

7-10 Maintenance

In maintenance, the removal of any factors that may cause traffic accidents to insure safe traffic service is the most important role. For this purpose, protection of road surface, slope surface, and structures are some of the items. The following lists in details the items included in the maintenance of a highway.

(a) Road surface

This includes the cleaning of road surface, sealing of cracks, partial overlay, or rectification of surface undulation.

(b) Shoulder and separator

This includes cleaning, weed clearing, or replanting of trees, and repairs of fence and railings.

(c) Drainage

This includes the cleaning of drains, water collection pipes, culverts, and waterways, removal of sediments and repair works to drainage system.

(d) Traffic control facilities

The maintenance, repair, or replacement of traffic signs, lane markings, and maintenance of lighting system.

(e) Bridge

The repair and maintenance of expansion joints, supporting points, and railings.

(f) Besides the above mentioned, there are also included improvement works, or the repairs or maintenance of machineries.

For the cost of the maintenance work, an estimated 0.5% of the construction cost is earmarked.

7-11 Considerations on Stage Construction

The project under study is a construction project of a large scale, and the simultaneous construction of the whole route will not be technically practical, nor will it be economically desirable. A stage construction program has to be drawn up for its efficient implementation.

In general, the following methods may be considered of stage construction.

- i) Stage construction of the route: The whole route is divided into several sections, and construction begins with the most urgent section/s. The remaining sections will be constructed at the future stage in accordance to the traffic demand.
- ii) Stage construction of the cross section: For the section that is to be implemented, only a part of the cross section is constructed to meet immediate demand, and expansion carried out in the future stage. Where a six lane road is envisaged for the final stage, construction work may start with only two or four lanes and expansion carried out at later stage. Where service roads are designed along the main route, the service roads may be completed first and the main route constructed later. This is applicable when the traffic volume estimated for the initial years is low when compared to the final estimated traffic volume.
- iii) Stage construction in structures: Where flyovers or interchanges are designed for the final stage, construction may start with construction of the route at grade and the structures postponed to a future date. The construction of structures is costly, and the stage construction in structure is usually useful in implementation of a highway under limited annual budgets.

- iv) A combination of the above methods: The adoption of any one of the above mentioned methods may not be the best, and in practice, a combination of the above methods is adopted.

In deciding on the stage construction program, the following factors are taken into consideration.

- i) The traffic demand
- ii) The development effect
- iii) The availability of the annual construction cost.
- iv) The availability of man-power and materials.
- v) Popular demand

With the above considerations, the following targets are set before a definite program is proposed.

- i) That the completion of the Ring is of urgency, even if the initial stage of the ring is only partially completed in cross section or in structure.
- ii) That the annual cost required should be reasonable as compared to present annual budget for highway construction.
- iii) That the sections where parallel existing roads are available may be deferred to a later stage.

The proposed stage construction program thus drawn up are as follows:

- i) It is recommended that the Section 6 be constructed first. This section will not only play the role as part of the Ring Road, but also will provide stimulus to the development of the region, and development effect can be greatly expected.

- ii) Simultaneous implementation of Section 5 should be carried out. The traffic demand of this section calls for the early implementation, which will provide relieve to the traffic situation on Sukhumvit Road.
- iii) The sections to be implemented next are the Section 7 (a) (1) and (a) (2) which is the extension of Section (6) to the Krung Phibun Songkhram Road. The completion of this section will offered convenient connection of the Pahol Yothin Road and the Mittraphap Road to the Prachachun Road, the Pracharat Road and the Phibun Songkhram Road thus providing easy access to Charan Sanitwong Road for traffic from the north.
- iv) The section 7 (a) (4), from Phetkasem Road to Tachang extension, will be next on the program. This will provide relief to the southern section of the Charan Sanitwong Road, which is expected to increase greatly in traffic volume after the completion of the Tachang Bridge.
- v) The Section 7 (a) (3) will be the last section to be implemented. The existence of the Charan Sanitwong will serve the traffic in this section in lieu of the Ring Road.

The ring will thus be completed by 1980.

On the cross-section, generally, the high-speed main roadway will be constructed first, with the service road and the major structures deferred pending the building up of the strip along the Ring Road. However, for Section 7 (a) (1), considering the interchange with the Mittraphap Road and the shortness in distance between intersections, as well as the building up situation of Chon Niwet district, service

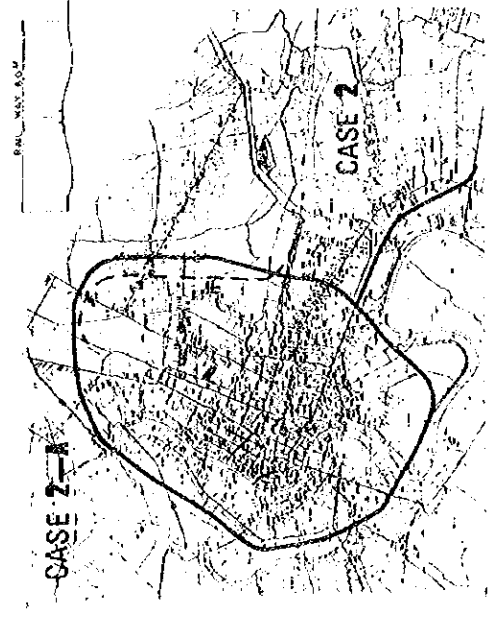
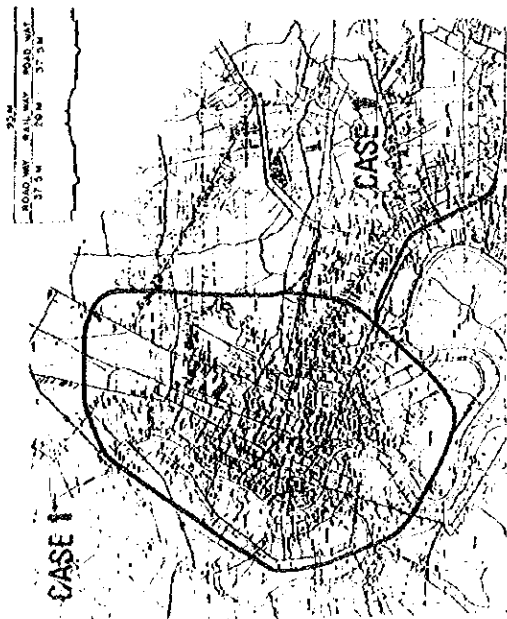
road will be constructed first, deferring the main roadway to a later stage.

The total volume of earthwork for the construction of the Ring Road Part II comes to about 1.5 million m³, or an annual volume of 200 thousand m³. The total volume for Section 5 is also about 1.5 million m³, which, for a construction period of 4 years, comes to 350 - 400 thousand m³ per year. If the construction work were carried out simultaneously for Ring Road Part II and Section 5, a total annual volume of 550 - 600 thousand m³ will be required for the peak years.

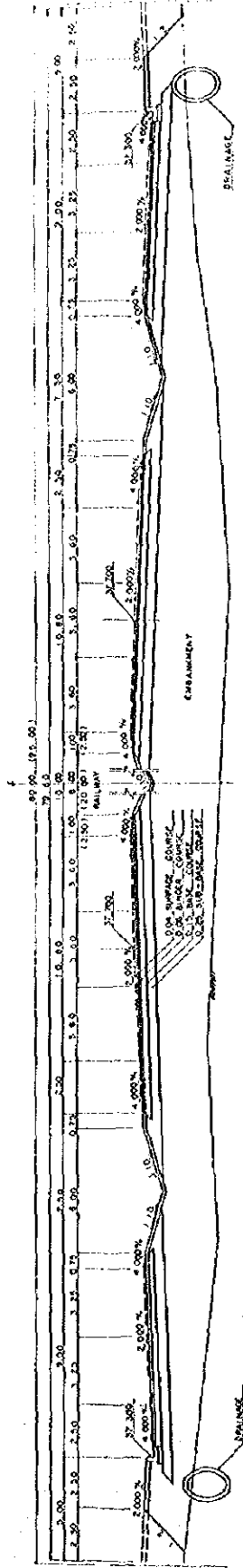
For the source of earthwork material, a supply of about 25,000 m³ per day can be expected from such districts within 100 km from Bangkok as Bang Pain, Ayuthaya, Samut Songkhram, Samut Sakhon, or Thonburi. Through the transportation both by trucks and by barges via Chao Phraya River, the demand volume can be secured.

The annual investment amount comes to 300 - 350 million bahts for Ring Road Part II and 100 - 200 million bahts for Section 5. The first stage will be open to traffic two years after commencement of construction, after which one section each will be newly open to traffic every year, and the whole project will be completed by the end of the eighth year. Assuming a period of 2 years for survey, design, acquisition and demolition, the ring will be completed in 6 years, and the whole project will be completed in 10 years.

