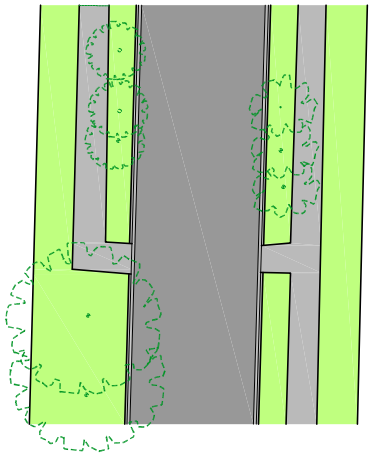
1. NORMAL LOCATION

Carriageway in centre of street reserve. Standard 4500 berm allows 1800 service strip, 1500 footpath, & 1200 verge for lamp posts & tree planting.



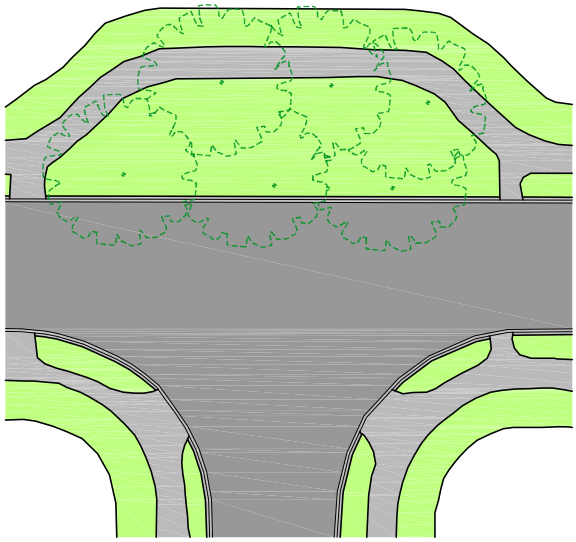
1200 verge permits only small trees pruned up as per standards.

Shrubs are unsuitable due to obstruction to vision.

Elimination of one footpath gives 2700 width for planting which allows more normal growth of medium sized trees.

3.ROAD RESERVE WIDENED

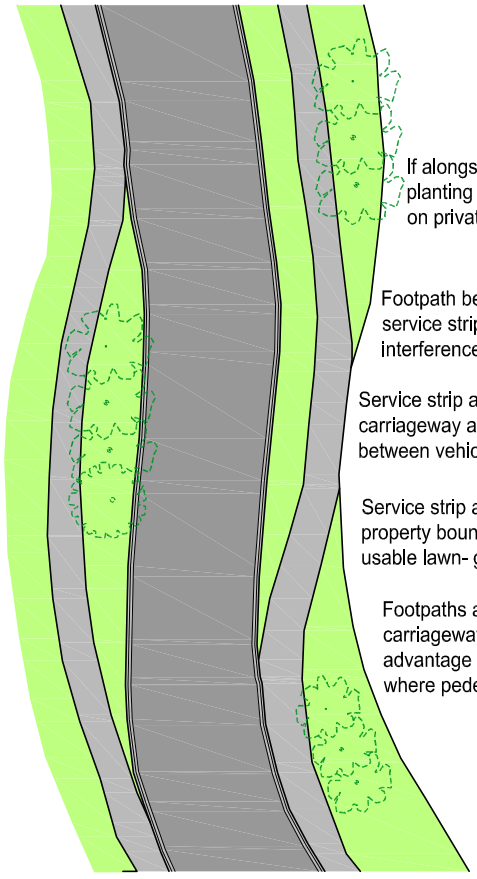
eg. at intersection



Increase in area may allow significant trees which give visual emphasis to the intersection, close view to houses beyond and screen these from headlights.

2. VARIATION OF CARRIAGEWAY LOCATION

Allows a planting area of 2500 on one side of the street.



If alongside the boundary planting may join with that on private property.

Footpath between trees & service strip reduces interference to services.

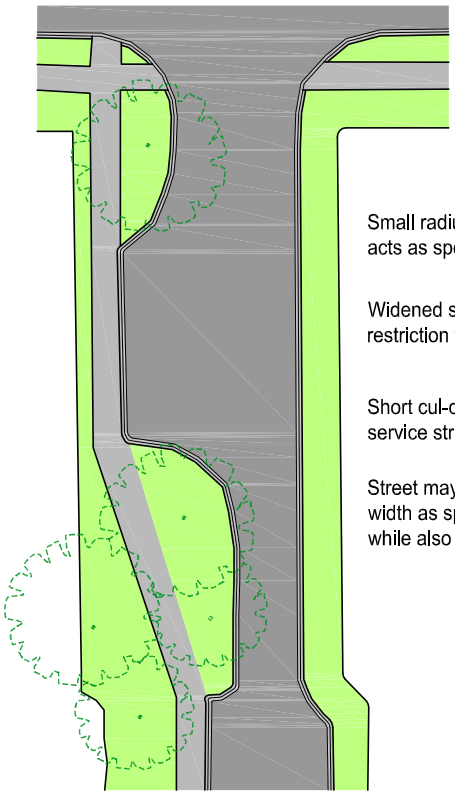
Service strip adjacent carriageway acts as buffer between vehicles & pedestrians.

Service strip alongside property boundary extends usable lawn- garden area.

Footpaths adjoining carriageway are an advantage at points where pedestrians cross.

4. VARIATION OF WIDTH OF CARRIAGEWAY

eg with short Cul-de-sac



Small radius curve at entrance acts as speed restriction device.

Widened street allows parking without restriction to turning heavy traffic.

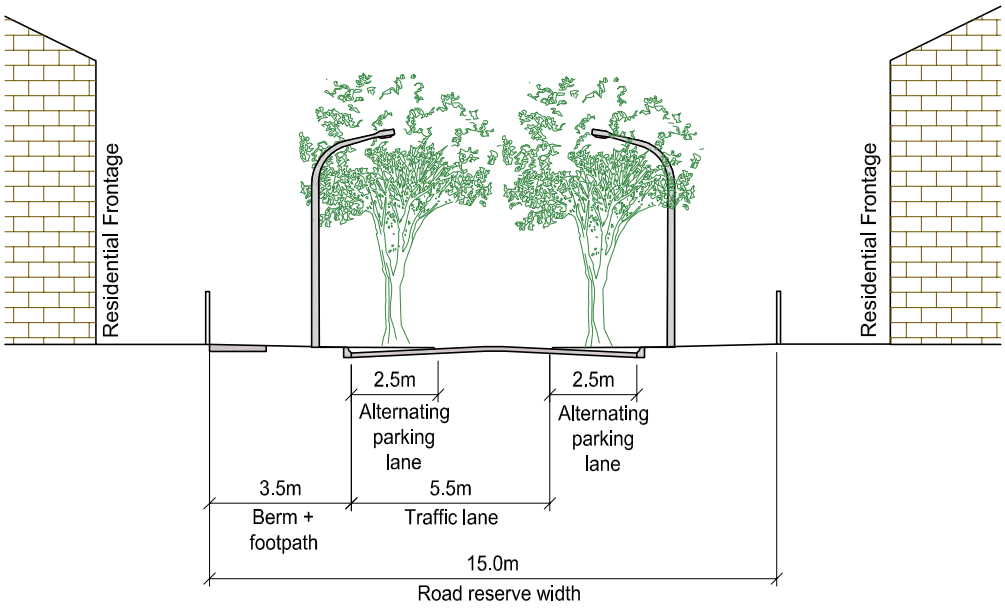
Short cul-de-sac allows single service strip and footpath.

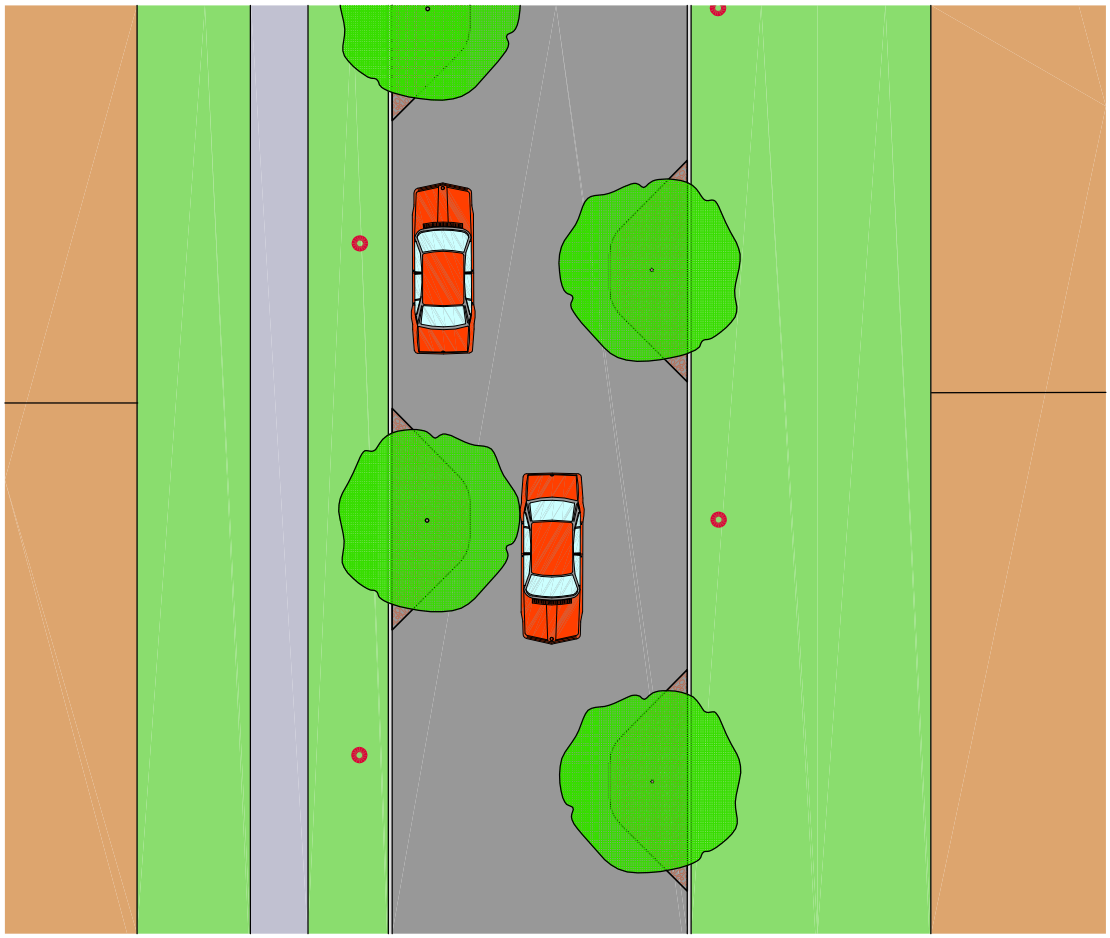
Street may be narrowed to 3000 width as speed restricting device while also increasing planting area.

CARRIAGEWAY

LOCATION & VARIATIONS NOS 1 - 4

W401

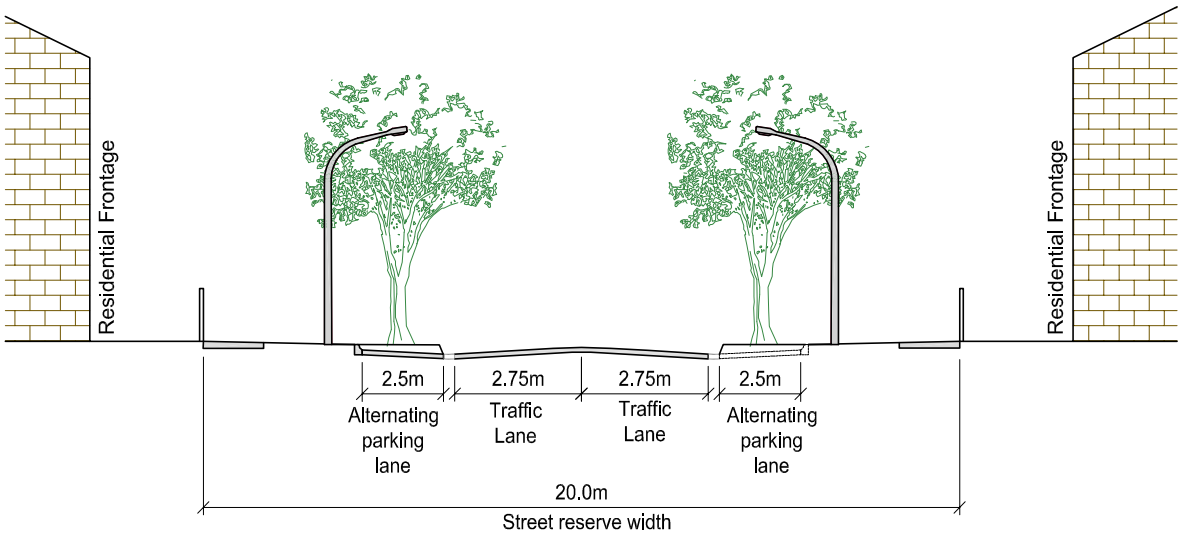


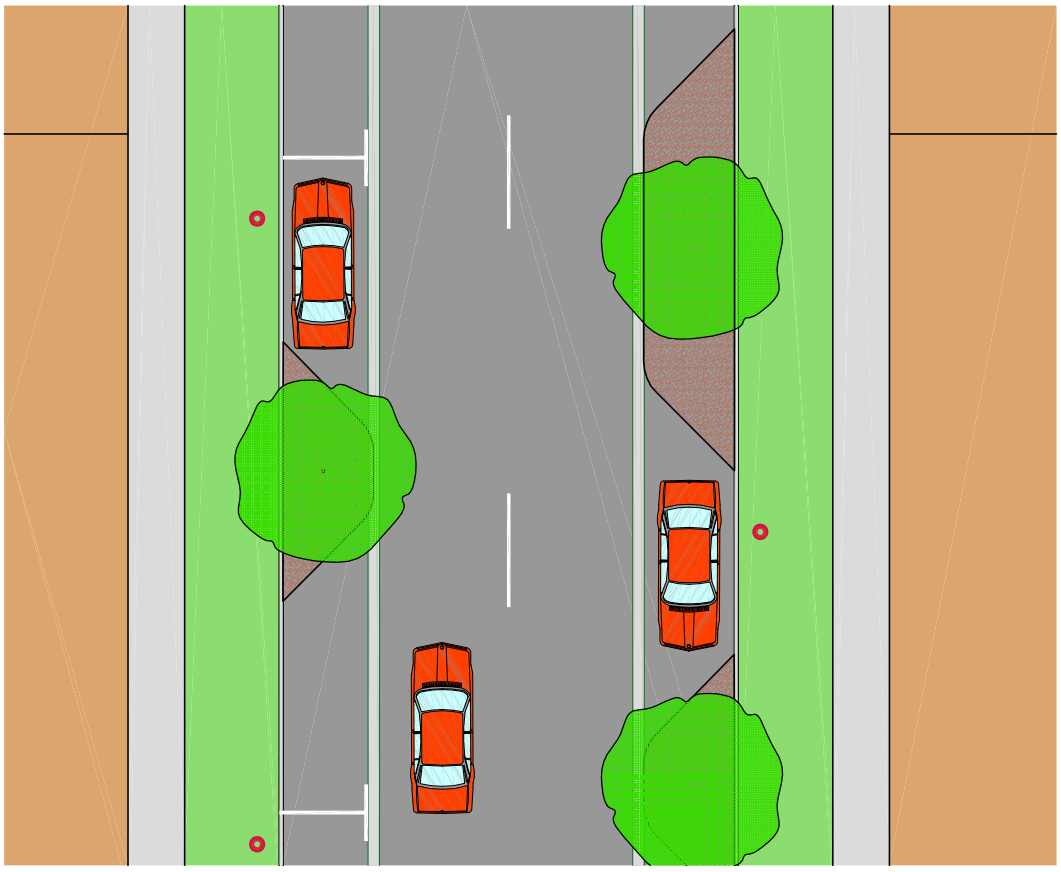


= Streetlights to be centrally located between street trees at 600mm from kerb

CARRIAGEWAY
LOCATION & VARIATION NO 5

W402



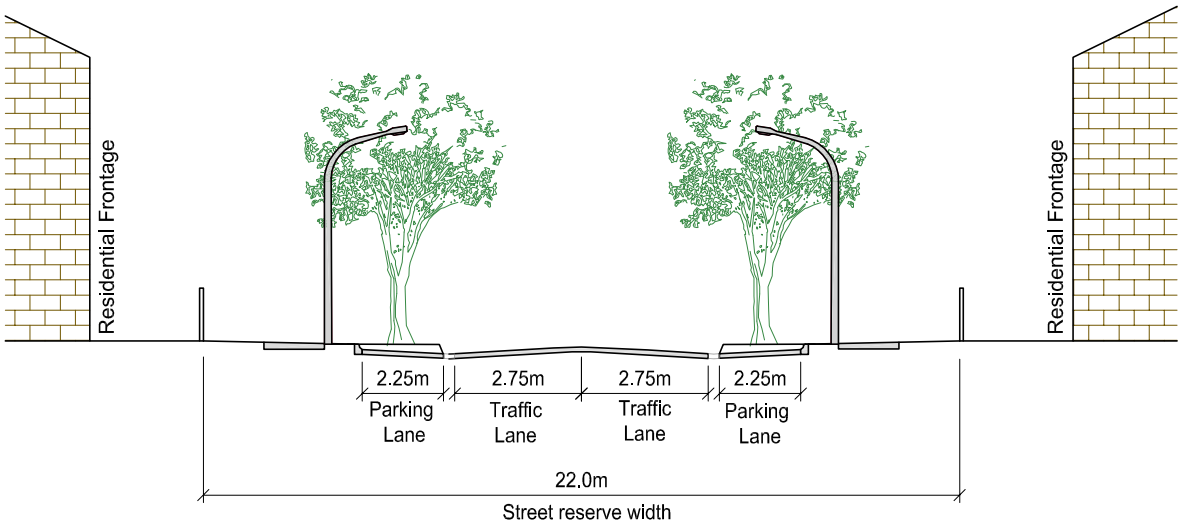


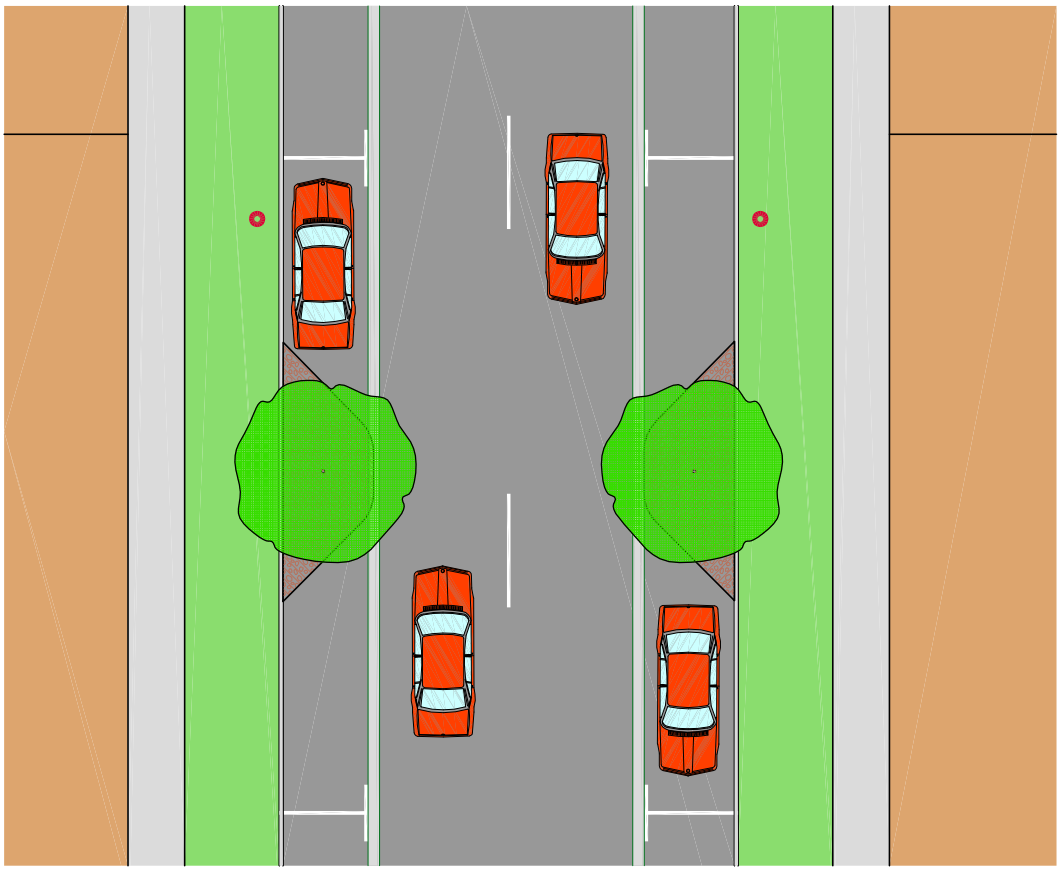
= Streetlights to be centrally located between street trees at 600mm from kerb

