APPENDIX F MEMORANDUM SIGHT DISTANCE REPORT

Memorandum

21 January 2021

To	**NGH Pty Ltd** **c/o** Louiza Romane		
Copy to	**GHD** Jeff Potts, GHD Project Director Andrew Harrop, GHD Design Reviewer Janesse Catiil, GHD Project Engineer Minh Ngo, GHD Road Design Lead		
From	Gustavo Palma, GHD Project Manager	Tel	02 8898 6886
Subject	Wellington North Solar Plant – Site Access (Goolma Road) Strategic Design and Sight Distance Assessment	Job no.	12538291

1 Executive Summary

This Memorandum was prepared to inform NGH Pty Ltd of the strategic design of a Basic Right Turn (BAR) and an Auxiliary Left Turn (AUL) at the intersection between Goolma Road and the proposed Access Road that will serve as the designated entry point to the Wellington North Solar Plant.

The purpose of this Memorandum is to undertake a horizontal and vertical sight distance assessment at the left-hand curve along Goolma Road, approaching the Access Road, to determine if the existing geometry meets the minimum sight distance required for the speed environment.

The calculations show that horizontal and vertical distances for Approach Sight Distance (ASD) requirements are met and the proposed location of the intersection's AUL will have negligible effects on existing sight distances.

2 Introduction

An overview of the Strategic Design on Goolma Road includes the following:

- Design of a BAR (Basic Right Turn) and an AUL (Auxiliary Left Turn) at the proposed entry point on Goolma Road.
- Sight distance assessment at the curve on approach to the proposed intersection using the supplied LiDAR survey.
- All proposed road alignments are two-dimensional 2D and are based on the supplied LiDAR survey and downloaded aerial image (See Section 4: Design Standards).

3 Project Site

The project site is located within the Dubbo Regional Council Local Government Area (LGA), seven kilometres northeast of Wellington town centre between Twelve Mile Road and Gladstone Road. The project site shown in Figure 1 below is located at Goolma Road and is the proposed entry point to the site.

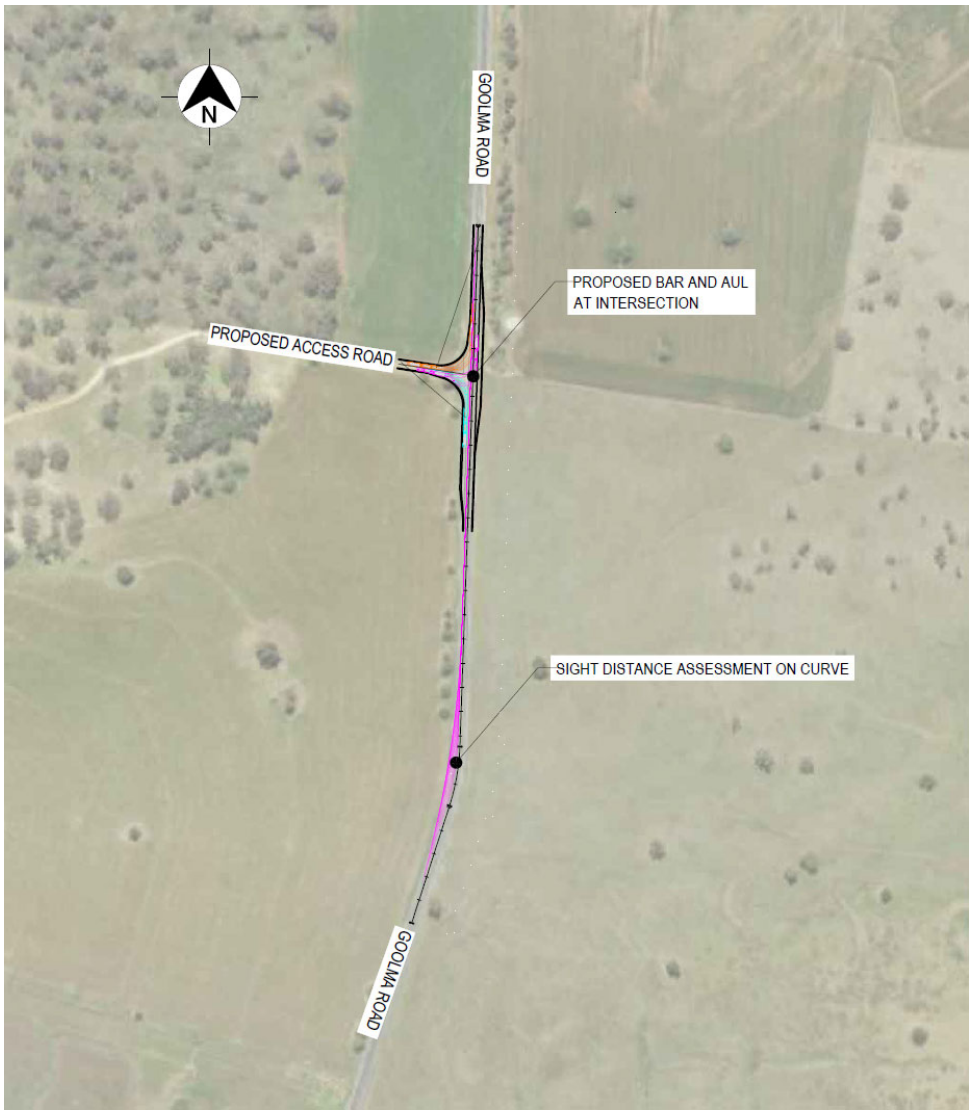


Figure 1. Location of Works

4 Design Standards

4.1 Existing Data

NGH Pty Ltd provided a topographic LiDAR survey of the site and geo-referenced aerial imagery was acquired by GHD through SIX Maps, downloaded to use as basis for the strategic design.