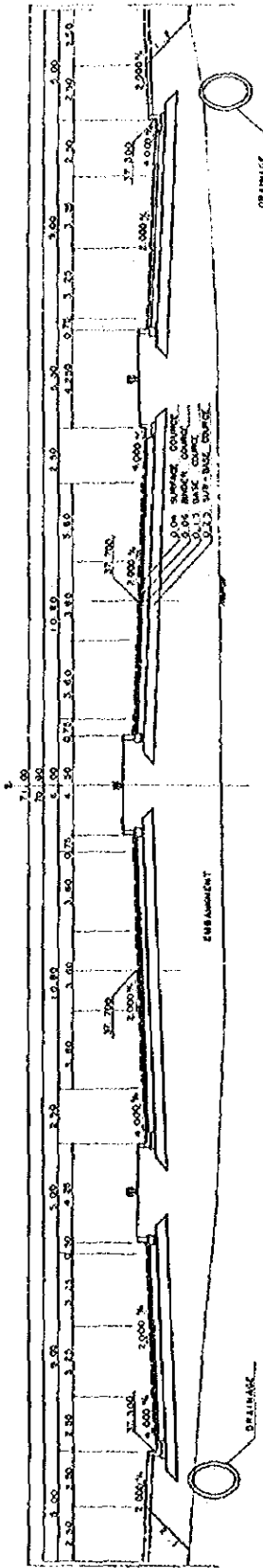
KEY PLAN



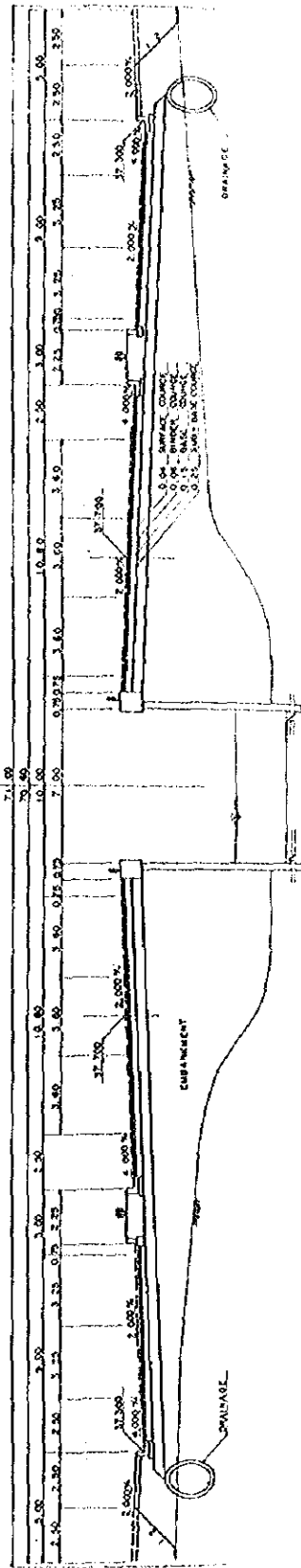
RING ROAD TYPICAL CROSS SECTION
(:) RAILWAY CASE 1.



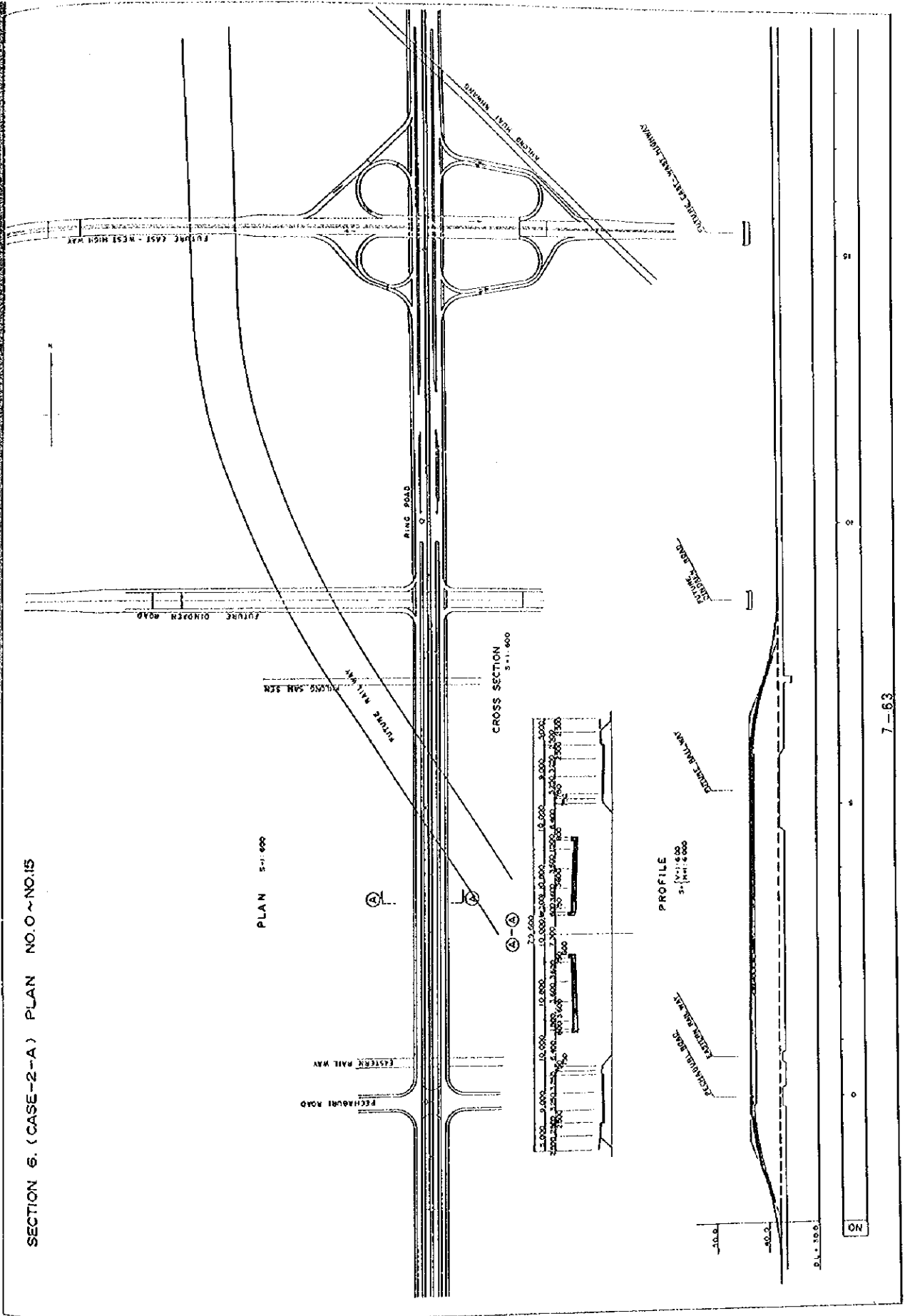
SECTION 5 TYPICAL CROSS SECTION



SECTION 5 TYPICAL CROSS SECTION (KHLONG TOEI)

