BEFORE THE DUNEDIN CITY COUNCIL

IN THE MATTER OF	Land Use Consent Application to construct and operate a commercial residential development by NZ Horizons Hospitality Group Limited.

STATEMENT OF EVIDENCE OF ANDREW DAVID CARR
Transportation
24 July 2017

GREENWOOD ROCHE
LAWYERS
CHRISTCHURCH
Solicitor: L J Semple
(Lauren@greenwoodroche.com)

Level 5
83 Victoria Street
P O Box 139
Christchurch
Phone: 03 353 0570

INTRODUCTION

1 My name is Andrew (Andy) David Carr.

2 I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I hold a Masters degree in Transport Engineering and Operations and also a Masters degree in Business Administration.

3 I am a member of the national committee of the Resource Management Law Association and a past Chair of the Canterbury branch of the organisation. I am also a Member of the Institution of Professional Engineers New Zealand, and an Associate Member of the New Zealand Planning Institute.

4 I have more than 28 years experience in traffic engineering, over which time I have been responsible for investigating and evaluating the traffic and transportation impacts of a wide range of land use developments, both in New Zealand and the United Kingdom.

5 I am presently a director of Carriageway Consulting Ltd, a specialist traffic engineering and transport planning consultancy which I founded in early 2014. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I am also a Hearings Commissioner and have acted in that role for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.

6 Prior to forming Carriageway Consulting Ltd, I was employed by traffic engineering consultancies where I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.

7 I have been involved in a number of proposals which have assessed the transportation-related outcomes of visitor accommodation. These have included sites in Thompson Street, Brisbane Street, Frankton Road and Adelaide Street in Queenstown, plus the Kawarau Village complex in Queenstown (now partly occupied by the Hilton Hotel). I

have also provided advice for visitor accommodation in Wanaka and Christchurch, and for the waterfront hotel in Dunedin.

8 For clarity, prior to being asked to review this application by the submitter, I provided independent advice to Mackenzie District Council for the applicant's proposal for visitor accommodation in Tekapo. I do not consider this to be a conflict of interest since the hearing into that application has now closed.

9 As a result of my experience, I consider that I am fully familiar with the particular traffic-related issues associated with large-scale visitor accommodation complexes, and the associated traffic generation.

10 I have read and am familiar with the Code of Conduct for Expert Witnesses in the current (2014) Environment Court Practice Note. I agree to comply with this Code of Conduct in giving evidence to this hearing and have done so in preparing this written brief. The evidence I am giving is within my area of expertise, except where I state I am relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I understand it is my duty to assist the hearing committee impartially on relevant matters within my area of expertise and that I am not an advocate for the party which has engaged me.

11 In preparing this evidence I have reviewed the following documents:

(a) The resource consent application and relevant appendices;

(b) The Council's section 42A report;

(c) The briefs of evidence for the Applicant, particularly from Mr Antoni Facey;

(d) The briefs of evidence from Graeme McIndoe and Graham Taylor; and

(e) The relevant planning documents.

SCOPE OF EVIDENCE

12 My evidence is presented on behalf of Millennium and Copthorne Hotels Limited (MCHL), a submitter in these proceedings. It addresses the following:

(a) The practicality of the proposed circulation route within the site; and

(b) The design issues associated with the proposed roundabout.

13 In undertaking the various analyses included in my evidence, I have been mindful that as the site is within the Central Activity Zone, under Rule 9.5.2(v) there is only a requirement for parking associated with the commercial residential activity (that is, the visitor accommodation). However Rule 9.5.2(viii) sets out that although there are no vehicle loading requirements "*where provided, loading areas shall comply with the performance standards in Section 20 (Transportation)*". This rule also sets out that "*access requirements for all activities shall comply with the performance standards in Section 20 (Transportation)*".

EXECUTIVE SUMMARY

14 In my view, the layout of the site has been developed without considering the difference in levels and the accessibility for vehicles. Having read the application and Council Officers reports, it appears that consideration of this important matter has been completely omitted.

15 In this case, the gradients that are proposed are not suitable for use by either light vehicles or coaches, and this will result in the on-site car and coach parking not being accessible. As a result, the application has not demonstrated how the required car and coach parking will be provided.

16 If the car and coach parking is somehow provided off-site, the extent and locations of the traffic movements that would arise have not been assessed, and consequently, no conclusions can be drawn as to the effects on the efficiency and safety of the adjacent road network.

17 Even if the matter of the gradients could be resolved such that parking could take place on the site, there are several other matters which will present design issues. This includes deficiencies in the layout of the porte cochere and the perimeter roadway width. Further, I consider that the number of parking spaces to achieve compliance with the District Plan has been incorrectly calculated.

18 Finally, I also consider that the proposed roundabout serving the site is unlikely to meet current guides and standards, and as a result will not function safely.

19 One outcome of the design deficiencies in the layout of the porte cochere and the perimeter roadway is that there are non-compliances with the rules of the District Plan that have not been identified within the application.

THE PROPOSAL

20 From a transportation perspective, one particular feature of the proposal is that it recognises the difference in levels between one site and the other. The plans provided with the application[1] show that:

(a) Level 1 of the building will accommodate a loading bay and the vehicular exit onto Filleul Street;

(b) Level 2 of the building will accommodate a floor of car parking;

(c) Level 3 of the building will accommodate another floor of car parking and the vehicular entrance; and

(d) Level 4 of the building has the porte cochere.

21 The floors are linked by a perimeter roadway, which is noted to operate in a clockwise direction for buses and coaches, and also for cars driven by guests, but with the plans showing that cars driven by valets will be able to circulate in both a clockwise and anti-clockwise direction. The plan of Level 3 notes that the vehicular entry will ramp up to Level 4 (and the porte cochere) before then descending again.

22 The entrance to the site will be by way of a priority intersection. The exit however involves the construction of a roundabout at the Moray

[1] Thom Craig Architects 'Architect's Statement', pages 10 to 13.

Place / Filleul Street intersection. Moray Place (east), Moray Place (west) and Filleul Street form three of the roundabout approaches, with the roundabout forming the fourth approach.

ASSESSMENT OF METHODOLOGY OF APPLICANTS EVIDENCE

Long Section of the Perimeter Roadway

23 One important element to consider when any development involving a change of levels is proposed is to ensure that the ramp gradients are suitable for the type of vehicles that will use them. In this case, although cross-sections of the building have been provided, no long-section for the perimeter roadway has been produced and so no details on gradients have been shown. In my experience it is unusual to not show the gradients of accesses where they are present.

24 Since the application does not provide the information, I have assessed the ramp gradients on the perimeter roadway. In producing this, I firstly identified the levels of the perimeter roadway based on the cross-sections provided, and these are plotted on the plan shown in Annexure A. It can be seen from this that the level of Level 4 corresponds to the level shown directly outside the porte cochere (RL 123.1).

25 I next added the locations of the entrances to the car parking and loading bay, and these are shown on Annexure B.

26 I then identified the levels of the perimeter roadway immediately adjacent to the accesses into each level of the building. One important element of this is that the perimeter road must be almost flat as it is adjacent to the accesses. This is firstly because as the vehicle turns to/from the access, they are travelling at 90-degrees to the perimeter roadway. This then means that the perimeter roadway gradient becomes the access crossfall[2], and at high crossfalls vehicles can become unstable. The second reason for the gradient of the perimeter

[2] Crossfall is the slope of the roadway at 90 degrees to the direction of travel, as illustrated below.

roadway needing to be relatively flat at the access is to ensure that there is sufficient headroom available. These issues are illustrated on Annexure C.

27 In practice a slight gradient is maintained to assist with drainage, and I have made allowance for this. The levels at the perimeter roadway at the accesses into each floor of the building are shown on Annexure D.

28 With the levels plotted in this way, a long section can then be produced for the perimeter roadway as it passes around the building, and this is shown on Annexure E. I have also calculated the gradients of the various sections of the perimeter roadway, and these are shown also. For clarity, the only information presented on Annexure E is that which can be found within, or is calculated from, the application itself - I have simply presented it in a different manner.