4.2 Standards and Guidelines

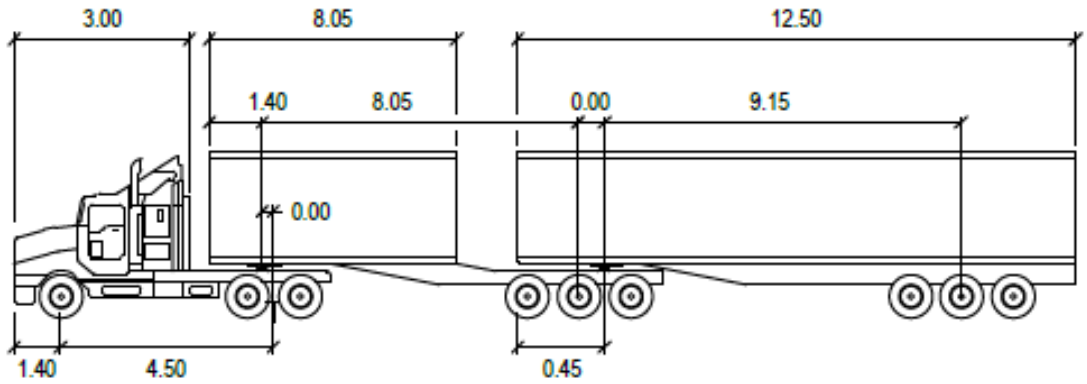
Austroads – Guide to Road Design Part 4A: Unsignalised and Signalised Intersections, Section 7.5.1 Basic Right Turn (BAR) design and Section 8.2.3 for Auxiliary Left Turn (AUL) design.

4.3 Design Speed

The proposed alignment is designed to 80km/hr to match the existing and posted speed environment at the site.

4.4 Design Vehicles

GHD is proposing to use the 26 m B-Double truck for the schematic design of the intersection and sight distance assessments. See Figure 2 for vehicle dimensions.



B-DOUBLE 26M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

Figure 2. Design Vehicle: 26 m B-Double

5 Sight Distance Assessment

5.1.1 Assumptions of Sight Distance Assessment

- The basis of the intersection design and sight distance assessment are as follows:
  - Lane widths are measured from the existing centreline based on aerial image and topographical LiDAR survey
  - Existing single carriageway width is 3.5 m by AutoCAD software measurement using the aerial image.

5.1.2 Sight Distance

The sight distance assessed for the purpose of this memorandum are based on ASD (Approach Sight Distance) and SSD (Stopping Sight Distance) from the curve at Goolma Road to the proposed location of the intersection. Both the horizontal and vertical component were assessed. The assessment methodology was carried out as per Austroads Guide to Road Design Part 3 and 4A (See Figures 3,4 & 5 below).

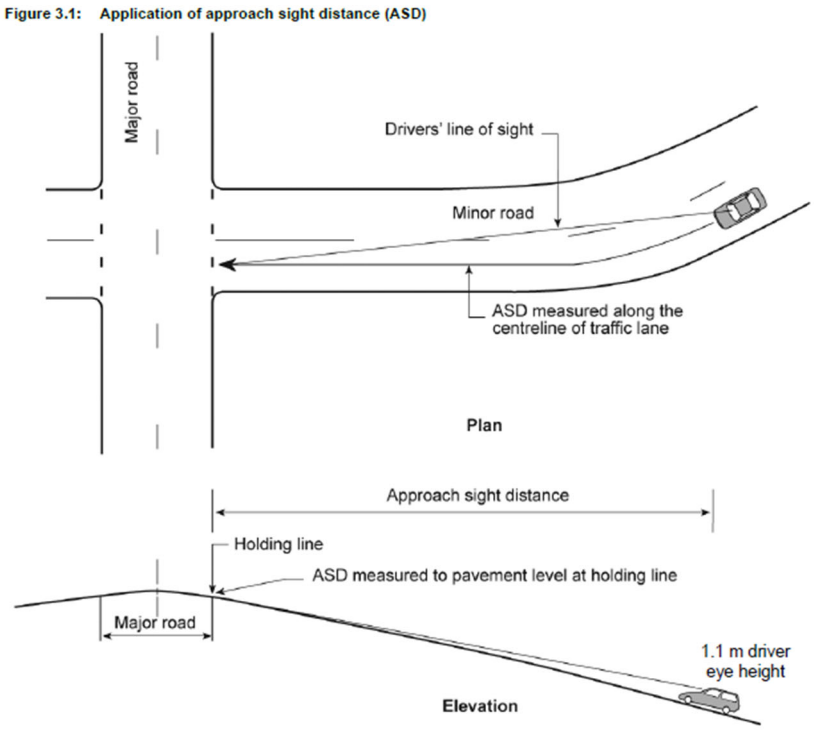


Figure 3. Excerpt from Austroads Guide to Road Design Part 4

$$ASD = \frac{R_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where

ASD	=	approach sight distance (m)
R_T	=	reaction time (sec), refer to *AGRD Part 3* (Austroads 2016b) for guidance on values
V	=	operating (85th percentile) speed (km/h)
d	=	coefficient of deceleration, refer to Table 3.3 and *AGRD Part 3* for values
a	=	a longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)

Figure 4. Excerpt from Austroads Guide to Road design Part 4 – ASD Formula

SSD is derived from two components:

1. the distance travelled during the total reaction time
2. the distance travelled during the braking time from the design speed to a stop and their relationship is shown in Equation 1.

$$SSD = \frac{R_T V}{3.6} + \frac{V^2}{254(d + 0.01a)} \qquad 1$$

where

R_T	=	reaction time (sec)
V	=	operating speed (km/h)
d	=	coefficient of deceleration (longitudinal friction factor)
a	=	longitudinal grade (%, + for upgrades and – for downgrades)

Figure 5. Excerpt from Austroads Guide to Road design Part 3 – SSD Formula

It is noted that sight distance calculations were based on the above formulas and undertaken using Bentley OpenRoads software. The sketches are included in Appendix A and the raw results are available in Appendices B and C.

