

**Supplementary Guidelines for Design of End-details
of
W-beam and Concrete Profile Barriers**

With a view to further improving road safety, the principles for design of end-details of thrie-beam barrier fence should be adopted for W-beam and concrete profile barriers on expressways and roads with posted speed limit of 70km/h and above. An end of W-beam / concrete profile barrier constituting a hazard to the road users should be treated according to one of the following means whenever possible :

- (a) Flaring the end of barrier away from carriageway and ending it beyond the clear-zone

In this case, W-beam barrier can be anchored using the typical anchor block (HyD Standard Drawing No. H 2122) according to Drawing No. TB-30. Concrete profile barrier may be ended with a sloped end treatment according to Drawing No. TB-31.

- (b) Extending the barrier to connect with adjacent uphill slope, retaining wall, barriers or parapets

Connect with an adjacent uphill slope or retaining wall

For W-beam, its end can be ended using the typical anchor block (HyD Standard Drawing No. H 2122) and then blended into an adjacent slope as shown on Drawing No. TB-25. Where there is a retaining wall, the W-beam end can be connected to a thrie-beam barrier and anchored onto the wall according to Drawing No. TB-24.

For concrete profile barrier, the end can be blended into an adjacent uphill slope according to Drawing No. TB-26. Where there is a retaining wall, the end of the concrete profile barrier should abut on the end of the retaining wall such that the vertical surface of the barrier will flush with the surface of the retaining wall (depression between the barrier and the wall should be smoothed out using sand cement mortar).

Connect with an adjacent barrier or parapet

For a W-beam:

- i. If the adjacent barrier is a W-beam, then the two barriers can be smoothly connected.
- ii. If the adjacent barrier is a thrie-beam or a double thrie-beam, then the W-beam end can be connected to the thrie-beam on the traffic side according to HyD Standard Drawing No. H 2196.
- iii. If the adjacent barrier or vehicle parapet is a concrete profile barrier, concrete parapet or a steel parapet, then the W-beam end can be connected to a transition to thrie-beam and then anchored onto the adjacent barrier or vehicle parapet according to Drawing No. TB-24.

For a concrete profile barrier:

- iv. If the adjacent barrier is a concrete profile barrier, then the two barriers can be smoothly connected.
- v. If the adjacent barrier is a W-beam, then the adjacent W-beam end can be connected to a transition to thrie-beam and then anchored onto the concrete profile barrier according to Drawing No. TB-24.
- vi. If the adjacent barrier is a thrie-beam or a double thrie-beam, then the concrete profile barrier end can be connected to the adjacent barrier according to para. 15 of HQ/GN/10.
- vii. If the adjacent barrier is a steel parapet, then the barrier and the steel parapet can be ended according to Drawing No. TB-27.

(c) Provision of a crash cushion for the leading end of the barrier

If the above connection arrangements are not feasible due to site constraint, a crash cushion can be installed at the leading end of the barrier.

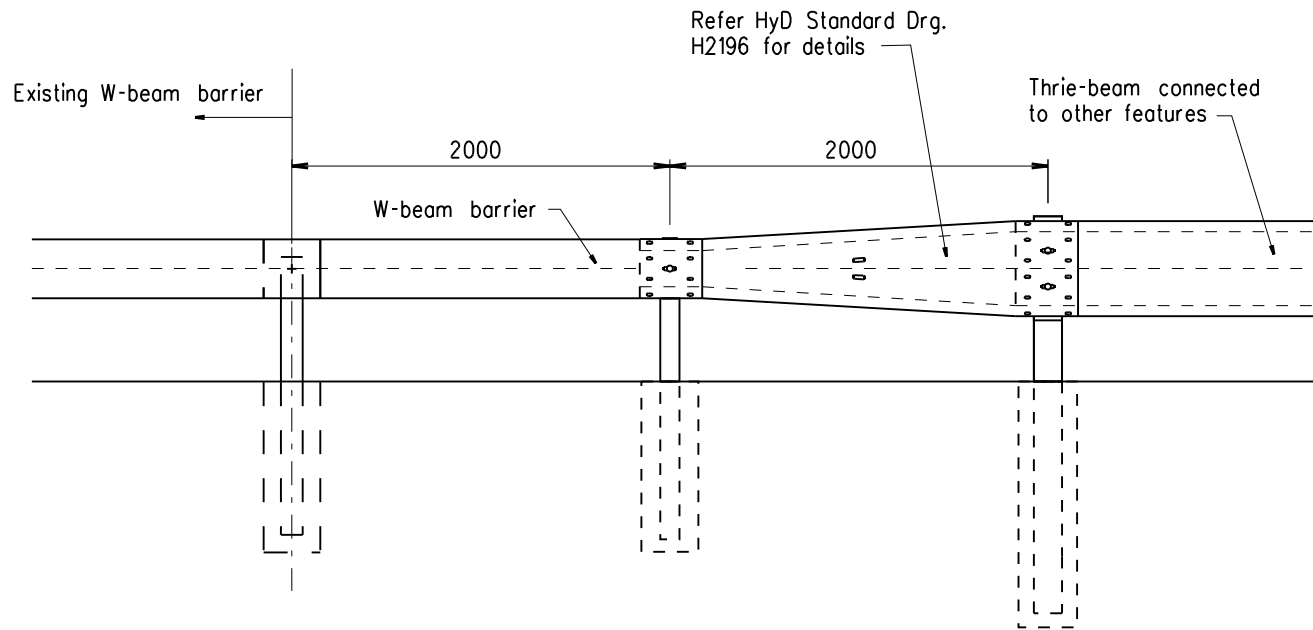
- (d) Extending the end of barrier to terminate at a road section with a lower posted speed limit

