BEFORE THE WELLINGTON CITY COUNCIL

IN THE MATTER OF of the Resource Management Act 1991

AND

IN THE MATTER OF the Wellington City Proposed District Plan

SUPPLEMENTARY STATEMENT OF EVIDENCE BY LACHLAN THURSTON ON BEHALF OF WELLINGTON INTERNATIONAL AIRPORT LIMITED (SUBMITTER 406, FURTHER SUBMITTER 36)

HEARING STREAM 10

23 JULY 2024

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1 My name is Lachlan Thurston. I am Head of Operational Readiness at Wellington International Airport Limited and have been employed in the Aviation industry for 39 years. I have outlined my qualifications and experience in my evidence in chief dated 1 July 2024. I do not repeat that here.

2 The Hearings Panel has asked that I provide supplementary evidence on a matter raised by the Panel at WIAL's presentation during the Hearing Stream 10 hearing.

3 In particular at paragraphs 2(b) (iii) and (iv) of Minute 53 the Panel has requested the following:

Amended versions of the cross sections annexed to Mr Thurston's evidence with more reference points along each cross section where they cross urban areas;

Further discussion of the point Mr Thurston made in his summary about the effect of an increase in the OLS, explaining in particular why a 3 metre elevation change in the OLS produces a 40 foot (12.19 metre) response in the minimum ceiling (i.e. why the response does not match the change)?

4 I have **attached** amended versions of the cross sections which have been prepared by Beca to include more reference points as requested.

5 I have also had a further discussion with Aeropath who undertook the assessment in relation to the effects of a 3 metre increase in permissible height referred to in my summary evidence.

6 The relationship between the increase in the OLS and the effects in terms of the airport's Decision Altitude is not a linear relationship and is assessed using a particular ILS obstacle environment model which is outlined below.

7 Collision Risk Modelling (**CRM)** which is ICAO approved, is based on statistics with some mathematical calculations that were not disclosed by the original author who worked for ICAO. I understand it is the only CRM programme used globally for assessing obstacles when designing precision instrument approach procedures.

8 The Airport's ILS was evaluated using the CRM programme and as such Aeropath are not able to provide the exact calculations. However Aeropath have advised me that the effect on an Aeropath obstacle control assessment surface (**OCA**) is not directly proportional to the increase in obstacle elevation. That is because the OCA surfaces used by Aeropath are complex and the relationships between these different surfaces cannot be interpolated or extrapolated linearly.

9 With CRM, this even gets more complex as the CRM considers the whole obstacle environment. The previously advised estimated Decision Altitude for the Airport considered an increase in the obstacle elevations of all obstacles and terrain surrounding the Airport. The way CRM evaluates is, it determines by mathematical analysis, the risks associated with the obstacle environment and then the software programme adjusts the height of the Decision Altitude to ensure that the risk associated with the obstacle environment is reduced to the recognised ICAO target level of safety (i.e. no worse than 10-7).