29 I discuss the implications of the gradients subsequently in this evidence.

Types of Vehicles within the Site

30 The application identifies that private cars and tour coaches will both use the perimeter roadway.

31 The particular characteristics of cars travelling along ramps are well-known. The primary source of information is Standard AS/NZS2890.1:2004 'Parking Facilities Part 1: Off-Street Car Parking', but some of the provisions of this are included as Rule 20.5.7(iv)(e) of the operative Dunedin City District Plan which notes that "*vehicle access shall be designed to minimise longitudinal gradients; and the maximum change in gradient without transition for all vehicular access shall be no greater than 1 in 8 for summit grade changes or 1 in 6.7 for sag grade changes*." This is retained in the Second Generation District Plan.

32 The reason for this requirement is simply that when there is a steep change of gradient, the bodywork or the underside of the car scrapes on the ramp (as described in Standard AS/NZS2890.1:2004, section 2.5.3(e)). When the change of gradient is extreme, it is simply not

possible for a car to traverse the ramp because the underside of the car jams on the ramp.

33 The engineering solution is to construct a small section of ramp which has a flatter gradient between the two other parts. This is known as a transition grade or transition ramp. For cars, Standard AS/NZS2890.1:2004 sets out that these should be 2m in length (that is, around two thirds the length of the car wheelbase).

34 An example of a transition ramp is shown in Annexure F. It can be seen that one outcome of simply adding a transition ramp at the foot of the ramp is that the ramp is extended slightly. In order to keep the ramp length the same, the gradient of the ramp has to be made steeper.

35 The District Plan does not stipulate a maximum gradient for an access used by cars, but Standard AS/NZS2890.1:2004 (section 2.5.3(b) notes than for a ramp of less than 20m a maximum of 1 in 4 is permitted with a maximum of 1 in 5 permitted for ramps longer than this.

36 The NZTA guide RTS 18 (On-Road Tracking Curves for Heavy Vehicles) shows that the standard 'design vehicle' for tour coaches is 12.6m long, but unlike for cars, there is no standard that specifically relates to designing a ramp for these vehicles. However it is a well-established principle that as the wheelbase of a vehicle and the bodywork overhangs at the front and rear become longer, the vehicle is less capable of negotiating sudden changes of grade. For instance, Standard AS2890.2:2002 'Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities' notes that a 12.5m truck (that is, approximately the same size as a tour coach) has a maximum rate of change of gradient of 1 in 16, and needs 7m long transition ramps. The maximum gradient that can be negotiated by such a truck is 1 in 6.5.

37 Since there is no guide for coaches, I measured ten tour coaches which were parked in an off-road location in Queenstown. When designing infrastructure, the typical approach is to accommodate the 85th or 99th percentile design vehicle (and I note that this principle is set out in Rule 20.5.5(vi)(a) and (b) of the operative District Plan).

My measurements showed that the 85th percentile clearance between the bodywork and ground, measured between the front and rear axles, was 0.25m. The 85th percentile clearance between the bodywork at the rear of the vehicle and the ground was 0.4m.

38 If an allowance is made for a separation of just 10cm between the vehicle bodywork and a ramp, then the maximum change of gradient at a summit grade is 1 in 10.4. At a sag grade, the maximum rate of change is 1 in 8.8. Transition grades of around 6m to 7m will also be required.

Comparison of Perimeter Roadway and Vehicle Characteristics

39 Considering firstly private cars, the long section of the perimeter shows that the requirements for the maximum changes of gradient are not met. This non-compliance with Rule 20.5.7(iv)(e) of the operative District Plan has not been identified in the application.

40 Moreover, the extent of the non-compliance is considerable. For instance, travelling between the porte cochere and the car parking on Level 3, the gradient changes from 1 in 32.1 to 1 in 3.2, which is a net change of gradient of 1 in 3.7. This is more than twice what is permissible under the District Plan or the Standard. Travelling from the car park access on Level 2 to the site exit, the change of gradient is even more severe.

41 As I set out above, one solution to reducing the rate of change of gradient is to use transition ramps. In this case, the length of the ramps cannot be extended because of the need to retain flatter areas immediately adjacent to the parking and loading accesses. This then means that the main part of the ramp needs to become steeper (as illustrated in Annexure F).

42 However two of the gradients are already 1 in 3.2 and 1 in 2.7, and these are considerably steeper than the Standard permits. In my view, it is not practical to make them even more steep to accommodate transition ramps. My preliminary calculation shows that the resultant gradients would be similar to those at the limit for specialist off-road 4WD vehicles.

43 The situation for coaches is worse than that for cars. The changes of gradient which they can traverse are less than those for a car, and so it follows that if cars cannot negotiate the perimeter roadway, then coaches cannot either. Even if the ramps were somehow to be flattened to enable cars to pass, the additional requirements to allow for coach movements such as longer transition ramps and lower changes of gradient could not be put in place.

44 On this basis, I conclude that the access arrangements shown in the application cannot function appropriately. The gradients on the perimeter roadway are much steeper than the maximums permitted under the Standard for cars. Similarly the changes in the gradients are far severe than permitted and in practice, I consider that cars are unlikely to be able to traverse these changes of gradient.

45 Similarly coaches will not be able to circulate around the perimeter roadway due to the gradients and change of gradient. Due to their more onerous requirements, in my view it is not possible to address this.

46 Accordingly, I do not consider that the application complies with Rule 20.5.5(vi)(a), that on-site maneouvring areas are designed to accommodate at least an 85th percentile design motor vehicle.

47 Finally, the plans show that service vehicles are expected to also circulate around the perimeter roadway. For the reasons above, such vehicles will also not be able to negotiate the perimeter roadway, meaning that it does not comply with Rule 20.5.6(i)(d) for having unobstructed access to a road or service lane.

48 On this basis, I do not consider that the application has demonstrated how the requirements of Rule 9.5.2 of the District Plan for the provision of car and coach parking have been met. In short, while parking spaces have been provided, in my view they cannot be accessed. I also consider that this means that the proposal does not meet District Plan Policy 20.3.5 ("*ensure safe standards for vehicle access*").

Outcomes for the Roading Network

49 In view of the design issues set out above, I consider that there will be a number of adverse outcomes for the adjacent roading network.

50 Since the on-site car parking would be inaccessible, any valet system for car parking would need to make use of an off-site car park. While this is not unusual, it means that the movement to and from a car parking space would not be internal to the site (as has been assumed in the application) but would result in the movement taking place on the internal road network.

51 The Integrated Transport Assessment included as part of the application sets out that the traffic generation of the site is expected to be four vehicle movements per car parking space:

(a) One movement out of the site in the morning as the guest vacates the room;

(b) One movement out of the site, and a return movement, associated with the guest sight-seeing; and

(c) One movement into the site in the evening.

52 However, if the car parking was provided off-site, then this would increase as follows (extra movements are highlighted in bold italics):

(a) ***One movement into the site in the morning as the valet returns the car, and then*** one movement out of the site in the morning as the guest vacates the room;

(b) ***One movement into the site as the valet returns the car, then*** one movement out of the site, and a return movement, associated with the guest sight-seeing, ***and then one movement out of the site as the valet moves the car to the off-site car parking***; and

(c) One movement into the site in the evening ***and then one movement out of the site as the valet moves the car to the off-site car parking***.

53 Therefore the four vehicle movements per parking space assumed in the Integrated Transport Assessment would in fact be eight movements.

54 Further, all of these cars will enter and exit the site via the Moray Place access, since it is not possible to travel to or from the porte cochere via the perimeter roadway and use the Filleul Street access. To date, the Moray Place access has been assumed to operate as entry-only.

55 The effects of the increased movements plus two-way flow at the proposed Moray Place / site access intersection has not been assessed and it has not been shown that it will operate safely or efficiently.

56 If no specific off-site car park is identified, then guests are likely to attempt to park in the adjacent on-street car parking. However the Explanation for Policy 9.3.4 of the District Plan makes it clear that developments such as proposed have parking characteristics which "*cannot reasonably be met by public facilities*" and meaning that on-street parking cannot be relied upon in this way.

57 From other commissions in the city, I am aware that the parking stock in the city centre is already heavily used, and has negligible capacity to absorb such demand. This will result in vehicles 'touring' in search of vacant spaces, with a consequent effect on congestion and road safety.

58 Since coaches also cannot use the perimeter roadway, smaller coaches are likely to undertake a three-point turn within the porte cochere. Given that this is an area where cars and pedestrians are present, in my view this movement would need to be undertaken under the control of a valet who would be able to ensure that it was carried out safely.