** Pedestrian based lighting to be addressed at time of design.

CARRIAGEWAY
LOCATION & VARIATION NO 6

W403



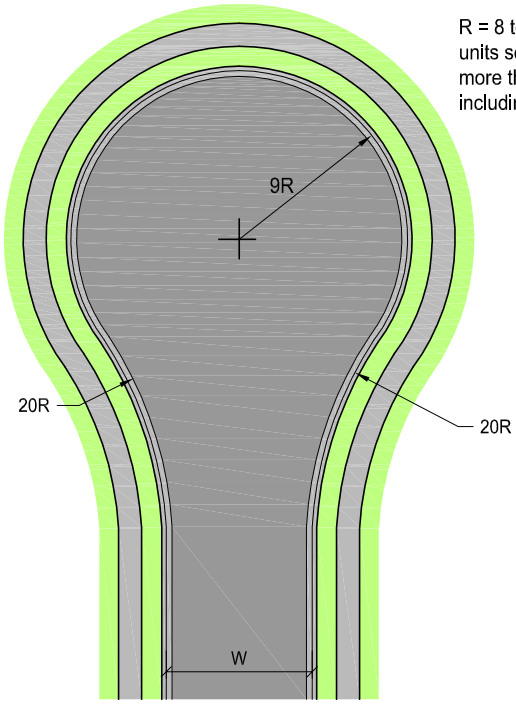


= Streetlights to be centrally located between street trees at 600mm from kerb

** Pedestrian based lighting to be addressed at time of design.

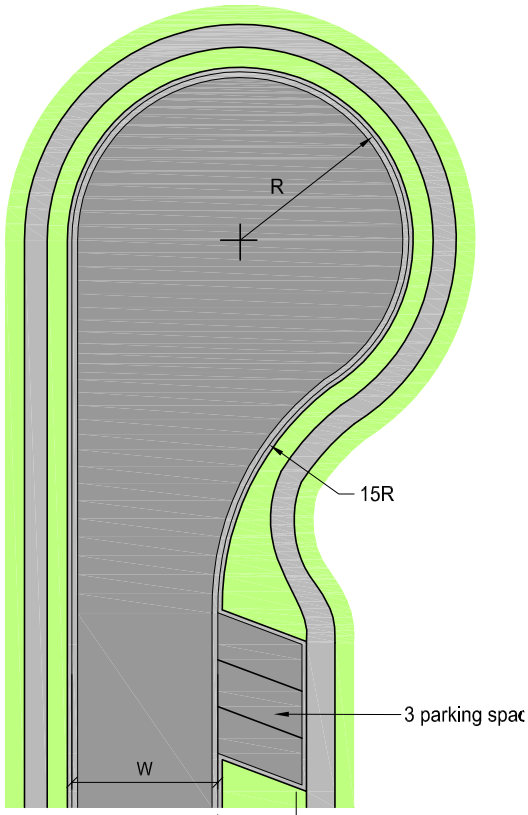
CARRIAGEWAY
LOCATION & VARIATION NO 7

W404



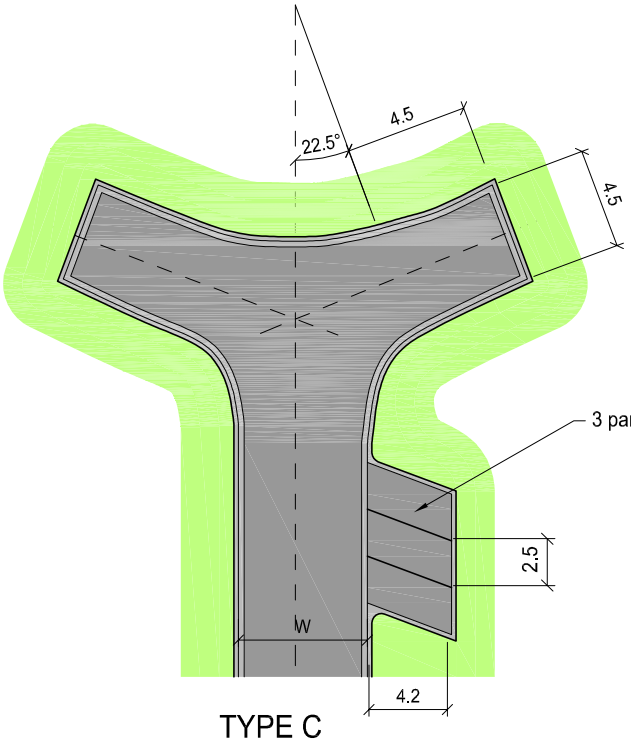
R = 8 to 9m if more than 15 units serviced or cul-de-sac more than 100m long including turning head

TYPE A



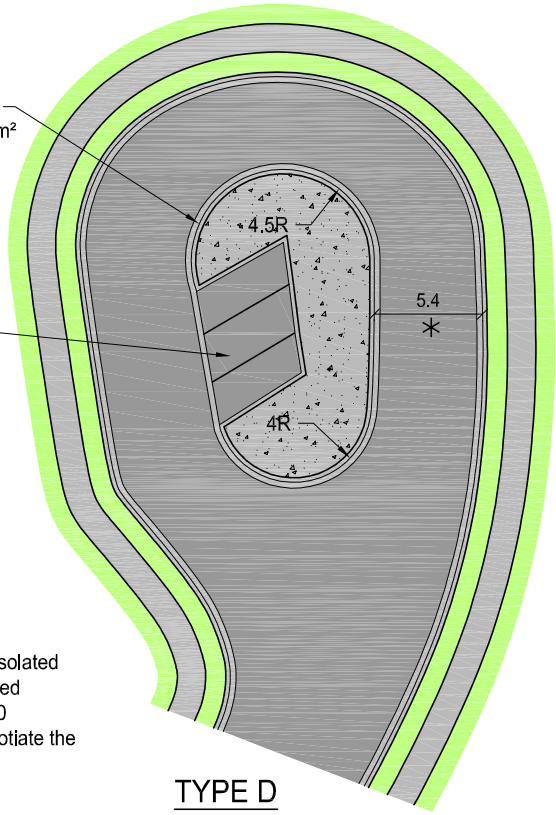
R = 6.5m if less than 15 units served and cul-de-sac less than 100m long plus three point turn area

TYPE B



TYPE C

W < 6.0
Maximum 12 household units on private rights of way only



TYPE D

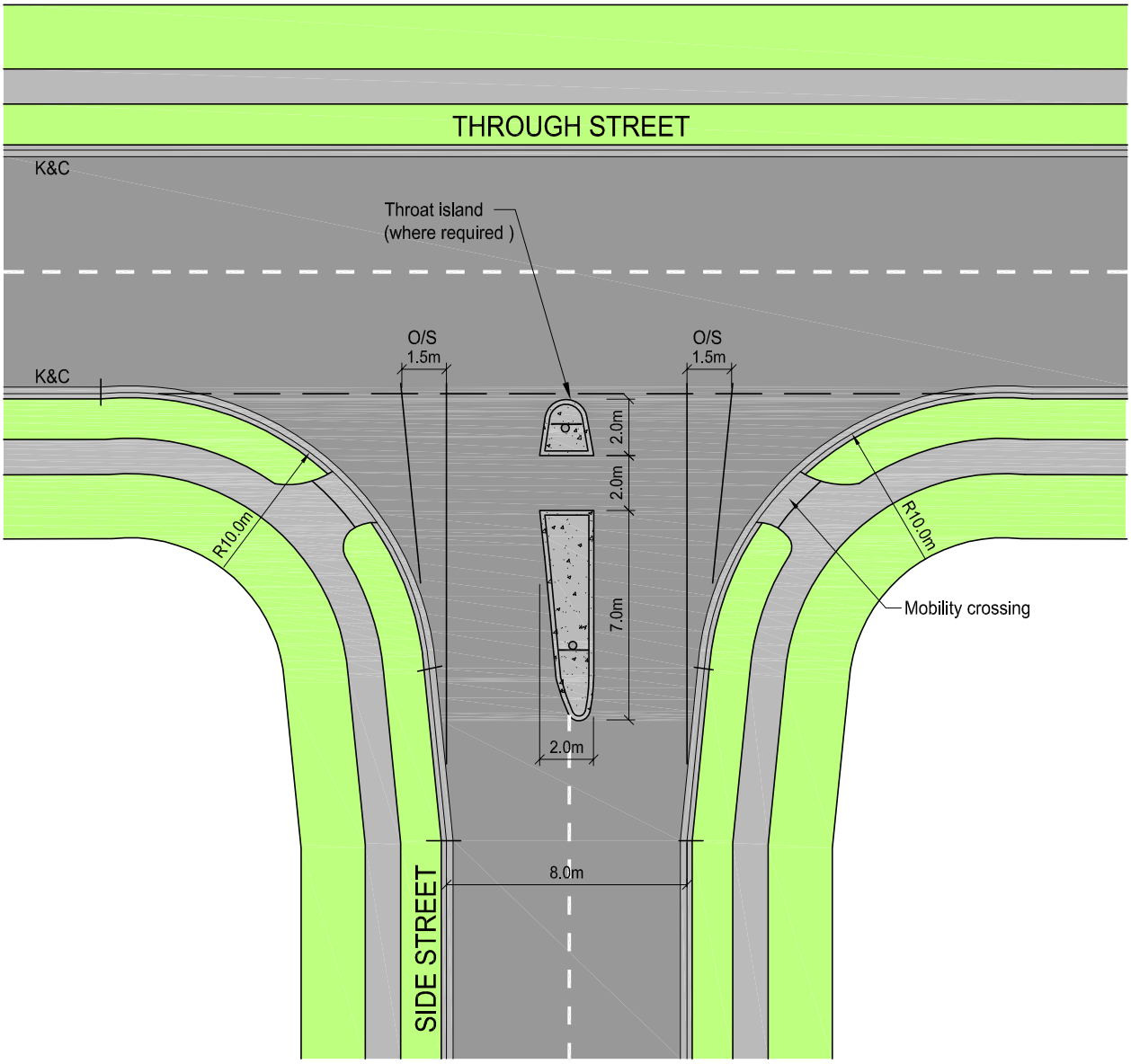
* May be reduced to 4.0m in isolated short length clear of proposed driveways but ensure that 90 percentile truck can still negotiate the turning head

TURNING AREAS

W406

NOTES:

1. Designed for 90 percentile single axle truck.
2. Where the through street is wider than 8 metres both tangents at the corner radii shall be flared 1.5 metres.



RADIUS

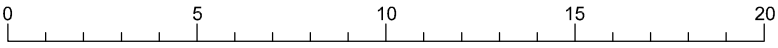
10m for Carriageway width< 12.2 Residential
12m for Carriageway width> 12.2 Industrial

TEE INTERSECTION DETAILS

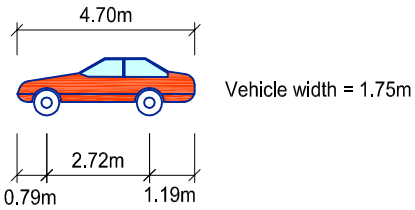
W407

NOTES:

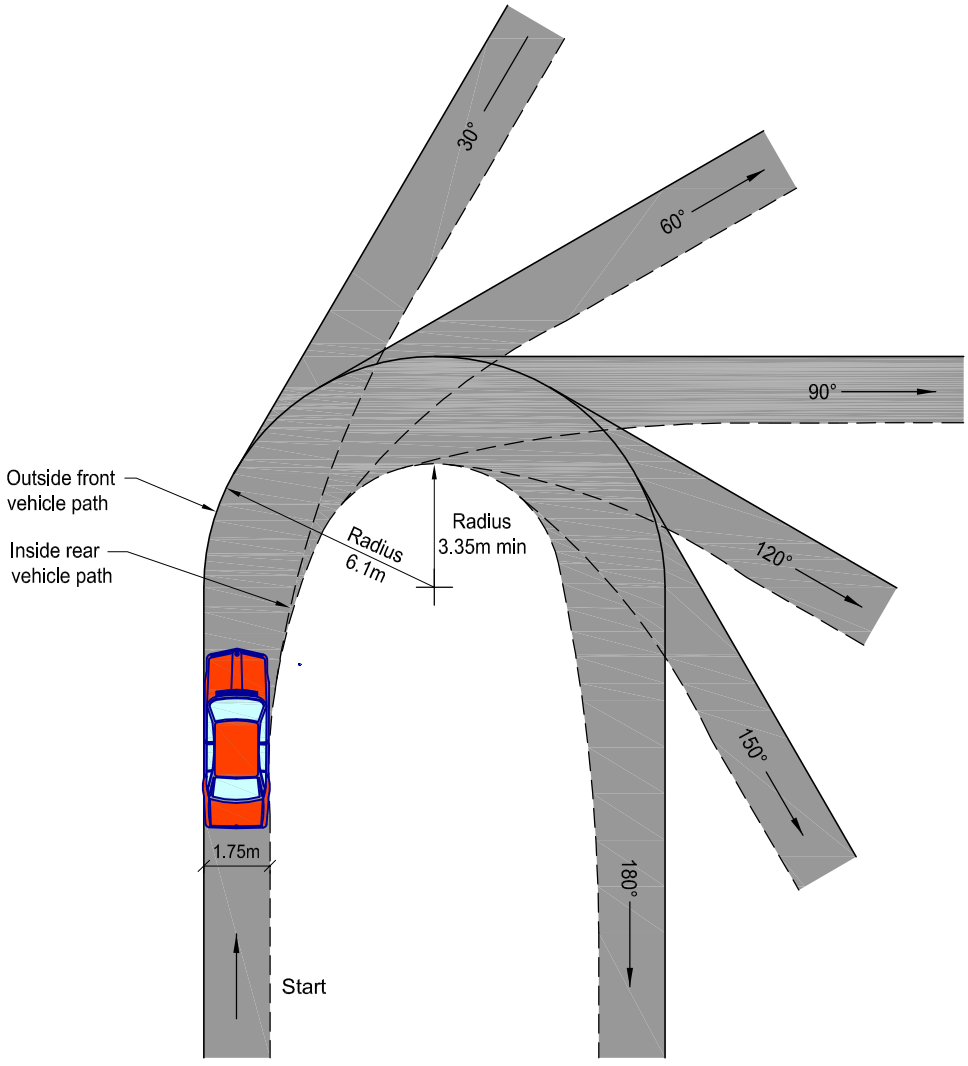
1. Minimum recommended clearance for both sides of vehicle : 600mm.



SCALE IN METRES



DESIGN VEHICLE DIMENSIONS



SWEEP PATH
90% Car
1:200

SWEPT PATH DESIGN
90% CAR

W410

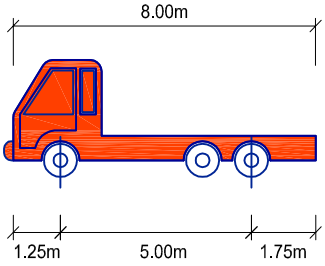
Western Bay of Plenty District Council

DEVELOPMENT CODE

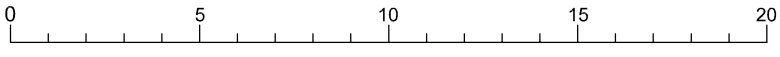
VERSION 1
AUG 09

NOTES:

1. Minimum recommended clearance for both sides of vehicle : 600mm.

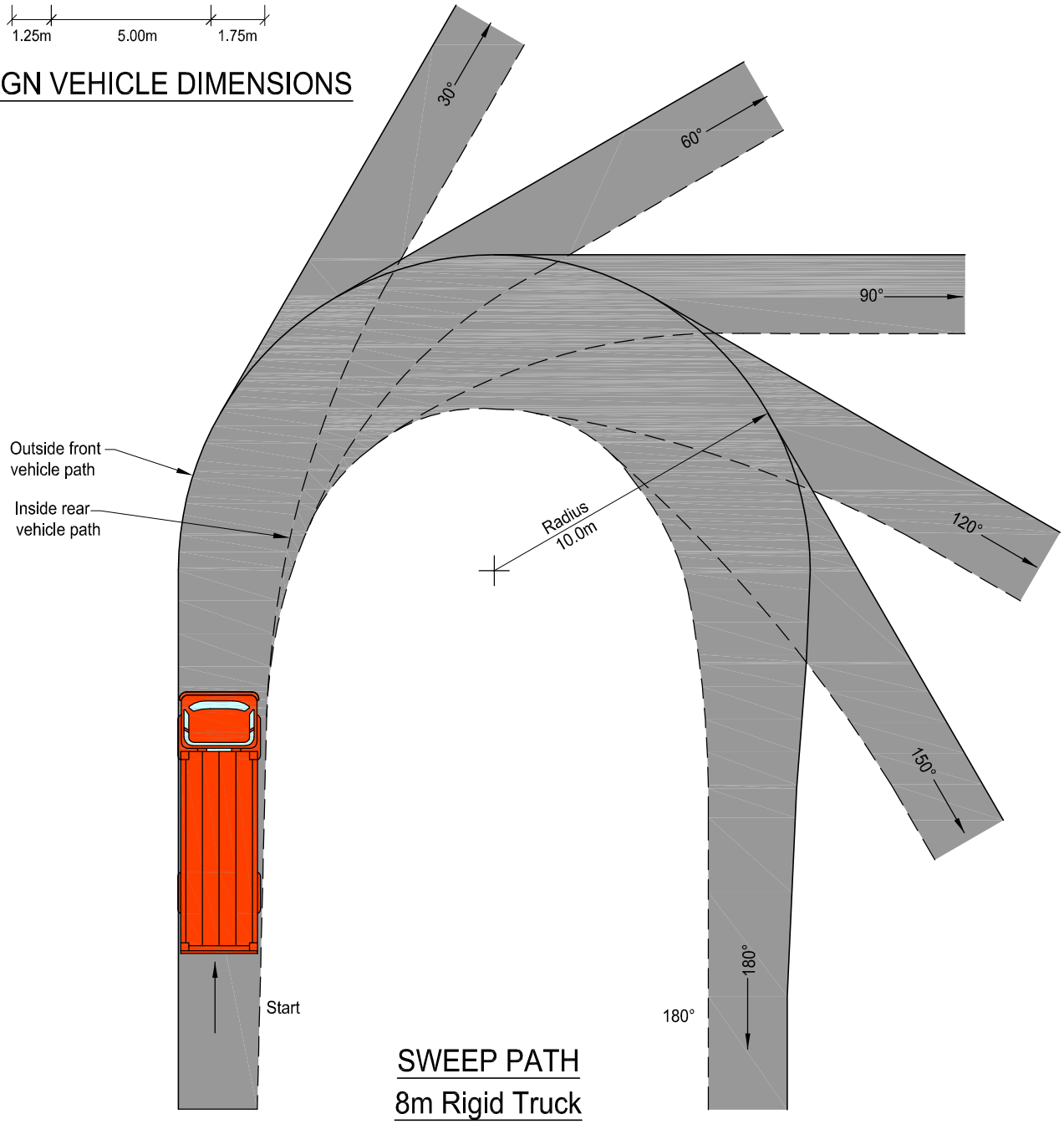


DESIGN VEHICLE DIMENSIONS



SCALE IN METRES

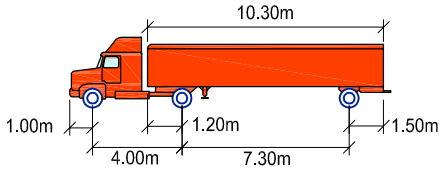
Vehicle width = 2.50m



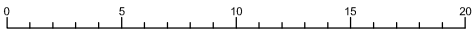
SWEEP PATH
8m Rigid Truck
1:200

SWEPT PATH DESIGN
MINIMUM TRUCK

W411

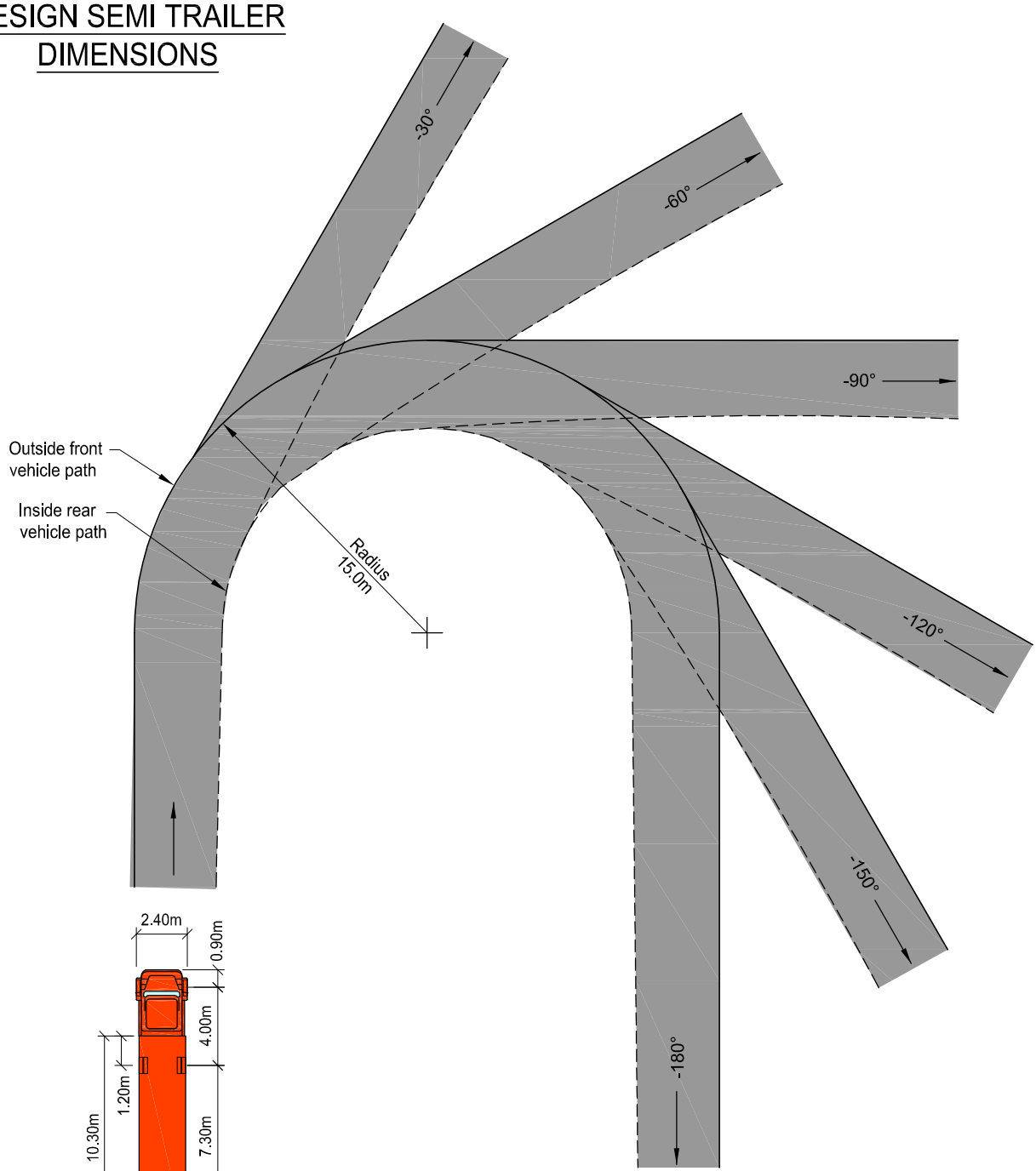


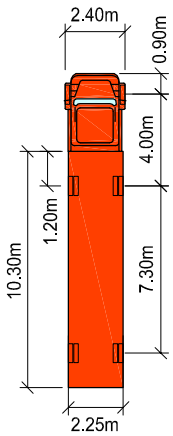
Vehicle width = 2.40m



SCALE IN METRES

DESIGN SEMI TRAILER DIMENSIONS





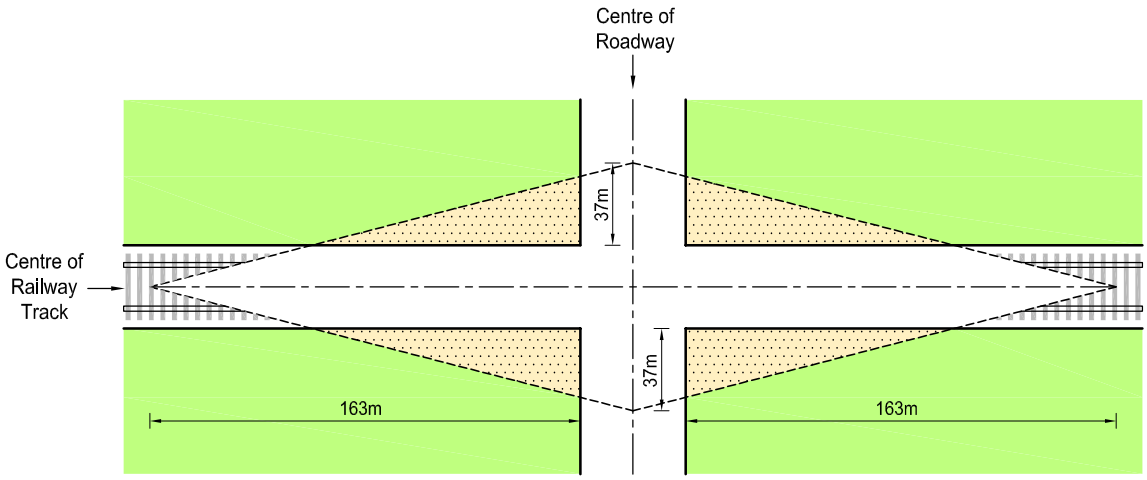
SWEPT PATH DESIGN

90% SEMI TRAILER

W412

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.



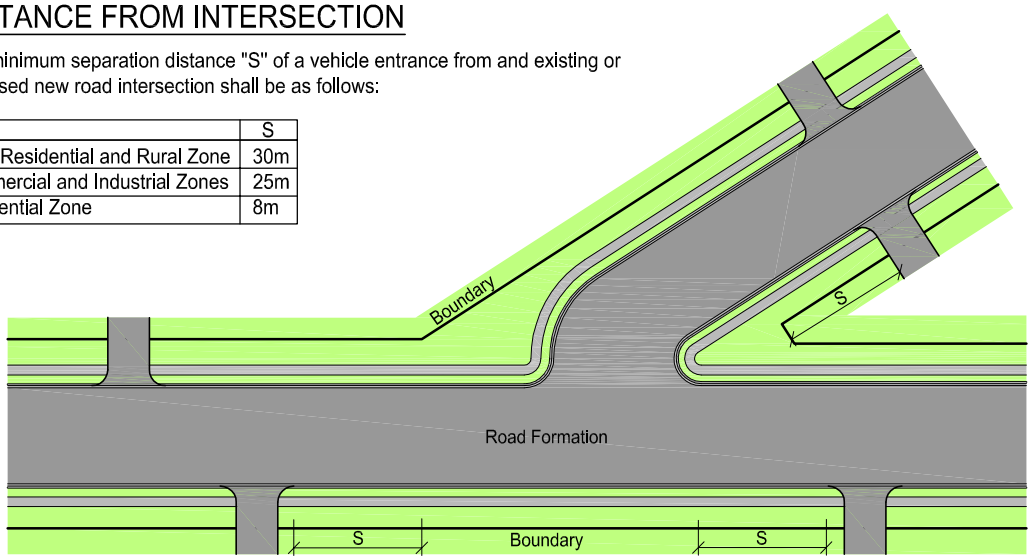
*** Shaded area to be kept free of building or other obstructions which might block sight-lines

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 meter sight line applies from the centre line of the nearest track.

DISTANCE FROM INTERSECTION

The minimum separation distance "S" of a vehicle entrance from and existing or proposed new road intersection shall be as follows:

	S
Rural Residential and Rural Zone	30m
Commercial 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. Entrance shall not be constructed in no stopping zones.

NOTES:

1. Table 'A' lists the minimum sight distances for various combinations of driveway classifications, frontage, road classifications and operating speeds.
2. These sight distances to be measured along the centre of the appropriate lane to establish points C and D in figure 1. For practical purposes A and B can be taken as opposite the centre of the driveway.
3. Sight lines shall be from drivers eye height to drivers eye height (1.15m) above ground level within the sight triangle
4. 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.
5. For unsealed roads, add 25% to sight distance.
6. For approach gradients >5% refer to Austroads tables and specifications.

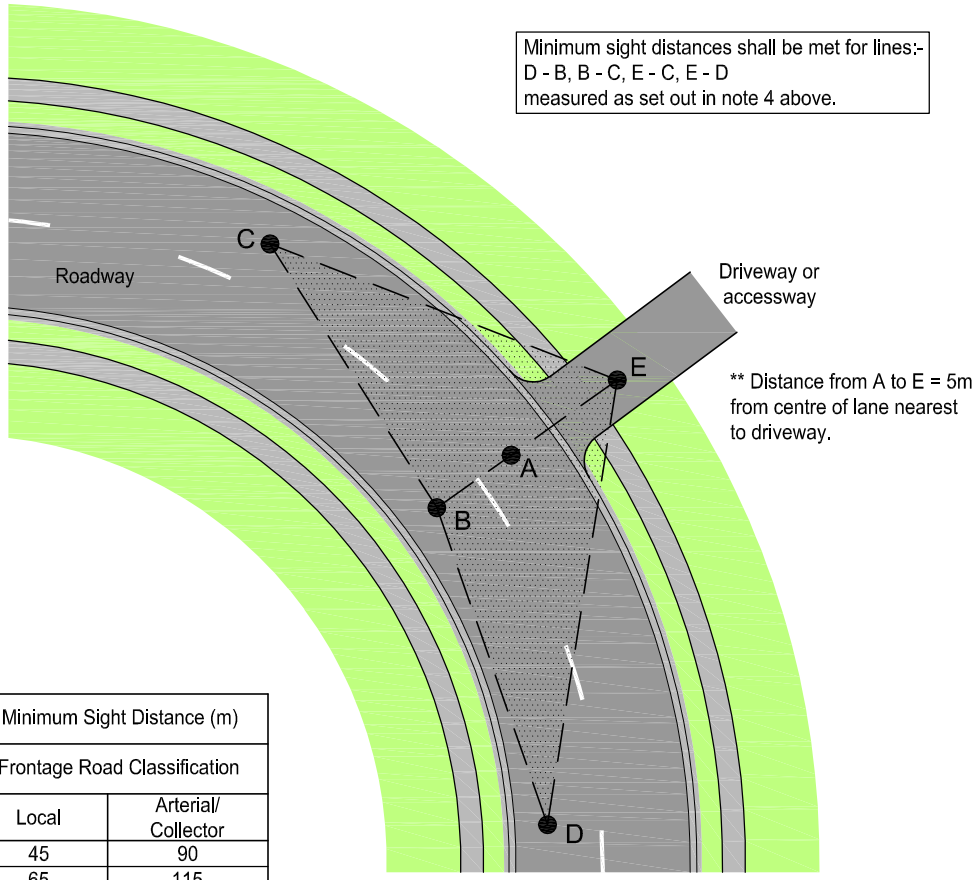


FIGURE 1

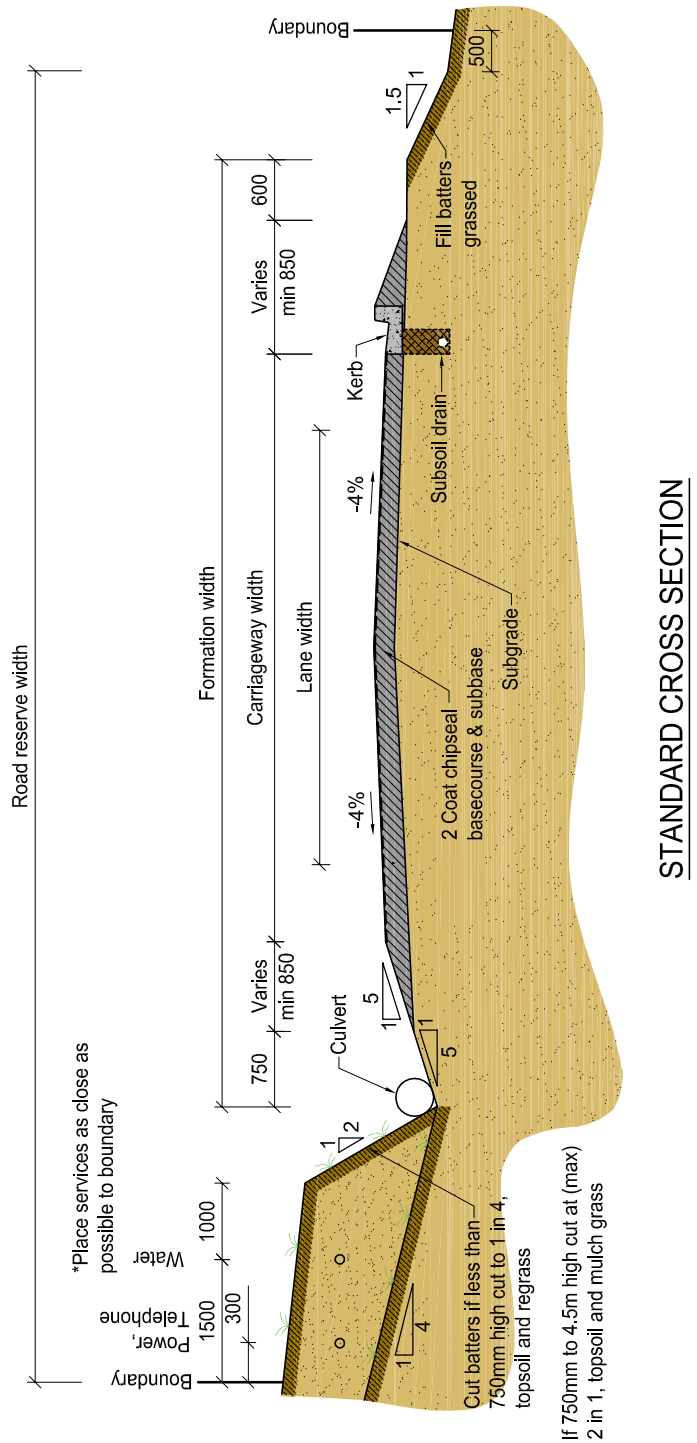
85th Percentile Speed Value on Frontage Road		Minimum Sight Distance (m)	
		Frontage Road Classification	
		Local	Arterial/ Collector
Measured Speed	50	45	90
	60	65	115
	70	85	140
	80	105	175
	90	130	210
	100	160	250
	110	190	290
	120	230	330
Assessed Speed	50	65	115
	60	85	140
	70	105	175
	80	130	210
	90	160	250
	100	190	290
	110	230	330
	120	270	370

TABLE A

**For 85th Percentile Speed below 50km per hour use sight distance for 50km per hour.

ENTRANCEWAY SIGHT DISTANCES

W415



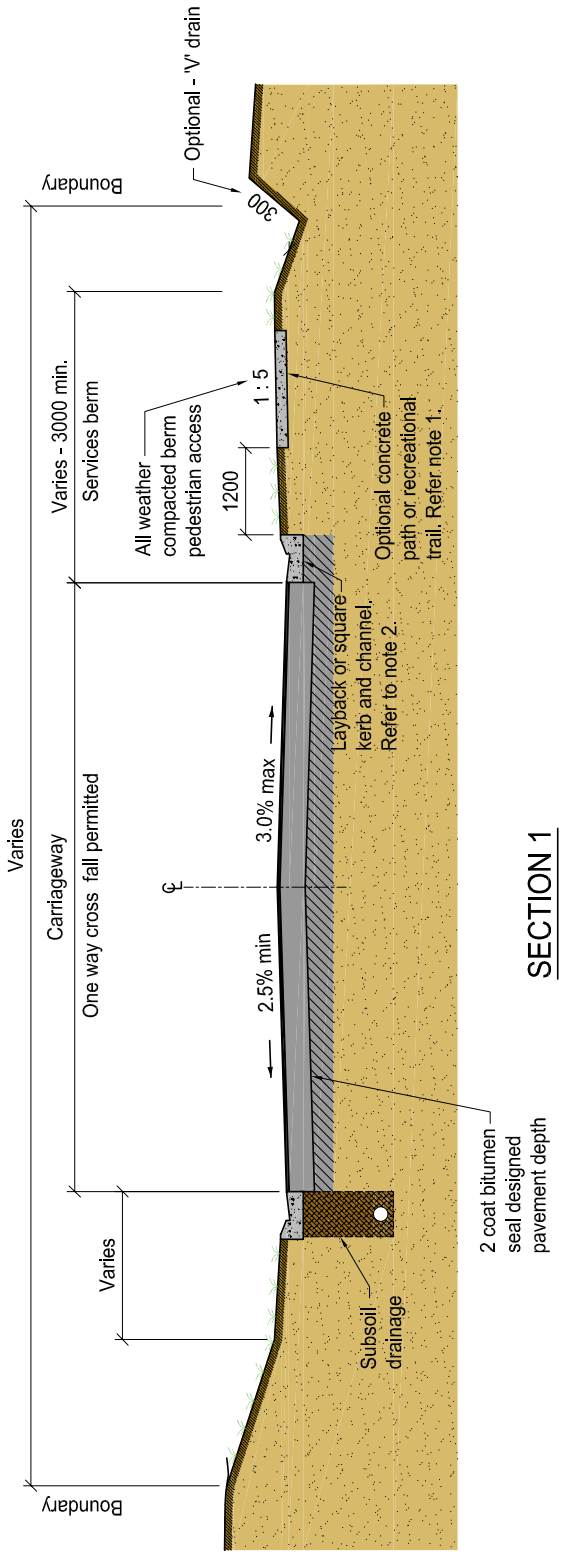
STANDARD CROSS SECTION

STANDARD RURAL PUBLIC ROAD

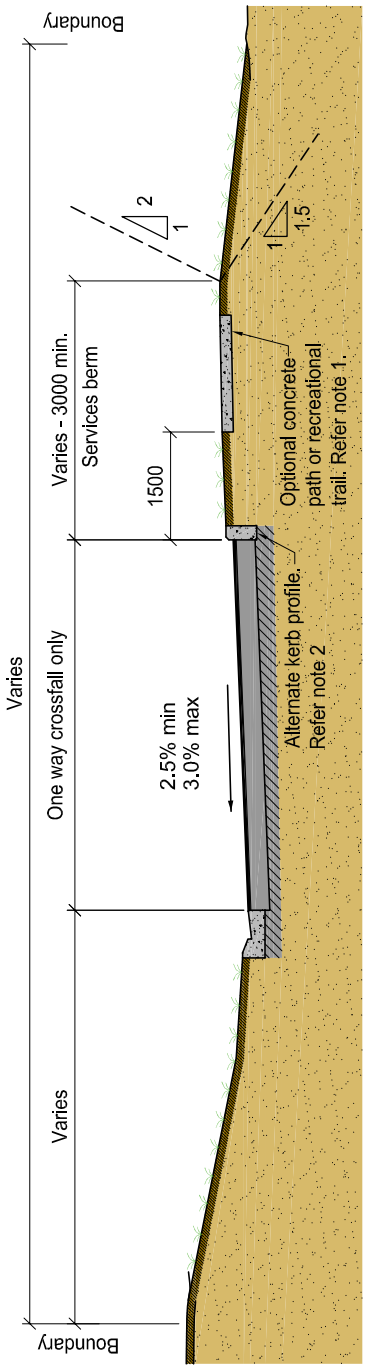
W417

NOTES:

1. A concrete pedestrian path, shared use path or recreational trail shall be on one side only where required by Council.
2. Flush kerb and barrier kerb may be used in special circumstances.



