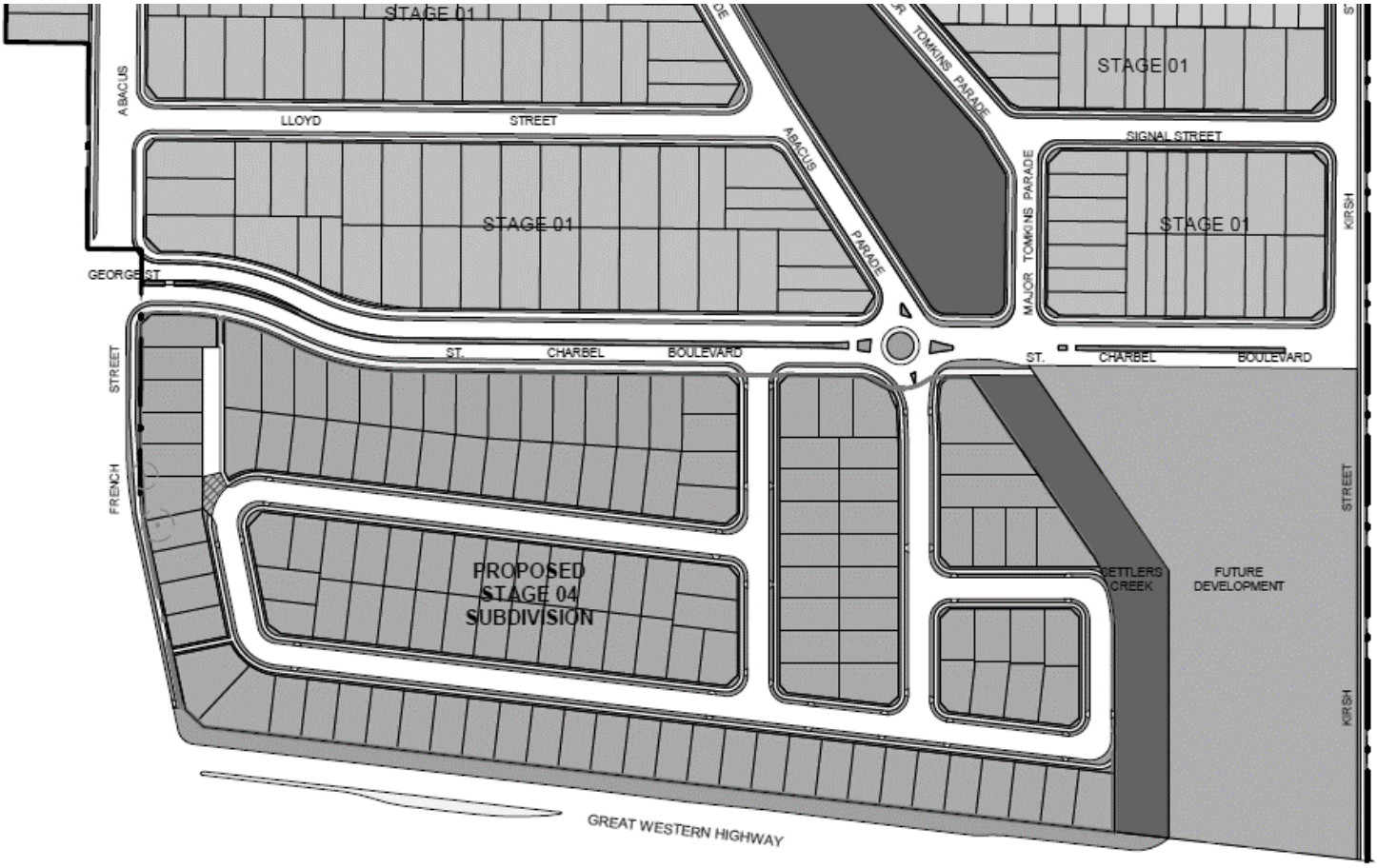

731-769 Great Western Hwy, Werrington
Stage 4 Residential

Traffic Impact Assessment

Prepared for:

Statewide Planning Pty Ltd

2 February 2021

The Transport Planning Partnership

E: info@ttpp.net.au

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Stage 4 Residential

Traffic Impact Assessment

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Version	Date	Prepared by	Reviewed by	Approved by	Signature
Final_01	02/02/20	Oasika Faiz	Ken Hollyoak	Ken Hollyoak	

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APPENDICES

1 Introduction

A development application (DA) is to be submitted to Penrith City Council (Council) for a proposed residential subdivision located at 731-739 Great Western Highway, Werrington. The DA specifically relates to the Stage 4 Residential component of the subdivision known within Council's Development Control Plan as the Werrington Mixed-Use area.

The Werrington Mixed-Use area comprises a development yield of 360 low density residential dwellings, 2,600m^2 GLFA commercial floor area, 1,370 retail floor area, and a service station. The proposed Stage 4 Residential site forms the final stage of the residential component assigned to the Werrington Mixed-Use development site and would include 134 residential dwellings. Stages 1 to 3 of the Werrington Mixed-Use includes the remaining residential dwelling provision, which is currently under construction.

The commercial component of the Werrington Mixed-Use area, the Stage 4 Commercial site sits adjacent to the subject site (Stage 4 Residential site) and will be subject to a separate DA. Notwithstanding, the impact from the adjacent commercial site has been considered as part of this study to determine the cumulative impacts to the road network.

The Werrington Mixed-Use area forms a sub-precinct within the Werrington Enterprise Living and Learning (WELL) Precinct. The future development of Werrington has been recognised by the NSW Government and Penrith City Council which led to the development of the WELL Precinct which sets out the objectives, guiding development principles and funding strategies for infrastructure improvements within the precinct.

This Traffic Impact Assessment has been prepared to examine the external traffic implications of the proposed Stage 4 Residential subdivision with a comparative assessment of the approved masterplan for the WELL Precinct.

The WELL Precinct was informed by a number of studies, including the WELL Precinct TMAP (2007)[1]. The following traffic study will set out the relative transport impacts of the subject proposal with the WELL Precinct development potential.

This report is set out as follows:

- Chapter 2 discusses the Site location and the strategic planning context for the Site.
- Chapter 3 describes the existing transport conditions surrounding the site.
- Chapter 4 provides an overview of the proposed development yield and layout for the Site

[1] *Transport Management and Accessibility Plan for Werrington Enterprise Living and Learning Precinct, Maunsell / AECOM, May 2007 (WELL Precinct.)*

- Chapter 5 presents the findings of the traffic assessment of the proposal both external and internal to the Site with consideration for cumulative impacts.
- Chapter 5 presents the assessment's conclusions.

2 Background

2.1 Site Location

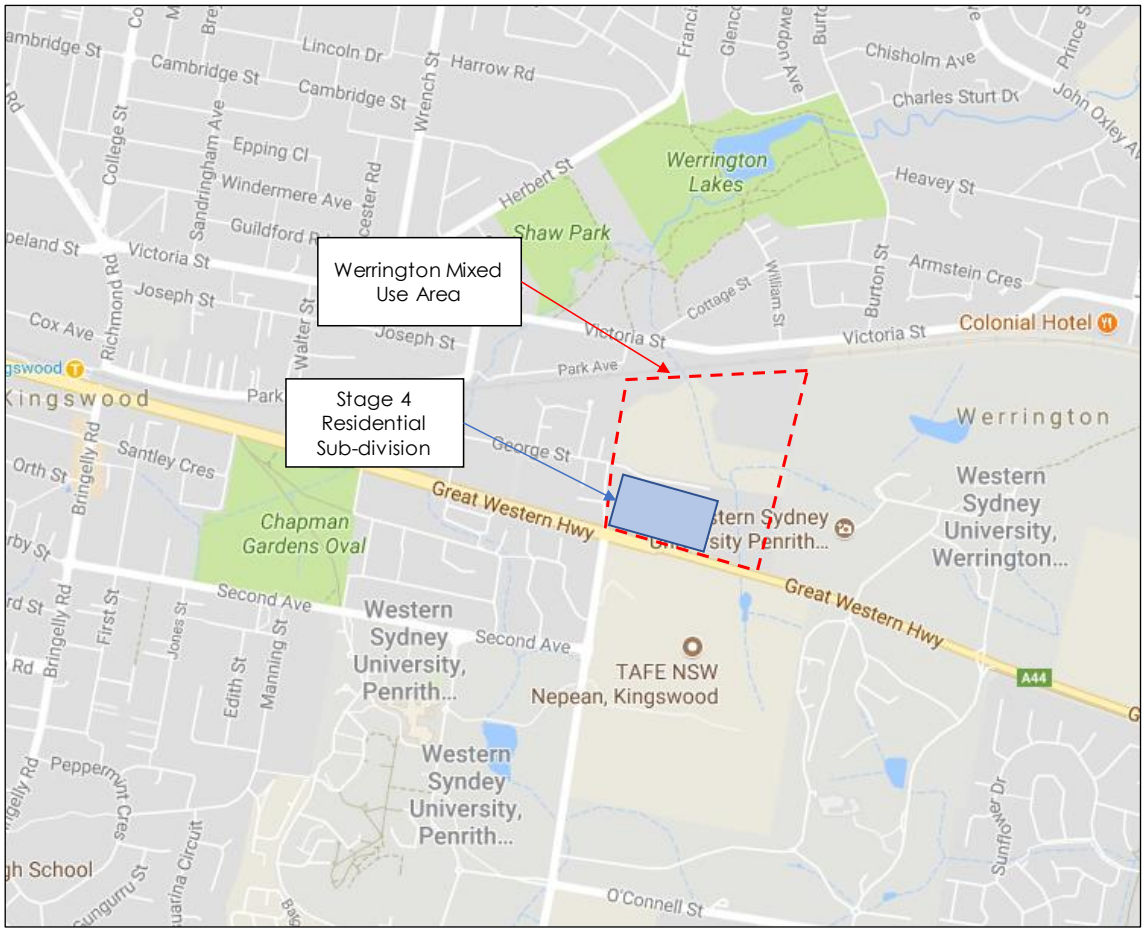
The site is located in Werrington, NSW, with a southern frontage to the Great Western Highway. The site incorporates Stage 4 of the larger staged sub-division known as the Werrington Mixed Use Area.

The Stage 4 Residential site is bounded by French Street to the west and Saint Charbel Boulevard to the north. The Western Sydney University Werrington North campus lies to the east and TAFE NSW Nepean College to the south. Sydney Train Lines T1/ T5 run in an east-west direction to the north of the site, with Kingswood station being the closest station (1.6km).

The Penrith Council Local Environmental Plan stipulates that the site is zoned as 'R3 Medium Density Residential'.

The site and its surrounds are shown below in Figure 2.1.