59 However there is insufficient area provided for larger coaches to turn. Consequently, they will either need to reverse from the site, or not enter the site and instead undertake drop-off/pick-up activities using the main carriageway of Moray Place or Filleul Street. This would obstruct passing traffic, and the additional manoeuvring may also present a road safety hazard. The situation of guest cars entering/exiting the access while tour coaches also enter and exit

(and potentially travelling in opposite directions, or even reversing) has not been assessed.

60 The levels close to Filleul Street mean that it would be possible for service vehicles to negotiate the eastern part of the perimeter roadway. This would mean that they entered via what is currently proposed to be an exit. However, the deflection island shown on the plans means that such vehicles could not turn right into the access, but would instead have to turn left. Revisions would be required to the Filleul Street access.

61 All of the above issues have implications for the safe and efficient functioning of the road network. These have not been assessed in the application, but in my view are likely to give rise to significant adverse effects. As such, I do not consider that the proposal meets District Plan Policies 20.3.4 ("*ensure traffic generating activities do not adversely affect the safe, efficient and effective operation of the roading network*"), 20.3.5 ("*ensure safe standards for vehicle access*") or 20.3.8 ("*provide for the safe interaction of pedestrians and vehicles*").

Operation of the Porte Cochere and Perimeter Roadway

62 For the sake of argument, I have assumed that the gradients of the perimeter roadway could be addressed such that it operates as described in the application. I have then assessed whether this represents a practical arrangement.

63 In the first instance, the plans show that the cars that have been retrieved by the valets will face the site entry when they are returned to the porte cochere. I consider that this creates a risk that guests will drive away in the direction that the car is facing, and attempt to exit the site via the entrance. Accordingly, I consider that should consent be granted a condition of consent should be imposed to require the valets to turn the cars around at the porte cochere such that they point away from the entrance prior to the vehicle being returned to the guest.

64 Irrespective, the need for the vehicle to be turned around means that at least two reverse movements are required (one to exit the space, and one to turn at the porte cochere). However only one reverse

movement is permitted under Rule 20.5.5(vi)(f), meaning that this represents a non-compliance with the District Plan.

65 I have also evaluated the routes of cars as they are moved to and from the accesses to the car parking levels. The swept paths are shown on Annexure G. For this, I have used the 85th percentile car, as required under Rule 20.5.5(vi)(a) of the operative District Plan for residential accesses.

66 As can be seen, a car emerging from a car parking level and turning anticlockwise would need to turn into the opposing traffic lane. However, because the busiest time for retrieval of cars (the left-turn movement) coincides with the busiest period for guests exiting the site (the oncoming movement), this potentially results in a high degree of conflict between the two.

67 Furthermore, valets emerging from the car parks will have extremely restricted visibility of any vehicles heading towards them. This is because the building's structure physically prevents an emerging driver from seeing oncoming vehicles until the driver has exited.

68 Consequently, given the combination of the limited sight distance, the need for exiting vehicles to use the opposing traffic lane without the drivers being able to see whether another vehicle is heading towards them, and the busiest period for clockwise and anticlockwise movements coinciding, I do not consider that it has been shown that the car park accesses will operate safely.

69 I have also assessed the swept path of a coach exiting the site, and this is shown on Annexure H. In producing this swept path, I have endeavoured to use the most favourable path for the coach, but even under this scenario, the length of the vehicle means that it occupies the whole of the perimeter roadway width at the corner of the site.

70 For an exiting coach to pass the parked coaches, the exiting coach needs to travel close to the side of the building. As noted above however, a driver exiting the Level 2 car parking is unsighted until their vehicle has partially emerged. Thus an exiting valet will simply not be able to see any oncoming coach until they are in a position where a collision could occur. Further, the swept path of the exiting coach means that there is no area remaining for any driver that has

exited Level 2 to wait until the coach has passed. Rather they must remain within the car park – however there is no way that the driver is able to know whether a coach is approaching.

71 Finally in respect of the coach swept path it appears that the bodywork of the coach will strike the corner of the hotel structure. I consider that this requires a more detailed assessment using detailed plans of the layout (rather than the PDF versions used in the swept paths).

72 The plans show that a coach parking in space 1 will be blocked by coaches parked in spaces 2 and 3. It therefore could not move off the site without one (or possibly both) of the other coaches being moved also. However, Rule 20.5.5(ii)(a) of the District Plan sets out that "*a motor vehicle occupying any parking space shall have ready access to a road at all times without the necessity of moving a motor vehicle occupying any other parking space on the site*", and so in my view, the arrangement represents a non-compliance with the rule.

73 Lastly, I note that the plans provided with the application show the route of a truck entering and exiting the loading bay. However it is evident that the area used by the truck overlaps with that used for coach parking. On Annexure I, I have shown a composite of the images included in the application of the loading bay (these are simply a cut-and-paste of the application plans; no new analysis has been carried out).

74 It can be seen that the truck could not enter or exit the loading bay when the coach parking spaces are occupied. This means that the arrangement does not comply with Rule 20.5.6(i)(d) which requires that "*unobstructed*" access is provided.

75 Overall then, even if the gradients of the perimeter roadway could be resolved, in my view there are further design deficiencies with the proposed site operation which mean that it does not represent a practical arrangement.

Car Parking Provisions

76 The District Plan sets out (under Rule 9.5.2(v)) that car parking is to be provided at the following rates:

(a) Unit type construction, for example motels: 1 space per unit for 1 to 10 units, thereafter 1 car park per 2 units;

(b) Guest room type construction, for example hotels: 1 car park per 3 guest rooms to 60 guest rooms, thereafter 1 car park per 5 guest rooms. Plus 1 car park per 20 guest rooms for staff.

77 The District Plan does not define what 'unit type construction' or 'guest room type construction' are, and I note that the use of 'motel' and 'hotel' are noted as being examples only rather than being prescriptive (and neither of these terms is defined either).

78 The 'step change' included in the wording of the rule is unusual, and it does not appear in the published sources of parking or traffic generation. In fact, I am only aware of this type of provision being provided in one other document, the Queenstown Lakes District Plan. In that Plan, the provision for parking at hotels and motels is identical to that of Rule 9.5.2(v) of the Dunedin City District Plan.

79 In the description of the parking ratio, the Queenstown Lakes District Plan also defines what is meant by 'unit type' accommodation. This is a visitor accommodation unit which contains a kitchen facility.

80 In the case of the current proposal, there are to be 210 guest rooms, 64 apartments and 4 penthouses. The Integrated Transport Assessment notes that "*although the apartments and penthouses may be sold for individual ownership, they will have an option to be available for management by the hotel*". On this basis, they have then been assessed as 'guest room type'.

81 In my view, this approach is not correct. These units will have kitchen facilities, and therefore should be assessed as 'unit-type' construction which requires a higher rate of parking provision.

82 Overall then, in my view the proposal requires 50 spaces for the guest rooms, plus 11 spaces for staff, plus 39 spaces for the apartments/penthouses. That is, 100 spaces are required in total, and with 84 spaces shown on the plans, this means that there is a shortfall of 16 spaces.

83 In my view it is reasonable to anticipate that vehicles which could not park within the site would park on-street in the vicinity of the hotel. The effects of additional parking demand have not been assessed in the application.

84 In practice, the shortfall only arises if the apartments/penthouses are used for visitor accommodation. To avoid this situation arising, in the absence of any assessment of effects of the off-site parking, I consider that a condition of consent should be imposed which prohibits the use of the apartments and penthouses as visitor accommodation until additional parking provision is made.

Moray Place / Filleul Street Roundabout

85 Assuming that the perimeter roadway could be traversed by vehicles, the proposal relies on the formation of a roundabout at the Moray Place / Filleul Street intersection, which is presently has priority control ('give-way'). An indicative roundabout design is shown in the application.

86 The primary source for roundabout design in New Zealand is the Austroads Guide to Road Design Part 4B ('Roundabouts'). I have reviewed the proposed layout against the Austroads guide.

87 The exit from the site does not fully intersect with the circulating carriageway of the roundabout, but rather, part of the access is onto Filleul Street itself. As such, this means that no deflection is provided for vehicles exiting the site, whereas providing deflection is described as being "*essential*" in the Austroads guide to slow traffic speeds and support a safe roading environment.

