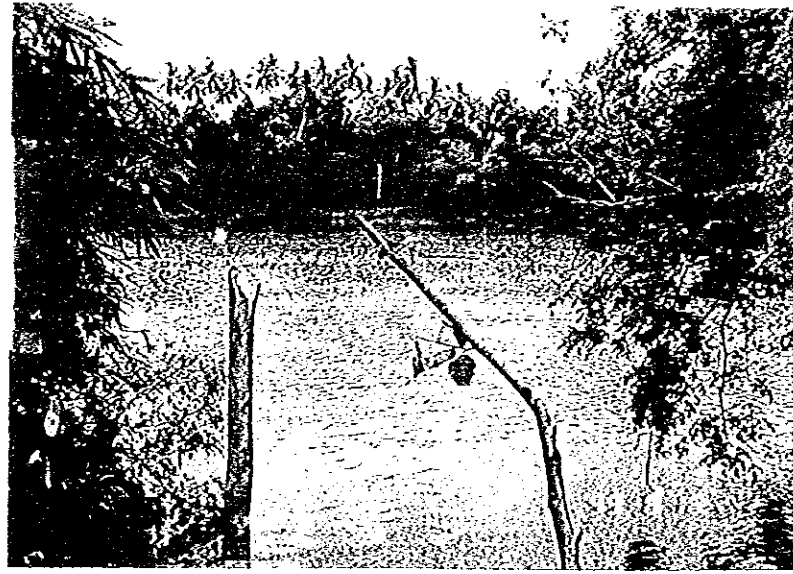
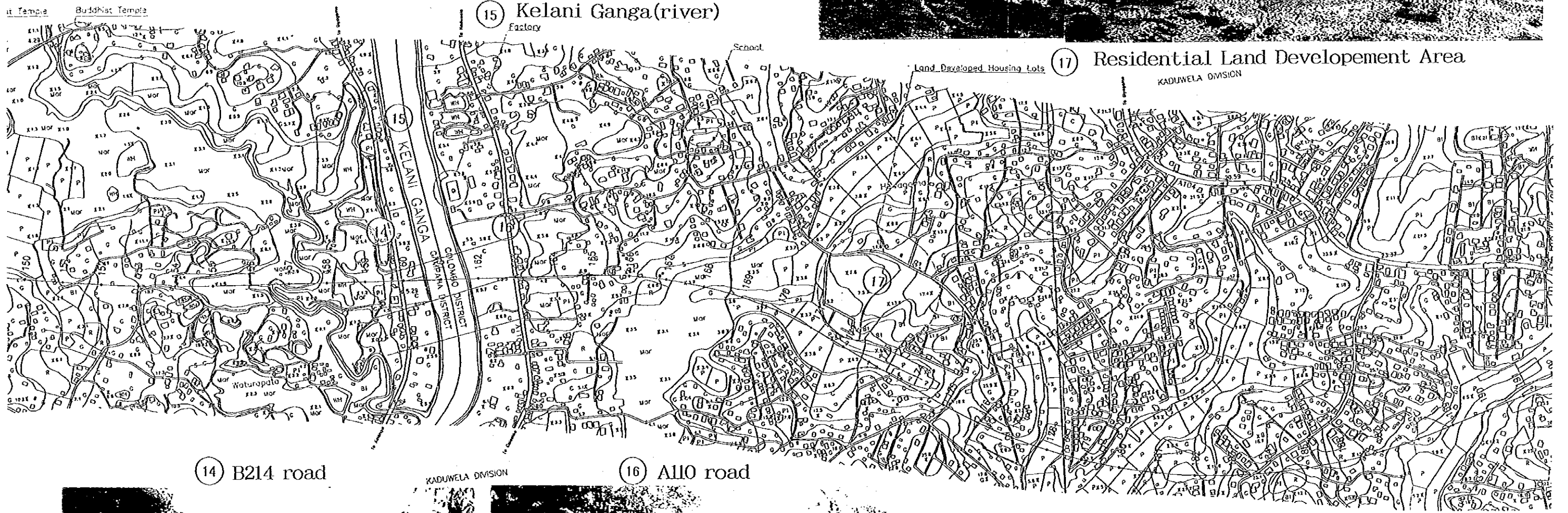


