

**Before Independent Hearing Commissioners
In Ngāruawāhia**

Under the Resource Management Act 1991 (the Act)

In the matter of of a submission by Ambury Properties Limited in respect of the proposed Waikato District Plan pursuant to Clause 6 of Schedule 1 of the Act seeking the rezoning of land at Ohinewai

and Ambury Properties Limited
(Submitter)

and NZ Transport Agency (Waka Kotahi)
(Submitter and Further Submitter)

**Summary statement of evidence of Robert Swears for Waka Kotahi –
Transportation Engineering**

9 September 2020

1 Qualifications and experience

- 1.1 My full name is Robert Clive Swears. I confirm I have the qualifications and experience described in my primary statement of evidence dated 13 August 2020. I also confirm that in preparing this summary statement I have complied with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014).

2 Clarification

- 2.1 In paragraph 4.11 of my primary statement, I stated that in relation to the speed surveys undertaken by Ambury (paragraph 4.6 of Mr Inder's primary statement of evidence), "[...] the exact locations at which this information was obtained has not been provided." I accept that some location information in relation to speed surveys was contained at paragraphs 9.40, 9.45, and 9.82 of Mr Inder's primary statement (as noted paragraph 3.5 of Mr Inder's statement of rebuttal evidence).

3 Summary of evidence

- 3.1 The Applicant is proposing a series of compromises to transportation standards, guidelines, and principles in order to accommodate the Proposal including the following:
- a Using an inter-regional arterial (Waikato Expressway) for local trips:
 - i The rezoning is reliant on Huntly and other locations to provide for the land use activities not available at the Site. As a result, local trips for activities such as employment, shopping, services, education, and recreation will need to be made on an inter-regional arterial that is intended for the safe and efficient movement of people and freight from one urban centre to another.
 - ii Similarly, workers at the Site, who do not live on the Site, will need to use the Waikato Expressway to travel to and from work.
 - b Creating the potential for active user journeys but positioning the Proposal at a location so these journeys are unattractive:
 - i The walking journey from the Site to the School is approximately twice the average distance that children walk to school. Therefore, while they are able to walk to school, the long distance means they are unlikely to do so.

- ii The cycling distance from the Site to Huntly is approximately twice the average distance that people cycle to work. While cyclists are able to cycle to Huntly, the long distance means it is unlikely many will take up the opportunity.
- c Roundabouts where the diameter is too small (both on Tahuna Road):
 - i The indicative roundabouts for the Tahuna Road / Lumsden Road intersection and Intersection 2 are smaller than the minimums indicated by the Austroads Guide to Road Design.
 - ii The Applicant has not provided any technical justification as to why the small roundabouts are appropriate.
- d Lane configurations that are too short (westbound exit from Tahuna / Lumsden intersection):
 - i If the Applicant's trip generation assumptions are correct, it may not be necessary for there to be two westbound lanes exiting the intersection. However, if they are not correct or there is additional trip generation from either the Site or from other land uses and two exit lanes are required, there will be safety issues associated with the inadequate distance for the merge manoeuvre between vehicles exiting the roundabout.
 - ii This inadequacy could be addressed through widening the rail overbridge.
- e Sight distances that are inadequate in both directions (southbound off-ramp).
- f Pedestrian facilities where these are not ordinarily appropriate (raised zebra crossing on Tahuna Road).
- g Promoting heavy vehicle turning movements where the carriageway width is inadequate or barely adequate (left turn from southbound off-ramp):
 - i Left turn heavy vehicle movements (from the southbound off-ramp) by multi-unit heavy vehicles (for example, semi-trailers) are likely to encroach into the westbound lane of Tahuna Road.
 - ii In addition, there is potential for heavy vehicle movements (and some light vehicle movements) to either cross the centreline of Tahuna Road

or to encroach into the carriageway width needed for any cyclists travelling across the Interchange overbridges.

- h Uncertainty regarding the applicability of modelling results due to the uncertainty associated with some trip generation rates.
 - i There is uncertainty regarding the results from the WRTM and the Applicant has modified traffic volumes to allow for some modelled values from the WRTM being less than existing traffic volumes. While the WRTM is the most appropriate model available, the uncertainty associated with the outputs means that caution should be applied in considering compromise solutions based on the modelling results.
 - ii The Applicant has applied a conservative approach (which includes sensitivity testing) for some of the trip generation rates associated with the Proposal. However, the Applicant's analysis indicates there can be a significant difference in trip generation for industrial land uses at the Site depending on the nature of the industrial land use.