5.2 Sight Distance Assessment Parameters

The basic parameters used for the assessment of ASD and SSD are outlined in the table below:

Table 1. Sight Distance Parameters

Parameters	Adopted Value
ASD - Required Approach Sight Distance (m)	**114.0**
SSD - Stopping Sight Distance (m)	**126.0**
Object Height	0.2m
Eye height	1.1m
RT - Reaction Time ASD(s)	2.0
RT - Reaction Time SSD(s)	2.5
V - Overall Speed (km/h)	80.0
d - Coefficient of Deceleration	0.362
a - Longitudinal Grade (%), Uphill (+) and Downhill (-)	+1.022%

5.2.1 Horizontal Sight Distance

The Horizontal sight distance assessment indicates that visibility needs to be achieved over a distance of 114 m over the left-hand curve for ASD and 126 m for SSD, in particular the shaded envelope region is required to be clear of all visual obstructions for drivers as indicated in Figures 6 and 7 below:

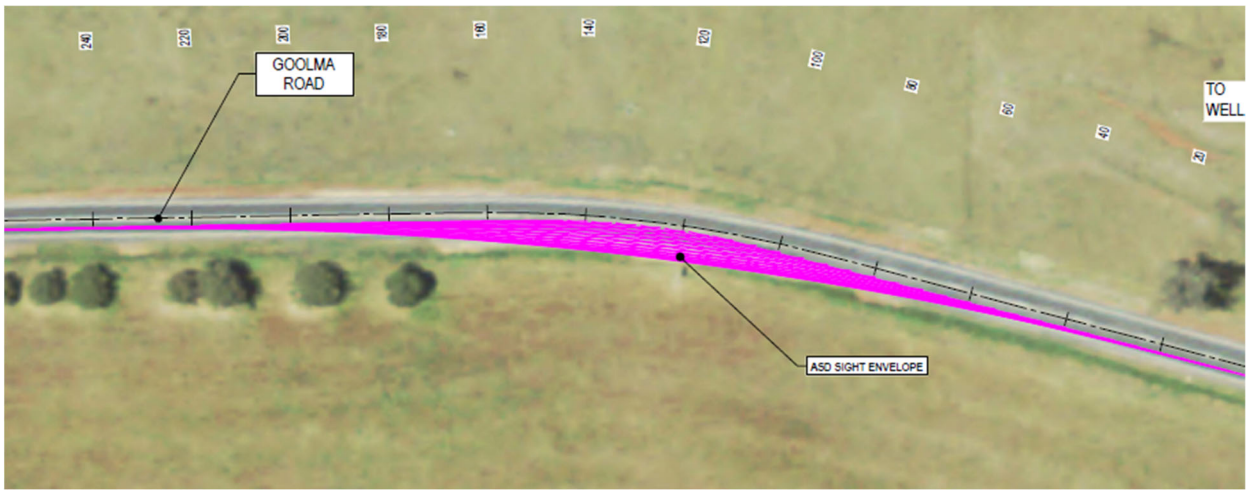


Figure 6. ASD Horizontal Sight Distance Envelope

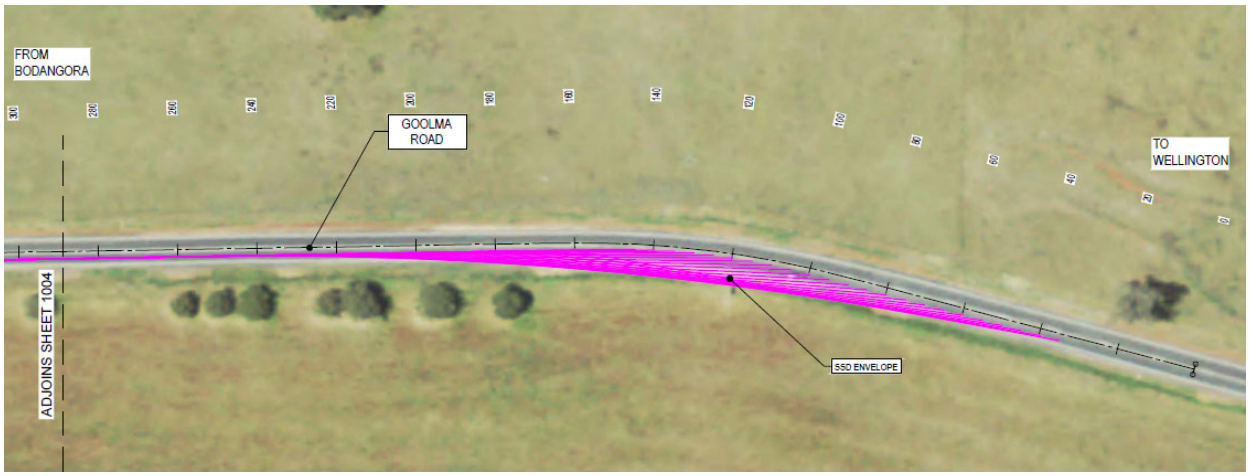


Figure 7. SSD Horizontal Sight Distance Envelope

The snapshot below (Figure 8), taken from Google earth, indicates that there are no permanent visual constraints impeding sight distance such as trees, cut batters, safety barriers or retaining walls, it is also noted that the existing tree line is well outside the sight distance envelopes to have any impact.

Figure 8. Google Earth Snapshot (Northbound Carriageway)

The horizontal sight distance results are summarised in the table below:

Table 2. Calculated Results for Horizontal Sight Distance

Check	
Min. Horizontal Design ASD (m)	114.0
Min. Horizontal Design SSD (m)	126.0
Result =>	**OK**

As per the assessment and observations above it is deemed that the required horizontal sight distances of 114 m and 126 m over the left-hand curve are achieved without obstructions, subject to a site visit for verification.

5.2.2 Vertical Sight Distance

The vertical sight distance component of the assessment calculated the visibility of an object on the road at a height of 0.2 m over the profile of the road. The provided point cloud survey was used as the road profile to carry out the calculations. The assessment was carried out from the left-hand curve at approximate chainage 40 to the proposed intersection as depicted in magenta in Figures 9 and 10 below:

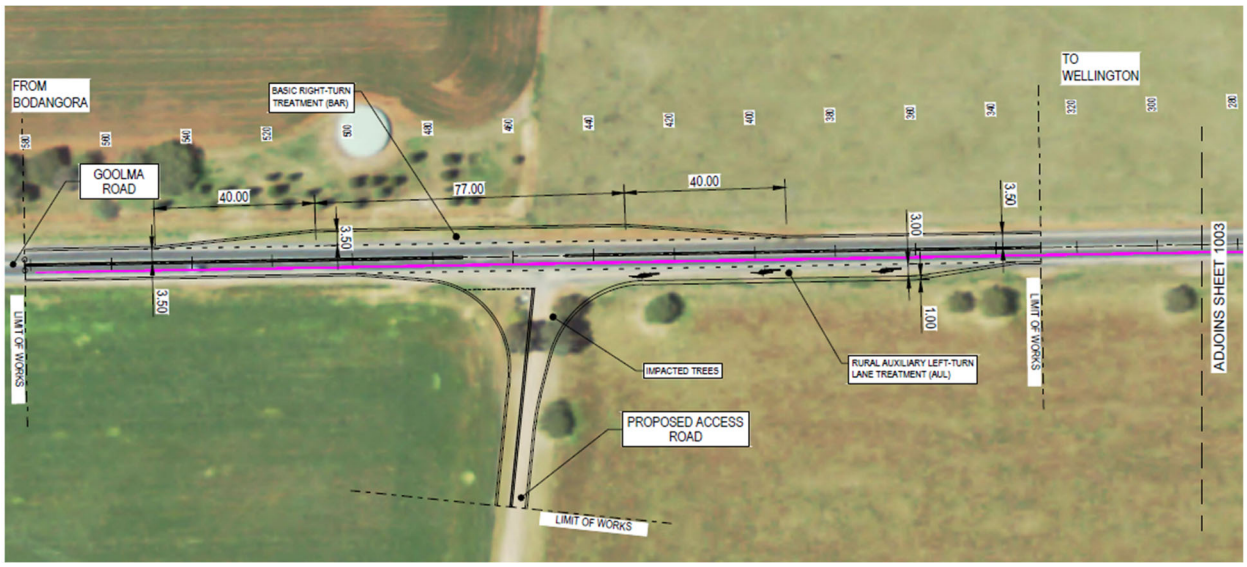


Figure 9. Extents of Vertical Sight Distance Assessment (ASD)

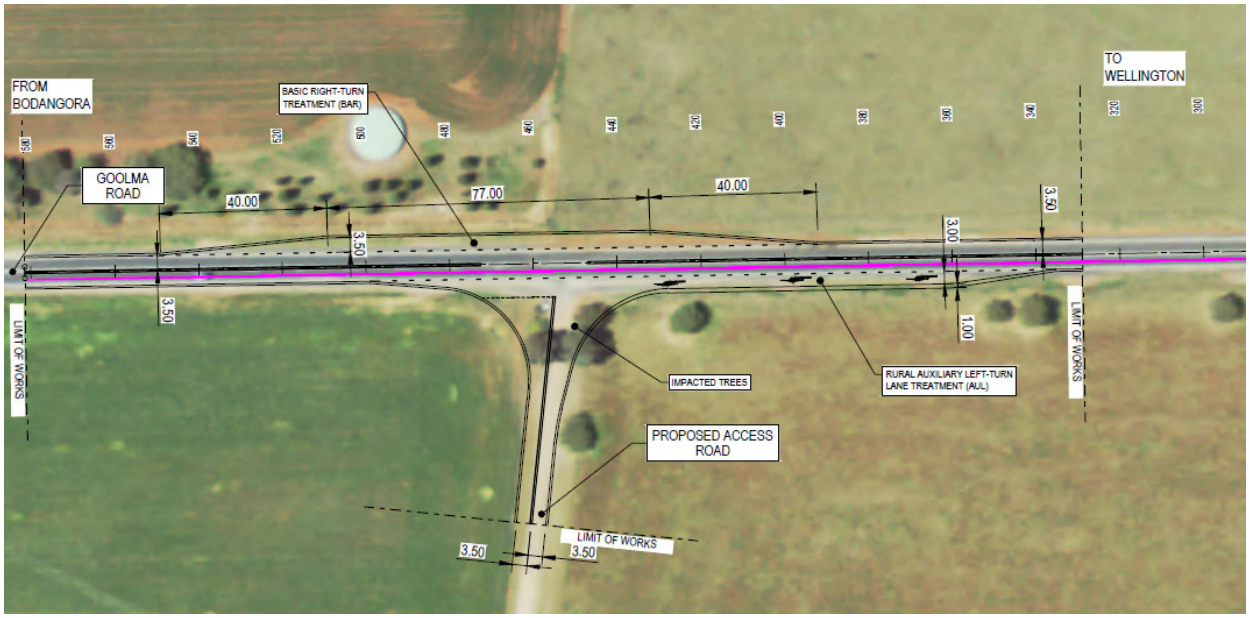


Figure 10. Extents of Vertical Sight Distance Assessment (SSD)

The vertical sight distance results are summarised in the table below:

Table 3. Calculated Results for Vertical Sight Distance

Check	
Min. Vertical Design ASD (m)	114.0
Min. Vertical Design SSD (m)	126.0
Result =>	**OK**

The reults above show that the minimum vertical sight distcnce (in magenta) is achieved to the intersection from the left hand curve along Goolma Road for both ASD and SSD.

Conclusion

Based on the sight distance (ASD and SSD) calculations at the Goolma Road left-hand curve and on approach to the intersection, the existing geometric conditions of the curve meet the required 114 m and 126 m sight distance for both the horizontal and vertical components. It is our opinion also that the introduction of the AUL at the proposed intersection location will have negligible effects on existing sight distance conditions.

Regards

Gustavo Palma
Project Manager

Attachments:

Appendix A – Strategic Design Layout

Appendix B – (ASD) Approach Sight Distance Calculation Data

Appendix C – (SSD) Stopping Sight Distance Calculation Data

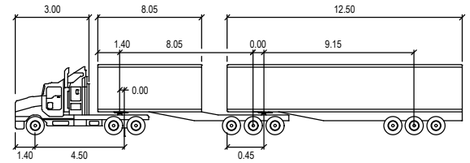
The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared

Appendix A – Strategic Design Layout

SCALE 1:1000 10 0 10 20 AT A3

GENERAL NOTES

1) DESIGN IS TWO DIMENSIONAL ONLY BASED OFF AERIAL IMAGERY.
2) AERIAL IMAGERY SOURCE; SIX MAPS.