Fig. 9-15



15 Kelani Ganga (river)

17 Residential Land Development Area

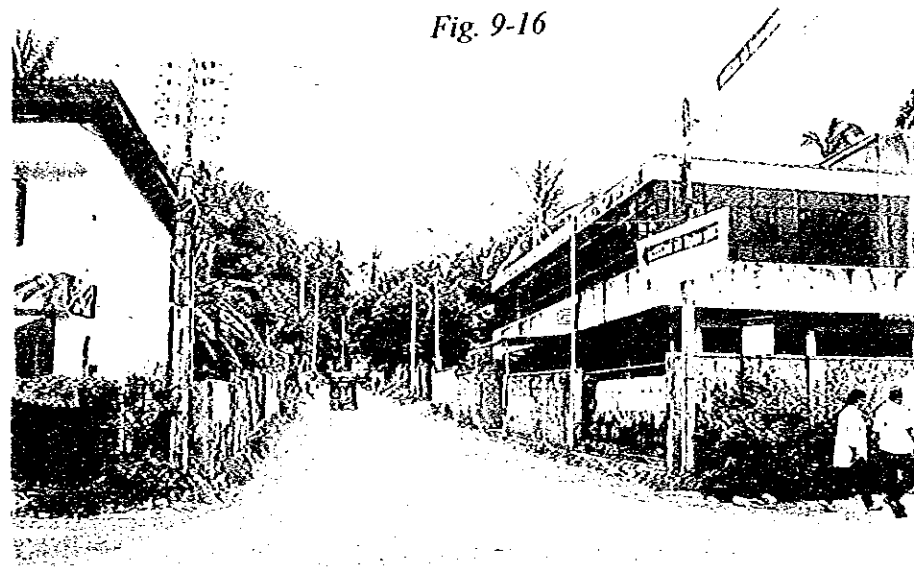


14 B214 road

16 A110 road



Fig. 9-16



18 Main Road (local)

18 Main Road (local) KADUWELA DIVISION

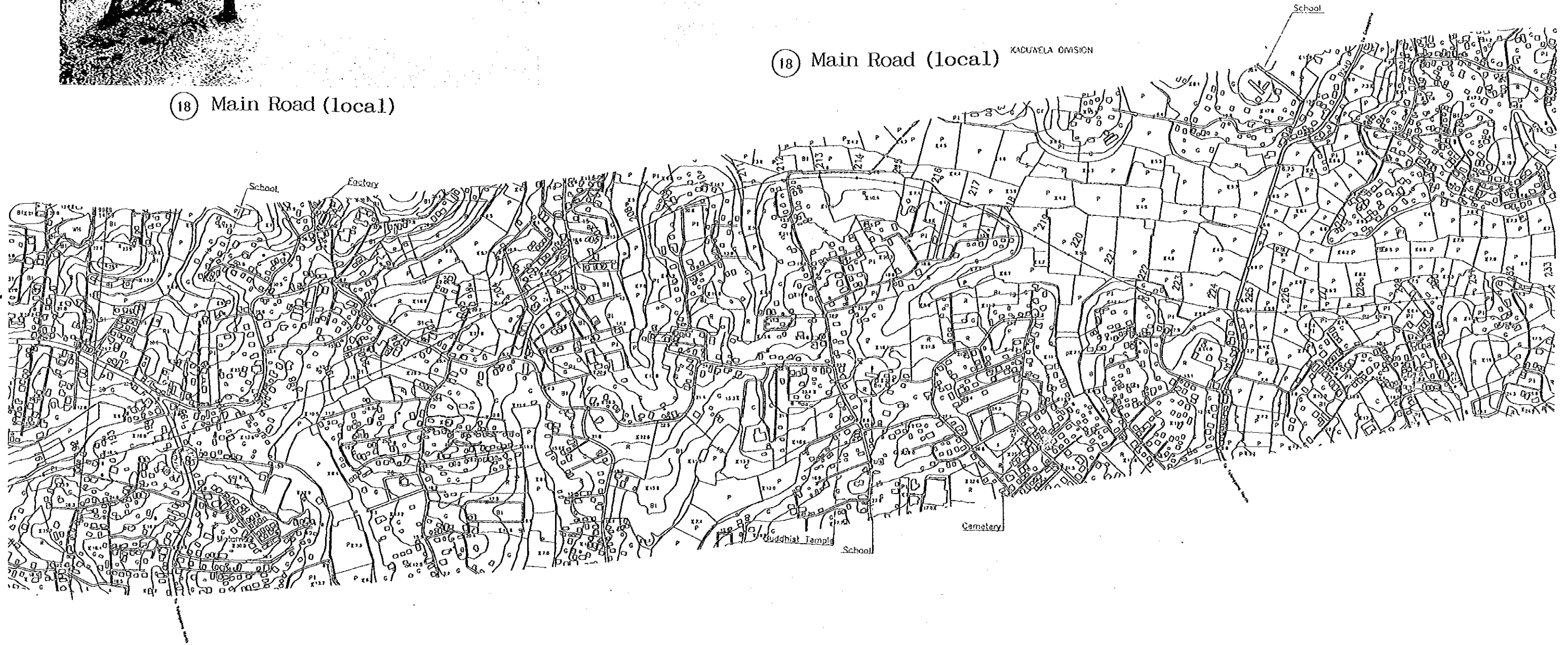
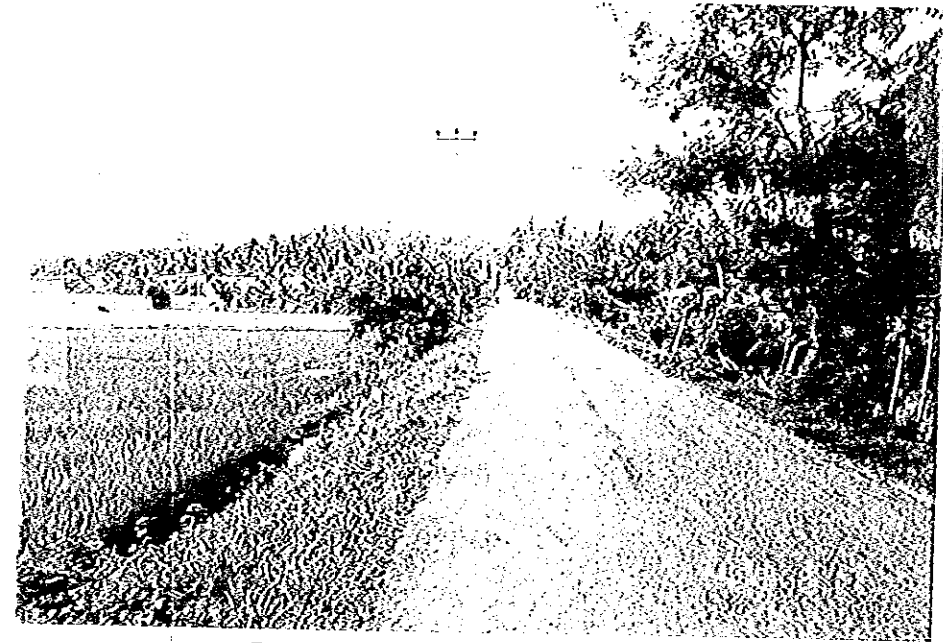


Fig. 9-17



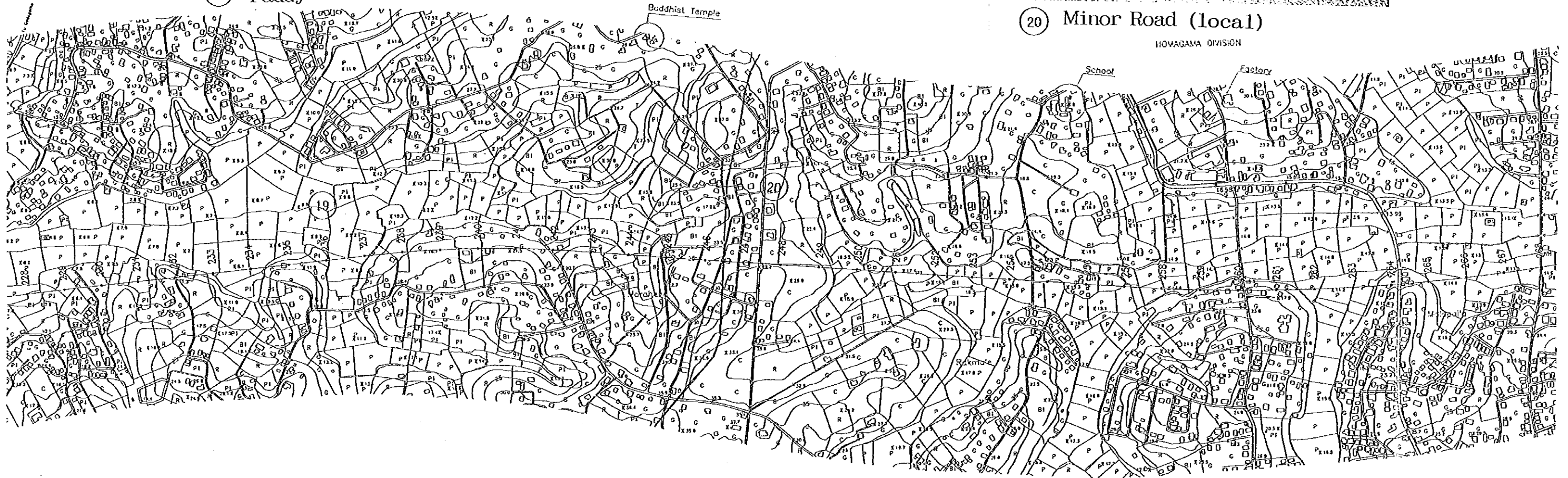
19 Paddy

KADUWELA DIVISION



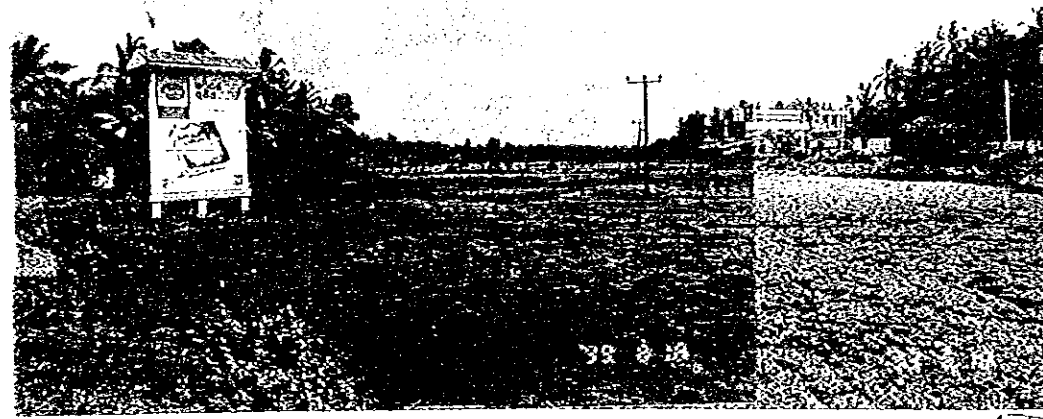
20 Minor Road (local)

