2.2.2.5 Drainage Structure

(1) Bridge

Along the concerned section of this project road, there are 4 constructed bridges. The carriageway widths of existing bridges are designed to fit with existing road width, and the width of carriage way are insufficient compared with carriageway width of 7.2m of 2 lanes on the designed cross section component. The conditions of all bridges are structurally sound at present and it doesn't yet necessary to be improved or reconstruction. To consider these situations, this project carries out only repair works on the improper portions of the bridges. In addition, warning signs on the reduced lane width, will be installed to call driver's attention, with guardrails and guidepost as guiding devices that meet driver's eye sight.

Existing conditions of each bridge and repair plan are presented in Table 2.2.2-14.

(2) Culvert

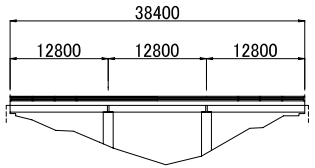
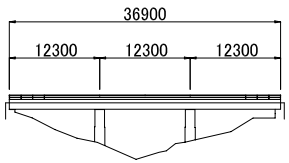
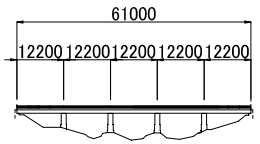
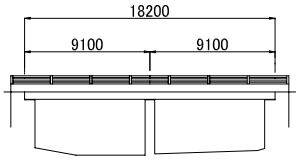
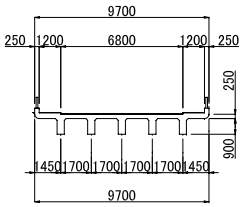
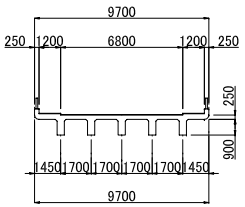
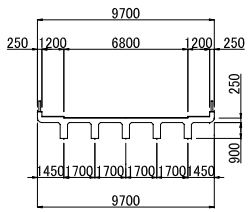
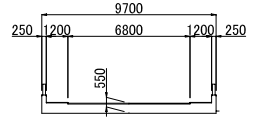
Along this project road, a total of 267 culverts, including pipe culverts and box culvers, are installed. In the "Review of Detailed Design of the Yen loan Project", discharge volume of all these culverts were studied so at this time culvert plans are designed based on this data. Basically, existing culverts shall be utilized and extended for insufficient length involving road widening. The culverts with inadequate capacity shall be replaced with suitable size for its discharge volume. However it will allow to be pooled temporarily in flood plain and the culverts shall be only extended even its capacity is less insufficient. In addition, new culverts shall be installed at locations where the cross drainage is necessary due to its topography. The culverts located in improper place shall be relocated and unnecessary culverts, located for example near top of crest, shall be removed.

A summary of culvert plan is presented in Table 2.2.2-15.

Table 2.2.2-15 Summary of Culvert Plan

Measure	Pipe Culvert		Box Culvert	
	No. of Locations	Construction Length	No. of Locations	Construction Length
Extension	116	524.85m	79	463.25m
Exchange	29	507.72m	34	551.12m
New	7	115.08m	1	16.93m
Relocation	2	28.15m	-	-
Remove	4	-	3	-

Table 2.2.2-14 Existing Conditions of Bridges and Repair Plan

		No.3		No.4		No.5		No.6	
Bridge Name		YAENLE Bridge		NAKWUO Bridge		AMISAH Bridge		MANKESSIM Bridge	
Chainage		42+190		80+270		92+424		94+061	
Side View									
Cross Section									
Type	Superstructure	RC Simple Girder 3-span		RC Simple Girder 3-span		RC Simple Girder 5-span		RC Simple Slab 2-span	
	Shoe	Roller/Plane/Roller		Plane Bearing		Plane Bearing		Plane Bearing	
	Expansion Joint	Butt Joint		Butt Joint		Butt Joint		Butt Joint	
	Abutment	RC pile & spill type		RC pile & spill hollow type		RC pile & spill type		RC Semi-Gravity Type	
	Pier	Block Masonry Wall		Block Masonry Wall		Block Masonry Wall		Block Masonry Wall	
Check Items	Condition/Repair	**Existing**	**Repair**	**Existing**	**Repair**	**Existing**	**Repair**	**Existing**	**Repair**
	Surface	Hairline cracks & rugged	Overlay by Asphalt Concrete	Hairline cracks & rugged	Overlay by Asphalt Concrete	Hairline cracks & rugged	Overlay by Asphalt Concrete	Hairline cracks & rugged	Overlay by Asphalt Concrete
	Concrete Slab	Fair	No Repair	Fair	No Repair	Fair	No Repair	Fair	No Repair
	Main Girder	Fair	No Repair	Fair	No Repair	Fair	No Repair	Fair	No Repair
	Expansion Joint	Fair	No Repair	Fair	No Repair	Fair	No Repair	Fair	No Repair
	Surface Drainage	Choking drain holes	Cleaning of drain holes	Choking drain holes	Cleaning of drain holes	Choking drain holes	Cleaning of drain holes	Choking drain holes	Cleaning of drain holes
	Railing	Damaged on both sides	Repair on damaged portion	Damaged on right side	Repair on damaged portion	Damaged on right side	Repair on damaged portion	Fair	No Repair
	Scouring	Collapsed dry pitting at abutment	Repair by Wet masonry	Collapsed dry pitting at abutment	Repair by Wet masonry	Collapsed dry pitting at abutment	Repair by Wet masonry	No scoring & Protection	No Repair
	Sidewalk	Damaged Pavement, existing water pipe	Overlay & Relocation of water pipe	Damaged Pavement	Overlay	Damaged Pavement	Overlay	Damaged Pavement	Overlay
	Others	-	Install Guardrail at both approaches	-	Install Guardrail at both approaches	-	Install Guardrail at both approaches	-	Install Guardrail at both approaches

(3) Side Ditch

Along the existing road, concrete ditches and masonry ditches are observed in populated areas but all ditches in general are earth-ditch type. Crossing water and pools are observed frequently on the road surface at the sections without ditches. Under this study, 3 types of side ditches are planned and designed: earth ditch in general section, masonry ditch in sections over 3% grade to protect against erosion, and concrete ditch with cover in dense populated sections to consider the convenience of road side service ability. The concrete ditch is not covered for all its length but covered only at the entrance of road side facilities. The drainage system in roundabouts at Winneba and Mankessim is designed as gutter type to bring the surface water to catch basin and drain to outlet by a conduit. Side ditches are designed in cross section component to lower the water level than bottom of sub-base course to prevent pavement structure damage by the rain water.

A summary of the side ditch plan is listed in Table 2.2.2-16.

Table 2.2.2-16 Summary of Side Ditch Plan

Ditch Type	Left Side		Right Side	
	Places	Total Length	Places	Total Length
Earth	159	33,985m	168	38,350m
Masonry	35	6,320m	38	7,100m
Concrete	7	2,850m	10	3,815m

2.2.2.6 Traffic Safety Facilities

The road section under this project has a role not only as an international highway connecting ECOWAS countries but also as a local street for the daily life of inhabitants along the highway. There are many uncontrolled at-grade junctions, and the highway is dividing the sphere of daily life of inhabitants so the people need to frequently cross the carriageway of the highway. Under these circumstances, the local traffic is mixed with the through traffic on the highway, and danger of traffic accidents becomes higher due to the contradiction of demand and objective between each road user. Therefore, safety measures are introduced to prevent accidents on the road. In addition, necessary safety measures on the road geometric are studied in both road alignment and cross section composition.

(1) Speed Restraint

A total of 36 towns/villages are located along the project road. On these 36 sections, speed restraint with 50kph is introduced for preventing high speed vehicles within the sphere of daily life of inhabitants. There are many other villages at a little far from the highway, where speed restrain shall not be introduced because the highway doesn't invade their sphere of daily life. To make the speed restrain more effective, road humps shall be installed at 25 towns/villages, where the houses are built close to the carriageway, as well as speed control devices to reduce the speed compulsorily.

(2) Sidewalk

In the cross section composition of project road, the shoulder is planned to have 2.5m width. There are 24 places with particularly dense pedestrian movement out of the above 36 towns/villages that need to widen the shoulder with 3.5m width to segregate pedestrians from vehicles running on the carriageway. At the roundabouts in Winneba and Mankessim, sidewalks shall be provided with curbs to protect pedestrians from vehicular traffic.

(3) Pedestrian Crossing

Pedestrian crossings are introduced at a total of 22 locations where it is expected that the main reason of accidents is pedestrians on the carriageway, a school located close to the highway and dense pedestrians crossings at major towns. Guide posts shall be installed on the shoulder at the crossings as a refuge to prevent vehicles.

In addition, it is recognized that there as 12 black spots along the project road based on the analysis results of traffic accidents data provided by GHA. Under this study, all spots were studied from the viewpoints of accidents situation, type and reason, and consequently, appropriate countermeasures are planned.

The results of the accident analysis and safety study are summarized in Table 2.2.2-17.

Table 2.2.2-17 Black Spots and Countermeasures

Chainage	Reason of Accidents	Countermeasures
18+050	Braking & Stopping of Bus on the Carriageway	Establishment of Bus Bay
22+000	Crossing of Pedestrian on the Carriageway	Speed Restraint, Installing of Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
26+600	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
29+200	Braking & Stopping of Bus on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost
47+300	Crossing of Pedestrian in the Roundabout	Speed Restraint, Installing of Hump, Sidewalk, Pedestrian Crossing & Guidepost
61+600	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
82+800	Over Speed (R=580m)	Speed Restraint, Installing of Hump
84+700	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost
93+400	Crossing of Pedestrian on the Carriageway	Speed Restraint, Installing of Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
93+800	Crossing of Pedestrian in the Roundabout	Speed Restraint, Installing of Hump, Sidewalk, Pedestrian Crossing & Guidepost, Widening of Shoulder
104+800	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
107+000	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder
114+400	Crossing of Pedestrian on the Carriageway	Speed Restraint, Establishment of Bus Bay, Hump, Pedestrian Crossing & Guidepost, Widening of Shoulder

2.2.2.7 Other Facilities

(1) Roundabout

There are 2 roundabout intersections connecting with major arterial roads in the project road at Winneba and Mankessim. The designed road is undivided single lane for each traffic direction and this type of roundabout intersection has limited capacity that may not meet future traffic volumes. On the other hand, both intersections are serving as the landmark of the town. Therefore it was determined to keep the roundabout type with some improvements under this project. Contents of the design for each intersection are mentioned below.

Winneba four-leg intersection Sta. 47+492:

- Radius of center circle shall be reduced from 27.0m to 25.5m to secure the newly constructed mount-up sidewalk with 2.5m in width at 4 sides for segregating of pedestrians from vehicles.
- A sidewalk with 2.0m width, utilized for the maintenance road, shall be placed in the center circle.
- The width of round lane in the rotary shall be secured as 5.0m, which satisfies the pass of semi-trailer on the curve radius at the lane center 28.0m, and the width of right turn lane shall be 4.0m, which satisfies the curve radius at the lane center 60.0m. Total width of carriageway is almost the same with existing intersection.
- Cross fall of the road surface shall be placed on round lane and right turn lane separately to fit their travel flow and creating crowned slope.
- The channelized strip at 4 nooks shall be indicated by only the road marking without introducing a channelized island.
- Surface water shall be gathered separately for inner side and outer side of carriageway in accordance with the cross fall of surface, and flow down to the outlet by the conduit.
- To prevent the flow out of soil and spoil the beauty of the town, turfing shall be carried out in the center circle.
- Pedestrian crossing shall be placed at 4 approaches for the safety of pedestrians.

Mankessim three-leg intersection Sta. 93+864:

- Radius of center circle shall be reduced from 27.0m to 24.5m to secure the newly constructed mount-up sidewalk with 2.0m width at 3 sides for segregating pedestrians from vehicles.
- A sidewalk with 2.0m width, utilized also for the maintenance road, shall be placed in the center circle.
- The width of round lane in the rotary shall be secured as 5.5m, which satisfies the pass of semi-trailer on the curve radius at the lane center 27.0m, and the width of right turn lane shall be 5.0m, which satisfies the curve radius at the lane center 30.0m. Total width of carriageway is almost the same with existing intersection.
- Cross fall of the road surface shall be placed inside lower due to round lane is mainly composed of the intersection.

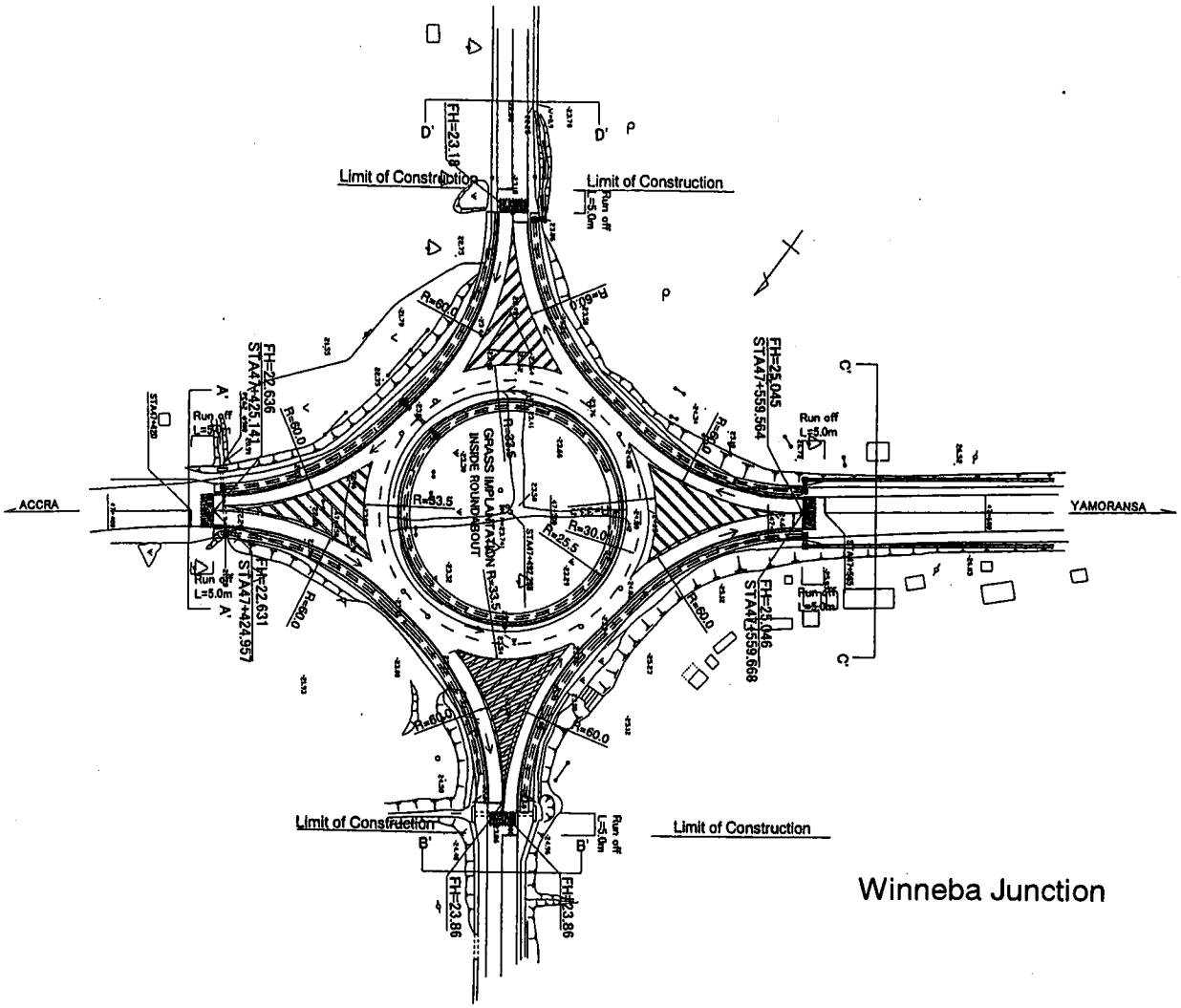
- The channelized strip at 3 nooks shall be indicated by only the road marking without introducing a channelized island.
- Surface water shall be gathered at inner side of carriageway in accordance with the cross fall of surface, and flow down to the existing channel by the conduit.
- To prevent the flow out of soil and spoil the beauty of the town, turfing shall be carried out in the center circle.
- Pedestrian crossing shall be placed at 3 approaches for the safety of pedestrians.
- The existing sidewalk of outer side of the rotary at one side is relatively high compared with the roadside ground level and give the anxiety to the pedestrians, so guide blocks shall be placed.

