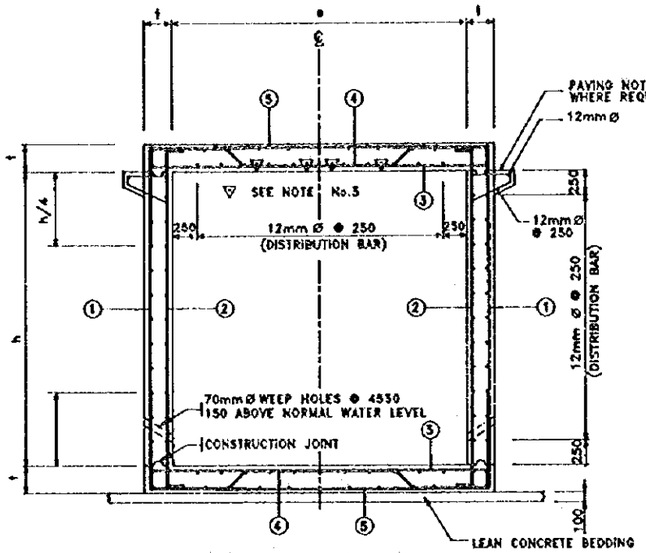


PAVEMENT DETAILS

N T S

SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE	ORIGINAL SCALE	DWG. No.
STANDARD REINFORCED CONCRETE BOX CULVERT	AS SHOWN	58