HOVAGAMA DIVISION

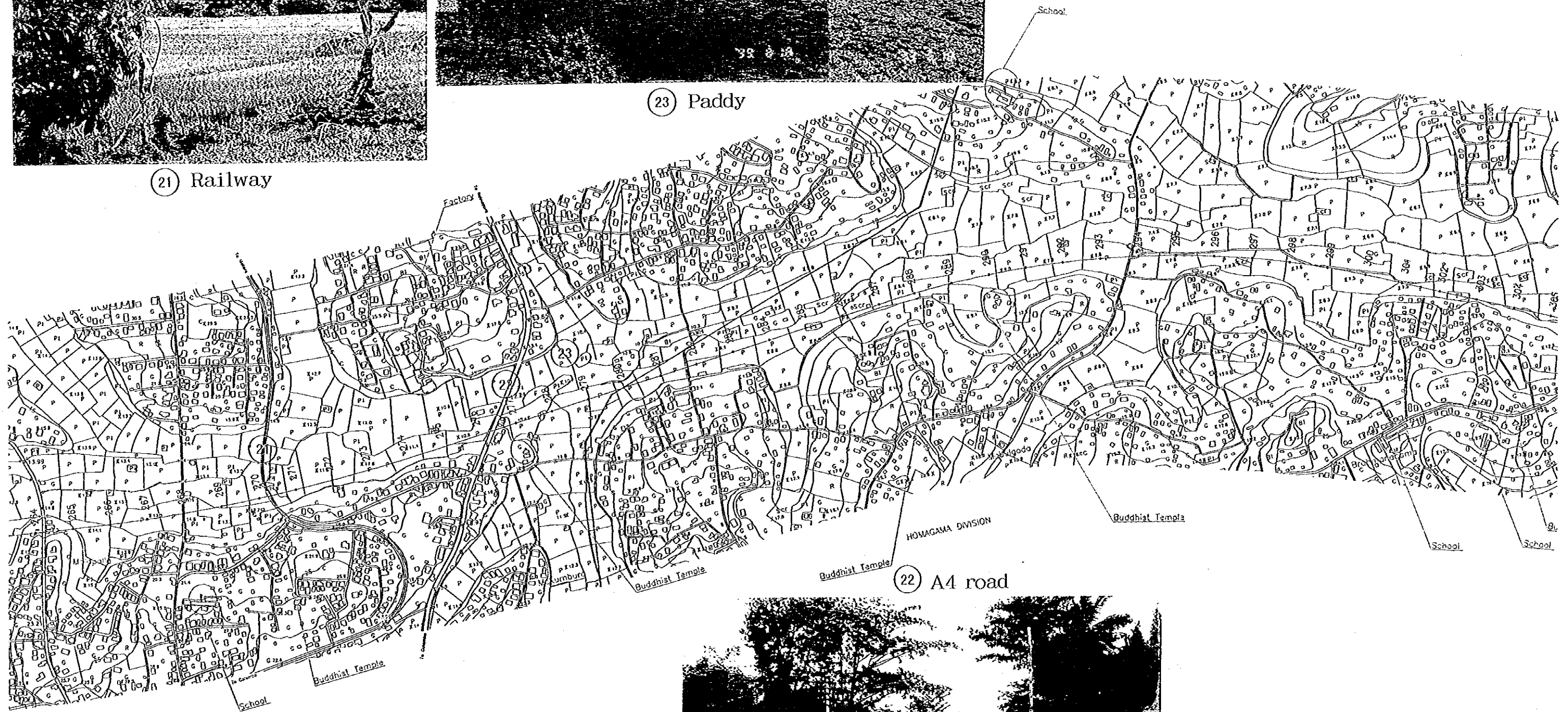




21 Railway



23 Paddy



22 A4 road

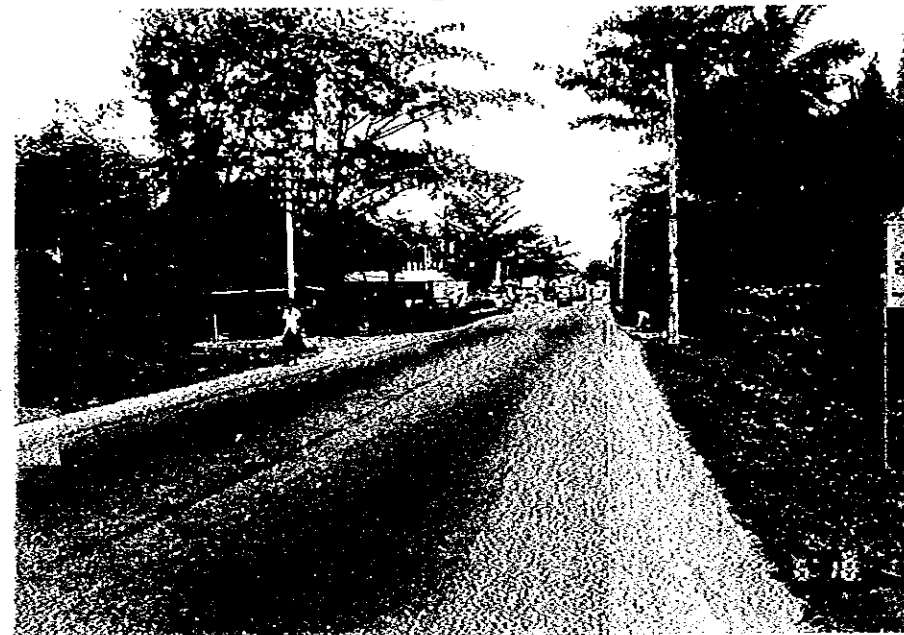
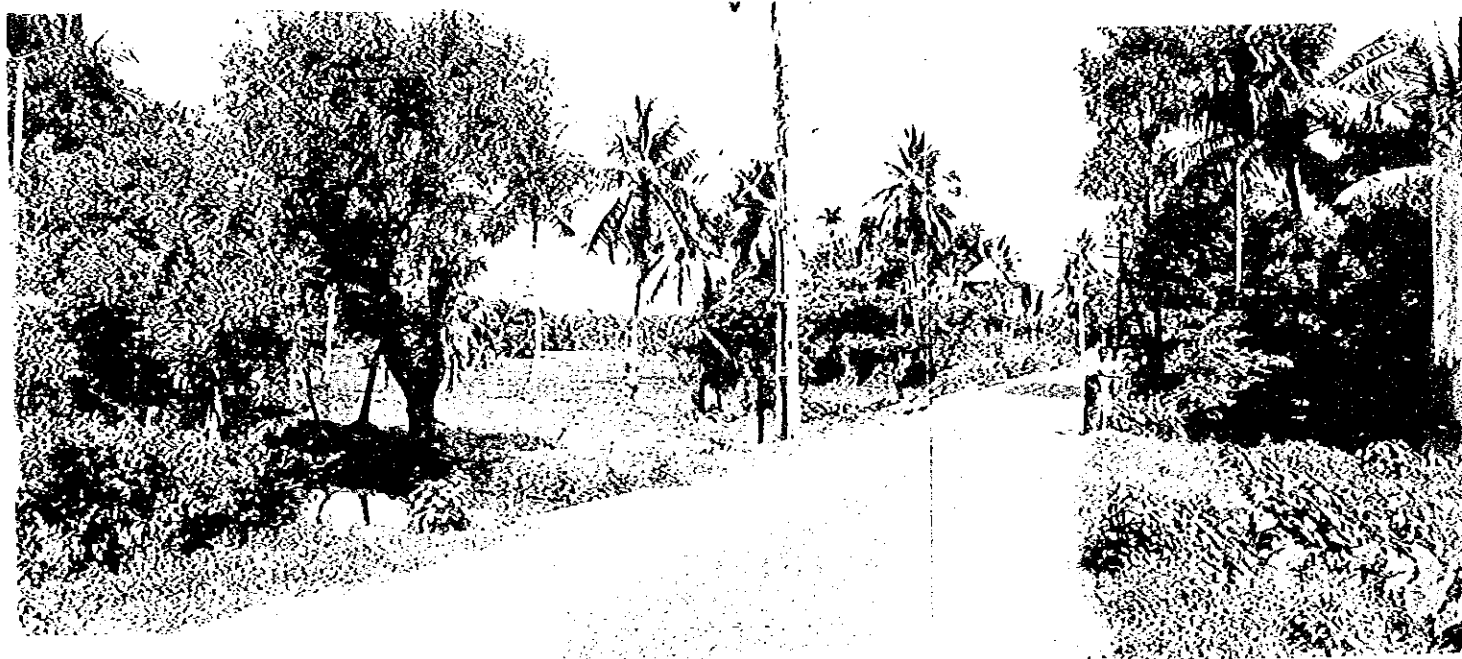