A sketch for each intersection is shown in Figure 2.2.2-4.

(2) Guardrail/Guidepost

The widths of carriageway on each of the existing bridges are narrow when compared with the designed approach road section, so not only a warning sign shall be installed to call driver's attention but also guardrails at both approaches to prevent vehicles from leaving traveled way. In addition, there are sections with severity of potential accidents involving vehicles leaving traveled way at high embankment section over 4m in height, small curve section with radii less than 1,000m (speed restraint section with 50kph are excluded) and center of Biriwa village where the near the end of project section and many houses are built just under the left side slope. Regarding those sections, guidepost shall be installed as the safety devices for sight line induction to reduce the severity of potential accidents involving vehicles leaving traveled way.

The sections with guideposts to be installed are listed in Table 2.2.2-18.



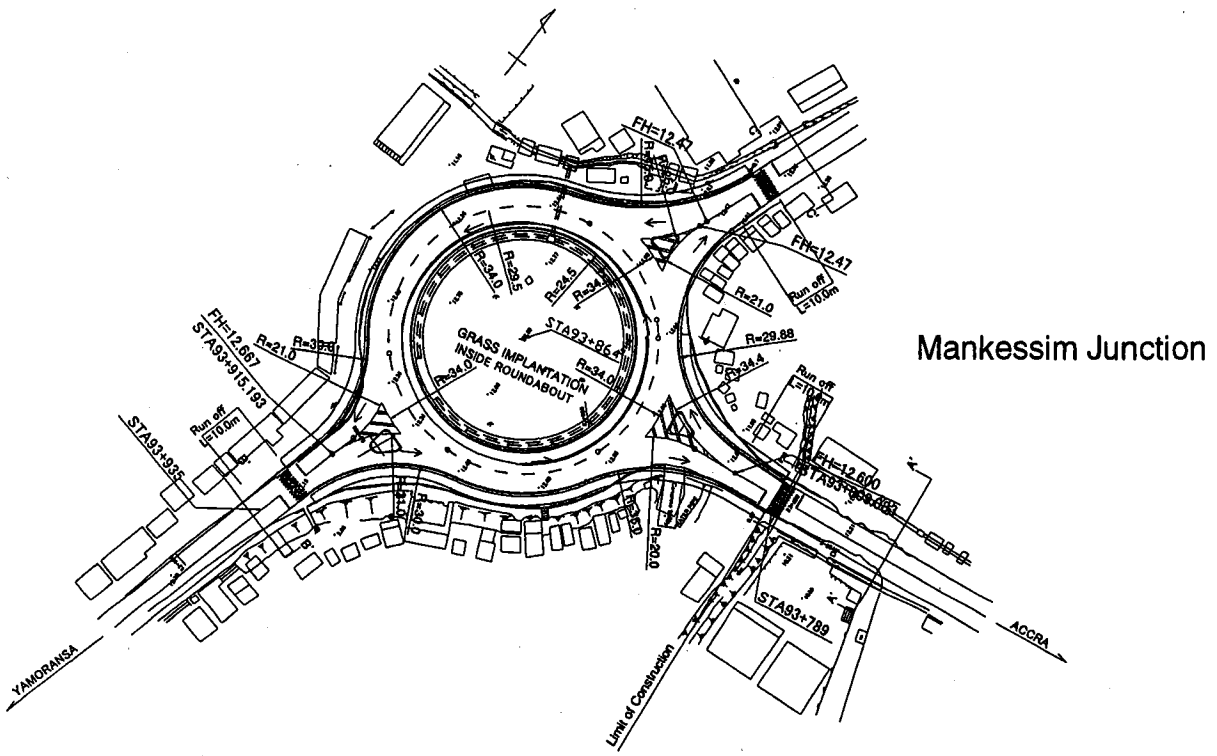


Figure 2.2.2-4 Sketch of the Roundabout

Table 2.2.2-18 List of Guidepost

Chainage		L/R	No.	Interval of Post (m)	Remarks
Start	End				
23+940	24+010	L/R	15*2	14@5.0	High Embankment
64+692	64+995	L	12	40+30+25+5@22.5+25+30+40	Small Curve
65+006	65+386	R	12	40+40+35+5@30+35+40+40	Small Curve
68+899	69+459	L	18	40+40+35+11@30+35+40+40	Small Curve
70+594	71+694	L	36	40+40+35+29@30+35+40+40	Small Curve
81+320	82+310	R	32	40+40+40+25@30+40+40+40	Small Curve
86+420	86+740	L	51	40+40+48@5.0	High Embankment
86+770	87+155	L	13	9@30+35+40+40	Small Curve
86+570	86+700	R	27	26@5.0	High Embankment
92+352	92+407	L/R	12*2	11@5.0	High Embankment
92+502	92+522	L/R	5*2	4@5.0	High Embankment
92+551	92+956	L	14	11@30+35+40	Small Curve
93+999	94+044	L/R	10*2	9@5.0	High Embankment
94+096	94+111	L	4	3@5.0	High Embankment
99+740	100+235	L	20	35+17@25+35	Small Curve
100+875	100+925	L	11	10@5.0	High Embankment
100+875	101+075	R	41	40@5.0	High Embankment
101+335	101+760	R	20	35+25+22.5+13@20+22.5+25+35	Small Curve
112+199	112+684	R	24	30+22.5+19@20+22.5+30	Small Curve
112+826	113+216	L	20	25+17@20+25	Small Curve
113+438	113+698	R	13	30+10@20+30	Small Curve
114+200	114+900	L	141	140@5.0	Houses at Roadside
115+514	115+731	L	10	30+7@22.5+30	Small Curve

(3) Road Sign/Road Marking

To secure smooth traffic flow and traffic safety on the highway after completion of improvement works, necessary warning signs, regulatory signs and road marking are installed. Warning signs shall be installed at small curves, junctions, narrow sections, pedestrian crossings and road humps to warn drivers. Regulatory signs indicates the task of the driver for speed restraint and stop. Road marking shall be placed as center line, road edge line, division line, stop line, pedestrian crossing and channelizing marking of the

roundabouts. Center line indicates the no-passing zone and warn the danger at such locations as junctions.

A summary of road sign plan is shown in Table 2.2.2-19.

Table 2.2.2-19 Summary of Road Sign Plan

Road Sign	Left Side	Right Side	Junction
Warning	138	140	107
Regulatory	100	95	107
Information	49	50	-

(4) Bus Bay

As mentioned in the previous paragraph 2.2.2.6, the mini buses, utilized as the dominant public transport mode for the inhabitants, cause accidents with following vehicles and coming vehicles on the opposite lane due to the sudden braking and stopping on the carriageway for passengers getting on and off. Under this study, bus bay shall be installed to isolate the stopping bus from carriageway at all towns/villages facing the highway and at junctions connecting major roads, where passengers frequently are getting on and off. This practice will eliminate the accident potential and provide convenience for inhabitants along the highway. Informatory signs shall be installed at bus bays to indicate bus destinations and other information. As there are already bus terminals existing at Winneba and Mankessim, new bus stops are not necessary.

The numbers of bus bays are shown in Table 2.2.2-20.

Table 2.2.2-20 Location & Number of Bus Bay

Location	Left Side	Right Side
Town	11	12
Village	23	23
Major Jct.	15	15

(5) Slope Protection

The tendency of rainfall in the project area is downpour type of concentrated rainfalls in short hours, and side slopes may suffer due to erosion by water flow immediately after construction. In view of long-term objective, there will be any problem by secured the necessary side slope and plantation shall be carried out to protect the slope as short-term countermeasure. All areas of

cut slope shall be covered with turfing due to the steep slope compared with embankment slope. Lined turf shall be carried out at gentle embankment slopes.

Under this study, overflow sections are established at 2 locations (Sta.41+700 ~42+000, Sta.51+125~51+225) against the possibility of flooding to minimize the damage on bridges, drainage structures and road embankment. At these 2 locations gabionade shall be provided on the embankment's slope to protect the road bed.

(6) Approaches for Connecting Roads and Roadside Facilities

The project road is a primary road in Ghana so there are many secondary roads, feeder roads, town/residence roads and private roads connected to the highway. In addition, there are many private properties facing the highway such as houses, stores, petrol-filling stations, etc. To assure convenience to local traffic and inhabitants, proper approaches of these locations are required. Field inventory of those approaches was carried out during this basic design study and each approach is designed in proportion to its importance. Arterial roads will have asphalt concrete pavement with corner cut in radius R=10m considering their heavy vehicular traffic. At other public roads, asphalt concrete pavement with corner cut in radius R=5m ~ 2.5m will be provided in proportion to their importance. At private roads, bituminous treatment surface without corner cut is designed due to their less traffic.

For the roadside facilities, only petrol-filling stations are recognized for publicity due to the utilization by vehicles and the approach is designed with corner cut in radius R=5m. At the approach for the other roadside facilities corner-cut is not introduced. Pavement of approaches is determined to be asphalt concrete or bituminous surface treatment depending on the number of users.

In addition, side ditches are installed in the designed road section for the lateral drainage as some portions require lateral drainage depending on the relationship between topography and the location of cross drainage even if side ditches are not required. Construction of approaches at connecting roads and roadside facilities will intercept these lateral drainage facilities, so concrete pipes shall be installed at the approaches to secure the efficient function of lateral drainage. However, approaches of sections with covered concrete ditch do not require concrete pipes because the entrance of the roadside facilities will be secured by the cover.

The approach plan of connecting roads and roadside facilities is summarized in Table 2.2.2-21.

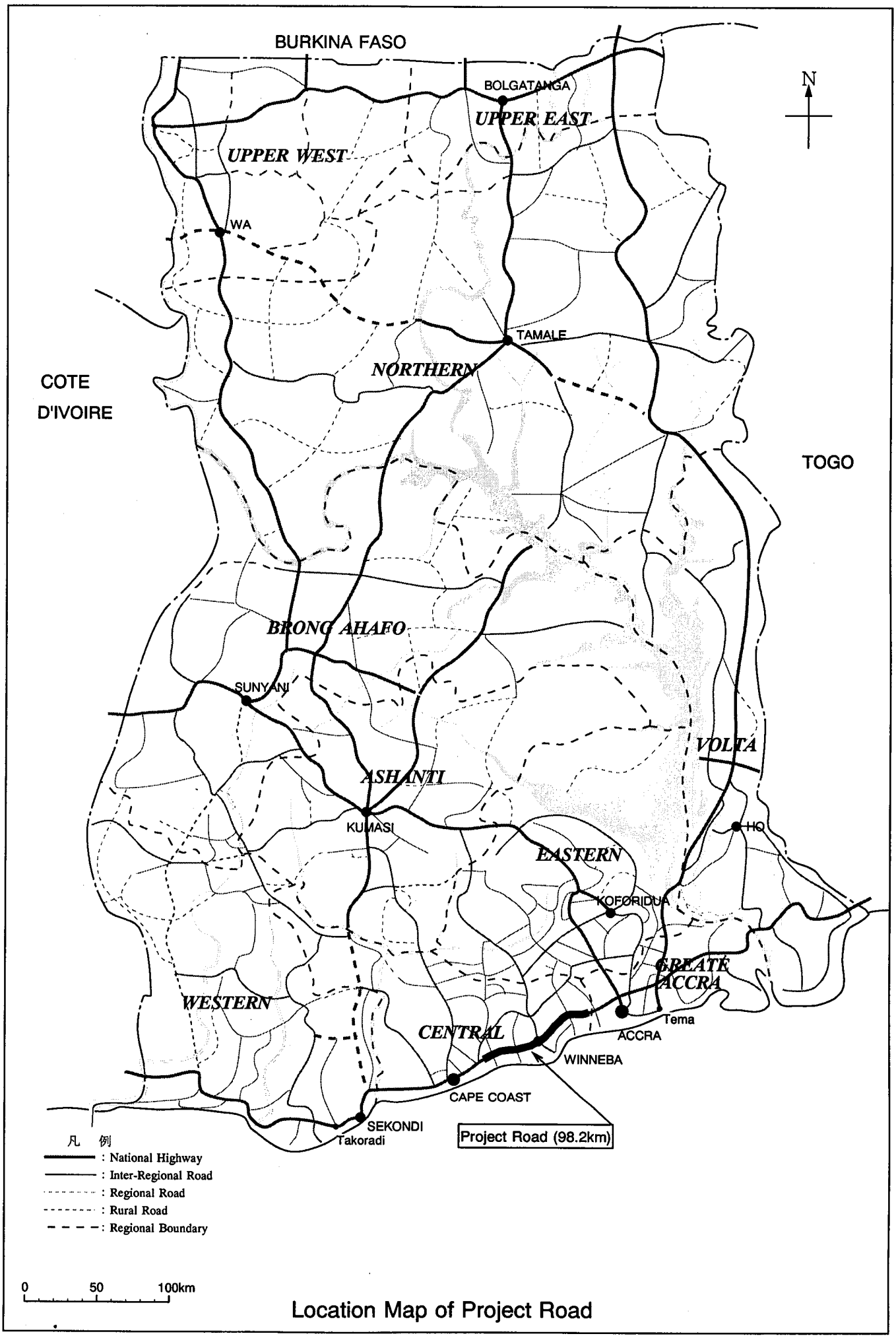
Table 2.2.2-21 Approach Plan of Connecting Road & Roadside Facility

Type	Corner Cut R(m)	Connection Road		Roadside Facility		Surface Type
		No.	Pipe Length	No.	Pipe Length	
Type A	10	33	163.4m	-	-	Asphalt Concrete
	5	74	361.6m	56	282.8m	Asphalt Concrete
Type B	2.5/3.5	25	85.0m	-	-	Asphalt Concrete
Type C	nil	2	6.0m	150	469.0m	Asphalt Concrete
Type D	nil	50	117.0m	171	447.0m	S.B.S.T