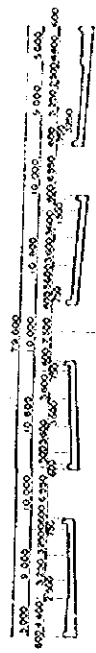


SECTION 6. (CASE-2-A) PLAN NO. 0 ~ NO. 15

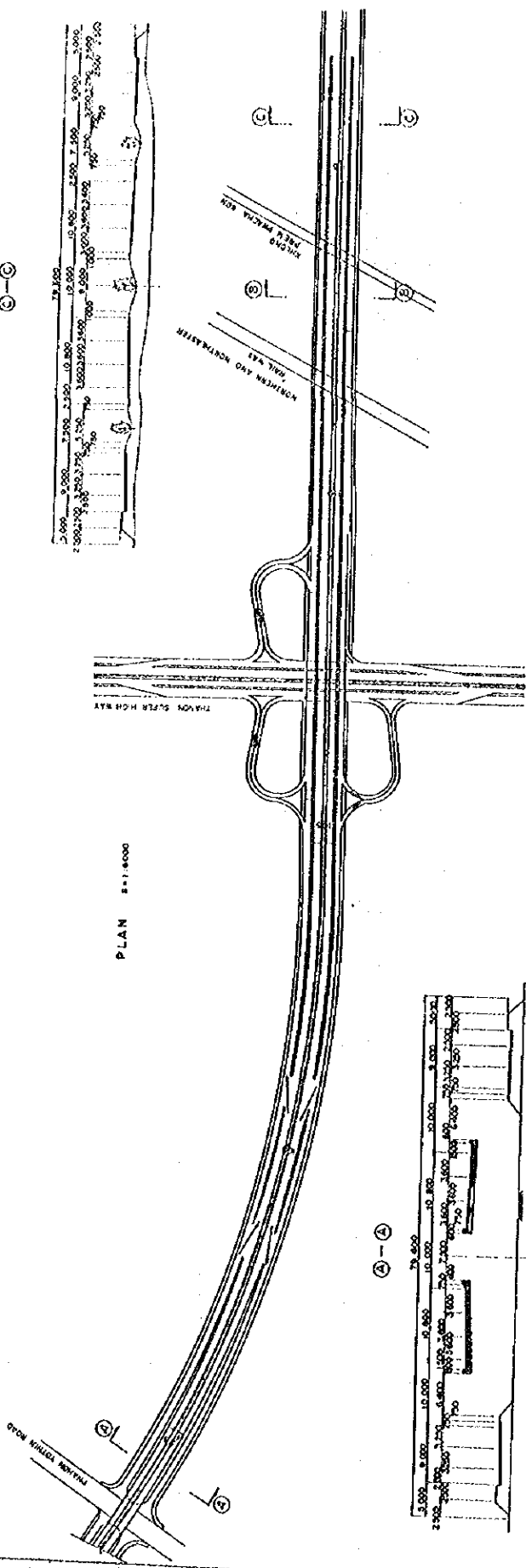


SECTION 6.7a. (CASE -2-A) PLAN NO. 95 ~ NO. 115

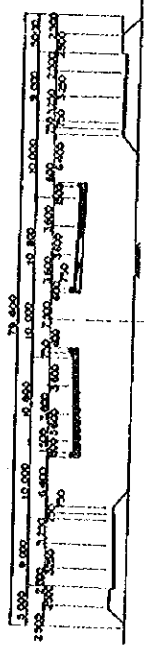
CROSS SECTION
1" = 1' 600



PLAN 1" = 1' 600



PROFILE
1" = 1' 600
3" = 1' 600



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SECTION 7a. (CASE-2-A) PLAN NO. 215 ~ NO. 235

STAGE TWO

STAGE ONE

CHERAN SANT WONG ROAD

FUTURE TRACHANG ROAD

PLAN S=1:6000

KHLOWS BANFOK NH

BANFOK NH TAKING CHAN

SOUTHERN RAIL WAY

CROSS SECTION S=1:6000

A-A

B-B



PROFILE S=1:1,000

EXISTING ROAD

THIRD BANFOK NH

BANFOK NH TAKING CHAN

SOUTHERN RAIL WAY

100

100

100

S.L. No. 2

100

20

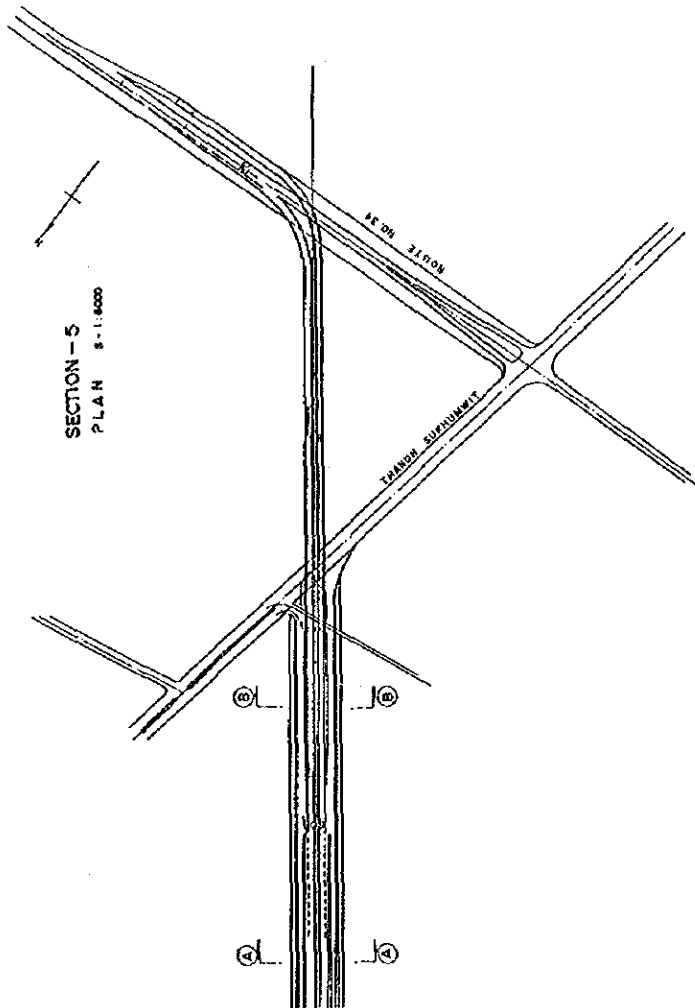
5

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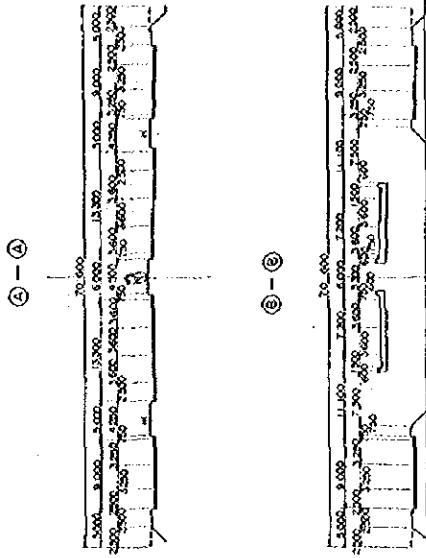
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SECTION 5. (CASE 2.) PLAN NO.60~NO.70