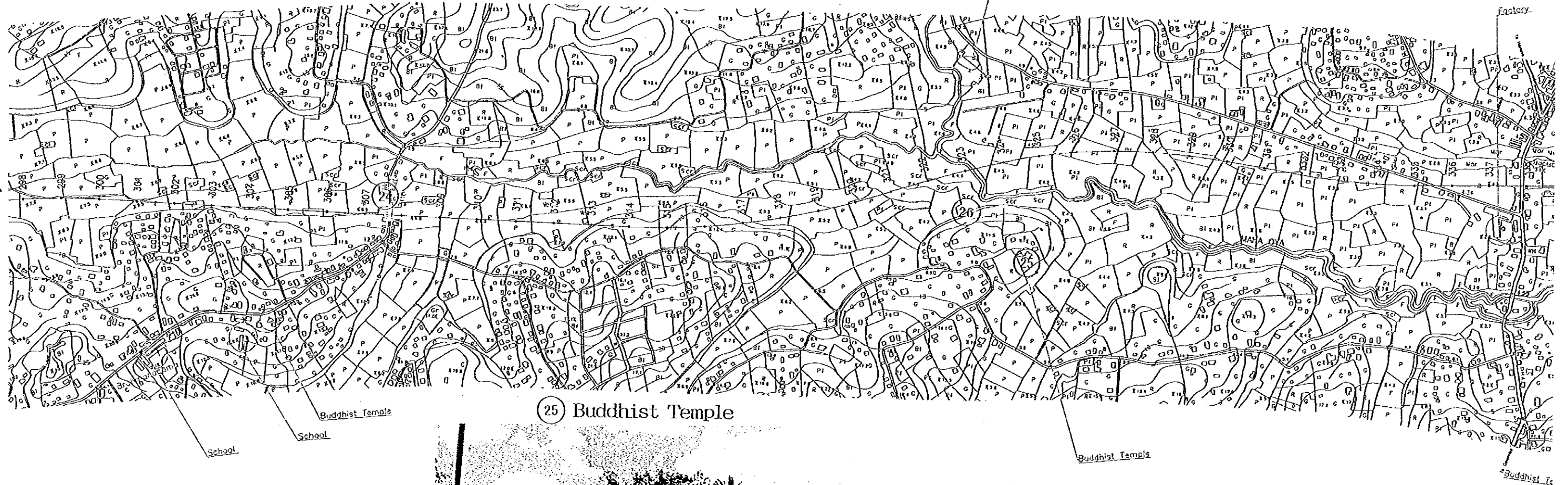
Fig. 9-19



(24) Main Road

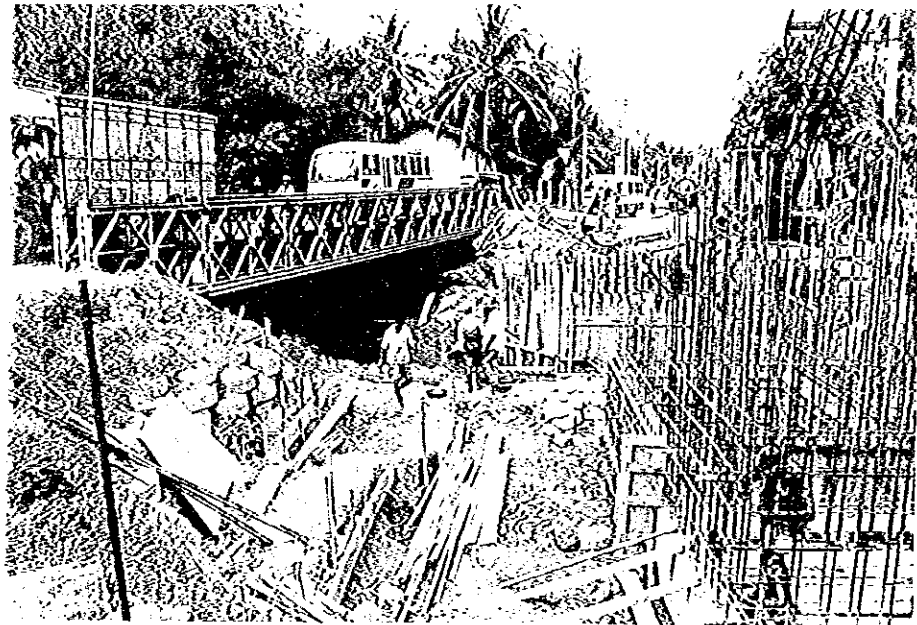


(26) Paddy



(25) Buddhist Temple

Fig. 9-20



(27) Bridge construction site



(28) Paddy