Where site situation allows, consideration can also be given to extending the barrier to end at a road section with posted speed limit lower than 70km/h to reduce the necessity of sophisticated end treatment.

2. Whilst these supplementary guidelines are for W-beams and concrete profile barriers on roads with posted speed limit of 70km/h or above, it is worth noting that no blunt end should be formed for any type of barriers regardless of the posted speed limit of the road.

3. Existing end arrangement of W-beam and concrete profile barrier, if not in compliance with the principles depicted in these guidelines, shall be modified according to these guidelines whenever resources and site conditions permit.

End



Refer to other reference drawings for connection with different features :

| Connected Feature | Reference drg. |
|-------------------------------|----------------|
| Concrete profile barrier | TB-07, TB-08 |
| Concrete vehicle parapet | TB-09, TB-10 |
| L1 / L2 Steel vehicle parapet | TB-11, TB-20 |
| Retaining wall | TB-17, TB-18 |

ELEVATION

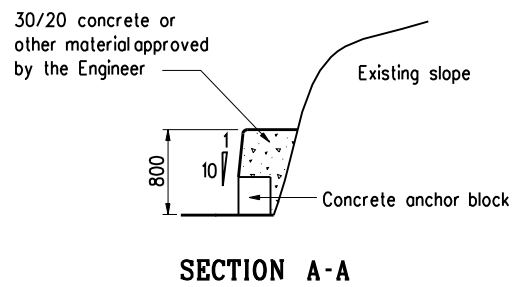
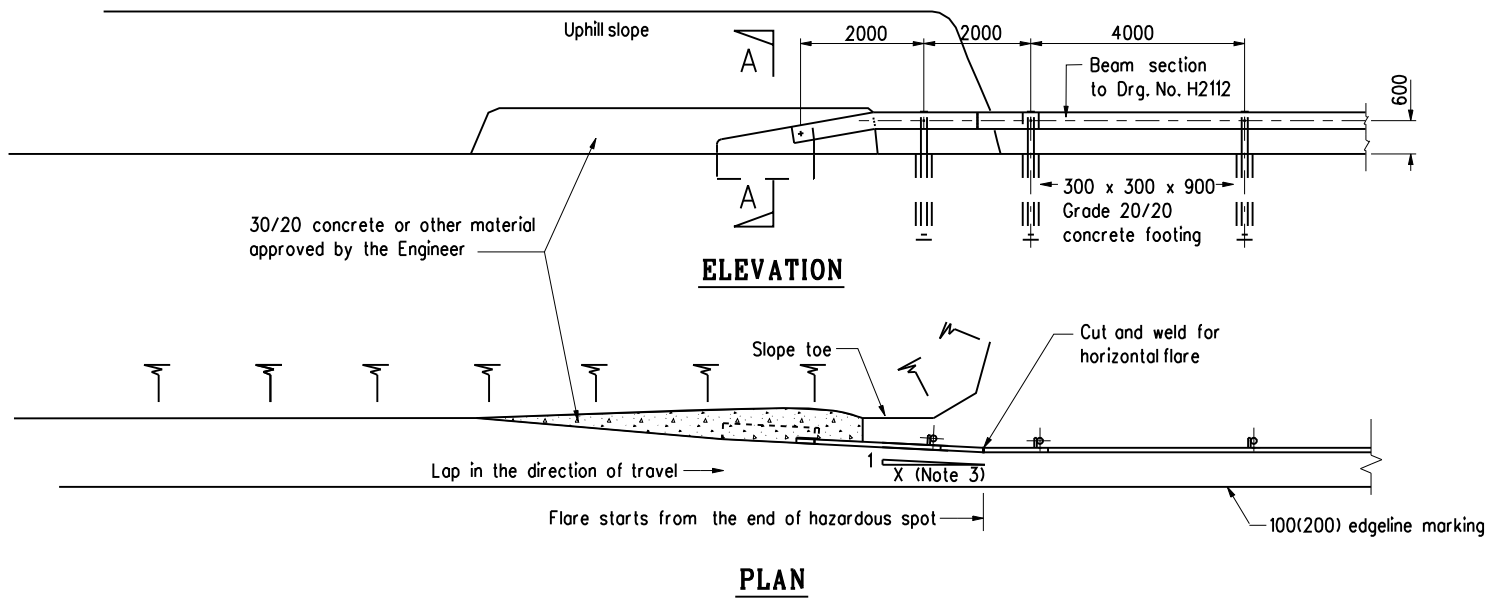
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title

