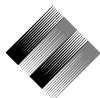


## Appendix (vii) – Western Bay of Plenty District Council Engineering Standards

This Appendix contains the following Tables and Drawings:

Table 1:	Urban Road Criteria and Standards
Table 2:	Rural Road Criteria and Standards
AFQ1	Standard Rural Vehicle Entrances
AFQ2	Standard Urban Vehicle Crossings
AFQ3	Visibility at Driveways Sight Distances
AFQ4	Visibility at Driveways Lines of Clear Sight
AFQ7	Tracking Curves 90 Percentile Car
AFQ8	Tracking Curves 90 Percentile Semi Trailer
AFQ9	Tracking Curves 90 Percentile SU Truck
AFQ12	Protection of Traffic Sight Lines at Railways



### Table 1: Urban Road Criteria and Standards

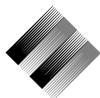
The following table sets out the requirements for carriageway and road reserve widths for different classifications of “urban” roads (Commercial, Industrial, Residential, Rural-Residential, Residential (Rural Community) / Papakainga and Future Urban Zones).

Classification		Criteria		Standards			
Category	Max Traffic (VPD)	Max Household Units	Minimum Carriageway Width (m)(sealed)	Minimum Road Res Width (m)	Min Berm Width (m)	Max Length (m)	Maximum Gradient
Arterial	>7000		Specific	Design			
Principal	7000	1250	13	22	4.5		8.33%
Major Residential	3000	450	11	20	4.5		10%
Minor Residential	1000	150	8	17	4.5		12.5%
Minor Access and Cul-de-sac		100	6	15	4.5		12.5%
Privateways	Not specified	Up to and including 2 dwellings	2.4m	2.7m (see Note)	Not specified	35m	16.7%
Privateways		Up to and including 4 dwellings	3	3.5m (see Note)		100m, with provision at the midway point to allow vehicles to pass within its boundaries where the privateway exceeds 70m in length	
Privateways		Up to and including 6 dwellings	3.5m	5.0m (see Note)			
Industrial	>1000		11	20	4.5		5%
Industrial	1000		8	17	4.5		5%
Commercial and Industrial Privateways				Specific Design			7.5%

Except that for Omokoroa the following shall apply:

Classification	Min Road Reserve	Min Carriageway (excl kerb and channel)	Max grade-%	Road function
Roads serving up to 30 household units (with dispensation)	12.0	6.0	12.5	Local access connects with local roads
Roads serving up to 30 household units	15.0	6.0	12.5	Local access connects with local roads
Roads serving 30-100 household units (with dispensation)	15.0	8.0	12.5	Local access connects with local roads
Roads serving 30-100 household units	15.0	8.0	12.5	Local access connects with local roads
Roads serving 101-200 household units (with dispensation)	17.0	8.0	10	Local access connects with local roads
Roads serving 101-200 household units	20.0	8.0	10	Roads serving 101-200 household units

- Notes:**
- Width dimensions are clear of encroachment of any buildings.
  - Privateways for up to and including two dwellings longer than 35m are required to comply with the minimum standards for household units up to and including four dwellings with the exception that the 35 metres closest to the dwelling may be at the lesser two household unit standard.
  - Lengths of privateways for household units up to and including two dwellings of greater than 35 metres are also permitted provided the household units are fitted with residential sprinkler systems complying with NZS4517:2002.



**Table 2: Rural Road Criteria and Standards**

The following table sets out the requirements for carriageway and road reserve widths for different classifications of “rural” roads (Rural G and H Zones).

Classification	Criteria		Standards				
			Carriageway Width (m) Required for Terrain*				
Category	Traffic Volume (ADT)	Road Reserve (m)	Level	Hilly	Mountainous	Max Length (m)	Maximum Gradient
Public	Less than 30	15	5.6	5.0	5.0		<u>12.5%</u>
	30-100	15	6.5	5.5	5.0		<u>12.5%</u>
	100-250	20	7.0	6.5	6.0	NA	<u>12.5%</u>
	250-500	20	8.0	7.5	7.0		<u>12.5%</u>
	500-2500	20	9.0	8.5	7.5		<u>12.5%</u>