88 It is important that a driver approaching the roundabout is able to look towards their right and be able to see a driver approaching. The Austroads Guide indicates that in this location, a sight distance of 27m to 33m is appropriate (Table 3.1 of the Guide) whereas in this case, the sight distance provided for a vehicle on Moray Place (east) is around 24m. Providing a reduced sight distance results in an elevated risk of road safety problems.

89 The minimum diameter for the central island of a roundabout in the Austroads Guide is 10m, whereas the layout shown has an 8m diameter.

90 According to the Council's Integrated Transport Strategy, both Moray Place and Filleul Street form part of the Strategic Pedestrian Network. On such routes, the Council "*will prioritise wider footpaths, and better facilities to enhance the pedestrian experience. This may include safety improvements, enhanced crossing points, pedestrian refuges, seating, lighting, greater pedestrian priority at intersections and signals, and general amenity improvements such as paving and planting*". Conversely, the layout shown indicates narrow splitter islands (used for pedestrian crossing movements) and a reduction in the footpath width to accommodate the circulating carriageway.

91 Overall then, in my view the proposed roundabout layout has several safety deficiencies and does not fit well with the Council's support for pedestrian movements on the Strategic Pedestrian Network.

RESPONSE TO SECTION 42A REPORT

92 In his report, the Council's Transport Planner/Engineer Mr Fisher does not address the matter of the gradient of the perimeter roadway nor identify any non-compliances with the District Plan in this regard. However he does address the proposed roundabout, highlighting that the Council "*broadly agrees*" that proposed layout is the most appropriate option to ensure the safe and efficient of operation of both the intersection and the vehicle access.

93 In my view, the layout shown does not support the safe operation of the roading network and accordingly I disagree with Mr Fisher on this point. However I note that Mr Fisher considers that the detailed design of the roundabout should be subject to the approval of the Transport section of the Council prior to construction commencing. Given my concerns about the present layout, I recommend that the proposed condition of consent is amended to also require an independent safety audit of the layout.

SUMMARY AND CONCLUSION

94 Having reviewed the proposed layout, I consider that it has been developed without an assessment of the difference in levels within the site and of the effects that this has on the gradients of the internal perimeter road. I have not been able to identify a detailed discussion of this matter within the application or the Council officers' reports.

95 Having reviewed the information provided within the application, I consider that the gradients that are proposed within the site are not suitable for use by either light vehicles or coaches. Both the changes of gradient, and the gradients themselves, are too steep to be negotiated by cars and coaches. This non-compliance with Rule 20.5.7(iv)(e) of the operative District Plan has not been identified in the application.

96 In turn this means that the on-site car and coach parking is not accessible, and thus, the application does not comply with Rules 20.5.5(vi)(a) which requires that on-site manoeuvring areas are designed to accommodate at least an 85th percentile vehicle; Rule 9.5.2(v) relating to the provision of car and coach parking within the site; or Rule 20.5.6(i)(d) which requires service vehicles to have unobstructed access to a road or service lane. There is also a non-compliance with Rule 20.5.5(ii)(a) in that coaches must be moved to gain access to all coach parking spaces.

97 However the application sets out that it "*is fully compliant with all transport related clauses*" and this is reiterated in Mr Facey's evidence (paragraph 17). In my view, these statements are not correct.

98 In the event that the hotel was to proceed with off-site parking, there would be an increase in the number of vehicle movements, but it would also result in the Moray Place access operating with two-way traffic flow, and coaches undertaking three-point-turns within the porte cochere, or reversing off the site, or loading/unloading passengers from Moray Place itself. The effects of this on road safety and efficiency have not been assessed and in my view the adverse effects are likely to be significant and contrary to District Plan Policies 20.3.4 ("*ensure traffic generating activities do not adversely affect the safe, efficient and effective operation of the roading network*"), 20.3.5 ("*ensure safe standards for vehicle access*") or 20.3.8 ("*provide for the safe interaction of pedestrians and vehicles*").

99 If the issues associated with the gradients of the perimeter roadway could be resolved, there remain design deficiencies in the layout. In the first instance, cars returned by valets will be facing towards the site entrance, although I consider that this can be addressed through a condition of consent.

100 Cars emerging from the parking on Levels 2 and 3 will have to use the opposing traffic lane, and this creates conflict with outgoing guests. This situation is exacerbated by the extremely restricted visibility created by the building's structure. Further, a coach occupies the full width of the roadway when it exits the site (in fact it appears to strike the corner of the building), which also creates conflict with vehicles emerging from Level 2. In practice, there is no area remaining for any driver that has exited Level 2 to wait until the coach has passed but rather they must remain within the car park – however there is no way that the driver is able to know whether a coach is approaching.

101 The use of the coach parking spaces towards the east of the site and loading zone is mutually exclusive, because the parked coaches block the loading bay access.

102 With regard to the number of car parking spaces, I consider that the 'unit type construction' ratios should be applied to the apartments/penthouses rather than the 'guest room type' ratios. This means that the layout has a shortfall of 16 car parking spaces. To avoid this situation arising, I consider that a condition of consent should be imposed which prohibits the use of the apartments and penthouses as visitor accommodation until additional parking provision is made.

103 The proposed layout of the Moray Place / Filleul Street roundabout has a number of design features that are not in accordance with the Austroads Guide to Road Design Part 4B ('Roundabouts'), including sight distance and deflection. The layout also narrows the footpaths on the Council's Strategic Pedestrian Network. Accordingly, I recommend that the design is subject to an independent safety audit prior to construction commencing.

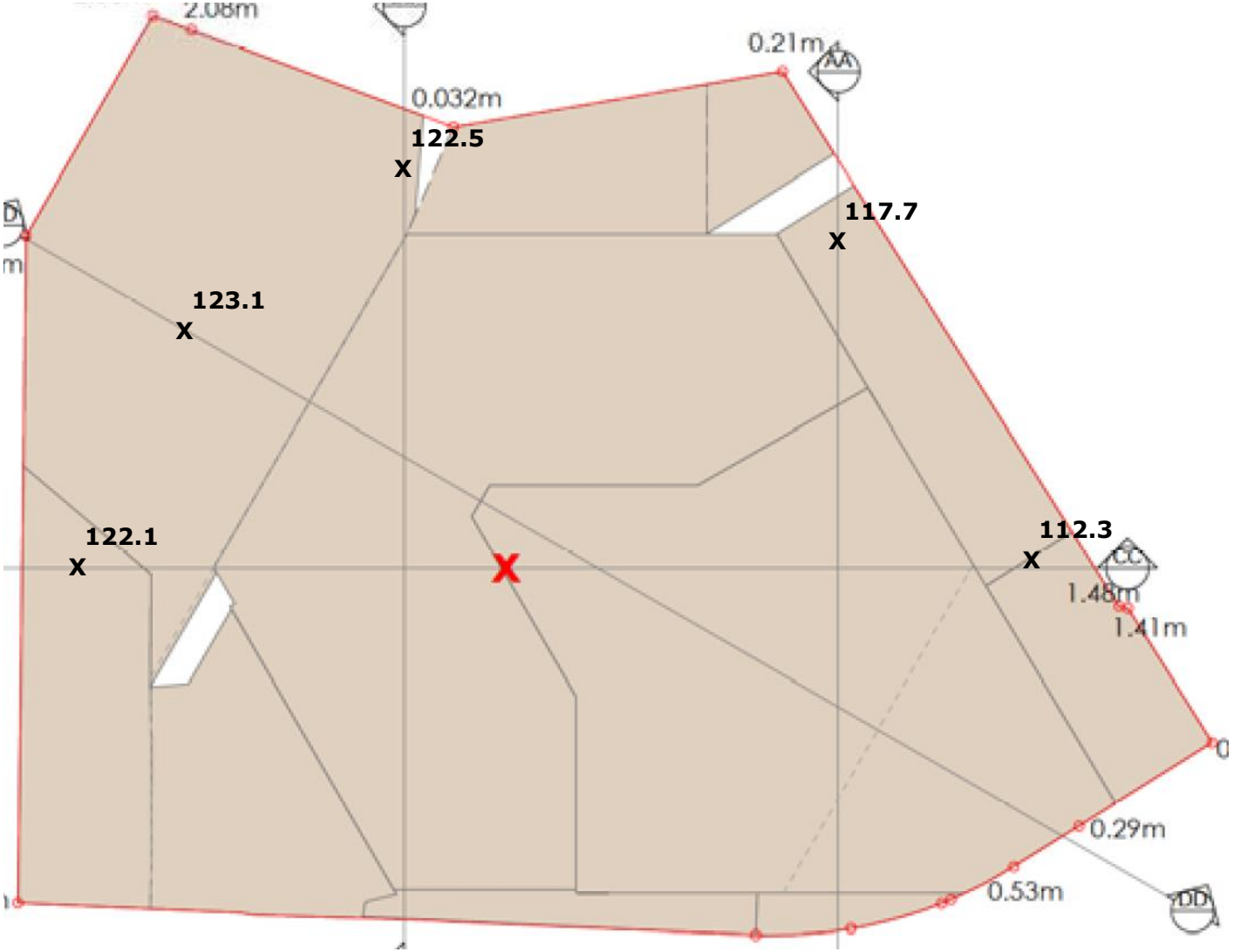
104 Overall however, it is the matter of the gradients on the perimeter roadway that I consider is the most significant, since it results in the