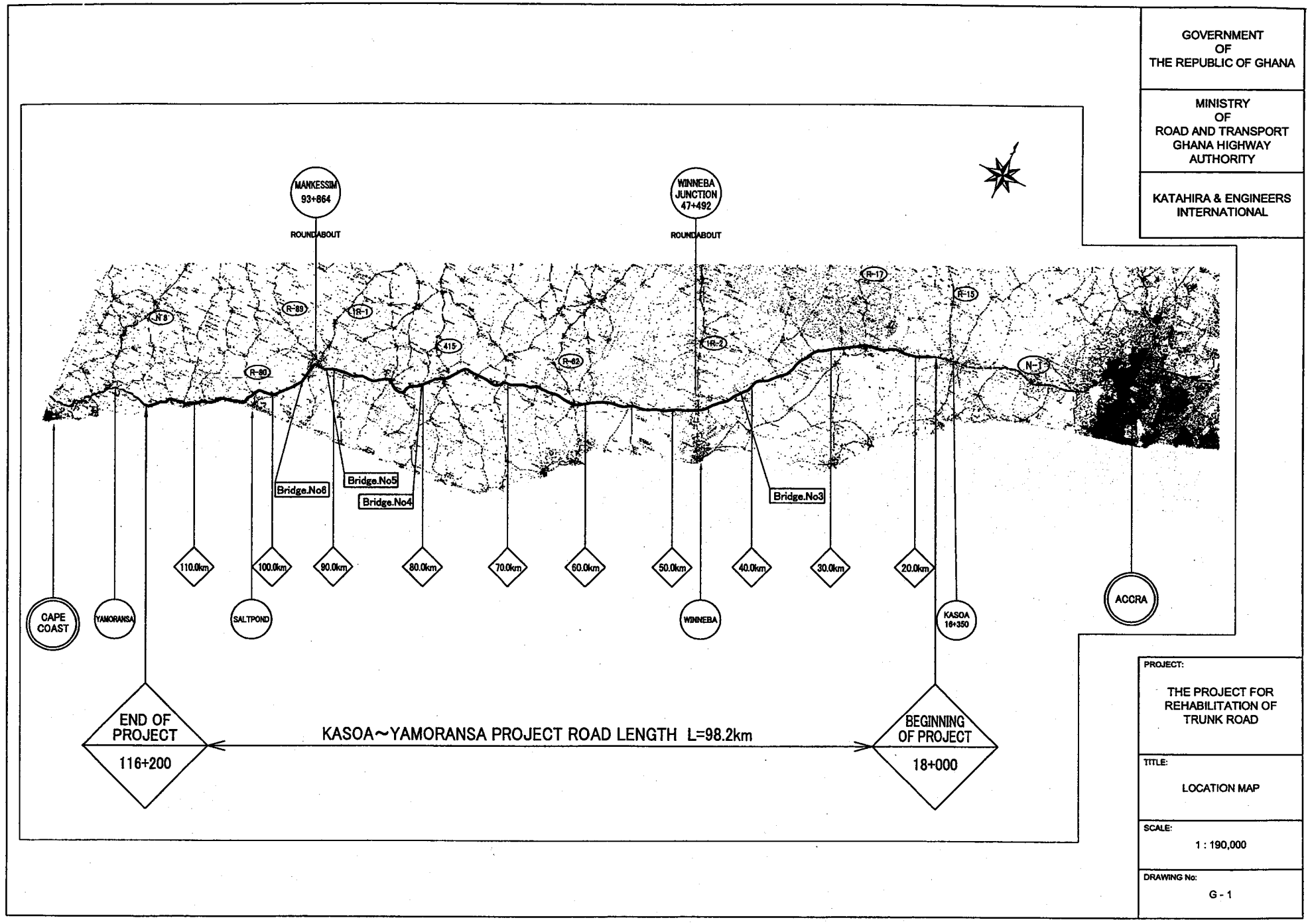
2.2.3 Basic Design Drawing

The followings are the basic design drawings for the whole project road, including:

- Location Map (1 page)
- Key Plans (3 pages)
- Typical Cross Sections (5 pages)
- Plans and Profiles (83 pages)
- General Plans of Roundabouts (2 pages)



Location Map of Project Road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40.0km
30.0km
20.0km
CAPE
COAST
YAMORANSA
SALTPOND
WINNEBA
KASOA
16+350
ACCRA
END OF
PROJECT
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THE PROJECT FOR
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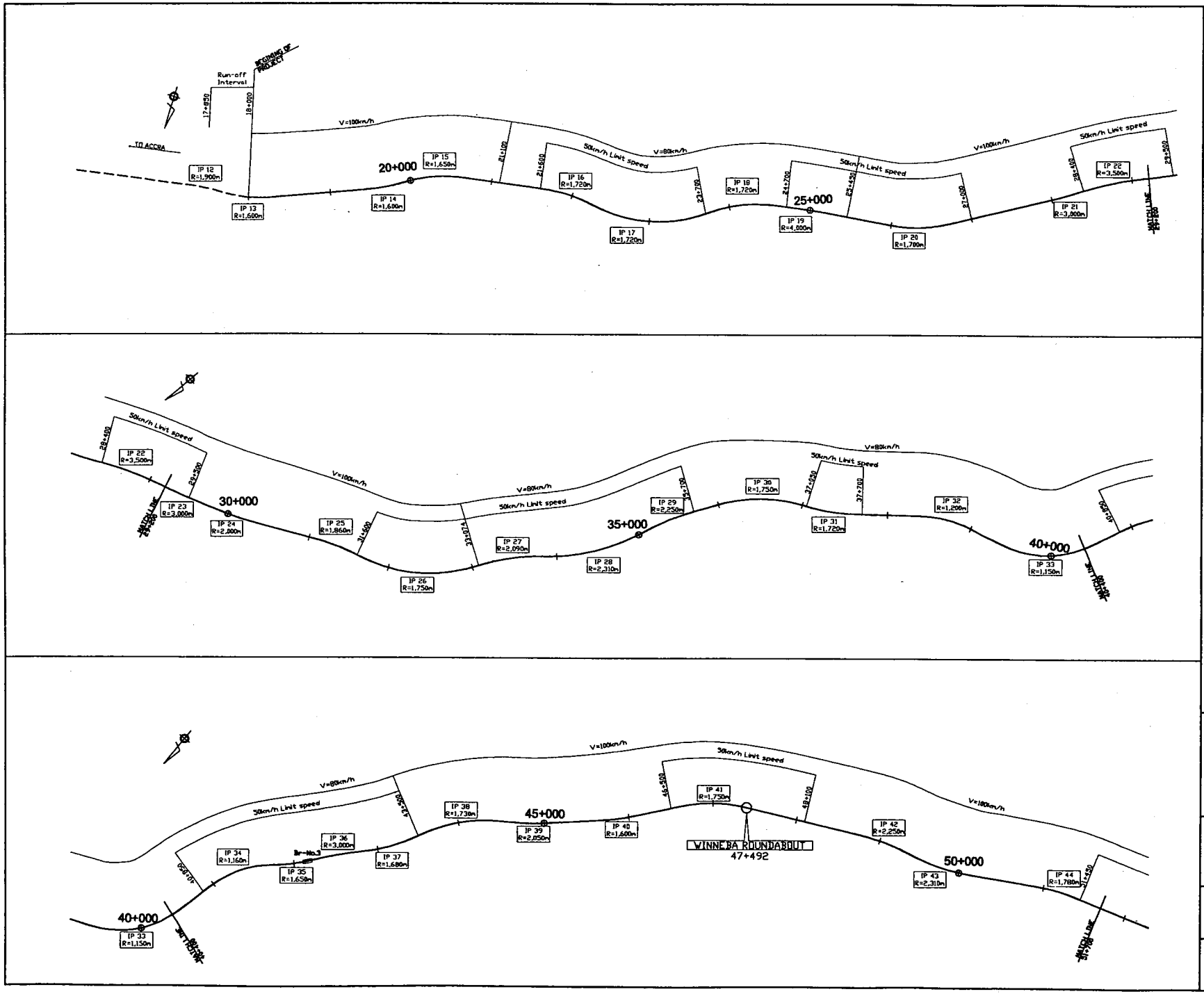

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INTERNATIONAL

NOTES:
1. V=00km/h
represents design speed.

PROJECT:
THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:
KEY PLAN (1/3)

SCALE:
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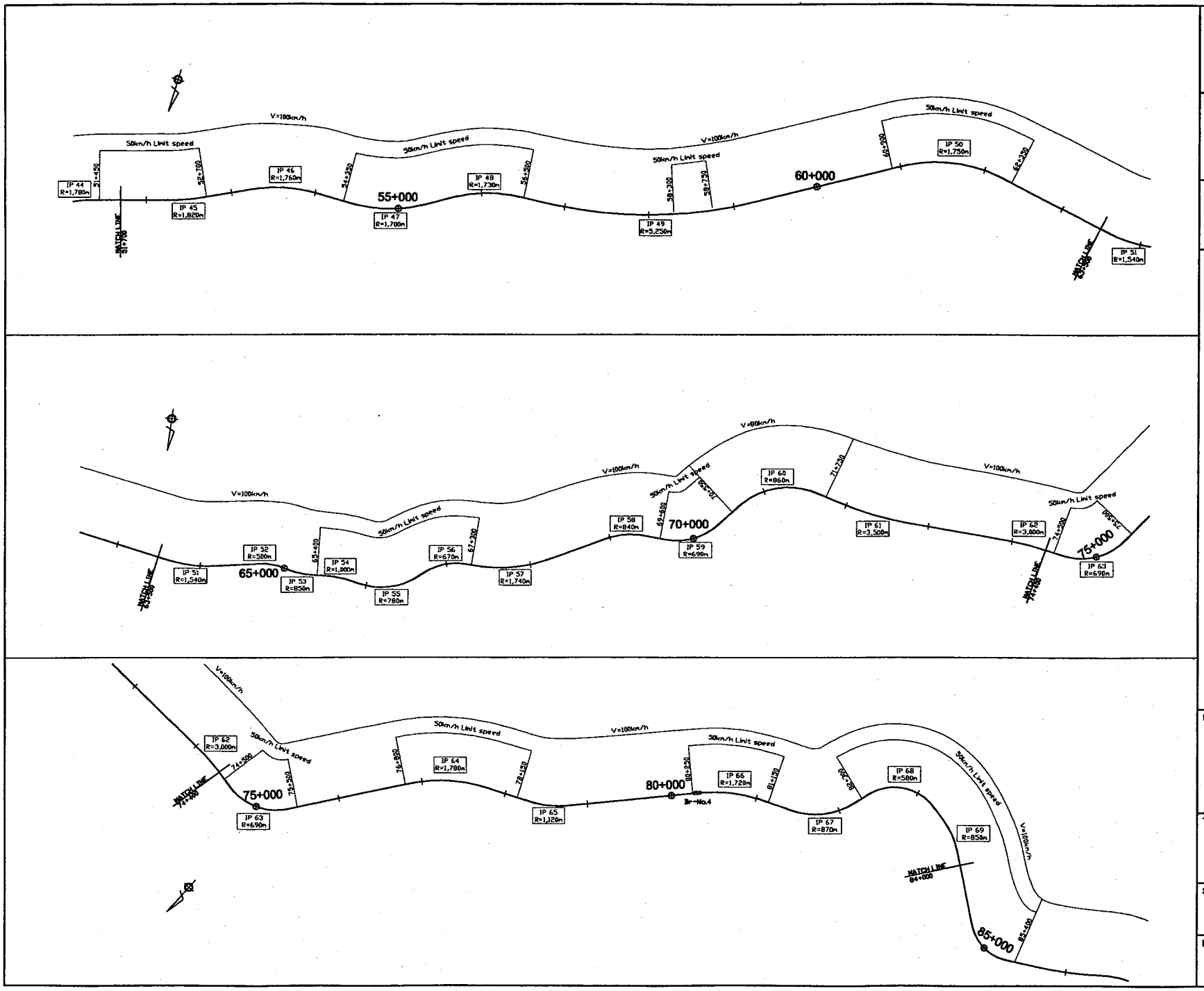


GOVERNMENT OF THE REPUBLIC OF GHANA

MINISTRY OF ROAD AND TRANSPORT GHANA HIGHWAY AUTHORITY

KATAHIRA & ENGINEERS INTERNATIONAL

PROJECT:

THE PROJECT FOR REHABILITATION OF TRUNK ROAD

TITLE:

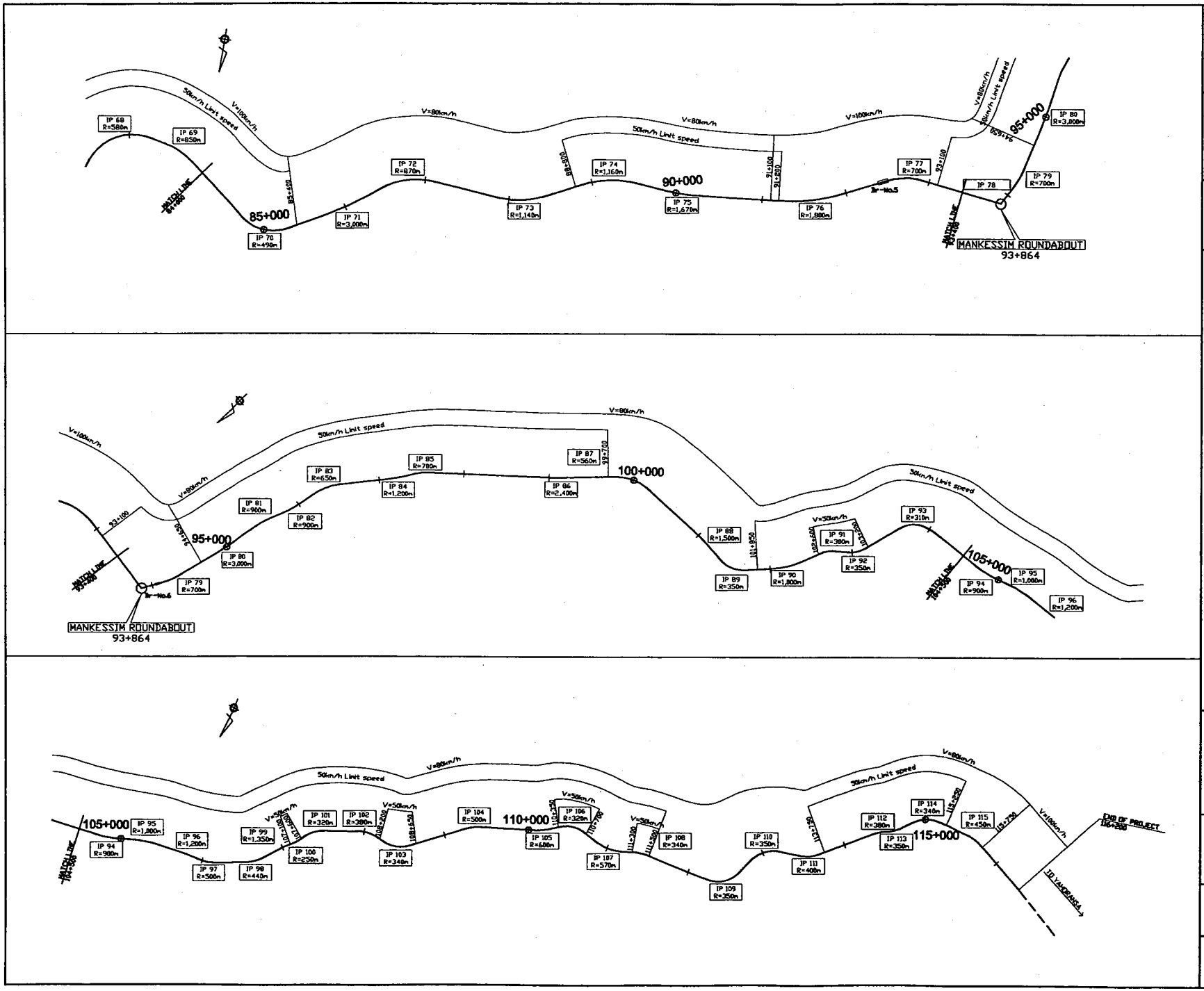
KEY PLAN (2/3)