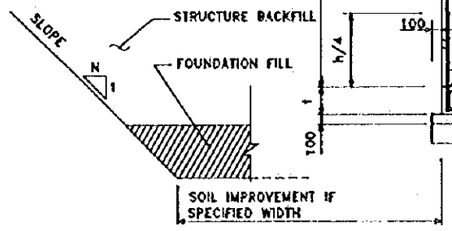


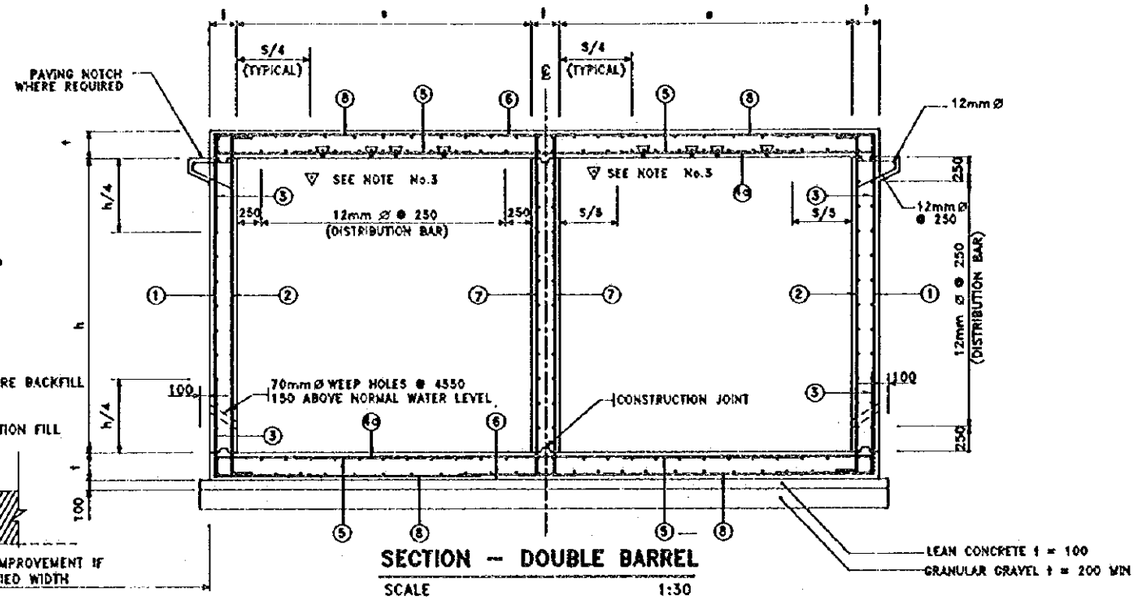
SECTION -- SINGLE BARREL
SCALE 1:30

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

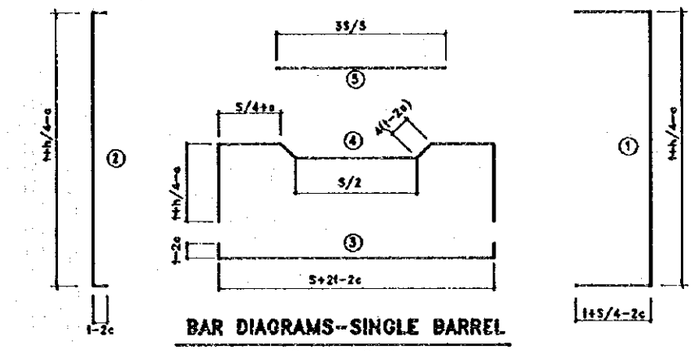
c = CLEAR CONCRETE COVER (50mm)

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

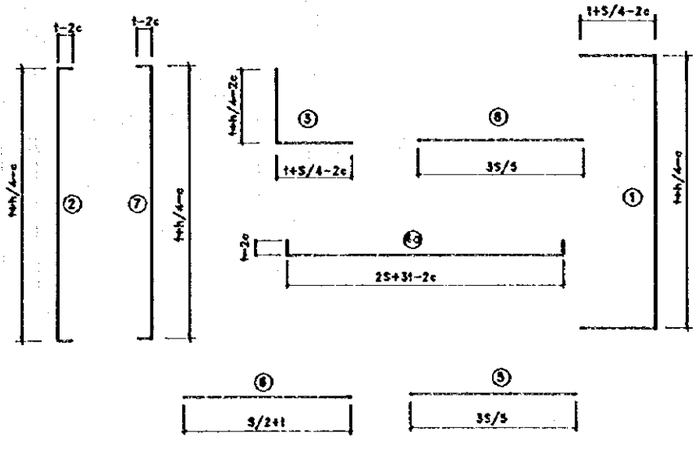




SECTION -- DOUBLE BARREL
SCALE 1:30



BAR DIAGRAMS--SINGLE BARREL
NOT TO SCALE



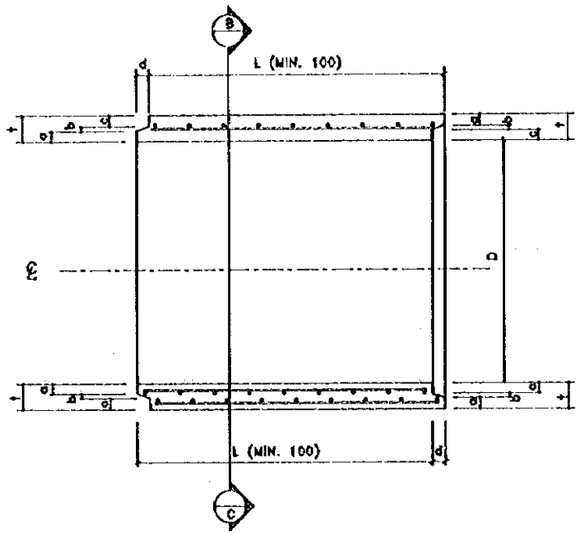
BAR DIAGRAMS--DOUBLE BARREL
NOT TO SCALE

CLEAR SPAN S	CLEAR HEIGHT h	SINGLE BARREL BOX CULVERT t	BAR 1 Ø	BAR 1 SPACING	BAR 2 Ø	BAR 2 SPACING	BAR 3 Ø	BAR 3 SPACING	BAR 4 Ø	BAR 4 SPACING	BAR 5 Ø	BAR 5 SPACING
1000	1000	180	12	300	12	300	12	300	12	300	12	300
	1250	180	12	300	12	300	12	300	12	300	12	300
	1500	180	12	300	12	300	12	300	12	300	12	300
	1800	180	12	300	12	260	12	300	12	300	12	300
1250	1000	180	12	300	12	300	12	300	12	300	12	300
	1250	180	12	300	12	300	12	300	12	300	12	300
	1500	180	12	300	12	280	12	300	12	300	12	300
	1800	180	12	300	12	260	12	300	12	300	12	300
1500	1000	180	16	240	16	300	16	240	16	240	12	300
	1250	180	16	240	16	300	16	240	16	240	12	300
	1500	180	16	240	16	280	16	240	16	240	12	300
	1800	180	16	240	16	280	16	240	16	240	12	300
1800	1250	200	16	260	16	300	16	260	16	260	12	280
	1500	200	16	260	16	300	16	260	16	260	12	280
	1800	200	16	260	16	280	16	260	16	260	12	280
	2100	200	16	260	16	260	16	260	16	260	12	280
2100	1500	220	16	260	16	280	16	240	16	240	12	280
	1800	220	16	260	16	280	16	240	16	240	12	280
	2100	220	16	220	16	260	16	240	16	240	12	280
	2400	220	16	220	16	240	16	240	16	240	12	280
2400	1800	220	16	220	16	280	16	220	16	220	12	240
	2100	220	16	220	16	260	16	220	16	220	12	240
	2400	220	16	220	16	200	16	220	16	220	12	240
	2750	220	16	200	16	180	16	200	16	200	12	260
3000	2100	280	16	260	16	260	16	260	16	260	12	200
	2400	280	16	260	16	260	16	260	16	260	12	200
	2750	280	16	200	16	240	16	220	16	200	12	200
	3000	280	16	200	16	220	16	200	16	200	12	200