3.2 I confirm that the position I set out in my primary statement of evidence remains the same, subject to the additional comments in Table 1 of **Appendix A** to this summary statement. Table 1 is reproduced from my primary statement of evidence, with an additional column where I have reviewed the key issues in Mr Inder's rebuttal evidence dated 24 August 2020.

Robert Clive Swears

9 September 2020

Appendix A: Summary of Key Transportation Engineering Issues

Table 1: Summary of key transportation engineering issues with reference to Mr Inder’s rebuttal statement

Issue ¹	Possible methods to address	Comments on Mr Inder’s rebuttal
Location of Site		
1. Distance between Site and Ohinewai School too great for walking journeys.	None.	In my primary statement of evidence I noted that the walking distance from the Site to Ohinewai School is approximately twice the average walk to school journey for children. However, the distance is less than the average cycle to work journey of 5.1 km. Mr Inder ² correctly notes that the values to which I refer are averages; clearly, this means that about half of the journeys are shorter than that and the other half are longer. However, at twice the distance of the average walking to school journey, I remain of the view that this distance will discourage many trips by foot.
2. Distance between Site and Huntly too great for cycling journeys.	None.	I accept Mr Inder’s point ³ that the average cycle to work journey distance may increase as a result of widespread use of electric bicycles. However, the return journey is still 16-20 km, which is a significant distance (even on an e-bike) for regular visits to access employment, education, medical services, retail and other services in Huntly. Information in relation to the proportion of bicycles that are electric bicycles and the average electric bicycle journey is not presently available. In my view, the distance between Huntly and Ohinewai is likely to be too great to assign a significant proportion of journeys from the Site to Huntly onto e-bikes rather than private motor vehicle. This is because the journey is much longer than the average cycle to work journey of 5.1 km.
3. Using Waikato Expressway inter-regional arterial for local trips.	Construct alternative route between the Site and Huntly; otherwise no solution available to address issue.	Mr Inder argues ⁴ that the Neighbourhood Centre component will serve the local community. However, even if it is developed, the Neighbourhood Centre does not include facilities that are likely to influence journeys being taken to more significant trip attractors beyond the Site such as schools, supermarkets, and places of work.

¹ The numbers assigned to these issues do not correlate with the numbering of the issues discussed through the transportation joint witness conferencing.

² Inder rebuttal statement, paragraph 4.4

³ Inder rebuttal statement, paragraph 4.4

⁴ Inder rebuttal statement, paragraph 8.10

<p>4. Inadequate spacing between Ohinewai Interchange and Huntly Northern interchange.</p>	<p>Construct alternative route between the Site and Huntly; otherwise no solution available to address issue.</p>	<p>I acknowledge that I have not undertaken an assessment⁵ of effects in relation to the spacing between the Ohinewai and Huntly Northern interchanges. However, I remain of the view that the spacing is less than desirable and will result in more weaving movements than otherwise (without the Proposal) occurring along a short length of the Expressway. While these effects may not be significant in the short-term future, consideration needs to be given to increasing traffic volumes on the Expressway, growth in Huntly, and potential further growth in Ohinewai.</p> <p>In terms of trips from Huntly via the alternative route proposed by Mr Inder,⁶ I acknowledge that the Applicant is proposing to implement a left turn slip lane access, which would allow northbound vehicles on Great South Road (the old SH1) to turn onto Ohinewai South Road. This is only likely to be attractive for those road users needing to make a linked trip between Huntly and the Site. I expect very few (if any) northbound journeys would be carried out using Ohinewai South Road unless there is a need to stop at the School, which is the only significant trip attractor between Huntly and the Site for which this connection would be useful.</p>
<p>Housing</p>		
<p>5. No requirement for housing on the Site to be occupied by workers on the Site.</p>	<p>Planning provisions to require Site housing to be occupied by Site workers to reduce the number of trips external to the Site.</p> <p>Remove housing from the Proposal to eliminate all journeys associated with household trips external to the Site.</p>	<p>I accept Mr Inder's point⁷ that I have not quantified the disbenefits from housing at the Site not being occupied by workers. The disbenefits include safety, travel time, vehicle operating costs, CO₂ emissions, and so on. The key disbenefits associated with housing on the Site not being occupied by workers relate to trips being assigned to the inter-regional transport network that would be more appropriately located on the local road network.</p>