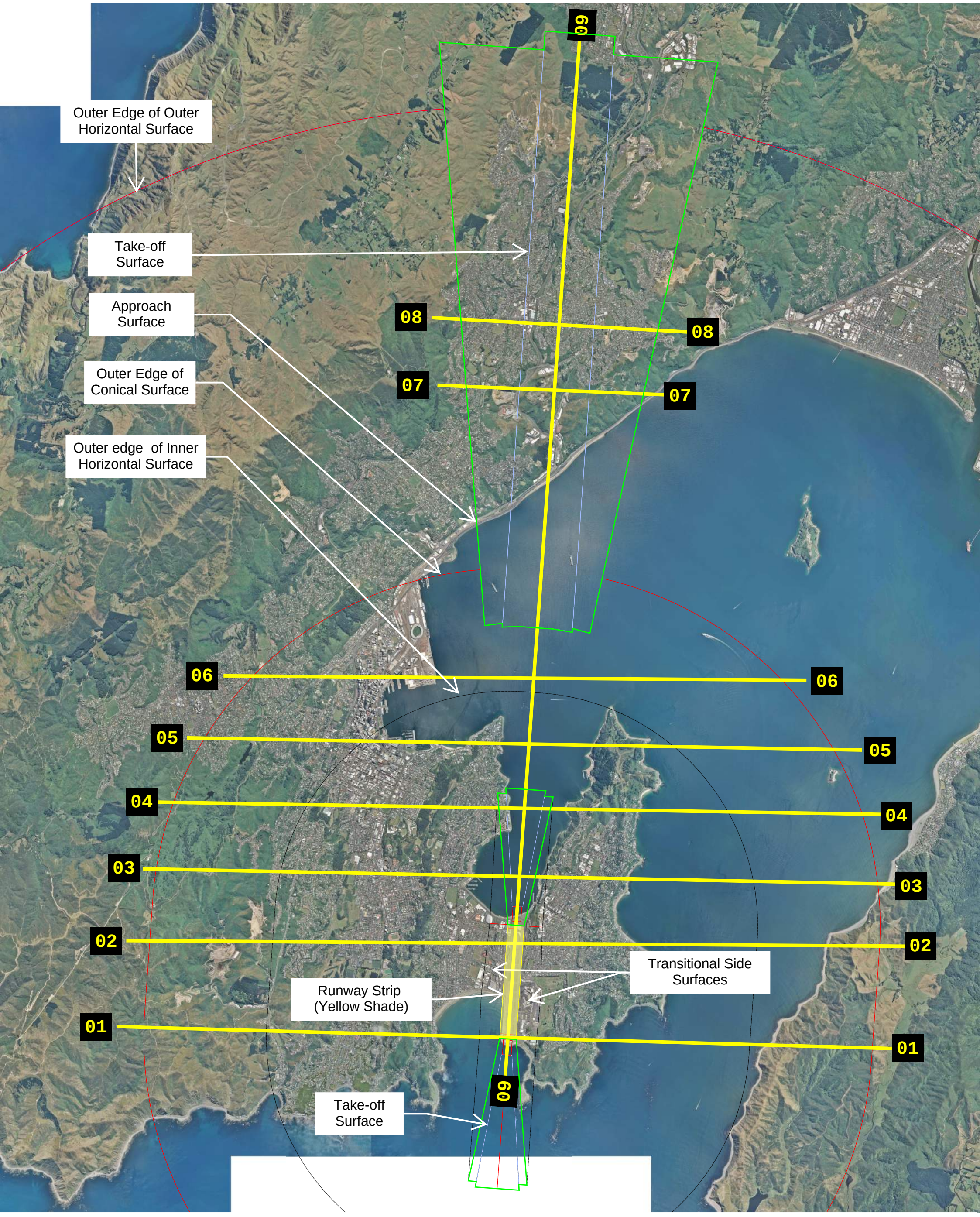
10 So, with a 3m overall increase to the obstacle environment, the CRM modelling has determined that the risk will increase, hence it adjusted the Decision Altitude up 40ft to meet the ICAO target level of safety.

11 This in turn, and as set out in my summary evidence, would have an adverse impact on flight operations at Wellington Airport.

