BEFORE THE QUEENSTOWN LAKES DISTRICT COUNCIL HEARINGS PANEL

UNDER	the Resource Management Act 1991
IN THE MATTER	of the review of parts of the Queenstown Lakes District Council's District Plan under the First Schedule of the Act
AND	
IN THE MATTER	of submissions and further submissions by **QUEENSTOWN PARK LIMITED AND REMARKABLES PARK LIMITED**

STATEMENT OF EVIDENCE OF TIMOTHY WILLIAM JOHNSON ON BEHALF OF QUEENSTOWN PARK LIMITED

(3D VISUALISATION – VISUAL SIMULATIONS)

STREAM 13 REZONING HEARINGS

9 June 2017

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1. QUALIFICATIONS AND EXPERIENCE

1.1 My name is Timothy William Johnson. I have 12 years' work experience in surveying, aerial mapping, computer programming and visualisation. I currently work for Buildmedia Ltd (Buildmedia) as a senior visualisation artist and studio manager. Buildmedia is a New Zealand company which specialises in providing accurate computer imagery and real-time visualisation software for the architecture and infrastructure industries. The last 10 years of my work experience have involved working on the preparation and presentation of 3D computer models, visual simulations, rendered computer imagery and full computer generated 3D video simulations depicting proposed developments of various kinds using 3DS Max software and Real-Time visualisation software.

1.2 I have completed a wide range of different visualisation projects from visual simulations of quarries to large infrastructure projects such as motorways and wind farms.

1.3 These include:

(a) Ara Tuhono - Puhoi to Wellsford visualisation and visual simulations;

(b) Visual simulations and visualisation for Western Ring Route;

(c) Tauranga Eastern Link visualisation;

(d) Visual simulations and visualisation of wind farm developments prepared for Mighty River Power, Meridian and Genesis;

(e) Visualisation for Auckland Airport Property;

(f) Visualisation for Sydney Olympic Park Authority;

(g) Visualisation for New South Wales Hunter Development Corporation;

(h) Visual Simulations for Auckland Council Quay Street Development;

(i) Visual simulations for Bunnings Limited – Takanini and New Lynn;

(j) Visual Simulations of Northport Crane;

(k) Visual Simulations of Stoney Ridge Quarry Waiheke; and

(l) Visual Simulations Skypath Auckland Harbour Bridge.

2. CODE OF CONDUCT

2.1 I have read and am familiar with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014), have complied with it, and will follow the Code when presenting evidence to the Council. I also confirm that the matters addressed in this statement of evidence are within my area of expertise, except when 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.

3. SUMMARY OF EVIDENCE

3.1 In my evidence I set out the Visual Simulation Methodology and conclude that the visual simulations provide accurate representations of the proposed gondola.

4. INTRODUCTION

4.1 Buildmedia was engaged to prepare imagery visualising the post-construction appearance of the proposed gondola. The visual simulations are **attached** to this evidence and marked "**A**".

4.2 The ten viewpoint locations were selected by Stephen Brown in conjunction with input from other consultants engaged on the project.

4.3 Buildmedia are recognised specialists in this discipline and utilise the best surveying and computer visualisation practices available. The proprietary techniques and processes Buildmedia has developed create robust and dependably accurate imagery.

4.4 Buildmedia's work does not include the assessment or interpretation of the visual simulations for issues relating to the development visibility and its visual effects.

4.5 The following methodology description explains the steps Buildmedia employed in the creation of the Remarkables Park gondola visual simulations.

5. PROCESS METHODOLOGY

5.1 The Visual Simulations created by Buildmedia were prepared using best surveying and visualisation practices and involve a series of processes and steps to ensure consistency and accuracy in the development of each image. Buildmedia follow the NZILA Best Practice Guide "NZILA BPG" as a method of producing visual simulations. The following steps briefly identify the method in which the proposed gondola was visualised.

6. ON GROUND PHOTOGRAPHY AND SURVEY

6.1 A series of photographs were taken for viewpoints 1 to 4 and 7 to 8 on the 5th and 6th March 2016 using a Canon EOS 50D digital camera with a 53 mm lens and using a tripod. Viewpoints 5 and 6 were captured on the 25th of April 2017 using a Canon EOS 60D digital camera with a 50 mm lens and using a tripod. Photographs were captured every 5 degrees using a specialist robotic panoramic head to remove parallax error.