SCALE:

1:20000

DRAWING No:

G - 3



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PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

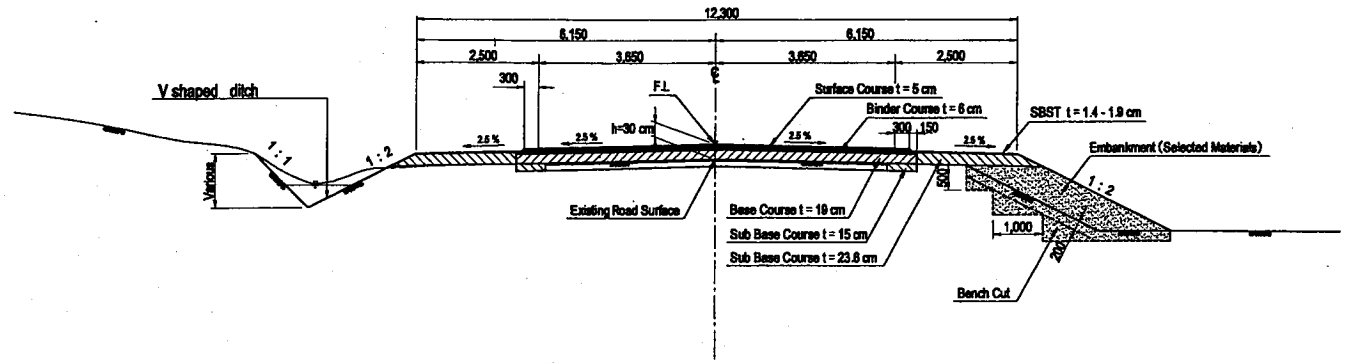
KEY PLAN (3/3)

SCALE:

1:20000

DRAWING No:

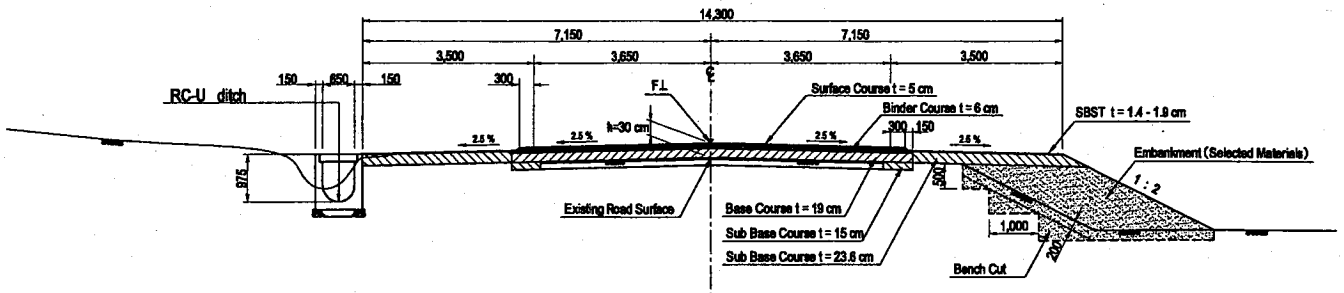
G - 4



TYPE - 1R (Section at Rural Areas)

18+000～48+000

(OVERLAY - 1)



TYPE - 1P (Section at Populated Areas)

18+000～48+000

(OVERLAY - 1)

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INTERNATIONAL

PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

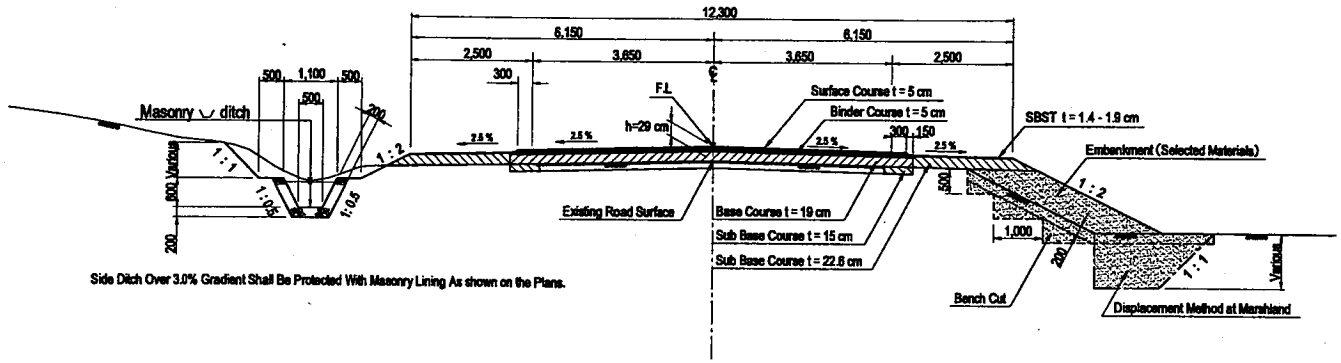
TYPICAL CROSS SECTION
1 / 5

SCALE:

1 : 50

DRAWING No:

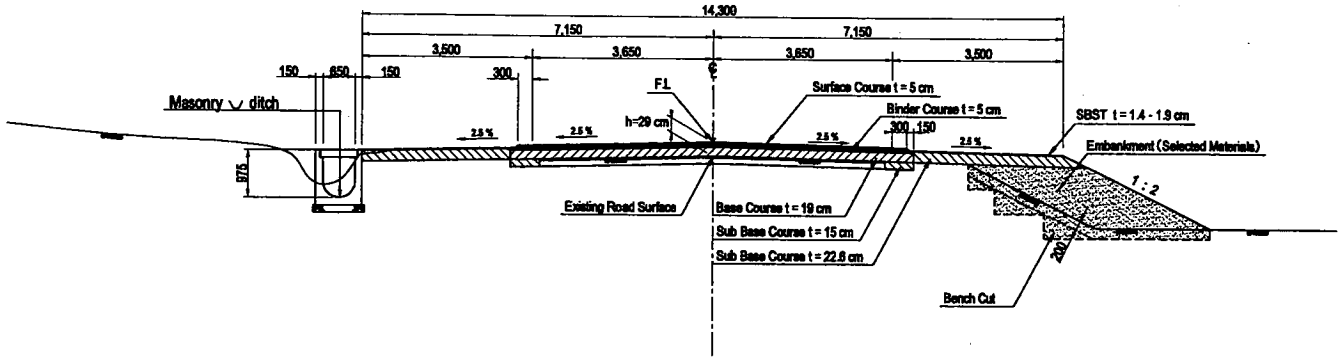
G - 5



TYPE - 2R （Section at Rural Areas）

48+000～94+060

（OVERLAY - 2）



TYPE - 2P （Section at Populated Areas）

48+000～94+060

（OVERLAY - 2）

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PROJECT:

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REHABILITATION OF
TRUNK ROAD

TITLE:

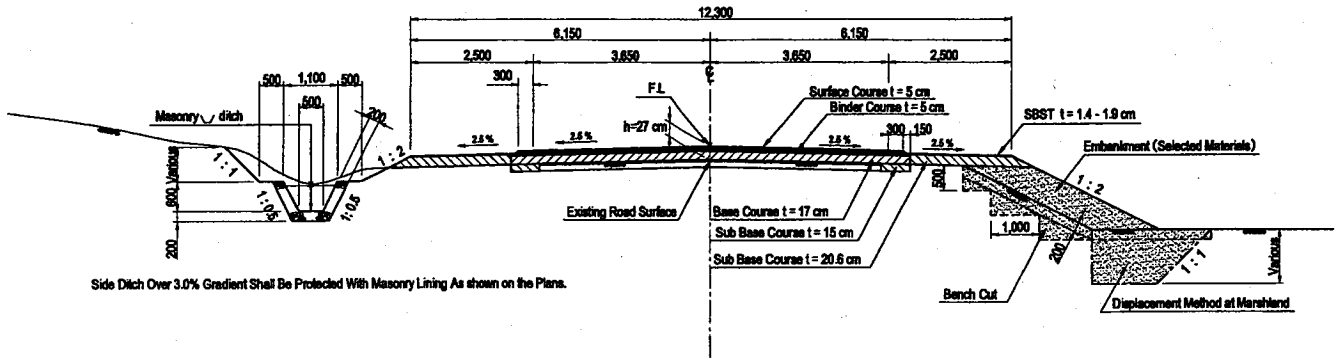
TYPICAL CROSS SECTION
2 / 5

SCALE:

1 : 50

DRAWING No:

G - 6

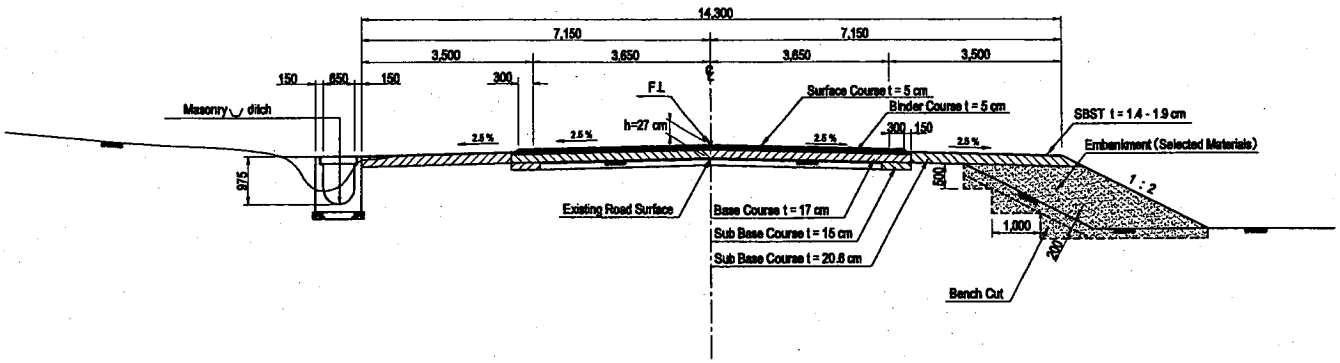


Side Ditch Over 3.0% Gradient Shall Be Protected With Masonry Lining As shown on the Plans.

TYPE - 3R (Section at Rural Areas)

94+060～116+200

(OVERLAY - 2)



TYPE - 3P (Section at Populated Areas)

94+060～116+200

(OVERLAY - 2)

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PROJECT:

THE PROJECT FOR REHABILITATION OF TRUNK ROAD

TITLE:

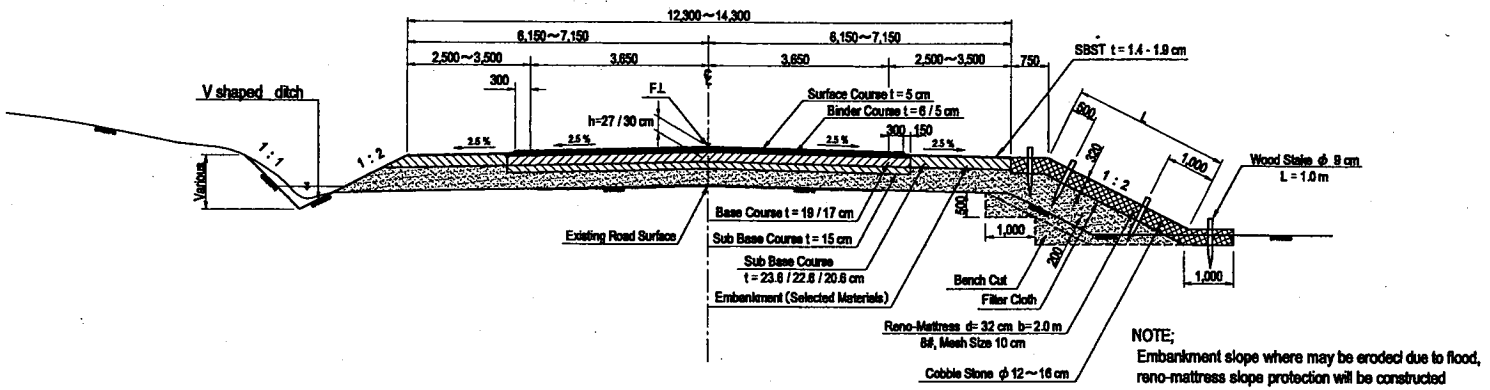
TYPICAL CROSS SECTION 3 / 5

SCALE:

1 : 50

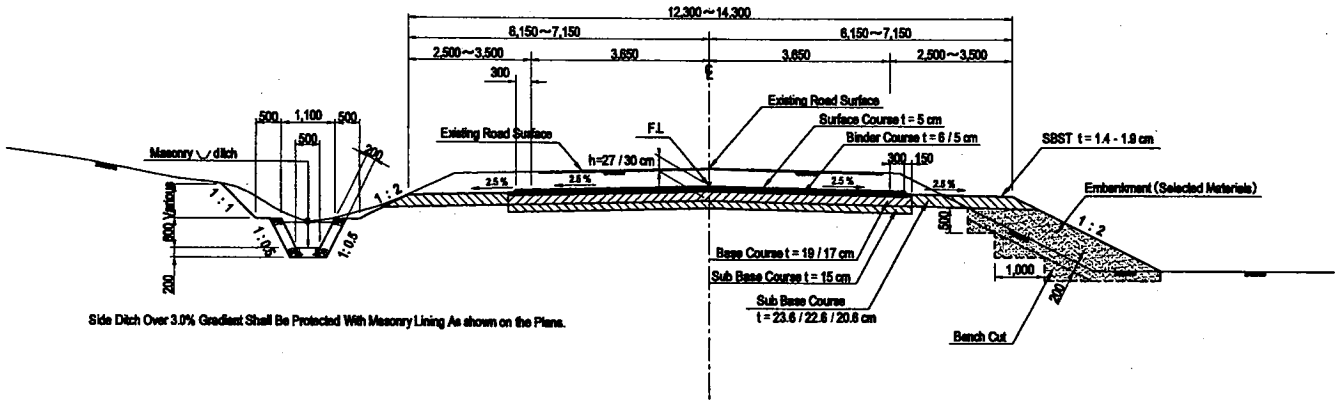
DRAWING No:

G - 7



TYPE - 4 (Section at Fill Areas)

(RECONSTRUCTION)



TYPE - 5 (Section at cut Areas)

(RECONSTRUCTION)

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PROJECT:
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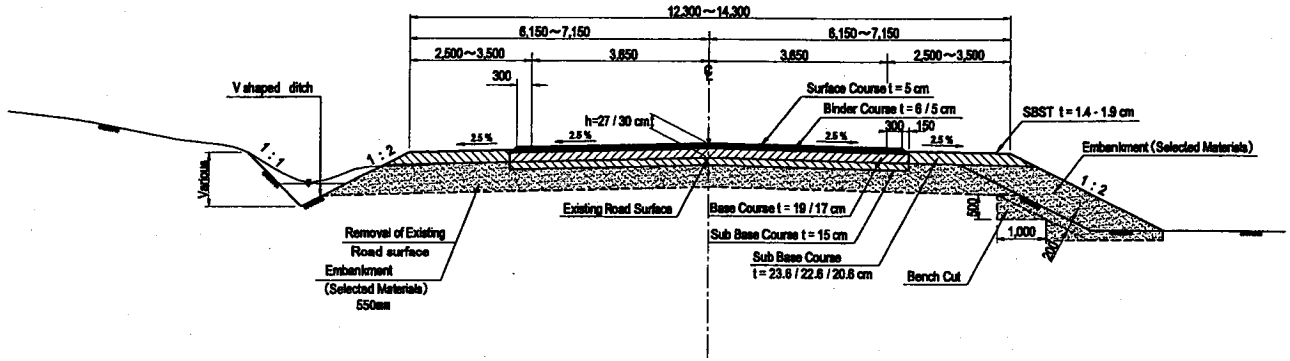
REHABILITATION OF
TRUNK ROAD

TITLE:
TYPICAL CROSS SECTION
4 / 5

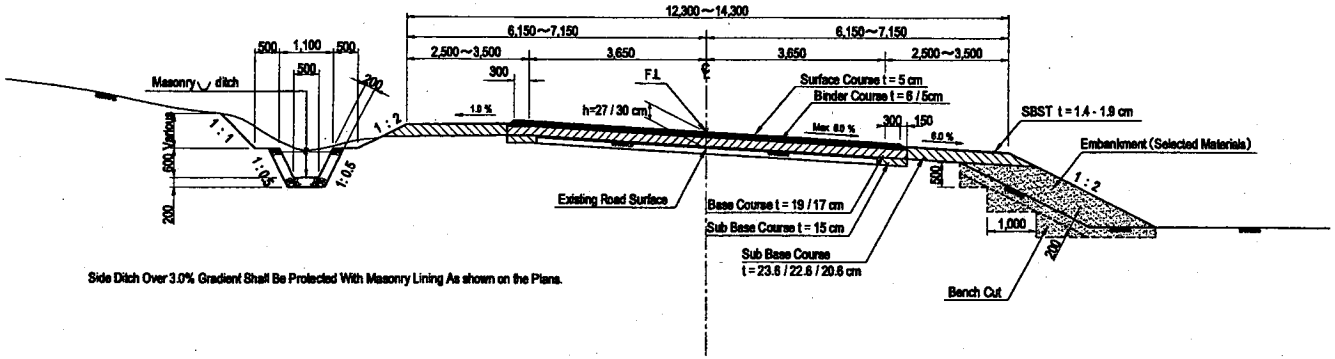
SCALE:
1 : 50

DRAWING No:
G - 8



TYPE - 6 (Section at soft Ground)

(RECONSTRUCTION WITH REPLACEMENT)



Side Ditch Over 3.0% Gradient Shall Be Protected With Masonry Lining As shown on the Plans.

TYPE - 7 (Section at Superelevation Areas)

(RECONSTRUCTION)

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PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

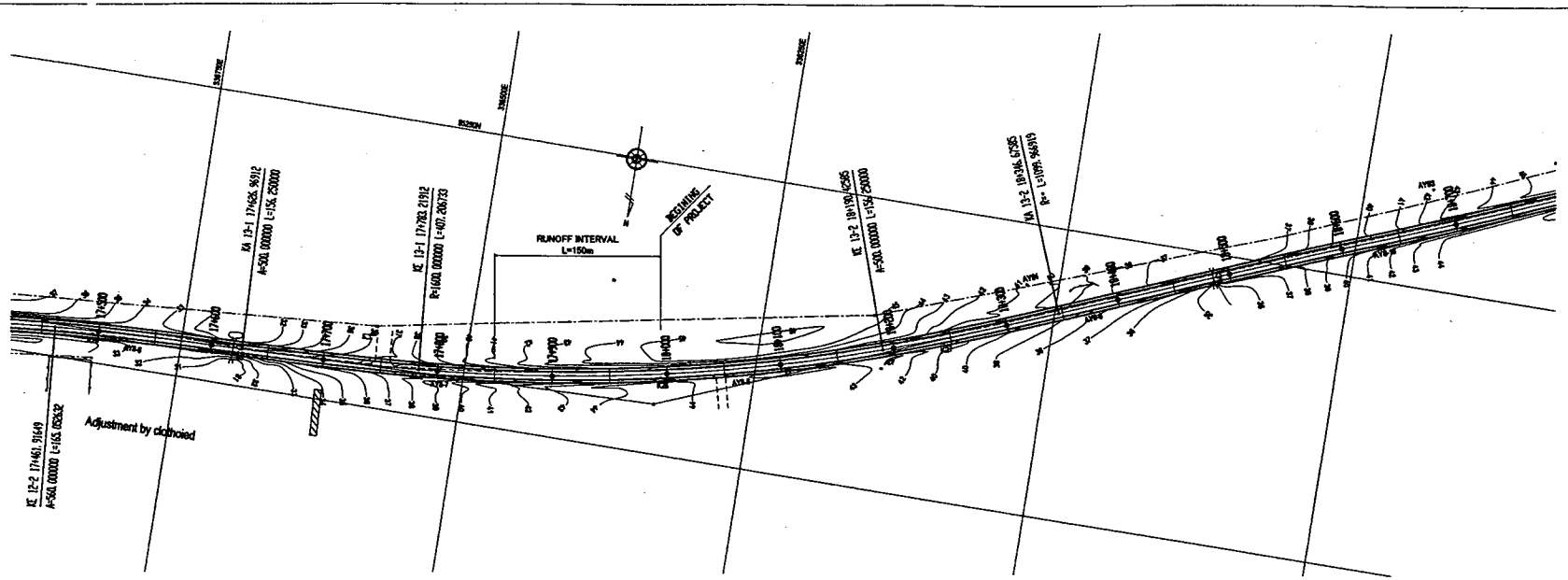
TYPICAL CROSS SECTION
5 / 5

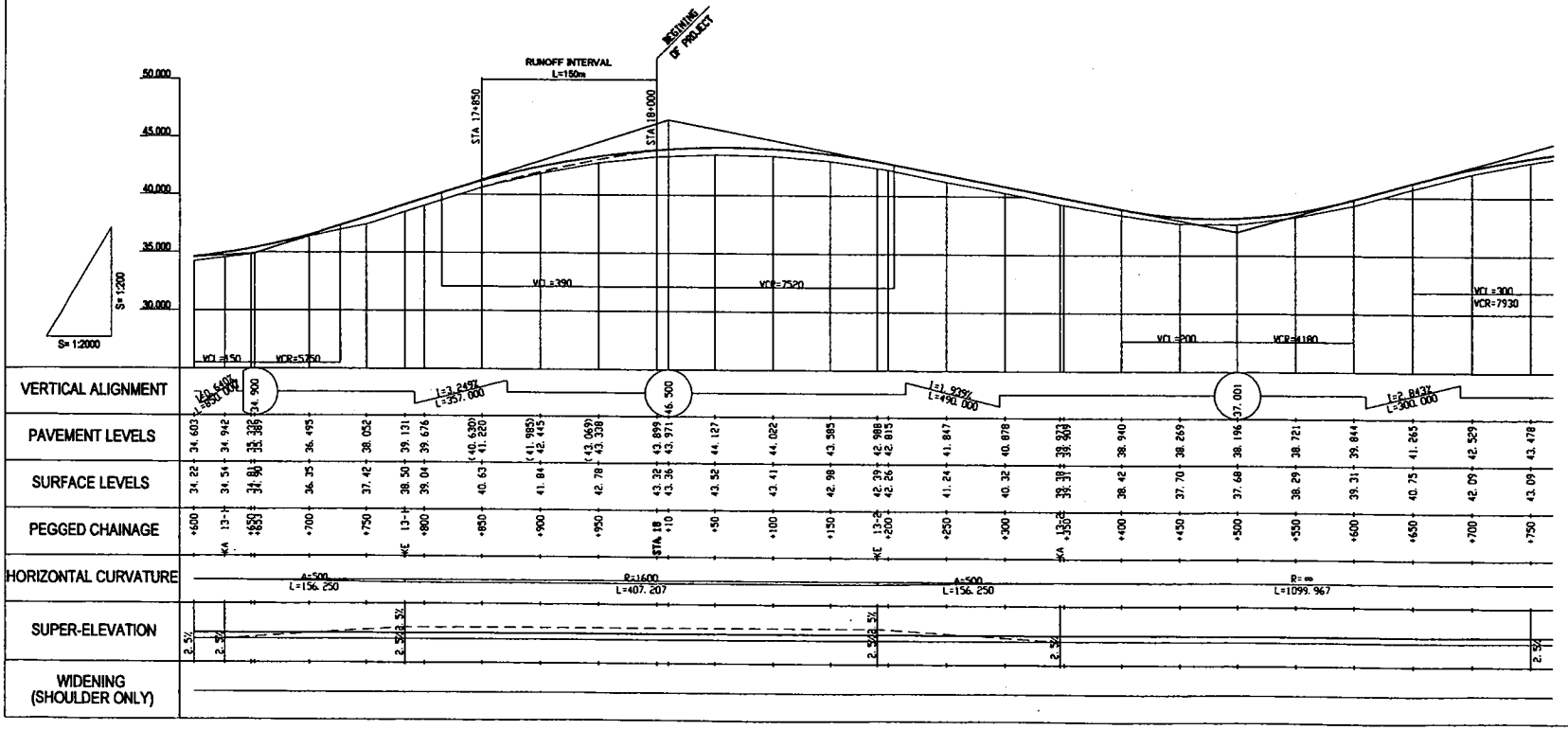
SCALE:

1 : 50

DRAWING No:

G - 9





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NOTES:

Numbericals inside brackets represent elevation of run off interval.

PROJECT:

THE PROJECT FOR REHABILITATION OF TRUNK ROAD

TITLE:

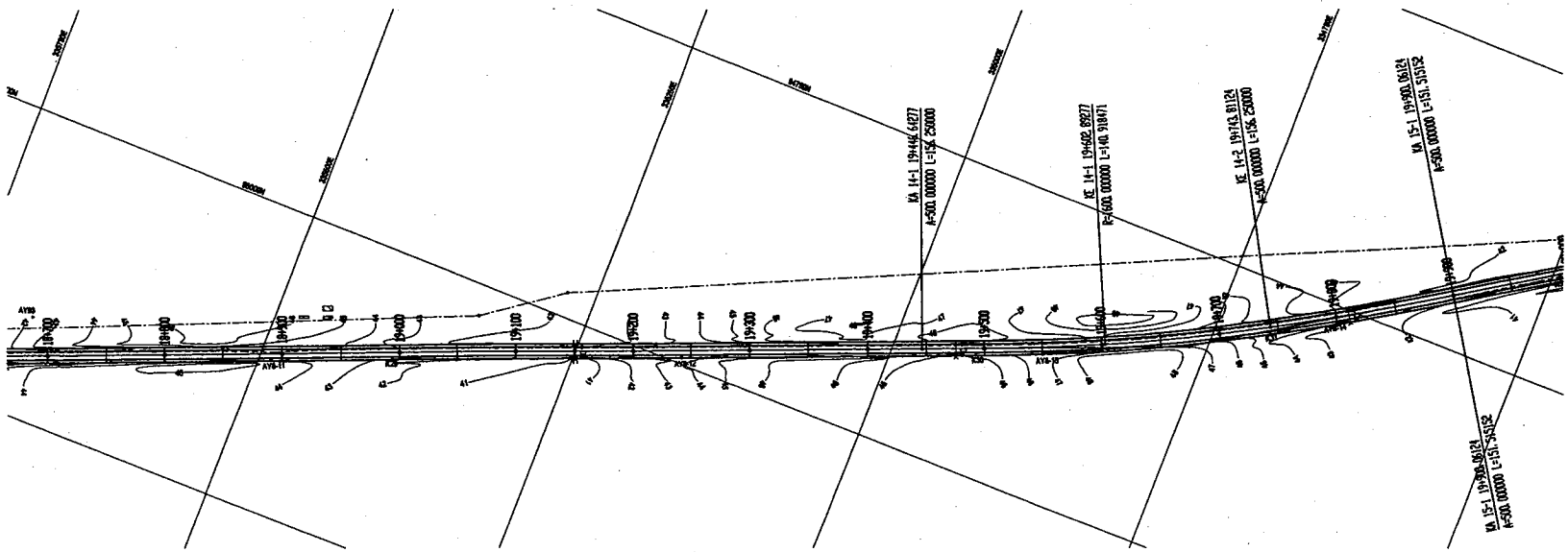
PLAN AND PROFILE (1/83)