⁵ Inder rebuttal statement, paragraph 9.3

⁶ Inder rebuttal statement, paragraph 8.10(c)

⁷ Inder rebuttal statement, paragraph 8.8

Interchange		
<p>6. Sight distance from southbound off-ramp is inadequate.</p>	<p>Ensure reduced operating speeds on Tahuna Road or widen NIMT overbridge and remove vertical sag curve between overbridge and Tahuna / Lumsden roundabout.</p>	<p>Mr Inder has referred⁸ to MegaMaps in relation to safe and appropriate speeds on the road network in the vicinity of the Site. However, MegaMaps has been updated recently⁹ and some of the speed limits to which he refers have changed. For example:</p> <ul style="list-style-type: none"> • Southbound off-ramp - 100 km/h rather than 60 km/h. • Tahuna Road across interchange - 60 km/h rather than 80 km/h. • Ohinewai Road South - 80 km/h rather than 60 km/h. <p>There presently is no certainty regarding the speed limit or the operating speed on Tahuna Road at the Interchange. However, I accept Mr Inder's observation¹⁰ that the vehicle movements associated with the Proposal are most likely to be turning left from the southbound off-ramp and therefore the sight distance to the right is most important; that sight distance is greater than the sight distance to the left. However, I have not changed my view that the sight distance to the left is inadequate and the adequacy of the sight distance to the right is very dependent on operating speeds on Tahuna Road and on minimum criteria being adopted for the position from which sight distances are measured.¹¹</p>
<p>7. Safety issues at southbound off-ramp intersection.</p>	<p>Change intersection form to a safe system solution such as roundabout.</p>	<p>I remain of the view that the increase of traffic on the southbound off-ramp will increase the existing safety risk at the intersection. Mr Inder proposes¹² measures similar to rural intersection activated warning signs (RIAWS) to improve road safety at the intersection. However, the electronic solution to which he refers was an unapproved trial and is not provided for through the Traffic Control Devices Manual or the Traffic Control Devices Rule.</p>

⁸ Inder rebuttal statement, paragraph 5.3

⁹ Access to MegaMaps II was closed off on or about 18 August 2020; after that date the MegaMaps login provided access to MegaMaps III.

¹⁰ Inder rebuttal statement, paragraph 12.5

¹¹ Refer to Appendix B of this statement for the safe intersection sight distance diagram and table from Austroads Guide to Road Design Part 4A.

¹² Inder rebuttal statement, paragraph 5.4

8. Pedestrians crossing the Interchange overbridges to access public transport facilities.	Widen overbridges to accommodate pedestrian movements.	I accept Mr Inder's point ¹³ that there may be more public transport demand originating from the eastern side of the Expressway than from the western side of the Expressway. However, irrespective of which side of the Expressway the bus stops are located, there will be some PT passengers whose journey begins on the opposite side of the Expressway. Therefore, if the bus stops are relocated to the eastern side of the Expressway, those passengers from the western side would still need to find a safe and efficient way of crossing the Expressway (but no crossing is proposed).
Tahuna Road Intersections		
9. Tahuna / Lumsden roundabout diameter too small.	Design for adequate diameter. Repositioning of roundabout may be required or property purchase to accommodate full-size roundabout.	Mr Inder has not commented on the roundabout diameter.
10. Unacceptable road user movements associated with Intersection 1.	Eliminate Intersection 1 or replace with a roundabout.	I agree with Mr Inder ¹⁴ that the incidence of crashes at an LTI / LTO Intersection 1 will not be frequent. However, by definition, crashes are rare, random, multi-factor events always preceded by a situation in which one or more persons failed to cope with their environment. My concerns in relation to the form of Intersection 1 primarily relate to the fact that there are safer solutions available. While Mr Inder places responsibility for crashes on "unacceptable driving behaviour" and "bad driving", the simple fact is that drivers make mistakes and crashes occur. The options to address this issue include removing Intersection 1 from the structure plan or replacing it with a roundabout.
11. Intersection 2 roundabout too small.	Design for adequate diameter. Repositioning of roundabout may be required or property purchase to accommodate full-size roundabout.	Mr Inder has not commented on the roundabout diameter.