W-BEAM TYPICAL TRANSITION DETAILS
FOR CONNECTION WITH OTHER FEATURES

scale
Not to Scale

drawing no.
TB-24



- Notes:
1. Details apply to roads of speed limit 70kph or above.
 2. All dimensions are in millimeters.
 3. Flare rate X refers to Table 3.9.3.2 of TPDM Vol2 Chapter 3.

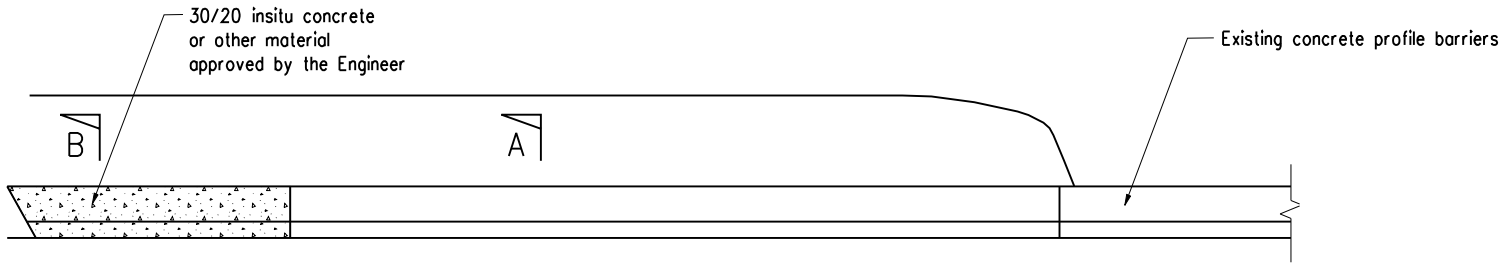
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title