Lachlan Thurston

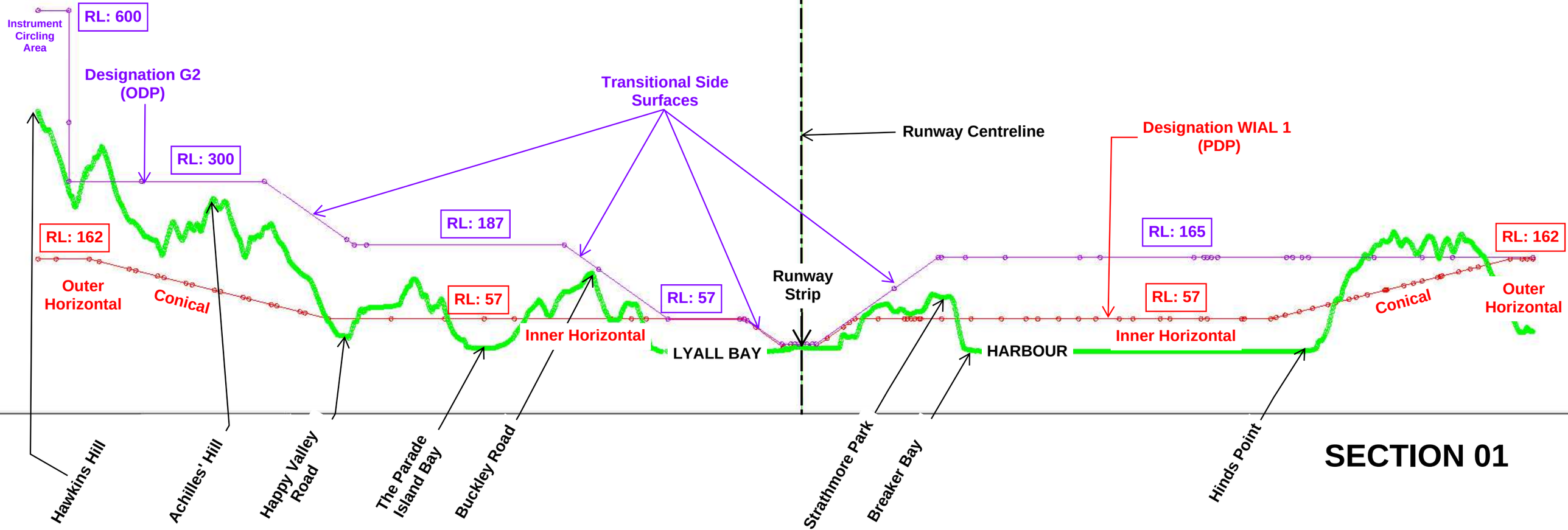
23 July 2024

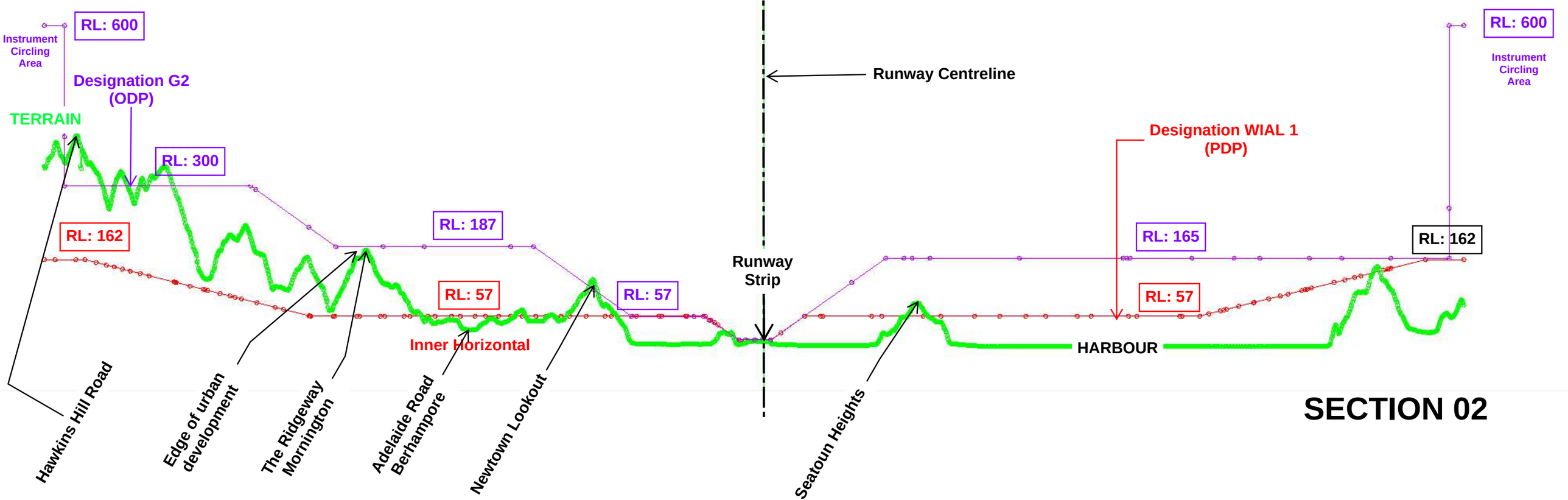
18 July 2024

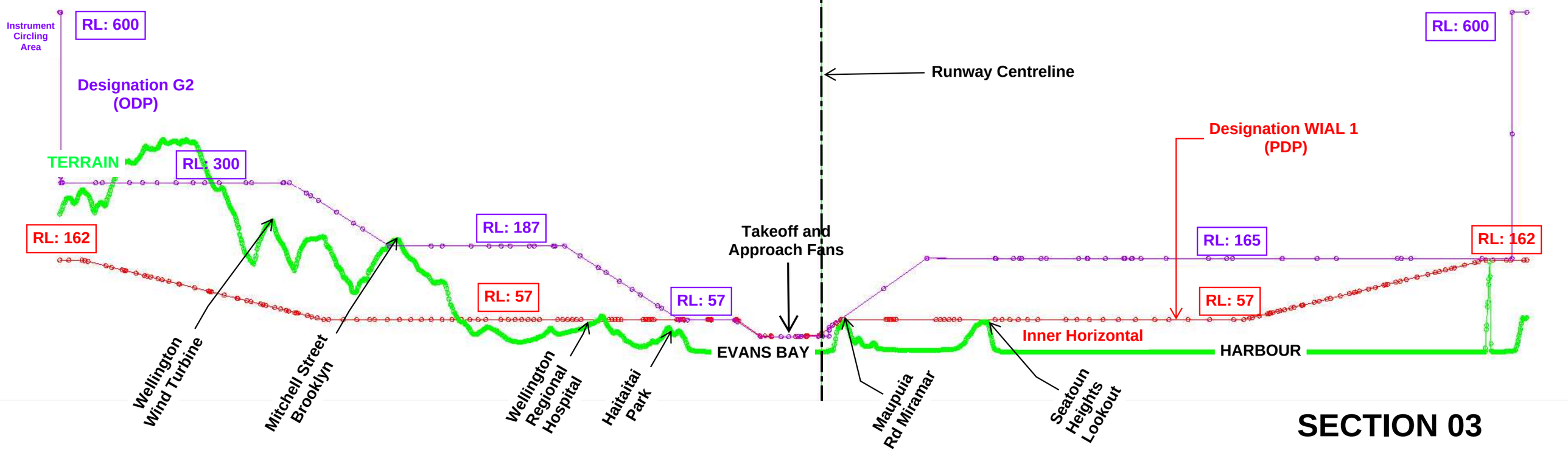


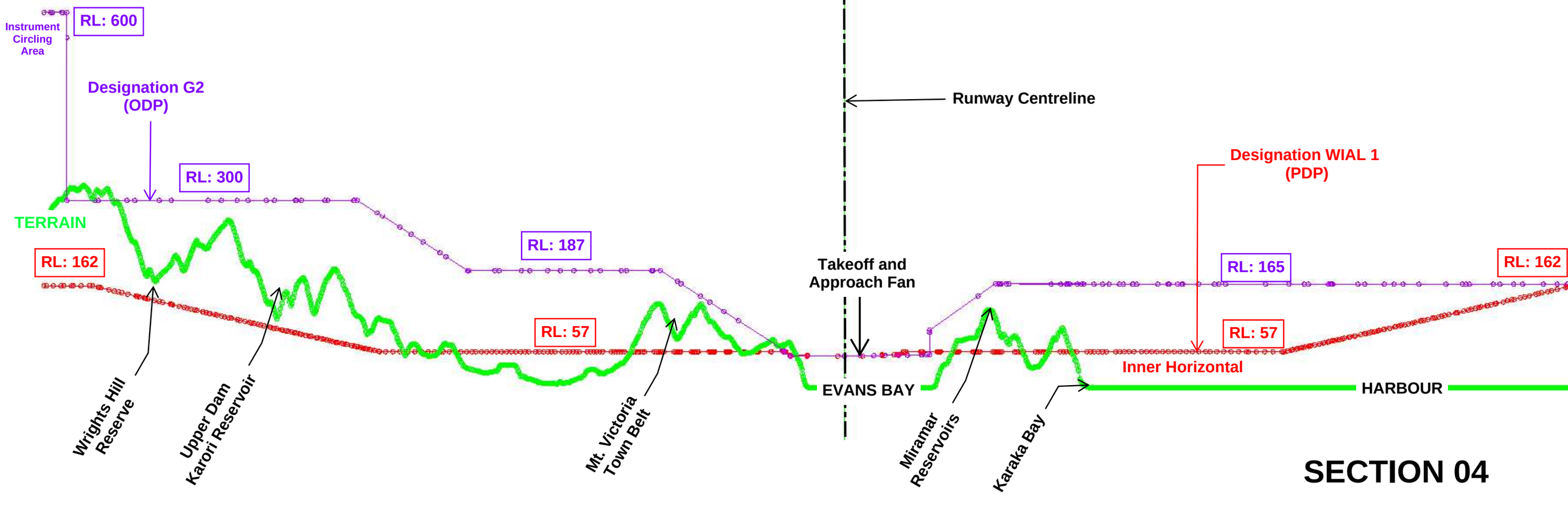
Note: On the following Sections -
Purple Text describes Designation G2 (ODP) OLS Surfaces