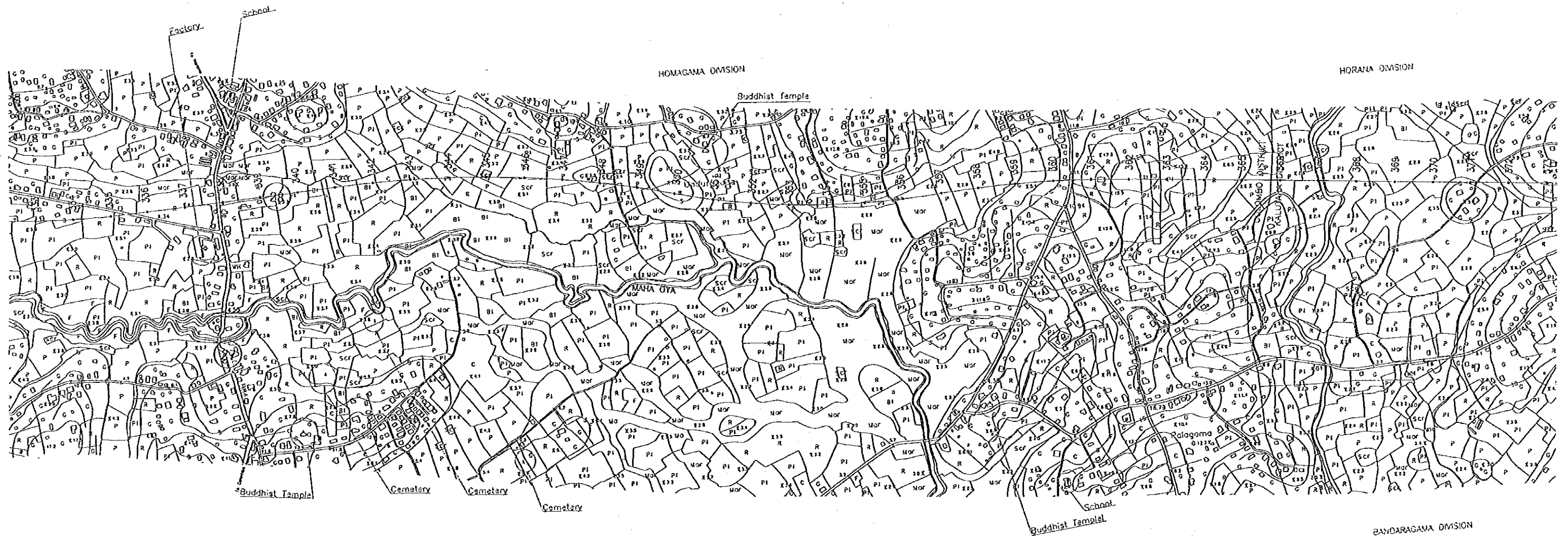


Fig. 9-21



(29) B216 road

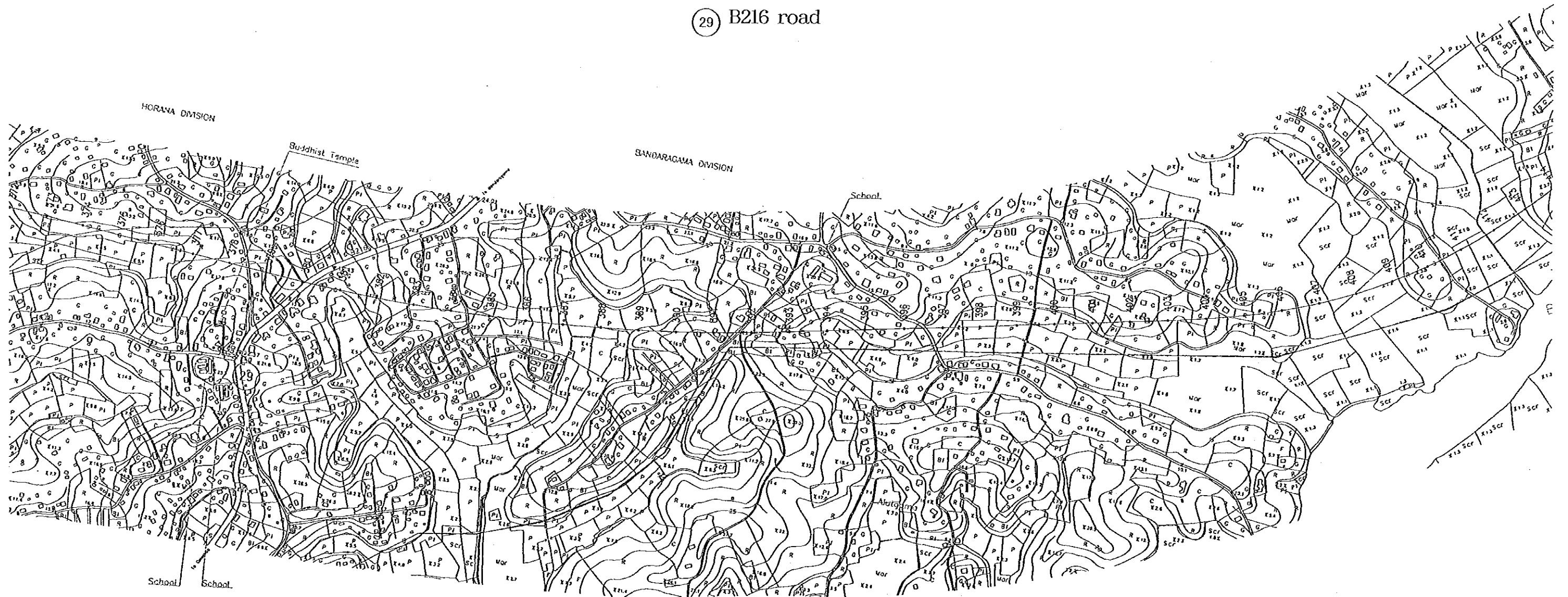


Fig. 9-22

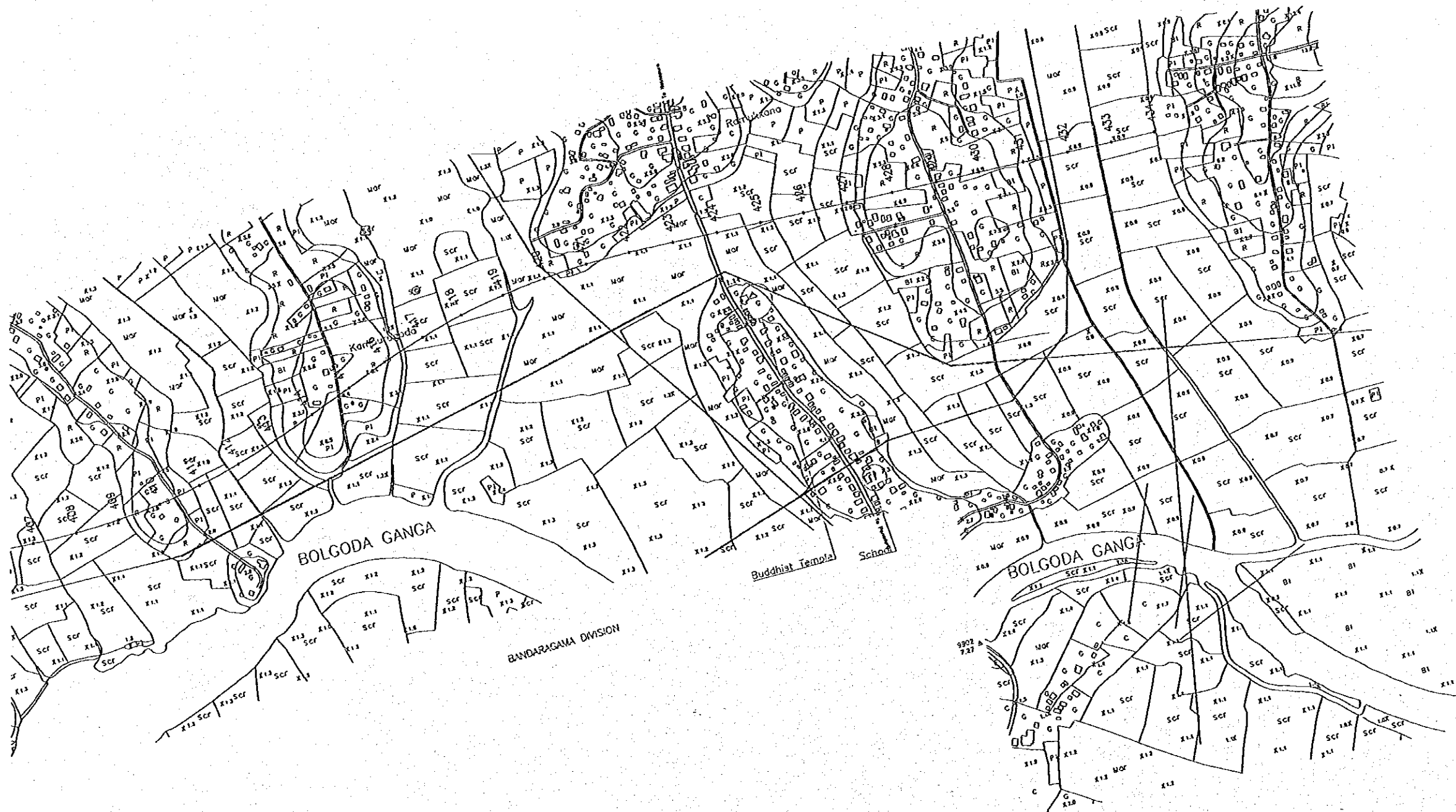
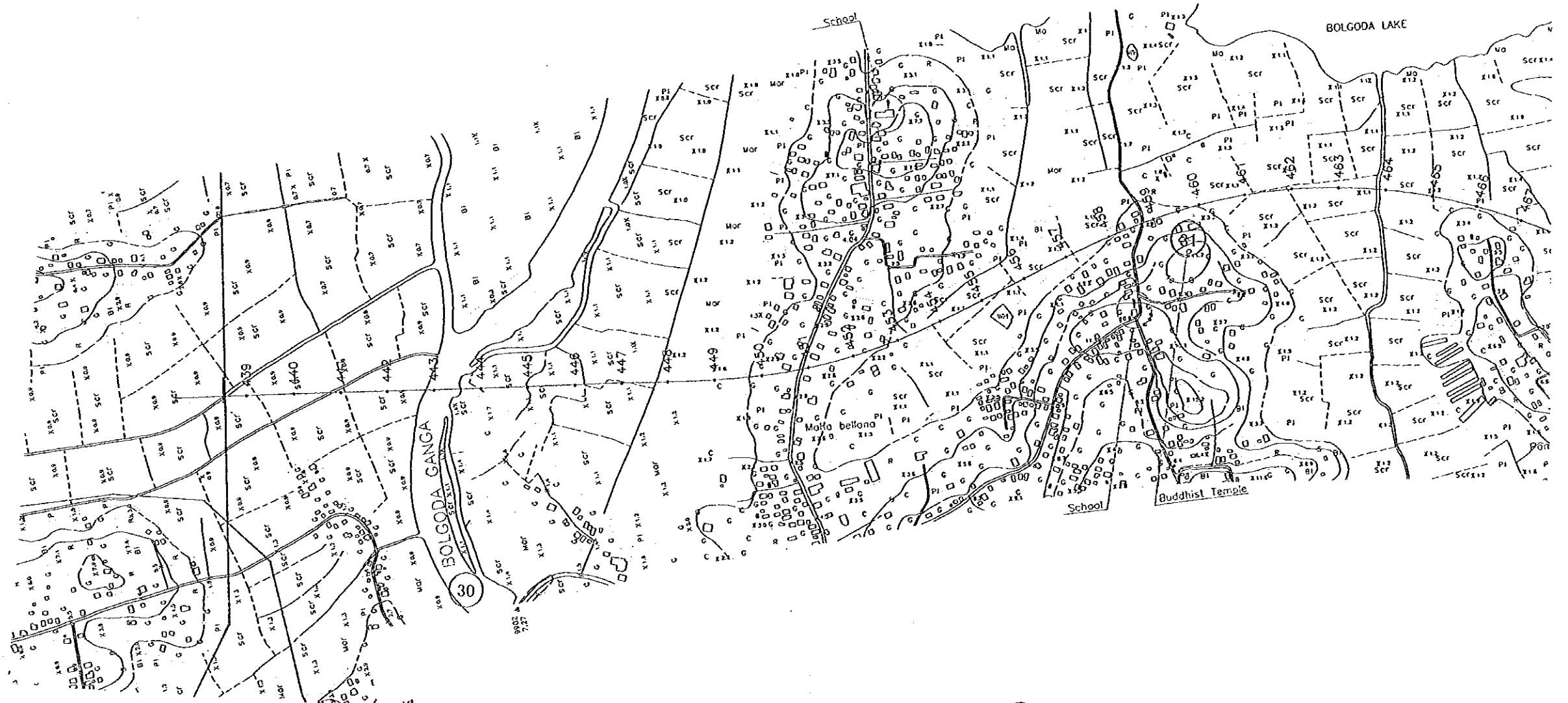