Category	Number of Lots	Road Reserve (m)	Level	Hilly	Mountainous	Max Length (m)	Maximum Gradient
Reduced Public Road Reserve Width, sealed with kerb and channel	4-10 lots	10	6.5	5.5	5.0	Lots up to 1 ha – 250m; greater than 1 ha – 500m	Permanent hard sealed surface – <u>20%</u> Any other unsealed surface – <u>16.7%</u>
Private Way, sealed or unsealed, without kerb and channel	1-3 lots	6.0	3.0	3.0	3.0		
Private Way, sealed or unsealed, without kerb and channel	4-6 lots	12	5.0	5.0	5.0		
Private Way, sealed, with kerb and channel	4-6 lots	8.0	5.0	5.0	5.0		

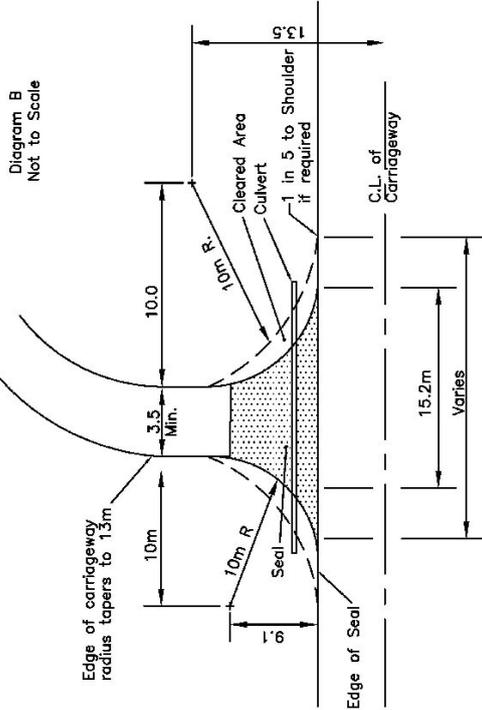
The carriageway widths include 500-700mm shoulders.

The terrain types are defined as follows:

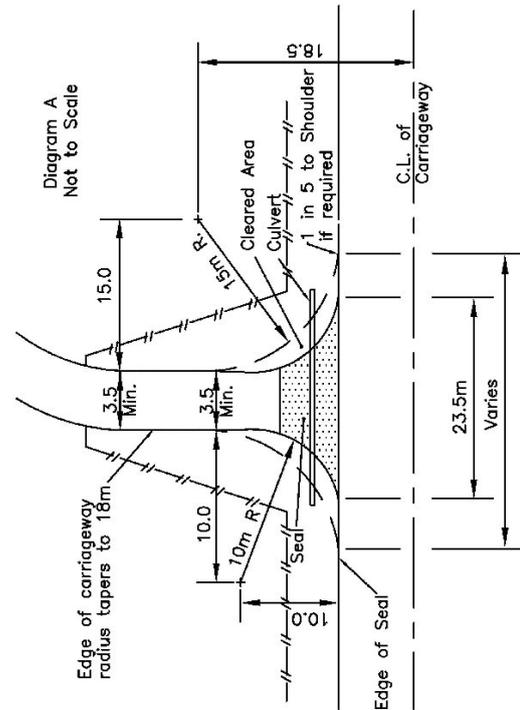
- ◆ **Level Terrain** – any combination of grades and horizontal and vertical alignment permitting heavy vehicles to maintain about the same speed as passenger cars.
- ◆ **Hilly Terrain** – any combination of grades and horizontal and vertical alignment causing heavy vehicles to reduce their speeds substantially below those of passenger cars, but not causing them to operate at crawl speeds for any significant length of time.
- ◆ **Mountainous Terrain** – any combination of grades and horizontal and vertical alignment causing heavy vehicles to operate a crawl speeds for significant distances and/or at frequent intervals.