roadway being impassable by cars and coaches, and in turn means that the on-site parking spaces are not accessible. As such, the site has a significant shortfall in parking spaces that are useable. The arrangement also gives rise to non-compliances with the District Plan that have not been identified, discussed, or addressed. On this basis, and the significant adverse effects that will arise from the lack of on-site parking, I do not consider that consent should be granted for the proposal.

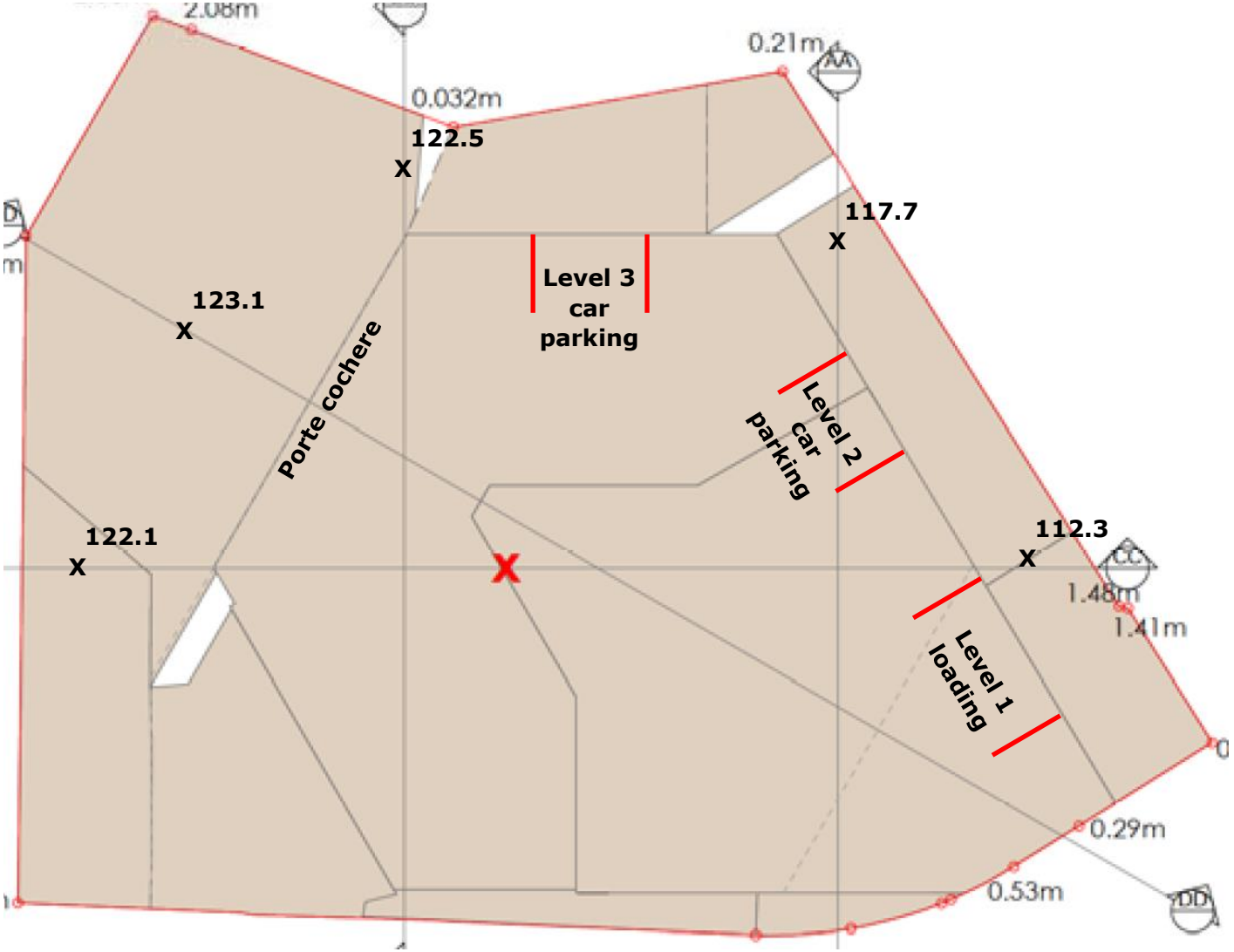
Andy Carr

24 July 2017

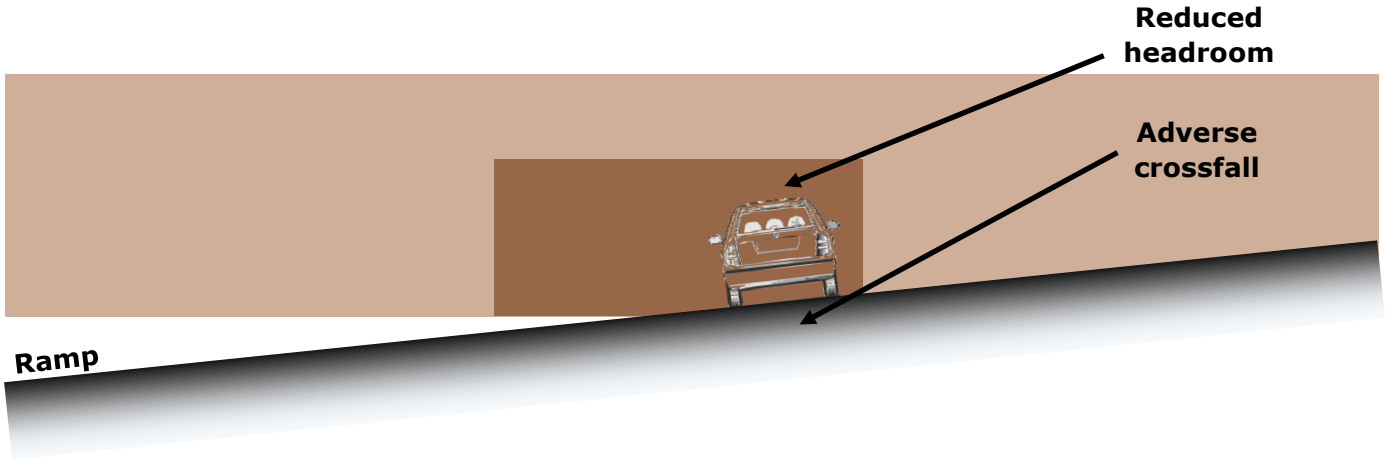
Annexure A: :Levels of Perimeter Roadway within the Site (Extracted from Site Cross-Sections)



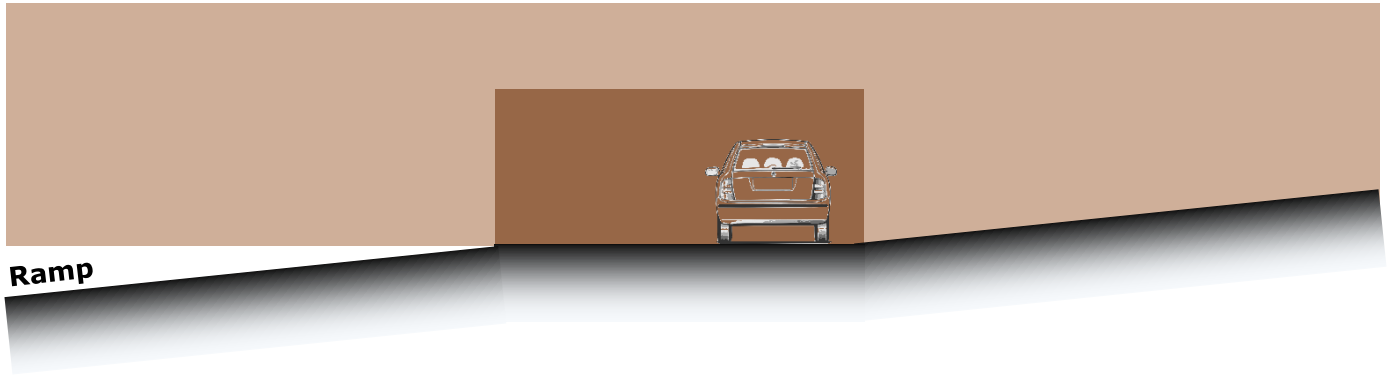
Annexure B: Levels of Perimeter Roadway, and Locations of Parking/Loading Accesses within the Site