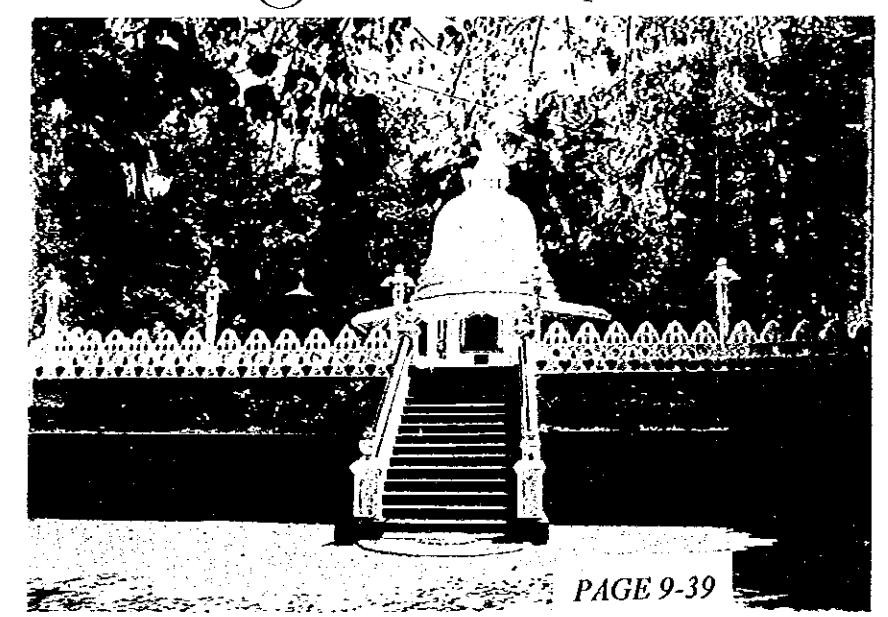
Fig. 9-23

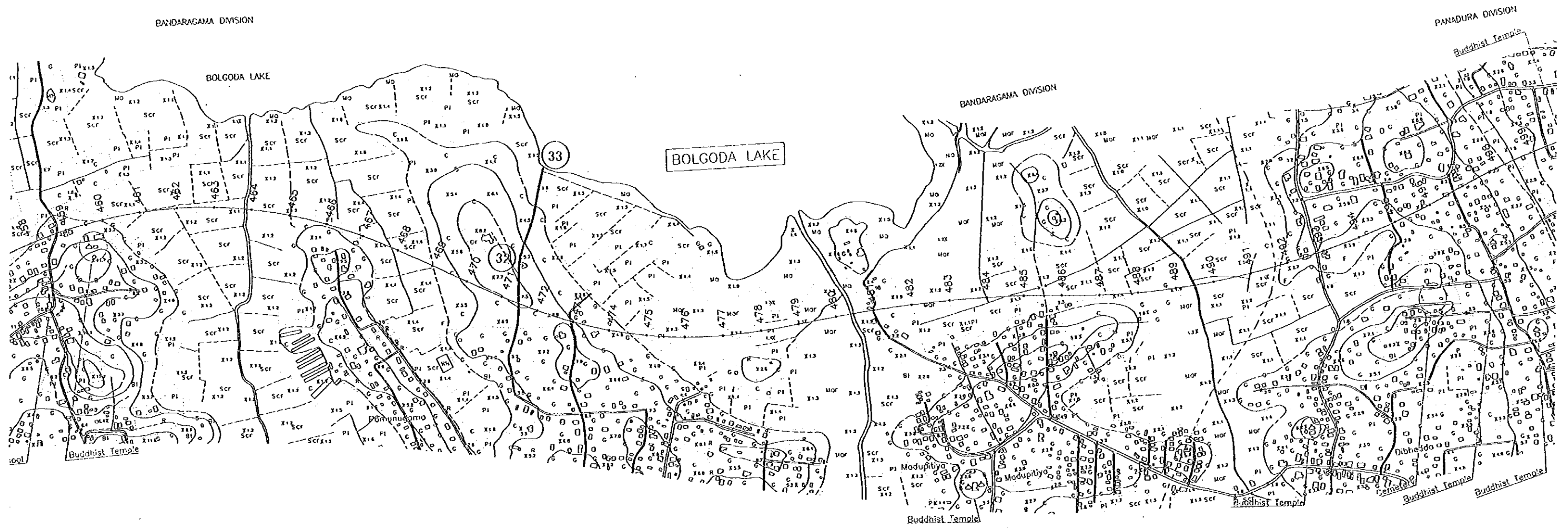
BANDARAGAMA DIVISION



30 Bolgoda Ganga(river)

31 Buddhist Temple





32 Coconut Plantation



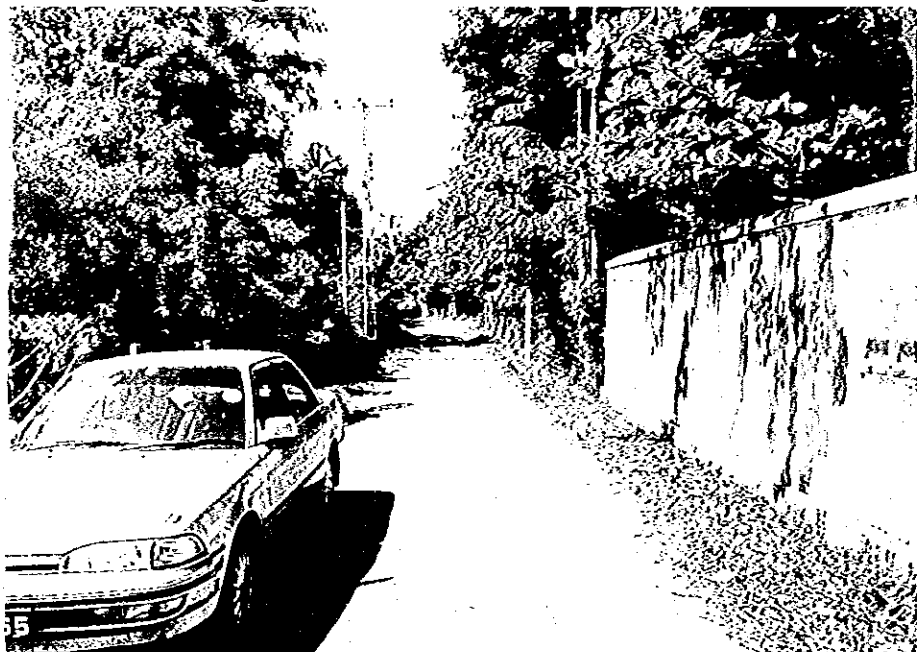
33 Bolgoda Lake



Fig. 9-25



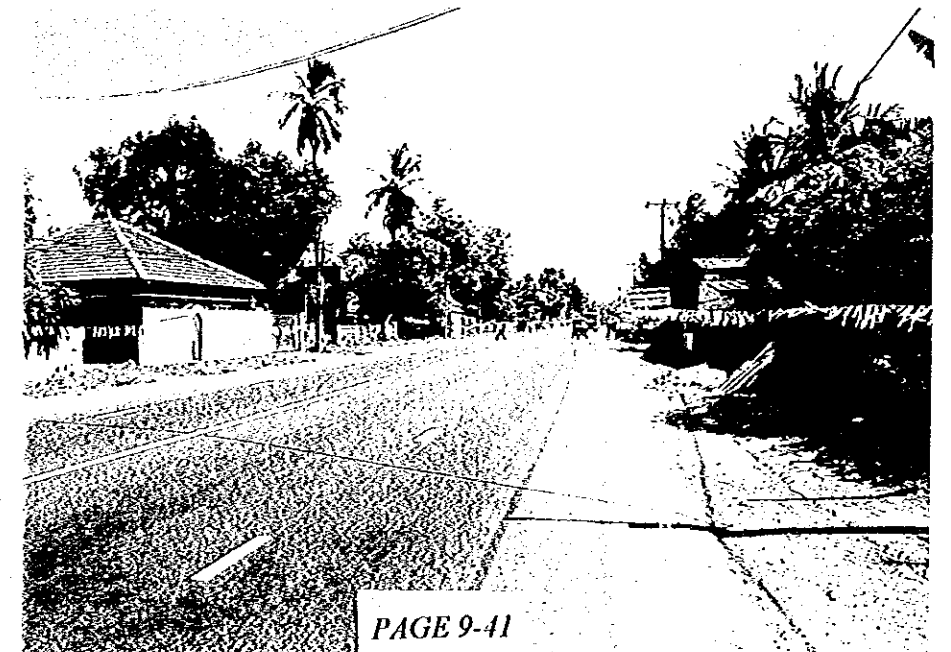
34 Minor Road (local)

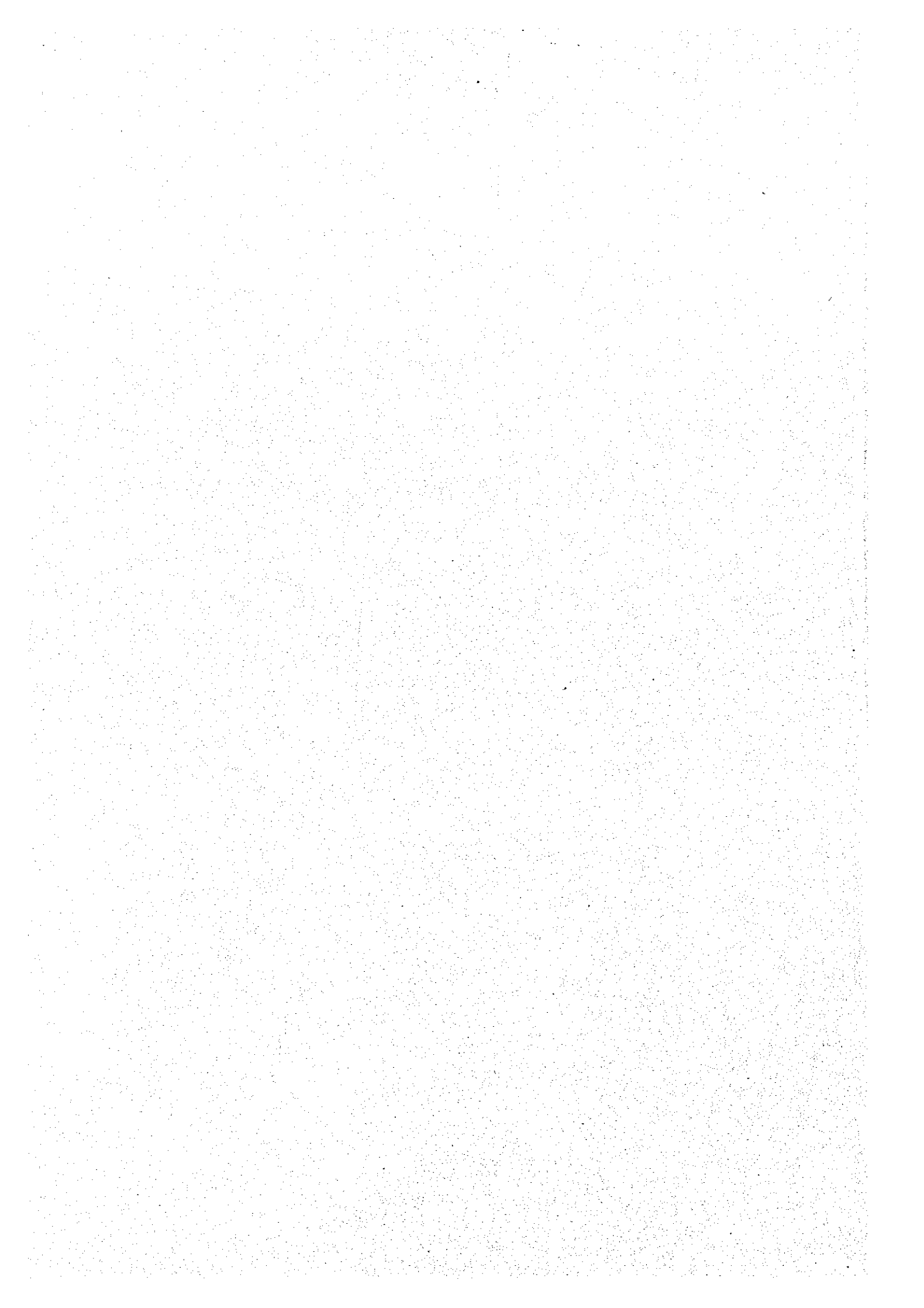


35 Buddhist Temple



36 A2 road





9.4.3 Alignment Setting

The horizontal alignment is set as shown in the table below.

Location	Concepts
1) CKE - A3 Road (Sta.6-51.4209 - Close to Sta.10)	<ul style="list-style-type: none"> Alignment runs straight from reclaimed land to the side of a brush plant. Alignment passes over existing road near milk plant.
2) A3 road - Railway (Sta.10 - 28)	<ul style="list-style-type: none"> Alignment passes through a narrow section close to Sta.27 to avoid milk plant schools, graveyards, and military facilities as well as a village.
3) Railway - B168 Road (Sta.28 - near 57)	<ul style="list-style-type: none"> Alignment crosses a canal (to be relocated) while avoiding a village close to Sta.33. To increase the amount of cutting, alignment passes, through a cut structure in an area with relatively few houses close to Sta.43 to 53. Alignment passes through a paddy field and intersects Rt. B168.
4) B168 Road - A1 Road (Sta.57 - close to 81)	<ul style="list-style-type: none"> Alignment passes through highland along a paddy field in order to avoid schools and residences as much as possible. Rt. A1 is an interchange location. The alignment is set so that of the radius of horizontal curve close to the interchange becomes 700 m or more.
5) A1 Road - close to Sta. 135	<ul style="list-style-type: none"> Alignment selected to avoid schools, plants, and Hindu shrine
6) Sta. 135 - close to Kelani River	<ul style="list-style-type: none"> Alignment avoids graveyards, temples and crosses the Kelani River at a right angle
7) Kelani River - close to Sta. 210	<ul style="list-style-type: none"> Alignment passes through a paddy field to avoid villages near the Sta.170 - 190 sections. Alignment avoids a developed area close to Sta. 170 - 173.