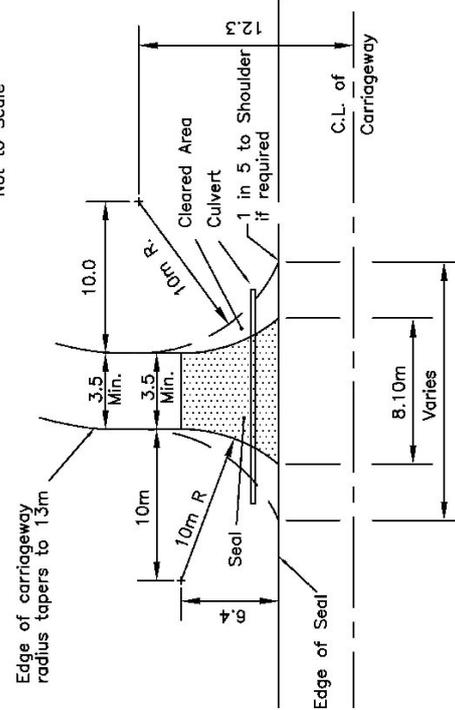
**LOTS BETWEEN 1HA & 10HA**



**LOTS GREATER THAN 10HA**



**LOTS LESS THAN 1HA**



**NOTES**

- 1/ Dimensions: All dimensions are minimums
- 2/ Visibility: Refer to the sight distance and lines of clear sight diagrams
- 3/ Gradients: The level of the entrance shall not exceed  $\pm 350\text{mm}$  from the road centre line level at a point 11m from the centre line except that council may approve alternatives which will not compromise achieving max grades of 1 in 12 to 6m from the carriageway and max grade of 1 in 6 beyond. (Taking into account potential road upgrading works).
- 4/ Culvert: A culvert (Min Dia 300mm) shall be installed to manufacturers specifications to carry water from all of the upstream catchment refer to clause 8.10.2(c). It shall be true to line and extend beyond the cleared area. The culvert shall be aligned with the waterable unless evidence is provided to Council that an alternative alignment is more suitable. Stormwater from the entrance shall be directed to the roadside drains.
- 5/ Subgrade: Remove organic or wet material and trim and compact.
- 6/ Basecourse: Shall be GAP 40 compacted to a dense state. Compacted thickness shall be 170mm minimum. Cleared areas may be grassed. There shall be no areas to pond water.
- 7/ Sealcoat: When adjacent to a sealed road the driveway shall be sealed to 6m clear of the edge of sealed road, indicated by the shaded area. Sealcoat shall be either 2 coat chip seal, 25mm asphaltic concrete or an alternative approved by council.
- 8/ Fences, cattlestops and gates shall be not less than 1m from the cleared area. New fences, gates and cattlestops may be located outside of the property boundary but will require an encroachment notice from council.
- 9/ Construction shall be in accordance with Council's Standard specifications.