Red Text describes WIAL 1 (PDP) OLS Surfaces

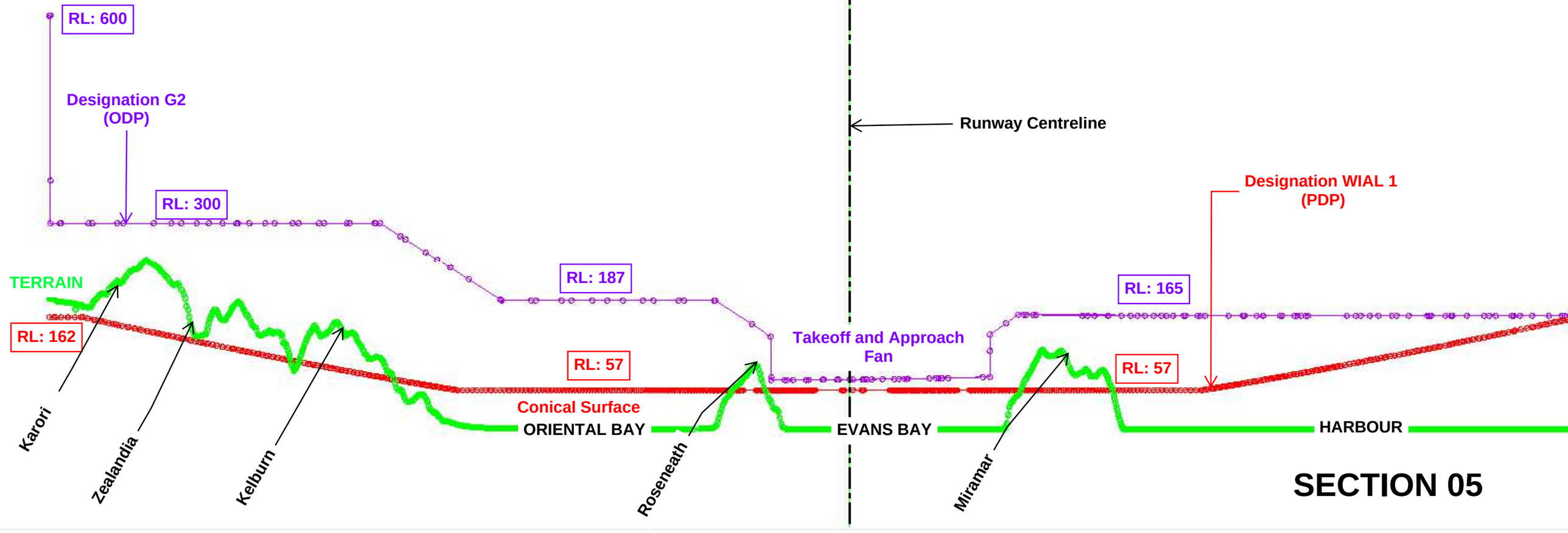
Comparison of Designation G2 (ODP) with Designation WIAL1 (PDP) Cross-Section Locations
Note: Surfaces shown in this figure are WIAL 1 (PDP) - based on CAA AC139