¹³ Inder rebuttal statement, paragraph 11.3

¹⁴ Inder rebuttal statement, paragraph 7.4 - 7.15

12. Lane configurations too short.	Relocate Tahuna / Lumsden intersection to the east or widen NIMT overbridge.	The distance from the Tahuna / Lumsden intersection to the NIMT overbridge is unlikely to be an issue unless there is a need for two westbound lanes exiting the roundabout. The lower the trip generation associated with the Proposal the less likely that additional capacity will be required at the roundabout. However, depending on the actual trip generation for the Proposal and other land use activities that will use the roundabout, there may be a need to increase capacity at the roundabout, which requires the NIMT overbridge to be widened. Mr Inder ¹⁵ has highlighted that he considers the capacity increase is not required and I accept that further analysis could be undertaken at resource consent stage; further plan provisions would be required to ensure that this reassessment occurs. Mr Mayhew addresses this in paragraph 16.2 of his evidence.
Lumsden Road Intersections		
13. Sight distance constraints from Intersection 3.	Sight distance covenant over land to the north.	Mr Inder ¹⁶ and I agree on the importance of protecting sight distances at the Lumsden Road / Balemi Road intersection. Further plan provisions are required to ensure that outcome.
14. Uncertainty regarding design of Lumsden / Balemi intersection.	<p>Confirm applicability of design vehicle used for the design.</p> <p>Confirm adequacy of measures proposed to reduce approach speeds on Lumsden so that operating speed is aligned with design speed.</p>	Mr Inder considers ¹⁷ my concerns regarding the design of the Lumsden / Balemi intersection can be addressed “[...] in future subject to normal approval processes.” I agree that this issue could be resolved at resource consent stage provided that no third-party land is required for the intersection, however, this does not presently appear to be the case. ¹⁸

¹⁵ Inder rebuttal statement, Attachment A

¹⁶ Inder rebuttal statement, paragraph 6.8

¹⁷ Inder rebuttal statement, paragraph 6.7

¹⁸ Refer to Drawing 1202-B in Appendix B of the ITA.

15. Sight distance constraints from Lumsden / Balemi intersection.	Sight distance covenant over land to the north that is not owned by the Applicant.	Depending on the design speed for the intersection, the 6 m wide berm may allow adequate sight distance to be maintained from Balemi Road at the Lumsden / Balemi intersection. While the building setback to which Mr Inder refers ¹⁹ also has the potential to provide adequate sight distance, that will be partially dependent on any features (such as landscaping) established within the building setback. It will also be dependent on the use of the property immediately north of Balemi Road over which the Applicant presently appears to have no control. The green hatched area to the north of Balemi Road, which is shown on Drawing 1202-B in Appendix B of the ITA, illustrates the area of the neighbouring property over which sight distance needs to be protected. In my opinion, further consideration should be given to protecting this sightline.
Accesses		
16. Unacceptable road user movements associated with Access A.	Eliminate Access A.	I acknowledge that the appropriateness of Access A can be determined by further assessment at resource consent stage, therefore, to ensure that outcome ²⁰ , I agree that the Business Area Structure Plan should highlight the requirement for the need for Access A to be assessed at resource consent stage. Mr Mayhew has advised me that all industrial developments must provide an ITA that assesses the level of traffic generation from the development, confirms the staging and timing of transport infrastructure upgrades, recommends any necessary mitigation measures, and that discretion is restricted to the effects on the safety and efficiency of the transport network with particular reference to the location and design of vehicle accesses.
17. Inappropriate access for service centre.	Eliminate Access A.	As above.
18. Risk of exiting movements at the Access A entry to the service centre.	Signage to discourage exiting movements. Eliminate Access A.	As above.