STANDARD RURAL VEHICLE ENTRANCES

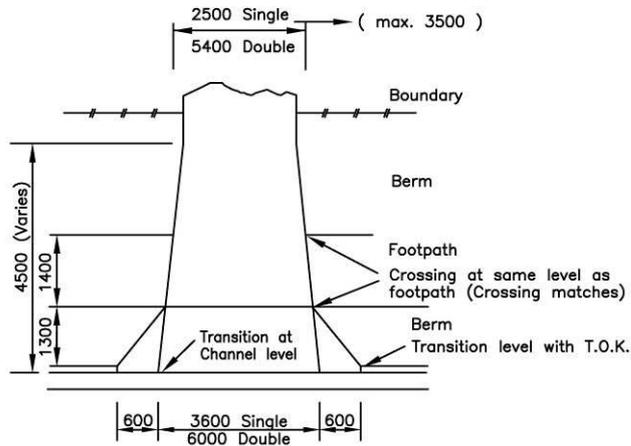
AFQ 1

WESTERN BAY OF PLENTY DISTRICT COUNCIL

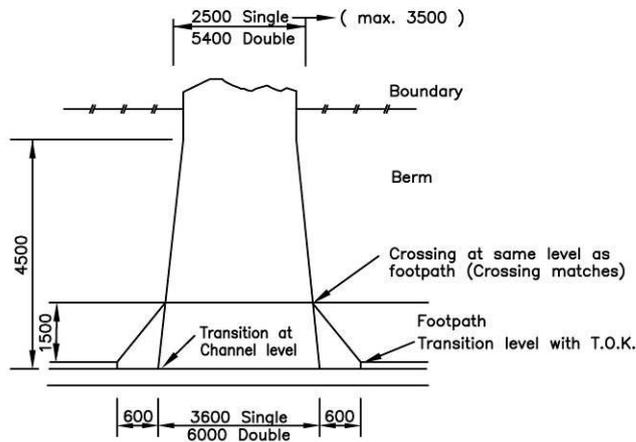
November 2000



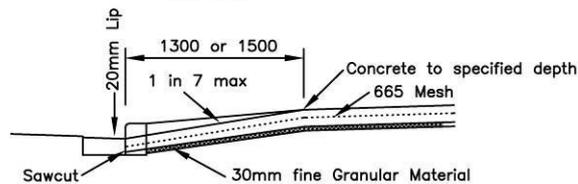
VEHICLE CROSSING  
(FOOTPATH SEPARATED FROM KERB)



VEHICLE CROSSING  
(FOOTPATH NEXT TO KERB)



SECTION OF KERB CROSSING



- NOTE: 1/ A vehicle crossing shall be provided between the kerblines and the boundary at the entrance to all access strips to rear lots, private ways and service lanes and at any other places where the location of the future driveway to a section can be determined.
- 2/ Construction shall be in accordance with NZS 3109
- 3/ Visibility – refer to the sight distance and lines of clear sight diagrams.
- 4/ All concrete to be 17.5MPa @ 28 days
- 5/ Residential crossing – concrete 120mm deep  
Industrial/commercial crossing – concrete 150mm deep (Double width)
- 6/ All crossings: One layer of 665 or equivalent, minimum cover to steel 40mm



STANDARD URBAN VEHICLE CROSSINGS

AFQ 2

WESTERN BAY OF PLENTY DISTRICT COUNCIL

November  
2000



**SIGHT DISTANCES**

TABLE 'A' LISTS THE MINIMUM SIGHT DISTANCES FOR VARIOUS COMBINATIONS OF DRIVEWAY CLASSIFICATIONS, FRONTAGE ROADS AND OPERATING SPEEDS (EXCEPT FOR PRIVATEWAYS SERVING 4-6 LOTS. FOR PRIVATE WAYS TABLE A FROM AFQ3 BELOW APPLIES EXCEPT WHERE A PRIVATE WAY SERVES 4 – 6 LOTS, IN WHICH CASE THE PRIVATE WAY IS REQUIRED TO MEET THE NEXT HIGHEST STANDARD OF MINIMUM SIGHT DISTANCES.

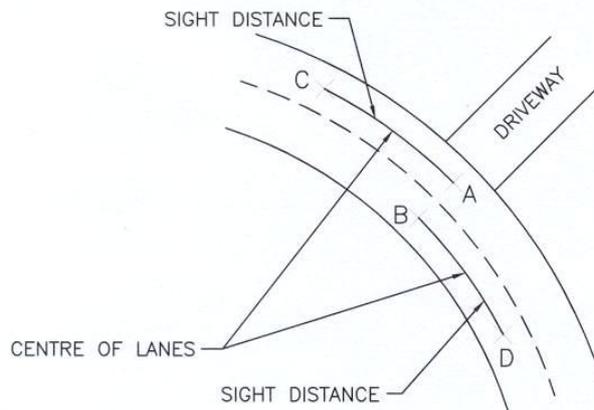
THESE SIGHT DISTANCES ARE TO BE MEASURED ALONG THE CENTRELINE OF THE APPROPRIATE LANE TO ESTABLISH POINTS C AND D IN FIGURES 1 AND 2. FOR PRACTICAL PURPOSES, A AND B CAN BE TAKEN AS OPPOSITE THE CENTRE OF THE DRIVEWAY.

TABLE A

85th PERCENTILE SPEED VALUE ON FRONTAGE ROAD (Km/hr)	MINIMUM SIGHT DISTANCE (m)	
	FRONTAGE ROAD CLASSIFICATION	
	OTHER	ARTERIAL
MEASURED SPEED		
50	45	90
60	65	115
70	85	140
80	105	175
90	130	210
100	160	250
110	190	290
120	230	330
ASSESSED SPEED		
50	65	115
60	85	140
70	105	175
80	130	210
90	160	250
100	190	290
110	230	330
120	270	370

FOR 85th PERCENTILE SPEED BELOW 50 Km PER HOUR  
USE SIGHT DISTANCE FOR 50 Km PER HOUR.