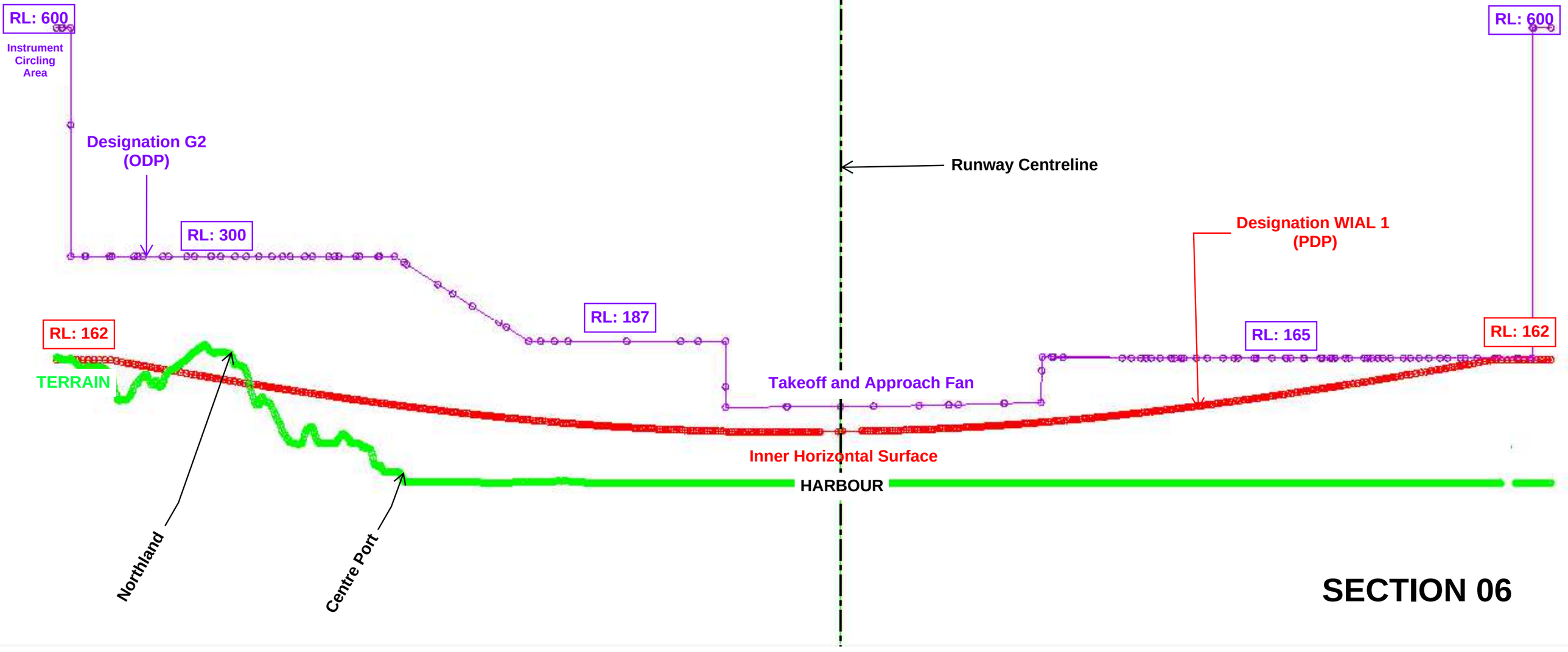

Instrument Circling Area
RL: 600
Designation G2 (ODP)
RL: 300
Transitional Side Surfaces
Runway Centreline
Designation WIAL 1 (PDP)
RL: 187
RL: 165
RL: 162
RL: 162
Outer Horizontal
Conical
RL: 57
RL: 57
RL: 57
Runway Strip
Inner Horizontal
LYALL BAY
HARBOUR
Inner Horizontal
Conical
Outer Horizontal
Hawkins Hill
Achilles' Hill
Happy Valley Road
The Parade Island Bay
Buckley Road
Strathmore Park
Breaker Bay
Hinds Point
SECTION 01