6.2 Camera positions were captured by Apex Surveying in local NZGD 2000 circuit (Mount Nicholas Circuit 2000) and NZTM (New Zealand Transverse Mercator projection). All levels are in terms of Dunedin Vertical Datum 1958.

7. DEVELOPMENT OF THE 3D MODEL

7.1 Aerial and Lidar Data was supplied by Remarkables Park Limited (**RPL**). This was imported into AutoCAD Civil software and Global Mapper software, and converted to a surface model for rendering in 3DSMax. Contour intervals of the terrain surface was modelled at 0.5m intervals. The vertical accuracy of the dataset is 0.15m.

7.2 The gondola towers were modelled using plans and elevations supplied by Lietner Poma. Height, inclination and position were modelled for each tower, the gondola cabins were spaced as per the specifications in the cross sections. Gondola towers and cabins were coloured Half Ironsand N38-005-056. Refer to **Fig1.**

7.3 The upper gondola station 3D model was supplied by Aireys Consultants and imported into the overall 3D model. This was coloured Half Ironsand N38-005-056. Refer to **Fig2**.

7.4 The lower gondola stations were modelled using Lietna Polma's cross sections and architectural designs supplied by RPL. The designs were modified in dimensions to match that of Lietna Polma's cross section dimensions. The stations were coloured Half Ironsand N38-005-056. Refer to **Fig3, Fig.4 and Fig.5.**

7.5 Glass reflections are not possible to represent within a model of this scale, as reflections rely on elements being present within the 3D model. To reflect the environment accurately would require all surrounding context to be modelled. Therefore, glass was represented as a semitransparent material with a transparency of 36%.

8. PANORAMIC PHOTO

8.1 Virtual cameras are placed into the 3D scene matched to the GPS coordinates of the field camera position ascertained on site by Apex Surveying.

8.2 The field of view and aspect ratio of the virtual camera was then adjusted to match the rectilinear image field of view of 90 degrees.

9. GENERATION OF TIE POINTS

9.1 Tie points are specific, identifiable surveyed objects visible in the panorama photograph. They are used to match the virtual camera target to the rectilinear image. These are represented as upside down yellow cones in the tie point image.

9.2 Apex Surveying captured tie points where accessible. The 3D tie point position indicators were added into the 3D scene at the actual positions determined by Apex Surveying. The virtual camera was then altered in direction so that the tie points matched the rectilinear image. Multiple tie points were used across the whole width of the view to ensure consistent accuracy. They were then rendered and overlaid onto the existing panorama.

9.3 For panoramas where no tie points were captured, contour data was generated from RPL Lidar Data and used to align the photography. The contour data was converted into a 3D mesh and added to the scene file. The virtual cameras were then altered in direction so that the contour data matched with the rectilinear image, as well as the known tie points. This is represented as a yellow terrain mesh.

10. RENDERING

10.1 In the 3D model, the sun and environment was simulated at the precise day and time each photograph was captured. This ensures the lighting of the gondola, as well as the shadows cast, are accurate representations of how the gondola would appear in the photography.

11. FINAL IMAGE ENHANCEMENTS

11.1 2D image editing software was used to correctly edit what would normally appear in the foreground of the image. Foreground features were transcribed out of the original photograph and placed into their exact position in front of the 3D object.

11.2 Buildmedia carefully compared onsite photography, plans and aerial photography when photo-editing the photography.

11.3 Both Rectilinear and Cylindrical image projections were created using specialist software.

12. PRESENTATION SHEET LAYOUTS

12.1 The final images were assembled using Adobe InDesign into PDF sheets that included titles, rectilinear and cylindrical visual simulations, tie-point information, and necessary camera information.

12.2 Correct reading distance for each visual simulation is specified at the bottom of the page for A3, A2 and A1 paper sizes.

12.3 Each viewpoint is formatted using four methods:

(a) Rectilinear 90 degree field of view panorama, showing gondola alignment in red, tie point locations, and 3d terrain model surface;

(b) Rectilinear 90 degree field of view panorama, showing before and after comparison of gondola alignment with cropped zoom in corner, gondola represented in colour half ironsand N38-005-056;

(c) Cylindrical 90 degree field of view panorama, showing gondola alignment coloured half ironsand N38-005-056; and

(d) Single photo simulated at 50mm lens showing gondola alignment coloured half ironsand N38-005-056.