Annexure C: Illustration of Problems Associated with Steep Ramps at Accesses

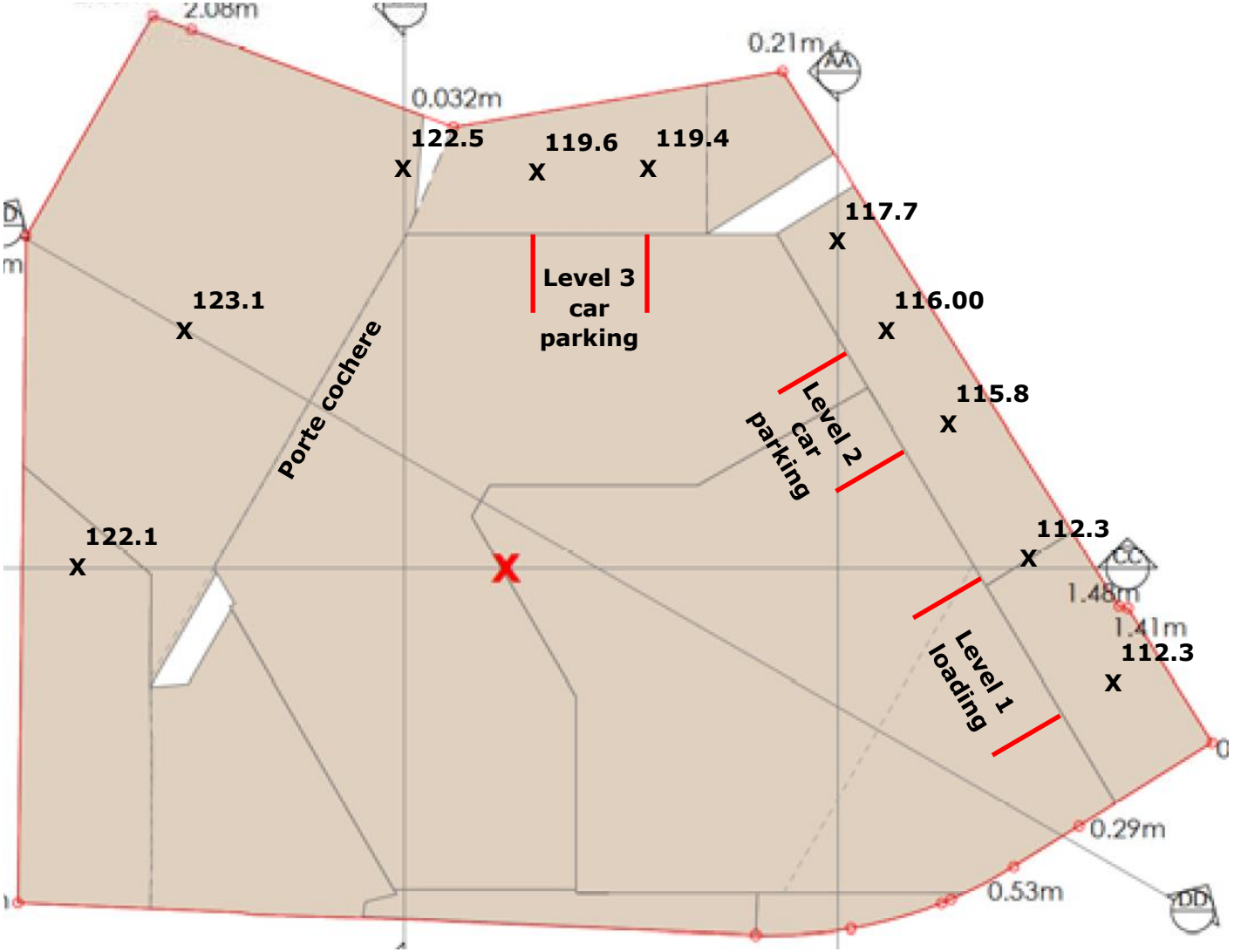


Continuous Ramp Gradient at Access

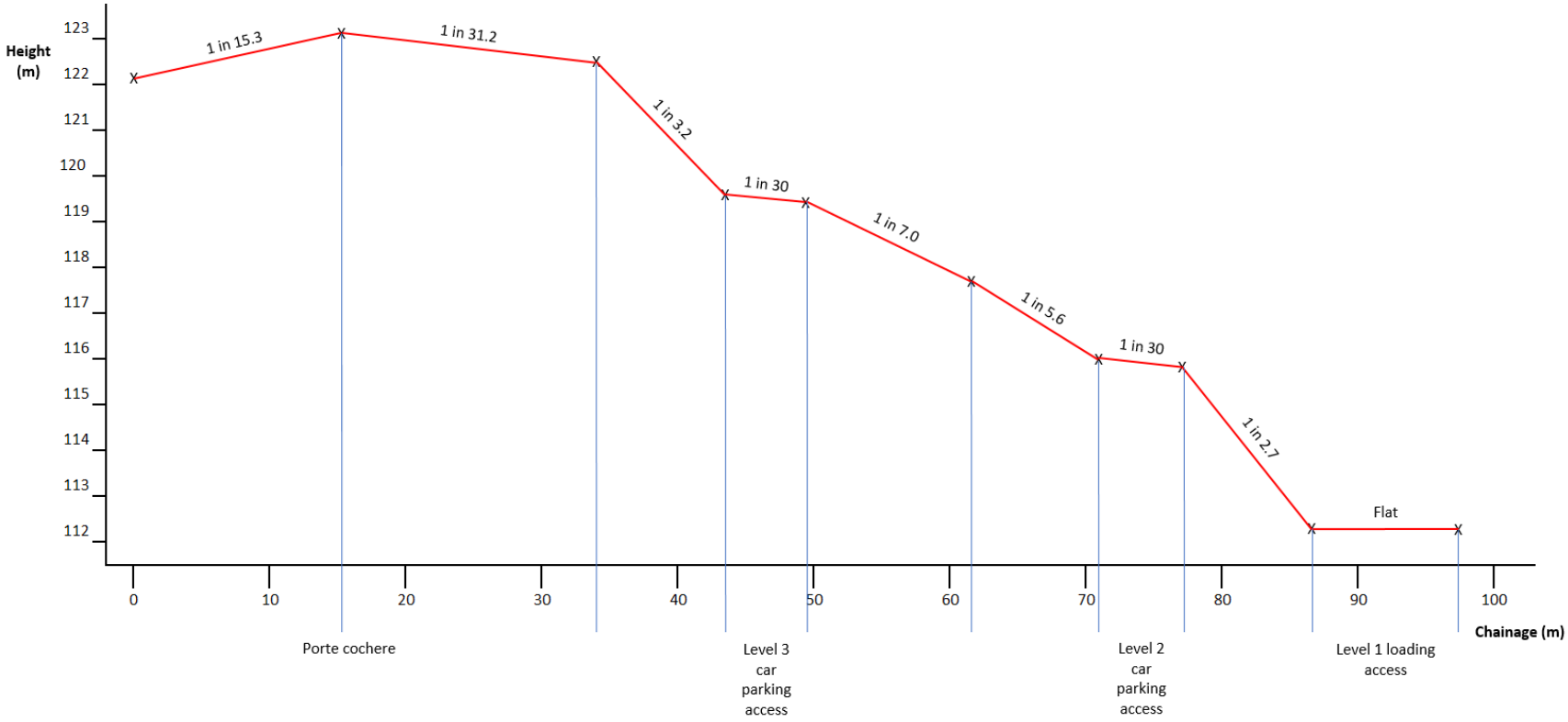


Flattened Gradient at Access

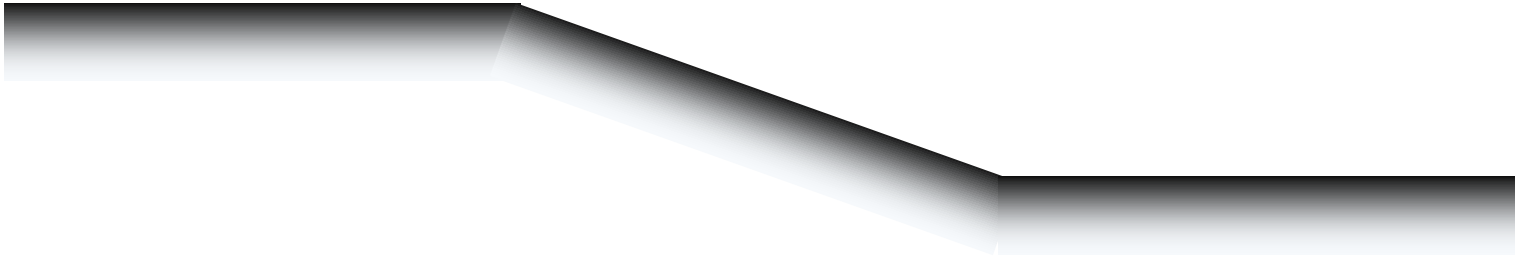
Annexure D: Levels of Perimeter Roadway, and Parking/Loading Accesses within the Site