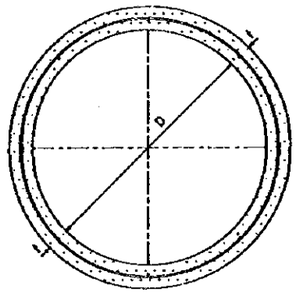
CLEAR SPAN S	CLEAR HEIGHT h	DOUBLE BARREL BOX CULVERT t	BAR 1 Ø	BAR 1 SPACING	BAR 2 Ø	BAR 2 SPACING	BAR 3 Ø	BAR 3 SPACING	BAR 4 Ø	BAR 4 SPACING	BAR 5 Ø	BAR 5 SPACING	BAR 6 Ø	BAR 6 SPACING	BAR 7 Ø	BAR 7 SPACING	BAR 8 Ø	BAR 8 SPACING
1000	1000	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
	1250	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
	1500	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
	1800	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
1250	1000	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
	1250	180	12	300	16	300	12	300	12	300	12	300	20	200	12	300	12	300
	1500	180	12	300	16	280	12	300	12	300	12	300	20	200	12	300	12	300
	1800	180	12	300	16	260	12	300	12	300	12	300	20	200	12	300	12	300
1500	1000	200	16	300	16	300	16	300	16	300	12	300	20	200	12	300	12	280
	1250	200	16	300	16	300	16	300	16	300	12	300	20	200	12	300	12	280
	1500	200	16	300	16	280	16	300	16	300	12	300	20	200	12	300	12	280
	1800	200	16	300	16	260	16	300	16	300	12	300	20	200	12	300	12	280
1800	1250	250	16	300	16	300	16	300	16	300	16	300	20	180	12	300	12	220
	1500	250	16	300	16	280	16	300	16	300	16	300	20	190	12	300	12	220
	1800	250	16	300	16	280	16	300	16	300	16	300	20	190	12	300	12	220
	2100	250	16	300	16	260	16	300	16	300	16	300	20	190	12	300	12	220
2100	1500	280	16	300	16	280	16	300	16	300	16	300	20	170	12	300	12	220
	1800	280	16	300	16	280	16	300	16	300	16	300	20	170	12	300	12	220
	2100	280	16	300	16	280	16	300	16	300	16	300	20	170	12	300	12	220
	2400	280	16	300	16	280	16	300	16	300	16	300	20	170	12	300	12	220
2400	1800	300	16	300	16	280	16	300	16	300	16	300	20	120	12	300	12	200
	2100	300	16	300	16	280	16	300	16	300	16	300	20	120	12	300	12	200
	2400	300	16	300	16	280	16	300	16	300	16	300	20	120	12	300	12	200
	2750	300	16	300	16	280	16	300	16	300	16	300	20	120	12	300	12	200
3000	2100	300	16	300	16	280	20	300	20	300	20	300	25	170	12	300	12	200
	2400	300	16	300	16	280	20	300	20	300	20	300	25	170	12	300	12	200
	2750	300	16	300	16	280	20	300	20	300	20	300	25	170	16	300	12	200
	3000	300	16	300	16	200	20	300	20	300	20	300	25	170	16	300	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.