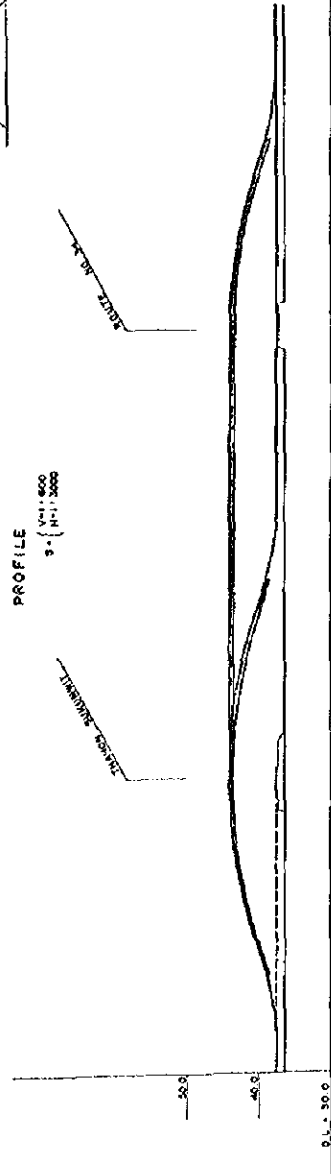
SECTION - 5
PLAN 5-11-6000



CROSS SECTION
5-11-600



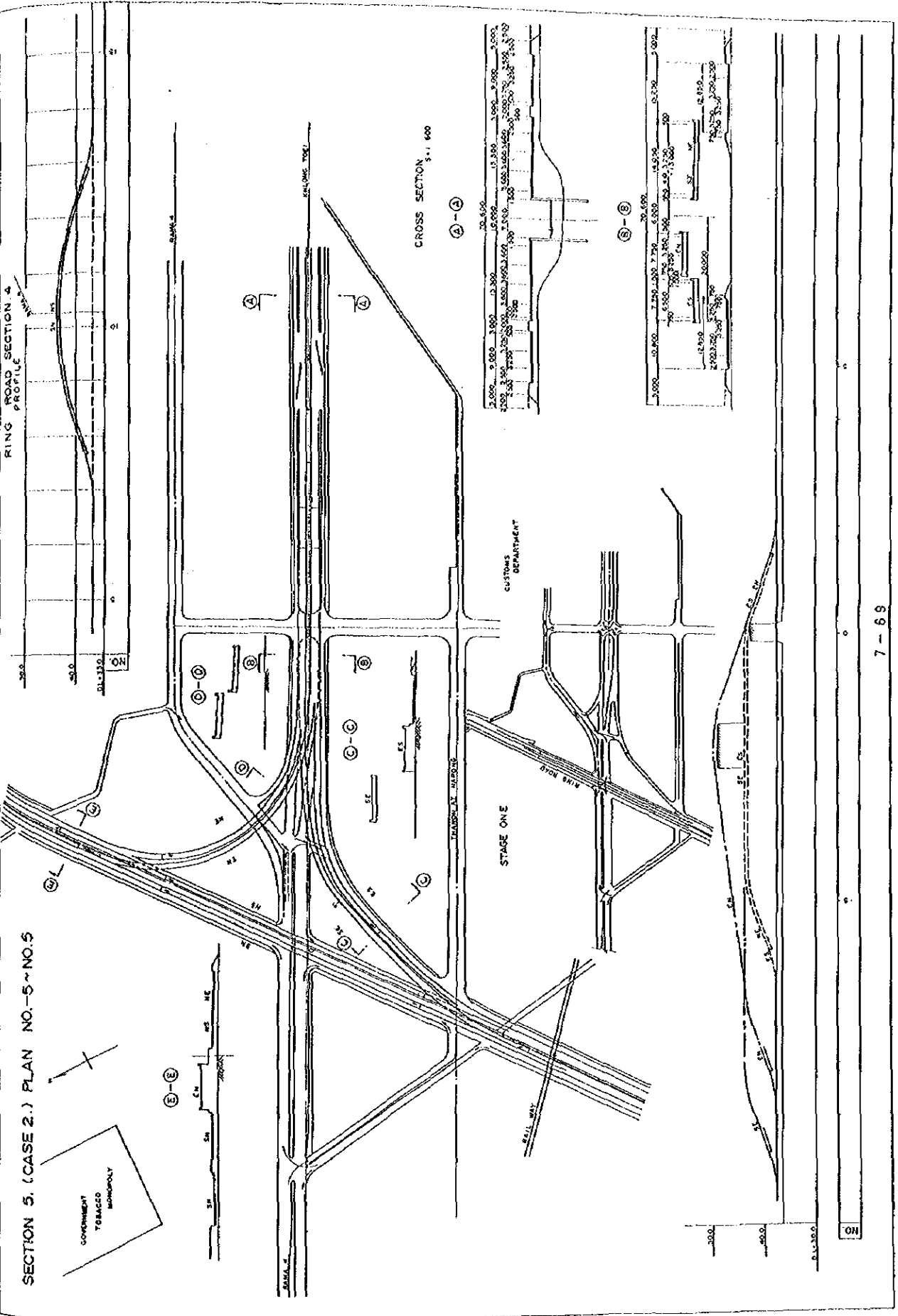
PROFILE
5-11-600
5-11-3000



ON

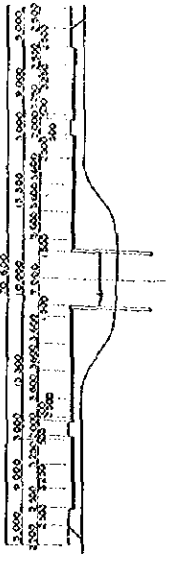
SECTION 5. (CASE 2.) PLAN NO. 5 - NO. 5

GOVERNMENT
TOBACCO
MONOPOLY

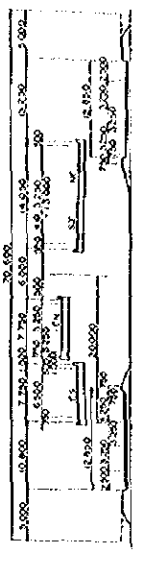


CROSS SECTION \$+1,600

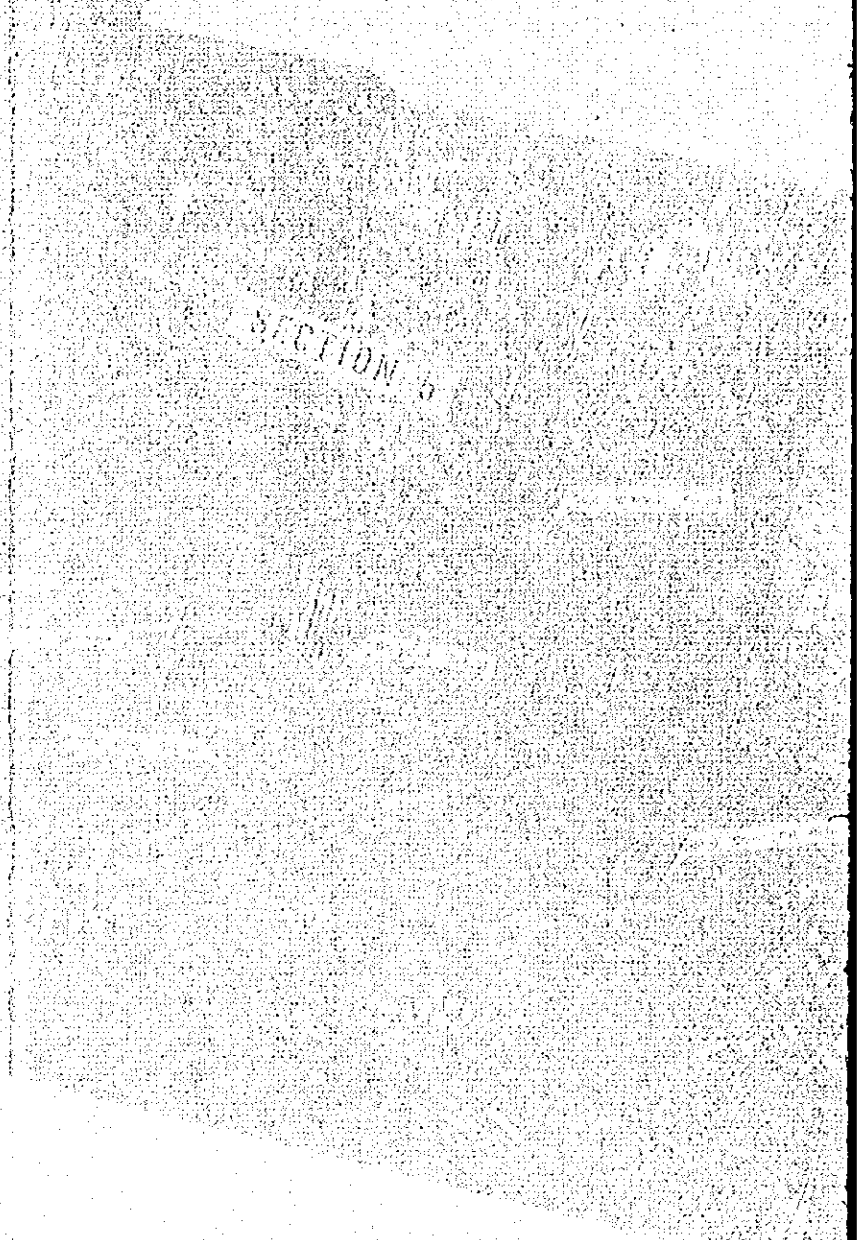
A-A



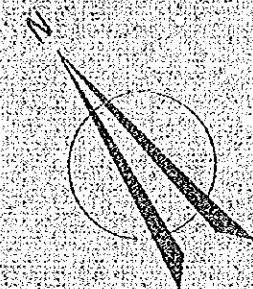
B-B



ON



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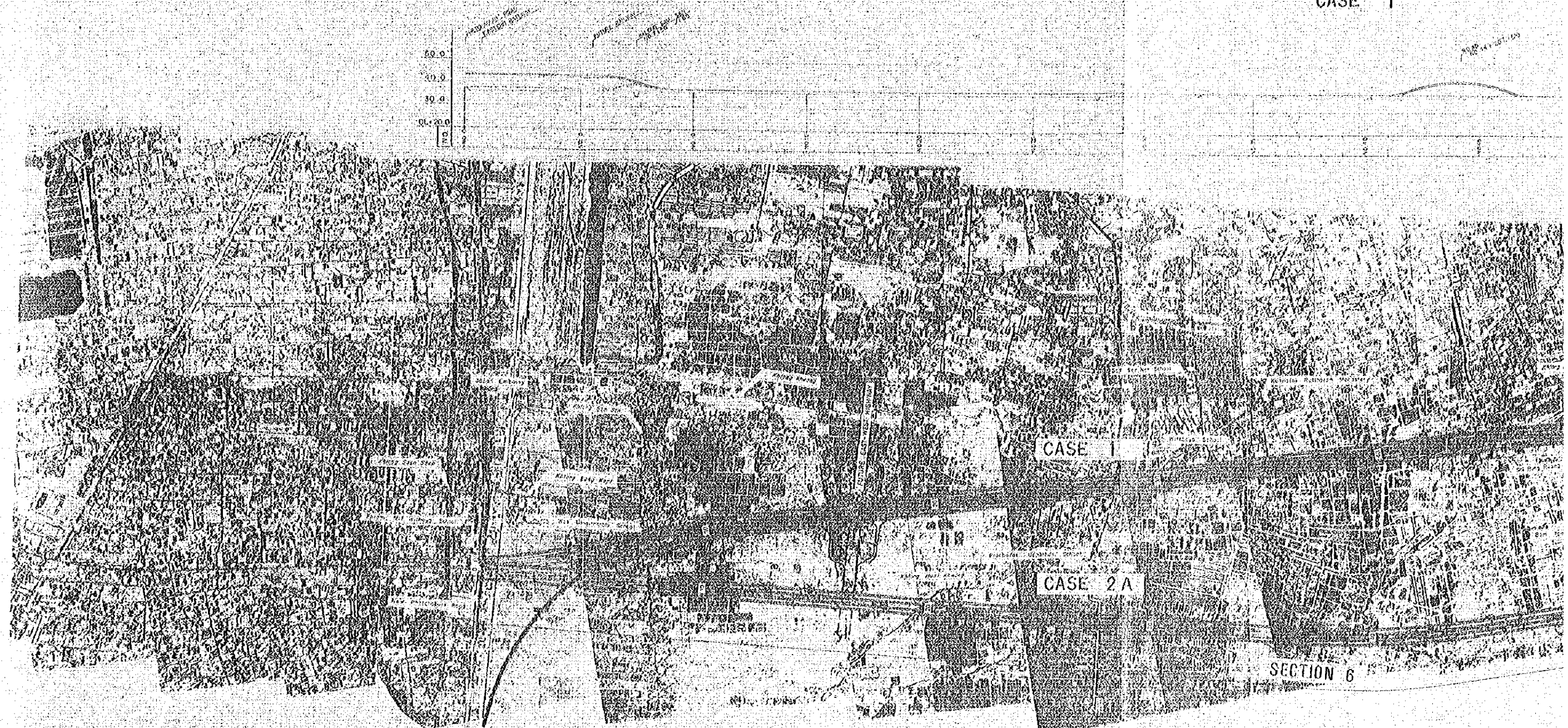
SECTION 5