Figure 2.1: Locality Map

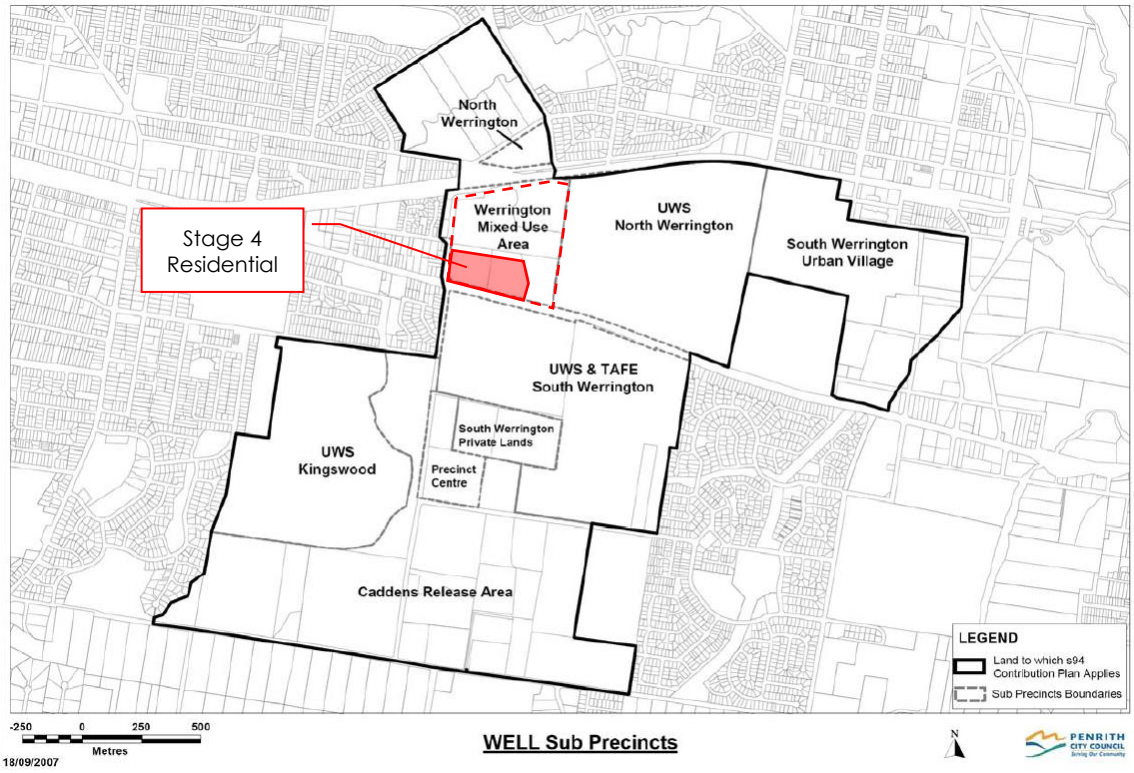


Source: Google Maps, 2017

2.2 Strategic Planning

The WELL Precinct TMAP (2007) set out the transport infrastructure requirements for the WELL Precinct and these were adopted in the WELL Precinct S.94 Development Contributions Plan. Figure 2.2 shows the extent of land subject to the WELL Precinct S94 Plan along with the sub precincts of the WELL Precinct.

Figure 2.2: WELL Precinct - Sub-Precincts



As shown in Figure 2.2 the proposed development site is located within the WELL Precinct and thus development on the precinct is the subject of S94 contributions for transport infrastructure as identified by the S94 Plan.

The WELL Precinct S94 plan has utilised sub precincts as a measure to apportion contributions for works relative to the location and impact of individual sub precincts (local improvements) as well as precinct wide regional improvements.

At Section 3.2.4 of the WELL Precinct S94, the principles for apportionment cited in the strategy include:

- Developers should be required to contribute to the extent necessary to ameliorate the impacts generated by their development; and
- Growth in background levels of demand for facilities and infrastructure should be met by government and not by developers.

The sub-precinct, Werrington Mixed Use Area, containing the subject proposed development, was required as part of the S94 plan to implement the extension of French Street which is located along the western border of the Werrington Mixed Use Area precinct.

This contribution has since been implemented as part of the early stages of the Werrington Mixed Use precinct development.

Thus, the transport assessment presented herein considers the traffic and transport implications associated directly with the development proposal, namely site access arrangements and pedestrian / cycle linkages to surrounding sites, noting that the broader regional and local contributions have been planned and funded through the Section 94 Plan mechanism.

2.3 DCP Objectives and Controls for Werrington Mixed Use Area

The site lies within the Werrington Mixed Use Area, which includes the land bounded by the Main Western Rail Line, Great Western Highway, French Street and University of Western Sydney (North Campus). Relevant objectives for the planning of the area, as outlined in the DCP, are:

- To create an urban environment that optimises residential and employment opportunities that will act as a catalyst for future development for the area, and provides a mix of residential and employment generating land uses.
- To optimise the potential for use of public transport by residents, employees and visitors to the site.
- To provide a high degree of accessibility that is safe and direct both within the site and between the site and the surrounding residential areas and educational institutions.
- To provide a permeable and interconnected street system, with direct access denied to and from the Great Western Highway and a network of public thoroughfares (street and car parking areas), that accommodate the needs of vehicles, bicycles and pedestrians for efficient, convenient and safe access to all areas.
- To require the preparation for a Concept Plan for each zone on the site and provide details on the information to be included in that plan.

The key controls of the DCP that are relevant to the Stage 4 residential subdivision are shown in Figure 2.3 and Figure 2.4.

Figure 2.3: DCP road network

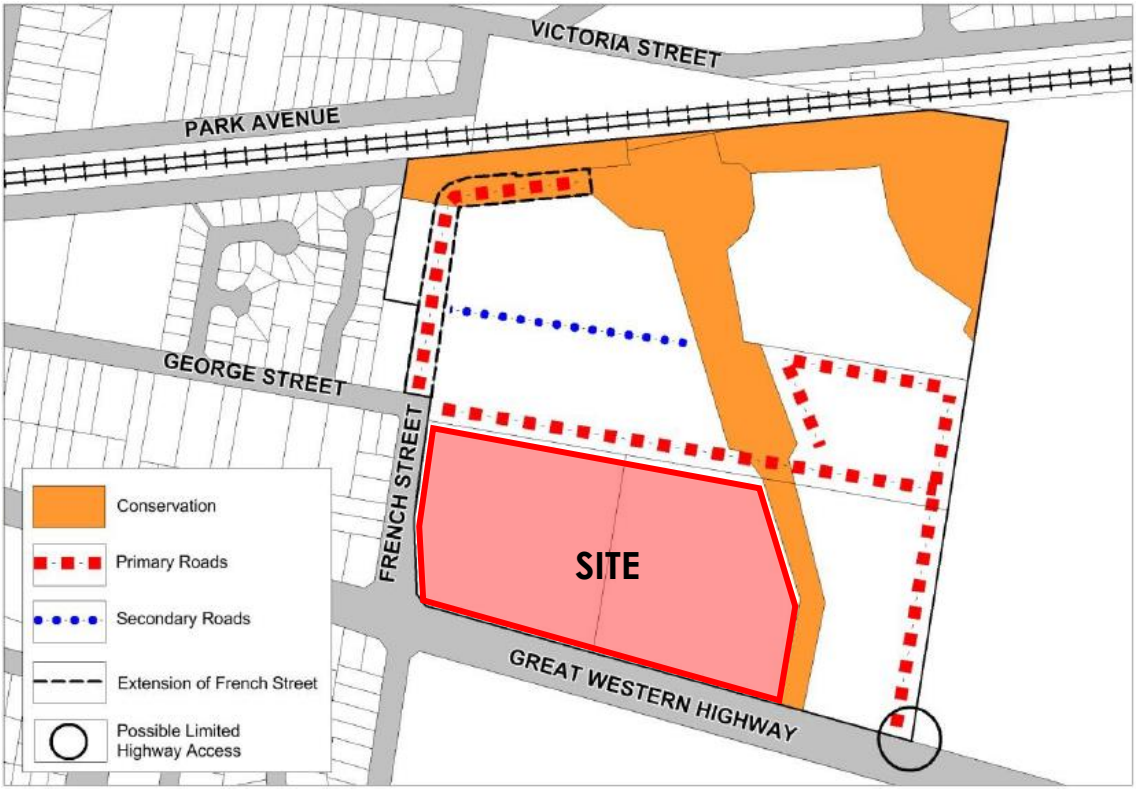
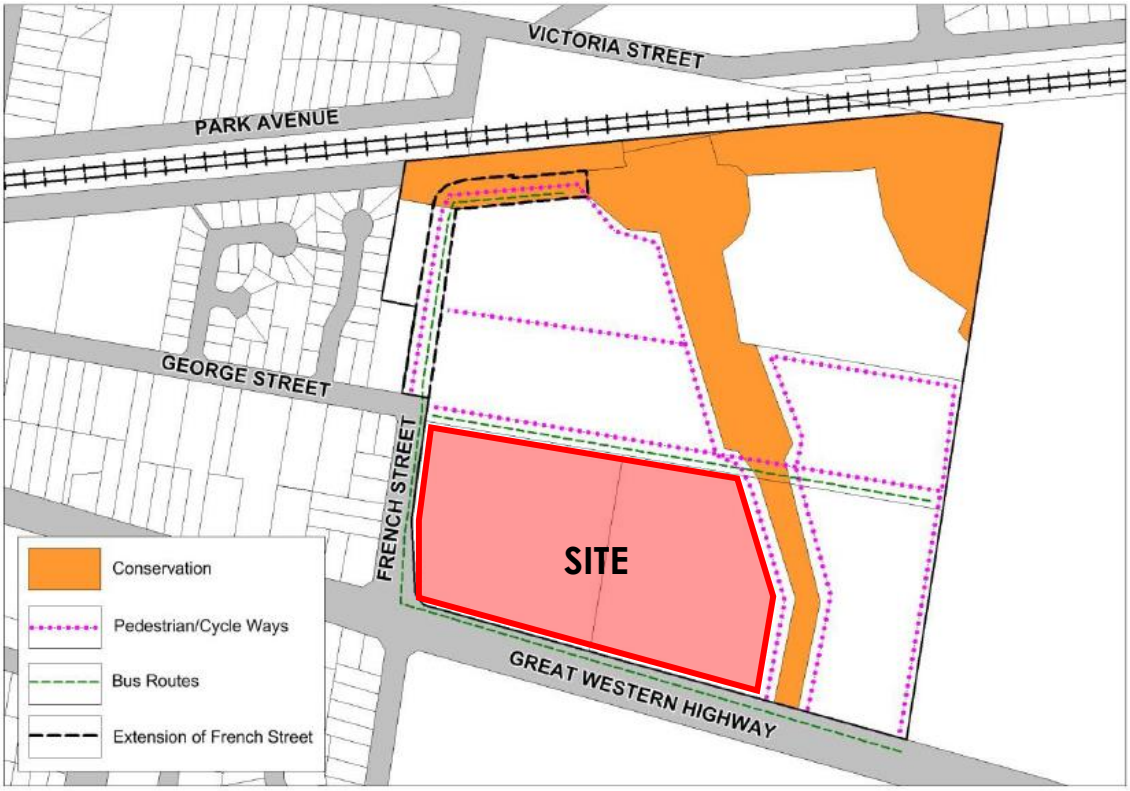


Figure 2.4: DCP Pedestrian/ Bus Connections



3 Existing Transport Context

3.1 Road Network

The major roads around the site are the Great Western Highway, French Street, and Saint Charbel Boulevard.