SECTION 1

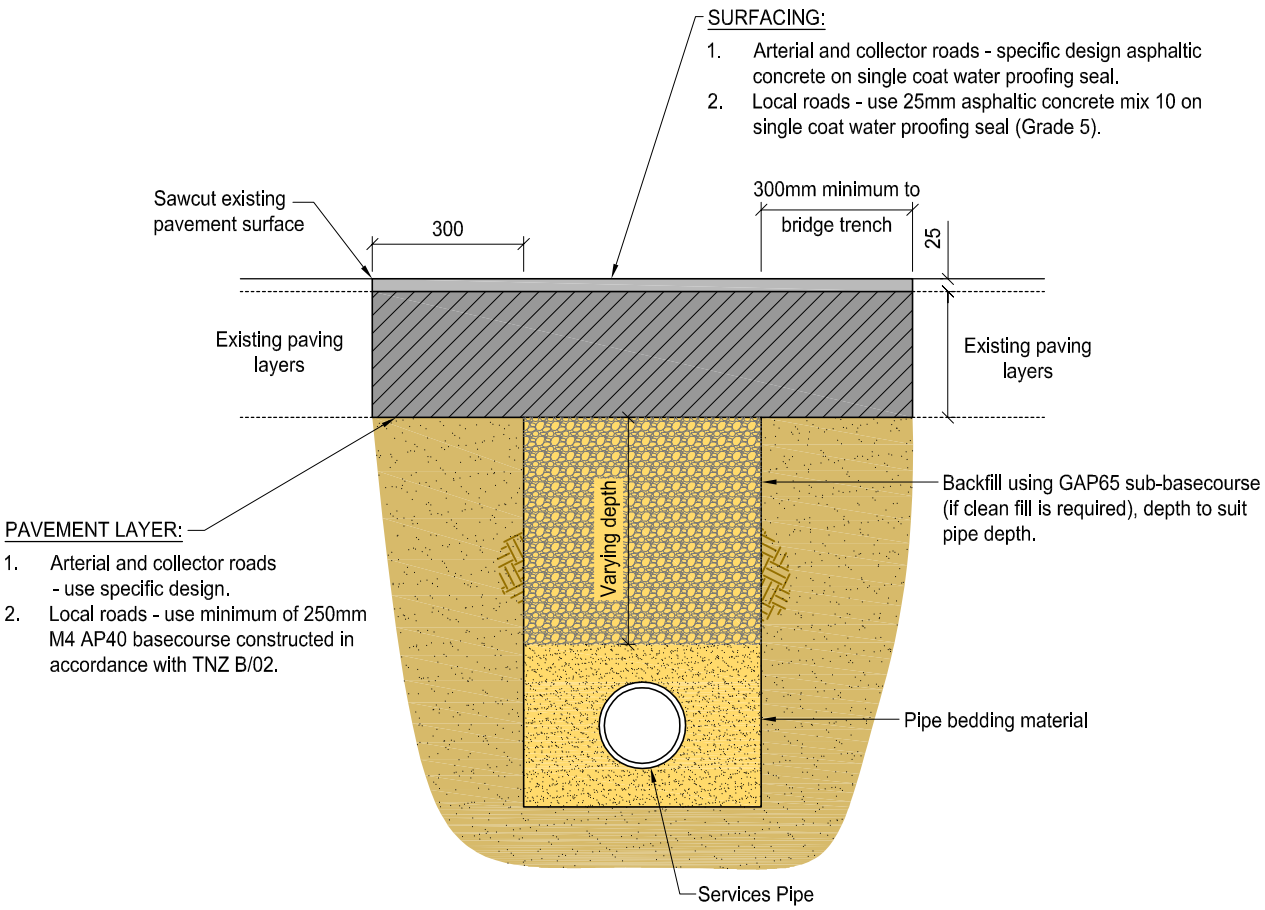


SECTION 2

SPECIAL CIRCUMSTANCES ONLY - 8 LOTS ABSOLUTE MAXIMUM

RURAL / RESIDENTIAL ROAD

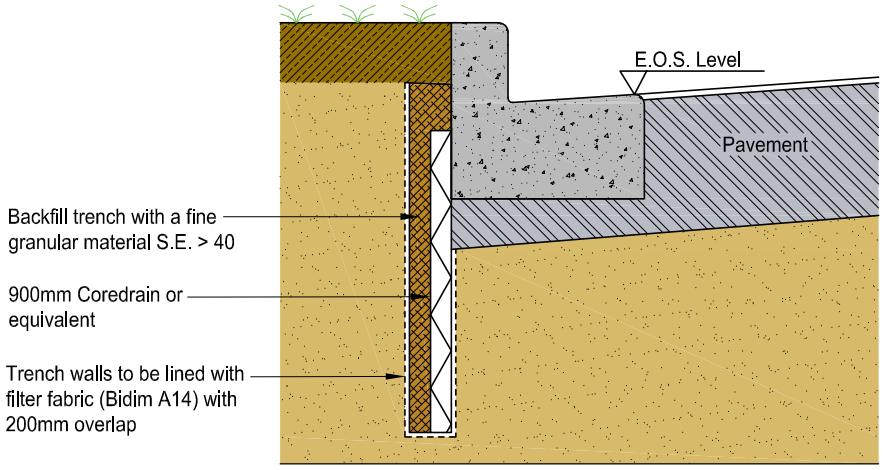
W418



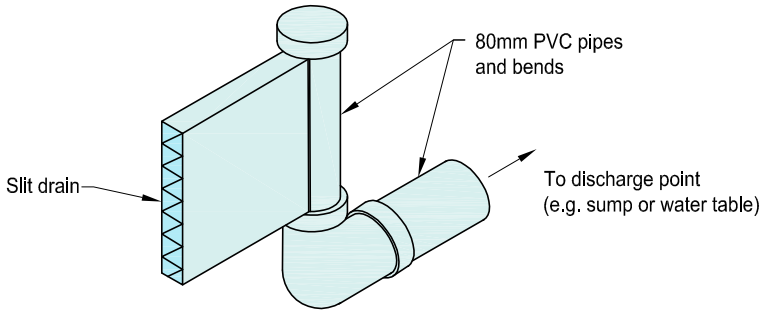
SERVICE TRENCH IN CARRIAGEWAY

NOTES:

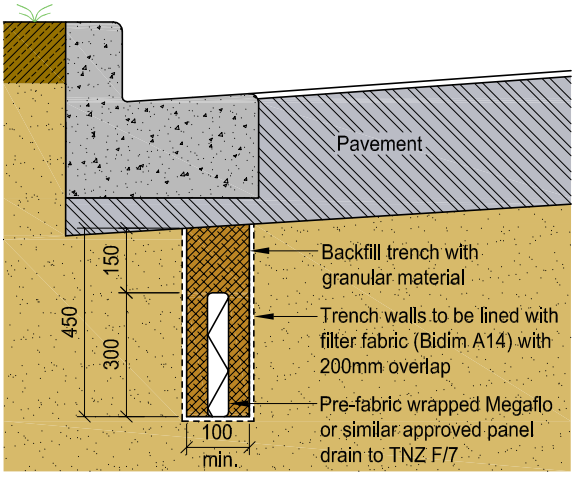
1. Reinforcement not required where thickness of concrete is 200mm or greater.
2. All concrete to be ordinary grade 20 MPa at 28 days minimum density 2320 kg/m³.



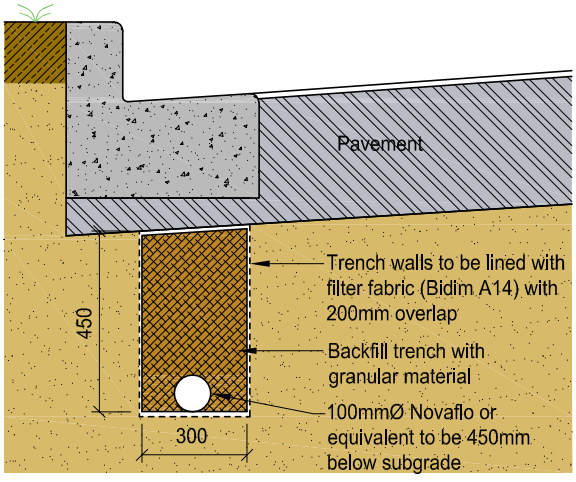
BERM CUT-OFF DRAIN



SLIT DRAIN TERMINATION



SLIT DRAIN ALTERNATIVE



DRAINCOIL ALTERNATIVE

UNDER KERB DRAIN

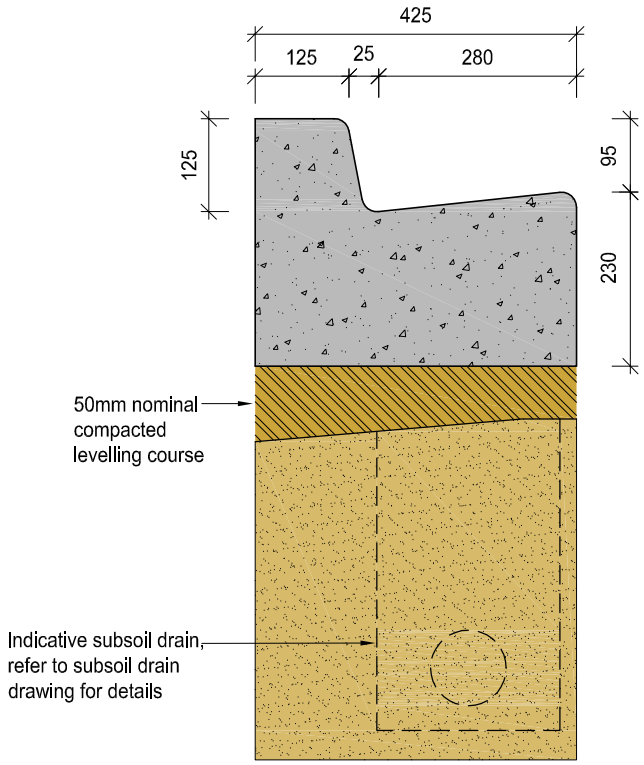
SUBSOIL DRAIN FOR KERBS

W422

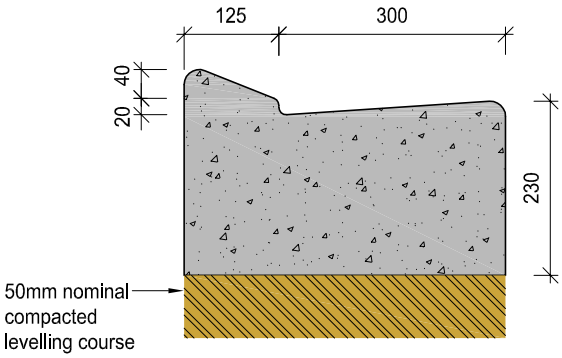
EXAMPLE PHOTO

NOTES:

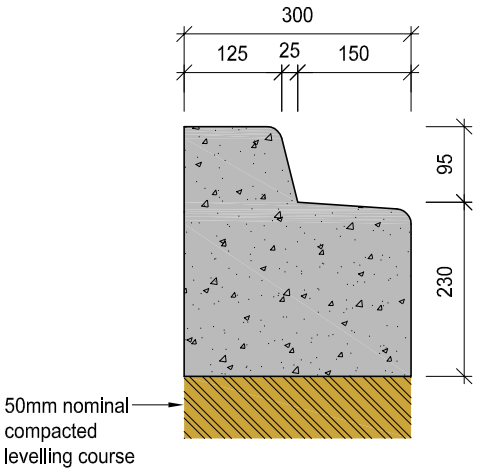
1. Mountable kerb shall only be permitted in areas where the Engineer is satisfied that berms will not be at risk as a result of indiscriminate access or continuous parking and stormwater can be controlled in accordance with design criteria.
2. The subgrade beneath the kerbs shall not be less than CBR 7.
3. A 200mm thick kerb may be used on natural ground in residential areas.
4. Subsoil drains shall be in accordance with specific design.



KERB AND CHANNEL



MOUNTABLE KERB & CHANNEL

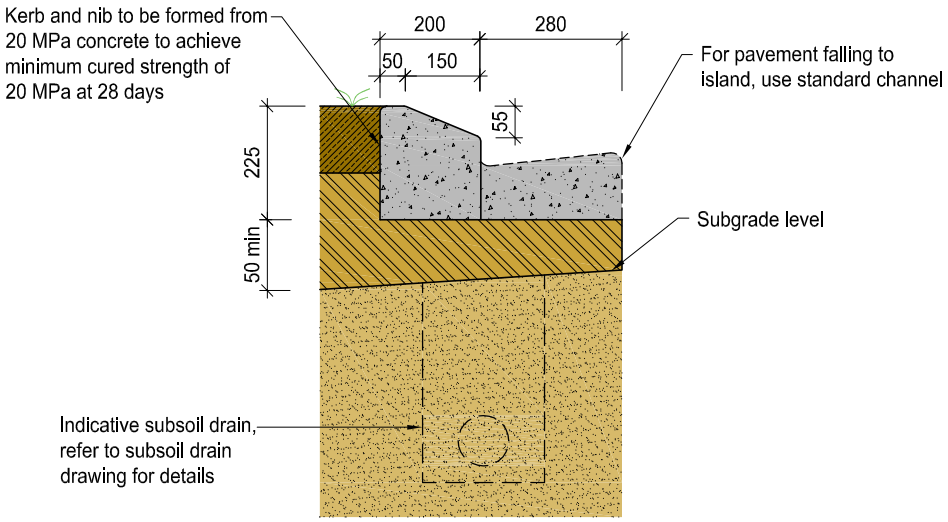


KERB AND FOOTING

EXAMPLE PHOTO

NOTES:

1. All concrete to be ordinary grade, 20 MPa at 28 days, fair faced finished.
2. Expansion joints required in kerb and channel/nib every 3.6m.



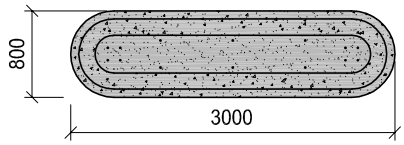
CONCRETE WORK

KERB & NIB FOR TRAFFIC ISLAND

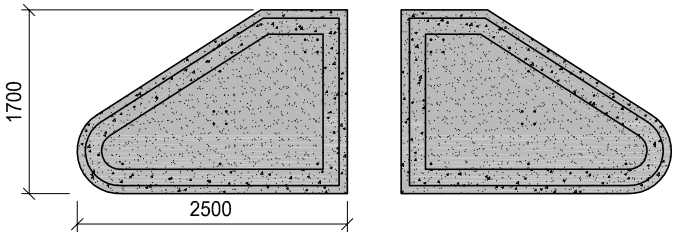
W424

NOTES:

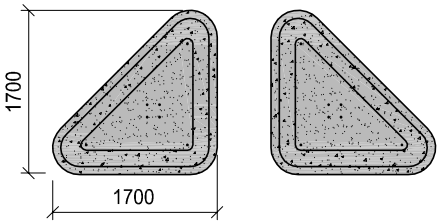
1. Precast traffic islands of other dimensions are available on request.
2. Cement to comply with NZS 3122:1974.
3. Aggregates to comply with NZS 3131, nominal size <14mm.
4. Pigments to comply with NZS 3117.
5. Slip resistance to AS/NZS 3611, mean coefficient (wet) > 0.4 and no specimen <0.35.



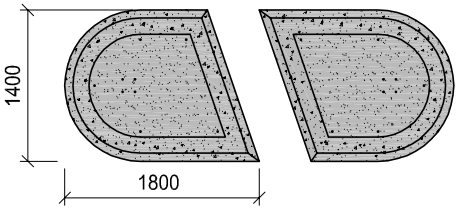
SIDE ISLAND STANDARD PROFILE



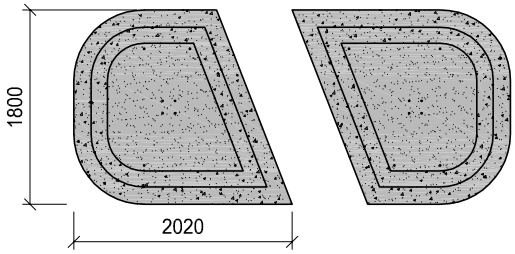
SIDE ISLAND STANDARD PROFILE



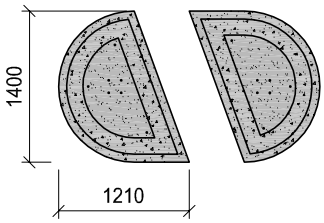
SIDE ISLAND STANDARD PROFILE



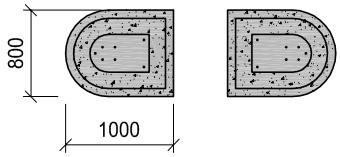
CENTRE REFUGE STANDARD PROFILE



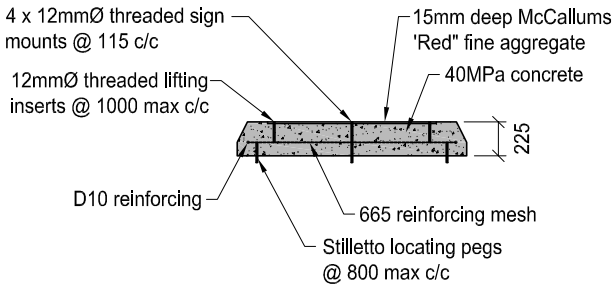
CENTRE REFUGE LOW PROFILE



CENTRE REFUGE STANDARD PROFILE SHORT



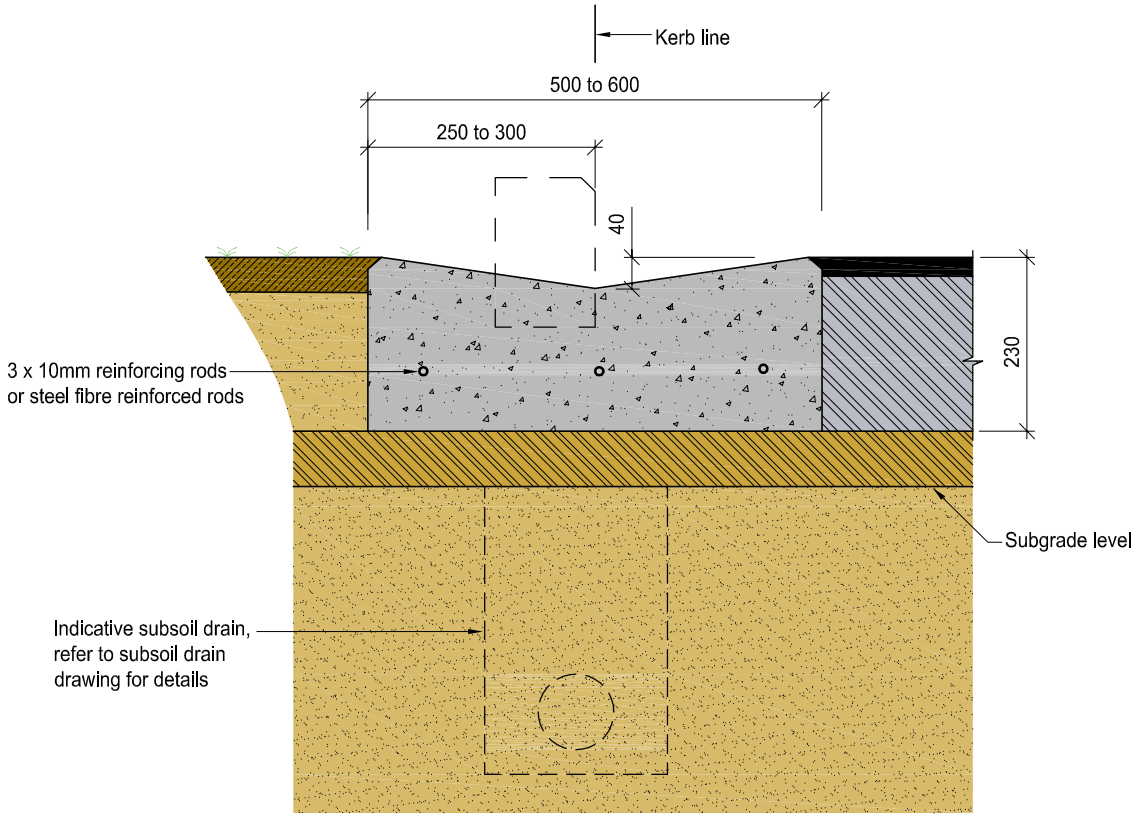
BARRIER GATE PEDESTAL STANDARD PROFILE



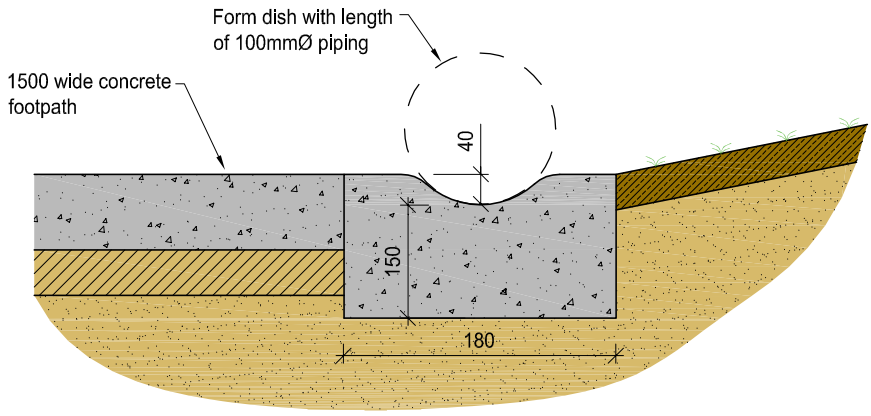
TYPICAL CROSS SECTION

NOTES:

1. Reinforcement not required where thickness of concrete is 200mm or greater.
2. All concrete to be ordinary grade 20 MPa at 28 days minimum density 2320 kg/m³.