SIGHT DISTANCE MEASUREMENT (FIGURE 1)



VISIBILITY AT ENTRANCES  
SIGHT DISTANCES

AFQ 3

WESTERN BAY OF PLENTY DISTRICT COUNCIL

October 2007



### LINES OF CLEAR SIGHT

THERE SHALL BE LINES OF CLEAR SIGHT FROM THE DRIVER'S EYE HEIGHT TO DRIVER'S EYE HEIGHT (1.15m ABOVE GROUND LEVEL) WITHIN THE SIGHT TRIANGLE.

### LINES OF CLEAR SIGHT (Figure 2)

THE SHADED AREA IS TO BE CONSIDERED AS THE CLEAR "SIGHT TRIANGLE". TRAVEL DISTANCES ARE TO BE MEASURED ALONG THE CENTRELINE OF THE LANE, BUT THE SIDES OF THE "SITE TRIANGLE" ARE ALWAYS TO BE STRAIGHT.

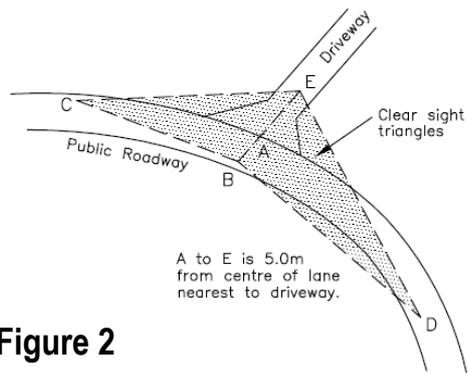


Figure 2

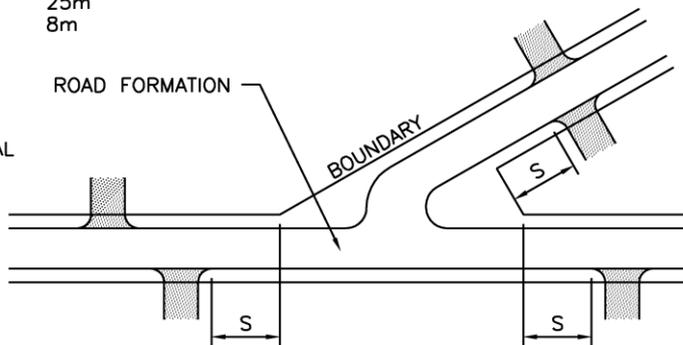
DRIVEWAYS WITH LINES OF SIGHT GREATER THAN THESE MINIMUM STANDARDS ARE DESIRABLE

### DISTANCE FROM INTERSECTION

THE MINIMUM SEPERATION DISTANCES 'S' OF A VEHICLE ENTRANCE FROM AN EXISTING OR PROPOSED NEW ROAD INTERSECTION (INCLUDING STATE HIGHWAY) SHALL BE AS FOLLOWS:

RURAL G AND RURAL H ZONE	30m
COMERCIAL AND INDUSTRIAL ZONES	25m
RESIDENTIAL ZONE	8m

(DISTANCE 'S') SHALL BE MEASURED FROM THE INTERSECTION OF THE LEGAL ROAD BOUNDARIES OR THE EDGE OF THE ROAD FORMATION, WHICHEVER IS CLOSER TO THE ENTRANCE. ENTRANCES SHALL NOT BE CONSTRUCTED IN NO STOPPING ZONES.