B-DOUBLE 26M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

FOR INFORMATION

rev	description	app'd	date
0	ISSUED FOR INFORMATION	GP	20.01.2021

LIGHT SOURCE BP
WELLINGTON NORTH SOLAR PLANT

PLANT ACCESS OPTION ROAD PLAN - SHEET 1 OF 1

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scale	1:1000 for A3	job no.	21-12538291
date	20.01.2021	rev no.	0

approved (PD) Jeff Potts

SK1001

SCALE 1:1000 10 0 10 20 AT A3

GENERAL NOTES

1) DESIGN IS TWO DIMENSIONAL ONLY BASED OFF AERIAL IMAGERY.
2) AERIAL IMAGERY SOURCE; SIX MAPS.

LEGEND

APPROACH SIGHT DISTANCE CHECK (114m ASD FOR 80km/h)
REFER TO SIGHT VISIBILITY REPORT

FOR INFORMATION

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SCALE 1:1000 10 0 10 20 AT A3

GENERAL NOTES

1) DESIGN IS TWO DIMENSIONAL ONLY BASED OFF AERIAL IMAGERY.
2) AERIAL IMAGERY SOURCE; SIX MAPS.

LEGEND

APPROACH SIGHT DISTANCE CHECK (114m ASD FOR 80km/h)
REFER TO SIGHT VISIBILITY REPORT

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WELLINGTON NORTH SOLAR PLANT

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SCALE 1:1000 10 0 10 20 AT A3

GENERAL NOTES

1) DESIGN IS TWO DIMENSIONAL ONLY BASED OFF AERIAL IMAGERY.
2) AERIAL IMAGERY SOURCE; SIX MAPS.

LEGEND

STOPPING SIGHT DISTANCE CHECK (126m SSD FOR 80km/h)
REFER TO SIGHT VISIBILITY REPORT

FOR INFORMATION

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GENERAL NOTES

1) DESIGN IS TWO DIMENSIONAL ONLY BASED OFF AERIAL IMAGERY.
2) AERIAL IMAGERY SOURCE; SIX MAPS.

LEGEND

STOPPING SIGHT DISTANCE CHECK (126m SSD FOR 80km/h)
REFER TO SIGHT VISIBILITY REPORT

FOR INFORMATION

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PLANT ACCESS OPTION
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date	20.01.2021	rev no.	0

approved (PD) Jeff Potts

SK1005

SCALE 1:1000 10 0 10 20 AT A3

Appendix B – (ASD) Approach Sight Distance Calculation Data

Sight Visibility Report

Report Created: Friday, 15 January 2021
Time: 10:42:51 AM

Settings File: C:\ProgramData\Bentley\OpenRoads Designer CE\Configuration\Organization-Civil\ANZ Design\Sight Visibility\AustRoads 2016 Sight Visibility Equations and Tables 5m Rounding.xml
Equation Setting: AustRoads 2016 Car ASD RT=2.0sec d=0.362 Centre

Sight Visibility Section: Sight Visibility7
Calculation Method: Table
Control Reference: MC00
Required Sight Distance: 114
Relaxed Sight Distance: 114
Eye Reference: MC00
Eye Interval: 5
Eye Offset: -1.75
Eye Height: 1.1

Standard Variables

Design Surface:
Existing Surface: TX00TRID DESIGN
Move Target to Achieve: Off
Object Reference: MC00
Object Interval: Not Used
Object Offset: -1.75
Object Height: 0.2

Method Variables

Eye Position	Actual End Position	Object Position	Eye Level	Actual End Level	Object Level	Design Speed	Instant Grade	Average Grade	Required Distance	Relaxed Distance	Achieved Distance	Achieved Chord Distance	Status	Surface Intersect
0	114	114	385.847	386.116	386.116	80	0	0	114	114	114	113.87	Achieved	None
5	119	119	385.902	386.167	386.167	80	0	0	114	114	114	113.807	Achieved	None
10	124	124	385.953	386.218	386.218	80	0	0	114	114	114	113.733	Achieved	None
15	129	129	386.004	386.269	386.269	80	0	0	114	114	114	113.647	Achieved	None
20	134	134	386.055	386.32	386.32	80	0	0	114	114	114	113.548	Achieved	None
25	139	139	386.107	386.371	386.371	80	0	0	114	114	114	113.434	Achieved	None
30	144	144	386.158	386.422	386.422	80	0	0	114	114	114	113.307	Achieved	None
35	149	149	386.209	386.473	386.473	80	0	0	114	114	114	113.164	Achieved	None
40	154	154	386.26	386.524	386.524	80	0	0	114	114	114	113.039	Achieved	None
45	159	159	386.311	386.575	386.575	80	0	0	114	114	114	112.949	Achieved	None
50	164	164	386.362	386.627	386.627	80	0	0	114	114	114	112.875	Achieved	None
55	169	169	386.413	386.678	386.678	80	0	0	114	114	114	112.819	Achieved	None
60	174	174	386.464	386.729	386.729	80	0	0	114	114	114	112.779	Achieved	None
65	179	179	386.515	386.78	386.78	80	0	0	114	114	114	112.755	Achieved	None
70	184	184	386.566	386.831	386.831	80	0	0	114	114	114	112.749	Achieved	None
75	189	189	386.617	386.882	386.882	80	0	0	114	114	114	112.759	Achieved	None
80	194	194	386.668	386.933	386.933	80	0	0	114	114	114	112.786	Achieved	None
85	199	199	386.719	386.984	386.984	80	0	0	114	114	114	112.83	Achieved	None
90	204	204	386.771	387.035	387.035	80	0	0	114	114	114	112.891	Achieved	None
95	209	209	386.822	387.086	387.086	80	0	0	114	114	114	112.968	Achieved	None
100	214	214	386.873	387.137	387.137	80	0	0	114	114	114	113.063	Achieved	None
105	219	219	386.924	387.188	387.188	80	0	0	114	114	114	113.199	Achieved	None
110	224	224	386.975	387.239	387.239	80	0	0	114	114	114	113.338	Achieved	None
115	229	229	387.026	387.291	387.291	80	0	0	114	114	114	113.462	Achieved	None
120	234	234	387.077	387.342	387.342	80	0	0	114	114	114	113.572	Achieved	None
125	239	239	387.128	387.393	387.393	80	0	0	114	114	114	113.668	Achieved	None
130	244	244	387.179	387.444	387.444	80	0	0	114	114	114	113.751	Achieved	None
135	249	249	387.23	387.495	387.495	80	0	0	114	114	114	113.822	Achieved	None
140	254	254	387.281	387.546	387.546	80	0	0	114	114	114	113.884	Achieved	None
145	259	259	387.332	387.597	387.597	80	0	0	114	114	114	113.938	Achieved	None
150	264	264	387.383	387.648	387.648	80	0	0	114	114	114	113.988	Achieved	None
155	269	269	387.435	387.699	387.699	80	0	0	114	114	114	114	Achieved	None
160	274	274	387.486	387.75	387.75	80	0	0	114	114	114	114	Achieved	None
165	279	279	387.537	387.801	387.801	80	0	0	114	114	114	114	Achieved	None
170	284	284	387.588	387.852	387.852	80	0	0	114	114	114	114	Achieved	None
175	289	289	387.639	387.903	387.903	80	0	0	114	114	114	114	Achieved	None
180	294	294	387.69	387.955	387.955	80	0	0	114	114	114	114	Achieved	None
185	299	299	387.741	388.006	388.006	80	0	0	114	114	114	114	Achieved	None
190	304	304	387.792	388.057	388.057	80	0	0	114	114	114	114	Achieved	None
195	309	309	387.843	388.108	388.108	80	0	0	114	114	114	114	Achieved	None
200	314	314	387.894	388.159	388.159	80	0	0	114	114	114	114	Achieved	None
205	319	319	387.945	388.21	388.21	80	0	0	114	114	114	114	Achieved	None
210	324	324	387.996	388.261	388.261	80	0	0	114	114	114	114	Achieved	None
215	329	329	388.048	388.312	388.312	80	0	0	114	114	114	114	Achieved	None
220	334	334	388.099	388.363	388.363	80	0	0	114	114	114	114	Achieved	None
225	339	339	388.15	388.414	388.414	80	0	0	114	114	114	114	Achieved	None
230	344	344	388.201	388.465	388.465	80	0	0	114	114	114	114	Achieved	None
235	349	349	388.252	388.516	388.516	80	0	0	114	114	114	114	Achieved	None
240	354	354	388.303	388.567	388.567	80	0	0	114	114	114	114	Achieved	None