LEGEND

- MAIN CARRIAGEWAY ROAD
- BRIDGE OR VIADUCT
- FRONTAGE ROAD

BANGKOK THONBURI
RING ROAD PART II
PLAN AND PROFILE
CASE 2
(No. 0 - No. 72)
SCALE 1/15000 1/8

CASE 1

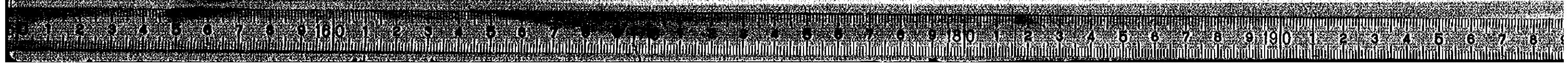
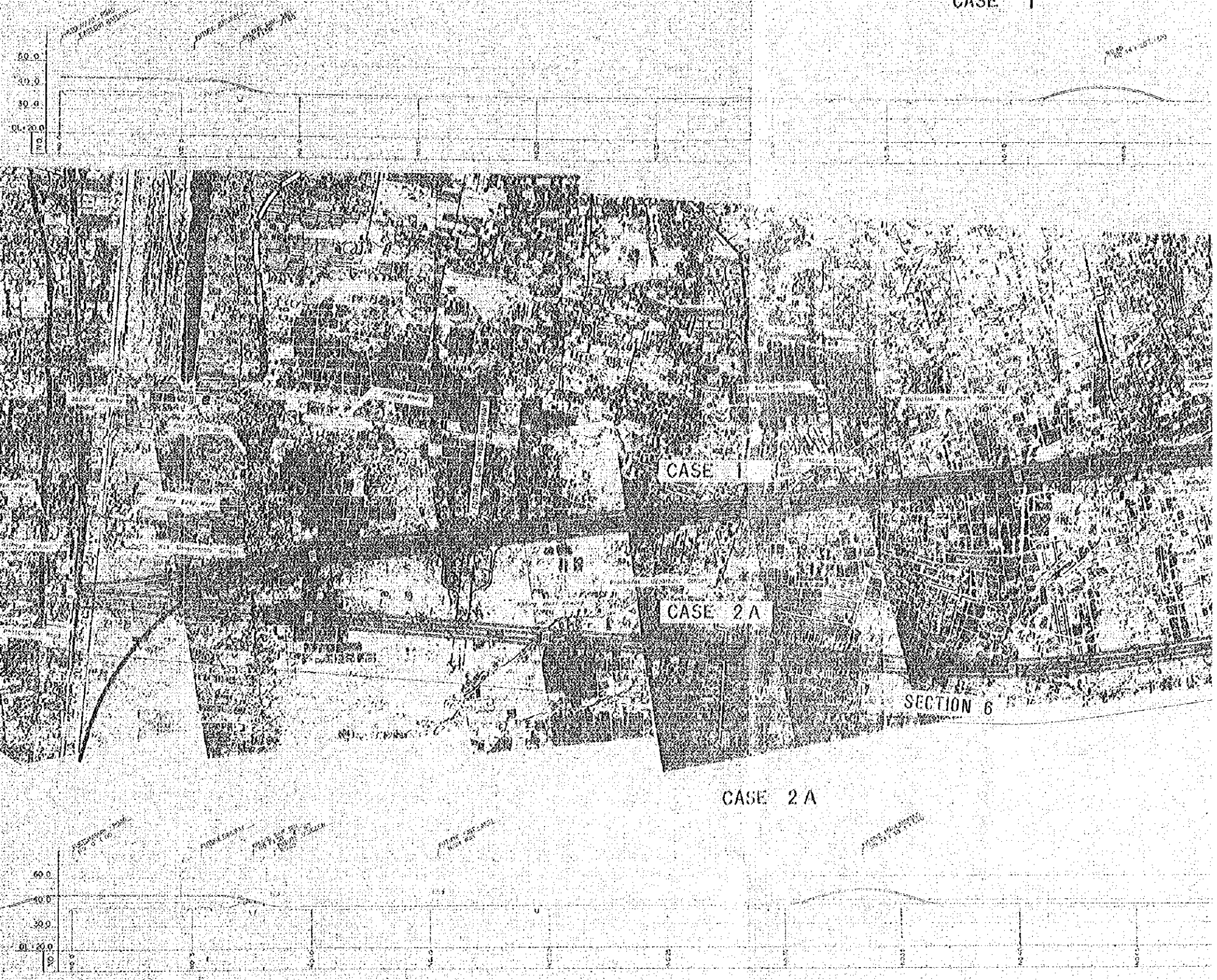


CASE 1

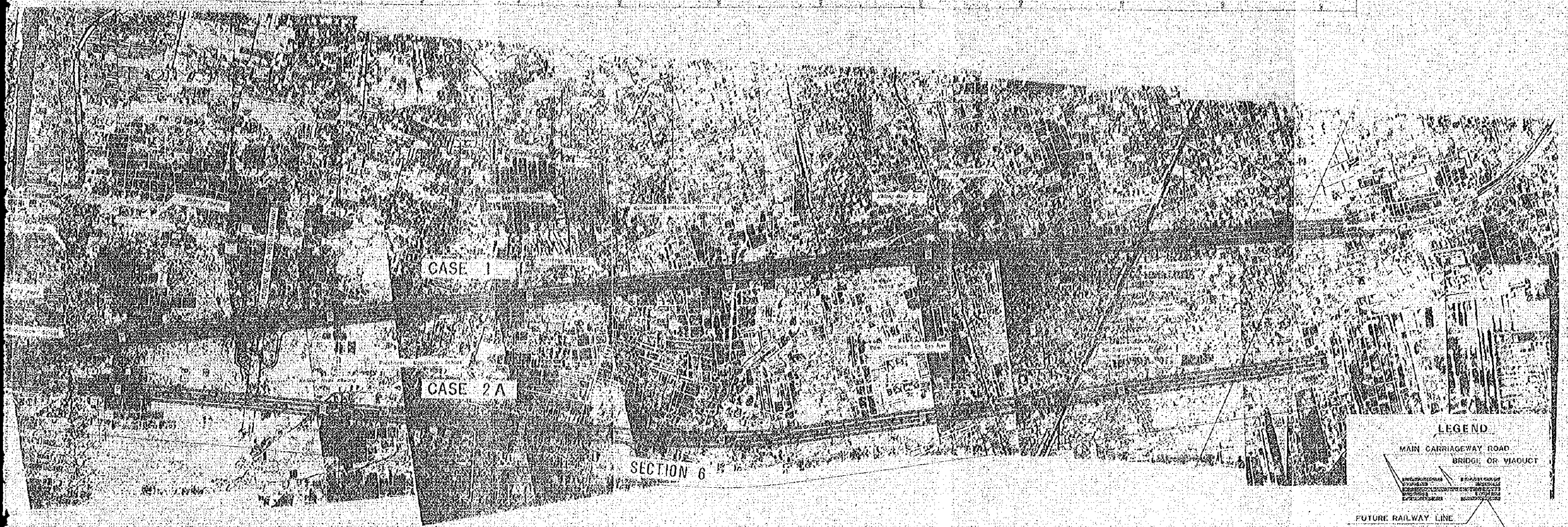
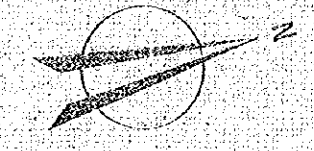
CASE 2 A