The **Great Western Highway** is a State Road that links the Sydney CBD to Bathurst in the west. The road is two-way with a carriageway of 24 metres and three lanes in each direction. The speed limit is 60 km/hr. To the east of the Stage 4 Residential site, the number of lanes in each direction falls to two, and the carriageway reduces to 16 metres. The posted speed limit increases to 80 km/hr. The road reserve width of the Great Western Highway is 40 metres.

French Street is a local collector road. It is a two-way, two-lane road (one lane in each direction) with kerbside parking, that forms the western frontage of the site. The carriageway length is 11 metres and the posted speed limit is 50 km/hr.

Saint Charbel Boulevard is a local road that runs in an east-west direction at the northern frontage of the site. A marked shared path is located along the southern side of this, as per the planning objectives of the DCP, as shown in Figure 2.4. The proposed development (Stage 4 Residential sub-division) would be accessed from Saint Charbel Boulevard.

3.2 Public Transport

The site is serviced by bus and train services. The closest train station is Kingswood train station (20-minute walk), which services trains on the T1 Western line.

The closest bus stops are located on the Great Western Highway and O'Connell Street and are both within walking distance from the site. These stops include:

- Stop 274731, Great Western Highway after French Street (1-minute walk) which serves routes 775, 776
- Stop 274786, Western Sydney Institute Nepean College (5-minute walk) which serves routes 775, 776 and 835.

Table 3.1 outlines the frequency of services and notable stops for each public transport option. Figure 3.1 shows the location of services relative to the subject site and Figure 3.2 illustrates the existing bus route network.

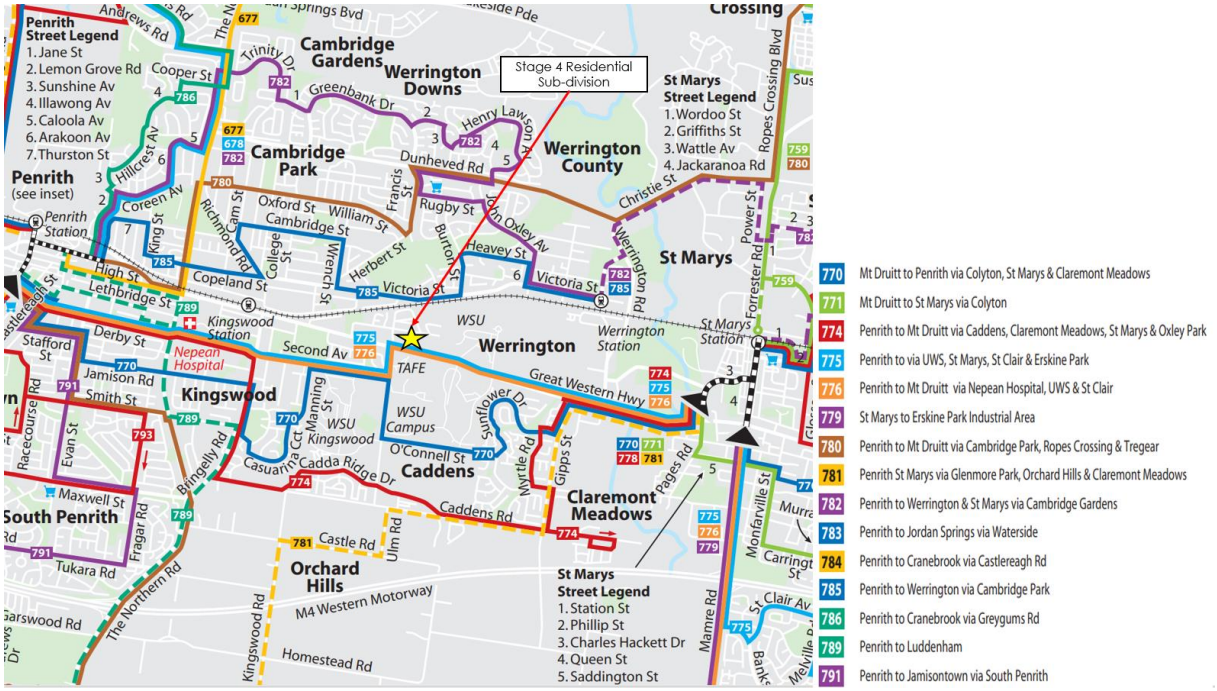
Table 3.1: Public Transport

Public Transport	Route	Frequency		Hours of Operation			Notable Stops
		On-peak	Off-peak	Weekday	Sat	Sun	
Train (Kingswood Station)	T1 Western Line	10-15 min	15-20 min	3:16am-00:19am	3:48am-00:02am	3:48am-11:32pm	Emu Plains, Blacktown, Parramatta, Sydney CBD
Bus: 775	Mount Druitt to Penrith via Erskine Park	30 min	30 min	6:01am-11:29pm	7:16am-11:04pm	8:15am-9:22pm	Penrith Station, St Marys, Esrkine Park, Mount Druitt
Bus: 776	Mount Druitt to Penrith via St Clair	25-30 min	30 min	6:16am-10:56pm	5:48am-11:38pm	7:47am-8:59pm	Penrith Station, St Marys, St Clair, Colyton, Mount Druitt
Bus: 835	UWS to Prairiewood	30 min	30 min	7:49am-3:23pm	Does not operate	Does not operate	TAFE NSW Nepean Campus, St Marys, Prairiewood

Figure 3.1: Existing Public Transport Network

Source: Open Street Maps

Figure 3.2: Existing Bus Network



Source: Transport NSW Greater Western Sydney Bus Network Map

3.3 Traffic Volumes (October 2016)

On the 20th of October 2016, TTPP commissioned traffic surveys to quantify the peak period traffic volumes at the Great Western Highway/ French Street/ O'Connell Street intersection.

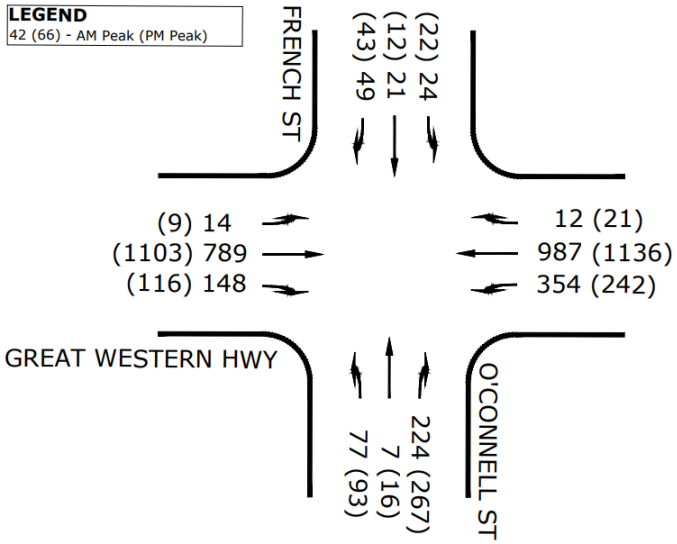
A summary of the peak period two-way traffic volumes for each direction is outlined in Table 3.2 and Figure 3.3. Full results are provided in Appendix A.

Table 3.2: AM and PM Peak Traffic Volumes at Intersection

Peak hour	O'Connell Street	Great Western Highway (West)	French Street	Great Western Highway (East)	Total
8:00AM-9:00AM	308	1353	94	951	2706
4:30PM-5:30PM	376	1399	77	1228	3080

Source: TTPP Surveys (October 2016)

Figure 3.3: Peak Hour Volume Diagram



3.4 Existing Intersection Operation

The existing operation of the nearby intersections to the Site have been assessed using SIDRA Intersection 7, a computer based modelling package which assesses intersection performance under prevailing traffic conditions.

SIDRA calculates intersection performance measures such as 'average delay' that vehicles encounter and the level of service (LoS). SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 3.3.

Table 3.3: Level of Service Criteria for Intersection Operation

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	good operation	good operation
B	15 to 28	good with acceptable delays and spare capacity	acceptable delays and spare capacity
C	29 to 42	satisfactory	satisfactory, but accident study required
D	43 to 56	operating near capacity	near capacity and accident study required
E	57 to 70	at capacity At signals, incidents will cause excessive delays.	at capacity, requires other control mode
F	Greater than 71	unsatisfactory with excessive queuing	unsatisfactory with excessive queuing; requires other control mode

Source: RMS Guide to Traffic Generating Developments, 2002

The results of the SIDRA intersection analysis are presented in Table 3.4. The results indicate that the key intersection of O'Connell Street/ French Street/ GHW operate satisfactorily with minimum delays and significant spare capacity.

Table 3.4: Existing (2016) Intersection Operation

Intersection	Intersection Control	AM Peak Hr			PM Peak Hr		
		Degree of Saturation	Ave. Delay (sec/veh)	Level of Service	Degree of Saturation	Ave. Delay (sec/veh)	Level of Service
O'Connell St/ French St / Great Western Highway	Signals	0.737	27	B	0.796	29	C

Source: SIDRA based on TTPP Surveys (October 2016)

The full SIDRA result is provided in Appendix B.

4 Stage 4 Residential Development

4.1 Land Use and Layout

The Stage 4 Residential sub-division of the Werrington Mixed Use area will include 134 medium density residential dwellings. The site layout and road network is as shown in Figure 4.1.

Figure 4.1: Site Layout

Source: Statewide Planning Pty Ltd

Access to the Stage 4 subdivision is provided off the main access road, Saint Charbel Boulevard, located along the northern boundary. Two access points are permitted including North South Road No. 3 which connects to Saint Charbel Boulevard as a roundabout controlled intersection and North South Road No. 2 which connects to Saint Charbel Boulevard as a westbound left-in/left-out, T intersection.