SOCIALIST REPUBLIC OF VIETNAM THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY		
TITLE OF DRAWING	ORIGINAL SCALE	DWG. No.
STANDARD REINFORCED CONCRETE PIPE CULVERT DETAILS	AS SHOWN	59

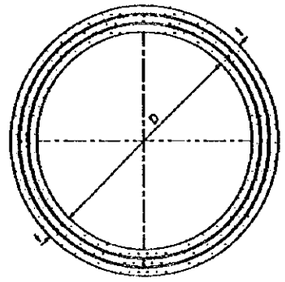


(A) LONGITUDINAL SECTION



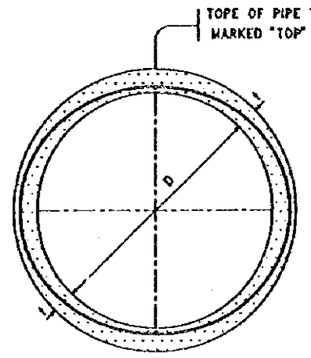
ONE LINE OF CIRCULAR REINFORCEMENT

(B) SECTION



TWO LINES OF CIRCULAR REINFORCEMENT

(C) SECTION



ONE LINE OF ELLIPTICAL REINFORCEMENT

(1) REINFORCED CONCRETE PIPE CULVERTS

INTERNAL DESIGNATED DIAMETTER (mm)	WALL THICKNESS (mm)	REINFORCEMENT, CM²/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 THE ULTIMATE LOAD 75.0			D-LOAD TO PRODUCE a 0.3mm CRACK 65.0 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		1.5
500	57	2.5		2.1	3.0		2.3
600	63	2.8		2.3	3.6		3.0
675	66	3.2		2.8	3.8		3.4
750	69	3.2		3.0	4.0		3.8
825	72	3.4		3.2	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	16.9
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	78	50	74	75

GENERAL NOTES :