SECTION 6

CASE 2 A



CASE 1



LEGEND

MAIN CARRIAGEWAY ROAD

BRIDGE OR VIADUCT

FUTURE RAILWAY LINE

FRONTAGE ROAD

BANGKOK-THONBURI

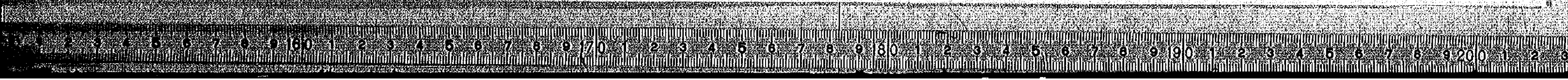
RING ROAD PART II

PLAN AND PROFILE

CASE I, 2 A

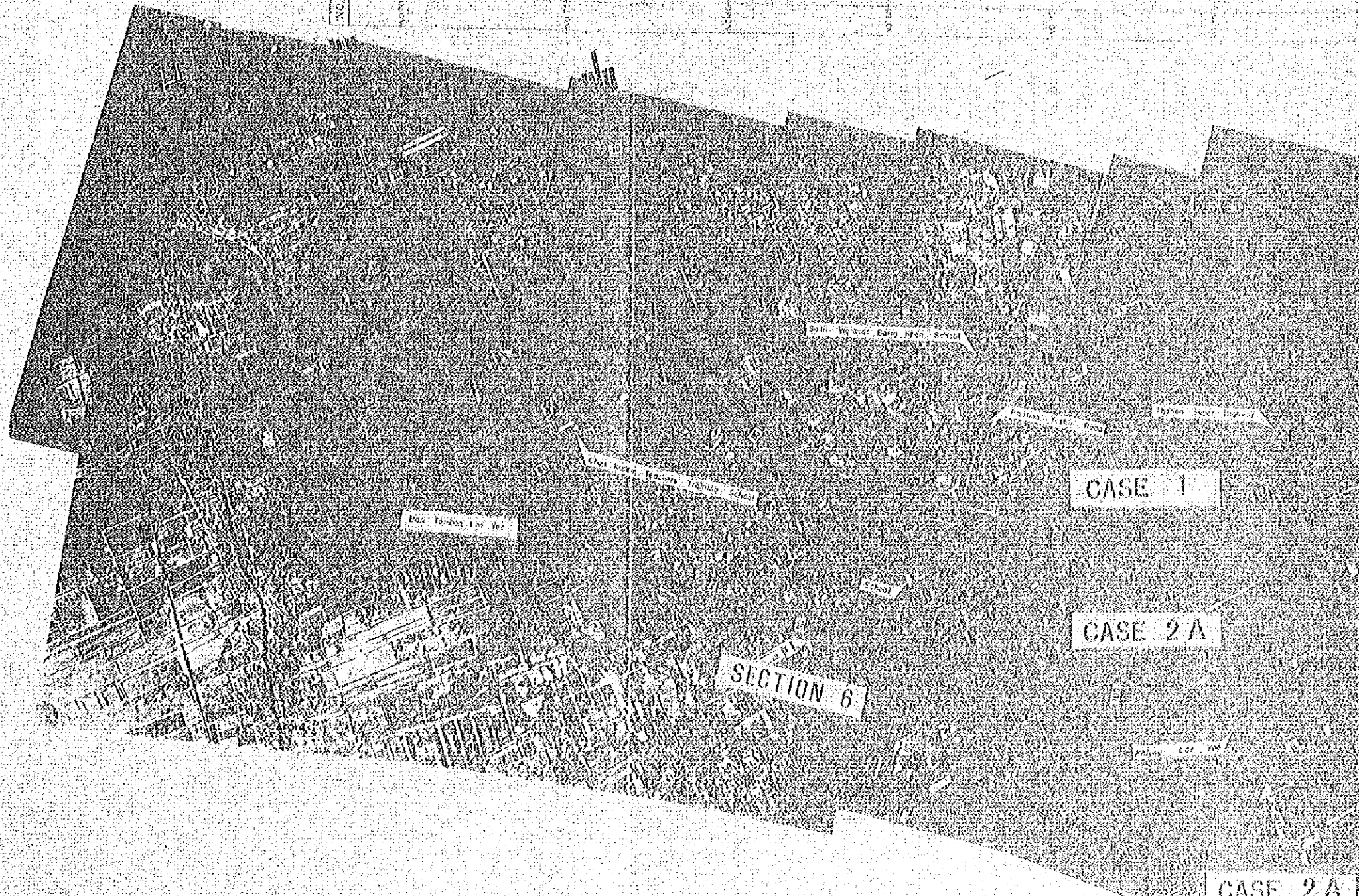
(No. 0 No. 70)