12.4 As detailed in the NZILA BPG, to maintain the correct viewing scale for rectilinear panoramas one must look directly at the centre of the image without moving one's head and rely on peripheral vision to see the extremities of the image.

12.5 As detailed in the NZILA BPG, to maintain correct scale of cylindrical panoramas viewed on a flat surface, it should be viewed repositioning along its length maintaining the specified reading distance as one moves.

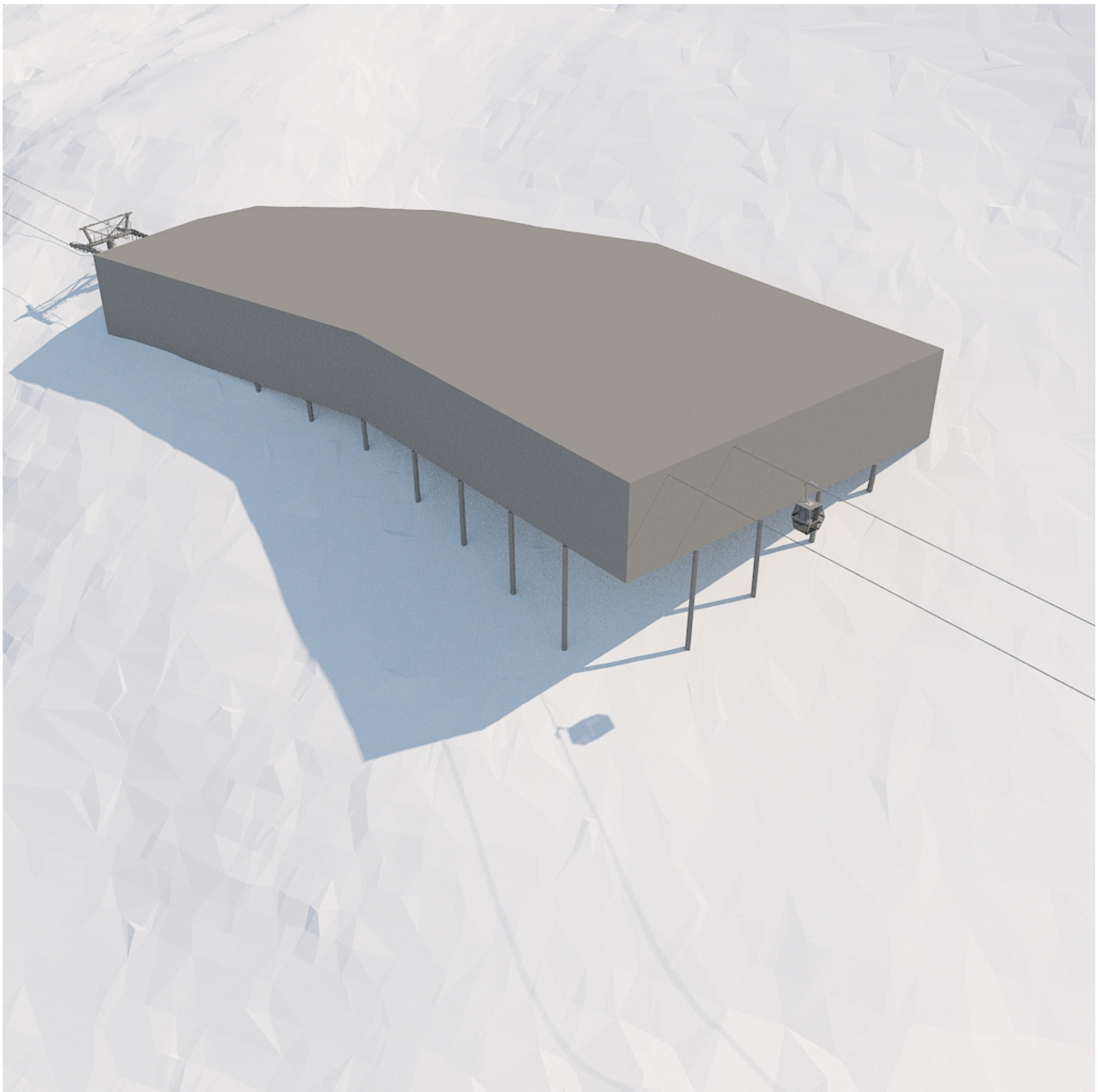
13. CONCLUSION

13.1 Buildmedia use the surveying and visualisation practices and involve a series of processes and steps to ensure consistency and accuracy in the development of each visual simulation. These visual simulations accurately represent the proportions and location of the proposed gondola and views from the selected locations as scribed by the design information available.