8) Sta. 210 - close to A4 Road (close to Sta. 276)	<ul style="list-style-type: none"> Alignment passes through a paddy field to minimize obstructions. Since the central portion of the paddy is muddy, which is not desirable in terms of road construction, the alignment passes slope close to the right-hand side of a village. Because the amount of the cut is small, the alignment is to pass by the base of a mountain to increase the amount of cut.
9) A4 Road - B84 Road (Sta. 276 - close to 338)	<ul style="list-style-type: none"> Alignment passes through a paddy field to avoid the cookie plant and temples. To minimize river crossing points, alignment passes over the edge (right) of a paddy field. Alignment intersects Rt. B84.
10) B84 Road - close to Sta. 380	<ul style="list-style-type: none"> Alignment passes through a paddy field to avoid houses and temples. Amount of cut to be secured while avoiding the village to the right of Sta.358.
11) Sta. 380 - close to Sta. 433	<ul style="list-style-type: none"> Alignment set to minimize obstructions while avoiding temples, schools, and a village to the right of Sta.383 - 400. Alignment passes through a paddy field to avoid villages on both sides of Sta.420 - 426. For the highland portion close to Sta.429, alignment divides a village in order to connect with the Southern Transport Corridor. Alignment set back from the Bolgoda River to prevent erosion and souring (close to Sta.410 - 415).
12) Southern Transport	<ul style="list-style-type: none"> On the basis of site surveys, the alignment is set to cross the

Corridor – close to Sta. 463	Bolgoda River at the shortest point, taking into consideration boring and site survey conditions.
13) Sta. 436 – close to Sta. 480	<ul style="list-style-type: none"> Alignment set to avoid villages scattered on both sides. Alignment runs close to the mountain base from Bolgoda Lake to avoid houses and temples.
14) Sta. 480 – End of Route	<ul style="list-style-type: none"> Alignment set in consideration of the IC at Rt. A2.