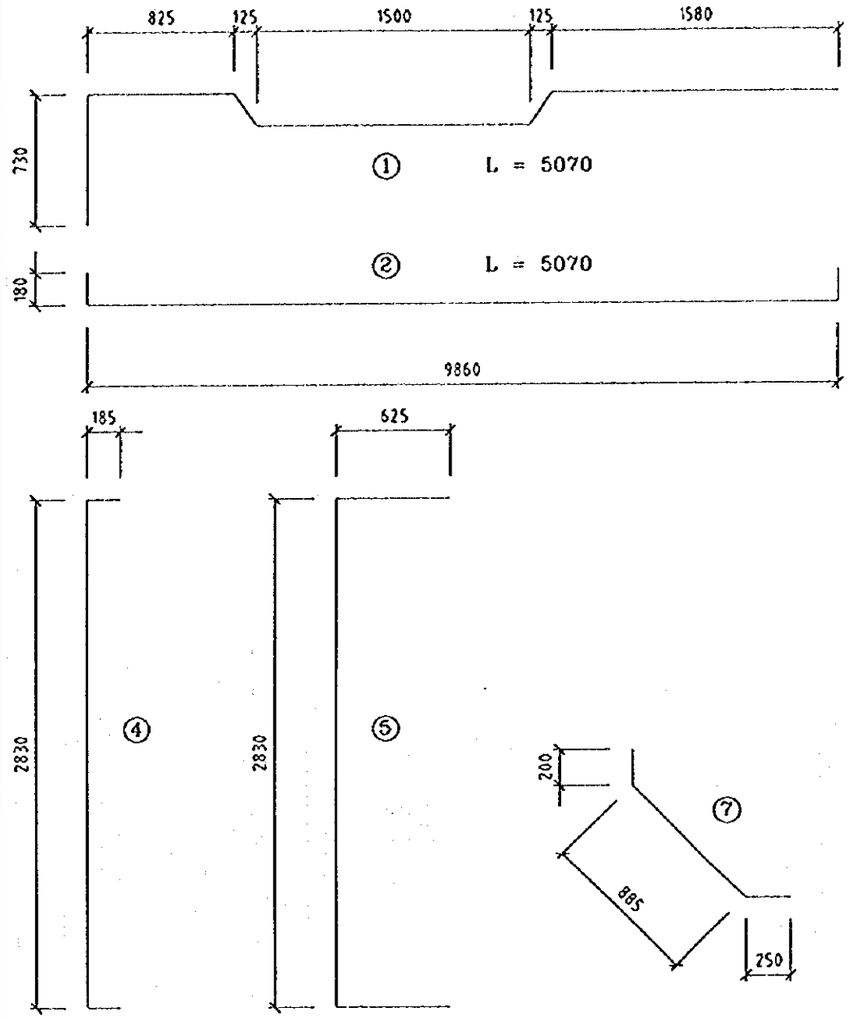
SPECIFICATIONS :
AASHTO DESIGNATION : M 170 M-93
ASTM DESIGNATION : C 76 M-90a

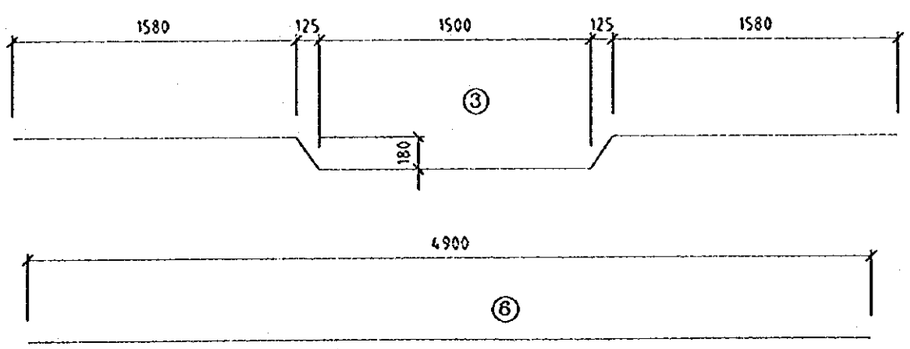
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. REINFORCED CONCRETE PIPE CULVERT.
   - 2.1 CEMENT CONTENT USED FOR CONCRETE MIX SHALL BE LESS THAN 335 KG PER CUBIC METER OF CONCRETE.
   - 2.2 REINFORCEMENT SHALL CONSIST OF WIRE CONFORMING TO AASHTO M32 OR M225, OR OF BARS OF GRADE 300 STEEL CONFORMING TO AASHTO M31 M.
   - 2.3 WHRE 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 500mm 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 MOTARED AS SHOWN ON THE DRAWING WITH CEMENT MORTAR (1:2 BY VOLUME).
4. CULVERT LENGTH (L) SHALL BE 100cmm 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