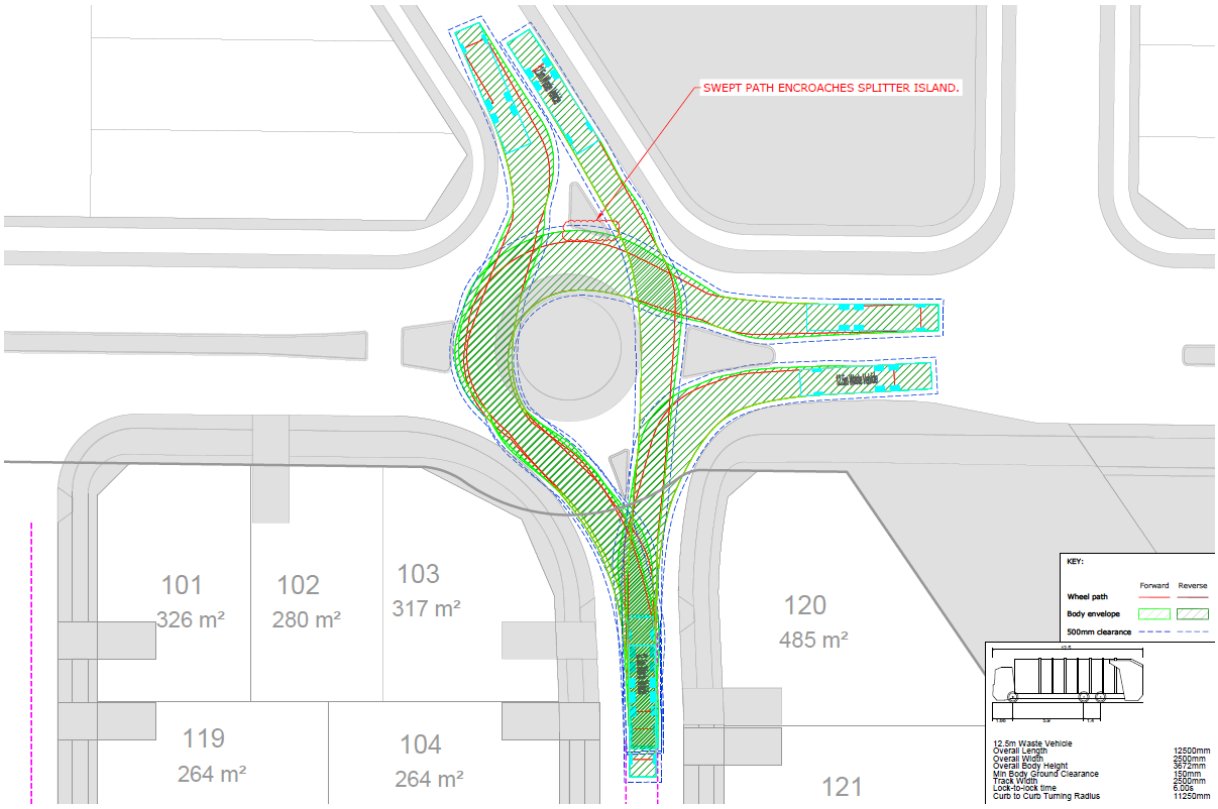
Saint Charbel Boulevard functions as an internal collector road in the wider Werrington Mixed Use area, forming a connection between French Street (to the west) and Kirsh Street (to the east), both roads providing access to the arterial road network.

French Street provides the primary access into the Werrington sub-division as it connects to the Great Western Highway as a signalised intersection. Kirsh Street forms secondary access with left-in/ left-out access restrictions from the Great Western Highway.

The road network and access into the site is consistent with Council's DCP, as shown in Figure 2.3. The internal road layout has been designed to accommodate Council's 12.5m long waste and recycling collection vehicle. Swept path analysis of Council's waste vehicle is provided in Appendix D.

Swept path analysis indicates that the existing northern median island at the roundabout intersection of Saint Charbel Boulevard and Abacus Parade, would need to be trimmed to accommodate a 12.5m long vehicle right turn from the site, as shown in Figure 4.2. It is understood that the existing roundabout would be modified as part of this development.

Figure 4.2: Swept Path at roundabout



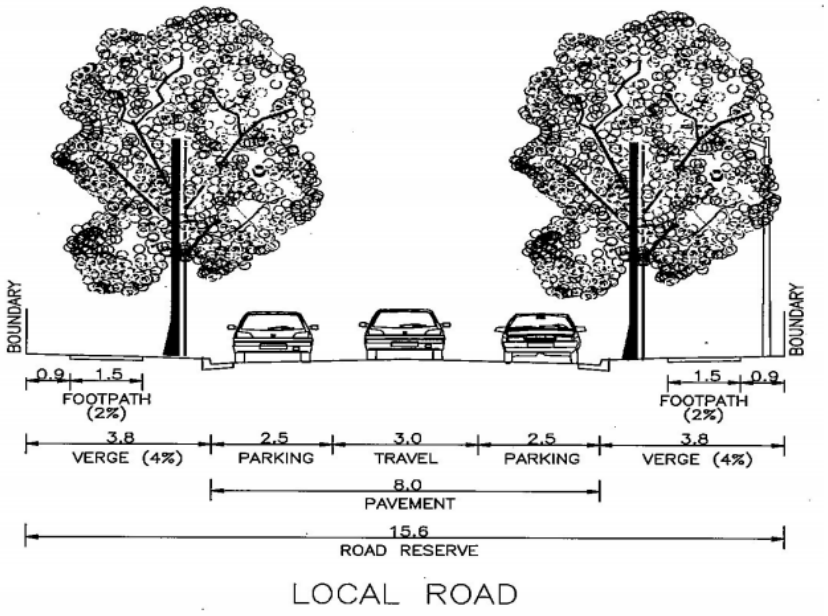
4.1.1 Road Width and Driveways

Internal roads are designed as per the DCP (Part C10 Transport Access and Parking) requirements for a local road, which includes:

- 15.6m road reserve
- 3m wide carriageway)
- 2.5m wide parking lanes on both sides of the road
- 1.5m wide concrete pathways, on the dwelling side
- 3.8m wide verge widths on both sides of the road.

The section plan of a typical local road is shown in Figure 4.3.

Figure 4.3: Local Road Section



Source: Penrith Development Control Plan 2014 Part C10 Transport Access and Parking

The exception is the service lane which is to provide vehicular access to lots 34-39 and lot 70. This service lane is to be 6.5m wide and ensures that driveways are not located along French Street or within close proximity to French Street, on Saint Charbel Boulevard.

Driveways are generally 3.5m wide. At corner lots, driveways have been positioned at least 6m clear of the tangent points of intersection corners, as per AS2890.1:2004 requirements.

Based on the swept path analysis in Appendix D, "No Stopping" signage should be applied near intersection corners and bends in the road to ensure that cars to do not park in the statutory no stopping areas and that there is sufficient room for truck turning. This is in line with NSW Road Rules 2008, which requires no stopping 10m from an intersection unless specifically reduced by Council and TfNSW.

It is assumed that appropriate signage and linemarking plans would be prepared as part of the Construction Certification stage.

4.2 Public Transport

The WELL Precinct TMAP envisaged that additional development within the WELL Precinct would increase the demand for and viability of additional public transport services within the Precinct. Based on this expectation, French Street and St Charbel Boulevard are planned as future bus routes in the Penrith DCP as shown in Figure 2.4.

The WELL Precinct TMAP and Section 94 Plan has also identified a plan for a Western Sydney University railway station (northern end of French Street) which if implemented, together with

regular bus services, will significantly increase the attractiveness of public transport modes for travel to the site.

4.3 Pedestrians and Cyclists

The DCP 2014 envisages improved bicycle and pedestrian connections through the site and from the Great Western Highway.

The internal road network of the site has been developed with consideration of connections to existing and proposed linkages external to the site along with through site links as identified in the DCP (see Figure 2.3).

Pedestrian paths are provided along all roads within the subdivision. All footpaths are 1.5m wide as per DCP requirements.

Pedestrian permeability is ensured by the provision of a pathway between lot 27 and 28 that connects East West Road No. 2 and the Great Western Highway and French Street intersection.

The existing path along the southern side Saint Charbel Boulevarde is a 2.5m wide marked shared path, that currently runs between French Street and Kirsh Street. The statutory shared path signage is present at the intersections of French Street, Abacus Parade and Kirsh Street. New signage would be required at each end of the proposed subdivision intersections to notify pedestrians and cyclists of the presence of a shared path.

It is assumed that appropriate signage and linemarking plans for shared path signage would be prepared as part of the Construction Certification stage.

4.4 Parking Requirements

The Penrith Development Control Plan 2014 (DCP) sets minimum requirements for off-street car parking provision. For a residential dwelling house, the DCP requires two spaces per dwelling.

It is envisaged, that each residential dwelling will include a garage for at least one space, with the driveway allowing an additional stacked parking space.

5 Traffic Assessment

5.1 WELL Precinct Masterplan

The WELL Precinct Masterplan as per the TMAP[2], has allowed for a yield of 240 dwellings and 40,000m^2 GLFA commercial area (supporting an estimate of 646 jobs) for the Werrington Mixed Use Area.

Using traffic generation rates from the Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments 2002*, the TMAP estimated a traffic generation of 717vph during the AM peak and 728vph during the PM peak. The full traffic generation estimate for the WELL Precinct as detailed in the TMAP is provided in Appendix C.

The impact of the WELL Precinct on the road network, was assessed in the TMAP with modelling undertaken by URS using NETANAL modelling software. The network modelling included two forecasted scenarios:

- Base Case: with WELL Precinct and committed developments including the upgrade of Werrington Arterial and associated M4 ramps by RMS3
- Network Improvement Case: Base Case plus additional network upgrades required to bring all intersections and links to LoS D or better.

The modelling results of the two scenarios are presented in Table 5.1.

Table 5.1: TMAP Intersection Modelling Results

O'Connell St/ French St / Great Western Highway	AM Peak Hour		PM Peak Hour	
	Ave. Delay (sec/veh)	Level of Service	Ave. Delay (sec/veh)	Level of Service
Base Case	188	F	203	F
Network Improvement Case	49	D	46	D

Source: Maunsell/ AECOM, 2006

As discussed in Section 2.2, the traffic modelling undertaken for the WELL Precinct identifies road network upgrades that would be required to enable the resultant growth from the WELL Precinct Masterplan. The upgrade requirements have been included in a S94 contributions plan, with the Werrington Mixed Use Area requiring only to implement the extension of French Street (now complete).

2 Transport Management and Accessibility Plan for Werrington Enterprise Living and Learning Precinct, Maunsell / AECOM, May 2007 (WELL Precinct.)
3 RMS Werrington Arterial Road project has been completed in May 2017

5.2 Proposed Traffic Generation

Using the same rates as the TMAP, that is, 0.5 trips per dwelling and 2 trips per 100m^2 office floor area, the Werrington Mixed Use Area with its current yield would generate 550 and 571vph during the AM and PM peaks respectively. Therefore, the precinct has reduced in traffic generation since the master planning stage.

