*DATED the 10th MAY 1984*

*D.O. NO. RW/PL-30(68)/82 ADDRESSED TO SHRI D.P. GHOSH, CHIEF ENGINEEER (N.H.), P.W. (ROAD DIRECTORATE CALCUTTA, SHRI H.M. SHAH CHIEF ENGINEER (N.H.), PWD., GANDHINAGAR*

Kindly refer to the demi-official letter of even No. dated 20th January 1984 from the Director General (Road Development) and Addl. Secretary addressed to the Secretary of the State Govt. and copy endorsed to you regarding road and bridge projects proposed under the World Bank Aid. This was followed by demi-official letter of even No. dated 1st Feb., 1984 wherein you were requested to furnish alignment proposals and the estimate for land acquisition, wherever necessary. I hope suitable action has been taken by you in this regard.

I now enclose the proposed geometric standards and cross section of expressway for guidance in the project preparation work.

*A BRIEF NOTE ON EXPRESSWAYS*

An Expressway is a divided arterial Highway intended for through traffic with full control of access and generally provided with grade separations at intersections. No slow moving traffic or pedestrians will be permitted on Expressways.

**The grade separations may be provided with or without interchanges, depending upon the importance of the cross-road. The need for interchanges shall be established after careful study of traffic flow.**

Interchanges are of several types such as :—

- Trumpet Interchange
- Y — Interchange
- Diamond Interchange
- Clover leaf Interchange
- Directional Interchange
- Rotary Interchange

The selection of a particular type should be carefully done after traffic surveys.

*GEOMETRIC DESIGN STANDARDS OF EXPRESSWAY (Flat Terrain)*

| | | | |
|---|---|---|---|
| 1. | Design speed (KPH) | : | 120 |
| 2. | Land Width (Metres) | : | 90 — extra to be provided where warranted |
| 3. | Building lines (Metres) | : | 10 metres beyond Right of Way |
| 4. | Roadway width (Metres) | | |
| | — For 4 lane divided carriageway | : | 27 |
| | — For 6 lane divided carriageway | : | 34 |
| | — On culverts | : | Same as for road section. |
| 5. | Carriageway Width (Metres) | | |
| | — 4 lane divided carriageway | : | 2 × 7.5 |
| | — 6 lane divided carriageway | : | 2 × 11 |
| 6. | Shoulder width (Metres) | | |
| | — Treated shoulder | : | 2.5 |
| | — Untreated shoulder | : | 1.0 |
| | — Total width | : | 3.5 |
| 7. | Median width (Metres) | : | 6 |
| 8. | Camber (per cent) | | |
| | — Carriageway | : | 2.5 |
| | — Treated shoulder | : | 3.0 |
| | — Untreated earth shoulder | : | 4.0 |

9. Sight Distance (Metres)
   - — Safe stopping sight distance (Minimum) : 250
   - — Desirable : 500

10. Radius of horizontal curve (m) : Min : 700, Desirable 2600
    (This radius requires no super-elevation & normal crown section will suffice)

11. Superelevation : As per formula $e = \frac{V^2}{225\ R}$
    Subject to a maximum of 4%

12. General notes on Horizontal alignment :
    (i) Long tangent sections exceeding 6 km. should be avoided.
    (ii) Broken-back curves should be avoided or at least separated by 500 metres straight length.
    (iii) Minimum curve length should be 150 metres for 5° deflection angle and increased at the rate of 30 m for 1° decrease thereafter.

13. Length of transition curve (metres) : $\frac{0.0215\ V^3}{CR}$ Where C = 0.5
    V-the design speed and
    R-the radius of circular curve.

14. Maximum gradient
    - — Ruling : 1 in 50
    - — Absolute : 1 in 40

15. Summit & valley curves (metres) : To be designed for sight distance mentioned at S. No. 9 and minimum length = 0.6 V

16. Vertical profile : 1 m clearance between HFL and subgrade.

17. Clearance through road over passes : Vertical; 6 metres.
    Horizontal : Same normal Section of expressway to continue.

18. Design standards for inter-change elements.

(i) Speed, sight distance and radius :

| | Design speed (KPH) | Radius (m) | Stopping sight distance (m) |
|---|---|---|---|
| Desirable | 80 | 230 | 130 |
| Minimum | 60 | 130 | 80 |

(The direct ramps/diagonal connections should be designed for the desirable design speed and the design speed of loops may be near the minimum)

(ii) Maximum grade (per cent) : Desirable — 4
Absolute — 6

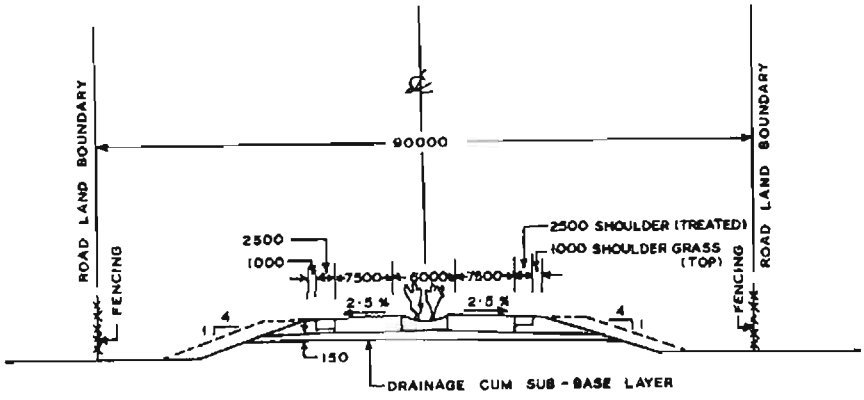
(iii) Summit & valley curves (metre) : To be designed as per stopping sight distances formulae and minimum lingth = 0.6V

(iv) Cross section elements :
   a) carriageway :
      Desirable — 2 lanes
      Minimum — Intermediate lane
   b) Shoulder : 2 metres each

(v) Length of speed change lanes (m)

| | Ramp/loop speed | |
|---|---|---|
| | 80 KPH | 60 KPH |
| Accleration lane | 300 | 400 |
| Deceleration Lane | 130 | 150 |

308 · 8




**TYPICAL CROSS SECTION OF EXPRESSWAY**

NOTES :— 1. ALL DIMENSIONS ARE IN MM.

2. DOTTED LINES INDICATE FUTURE EXTENSION