END OF W-BEAM BARRIER TO BE BLENDED WITH UPHILL SLOPE

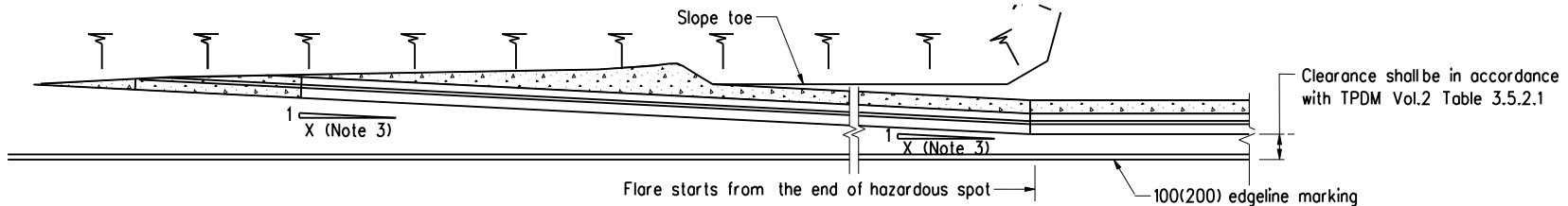
scale Not to Scale

drawing no. **TB-25**



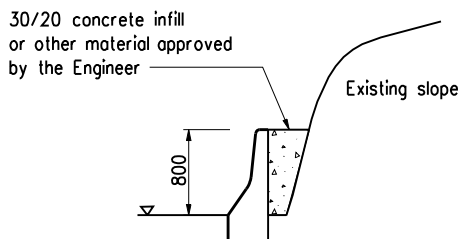
ELEVATION WITH CONCRETE PROFILE BARRIER

(Leading / trailing end similar)



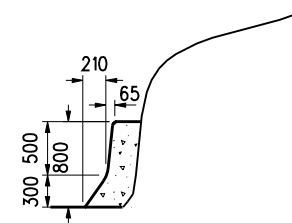
PLAN WITH CONCRETE PROFILE BARRIER

(Modified on standard three-beam barrier)



SECTION A-A

- Notes:
1. Details apply to roads of speed limit 70kph or above.
 2. All dimensions are in millimeters.
 3. Flare rate X refers to Table 3.9.3.2 of TPDM Vol2 Chapter 3.



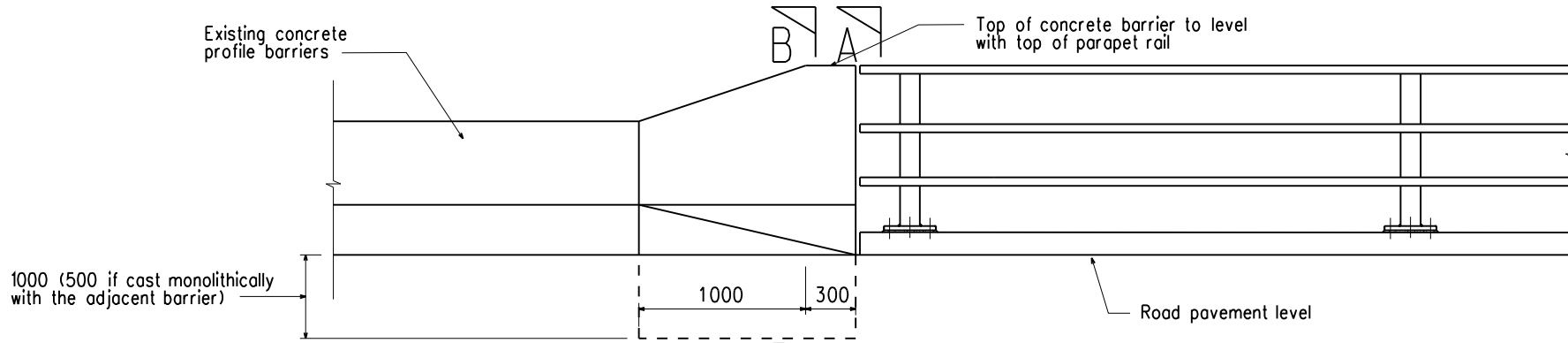
SECTION B-B

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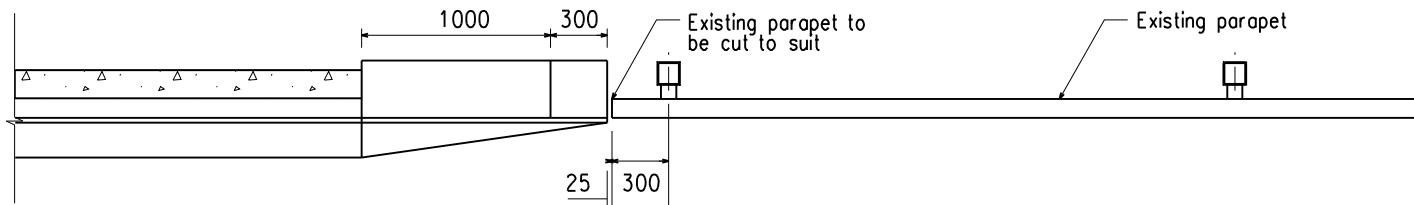
title