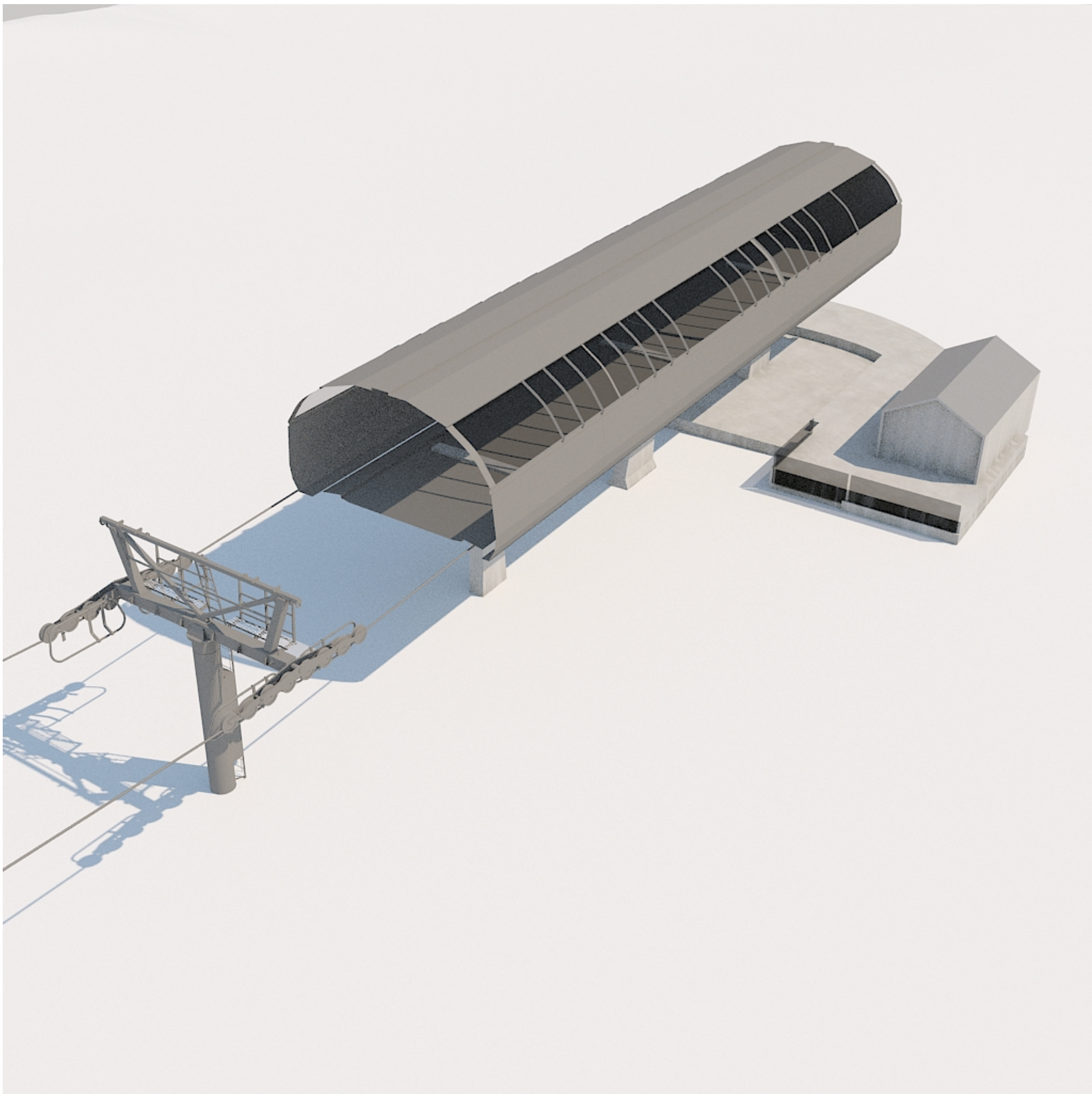
14. VISUALISED STRUCTURES

14.1 Figure 1 Gondola Tower.

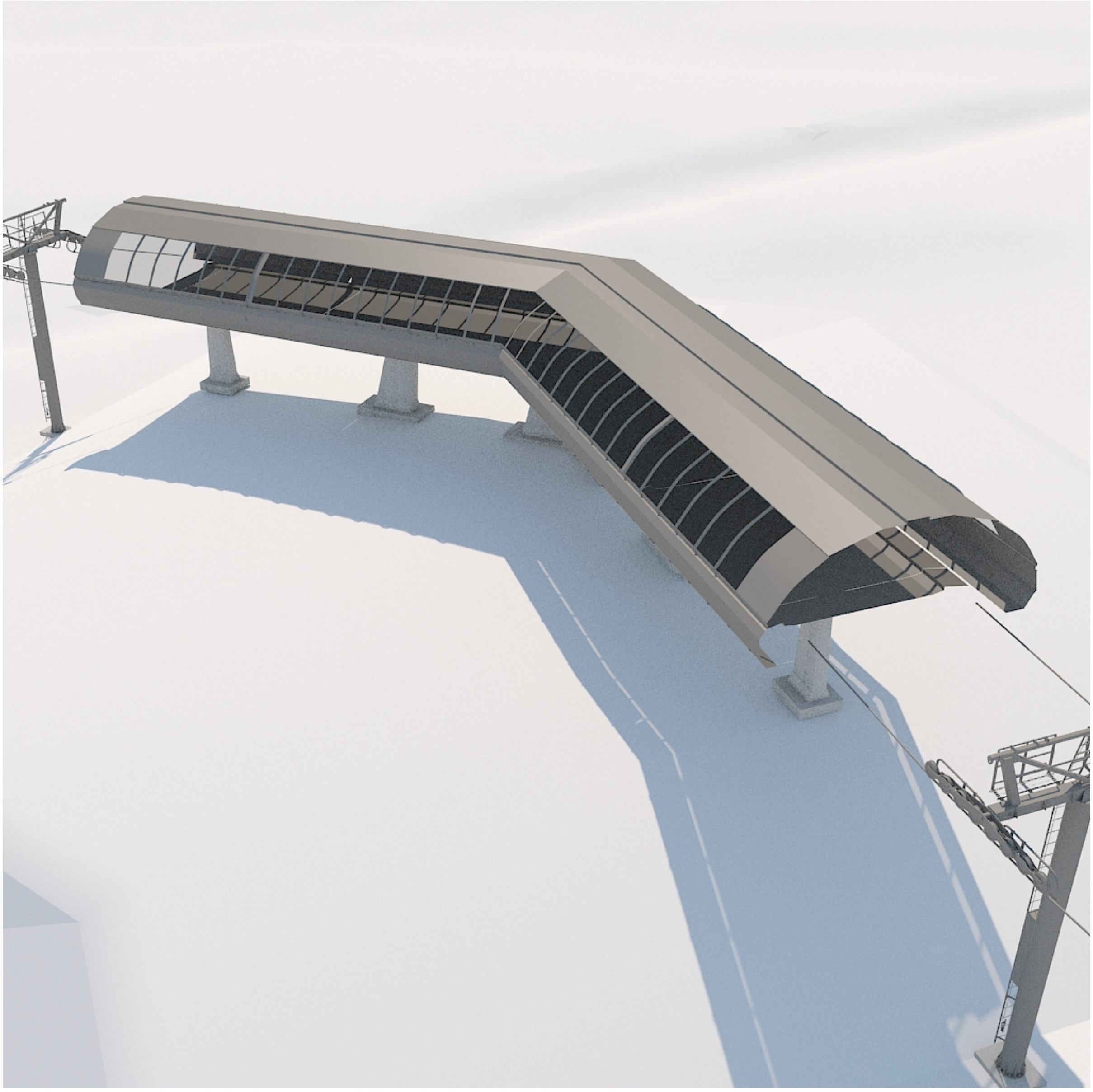