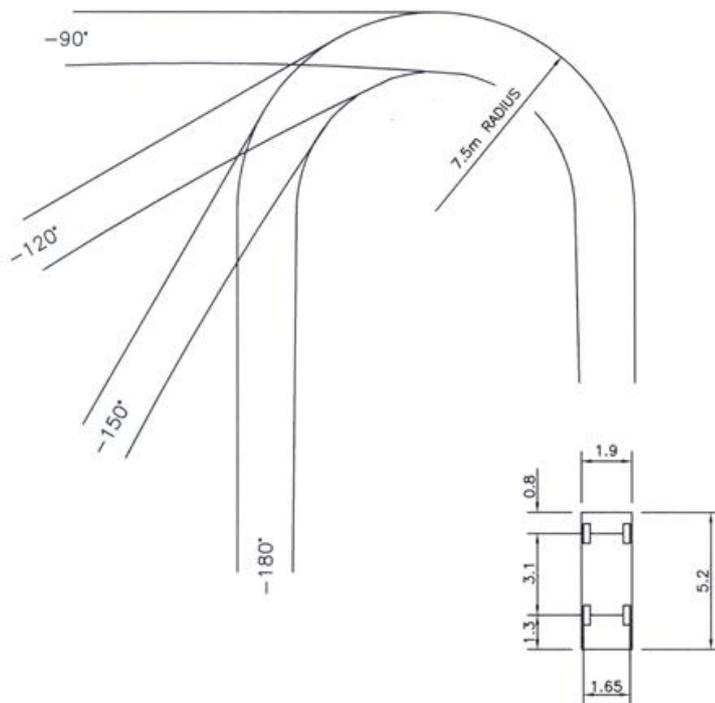


VISIBILITY AT ENTRANCES  
LINES OF CLEAR SIGHT

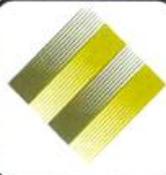
AFQ 4

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October 2007



7.5m RADIUS CAR  
SCALE: 1 TO 250

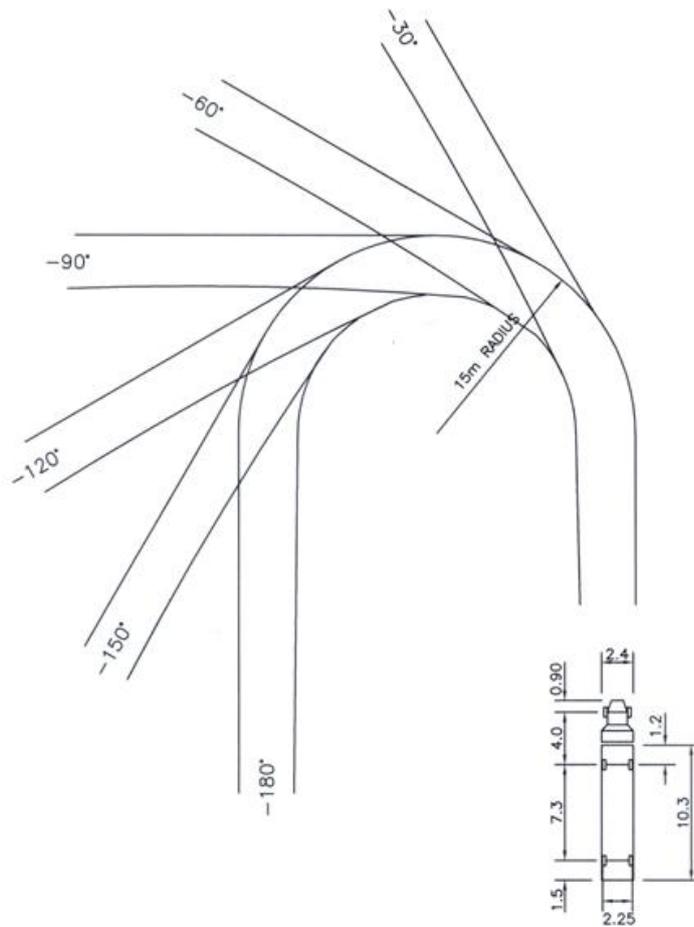


TRACKING CURVES: 90 PERCENTILE  
CAR

AFQ 7

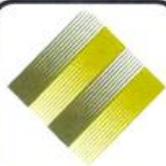
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February  
2002