Sight Visibility Section: Sight Visibility7
Calculation Method: Table
Control Reference: MC00
Design Surface:
Required Sight Distance: 114
Existing Surface: TX00TRID DESIGN
Relaxed Sight Distance: 114
Move Target to Achieve: Off
Eye Reference: MC00
Object Reference: MC00
Eye Interval: 5
Object Interval: Not Used
Eye Offset: -1.75
Object Offset: -1.75
Eye Height: 1.1
Object Height: 0.2

Standard Variables

Method Variables

Eye Position	Actual End Position	Object Position	Eye Level	Actual End Level	Object Level	Design Speed	Instant Grade	Average Grade	Required Distance	Relaxed Distance	Achieved Distance	Achieved Chord Distance	Status	Surface Intersect
245	359	359	388.354	388.619	388.619	80	0	0	114	114	114	114	Achieved	None
250	364	364	388.405	388.67	388.67	80	0	0	114	114	114	114	Achieved	None
255	369	369	388.456	388.721	388.721	80	0	0	114	114	114	114	Achieved	None
260	374	374	388.507	388.77	388.77	80	0	0	114	114	114	114	Achieved	None
265	379	379	388.558	388.816	388.816	80	0	0	114	114	114	114	Achieved	None
270	384	384	388.609	388.857	388.857	80	0	0	114	114	114	114	Achieved	None
275	389	389	388.66	388.895	388.895	80	0	0	114	114	114	114	Achieved	None
280	394	394	388.712	388.929	388.929	80	0	0	114	114	114	114	Achieved	None
285	399	399	388.763	388.959	388.959	80	0	0	114	114	114	114	Achieved	None
290	404	404	388.814	388.984	388.984	80	0	0	114	114	114	114	Achieved	None
295	409	409	388.865	389.006	389.006	80	0	0	114	114	114	114	Achieved	None
300	414	414	388.916	389.024	389.024	80	0	0	114	114	114	114	Achieved	None
305	419	419	388.967	389.037	389.037	80	0	0	114	114	114	114	Achieved	None
310	424	424	389.018	389.047	389.047	80	0	0	114	114	114	114	Achieved	None
315	429	429	389.069	389.053	389.053	80	0	0	114	114	114	114	Achieved	None
320	434	434	389.12	389.055	389.055	80	0	0	114	114	114	114	Achieved	None
325	439	439	389.171	389.052	389.052	80	0	0	114	114	114	114	Achieved	None
330	444	444	389.222	389.046	389.046	80	0	0	114	114	114	114	Achieved	None
335	449	449	389.273	389.036	389.036	80	0	0	114	114	114	114	Achieved	None
340	454	454	389.324	389.021	389.021	80	0	0	114	114	114	114	Achieved	None
345	459	459	389.376	389.003	389.003	80	0	0	114	114	114	114	Achieved	None
350	464	464	389.427	388.981	388.981	80	0	0	114	114	114	114	Achieved	None
355	469	469	389.478	388.954	388.954	80	0	0	114	114	114	114	Achieved	None
360	474	474	389.529	388.924	388.924	80	0	0	114	114	114	114	Achieved	None
365	479	479	389.58	388.89	388.89	80	0	0	114	114	114	114	Achieved	None
370	484	484	389.631	388.852	388.852	80	0	0	114	114	114	114	Achieved	None
375	489	489	389.68	388.809	388.809	80	0	0	114	114	114	114	Achieved	None
380	494	494	389.725	388.763	388.763	80	0	0	114	114	114	114	Achieved	None
385	499	499	389.766	388.713	388.713	80	0	0	114	114	114	114	Achieved	None
390	504	504	389.803	388.659	388.659	80	0	0	114	114	114	114	Achieved	None
395	509	509	389.835	388.6	388.6	80	0	0	114	114	114	114	Achieved	None
400	514	514	389.864	388.538	388.538	80	0	0	114	114	114	114	Achieved	None
405	519	519	389.889	388.472	388.472	80	0	0	114	114	114	114	Achieved	None
410	524	524	389.91	388.401	388.401	80	0	0	114	114	114	114	Achieved	None
415	529	529	389.927	388.327	388.327	80	0	0	114	114	114	114	Achieved	None
420	534	534	389.94	388.249	388.249	80	0	0	114	114	114	114	Achieved	None
425	539	539	389.949	388.167	388.167	80	0	0	114	114	114	114	Achieved	None
430	544	544	389.954	388.08	388.08	80	0	0	114	114	114	114	Achieved	None
435	549	549	389.955	387.99	387.99	80	0	0	114	114	114	114	Achieved	None
440	554	554	389.952	387.898	387.898	80	0	0	114	114	114	114	Achieved	None
445	559	559	389.944	387.805	387.805	80	0	0	114	114	114	114	Achieved	None
450	564	564	389.933	387.712	387.712	80	0	0	114	114	114	114	Achieved	None
455	569	569	389.918	387.619	387.619	80	0	0	114	114	114	114	Achieved	None
460	574	574	389.899	387.526	387.526	80	0	0	114	114	114	114	Achieved	None
465	579	579	389.876	387.433	387.433	80	0	0	114	114	114	114	Achieved	None