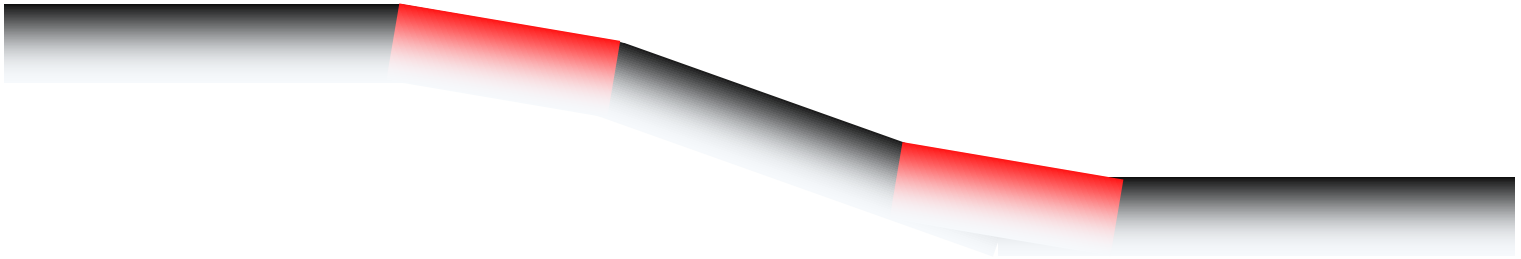
Annexure E: Long Section of Perimeter Roadway



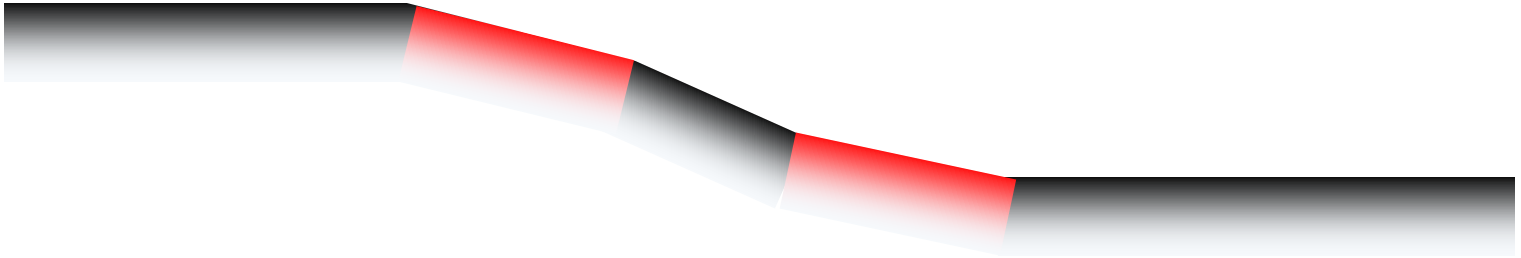
Annexure F: Examples of Transition Ramps



No Transition Ramps

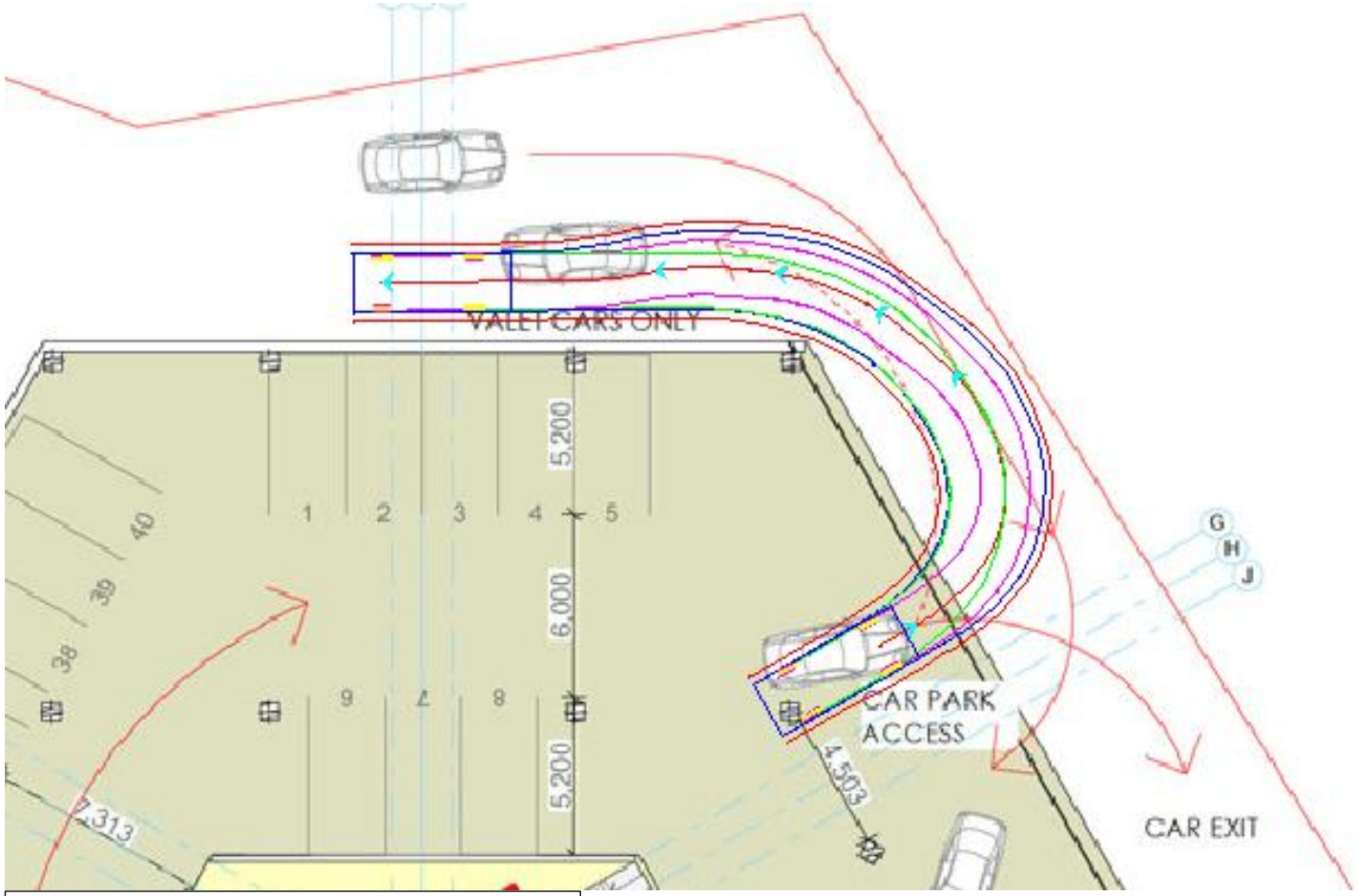


With Transition Ramps, Ramp Extended at Bottom (and Main Ramp Remains at Same Gradient)