However, based on the latest practice and updated traffic data, the actual traffic generating characteristics of the site's land uses are considered to be higher than was estimated in the TMAP.

That is, latest engineering practice recommends the site to be taken as a low density subdivision rather than medium density when calculating the future traffic generation. Furthermore, updated survey data released by RMS in its 2013 Technical Direction TDT 2013/04a (herein RMS TDT) provides new rates for residential and commercial developments.

Based on the rates stipulated in the RMS TDT for commercial and low density residential, the estimated traffic generation of the subject development (Stage 4 Residential site) is summarised in Table 5.2 and the overall traffic generation of the Werrington Mixed Use area is summarised in Table 5.3.

Table 5.2: Proposed Development Traffic

Land Use	Size (units/sqm)	Trip Rate		Trips (mph)	
		AM	PM	AM	PM
Residential	134 units	0.95 per unit	0.99 per unit	127	133

Table 5.3: Cumulative Traffic Generation of Werrington Mixed Use Area

Land Use	Size (units/sqm)	Trip Rate		Trips (veh)	
		AM	PM	AM	PM
Residential	360 units	0.95 per unit	0.99 per unit	342	356
Commercial	2,600m^2	1.60 per 100m^2	1.20 per 100m^2	42	31
Retail	920m^2	2.30 per 100m^2	4.60 per 100m^2	21	42
Service Station	450m^2	0.66 x Retail GFA[1]	0.66 x Retail GFA	297	297
Total	**-**	**-**	**-**	**702**	**727**

1 The RMS guide stipulates a trip rate for Service Stations for the PM peak only. It has been conservatively assumed that the AM peak traffic generation would equate to the PM peak.

Table 5.2 indicates that the proposed Stage 4 Residential component of the Werrington sub-division will generate 127 and 133 vehicles per hour (mph) during the morning and afternoon peaks respectively.

However, to appropriately assess the impact of the proposed development, it is necessary to review the cumulative impact of the whole Werrington sub-division. In this regard, the overall Werrington sub-division, with 360 residential dwellings, 2,600m^2 commercial floor area, 920m^2

retail and a service station containing a 450m^2 convenience store, is estimated to generate 702 and 727vph during the morning and afternoon peaks respectively (Table 5.3).

The current estimate of the traffic generation of the Werrington Mixed Use area is therefore in line with the original estimate of the WELL Precinct TMAP (Section 5.1).

5.2.1 Traffic Distribution

Based on the cumulative traffic generation estimate presented in Table 5.3, the site generated traffic has been distributed based on typical in/ out splits:

- AM peak hour
  - Residential traffic: 20 per cent IN/ 80 per cent OUT
  - Commercial traffic: 80 per cent IN/ 20 per cent OUT
- PM peak hour
  - Residential traffic: 80 per cent IN/ 20 per cent OUT
  - Commercial traffic: 20 per cent IN/ 80 per cent OUT.

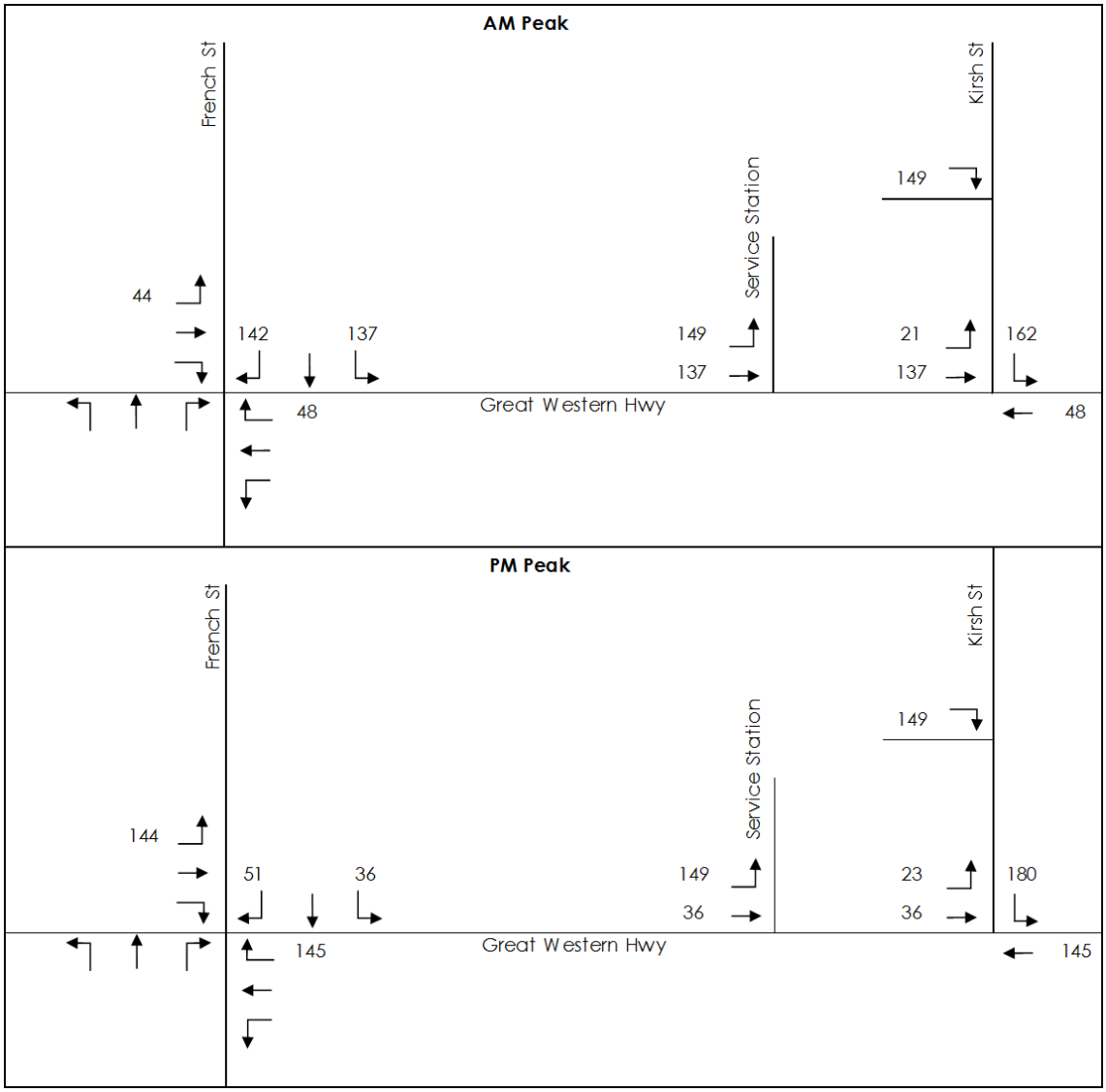
The site traffic was then distributed into the road network based on Journey to Work data (Bureau of Transport Statistics) for the site and surrounds, which provided the following approximate directional distribution along the Great Western Highway:

- Residential traffic: 50 per cent to the west, 50 per cent to the east
- Commercial traffic: 60 per cent to the west, 40 per cent the east.

The model assumes all residential traffic will access/leave the site via the O'Connell Street/ French Street/ Great Western Highway intersection. The commercial and retail traffic will access the site via both the French Street and Kirsh Street access points, whereas the service station will have direct access from the Great Western Highway.

The development traffic volumes and distribution is shown in Figure 5.1.

Figure 5.1: Development Traffic Volumes



5.3 Intersection Modelling

Notwithstanding the results of the TMAP, TTPP have undertaken a localised impact assessment on the key access road to the Werrington Mixed Use area; the intersection of O'Connell Street/ French Street/ Great Western Highway.

To assess the impact of the proposed development, the intersection was assessed for the following two scenarios:

- Scenario 1 Post Development – Existing plus Werrington Mixed Use Area traffic
- Scenario 2 Cumulative WELL Precinct – Existing plus Werrington Mixed Use Area and WELL Precinct

Scenario 1 has been assessed based on the trip generation and distribution detailed in Section 5.2. Scenario 2 has been assessed by obtaining traffic volumes from a previous DA study for the WELL Precinct (TTPP, 2017, *46-66 & 46A O'Connell Street, Caddens, Concept Plan DA, Traffic Impact Assessment*)

The results of the SIDRA model are summarised in Table 5.4 with full results in Appendix B.

Table 5.4: Post Development Intersection Operation

Scenario	AM Peak Hr			PM Peak Hr		
	Degree of Saturation	Ave. Delay (sec/veh)	Level of Service	Degree of Saturation	Ave. Delay (sec/veh)	Level of Service
Post Development	0.832	33	C	0.979	37	C
Cumulative WELL Precincts	1.221	60	E	1.930	79.7	F

Table 5.4 indicates that the key intersection to the development would operate satisfactorily with the estimated traffic of the Werrington Mixed Use Area.

The cumulative impacts from the WELL Precinct will result in the subject intersection to reach capacity. The result is close to the TMAP in this regard (See Table 5.5), however the SIDRA analysis as part of this assessment has identified lower delays than the TMAP's NETANAL model.

Table 5.5: Post Development Intersection Operation WELL PRECINCT TMAP

O'Connell St/ French St / Great Western Highway	AM Peak Hour		PM Peak Hour	
	Ave. Delay (sec/veh)	Level of Service	Ave. Delay (sec/veh)	Level of Service
Base Case	188	F	203	F
Network Improvement Case	49	D	46	D

Source: Maunsell/ AECOM, 2006

As can be seen from Table 5.5, the scenario with the Network improvements will improve the performance to Level of Service D.

Based on this, it is expected that the road network improvements proposed as part of the TMAP and S94 plan would similarly address the capacity issues identified in the cumulative development scenario shown in Table 5.4.

Overall, the assessment indicates that the access arrangements via French Street and Kirsh Street are sufficient to accommodate the traffic from the Werrington Mixed Use area.

6 Conclusion

The above traffic impact assessment has been prepared to support a Development Application for the Stage 4 Residential sub-division of the Werrington Mixed Use Area, in Werrington, NSW. The Site is located within the area referred to as the WELL Precinct which is an area recognised by State Government and Penrith City Council for future potential redevelopment as an enterprise, living and learning precinct.