PARKING AREA



LOW LEVEL PATH

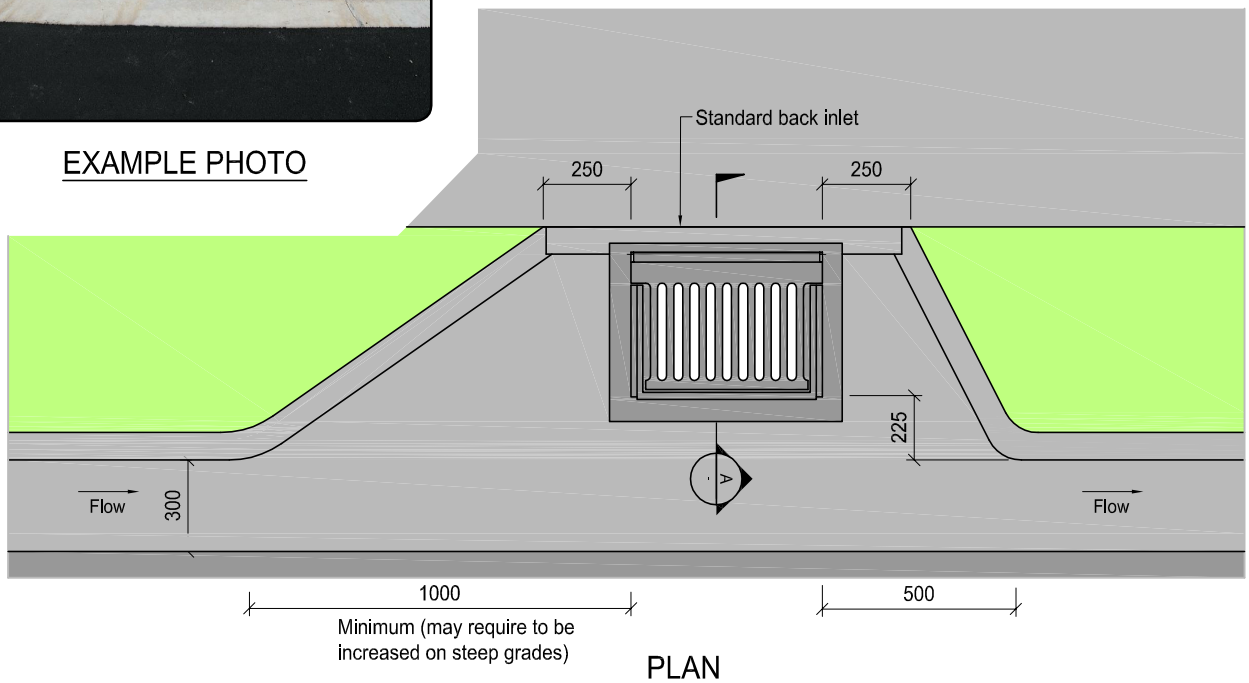
CONCRETE WORK
DISHED CHANNEL

W426

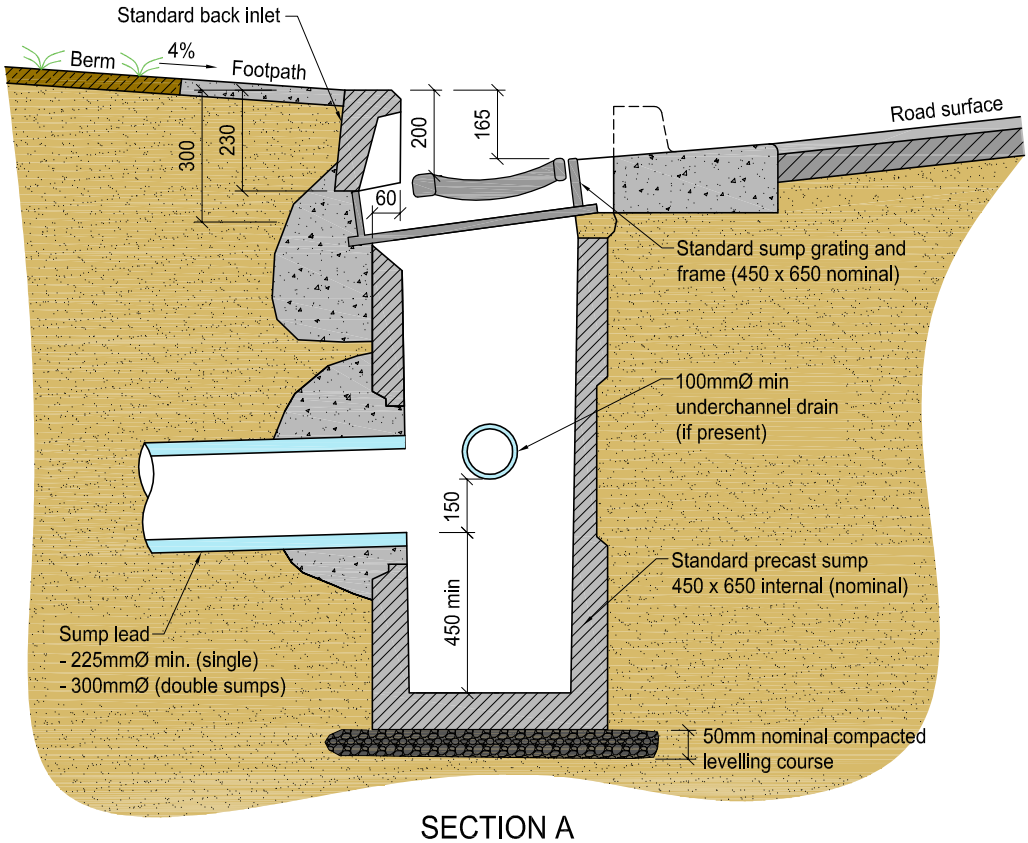
EXAMPLE PHOTO

NOTES:

1. All concrete to be ordinary grade 20 MPa at 28 days.
2. All pipes to be finished flush with inside wall of sump with ends epoxy mortared.
3. 225mm gap between double sumps.



PLAN



SECTION A

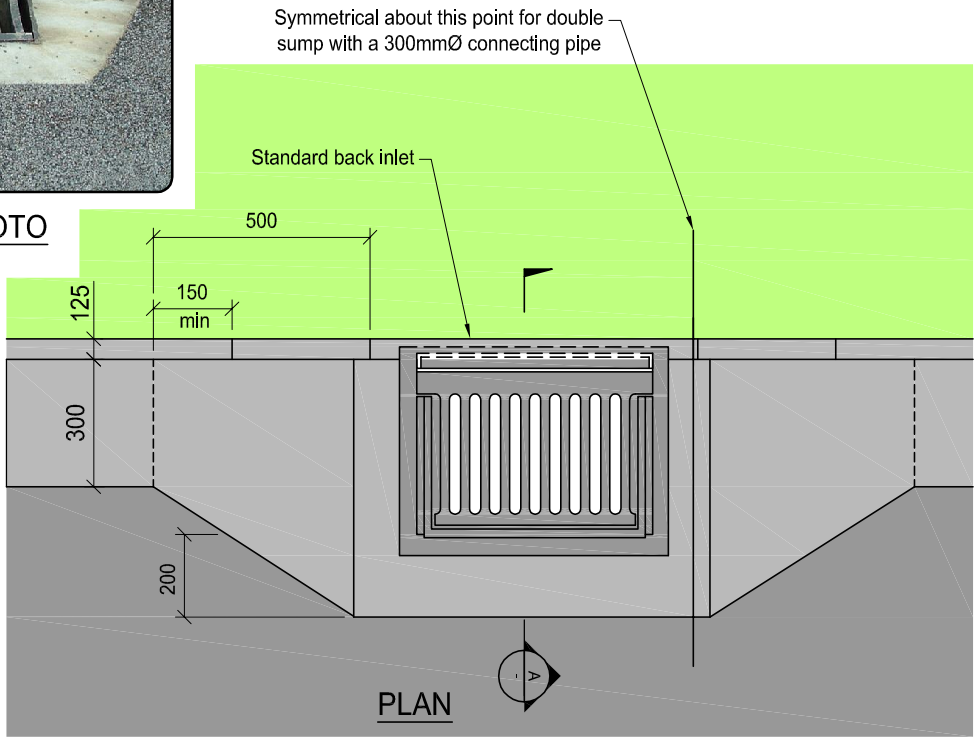
CONCRETE WORK
RECESSED SUMP

W427

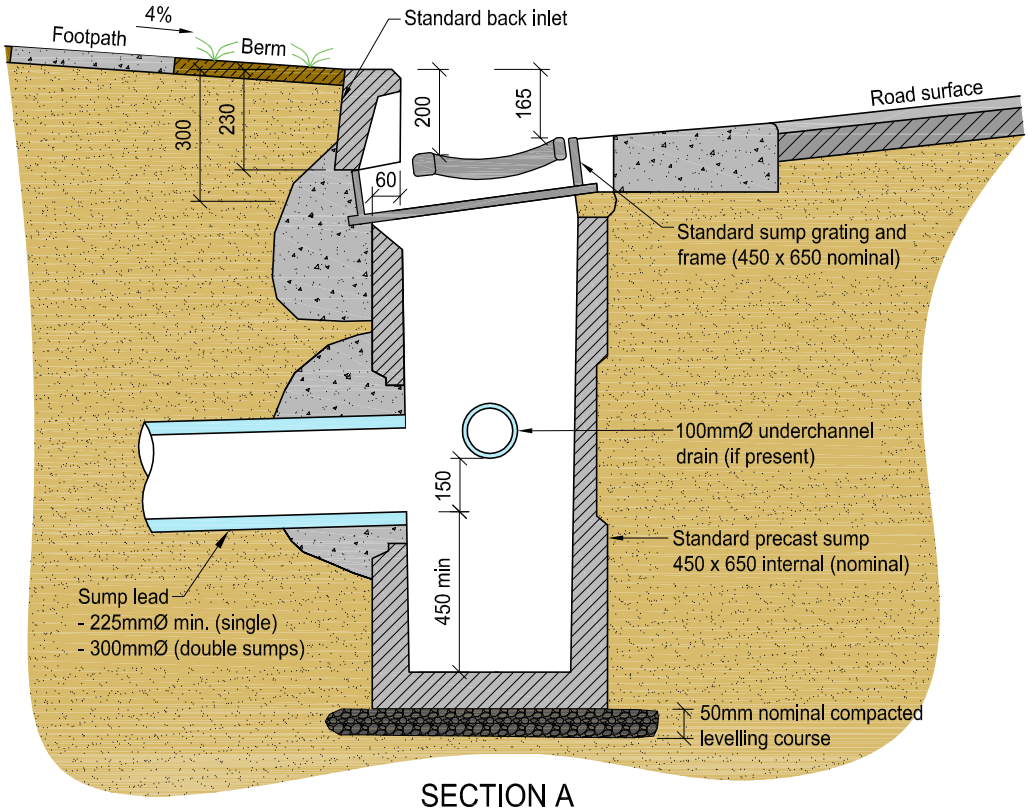
EXAMPLE PHOTO

NOTES:

1. All concrete to be ordinary grade 20 MPa at 28 days.
2. All pipes to be finished flush with inside wall of sump with ends epoxy mortared.



PLAN

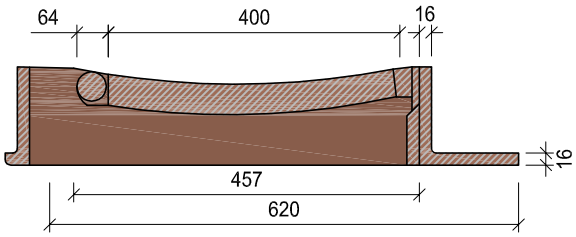


SECTION A

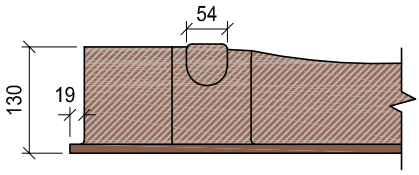
CONCRETE WORK

ALTERNATIVE SUMP (SPECIAL APPROVAL ONLY)