¹⁹ Inder rebuttal statement, paragraph 7.17

²⁰ Inder rebuttal statement, paragraph 7.3

19. Risk of entering movements at the Access B exit from the service centre.	Signage and / or physical features to discourage entering movements. Eliminate Access B.	As above.
Heavy Vehicles		
20. Heavy vehicle turning movements encroaching into opposing lane on Tahuna Road.	Widen NIMT overbridge.	Mr Inder has undertaken further modelling in relation to the southbound off-ramp intersection. I have not measured sight distances from truck driver eye height, therefore, I do not know whether westbound vehicles disappear into the dip on Tahuna Road when viewed from a heavy vehicle. However, my opinion remains that the potential for encroachment ²¹ into the opposing lane affecting westbound vehicles on Tahuna Road is not addressed through the position of a driver's eye height. Neither will the issues associated with cyclists using the Interchange overbridges be addressed through signage alone.
Walking and Cycling		
21. Mode choice being private motor vehicle focused.	Establish grade separated active mode crossing early in development of the Site. Remove housing from the Proposal so that journeys, which would otherwise be external to the Site, occur closer to trip attractors so that active modes are more likely to be adopted.	Mr Inder has provided feedback from a small sample of local residents as to whether their children would walk to school. ²² I remain of the view that the distance between the residential area of the Site and Ohinewai School is significantly longer than the average walking journey that children will make to school (0.92 km).

²¹ Inder rebuttal statement, paragraph 12.5e

²² Inder rebuttal statement, Section 4

22. Raised platform pedestrian crossing on Tahuna Road inappropriate.	Traffic signals. Grade separated structure. Identify alternative location for crossing.	Mr Inder does not comment on the appropriateness of the zebra crossing on a raised platform across Tahuna Road. He relies on the fact that a road safety audit ²³ did not mention the raised platform as the basis for the platform being suitable. I remain of the view that the raised platform is inappropriate for this location and that there is unlikely to be justification for a zebra crossing to be provided on that platform.
23. Grade separated active mode facility does not accommodate all likely desire lines.	Widen NIMT overbridge and Expressway overbridge to better accommodate active mode users; particularly cyclists.	Mr Inder considers ²⁴ that the addition of 910 m to a walking journey to the bus stop on the east side is not “too far”, however, given that the average walk to work journey is 1.2 km, I consider that an additional 910 m will be a significant deterrent to pedestrian journeys from the western side of the Expressway to a bus stop on the eastern side (or vice versa).
24. Potential for pedestrians crossing Expressway between Shand site and the Site.	Planning provisions to avoid development of the Shand site and / or barriers to desire line constructed and / or construct active mode crossing to the north of the Interchange.	This issue is not addressed in Mr Inder’s rebuttal.
25. Some public transport passengers will need to cross the Expressway to access bus stops.	Obtain funding to allow for bus stops on both sides of the Expressway to be serviced. Widen Expressway overbridges to accommodate pedestrian movements.	Issues associated with passengers needing to cross the Expressway on the Interchange bridges are not addressed by Mr Inder. Unless bus stops are provided on both sides of the Expressway, I remain of the opinion that suitable provision should be made for pedestrians to cross the Expressway in the vicinity of the bus stops.