Appendix C – (SSD) Approach Sight Distance Calculation Data

Sight Visibility Report

Report Created: Wednesday, 13 January 2021
Time: 11:30:24 AM

Settings File: C:\ProgramData\Bentley\OpenRoads Designer CE\Configuration\Organization-Civil\ANZ Design\Sight Visibility\AustRoads 2016 Sight Visibility Equations and Tables 5m Rounding.xml
Equation Setting: AustRoads 2016 Car SSD RT=2.5sec d=0.36 Centre

Sight Visibility Section: Sight Visibility5
Calculation Method: Table
Control Reference: MC00
Required Sight Distance: 126
Relaxed Sight Distance: 126
Eye Reference: MC00
Eye Interval: 5
Eye Offset: -1.75
Eye Height: 1.1

Standard Variables

Design Surface:
Existing Surface: TX00TRID DESIGN
Move Target to Achieve: On
Object Reference: MC00
Object Interval: 2
Object Offset: -1
Object Height: 0.2

Method Variables

Eye Position	Actual End Position	Object Position	Eye Level	Actual End Level	Object Level	Design Speed	Instant Grade	Average Grade	Required Distance	Relaxed Distance	Achieved Distance	Achieved Chord Distance	Status	Surface Intersect
0	126	126	385.847	386.261	386.261	80	0	0	126	126	126	125.793	Achieved	None
5	131	131	385.902	386.312	386.312	80	0	0	126	126	126	125.717	Achieved	None
10	136	136	385.953	386.363	386.363	80	0	0	126	126	126	125.625	Achieved	None
15	141	141	386.004	386.414	386.414	80	0	0	126	126	126	125.518	Achieved	None
20	146	146	386.055	386.465	386.465	80	0	0	126	126	126	125.393	Achieved	None
25	151	151	386.107	386.516	386.516	80	0	0	126	126	126	125.252	Achieved	None
30	156	156	386.158	386.567	386.567	80	0	0	126	126	126	125.133	Achieved	None
35	161	161	386.209	386.618	386.618	80	0	0	126	126	126	125.031	Achieved	None
40	166	166	386.26	386.669	386.669	80	0	0	126	126	126	124.945	Achieved	None
45	171	171	386.311	386.721	386.721	80	0	0	126	126	126	124.873	Achieved	None
50	176	176	386.362	386.772	386.772	80	0	0	126	126	126	124.817	Achieved	None
55	181	181	386.413	386.823	386.823	80	0	0	126	126	126	124.775	Achieved	None
60	186	186	386.464	386.874	386.874	80	0	0	126	126	126	124.749	Achieved	None
65	191	191	386.515	386.925	386.925	80	0	0	126	126	126	124.738	Achieved	None
70	196	196	386.566	386.976	386.976	80	0	0	126	126	126	124.742	Achieved	None
75	201	201	386.617	387.027	387.027	80	0	0	126	126	126	124.762	Achieved	None
80	206	206	386.668	387.078	387.078	80	0	0	126	126	126	124.796	Achieved	None
85	211	211	386.719	387.129	387.129	80	0	0	126	126	126	124.846	Achieved	None
90	216	216	386.771	387.18	387.18	80	0	0	126	126	126	124.911	Achieved	None
95	221	221	386.822	387.231	387.231	80	0	0	126	126	126	124.991	Achieved	None
100	226	226	386.873	387.282	387.282	80	0	0	126	126	126	125.086	Achieved	None
105	231	231	386.924	387.333	387.333	80	0	0	126	126	126	125.222	Achieved	None
110	236	236	386.975	387.385	387.385	80	0	0	126	126	126	125.359	Achieved	None
115	241	241	387.026	387.436	387.436	80	0	0	126	126	126	125.48	Achieved	None
120	246	246	387.077	387.487	387.487	80	0	0	126	126	126	125.587	Achieved	None
125	251	251	387.128	387.538	387.538	80	0	0	126	126	126	125.68	Achieved	None
130	256	256	387.179	387.589	387.589	80	0	0	126	126	126	125.76	Achieved	None
135	261	261	387.23	387.64	387.64	80	0	0	126	126	126	125.829	Achieved	None
140	266	266	387.281	387.691	387.691	80	0	0	126	126	126	125.888	Achieved	None
145	271	271	387.332	387.742	387.742	80	0	0	126	126	126	125.941	Achieved	None
150	276	276	387.383	387.793	387.793	80	0	0	126	126	126	125.99	Achieved	None
155	281	281	387.435	387.844	387.844	80	0	0	126	126	126	126.002	Achieved	None
160	286	286	387.486	387.895	387.895	80	0	0	126	126	126	126.002	Achieved	None
165	291	291	387.537	387.946	387.946	80	0	0	126	126	126	126.002	Achieved	None
170	296	296	387.588	387.997	387.997	80	0	0	126	126	126	126.002	Achieved	None
175	301	301	387.639	388.049	388.049	80	0	0	126	126	126	126.002	Achieved	None
180	306	306	387.69	388.1	388.1	80	0	0	126	126	126	126.002	Achieved	None
185	311	311	387.741	388.151	388.151	80	0	0	126	126	126	126.002	Achieved	None
190	316	316	387.792	388.202	388.202	80	0	0	126	126	126	126.002	Achieved	None
195	321	321	387.843	388.253	388.253	80	0	0	126	126	126	126.002	Achieved	None
200	326	326	387.894	388.304	388.304	80	0	0	126	126	126	126.002	Achieved	None
205	331	331	387.945	388.355	388.355	80	0	0	126	126	126	126.002	Achieved	None
210	336	336	387.996	388.406	388.406	80	0	0	126	126	126	126.002	Achieved	None
215	341	341	388.048	388.457	388.457	80	0	0	126	126	126	126.002	Achieved	None
220	346	346	388.099	388.508	388.508	80	0	0	126	126	126	126.002	Achieved	None
225	351	351	388.15	388.559	388.559	80	0	0	126	126	126	126.002	Achieved	None
230	356	356	388.201	388.61	388.61	80	0	0	126	126	126	126.002	Achieved	None
235	361	361	388.252	388.661	388.661	80	0	0	126	126	126	126.002	Achieved	None
240	366	366	388.303	388.713	388.713	80	0	0	126	126	126	126.002	Achieved	None
245	371	371	388.354	388.763	388.763	80	0	0	126	126	126	126.002	Achieved	None