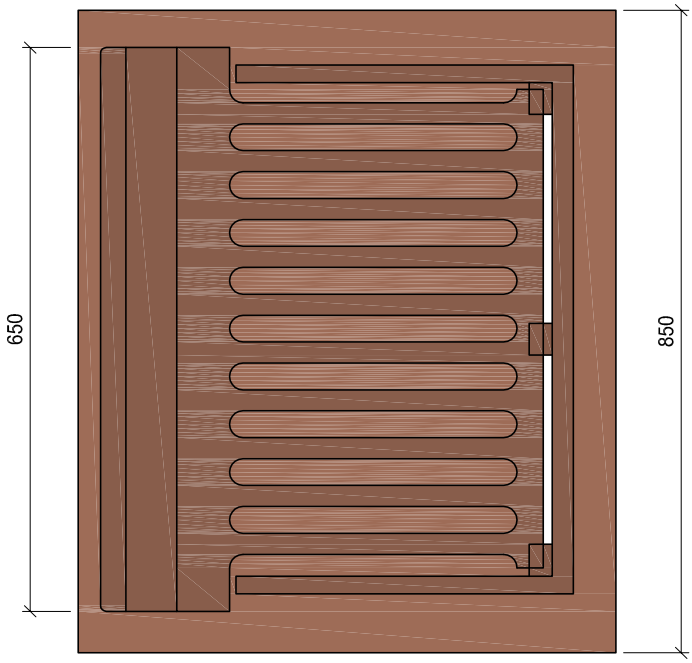
W428



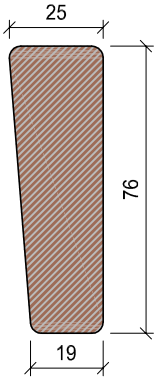
SECTION



PART END ELEVATION



PLAN



SECTION OF RIB

CONCRETE WORK

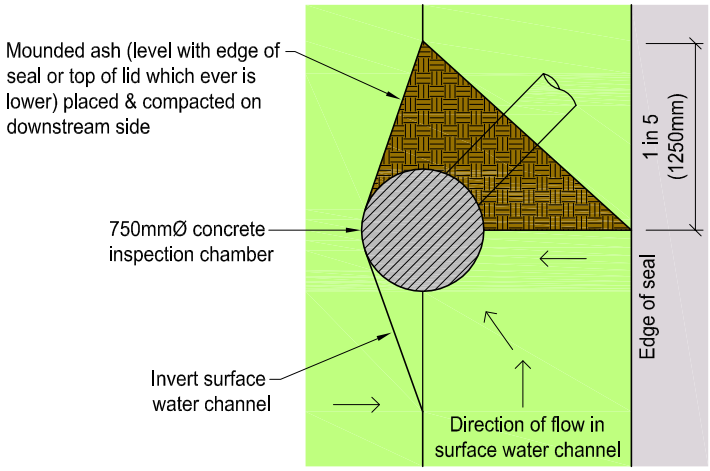
SUMP - FRAME & GRATE

W429

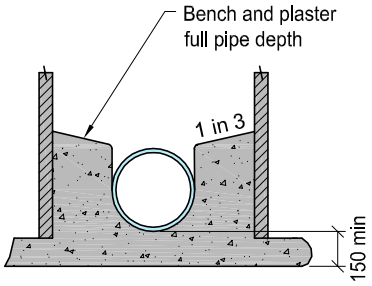
Western Bay of Plenty District Council

DEVELOPMENT CODE

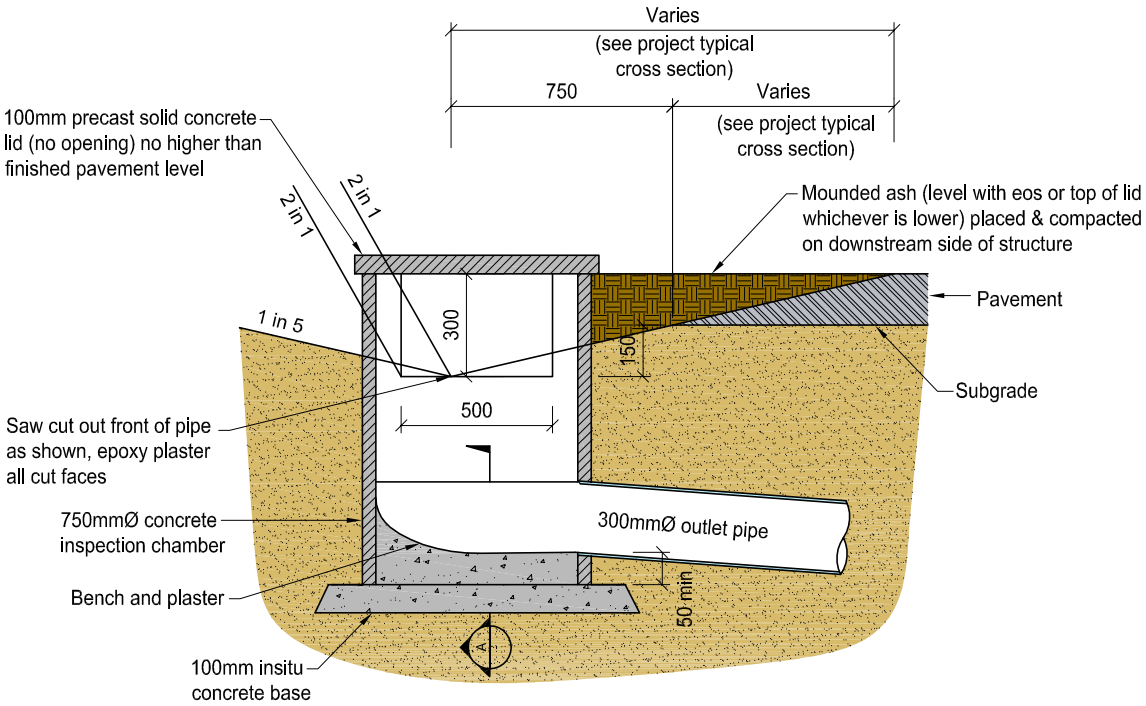
VERSION 1
AUG 09



PLAN



SECTION A



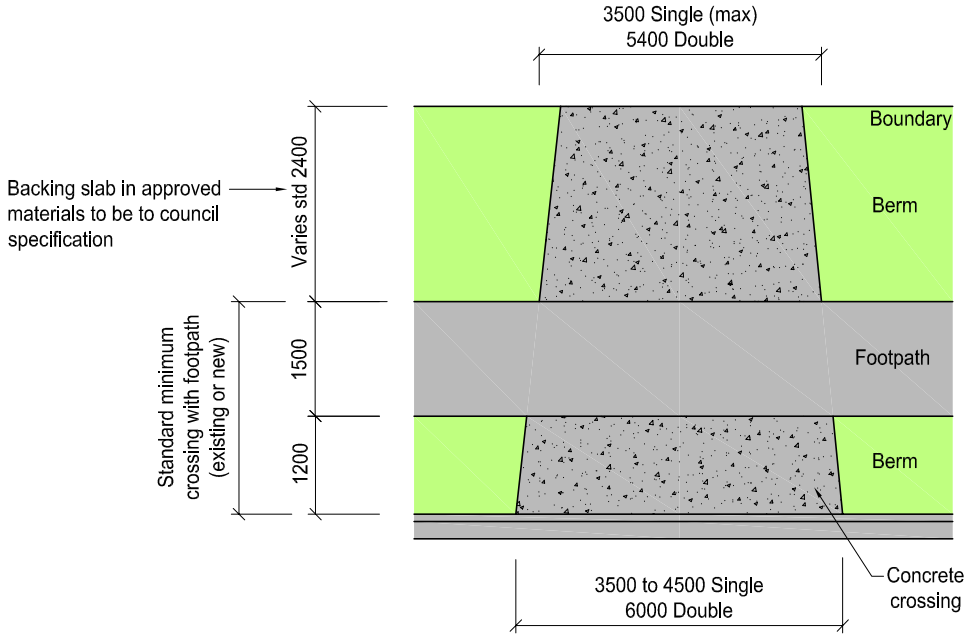
DROP STRUCTURE DETAIL

CONCRETE WORK
DROP STRUCTURE

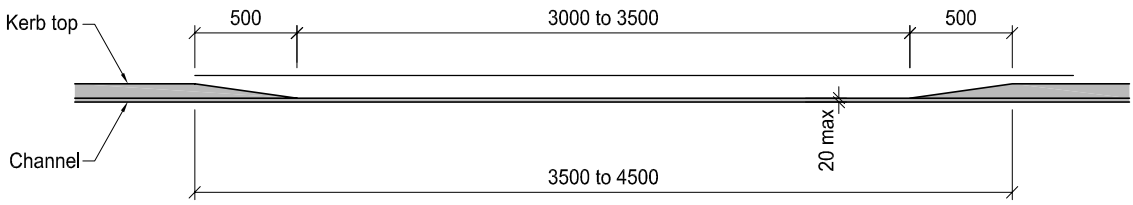
W430

NOTES:

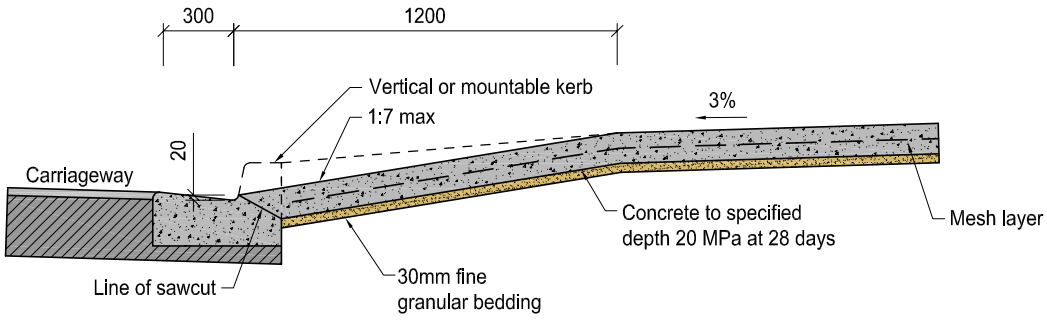
1. Standard minimum crossing thickness:
   - Residential min. 120mm thick - 1 layer 668 mesh
   - Commercial / Industrial min. 150mm thick - 1 x layer 668 mesh



VEHICLE CROSSING



KERB LET DOWN



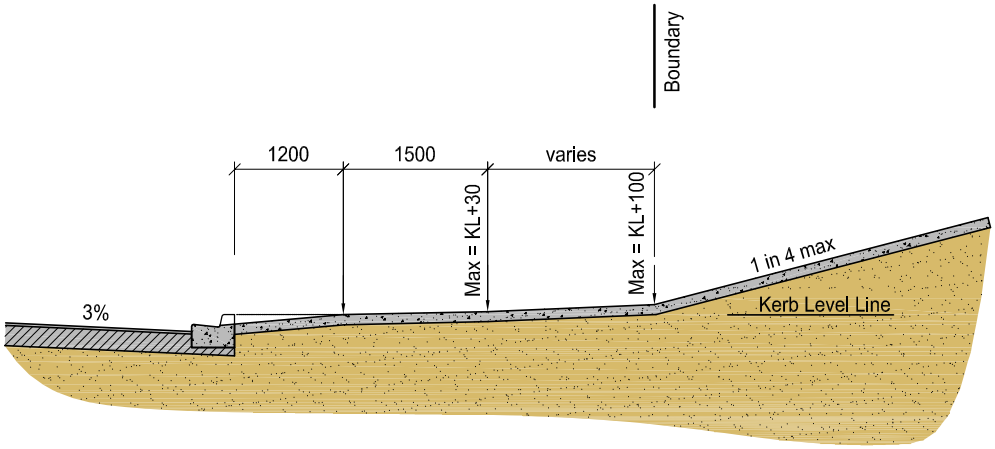
SECTION OF KERB CROSSING

URBAN VEHICLE CROSSING

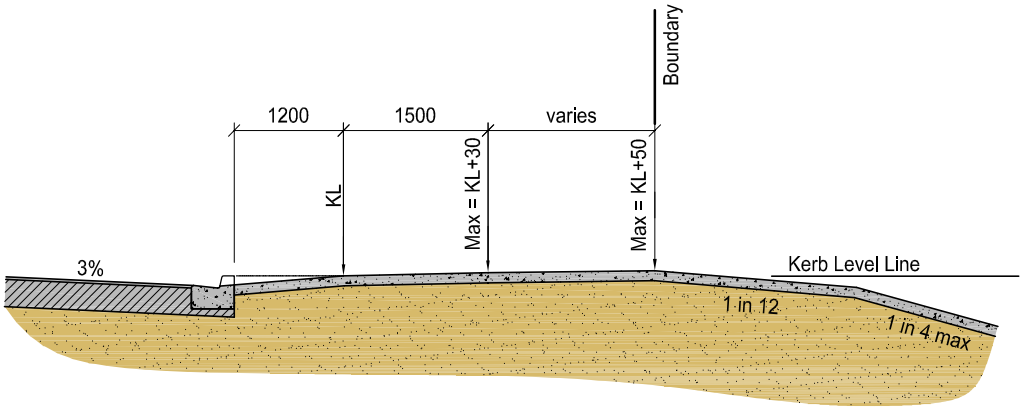
W435

NOTES:

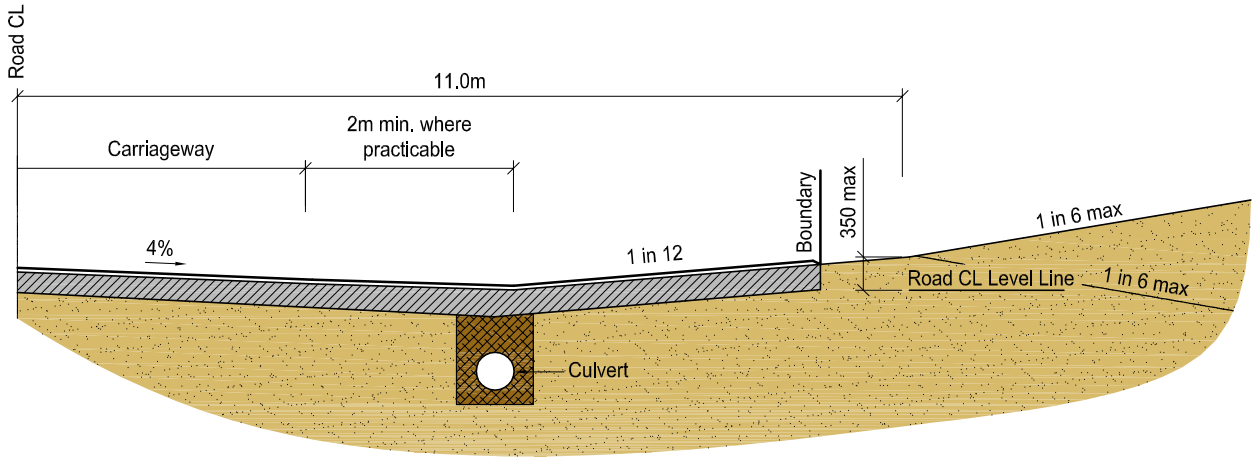
1. To suit 99 percentile vehicle with 50mm ground clearance. (M.O.T. 1975 dimensions)
2. K.L. = Top of kerb level.



HIGH ACCESS



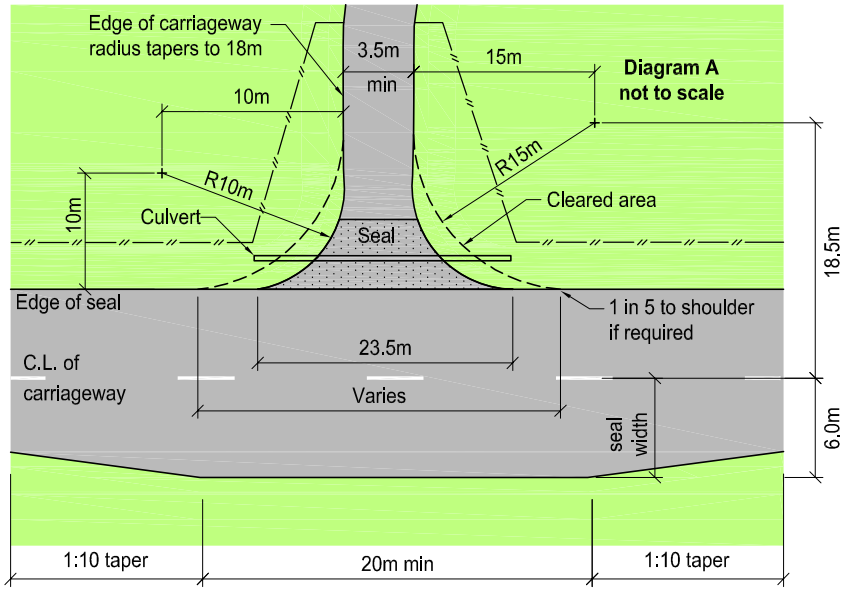
LOW ACCESS



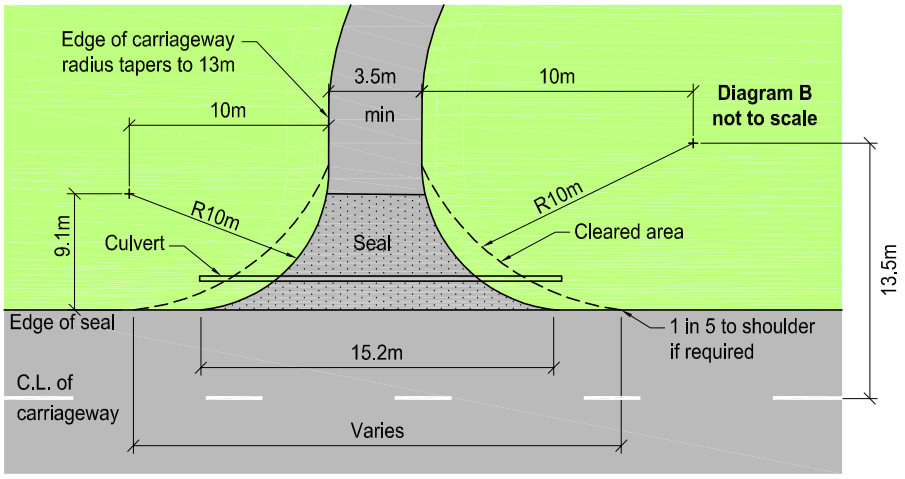
RURAL ACCESS

VEHICLE CROSSING PROFILES

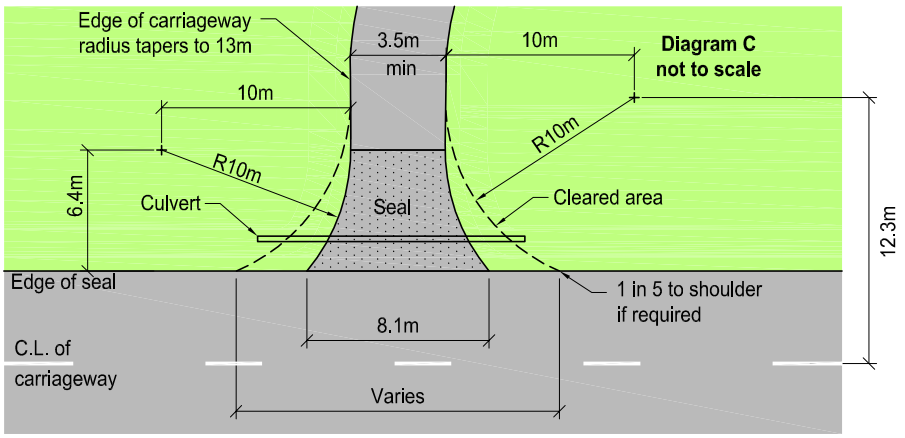
W436



COMMERCIAL DEVELOPMENT & TANKER ENTRIES



PASTORAL LOTS



RURAL & RURAL RESIDENTIAL

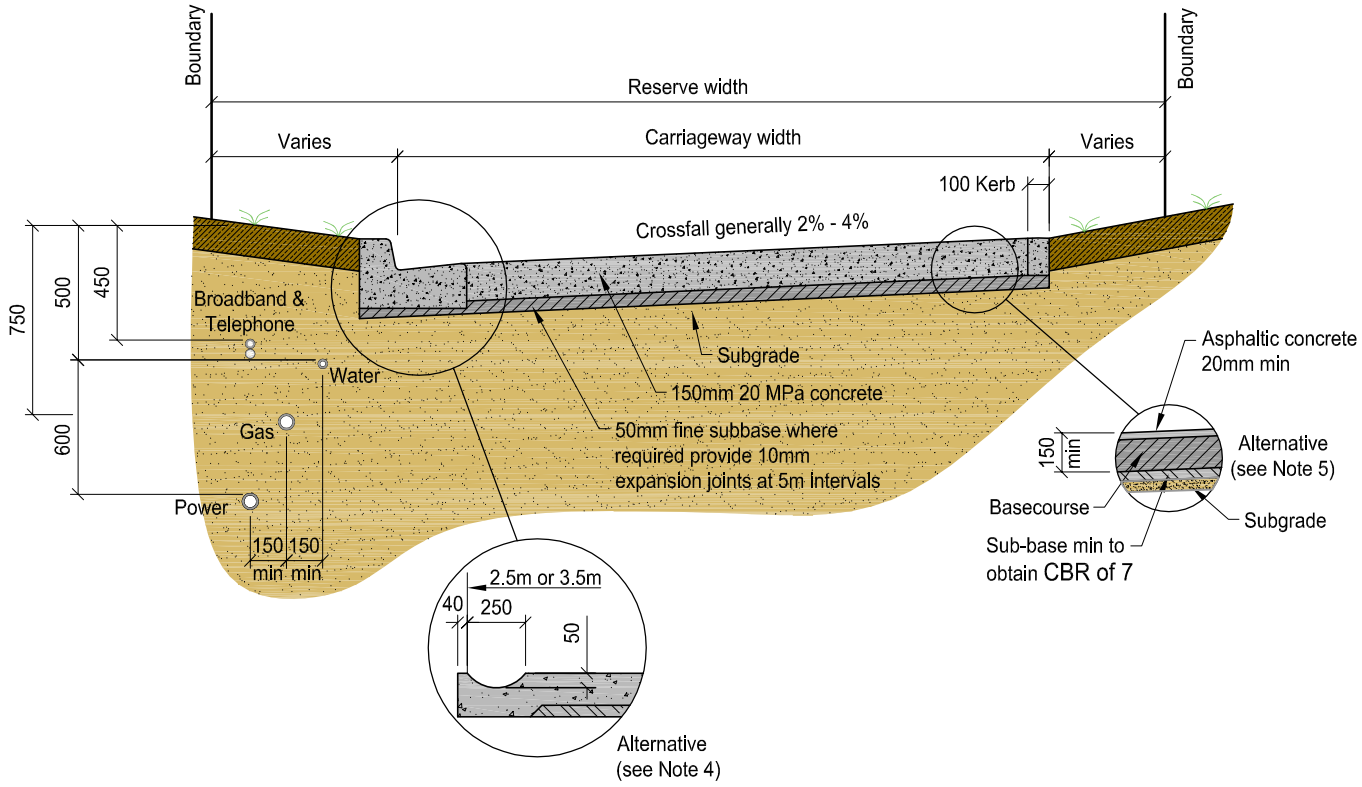
RURAL VEHICLE ENTRANCE

W437

EXAMPLE PHOTO

NOTES:

1. For private ways longer than 70m watermain to be 100mmØ.
2. For private ways serving up to 4 residential units, construct carriageway only or two 750mm x 130mm concrete strips with 750mm space between. Concrete infill between strips will be required where individual dwelling access onto the R.O.W. All concrete to be 20 MPa minimum strength.
3. Where longitudinal grade is less than 12.5% & stormwater control is not critical, dished channel alternative may be used.
4. Basecourse & asphaltic pavement or cobble stones (heavy duty) alternatives may be used in place of concrete shown.
5. Maximum sealed private way area of 300m² to discharge through 450 x 450mm catchpit with 225mmØ outlet.
6. Stormwater from privateways is to be contained so as to minimise the effect of discharge onto adjoining properties.

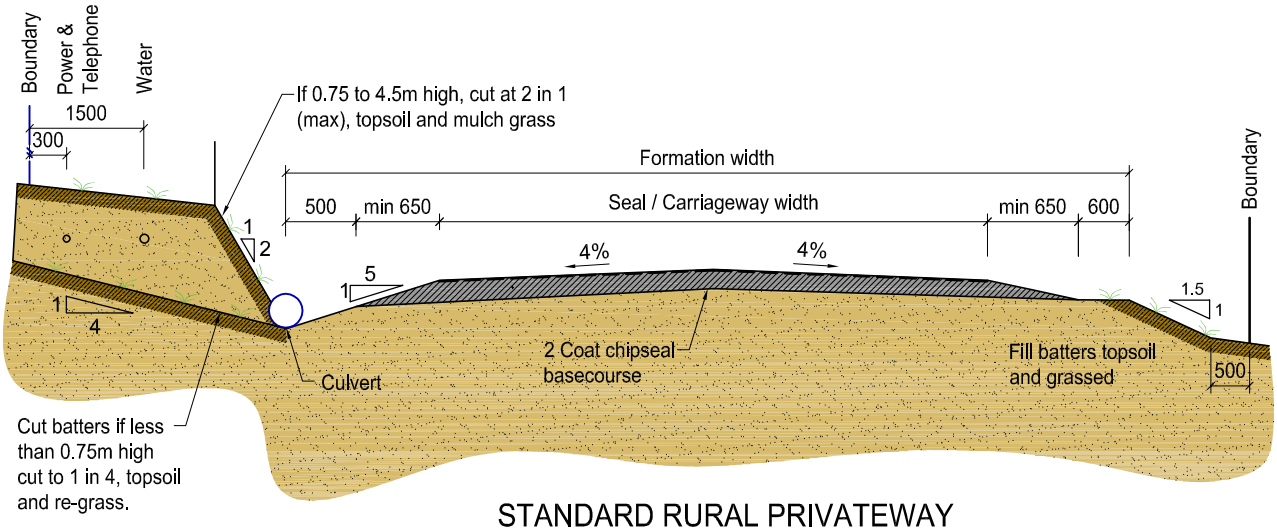


RESIDENTIAL PRIVATE WAY

W438

NOTES:

1. Visibility: Minimum sight distances of 30m are required. Adequate lines of clear sight shall be provided to all confined entrance locations.
2. Dimensions: Where services are to be located in the privateway at least 2.5m shall be provided on one side of the carriageway to provide for the construction of the underground services.
3. Stormwater: Provision shall be made for the collection and disposal of stormwater. All upstream catchments shall be provided for. Consideration shall be given to scour &/or silting. Culverts shall be 225 minimum diameter, constructed to manufacturers recommendation.
4. Curves and corners: Minimum inside radius of curves shall be 9m.
5. Reserve width: The legal boundary of the privateway shall include all cut and fill batters steeper than 1 in 4 and passing bays.
6. Alternatives: Single crossfall shall also be considered.