Based on the findings of this assessment the following conclusions have been made:

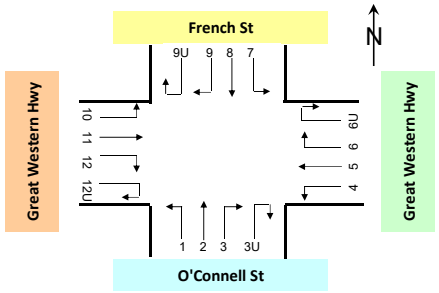
- The subject development application relates to a residential sub-division for 134 dwellings.
- The proposed site master plan will facilitate the provision of public transport networks (bus), cyclist and pedestrian routes as envisaged in the Penrith DCP 2014.
- Traffic generation of the overall Werrington Mixed Use Area is estimated to be in the order of 702 and 727 vehicles per hour during the AM and PM peak periods respectively.
- The estimated traffic generation of the Werrington Mixed Use Area is in line with original planning for WELL Precinct, which included a traffic generation of 717 and 728 vehicles per hour during the AM and PM peak periods respectively, as estimated in the TMAP.
- The existing site access arrangements via French Street and Kirsh Street is sufficient for the Werrington Mixed Use development.
- Road network improvements are proposed in the wider WELL Precinct as part of the S94 plan, which is expected to address capacity issues associated with traffic generated from the whole WELL precinct.

Appendix A

Traffic survey data

Job No. : N2749
Client : TTPP
Suburb : Kingswood
Location : 1. O'Connell St / Great Western Hwy / French St

Day/Date : Thursday, 20th October 2016
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



MATRIX Traffic and Transport Data

Approach	O'Connell St																Great Western Hwy															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	66	1	0	**67**	9	1	0	**10**	163	4	7	**174**	0	0	0	**0**	102	3	7	**112**	634	28	3	**665**	15	0	0	**15**	0	0	0	**0**
7:15 to 8:15	71	2	0	**73**	7	1	0	**8**	208	5	7	**220**	0	0	0	**0**	133	2	8	**143**	715	25	3	**743**	15	0	0	**15**	0	0	0	**0**
7:30 to 8:30	80	1	0	**81**	7	0	0	**7**	229	3	6	**238**	0	0	0	**0**	198	3	9	**210**	819	25	3	**847**	12	0	0	**12**	0	0	0	**0**
7:45 to 8:45	86	1	0	**87**	8	0	0	**8**	214	1	7	**222**	0	0	0	**0**	265	2	8	**275**	929	24	2	**955**	12	0	0	**12**	0	0	0	**0**
8:00 to 9:00	73	4	0	**77**	7	0	0	**7**	216	1	7	**224**	0	0	0	**0**	343	2	9	**354**	959	24	4	**987**	11	1	0	**12**	0	0	0	**0**
AM Totals	**139**	**5**	**0**	**144**	**16**	**1**	**0**	**17**	**379**	**5**	**14**	**398**	**0**	**0**	**0**	**0**	**445**	**5**	**16**	**466**	**1,593**	**52**	**7**	**1,652**	**26**	**1**	**0**	**27**	**0**	**0**	**0**	**0**
16:00 to 17:00	110	0	1	**111**	10	1	0	**11**	297	1	10	**308**	0	0	0	**0**	225	1	9	**235**	1,172	24	2	**1,198**	17	2	0	**19**	0	0	0	**0**
16:15 to 17:15	96	0	1	**97**	14	1	0	**15**	285	1	9	**295**	0	0	0	**0**	226	1	9	**236**	1,130	21	3	**1,154**	18	1	0	**19**	0	0	0	**0**
16:30 to 17:30	92	0	1	**93**	15	1	0	**16**	255	3	9	**267**	0	0	0	**0**	233	1	8	**242**	1,110	22	4	**1,136**	21	0	0	**21**	0	0	0	**0**
16:45 to 17:45	83	0	1	**84**	14	0	0	**14**	253	3	8	**264**	0	0	0	**0**	228	3	9	**240**	1,154	20	3	**1,177**	32	0	0	**32**	0	0	0	**0**
17:00 to 18:00	81	0	0	**81**	12	0	0	**12**	232	2	7	**241**	0	0	0	**0**	222	2	10	**234**	1,149	16	4	**1,169**	34	0	0	**34**	0	0	0	**0**
PM Totals	**191**	**0**	**1**	**192**	**22**	**1**	**0**	**23**	**529**	**3**	**17**	**549**	**0**	**0**	**0**	**0**	**447**	**3**	**19**	**469**	**2,321**	**40**	**6**	**2,367**	**51**	**2**	**0**	**53**	**0**	**0**	**0**	**0**

Approach	French St																Great Western Hwy															
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 8:00	29	0	0	**29**	2	1	0	**3**	34	4	0	**38**	0	0	0	**0**	9	4	0	**13**	713	34	9	**756**	42	3	4	**49**	0	0	0	**0**
7:15 to 8:15	30	1	0	**31**	5	2	0	**7**	37	4	0	**41**	0	0	0	**0**	7	4	0	**11**	786	33	9	**828**	55	1	5	**61**	0	0	0	**0**
7:30 to 8:30	26	1	0	**27**	7	2	0	**9**	38	3	0	**41**	0	0	0	**0**	10	3	0	**13**	777	27	6	**810**	79	0	7	**86**	0	0	0	**0**
7:45 to 8:45	22	2	0	**24**	12	1	0	**13**	49	1	0	**50**	0	0	0	**0**	15	2	0	**17**	782	27	3	**812**	101	0	8	**109**	0	0	0	**0**
8:00 to 9:00	22	2	0	**24**	20	1	0	**21**	48	1	0	**49**	0	0	0	**0**	12	2	0	**14**	759	29	1	**789**	140	0	8	**148**	0	0	0	**0**
AM Totals	**51**	**2**	**0**	**53**	**22**	**2**	**0**	**24**	**82**	**5**	**0**	**87**	**0**	**0**	**0**	**0**	**21**	**6**	**0**	**27**	**1,472**	**63**	**10**	**1,545**	**182**	**3**	**12**	**197**	**0**	**0**	**0**	**0**
16:00 to 17:00	17	1	0	**18**	8	0	0	**8**	36	0	0	**36**	0	0	0	**0**	8	0	0	**8**	973	13	1	**987**	101	1	8	**110**	0	0	0	**0**
16:15 to 17:15	15	1	0	**16**	9	0	0	**9**	44	0	0	**44**	0	0	0	**0**	9	0	0	**9**	1,029	14	1	**1,044**	115	0	8	**123**	0	0	0	**0**
16:30 to 17:30	20	2	0	**22**	12	0	0	**12**	43	0	0	**43**	0	0	0	**0**	9	0	0	**9**	1,091	11	1	**1,103**	108	0	8	**116**	0	0	0	**0**
16:45 to 17:45	22	2	0	**24**	15	0	0	**15**	40	0	0	**40**	0	0	0	**0**	9	0	0	**9**	1,043	13	1	**1,057**	100	0	7	**107**	0	0	0	**0**
17:00 to 18:00	19	1	0	**20**	15	0	0	**15**	39	0	0	**39**	0	0	0	**0**	7	0	0	**7**	998	13	2	**1,013**	86	0	5	**91**	0	0	0	**0**
PM Totals	**36**	**2**	**0**	**38**	**23**	**0**	**0**	**23**	**75**	**0**	**0**	**75**	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**15**	**1,971**	**26**	**3**	**2,000**	**187**	**1**	**13**	**201**	**0**	**0**	**0**	**0**

Appendix B

SIDRA Results

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - Ex AM Peak]

Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	81	5.2	0.125	26.8	LOS B	3.0	21.6	0.66	0.69	38.3
2	T1	7	0.0	0.125	22.2	LOS B	3.0	21.6	0.66	0.69	36.8
3	R2	236	3.6	0.668	44.4	LOS D	11.5	83.3	0.94	0.84	34.0
Approach		324	3.9	0.668	39.5	LOS C	11.5	83.3	0.87	0.80	35.0
East: Great Western Hwy - E											
4	L2	373	3.1	0.470	29.1	LOS C	14.1	101.3	0.76	0.80	37.8
5	T1	1039	2.8	0.627	25.6	LOS B	21.7	155.6	0.83	0.74	42.2
6	R2	13	8.3	0.159	64.0	LOS E	0.7	5.3	0.99	0.68	27.8
Approach		1424	3.0	0.627	26.9	LOS B	21.7	155.6	0.81	0.75	40.8
North: French St - N											
7	L2	25	8.3	0.051	30.1	LOS C	1.1	8.1	0.69	0.65	38.7
8	T1	22	4.8	0.180	31.9	LOS C	2.9	20.5	0.78	0.70	33.7
9	R2	52	2.0	0.180	38.6	LOS C	2.9	20.5	0.81	0.71	34.6
Approach		99	4.3	0.180	34.9	LOS C	2.9	20.5	0.77	0.69	35.3
West: Great Western Hwy - W											
10	L2	15	14.3	0.352	21.3	LOS B	7.3	52.9	0.59	0.52	43.6
11	T1	831	3.8	0.352	16.0	LOS B	10.8	78.1	0.61	0.52	52.7
12	R2	156	5.4	0.737	60.2	LOS E	8.7	63.5	1.00	0.86	28.7
Approach		1001	4.2	0.737	23.0	LOS B	10.8	78.1	0.67	0.58	46.5
All Vehicles		2848	3.5	0.737	27.2	LOS B	21.7	155.6	0.77	0.69	41.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	44.6	LOS E	0.1	0.1	0.90	0.90
P4	West Full Crossing	53	44.6	LOS E	0.1	0.1	0.90	0.90
All Pedestrians		105	44.6	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - Ex PM Peak]

Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	98	1.1	0.211	46.3	LOS D	6.2	44.1	0.79	0.74	31.9
2	T1	17	6.3	0.211	41.7	LOS C	6.2	44.1	0.79	0.74	30.8
3	R2	281	0.0	0.523	53.4	LOS D	16.8	117.8	0.88	0.80	31.6
Approach		396	0.5	0.523	51.1	LOS D	16.8	117.8	0.86	0.78	31.7
East: Great Western Hwy - E											
4	L2	255	3.7	0.483	28.8	LOS C	21.6	155.1	0.68	0.71	39.0
5	T1	1196	2.3	0.483	23.1	LOS B	22.3	159.1	0.67	0.62	43.3
6	R2	22	0.0	0.223	82.2	LOS F	1.6	11.4	0.99	0.71	24.5
Approach		1473	2.5	0.483	24.9	LOS B	22.3	159.1	0.68	0.64	42.0
North: French St - N											
7	L2	23	9.1	0.049	41.8	LOS C	1.3	10.0	0.72	0.66	34.3
8	T1	13	0.0	0.170	47.0	LOS D	3.2	22.5	0.81	0.71	29.6
9	R2	45	0.0	0.170	55.7	LOS D	3.2	22.5	0.85	0.73	29.7
Approach		81	2.6	0.170	50.4	LOS D	3.2	22.5	0.81	0.71	30.9
West: Great Western Hwy - W											
10	L2	9	0.0	0.528	23.5	LOS B	13.0	91.6	0.57	0.50	42.6
11	T1	1161	1.1	0.528	18.7	LOS B	19.8	140.2	0.59	0.52	50.8
12	R2	122	6.9	0.796	84.7	LOS F	9.5	70.2	1.00	0.88	24.1
Approach		1293	1.6	0.796	25.0	LOS B	19.8	140.2	0.63	0.55	45.9
All Vehicles		3242	1.9	0.796	28.8	LOS C	22.3	159.1	0.68	0.62	41.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
P4	West Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
All Pedestrians		105	57.3	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - Post Dev AM Peak]

Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	81	5.2	0.105	21.6	LOS B	2.6	18.9	0.58	0.67	40.5
2	T1	7	0.0	0.105	17.0	LOS B	2.6	18.9	0.58	0.67	38.8
3	R2	236	3.6	0.686	43.2	LOS D	11.6	83.6	0.93	0.85	34.3
Approach		324	3.9	0.686	37.2	LOS C	11.6	83.6	0.84	0.80	35.8
East: Great Western Hwy - E											
4	L2	373	3.1	0.564	35.7	LOS C	16.0	115.0	0.86	0.83	35.4
5	T1	1039	2.8	0.778	34.6	LOS C	26.5	190.0	0.94	0.86	38.3
6	R2	69	1.5	0.832	70.7	LOS F	4.2	29.9	1.00	0.90	26.5
Approach		1481	2.8	0.832	36.6	LOS C	26.5	190.0	0.92	0.85	36.8
North: French St - N											
7	L2	198	1.1	0.322	24.1	LOS B	6.4	45.3	0.65	0.73	41.9
8	T1	22	4.8	0.550	30.6	LOS C	8.1	57.2	0.82	0.77	34.0
9	R2	172	0.6	0.550	35.1	LOS C	8.1	57.2	0.82	0.77	35.5
Approach		392	1.1	0.550	29.3	LOS C	8.1	57.2	0.73	0.75	38.4
West: Great Western Hwy - W											
10	L2	54	3.9	0.446	26.4	LOS B	8.6	62.1	0.68	0.62	40.8
11	T1	831	3.8	0.446	21.6	LOS B	13.9	100.5	0.71	0.62	48.6
12	R2	156	5.4	0.737	60.2	LOS E	8.7	63.5	1.00	0.86	28.7
Approach		1040	4.0	0.737	27.6	LOS B	13.9	100.5	0.75	0.65	43.6
All Vehicles		3237	3.1	0.832	32.9	LOS C	26.5	190.0	0.83	0.77	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	37.7	LOS D	0.1	0.1	0.83	0.83
P4	West Full Crossing	53	37.7	LOS D	0.1	0.1	0.83	0.83
All Pedestrians		105	37.7	LOS D			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - Post Dev PM Peak]

Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	98	1.1	0.209	46.3	LOS D	6.1	43.7	0.79	0.74	31.9
2	T1	17	6.2	0.513	42.1	LOS C	16.8	117.8	0.79	0.74	30.7
3	R2	281	0.0	0.513	53.2	LOS D	16.8	117.8	0.88	0.80	31.7
Approach		396	0.5	0.513	51.0	LOS D	16.8	117.8	0.85	0.78	31.7
East: Great Western Hwy - E											
4	L2	255	3.7	0.516	28.2	LOS B	23.8	170.9	0.68	0.70	39.3
5	T1	1196	2.3	0.516	21.9	LOS B	24.5	174.9	0.66	0.61	43.9
6	R2	205	0.0	0.979	112.0	LOS F	19.2	134.4	1.00	1.06	20.4
Approach		1656	2.2	0.979	34.0	LOS C	24.5	174.9	0.70	0.68	37.8
North: French St - N											
7	L2	68	3.1	0.113	38.4	LOS C	3.6	25.7	0.70	0.70	35.9
8	T1	13	0.0	0.396	44.8	LOS D	6.2	43.2	0.80	0.74	30.0
9	R2	91	0.0	0.396	60.9	LOS E	6.2	43.2	0.91	0.77	28.4
Approach		172	1.2	0.396	50.7	LOS D	6.2	43.2	0.82	0.74	31.1
West: Great Western Hwy - W											
10	L2	132	0.0	0.692	31.3	LOS C	16.7	117.5	0.68	0.66	38.3
11	T1	1161	1.1	0.692	27.5	LOS B	28.9	204.1	0.73	0.66	45.0
12	R2	122	6.9	0.941	101.8	LOS F	10.6	78.9	1.00	1.01	21.6
Approach		1415	1.5	0.941	34.2	LOS C	28.9	204.1	0.75	0.69	40.6
All Vehicles		3638	1.7	0.979	36.7	LOS C	28.9	204.1	0.74	0.70	37.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
P4	West Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
All Pedestrians		105	57.3	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - WELL Precinct + Post Dev AM Peak]

Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	135	3.1	0.171	22.2	LOS B	4.4	31.8	0.61	0.69	40.3
2	T1	12	0.0	0.171	17.6	LOS B	4.4	31.8	0.61	0.69	38.5
3	R2	394	2.1	1.221	267.0	LOS F	56.4	401.8	1.00	1.83	10.9
Approach		540	2.3	1.221	200.6	LOS F	56.4	401.8	0.89	1.52	13.5
East: Great Western Hwy - E											
4	L2	493	2.4	0.742	38.8	LOS C	23.2	165.9	0.93	0.87	34.3
5	T1	1039	2.8	0.778	34.6	LOS C	26.5	190.0	0.94	0.86	38.3
6	R2	69	1.5	0.832	70.7	LOS F	4.2	29.9	1.00	0.90	26.5
Approach		1601	2.6	0.832	37.4	LOS C	26.5	190.0	0.94	0.86	36.3
North: French St - N											
7	L2	198	1.1	0.335	24.1	LOS B	6.4	45.4	0.65	0.73	41.9
8	T1	28	3.7	0.629	32.8	LOS C	8.7	61.6	0.85	0.78	33.3
9	R2	172	0.6	0.629	37.3	LOS C	8.7	61.6	0.85	0.78	34.8
Approach		398	1.1	0.629	30.4	LOS C	8.7	61.6	0.75	0.75	37.9
West: Great Western Hwy - W											
10	L2	54	3.9	0.446	26.4	LOS B	8.6	62.1	0.68	0.62	40.8
11	T1	831	3.8	0.446	21.6	LOS B	13.9	100.5	0.71	0.62	48.6
12	R2	205	4.1	0.963	85.1	LOS F	14.4	104.4	1.00	1.10	24.0
Approach		1089	3.9	0.963	33.8	LOS C	14.4	104.4	0.76	0.71	40.4
All Vehicles		3628	2.8	1.221	59.9	LOS E	56.4	401.8	0.86	0.90	29.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	37.7	LOS D	0.1	0.1	0.83	0.83
P4	West Full Crossing	53	37.7	LOS D	0.1	0.1	0.83	0.83
All Pedestrians		105	37.7	LOS D			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [O'Connell St / Great Western Hwy / French St - WELL Precinct + Post Dev PM Peak]

Signals - Fixed Time Isolated Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: O'Connell St - S											
1	L2	106	1.0	0.225	45.8	LOS D	6.7	47.5	0.79	0.74	32.1
2	T1	18	5.9	0.225	41.2	LOS C	6.7	47.5	0.79	0.74	30.9
3	R2	306	0.0	0.603	54.9	LOS D	18.7	131.2	0.90	0.81	31.2
Approach		431	0.5	0.603	52.1	LOS D	18.7	131.2	0.87	0.79	31.4
East: Great Western Hwy - E											
4	L2	537	1.8	0.640	32.9	LOS C	31.7	225.6	0.78	0.82	36.6
5	T1	1196	2.3	0.640	26.1	LOS B	33.0	235.6	0.74	0.68	41.9
6	R2	205	0.0	1.184	251.8	LOS F	30.3	212.1	1.00	1.37	11.1
Approach		1938	1.9	1.184	51.9	LOS D	33.0	235.6	0.78	0.79	31.4
North: French St - N											
7	L2	68	3.1	0.116	39.1	LOS C	3.6	25.8	0.71	0.70	35.7
8	T1	26	0.0	0.408	49.5	LOS D	6.9	48.6	0.85	0.75	29.0
9	R2	91	0.0	0.408	58.3	LOS E	6.9	48.6	0.89	0.77	29.1
Approach		185	1.1	0.408	50.0	LOS D	6.9	48.6	0.82	0.74	31.2
West: Great Western Hwy - W											
10	L2	132	0.0	0.683	27.8	LOS B	16.6	117.1	0.64	0.63	39.8
11	T1	1161	1.1	0.683	23.0	LOS B	23.4	165.6	0.66	0.60	47.7
12	R2	257	3.3	1.415	446.0	LOS F	51.7	372.1	1.00	1.68	6.8
Approach		1549	1.4	1.415	93.5	LOS F	51.7	372.1	0.72	0.78	23.8
All Vehicles		4103	1.5	1.415	67.5	LOS E	51.7	372.1	0.77	0.78	28.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
P4	West Full Crossing	53	57.3	LOS E	0.2	0.2	0.88	0.88
All Pedestrians		105	57.3	LOS E			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix C