15m RADIUS SEMI TRAILER

SCALE: 1 TO 500

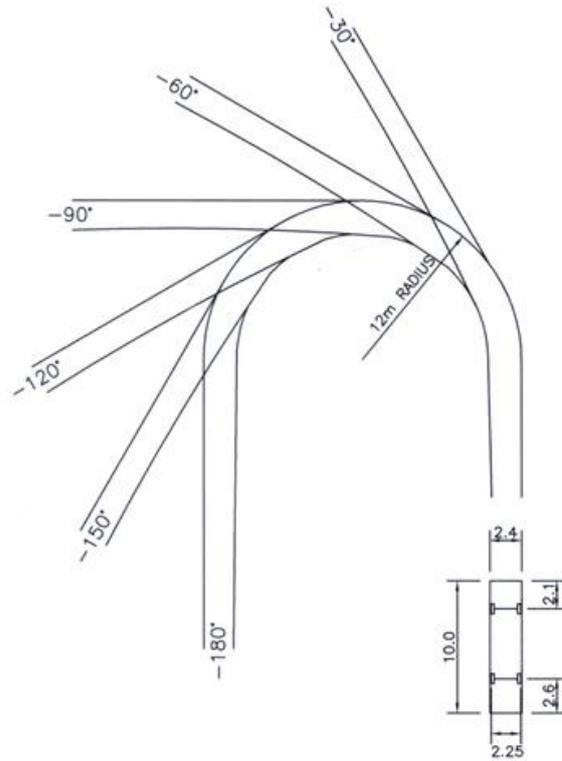


TRACKING CURVES: 90 PERCENTILE SEMI TRAILER

AFQ 8

WESTERN BAY OF PLENTY DISTRICT COUNCIL

February 2002



12m RADIUS SINGLE UNIT TRUCK

SCALE: 1 TO 500



TRACKING CURVES: 90 PERCENTILE  
SINGLE UNIT TRUCK

AFQ 9

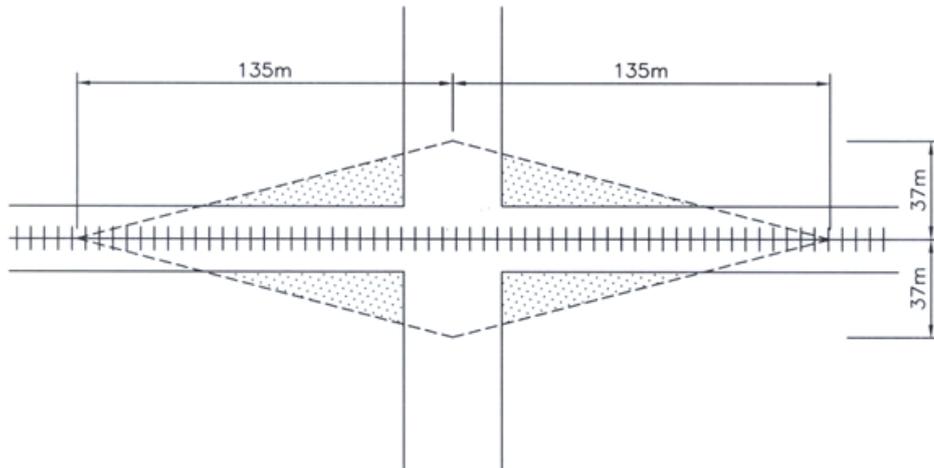
WESTERN BAY OF PLENTY DISTRICT COUNCIL

February  
2002

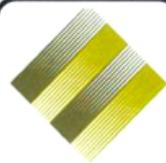


## PROTECTION OF TRAFFIC SIGHT LINES

NO CONSTRUCTION OF BUILDINGS, FENCES OR OTHER STRUCTURES, PLACING OF OBSTRUCTIONS OR THE GROWTH OF VEGETATION SHALL BE PERMITTED ON THE IMMEDIATE VICINITY OF ROAD AND RAILWAY INTERSECTIONS AS FOLLOWS:



1. DISPENSATION TO DIMENSIONS GIVEN MAY BE POSSIBLE THROUGH APPLICATION TO NEW ZEALAND RAIL LIMITED DEPENDANT UPON TRAIN MOVEMENTS IN THE AREA.
2. WHERE THERE ARE TWO OR MORE RAIL TRACKS, THE 37 METRE SIGHT LINE APPLIES FROM THE CENTRELINE OF THE NEAREST TRACK



PROTECTION OF TRAFFIC SIGHT  
LINES AT RAILWAYS

AFQ 12

WESTERN BAY OF PLENTY DISTRICT COUNCIL

February  
2002