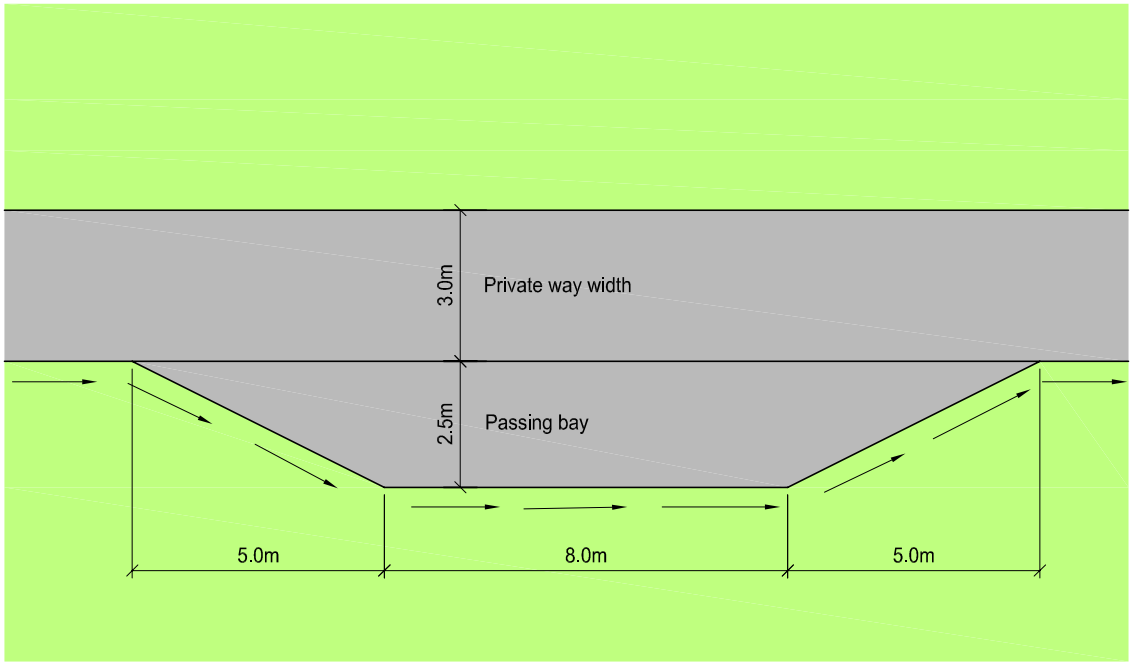
STANDARD RURAL PRIVATEWAY

PASSING BAYS

1. Passing bays shall be provided outside the minimum carriageway width at generally not more than 150m intervals passing bays shall be constructed in accordance with W440

NOTES:

1. The passing bay can be combined with a vehicle entry point.



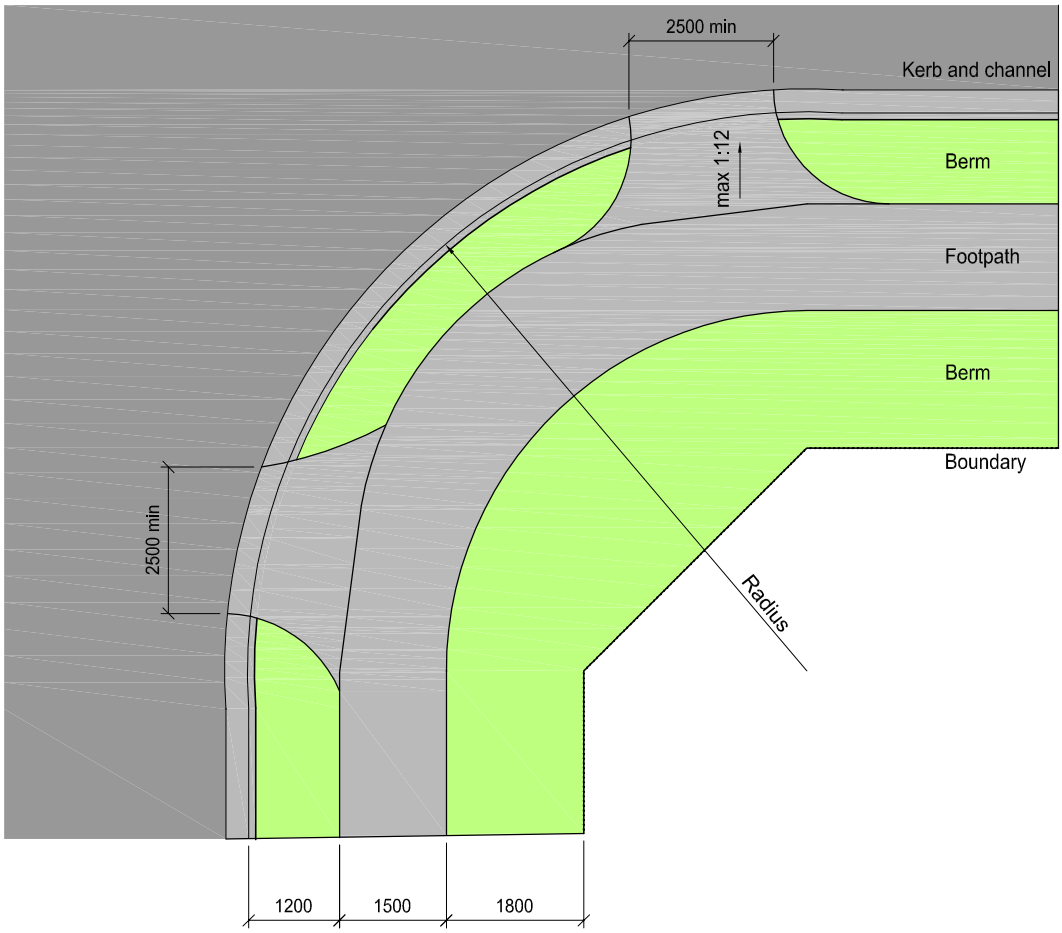
PASSING BAY
for a 90% car

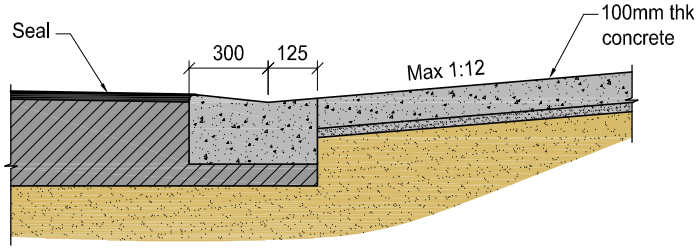
RURAL PRIVATEWAY PASSING BAY

W440

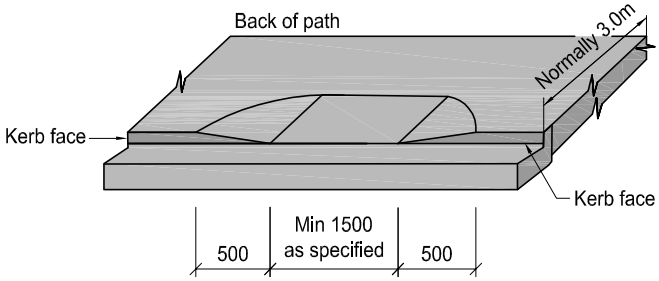
NOTES:

1. Concrete to be ordinary grade 20 MPa @ 28 days.
2. Location of crossings may vary according to specific design.



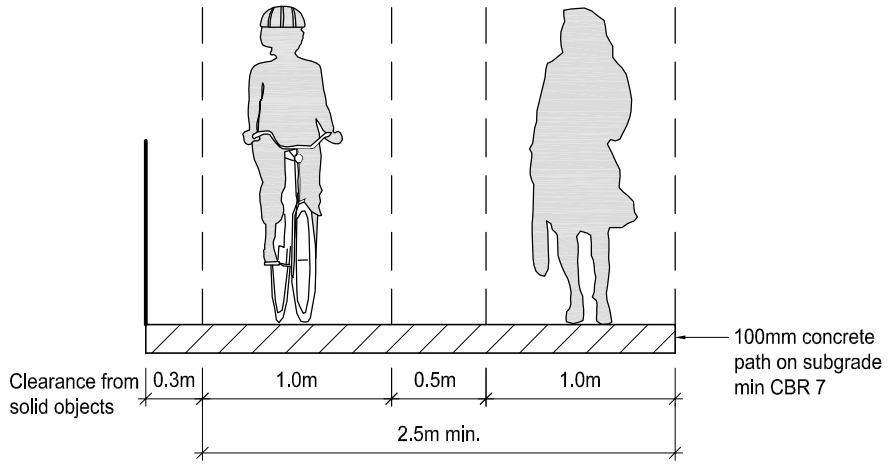


SECTION THROUGH CROSSING



BERM FEATURES
MOBILITY PRAM KERB CROSSING

W445

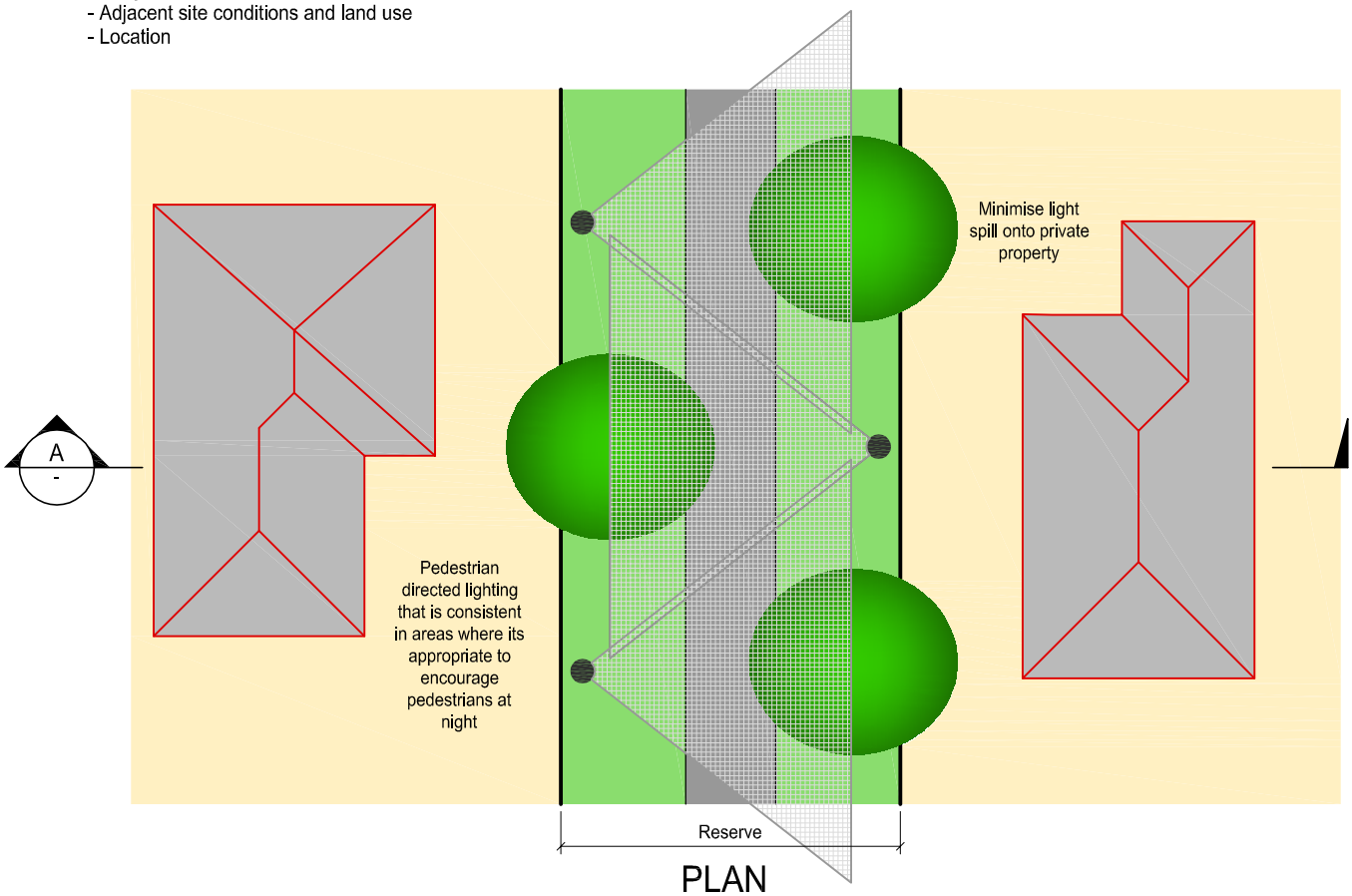


BERM FEATURES
PEDESTRIAN & CYCLE PATHWAY

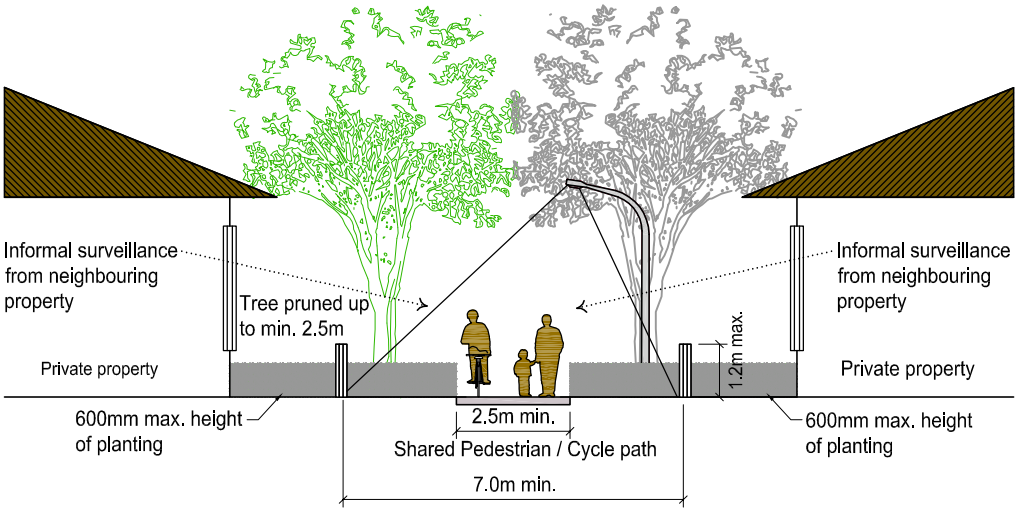
W446

NOTES:

1. Ensure:
   Good sightlines are maintained through the accessway i.e. no bends/blind corners, obstructions such as planting, sudden changes in grade, or areas where people could conceal themselves
2. The accessway is wide enough for strangers to pass each other comfortably and maintain some distance from neighbouring properties to lessen their potential impact on them i.e. noise, loss of privacy.
3. Informal surveillance from adjacent properties i.e. people using the walkway are visible from windows, gardens and other well used areas of neighbouring properties.
4. Variation to width dependent on factors such as:
   - Length
   - Adjacent site conditions and land use
   - Location



PLAN



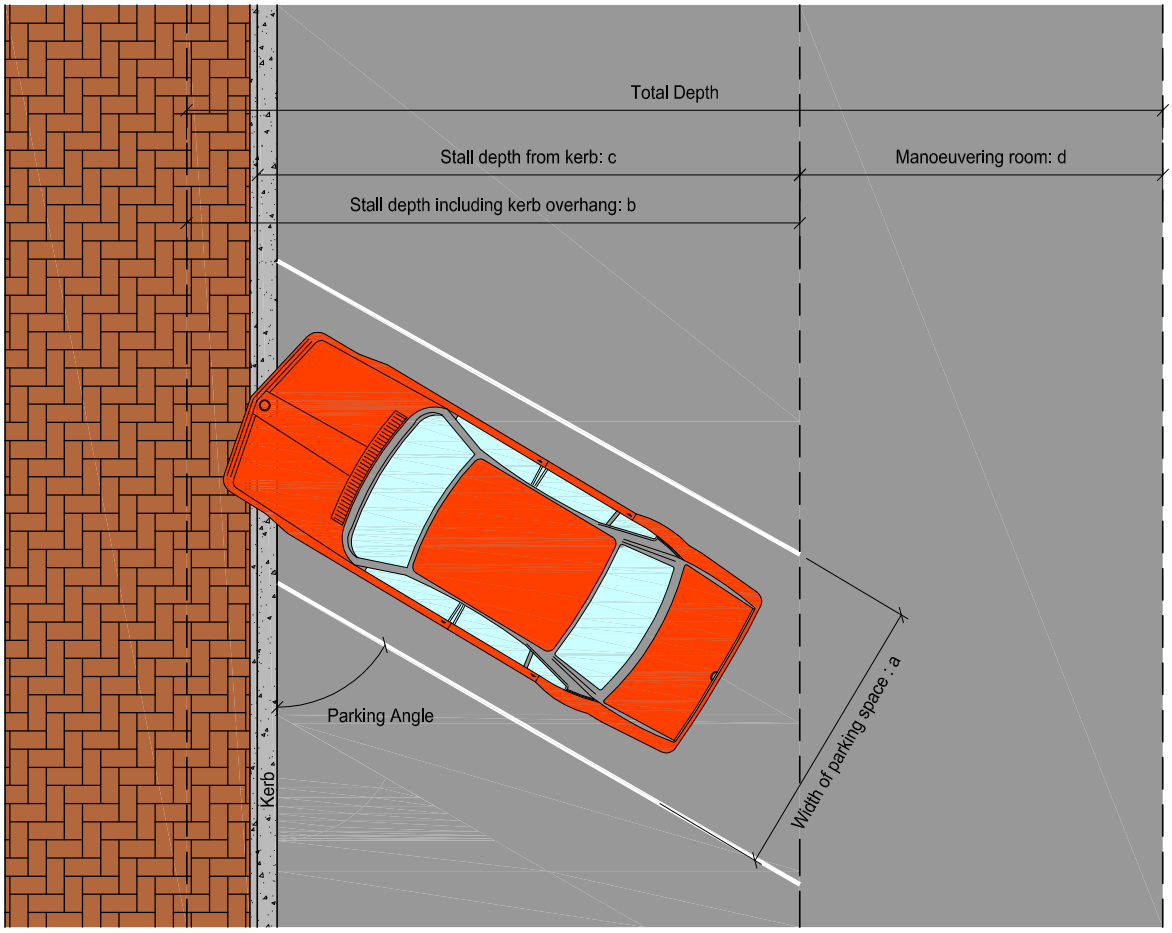
SECTION A -

WALKWAY/ACCESSWAY & PEDESTRIAN/CYCLE PATHWAY

W449

NOTES:

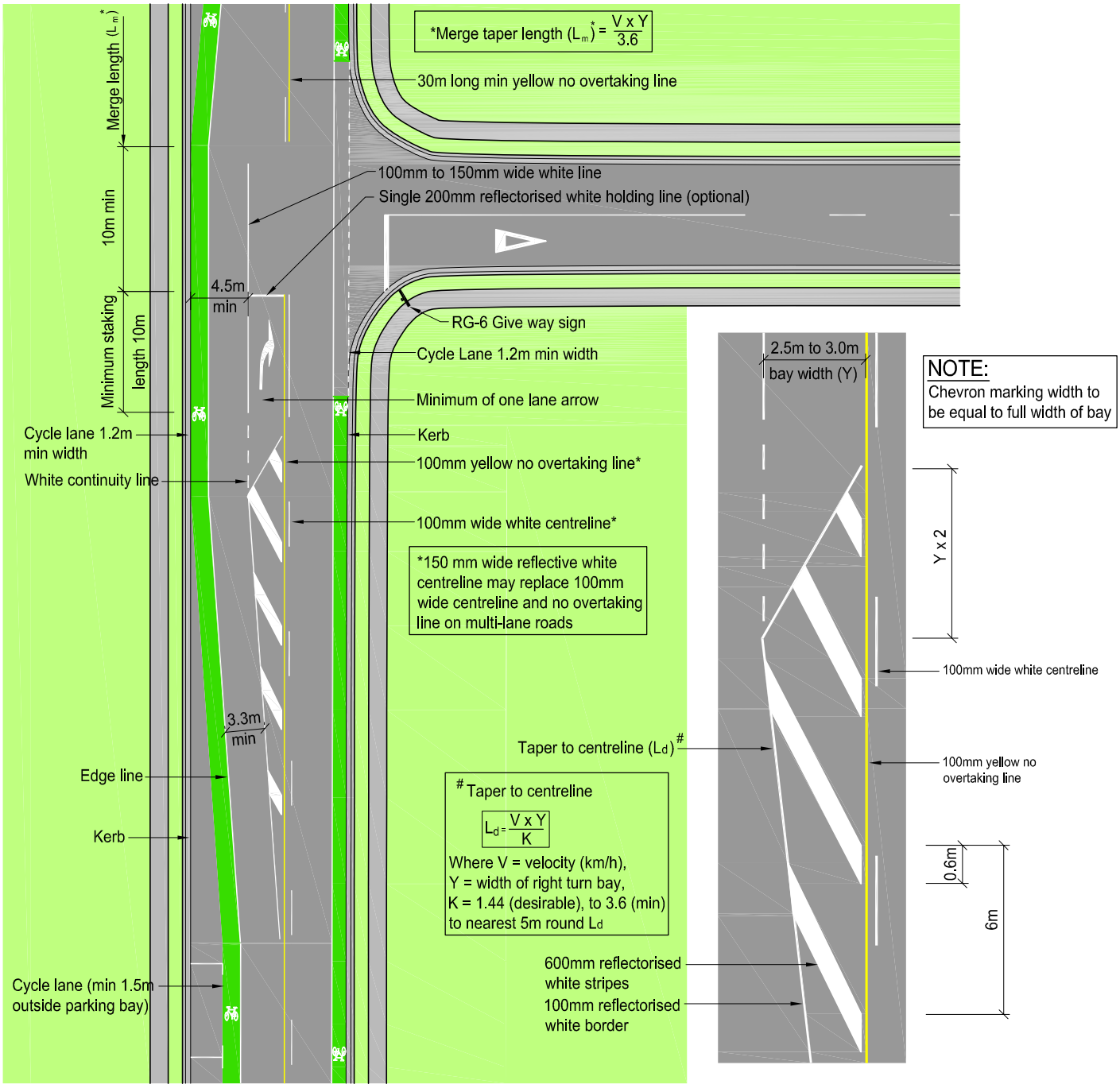
1. These standards are based on AS 2890.1 : 1993 table 1 and Fig. 2.2 for a Class 2 facility (Long Term Casual Parking). Full range of dimensions for Class 1 - 4 given in AS 2890.1 : 1993.



Type of Parking	Stall Width: a	Stall Depth for Wall: b	Stall Depth for Kerb: c	Length	Aisle Width: d	Total Depth One Row	Total Depth Two Rows
Parallel	2.5m	-	-	6.0m	-	-	-
45°	2.5m	5.2m	4.8m	-	3.7m	8.9m	14.1m
60°	2.5m	5.4m	5.1m	-	4.6m	10.6m	16.0m
90°	2.5m	5.2m	4.8m	-	5.8m	10.6m	16.0m

ROAD MARKING
PARKING DIMENSIONS

W460



ALL ROAD MARKINGS TO CONFORM WITH MOTSAM

ROAD MARKING

URBAN RIGHT TURN BAY (OPTION A)

W461

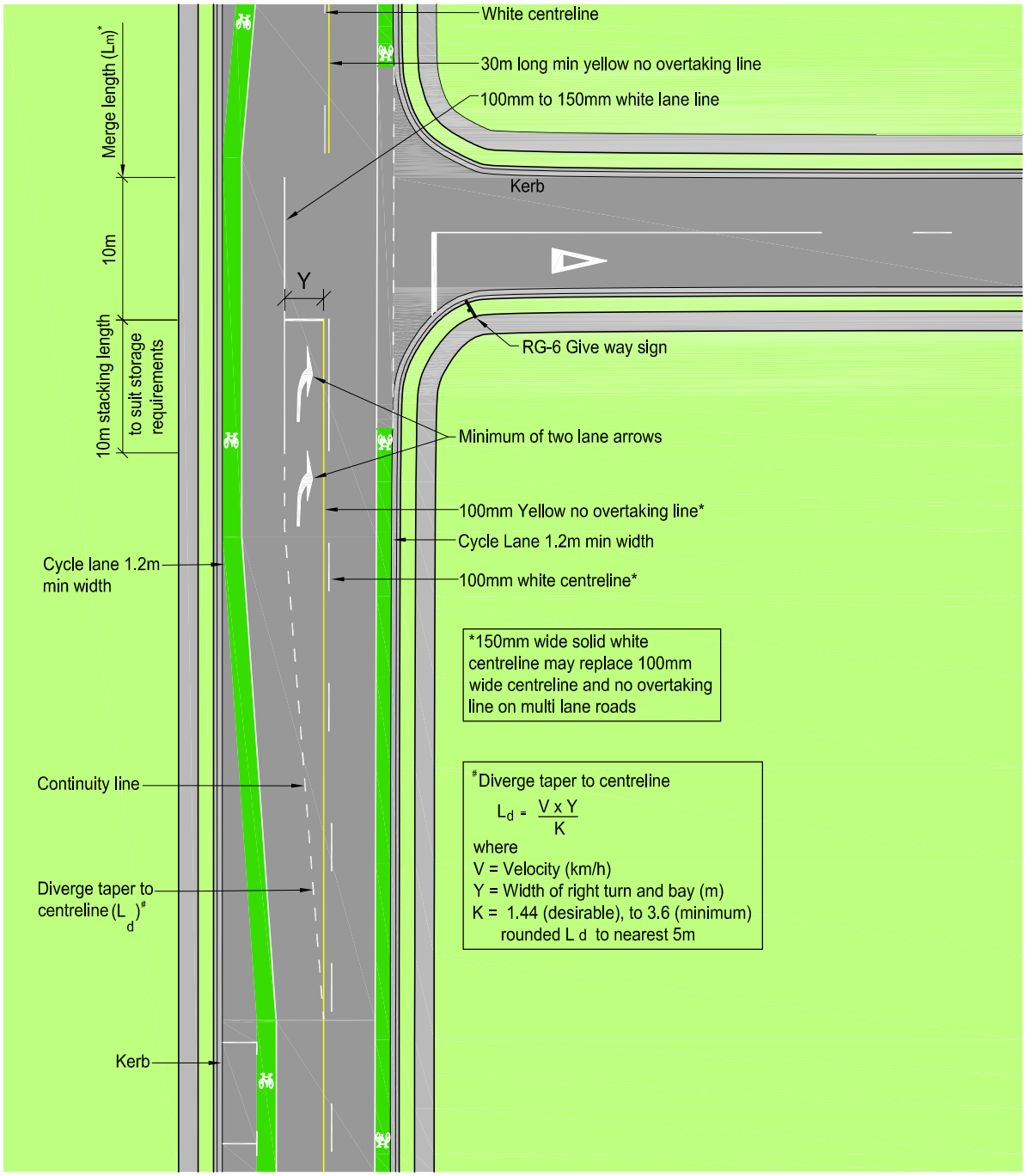
*Merge Length

$L_m = \frac{V \times Y}{3.6}$

where

V = Velocity (km/h)

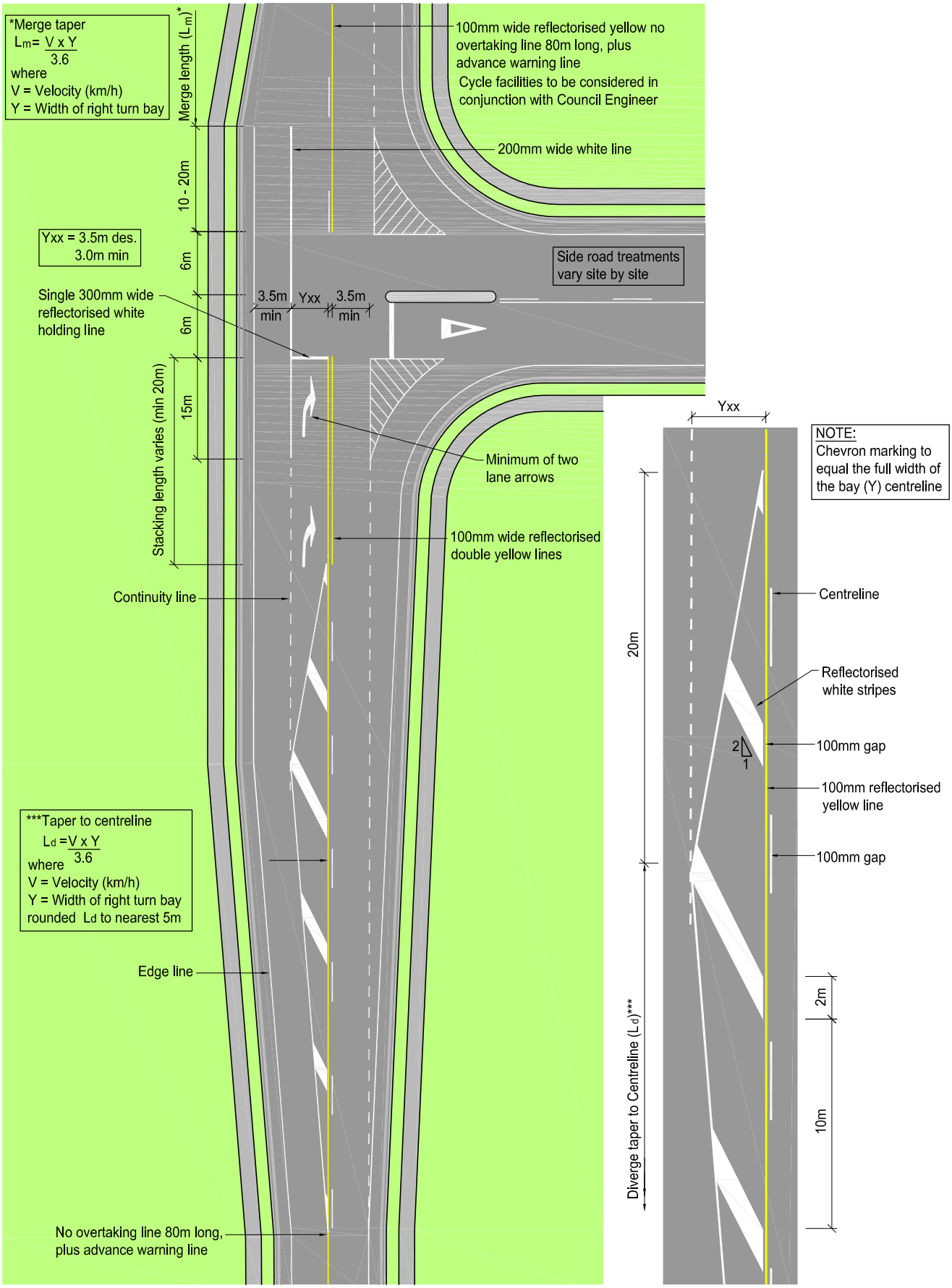
Y = Width of right turn bay



ROAD MARKING

URBAN RIGHT TURN BAY (OPTION B)

W462

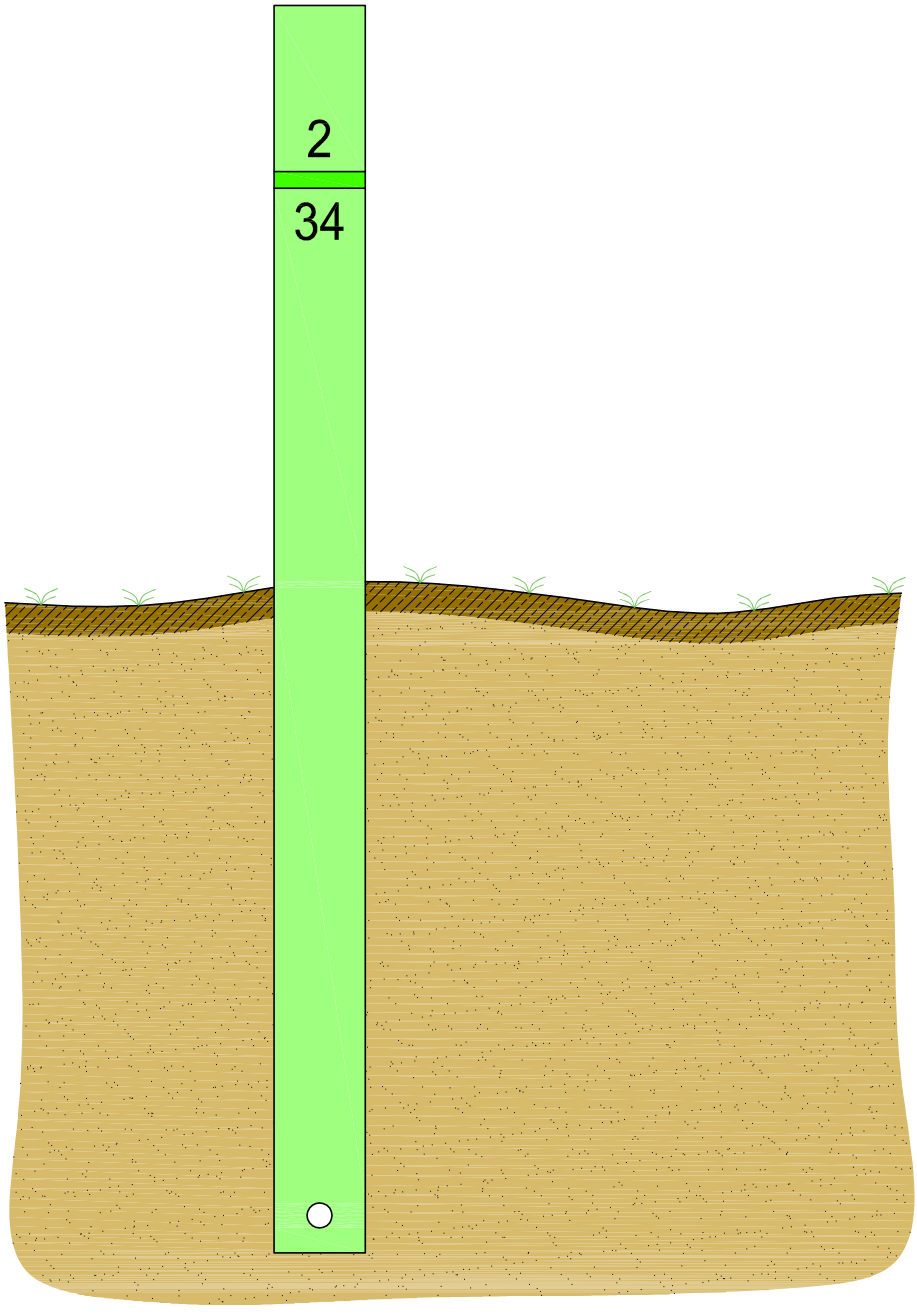


ROAD MARKING
RURAL RIGHT TURN BAY

W463

NOTES:

1. Reflector - Green
   Numbers - Black numbers
   Marker post - Pale green
2. $\frac{2}{34}$ Marking Indicates a culvert at route station 2.34km



ROAD MARKING
CULVERT MARKER

W464

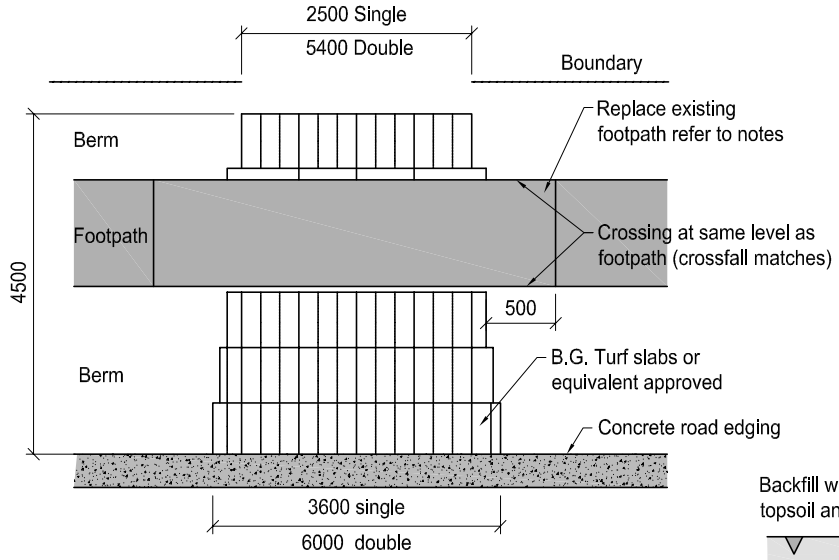
Western Bay of Plenty District Council

DEVELOPMENT CODE

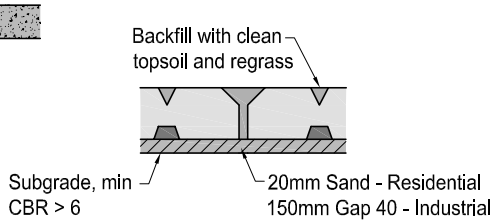
VERSION 1
AUG 09

NOTES:

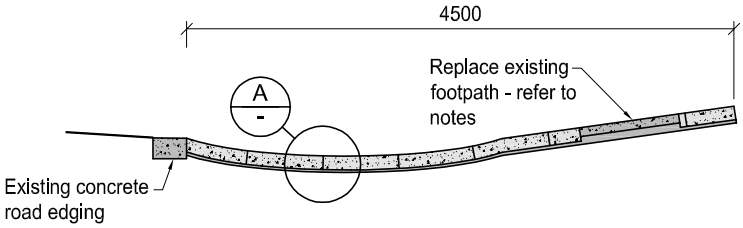
1. The construction of B.G. Turf slab vehicle crossings is only permitted in Pio Shores where no kerb and channel and swale drainage system exists. Refer to typical section.
2. A vehicle crossing shall be provided between the road edge and the boundary at the entrance to all access strips to rear lots, privateways and service lanes and at any other places where the location of the future driveway to a section can be determined.
3. The existing footpath shall be saw cut, removed and reinstated to a depth of 120mm residential and 150mm Industrial with HRC 665 mesh or equivalent.
4. Visibility - Refer to the sight distance and line of clear sight diagrams.
5. All concrete to be 20 MPa @ 28 Days.
6. The subgrade shall have a min CBR of 6 and shall be measured with a scala penetrometer with a max allowable penetration shown as 30mm/blow.



TYPICAL PLAN OF VEHICLE CROSSING



DETAIL A



TYPICAL SECTION OF VEHICLE CROSSING

PIO SHORES URBAN VEHICLE CROSSING

W468