END OF CONCRETE PROFILE BARRIER TO BE BLENDED WITH UPHILL SLOPE

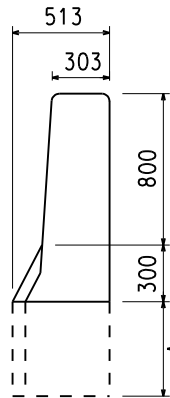
| | |
|-------------|--------------|
| scale | Not to Scale |
| drawing no. | TB-26 |



FRONT ELEVATION

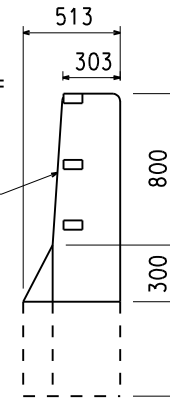


PLAN OF CONNECTOR DETAIL



SECTION B-B

Transition profile shall match with existing profile of concrete barrier



SECTION A-A

1000 (500 if cast monolithically with the adjacent barrier)

1000 (500 if cast monolithically with the adjacent barrier)

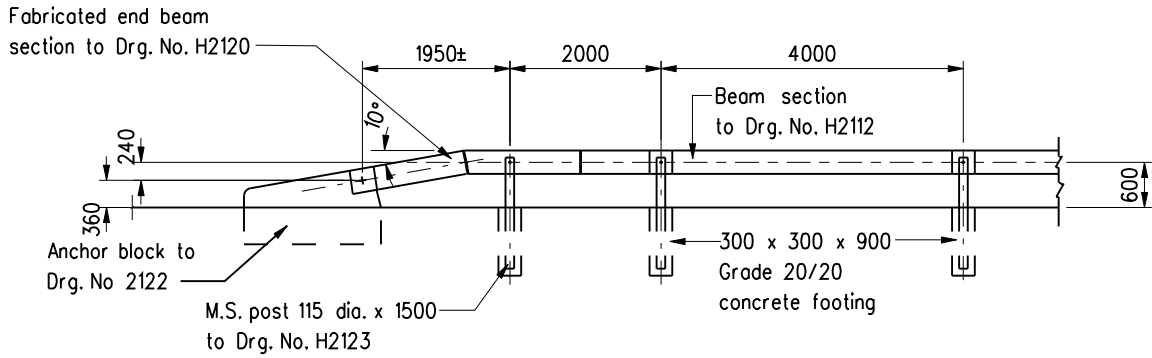
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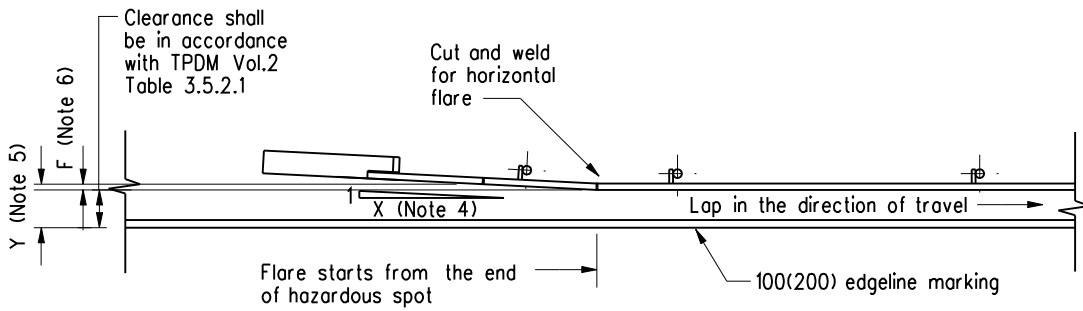
**CONNECTION DETAILS OF CONCRETE PROFILE BARRIER
TO L1 / L2 STEEL VEHICLE PARAPET - LEADING / TRAILING END**

scale
Not to Scale

drawing no.
TB-27



ELEVATION



PLAN

Notes:

1. Details apply to roads of speed limit 70kph or above.
2. All dimensions are in millimeters.
3. Where the concrete footing is located in block paved footpath, the footing should be made of colour concrete with colour to tie with that of the paving blocks.
4. Flare rate X refers to Table 3.9.3.2 of TPDM Vol2 Chapter 3.
5. For expressways, the barrier end shall be located outside the clear-zone. Please refer to Appendix C of HQ/GN/10 'Guidelines for Design of End-details of Thrie-beam Barrier Fence' for the clear-zone distance (Y). End of barrier shall also flare away from the main alignment of the barrier by 1000mm or above (flare distance - F).
6. For roads other than expressways, the desirable flare distance - F should be 1000mm or above. The flare distance shall never be less than 500mm.
7. The clear-zone distance requirement is primarily for the leading end, but it shall also be applied for the trailing end if end-on impact by opposite traffic is anticipated.