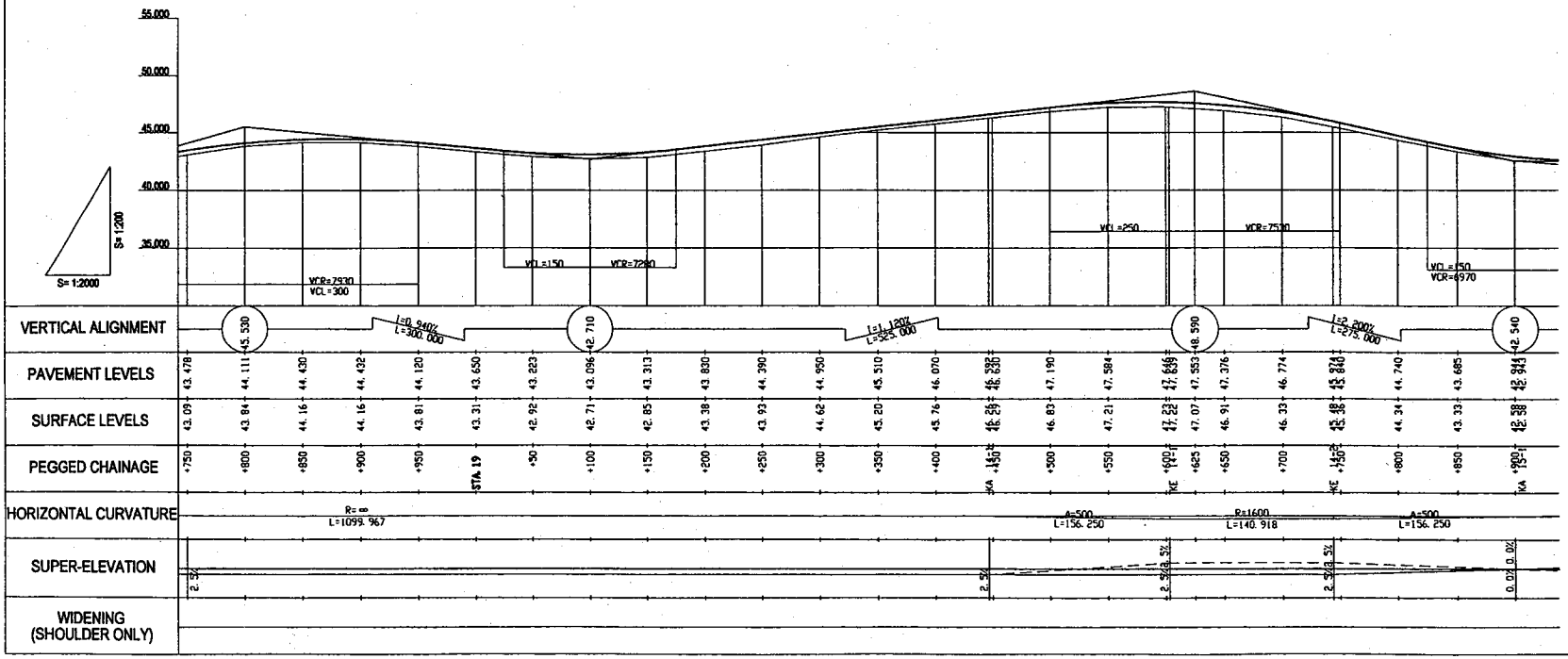
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-01





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PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

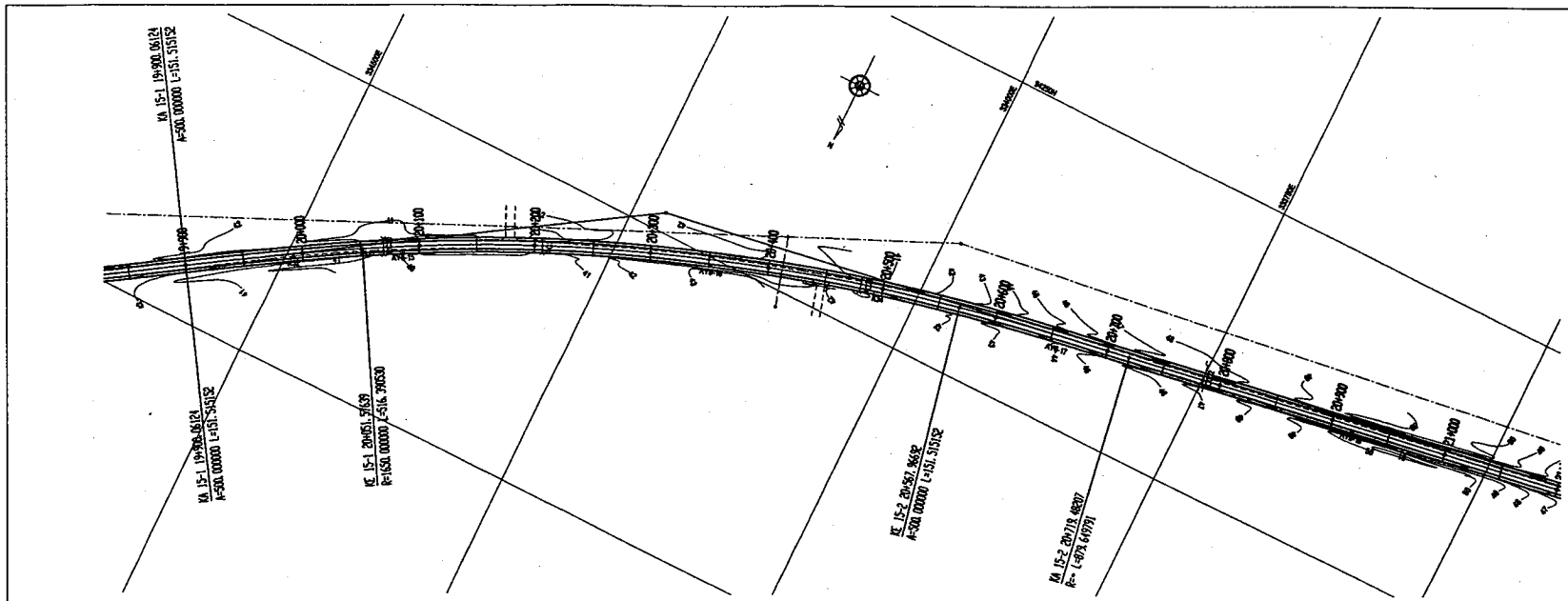
PLAN AND PROFILE (2/83)

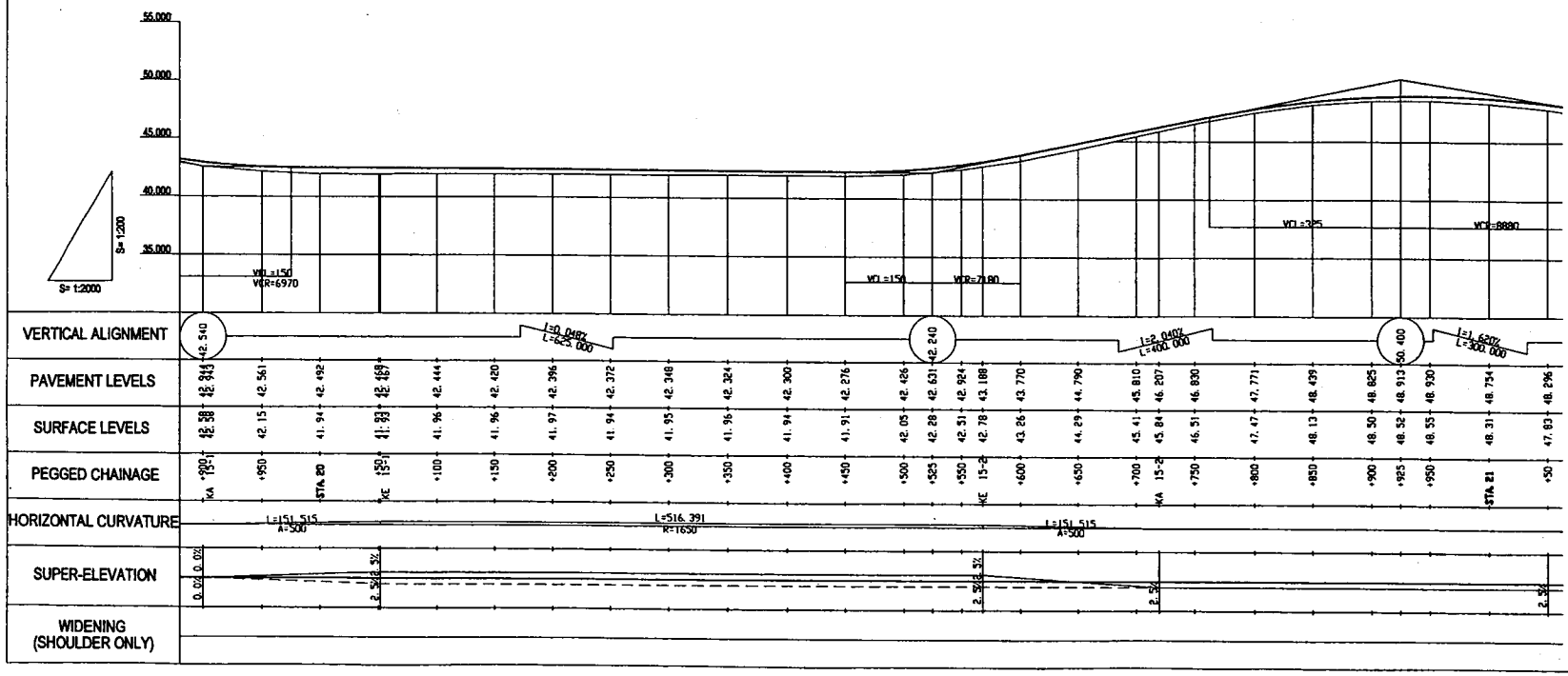
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-02





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PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

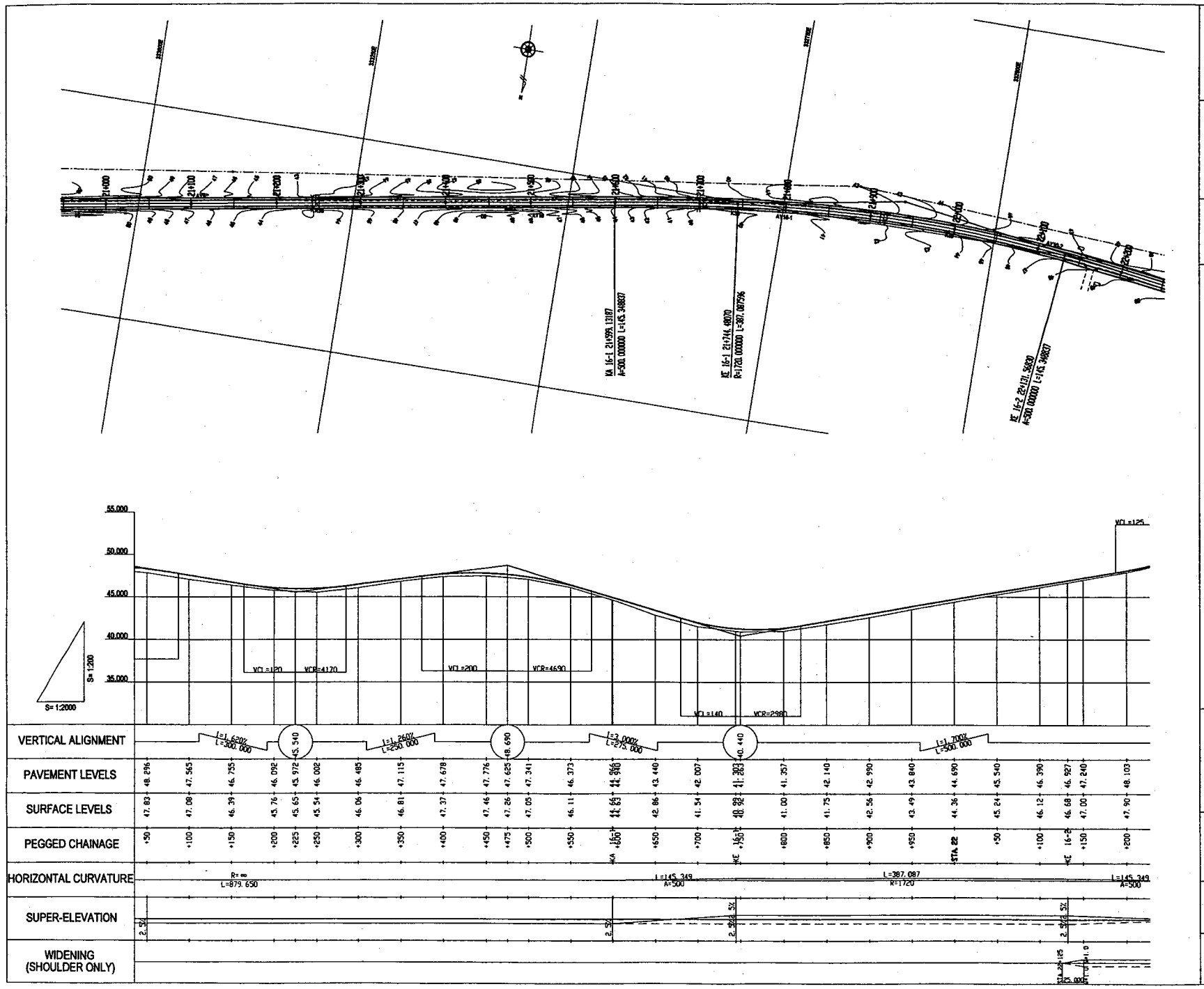
PLAN AND PROFILE (3/83)

SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-03



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PROJECT:

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TRUNK ROAD

TITLE:

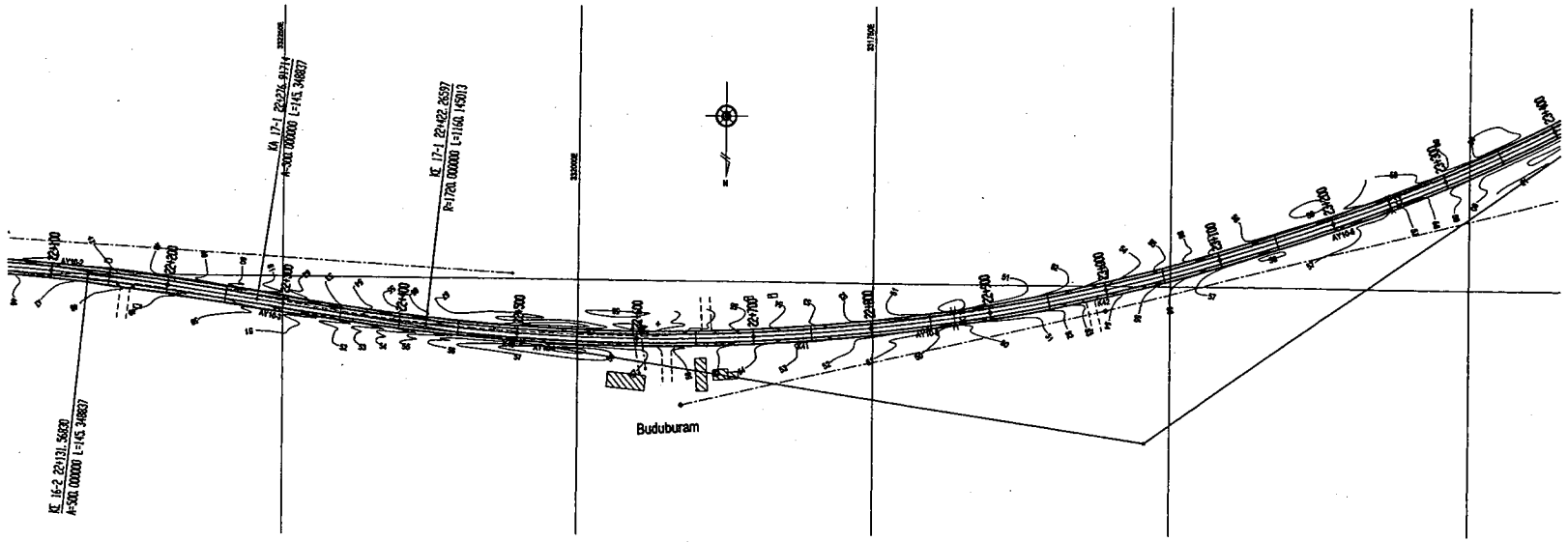
PLAN AND PROFILE (4/83)