SCALE 1:1500 2.8



CASE 1

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DL - 20.0



SECTION 7 d1

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DL - 20.0

CASE 1

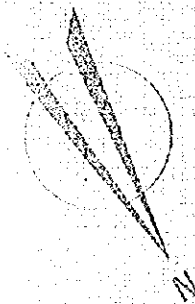
CASE 1

CASE 2 A

CASE 2 A

SECTION 7a2

SECTION 7a1



LEGEND

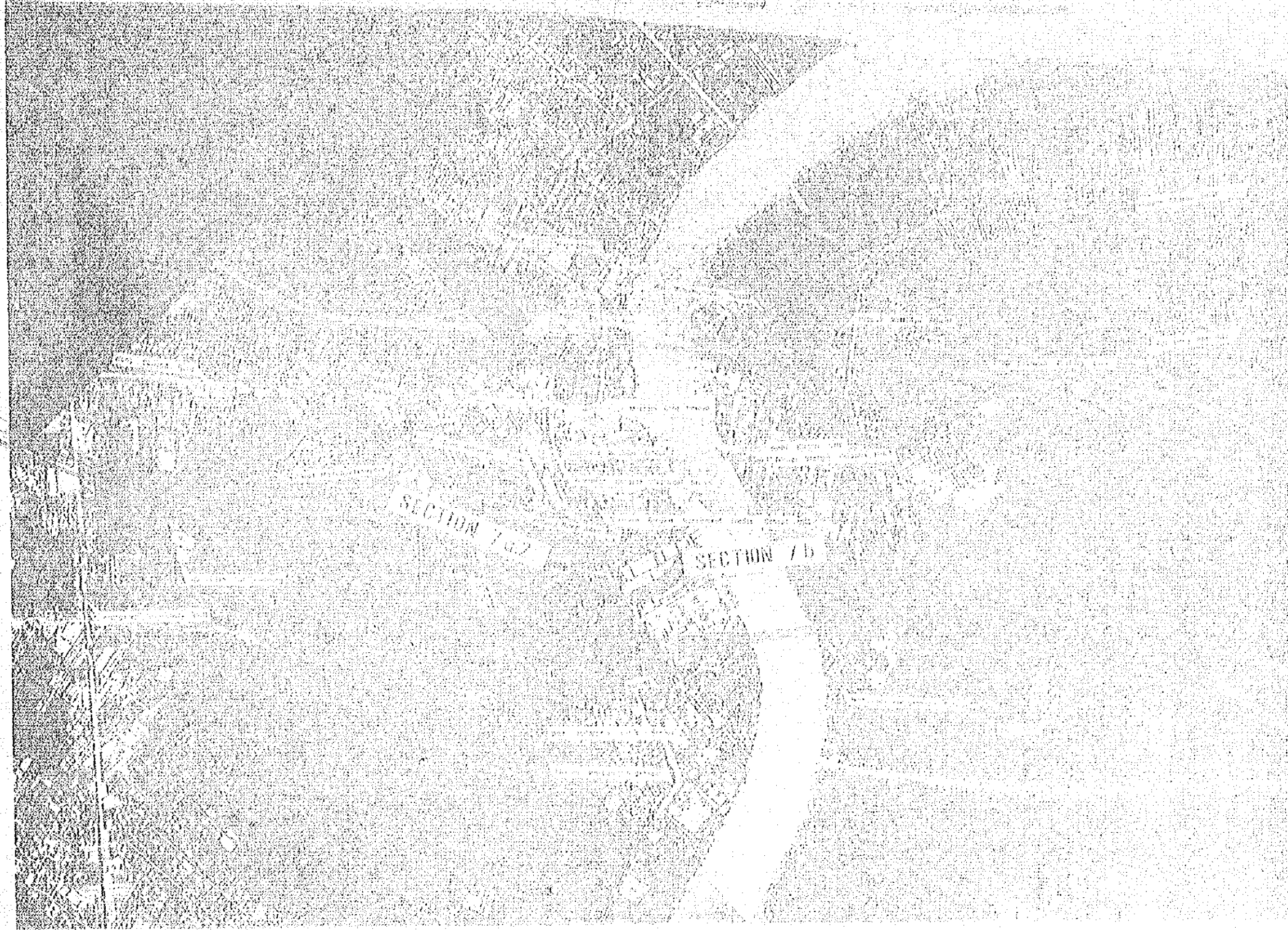
MAIN CARRIAGEWAY ROAD

BRIDGE OR VIADUCT

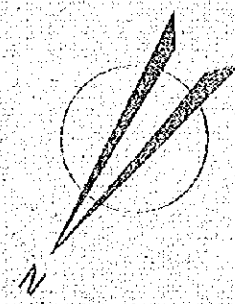
FUTURE RAILWAY LINE

FRONTAGE ROAD

BANGKOK-THONBURI
 RING ROAD PART II
 PLAN AND PROFILE
 CASE 1, 2 A
 (No. 70 - No. 148)
 SCALE 1/1000 3/8



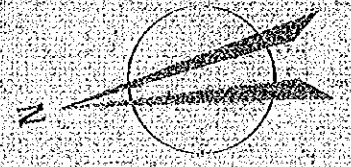
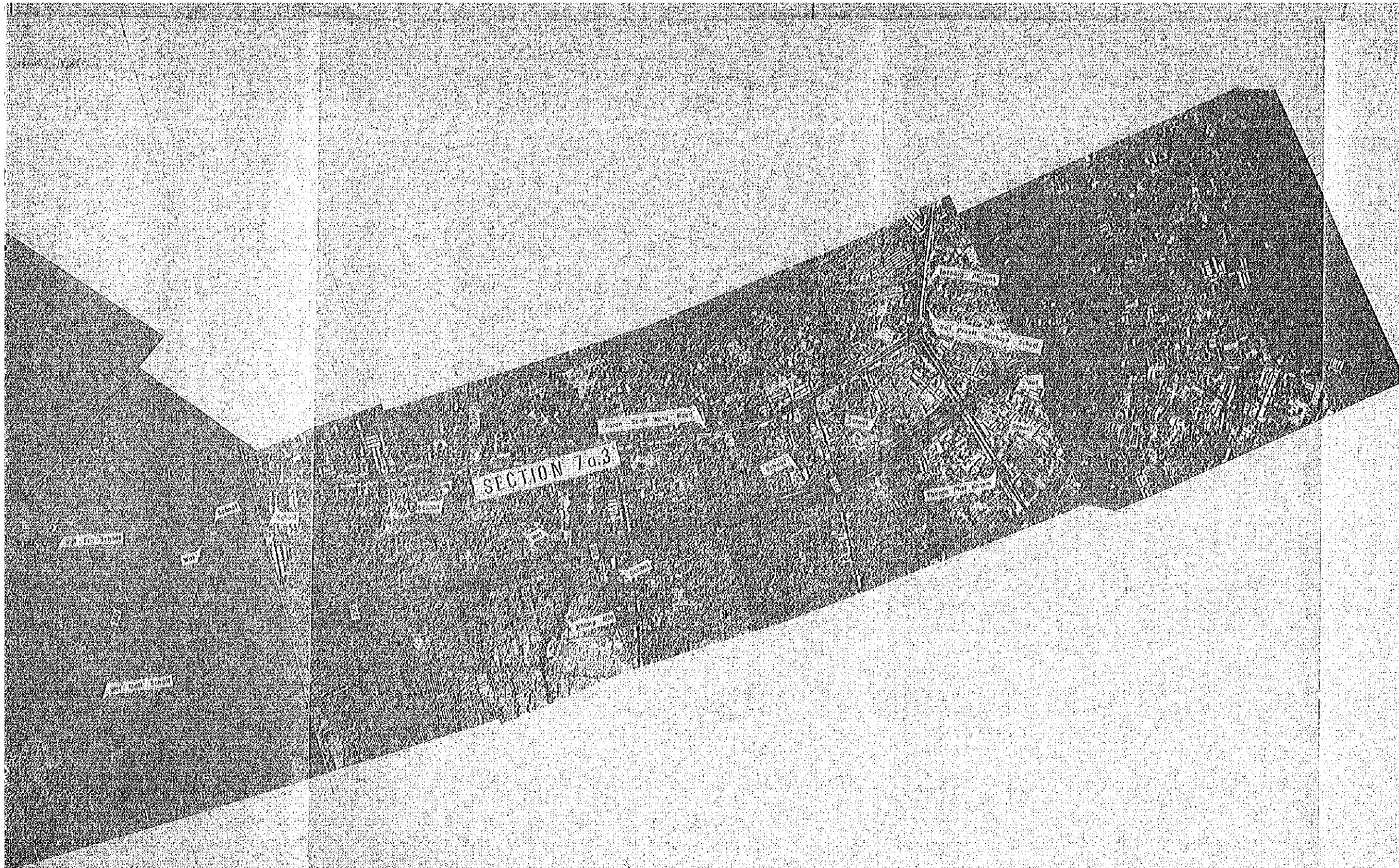
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LEGEND

	MAIN CARRIAGEWAY ROAD
	BRIDGE OR VIADUCT
	FRONTAGE ROAD

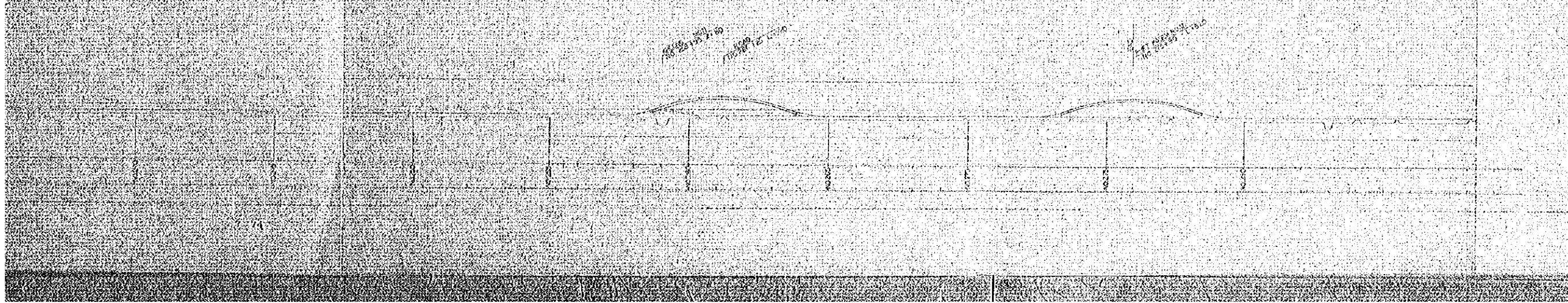
BANGKOK THONBURI
RING ROAD PART II
PLAN AND PROFILE
CASE 2 A
(No. 145 - No. 220)
SCALE 1 : 15000 4 / 8