RL: 600
Instrument Circling Area
Designation G2 (ODP)
TERRAIN
RL: 300
RL: 162
RL: 187
RL: 57
RL: 57
Inner Horizontal
Runway Centreline
Runway Strip
RL: 600
Instrument Circling Area
Designation WIAL 1 (PDP)
RL: 165
RL: 162
RL: 57
HARBOUR
Hawkins Hill Road
Edge of urban development
The Ridgeway Mornington
Adelaide Road Berhampore
Newtown Lookout
Seatoun Heights
SECTION 02


Instrument Circling Area
RL: 600
Designation G2 (ODP)
TERRAIN
RL: 300
RL: 162
RL: 187
RL: 57
RL: 57
Takeoff and Approach Fans
Runway Centreline
RL: 600
Designation WIAL 1 (PDP)
RL: 165
RL: 57
RL: 162
Inner Horizontal
EVANS BAY
HARBOUR
Wellington Wind Turbine
Mitchell Street Brooklyn
Wellington Regional Hospital
Haitaitai Park
Maupuia Rd Miramar
Seatoun Heights Lookout
SECTION 03


Instrument Circling Area
RL: 600
Designation G2 (ODP)
RL: 300
TERRAIN
RL: 162
RL: 187
RL: 57
Runway Centreline
Takeoff and Approach Fan
Designation WIAL 1 (PDP)
RL: 165
RL: 162
RL: 57
Inner Horizontal
EVANS BAY
HARBOUR
Wrights Hill Reserve
Upper Dam Karori Reservoir
Mt. Victoria Town Belt
Miramar Reservoirs
Karaka Bay
SECTION 04