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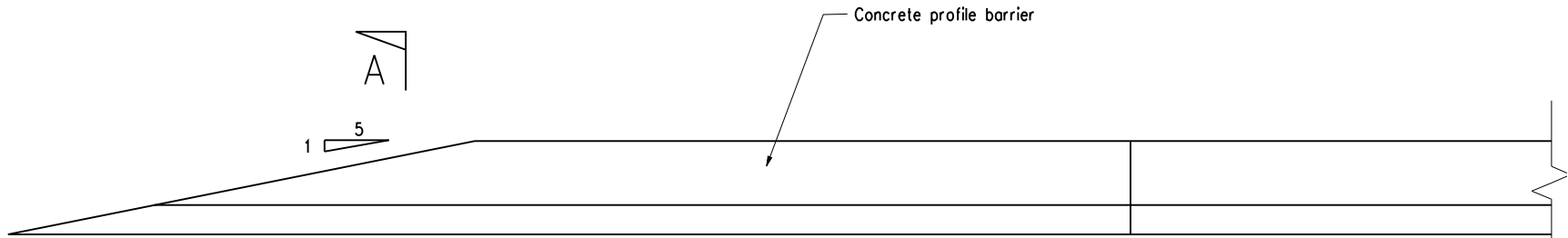
**TERMINAL OF
W-BEAM BARRIER
AT ROADSIDE**

scale

Not to Scale

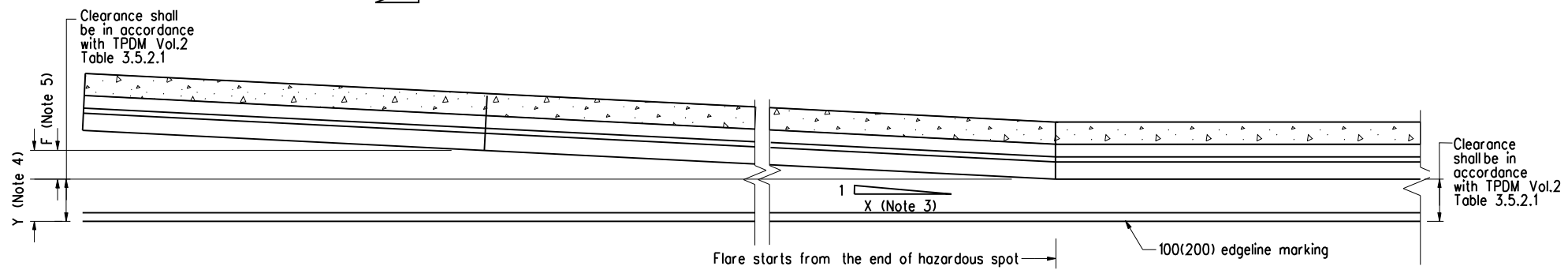
drawing no.

TB-30



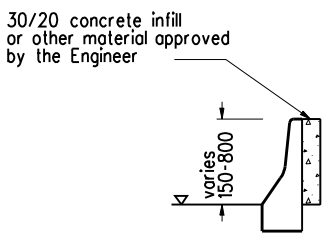
ELEVATION

(Leading / trailing end similar)



PLAN

(Note 6 refers)



SECTION A-A

- Notes:
1. Details apply to roads of speed limit 70kph or above.
 2. All dimensions are in millimeters.
 3. Flare rate X refers to Table 3.9.3.2 of TPDM Vol2 Chapter 3.
 4. The barrier end shall be located outside the clear-zone. Please refer to Appendix C of HQ/GN/10 Guidelines for Design of End-details of Thrie-beam Barrier Fence for the clear-zone distance (Y).
 5. The desirable flare distance - F should be 1000mm minimum. The flare distance shall never be less than 500mm.
 6. The clear-zone distance and flaring requirements are primarily for the leading end, but it shall also be applied for the trailing end if end-on impact by opposite traffic is anticipated.

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| scale Not to Scale | | | |
| drawing no. TB-31 | | | |

TERMINAL OF CONCRETE PROFILE BARRIER AT ROADSIDE