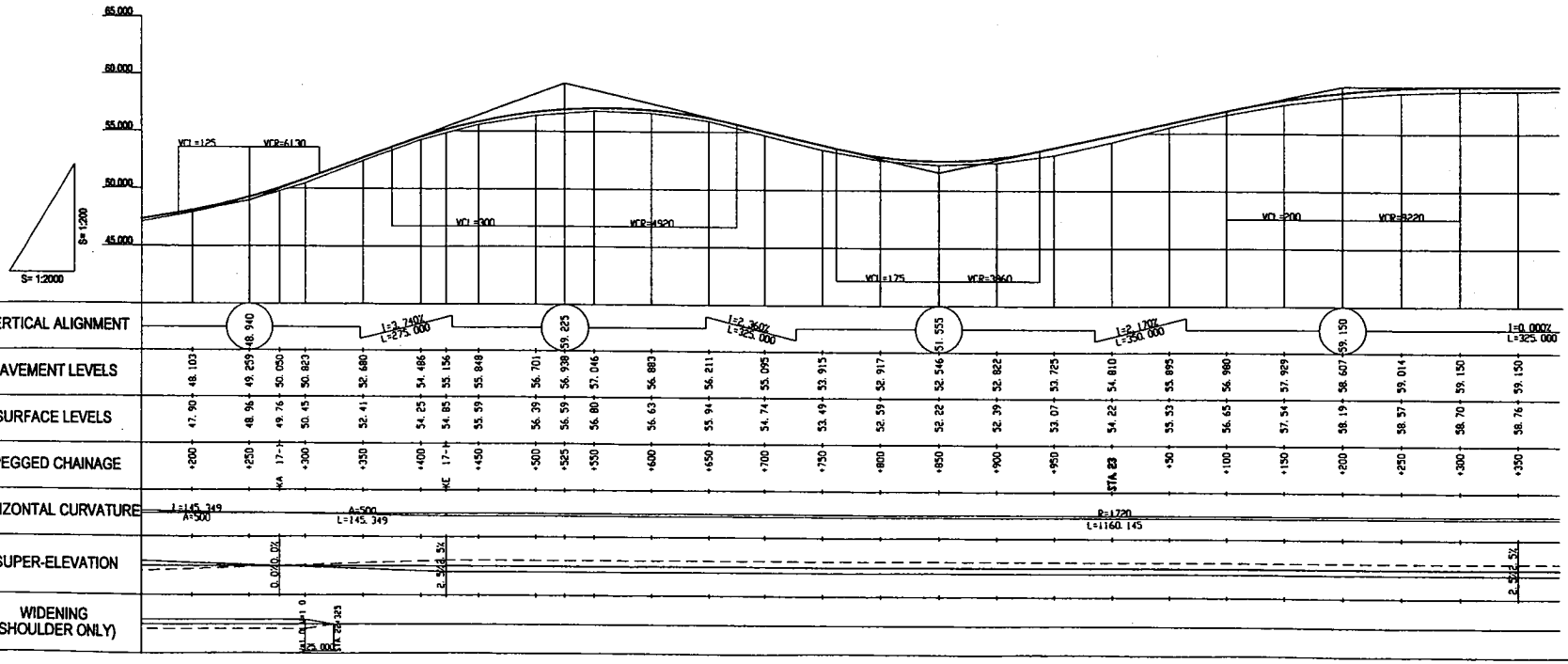
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-04





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PROJECT:

THE PROJECT FOR REHABILITATION OF TRUNK ROAD

TITLE:

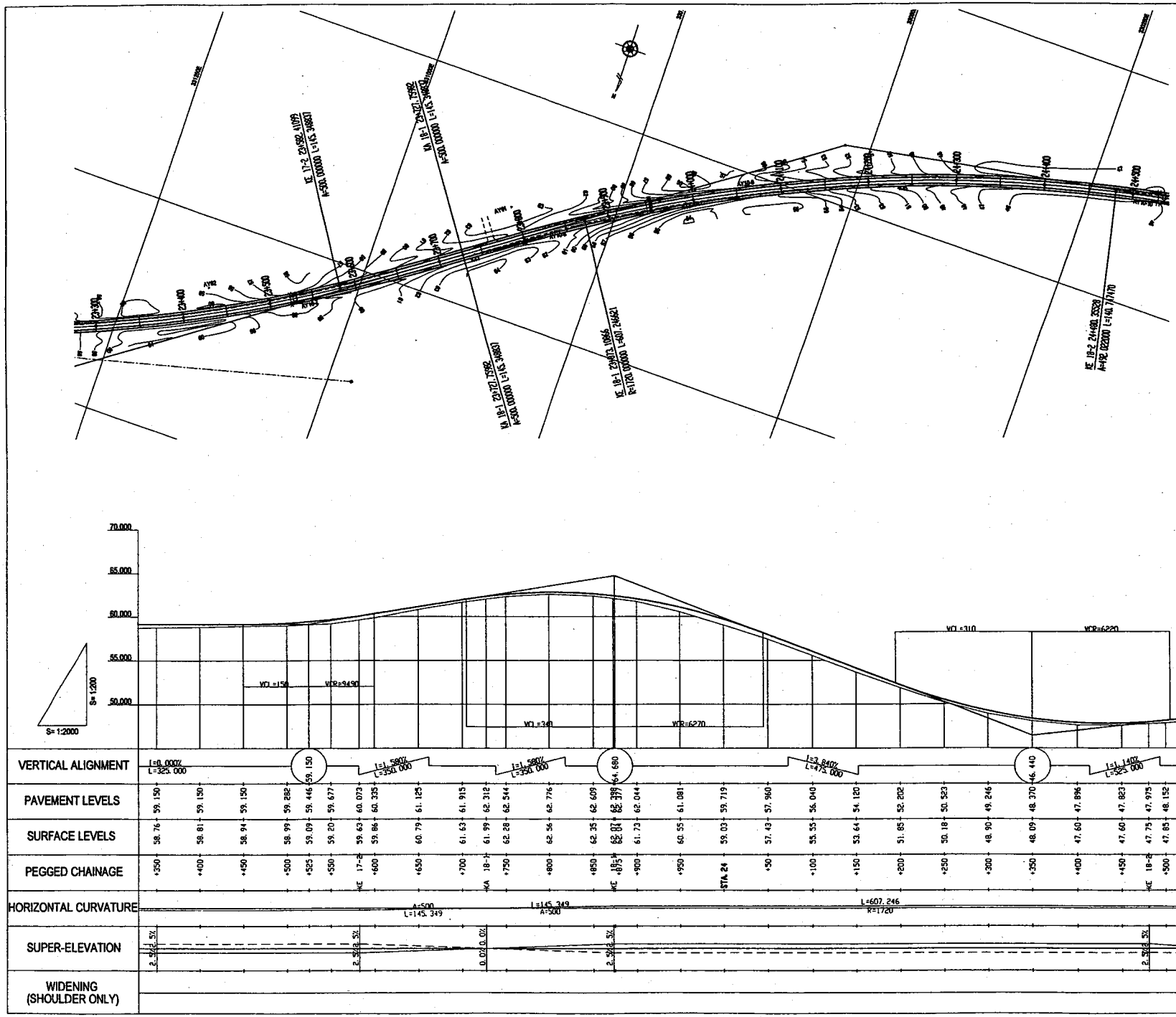
PLAN AND PROFILE (5/83)

SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-05



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PROJECT:

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TRUNK ROAD

TITLE:

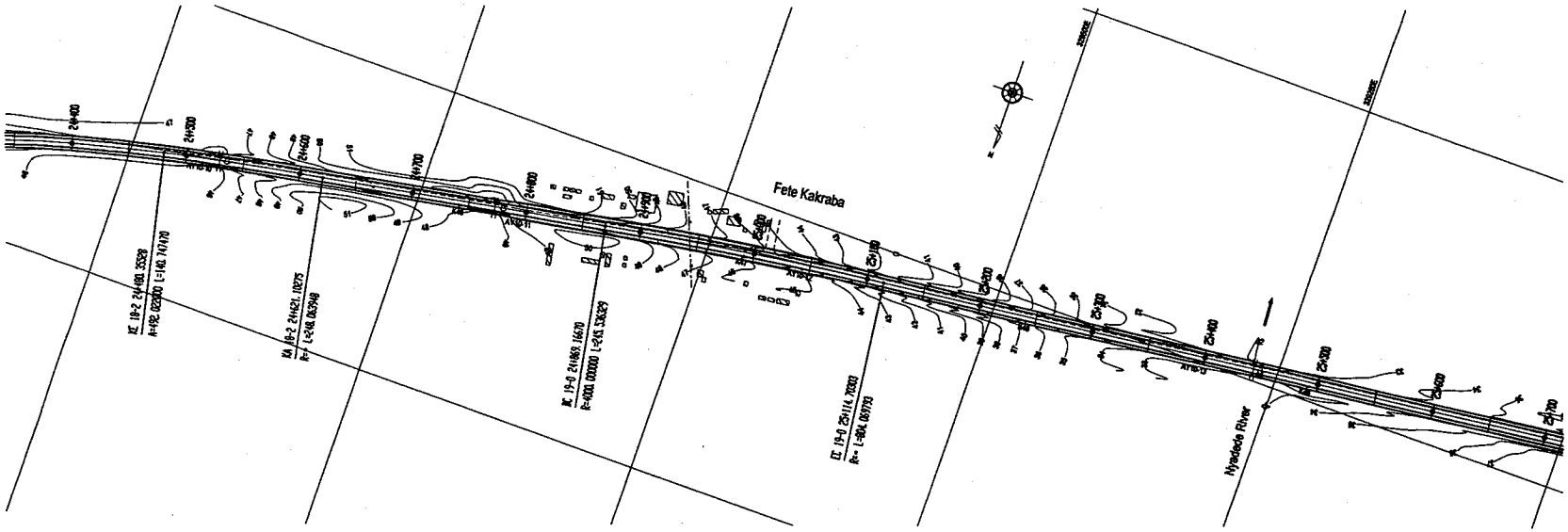
PLAN AND PROFILE (6/83)

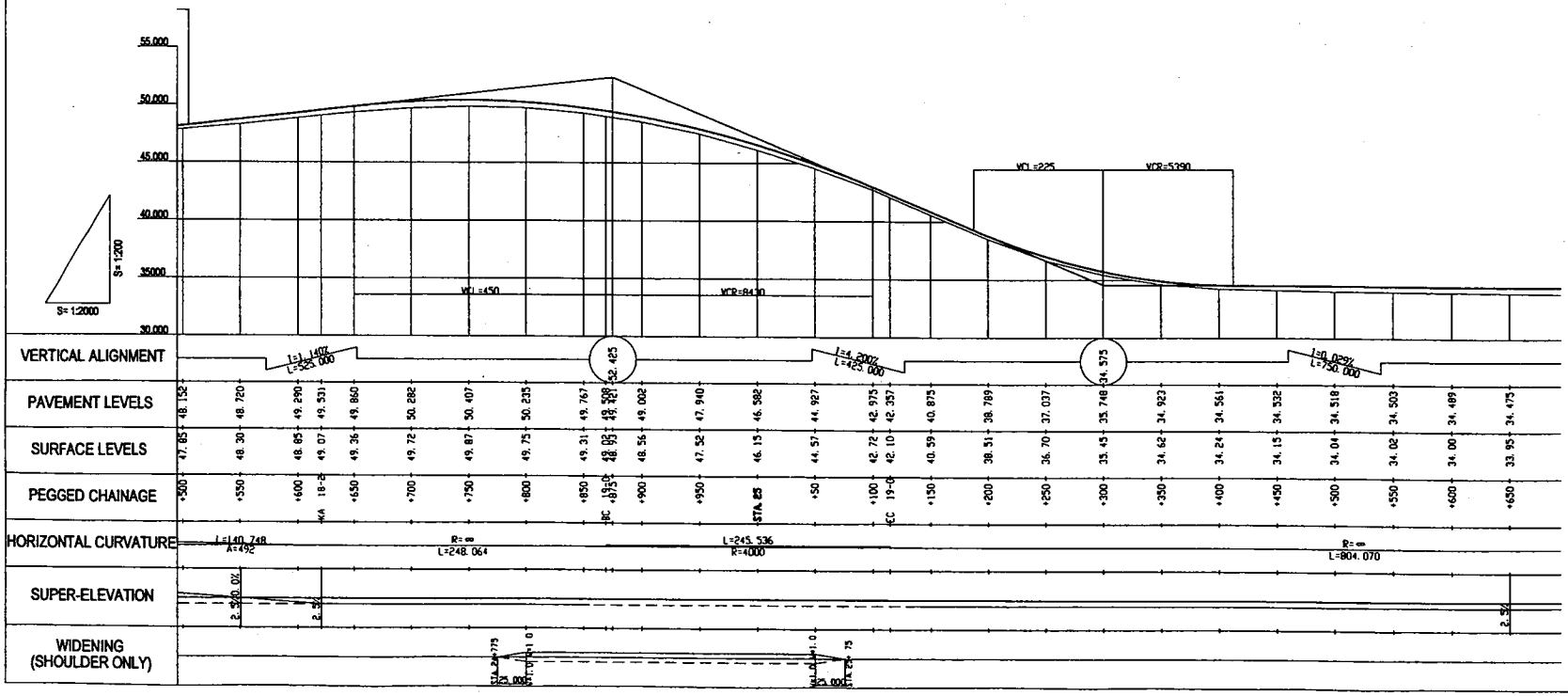
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-06





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NOTES:

PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

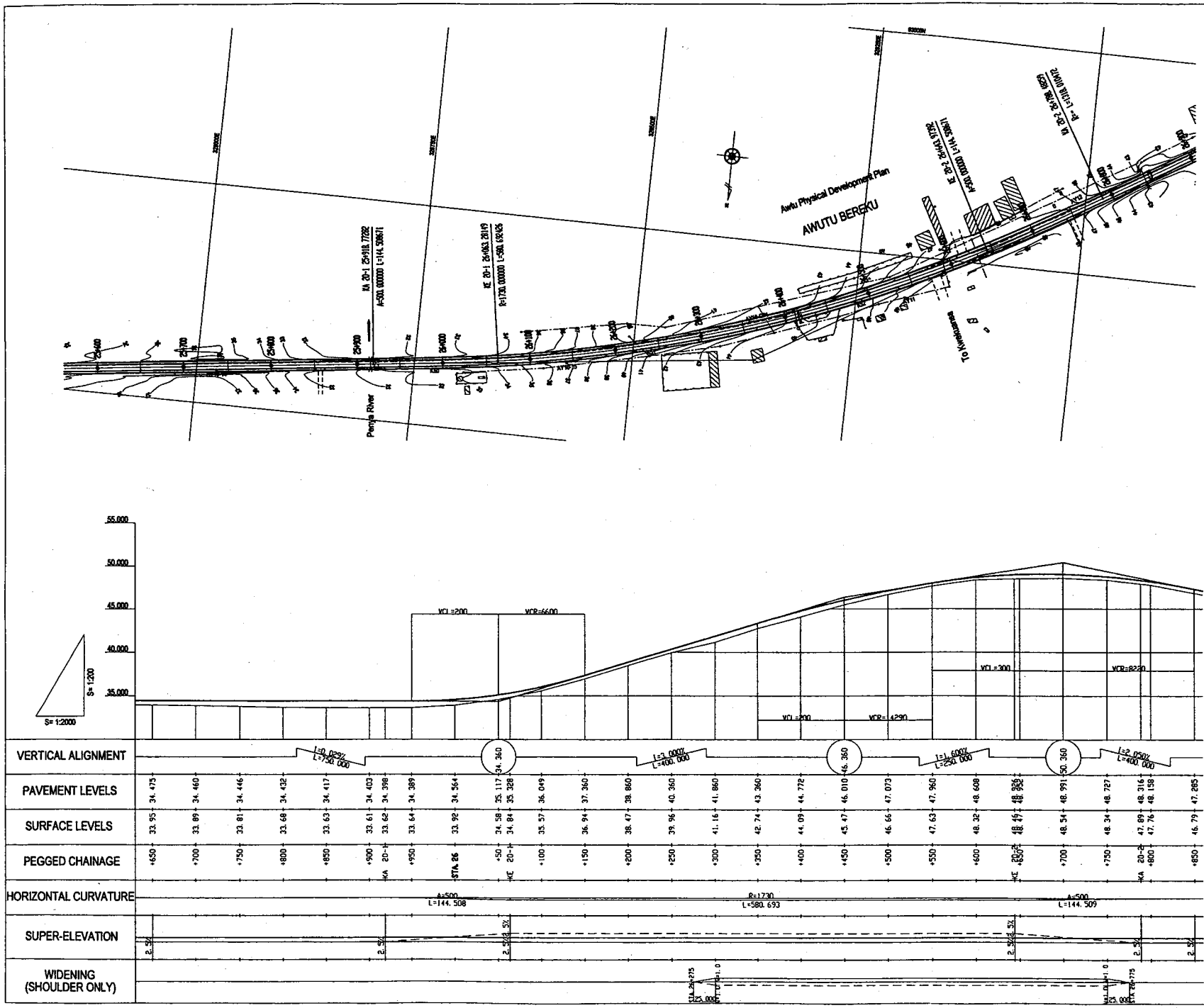
PLAN AND PROFILE (7/83)

SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-07



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NOTES:

PROJECT:

THE PROJECT FOR REHABILITATION OF TRUNK ROAD

TITLE:

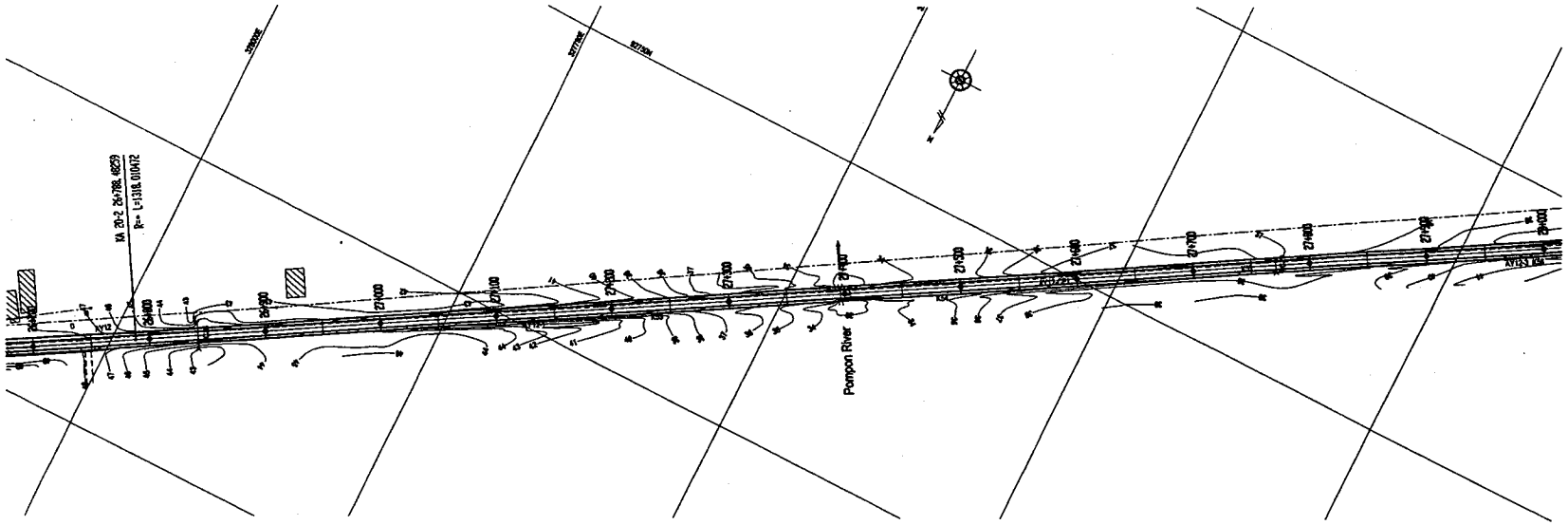
PLAN AND PROFILE (8/83)

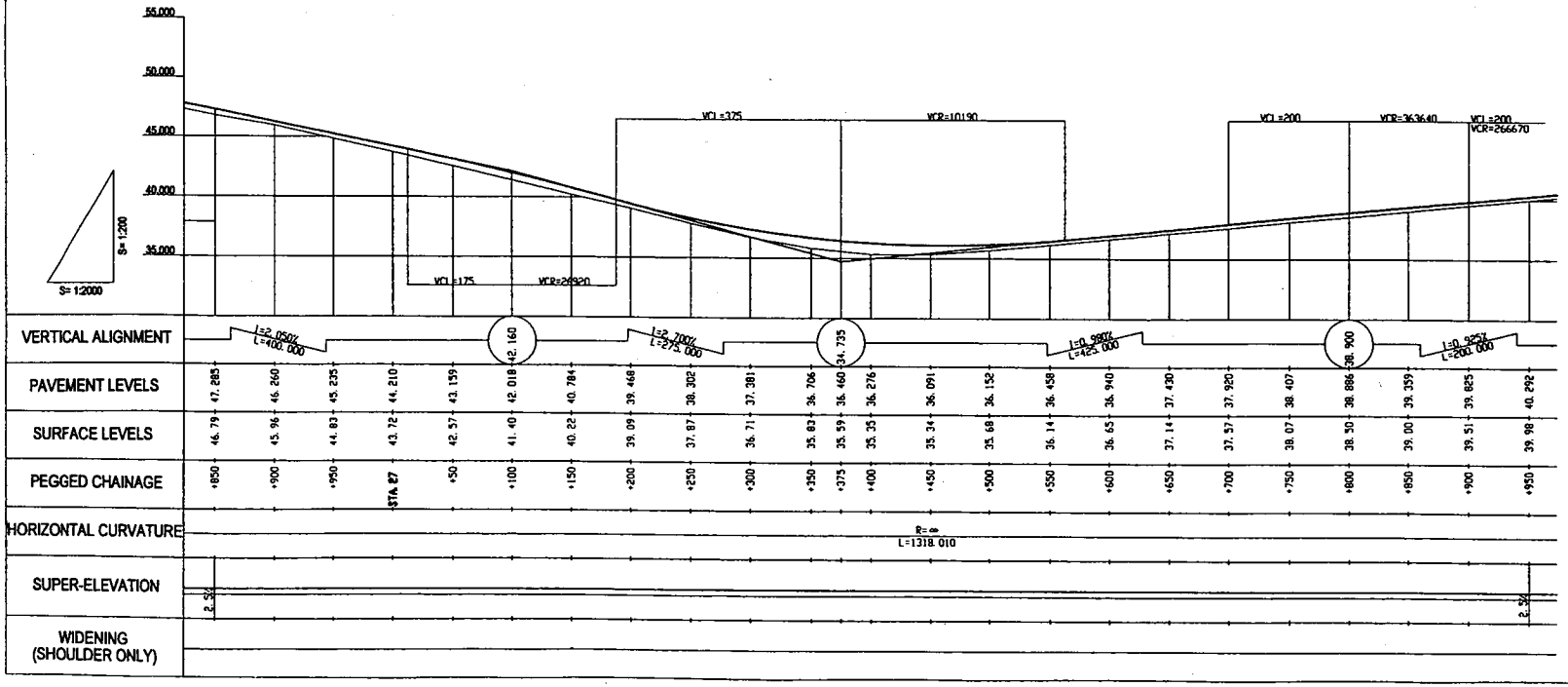
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-08





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NOTES:

PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

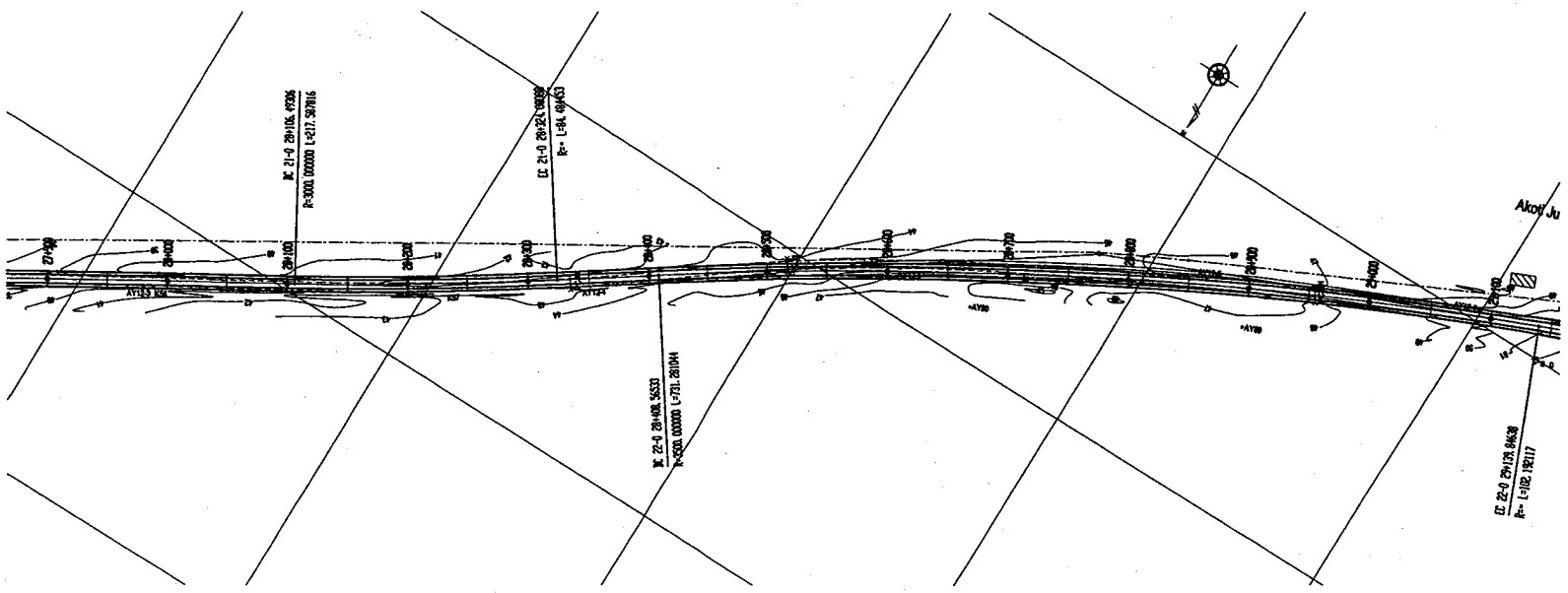
PLAN AND PROFILE (9/83)

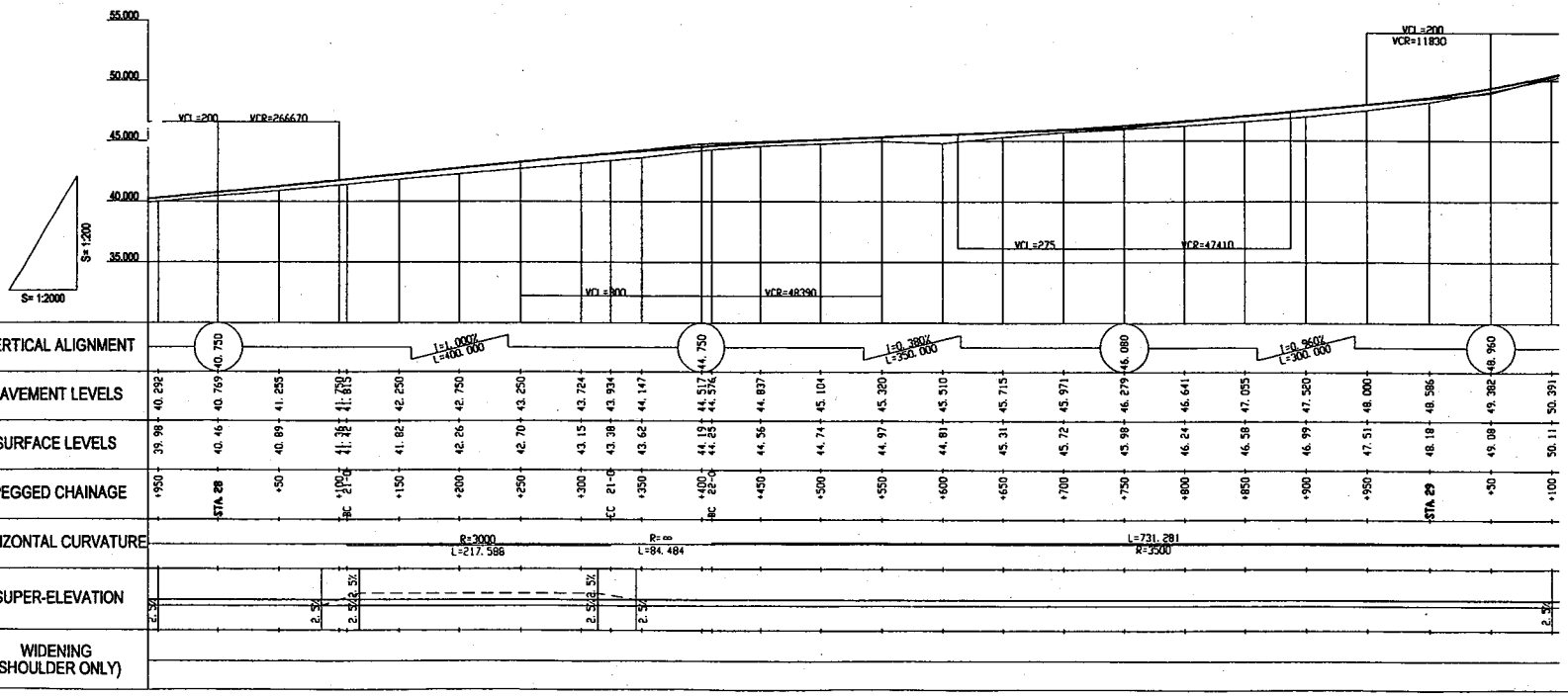
SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-09





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NOTES:

PROJECT:

THE PROJECT FOR
REHABILITATION OF
TRUNK ROAD

TITLE:

PLAN AND PROFILE (10/83)

SCALE:

V = 1:200
H = 1:2000

DRAWING No:

PL-10