14.2 Figure 2 Upper Gondola Station



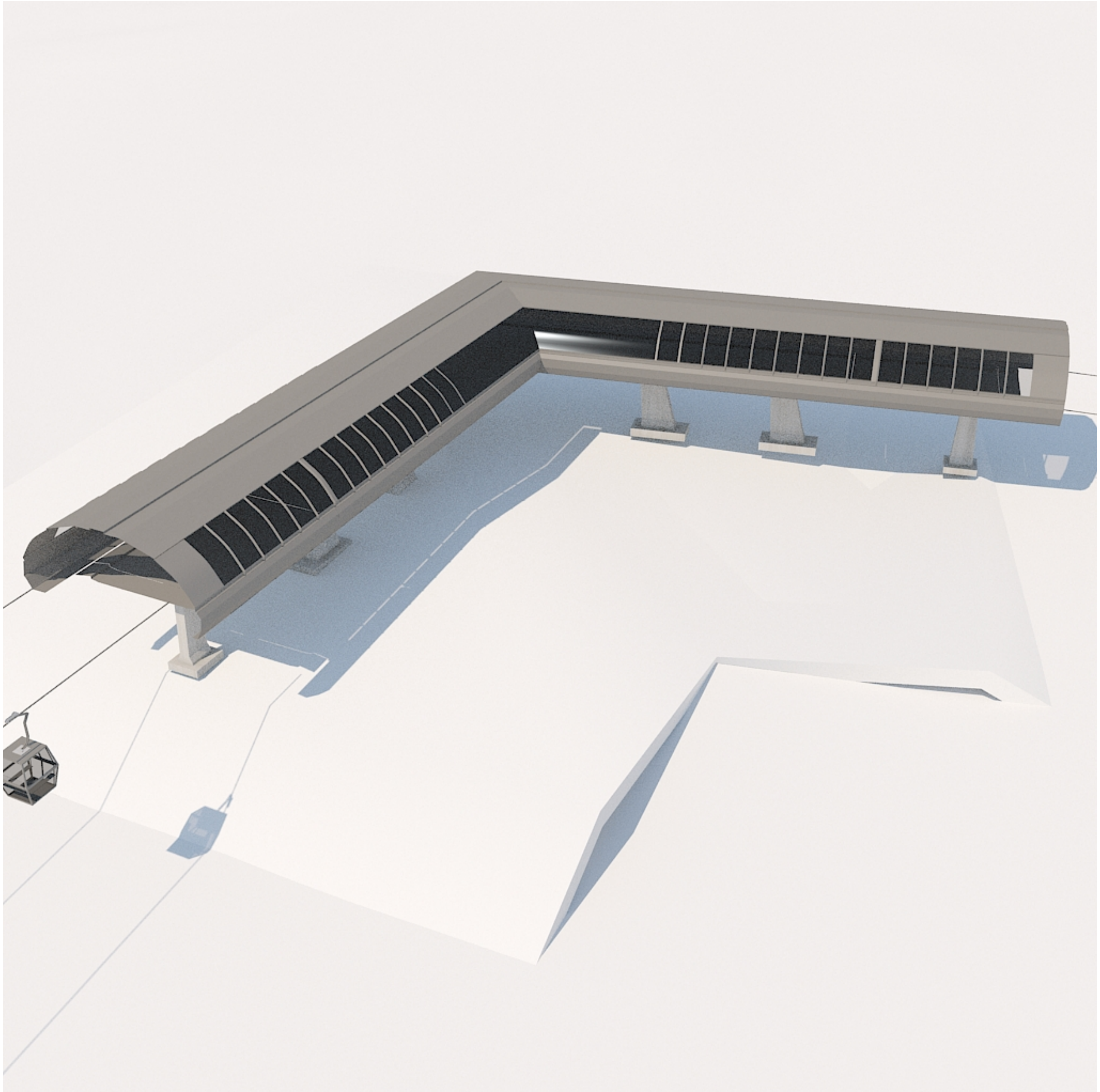
14.3 Figure 3 Remarkables Park Town Centre Station



14.4 Figure 4 Bend Station



14.5 Figure 5 Turn Station



Timothy William Johnson

9 June 2017

ATTACHMENT A: VISUAL SIMULATIONS