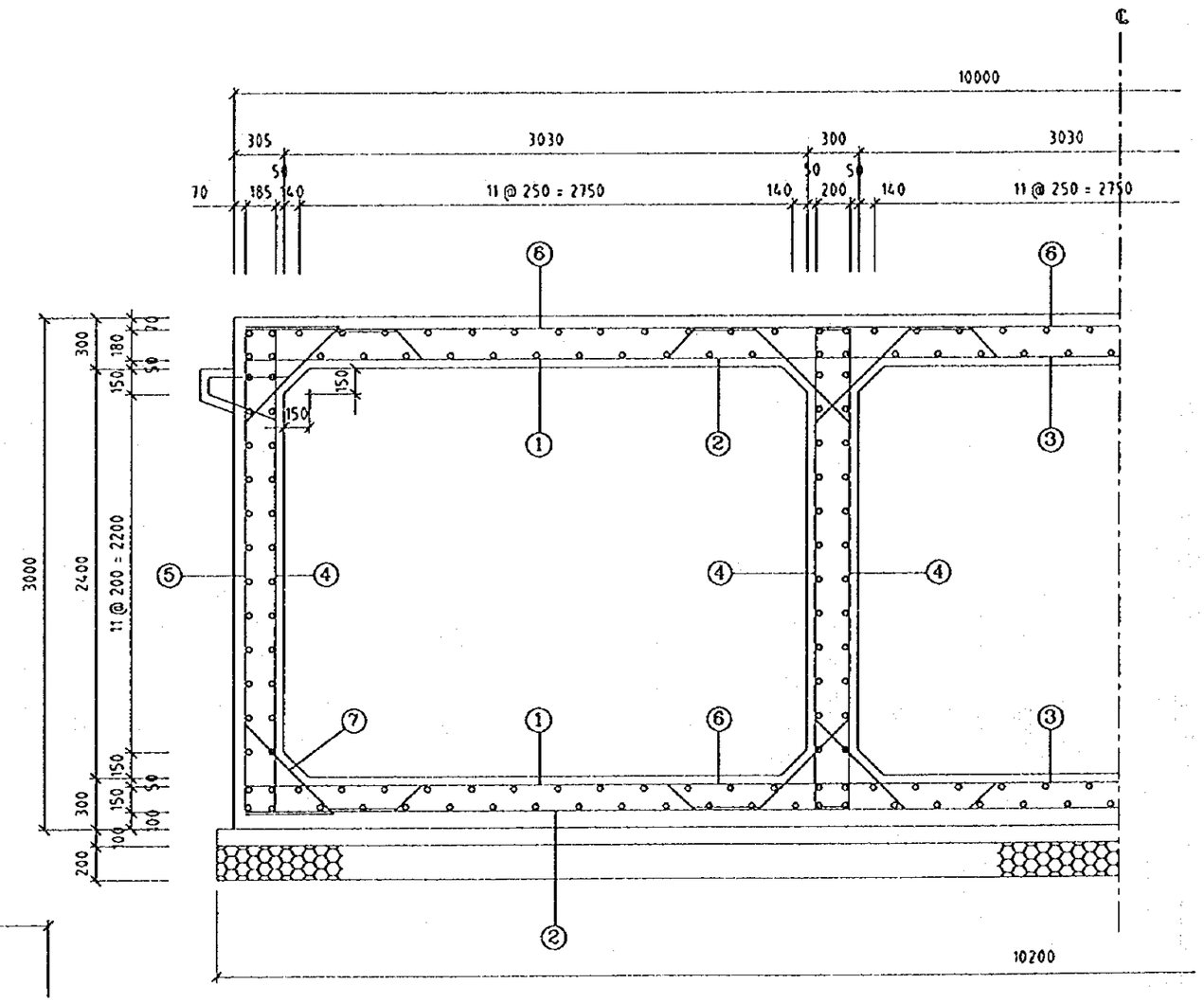
SOCIALIST REPUBLIC OF VIET NAM

THE FEASIBILITY OF NEW CBD FOR HANOI CITY

TITLE OF DRAWING	ORIGINAL SCALE	DWG. No
STANDARD REINFORCED CONCRET BOX CULVERT (2)	AS SHOWN	60

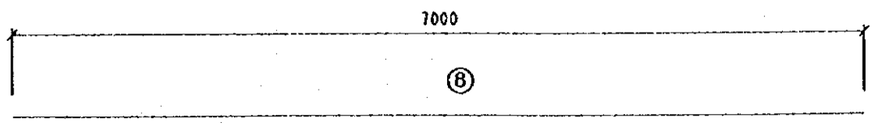




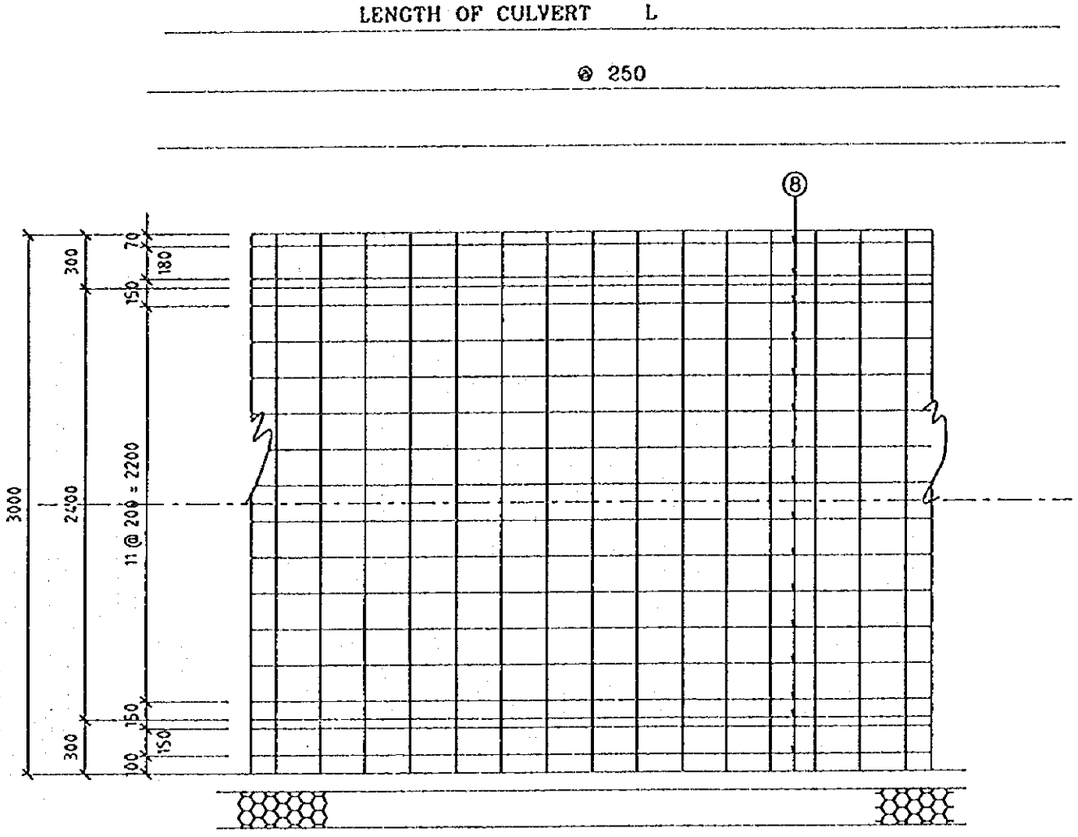


DETAIL OF CROSS SECTION