²³ Inder rebuttal statement, paragraph 7.21

²⁴ Inder rebuttal statement, paragraph 11.7

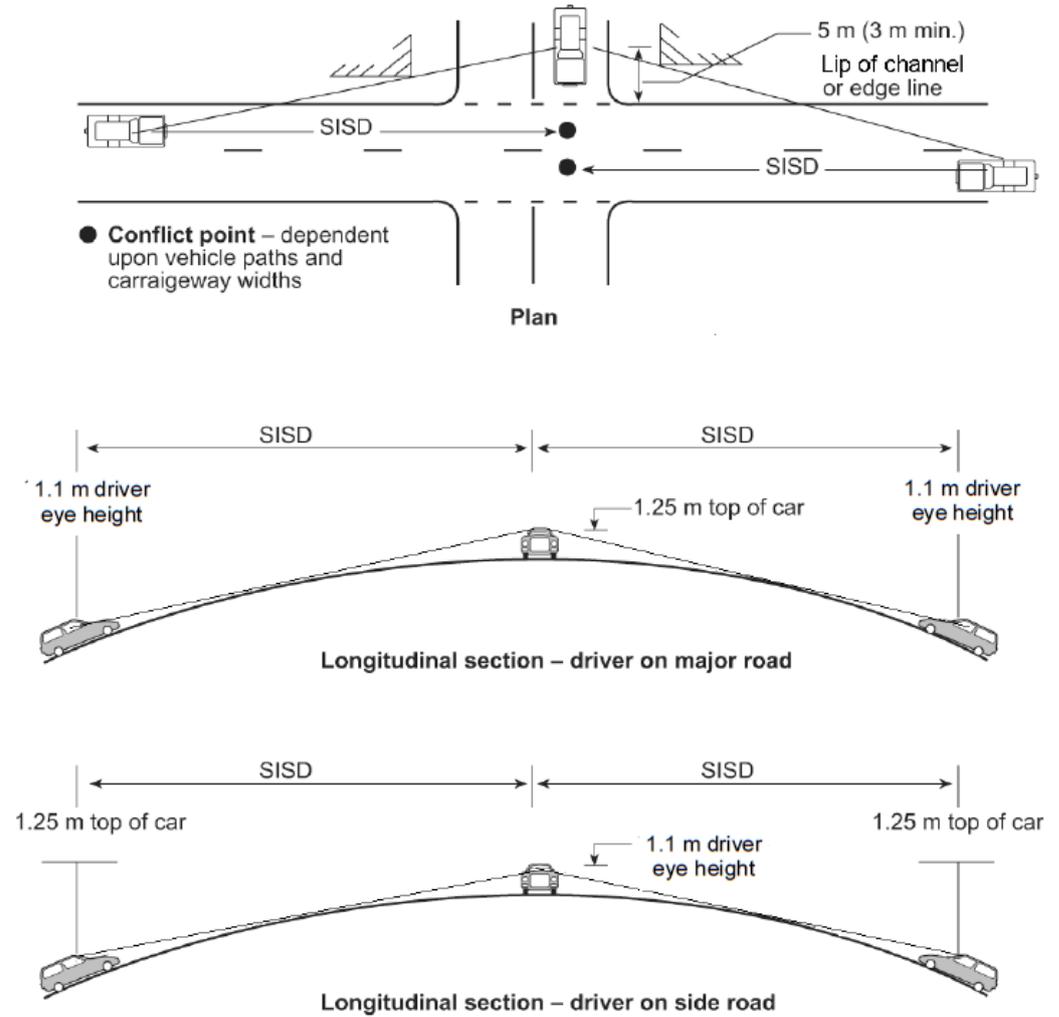
Rail Siding		
26. Uncertainty regarding rail siding.	Planning provisions to require provision.	The Applicant has obtained assurances ²⁵ from KiwiRail in relation to the acceptability of a rail siding. However, Mr Mayhew has advised me that there is nothing in the planning provisions requiring the rail siding to be constructed. While the ITA describes the potential benefits that could be realised if the rail siding removes freight traffic from the road network, if the rail siding is not constructed, then these benefits will not accrue.
Modelling		
27. Uncertainty regarding scale and nature of adverse effects as Site develops.	Additional modelling and analysis at various stages of development.	There is always uncertainty associated with modelling. However, further modelling at resource consent application stage through the provision of an ITA (or ITAs as appropriate), combined with refinement of the WRTM and the input parameters to the model, would reduce that uncertainty.
28. Effect of trip adjustment factors on assessing effects of the Proposal.	Allow a mechanism in planning provisions for reassessment of the modelled effects of the Proposal.	As above.
29. Uncertainty regarding data used in traffic modelling.	Update WRTM to ensure accuracy. Stage development of the Proposal to allow accuracy of modelling to be compared with reality.	As above.

²⁵ Inder rebuttal statement, Section 6

Appendix B: Austroads Safe Intersection Sight Distance

Included below are Figure 3.2 and Table 3.2 from the Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (2017).

Figure 3.2: Safe intersection sight distance (SISD)



Source: Based on Department of Main Roads (2006⁶).

Table 3.2: Safe intersection sight distance (SISD) and corresponding minimum crest vertical curve size for sealed roads ($S < L$)

Design speed (km/h)	Based on safe intersection sight distance for cars ⁽¹⁾ $h_1 = 1.1; h_2 = 1.25, d = 0.36^{(2)}$; Observation time = 3 sec					
	$R_T = 1.5 \text{ sec}^{(3)}$		$R_T = 2.0 \text{ sec}$		$R_T = 2.5 \text{ sec}$	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	–	–
50	90	8.6	97	10	–	–
60	114	14	123	16	–	–
70	141	22	151	25	–	–
80	170	31	181	35	–	–
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	–	–	285	87	300	97
120	–	–	324	112	341	124
130	–	–	365	143	383	157