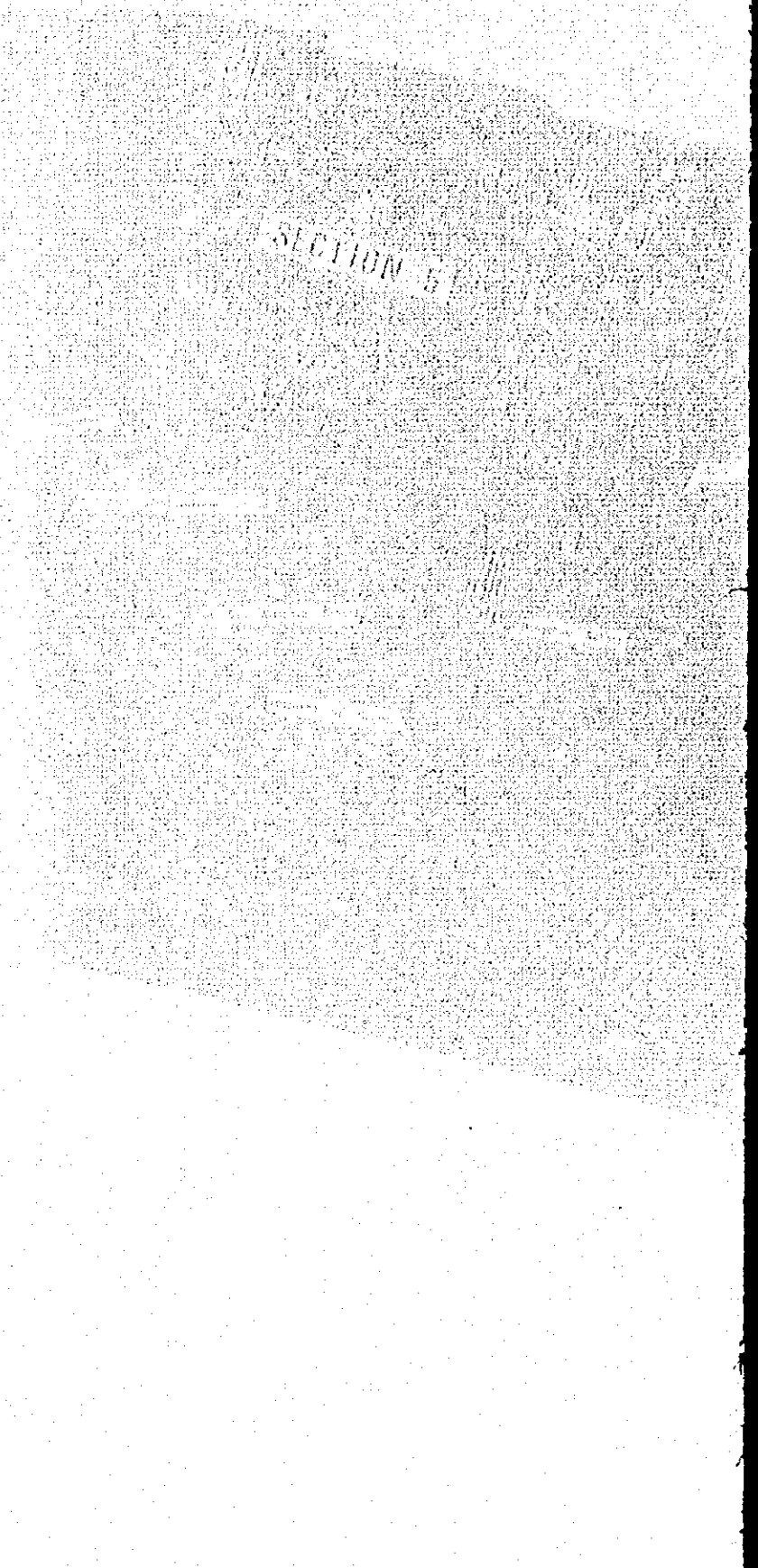
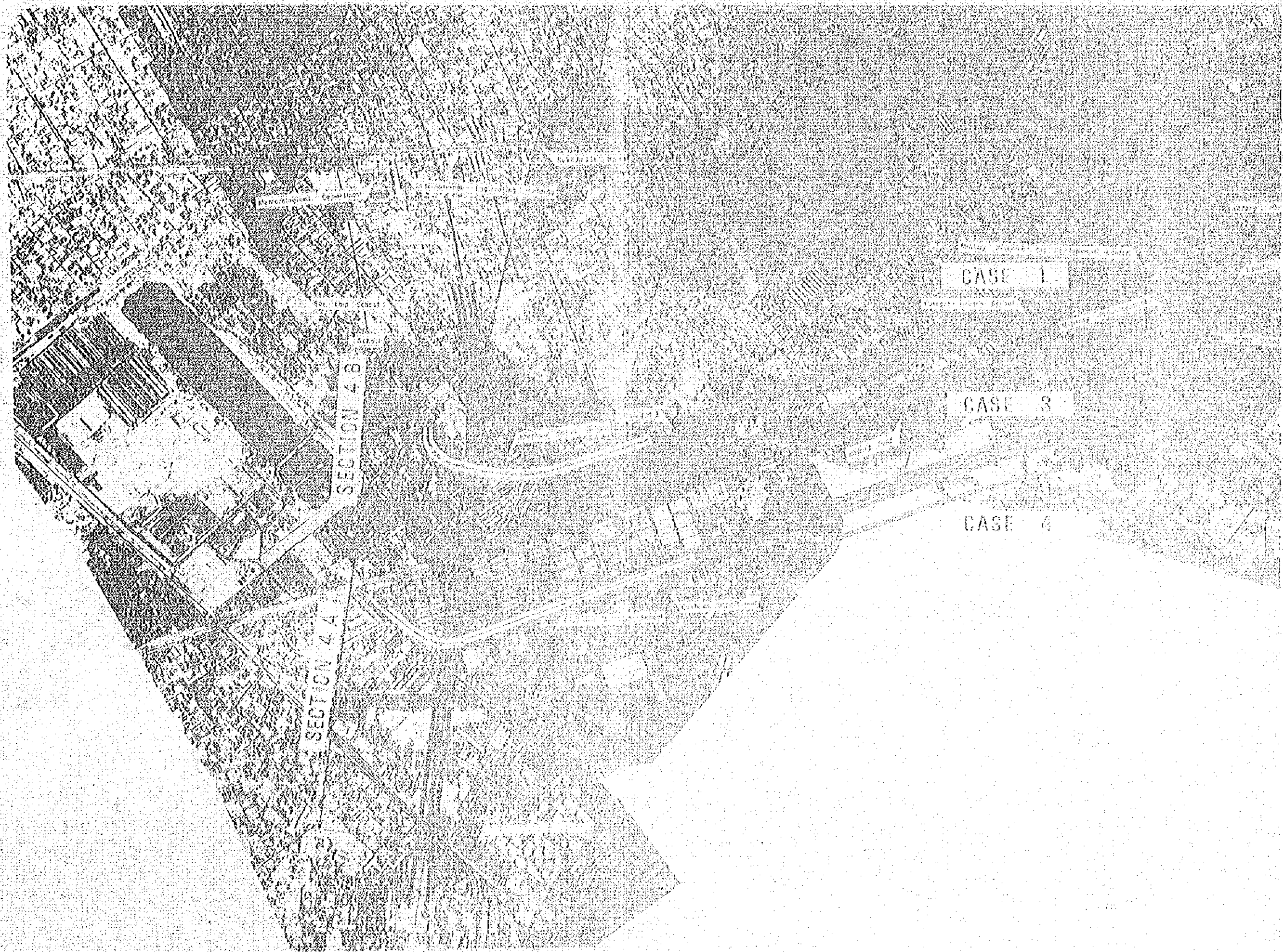


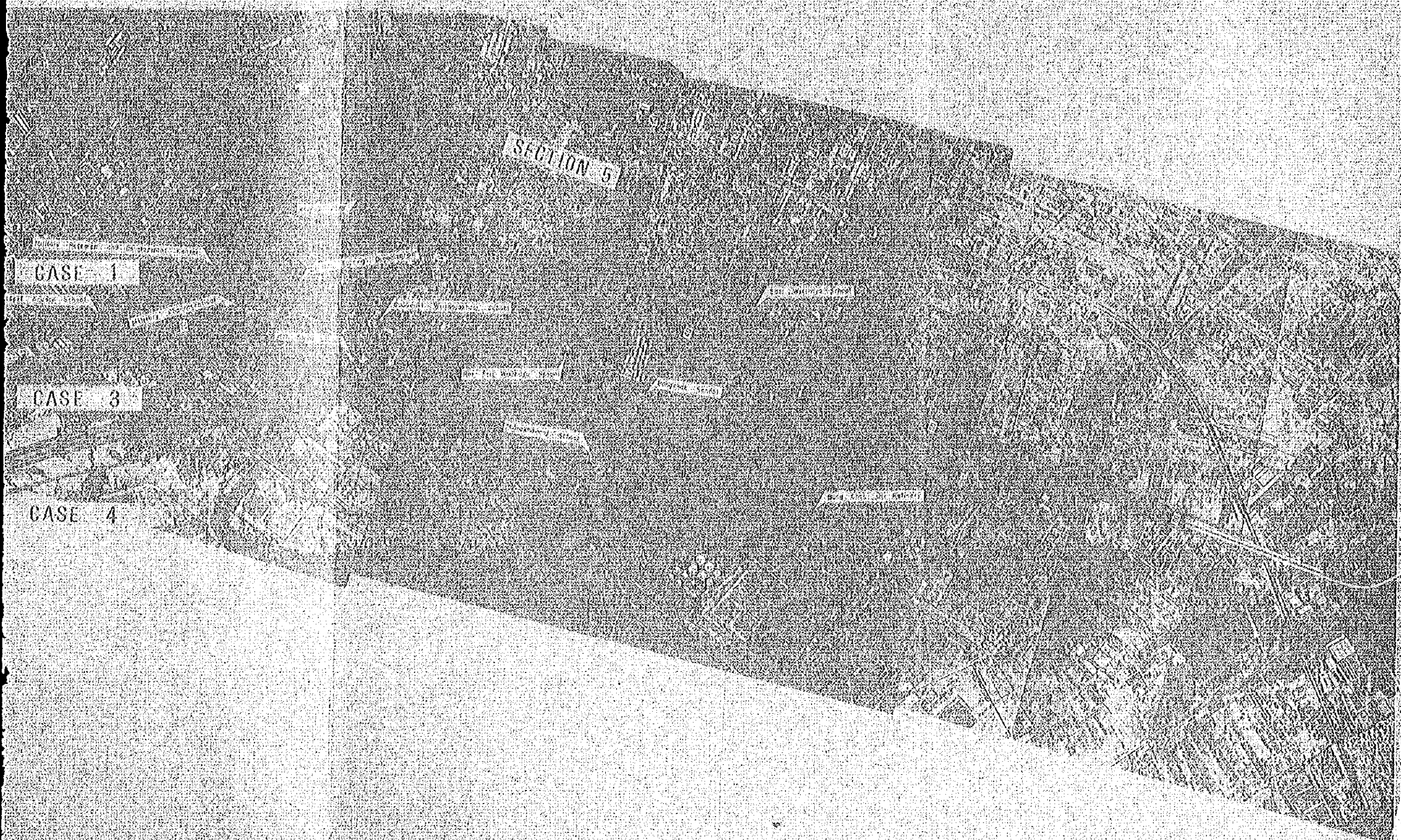
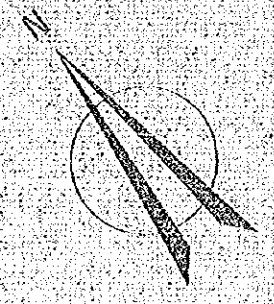
LEGEND

	MAIN CARRIAGEWAY ROAD
	BRIDGE OR VIADUCT
	FRONTAGE ROAD

BANGKOK-THONBURI
 RING ROAD PART-II
 PLAN AND PROFILE
 CASE 2 A
 (No. 220 - No. 275+00)
 SCALE 1/15000 5/8







LEGEND

—	MAIN CARRIAGEWAY ROAD
—	BRIDGE OR VIADUCT
—	FRONTAGE ROAD
—	FUTURE RAILWAY LINE

BANGKOK THONBURI
RING ROAD PART II
PLAN AND PROFILE
CASE 1, 3, 4
(No. 0 - No. 72)
SCALE 1 : 15000 6 8