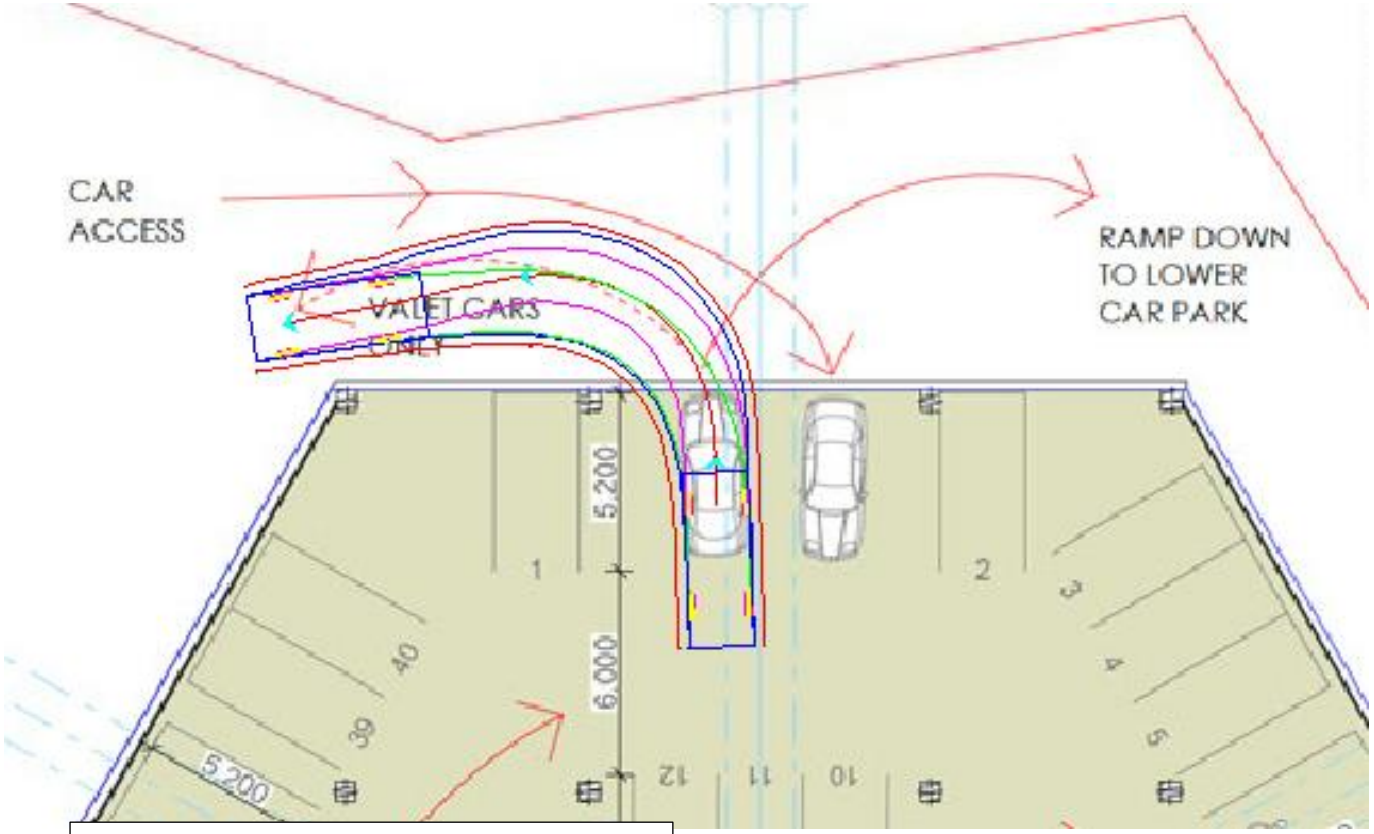
With Transition Ramps, Ramp Not Extended at Bottom (so Main Ramp Becomes Steeper)

Annexure G: Swept Paths of Vehicles at the Car Park Accesses (1)



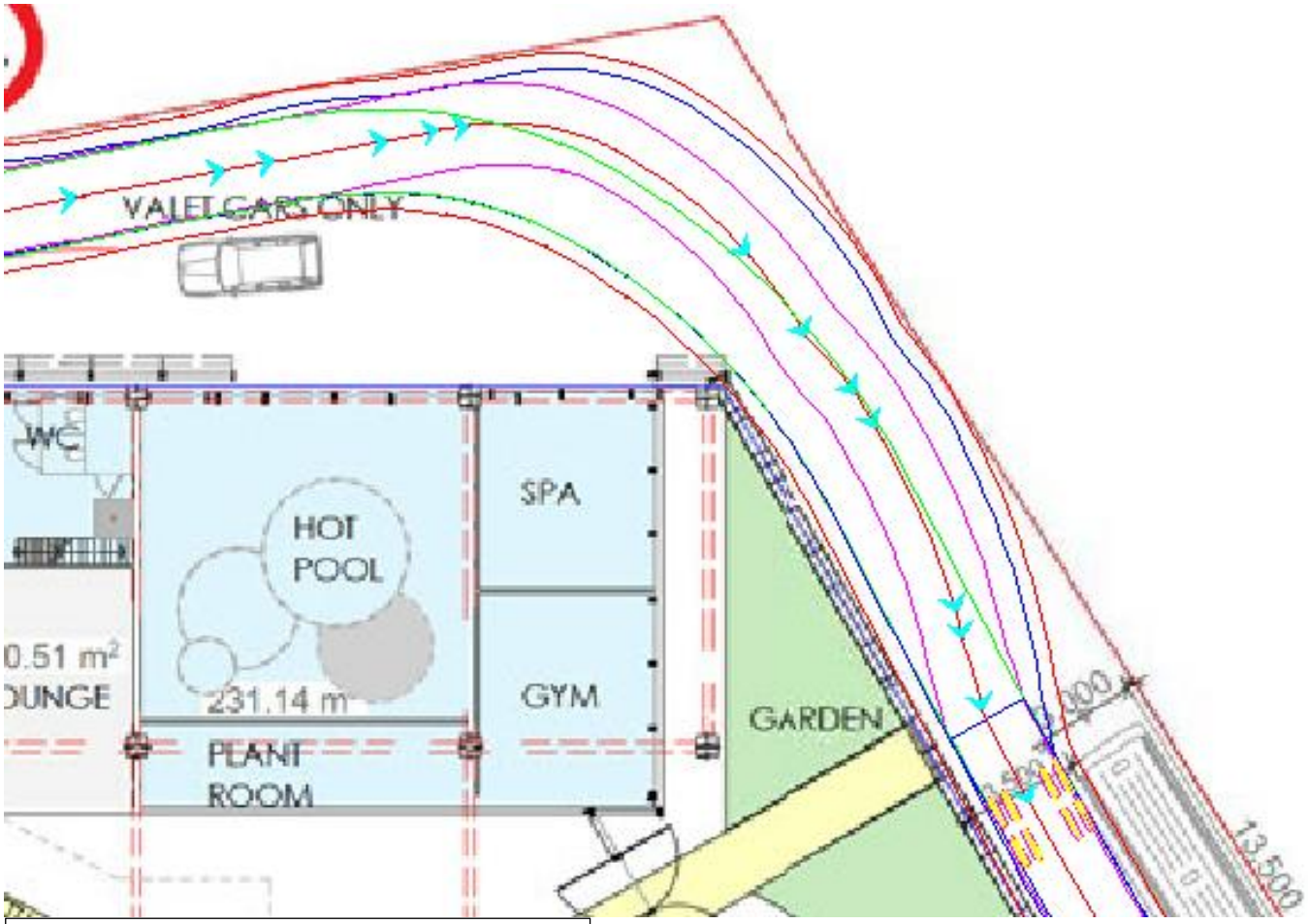
Blue line: vehicle bodywork
Red line: 0.3m clearance to vehicle bodywork

Annexure G: Swept Paths of Vehicles at the Car Park Accesses (2)



Blue line: vehicle bodywork
Red line: 0.3m clearance to vehicle bodywork

Annexure H: Swept Path of a Coach



Blue line: vehicle bodywork
Red line: 0.5m clearance to vehicle bodywork

Annexure I: Truck Manoeuvring and Coach Parking