Sight Visibility Section: Sight Visibility5
Calculation Method: Table
Control Reference: MC00
Required Sight Distance: 126
Relaxed Sight Distance: 126
Eye Reference: MC00
Eye Interval: 5
Eye Offset: -1.75
Eye Height: 1.1

Design Surface:
Existing Surface: TX00TRID DESIGN
Move Target to Achieve: On
Object Reference: MC00
Object Interval: 2
Object Offset: -1
Object Height: 0.2

Standard Variables

Method Variables

Eye Position	Actual End Position	Object Position	Eye Level	Actual End Level	Object Level	Design Speed	Instant Grade	Average Grade	Required Distance	Relaxed Distance	Achieved Distance	Achieved Chord Distance	Status	Surface Intersect
250	376	376	388.405	388.811	388.811	80	0	0	126	126	126	126.002	Achieved	None
255	381	381	388.456	388.855	388.855	80	0	0	126	126	126	126.002	Achieved	None
260	386	386	388.507	388.895	388.895	80	0	0	126	126	126	126.002	Achieved	None
265	391	391	388.558	388.932	388.932	80	0	0	126	126	126	126.002	Achieved	None
270	396	396	388.609	388.964	388.964	80	0	0	126	126	126	126.002	Achieved	None
275	401	401	388.66	388.992	388.992	80	0	0	126	126	126	126.002	Achieved	None
280	406	406	388.712	389.016	389.016	80	0	0	126	126	126	126.002	Achieved	None
285	411	411	388.763	389.036	389.036	80	0	0	126	126	126	126.002	Achieved	None
290	416	416	388.814	389.052	389.052	80	0	0	126	126	126	126.002	Achieved	None
295	421	421	388.865	389.064	389.064	80	0	0	126	126	126	126.002	Achieved	None
300	426	426	388.916	389.072	389.072	80	0	0	126	126	126	126.002	Achieved	None
305	431	431	388.967	389.077	389.077	80	0	0	126	126	126	126.002	Achieved	None
310	436	436	389.018	389.077	389.077	80	0	0	126	126	126	126.002	Achieved	None
315	441	441	389.069	389.073	389.073	80	0	0	126	126	126	126.002	Achieved	None
320	446	446	389.12	389.065	389.065	80	0	0	126	126	126	126.002	Achieved	None
325	451	451	389.171	389.053	389.053	80	0	0	126	126	126	126.002	Achieved	None
330	456	456	389.222	389.037	389.037	80	0	0	126	126	126	126.002	Achieved	None
335	461	461	389.273	389.017	389.017	80	0	0	126	126	126	126.002	Achieved	None
340	466	466	389.324	388.993	388.993	80	0	0	126	126	126	126.002	Achieved	None
345	471	471	389.376	388.965	388.965	80	0	0	126	126	126	126.002	Achieved	None
350	476	476	389.427	388.933	388.933	80	0	0	126	126	126	126.002	Achieved	None
355	481	481	389.478	388.898	388.898	80	0	0	126	126	126	126.002	Achieved	None
360	486	486	389.529	388.858	388.858	80	0	0	126	126	126	126.002	Achieved	None
365	491	491	389.58	388.814	388.814	80	0	0	126	126	126	126.002	Achieved	None
370	496	496	389.631	388.766	388.766	80	0	0	126	126	126	126.002	Achieved	None
375	501	501	389.68	388.714	388.714	80	0	0	126	126	126	126.002	Achieved	None
380	506	506	389.725	388.658	388.658	80	0	0	126	126	126	126.002	Achieved	None
385	511	511	389.766	388.598	388.598	80	0	0	126	126	126	126.002	Achieved	None
390	516	516	389.803	388.534	388.534	80	0	0	126	126	126	126.002	Achieved	None
395	521	521	389.835	388.467	388.467	80	0	0	126	126	126	126.002	Achieved	None
400	526	526	389.864	388.395	388.395	80	0	0	126	126	126	126.002	Achieved	None
405	531	531	389.889	388.319	388.319	80	0	0	126	126	126	126.002	Achieved	None
410	536	536	389.91	388.239	388.239	80	0	0	126	126	126	126.002	Achieved	None
415	541	541	389.927	388.155	388.155	80	0	0	126	126	126	126.002	Achieved	None
420	546	546	389.94	388.067	388.067	80	0	0	126	126	126	126.002	Achieved	None
425	551	551	389.949	387.976	387.976	80	0	0	126	126	126	126.002	Achieved	None
430	556	556	389.954	387.883	387.883	80	0	0	126	126	126	126.002	Achieved	None
435	561	561	389.955	387.79	387.79	80	0	0	126	126	126	126.002	Achieved	None
440	566	566	389.952	387.697	387.697	80	0	0	126	126	126	126.002	Achieved	None
445	571	571	389.944	387.604	387.604	80	0	0	126	126	126	126.002	Achieved	None
450	576	576	389.933	387.511	387.511	80	0	0	126	126	126	126.002	Achieved	None
455	581	581	389.918	387.418	387.418	80	0	0	126	126	126	126.002	Achieved	None