RL: 600
Designation G2
(ODP)
RL: 300
RL: 187
TERRAIN
RL: 162
RL: 57
Conical Surface
Takeoff and Approach
Fan
Runway Centreline
Designation WIAL 1
(PDP)
RL: 165
RL: 57
ORIENTAL BAY
EVANS BAY
HARBOUR
Karori
Zealandia
Kelburn
Roseneath
Miramar
SECTION 05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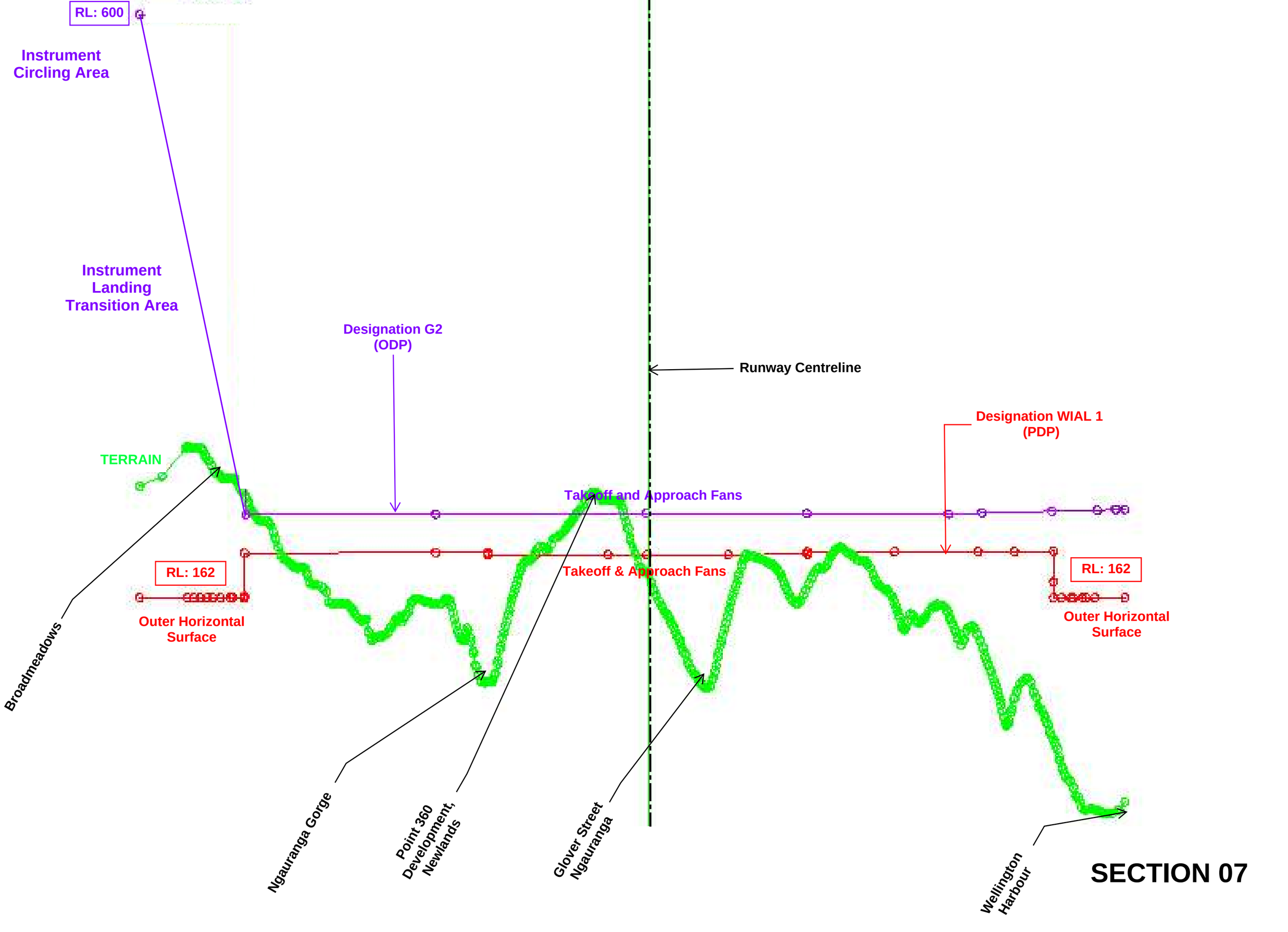
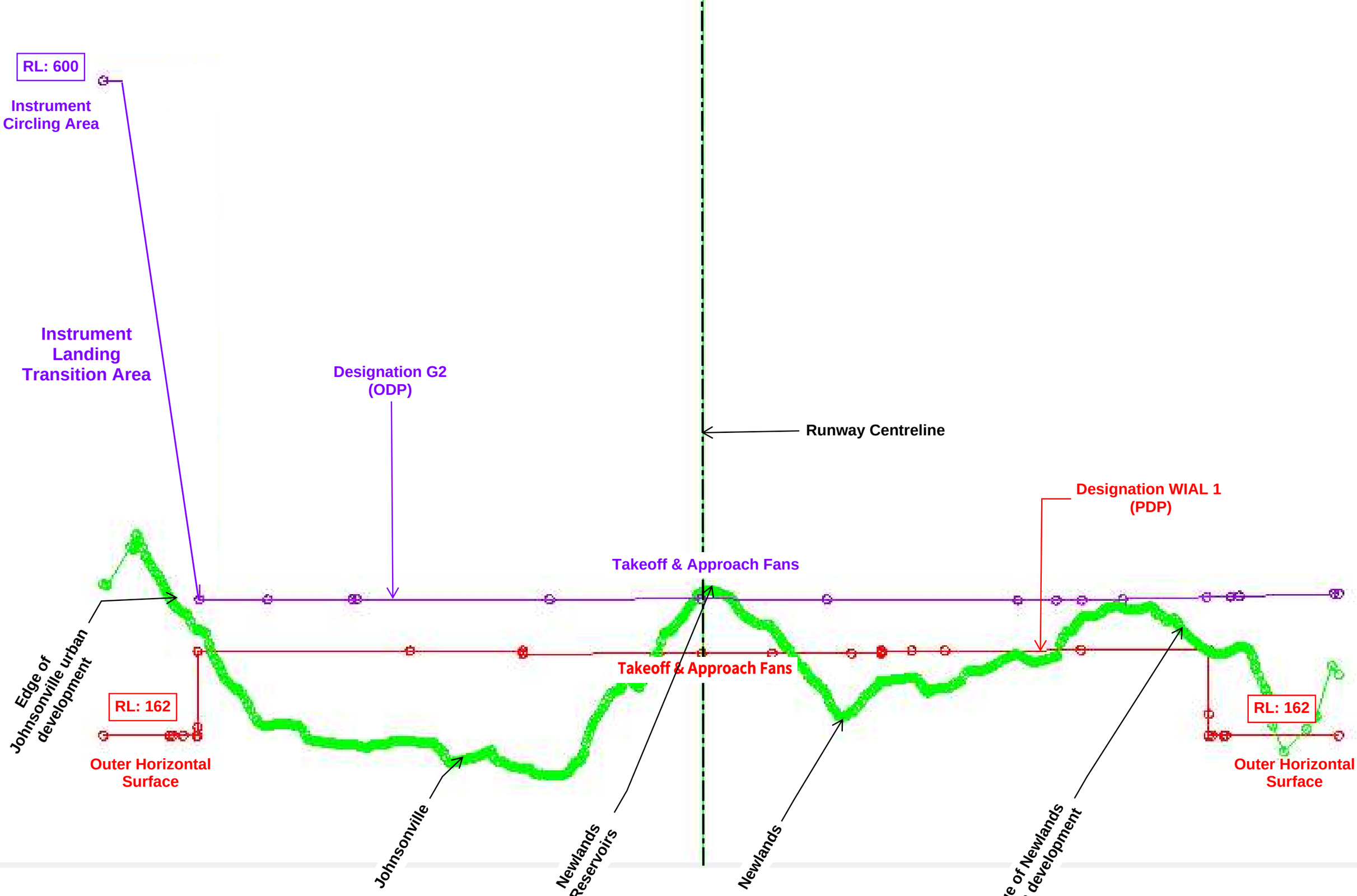
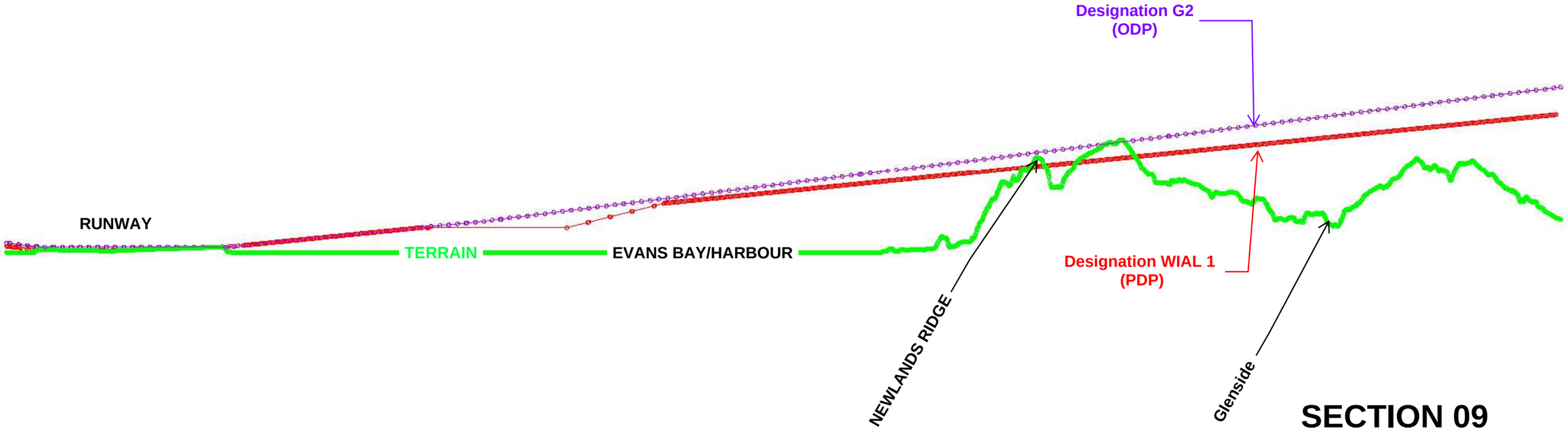
Instrument Circling Area
Designation G2 (ODP)
RL: 300
RL: 187
RL: 162
TERRAIN
Runway Centreline
Takeoff and Approach Fan
Designation WIAL 1 (PDP)
RL: 165
RL: 600
RL: 162
Inner Horizontal Surface
HARBOUR
Northland
Centre Port
SECTION 06


RL: 600
Instrument Circling Area
Instrument Landing Transition Area
Designation G2 (ODP)
Runway Centreline
Designation WIAL 1 (PDP)
TERRAIN
Takeoff and Approach Fans
RL: 162
Takeoff & Approach Fans
RL: 162
Outer Horizontal Surface
Outer Horizontal Surface
Broadmeadows
Ngauranga Gorge
Point 360 Development, Newlands
Glover Street Ngauranga
Wellington Harbour
SECTION 07


RL: 600
Instrument Circling Area
Instrument Landing Transition Area
Designation G2 (ODP)
Runway Centreline
Designation WIAL 1 (PDP)
Takeoff & Approach Fans
Takeoff & Approach Fans
Edge of Johnsonville urban development
RL: 162
Outer Horizontal Surface
Johnsonville
Newlands Reservoirs
Newlands
Edge of Newlands urban development
RL: 162
Outer Horizontal Surface

SECTION 08


Designation G2
(ODP)
RUNWAY
TERRAIN
EVANS BAY/HARBOUR
Designation WIAL 1
(PDP)
NEWLANDS RIDGE
Glenside
SECTION 09