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



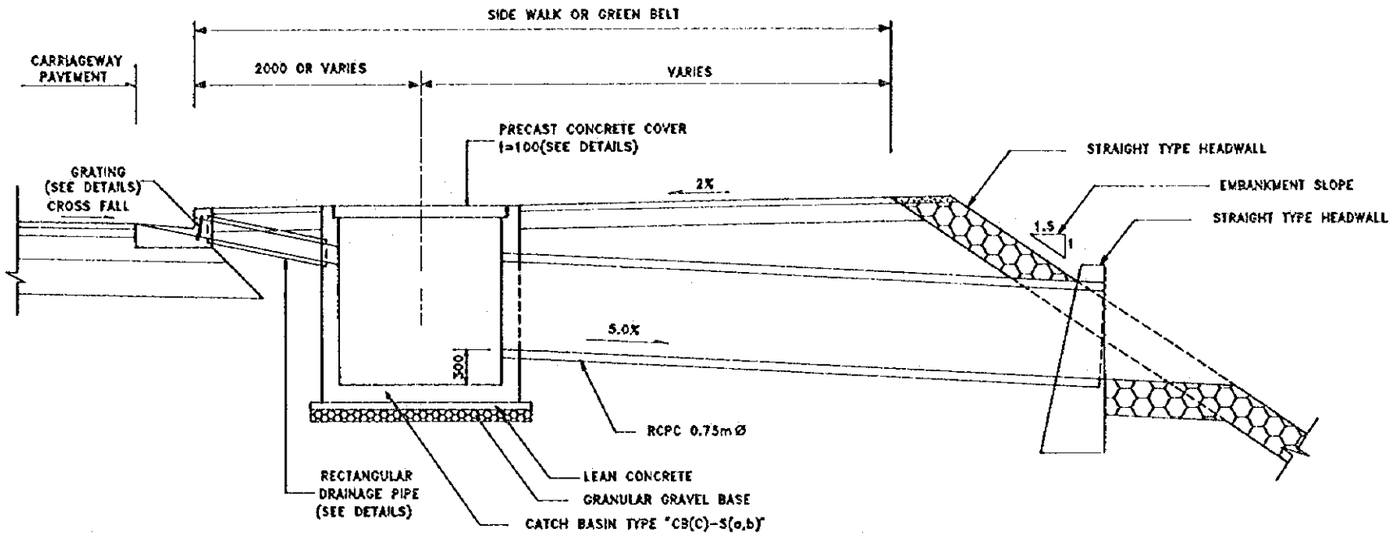
QUANTITY OF OEN METER REINFORCEMENT BAR

	D	$L_{(m)}$	n	w	$\Sigma W_{(kg)}$
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
					$1539^{kg/m}$

CONCRETE (class A)	$9.039^{m^3/m}$
LEAN CONCRETE	$1.04^{m^3/m}$
BROCEN STONE	$2.08^{m^3/m}$