9.5 Vertical Alignment

9.5.1 Basic Concept

The basic concept for determining the vertical alignment is described below.

<Basic concept>

- As the amount of cut is small and borrowed material has to be used, a low (2 – 3 m) embankment is basically employed.
- Considering flood height, embankment height near rivers is increased by 1 m from the existing height.
- The gentlest gradient is 0.3%.
- The clearance for intersecting roads and railways is 5.25 m and 5.50m, respectively (see below).

The diagrams illustrate three different clearance scenarios:

- Diagram 1:** Shows a vertical clearance of 5.25 M between the pavement surface and the top of an existing road.
- Diagram 2:** Shows a vertical clearance of 5.50 M between the pavement surface and the top of a road structure. The road structure has a total width of 3500 M and a lane width of 1510 M.
- Diagram 3:** Shows a vertical clearance of 4.50 M between the pavement surface and the top of an existing road.

- The clearance for intersections with agricultural and community roads is set at 4.5 m, but will be reviewed on a case-by-basis in the detailed design stage.

* : Annotations and Application of the Road Structure Ordinance” of the Japan Road Association” (February 1983)

9.5.2 Control Points

Control points to be taken into account for determination of the longitudinal alignment are shown below.

<Control points>

- Intersecting roads: Intersections with the main road must be of a grade separation type.
- Intersecting railway:
Colombo – Ragama Railway
Kelani Valley Railway

Control points used for determination of the longitudinal alignment are summarized in Tab. 9.6.

Tab. 9.6 List of Control Points on Bridges and Viaduct for the Outer Circular Highway

No.	Bridge or Viaduct	Reference STA	Type of Bridge	Span	Ground Height	Clearance	Navigation Clearance	Thickness Of Slab	Height Of Haunch	Thickness Of Pavement	Superelevation		(A) Critical Height	(B) Proposed Height	(B)-(A) Free Board	Remarks	
											Width	Difference					
1	Highway Bridge	0 -15.000	PC Composite Girder	40.0	2.151	5.250	1/15	0.23		0.075	9.000	+2.500	0.225	10.631	10.721	0.090	
2	A-3 Road IC Bridge	9 +50.000	PC Composite Girder	40.0	8.300	5.250	1/15	0.23		0.075	15.500	+2.500	0.388	16.943	17.030	0.088	GH=8.6+0.3 A-3 Road
3	Railway Bridge	28 +40.000	PC Composite Girder	30.0	2.000	5.250	1/15	0.23		0.075	8.250	+2.500	0.206	9.761	9.830	0.069	Railway
4	A-1 Road IC Bridge	81 +60.000	PC Composite Girder	30.0	12.500	5.250	1/15	0.23		0.075	8.250	+4.000	0.330	20.155	22.370	2.215	A-1 Road available up to GH=5.75m
5	B214 Road IC bridge	159 +80.000	PC Pre-tension Girder	22.0	5.290	5.250	1.05			0.075	8.250	+2.500	0.206	11.871	12.330	0.459	B214 Road available up to GH=5.99m
6	A110 Road IC Bridge	163 +05.000	PC Pre-tension Girder	22.0	5.400	5.250	1.05			0.075	8.250	+2.500	0.206	11.981	12.575	0.594	A110 Road available up to GH=5.99m
7	Railway Bridge	270 +10.000	PC Pre-tension Girder	15.0	15.000	5.250	0.80			0.075	8.250	+2.500	0.206	21.331	21.777	0.446	Railway
8	A-4 Road IC Bridge	276 +65.000	Box Girder	48.0	12.700	5.250	1/20	2.40		0.075	10.000	+2.500	0.250	20.675	20.881	0.206	A-4 Road
9	B84 Road IC bridge	338 +10.000	PC Composite Girder	30.0	4.100	5.250	1/15	0.23		0.075	8.250	+2.500	0.206	11.861	12.447	0.586	B84 Road
10		367 +25.000	PC Pre-tension Girder	22.0	2.500	1.000	1.05			0.075	8.250	+2.500	0.206	4.831	5.480	0.649	river
11	A-8 Road IC Bridge	423 +85.000	PC Pre-tension Girder	22.0	2.500	5.250	1.05			0.075	8.250	+2.500	0.206	9.081	9.317	0.236	A8 Road WL=0.02
12	Bolgoda River Bridge	443 +10.000	PC Pre-tension Girder	18.0	0.020	0.000	0.90			0.075	8.250	+2.500	0.206	1.201	4.208	3.007	Bolgoda River WL=0.02
13	Bolgoda River Bridge	443 +90.000	PC Pre-tension Girder	18.0	0.020	0.000	0.90			0.075	8.250	+2.500	0.206	1.201	4.028	2.827	Bolgoda River WL=0.02
14																	
15																	
16																	
17																	
18																	

9.5.3 Vertical Alignment Setting

The vertical alignment is set as shown below.

Location	Concepts
1) CKE - close to Sta.10	<ul style="list-style-type: none"> Vertical alignment set at 5.25 m because of the CKE and Rt. A3.
2) Sta.10 - close to 66	<ul style="list-style-type: none"> Clearance of 5.50 m secured at intersection with railway. Since the ground near Sta.17 – 27 is soft, a low embankment will be used to minimize subsidence. The ground close to Sta.32 – 42 across the railway is not soft. However, a low embankment will be used for cost reasons. For the hilly section, the vertical alignment is lowered to increase the amount of cutting due to insufficient fill material.
3) Sta.66 - close to 120	<ul style="list-style-type: none"> For Sta.66 – 76, which connects a low embankment with a high embankment, the alignment is set so as to increase cutting. In view of the intersection with Rt. A1, a high embankment is to be employed.
4) Sta.120 - close to 170	<ul style="list-style-type: none"> Vertical alignment set low to pass inside a paddy field. Note that the alignment is planned at a height above the ground level of houses by taking flood height into account. Clearance for the intersection with Rt. B214 and A110 near the Kelani River is controlled.
5) Sta.170 - close to 210	<ul style="list-style-type: none"> Alignment set to increase cutting amount.
6) Sta.210 - close to 250	<ul style="list-style-type: none"> Vertical alignment set low.
7) Sta.250 - close to 370	<ul style="list-style-type: none"> Vertical alignment set low. However, 5.50 m clearances for railway and 5.25m for Rt. A4 and B84 are secured
8) Sta.370 - close to 400	<ul style="list-style-type: none"> Alignment set to increase cutting in the hilly section. Gentle gradient of 0.3% continued.
9) Sta.400 - close to 434	<ul style="list-style-type: none"> High embankment at intersection with Rt. A8 to secure space for IC construction. Low embankment for JCT because there is no intersecting road. This will allow cutting on the hilly section of the roadside on Rt. A8. Future review necessary because no vertical alignment is set for the Southern Transport Corridor.
10) Sta.434 - Rt. A2	<ul style="list-style-type: none"> Flood height taken into account for crossing the Bolgoda River. Vertical alignment set low since there are a few intersecting roads. Intersecting roads to be integrated to cross the main line by means of a box or overpass. Rt. A2 to be accessed at the current road height in view of the shape of the planned interchange.

The vertical alignment plan discussed above is shown in the subsequent pages.