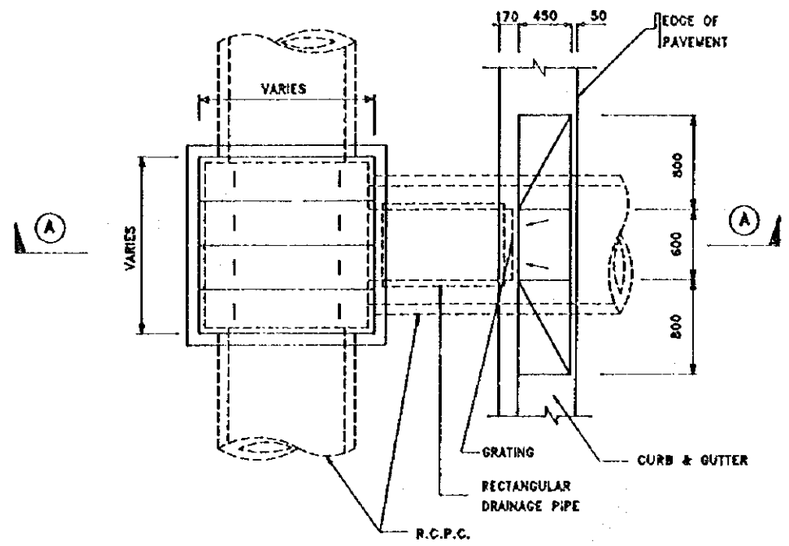
SOCIALIST REPUBLIC OF VIETNAM
THE FEASIBILITY STUDY OF NEW CBD FOR HANOI CITY

TITLE	ORIGINAL SCALE	DWG. No.
ROAD DRAINAGE	1:200	62



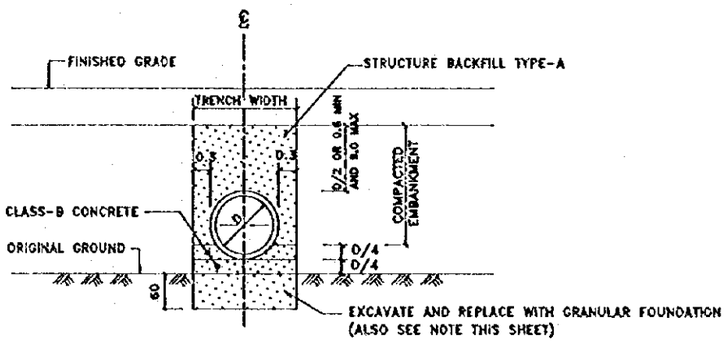
TYPICAL CULVERT ELEVATION ON THE SIDE WALK

NOT TO SCALE

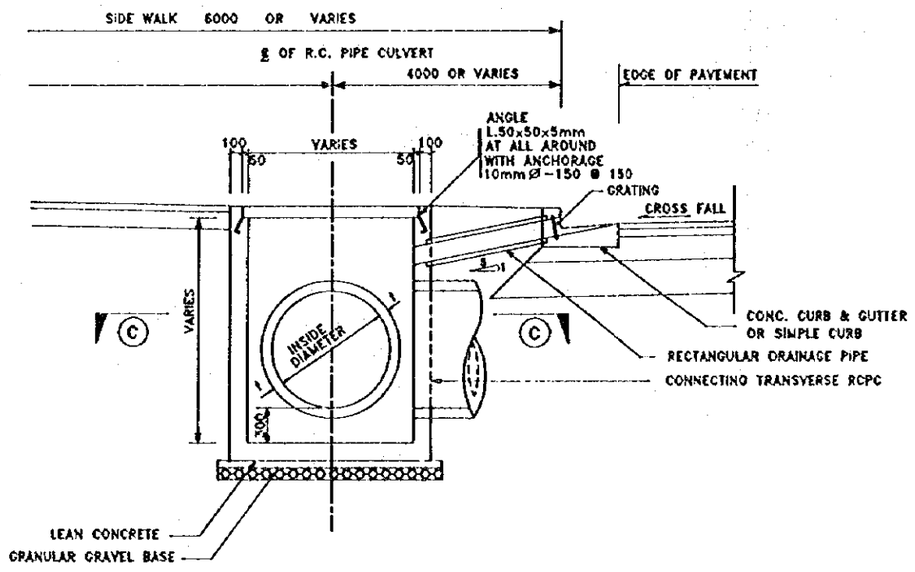


PLAN

NOT TO SCALE



CONCRETE CRADLE BEDDING



SECTION Ⓐ – Ⓐ