TMAP (2006) Traffic Generation

Table 6.2: Trip Generation of Development Scenario in 2016

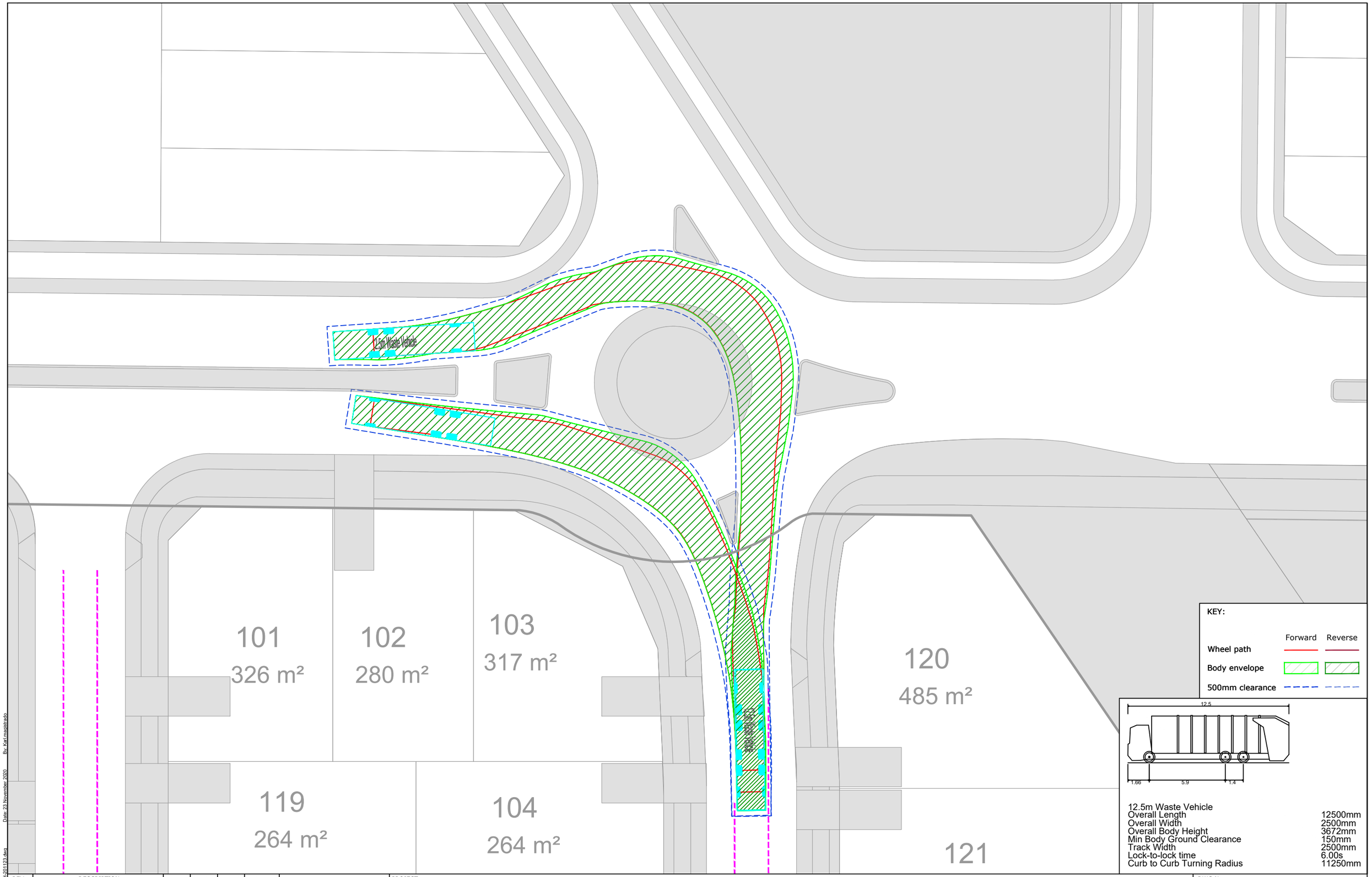
WELL Precinct Traffic Generation

LAND USE	PARCEL NO.	PARCEL NO.	Development Opportunities (DO)										AM RTA Rate	PM RTA Rate	End State Trip Generation								
			Total GFA (m2)	GFA	FSR (2)	GLFA	jobs	GLFA/job (3)	Land area	Density (4)	dwellings	enrolments			AM PEAK HOUR TRIPS					PM PEAK HOUR TRIPS				
															Total	% In	% Out	In	Out	Total	% In	% Out	In	Out
North Werrington																								
Medium Density Residential	1												0.50	0.50	0	10%	90%	0	0	0	90%	10%	0	0
Medium Density Residential	2	D2							3.1	30	93		0.50	0.50	47	10%	90%	5	42	47	90%	10%	42	5
Sub total				**0**		**0**	**0**				**93**	**0**			**47**			**5**	**42**	**47**			**42**	**5**
Werrington Mixed Use Area																								
Medium Density Residential	3	D2							3.9	30	117		0.50	0.50	59	10%	90%	6	53	59	90%	10%	53	6
Medium Density Residential	4	D2							4.1	30	123		0.50	0.50	62	10%	90%	6	55	62	90%	10%	55	6
Mixed Use/Employment High Tech	5	E1		38,342	0.50	19,171							0.02	0.02	383	85%	15%	326	58	383	15%	85%	58	326
Mixed Use/Employment High Tech	6	E1	80,000	14,378	0.50	7,189	425	62					0.02	0.02	144	85%	15%	122	22	144	15%	85%	22	122
Mixed Use/Employment High Tech (Industrial)	5,6	E1		27,280	0.50	13,640	220						0.32	0.37	70	85%	15%	59	10	80	15%	85%	12	68
Sub total				**80,000**		**40,000**	**645**				**240**	**0**			**717**			**520**	**188**	**728**			**189**	**528**
UWS North Werrington Campus																								
Employment High Tech	7	E2		101,740	0.50	50,870							0.015	0.015	763	85%	15%	649	114	763	15%	85%	114	649
Employment High Tech	8	E2	582,000	388,511	0.50	194,255	5,167	47					0.015	0.015	2914	85%	15%	2477	437	2914	15%	85%	437	2477
Employment High Tech (Industrial)	7,8	E2		91,749	0.50	45,874	967						0.32	0.37	308	85%	15%	261	46	353	15%	85%	53	300
Sub total				**682,000**		**291,000**	**6,134**				**0**	**0**			**3,984**			**3,387**	**598**	**4,030**			**804**	**3,426**
South Werrington Urban Village																								
Low/Medium Density Residential	9,29	D1							25.2	15	378		0.60	0.60	227	10%	90%	23	204	227	90%	10%	204	23
Employment Service (Industrial)	8	E3	157,000	157,000	0.50	78,500	595	132					0.32	0.37	189	85%	15%	161	28	217	15%	85%	33	185
Sub total				**157,000**		**78,500**	**595**				**378**	**0**			**418**			**183**	**232**	**444**			**237**	**207**
Werrington South Campus																								
Employment Creative Entreprises	13,21-24	E4	393,000	393,000	0.50	196,500	38	6,200					1.00	1.00	38	85%	15%	32	6	38	15%	85%	6	32
Low/Medium Density Residential	25-28	D1							8.9	15	134		0.60	0.60	80	10%	90%	8	72	80	90%	10%	72	8
TAFE	10											2,500	0.10	0.07	250	80%	20%	200	50	175	40%	60%	70	105
Low/Medium Density Residential/Employment (1)	12	D1							9.7	15	146		0.60	0.60	87	10%	90%	9	79	87	90%	10%	79	9
Low/Medium Density Residential/Employment (1)	12	E5	97,000	97,000	0.50	48,500	970	60					0.02	0.02	0	85%	15%	0	0	0	15%	85%	0	0
Sub total				**490,000**		**246,000**	**1,008**				**279**	**2,500**			**455**			**249**	**206**	**380**			**228**	**164**
UWS Kingswood																								
Student Accommodation/Precinct Centre	11										100		0.00	0.00	0	10%	90%	0	0	0	90%	10%	0	0
Open Space	15												0.00	0.00	0	0%	0%	0	0	0	0%	0%	0	0
Medium Density Residential	16-18	D1							6.2	15	93		0.60	0.60	56	10%	90%	6	50	56	90%	10%	50	6
UWS												2,624	0.10	0.07	262	80%	20%	210	52	184	40%	60%	73	110
Sub total				**0**		**0**	**0**				**193**	**2,624**			**318**			**216**	**103**	**239**			**124**	**116**
Caddens Release																								
Low/Medium Density Residential	14,19,20	D1							90	15	1,344		0.60	0.60	806	10%	90%	81	726	806	90%	10%	726	81
Sub total				**0**		**0**	**0**				**1,344**	**0**			**806**			**81**	**726**	**806**			**726**	**81**
Claremont Meadows																								
Stage 2 Residential		D3							5.2	8	42		0.85	0.85	35	10%	90%	4	32	35	90%	10%	32	4
Stage 2 Residential		D3							9.2	8	74		0.85	0.85	63	10%	90%	6	56	63	90%	10%	56	6
Stage 2 Residential		D3							45.5	8	364		0.85	0.85	309	10%	90%	31	278	309	90%	10%	278	31
Sub total				**0**		**0**	**0**				**478**	**0**			**407**			**41**	**367**	**407**			**367**	**41**
Precinct Centre (5)																								
Mixed Use Residential	11								6.7		134		0.50	0.50	67	10%	90%	7	60	67	90%	10%	60	7
Office	11					700							0.020	0.020	14	85%	15%	12	2	14	15%	85%	2	12
Retail (Specialty)	11					9,000	323	30					0.020	0.046	180	85%	15%	153	27	414	60%	40%	248	166
Sub total				**0**		**9,700**	**323**				**134**	**0**			**261**			**172**	**89**	**495**			**311**	**184**
Total				**1,309,000**		**864,200**	**8,705**				**3,140**	**6,124**			**7,412**			**4,862**	**2,680**	**7,576**			**2,836**	**4,741**

(1) - Unconfirmed Land Use (Assumed to be 100% residential for parcel 12)
(2) - FSR are assumed by Architectus
(3) - GLFA/job are assumed by SGS Employment Report except for Creative Precinct
(4) - Density (dwellings/ha) are assumed by Architectus
(5) - Precinct Centre (B) is assumed to be located in parcel 11 off O'Connell St.
(6) - Full development will be modelled for future year of 2016

Appendix D

Swept Paths



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 1

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magistrado

SWEPT PATH ENCROACHES SPLITTER ISLAND.

12.5m Waste Vehicle

12.5m Waste Vehicle

101
326 m²

102
280 m²

103
317 m²

120
485 m²

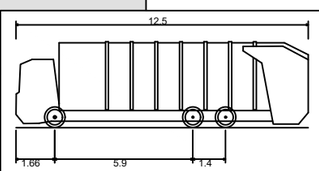
119
264 m²

104
264 m²

121

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 2

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magistrado

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

12.5m Waste Vehicle

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

122
486 m²

123
257 m²

124
264 m²

125
264 m²

NORTH SOUTH ROAD No 3

127
239 m²

128
253 m²

134
225 m²

133

132

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

12.5m Waste Vehicle

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

122
486 m²

123
257 m²

124
264 m²

125
264 m²

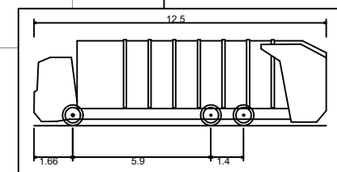
NORTH SOUTH ROAD No 3

127
239 m²

134
225 m²

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT

731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE

SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #3 - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 3

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magistrado

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

12.5m Waste Vehicle

NORTH SOUTH ROAD No 3

122
486 m²

123
257 m²

124
264 m²

125
264 m²

127
239 m²

128
253 m²

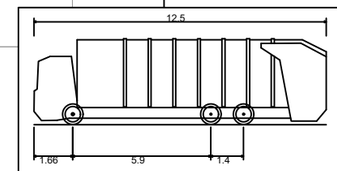
134
225 m²

133

132

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

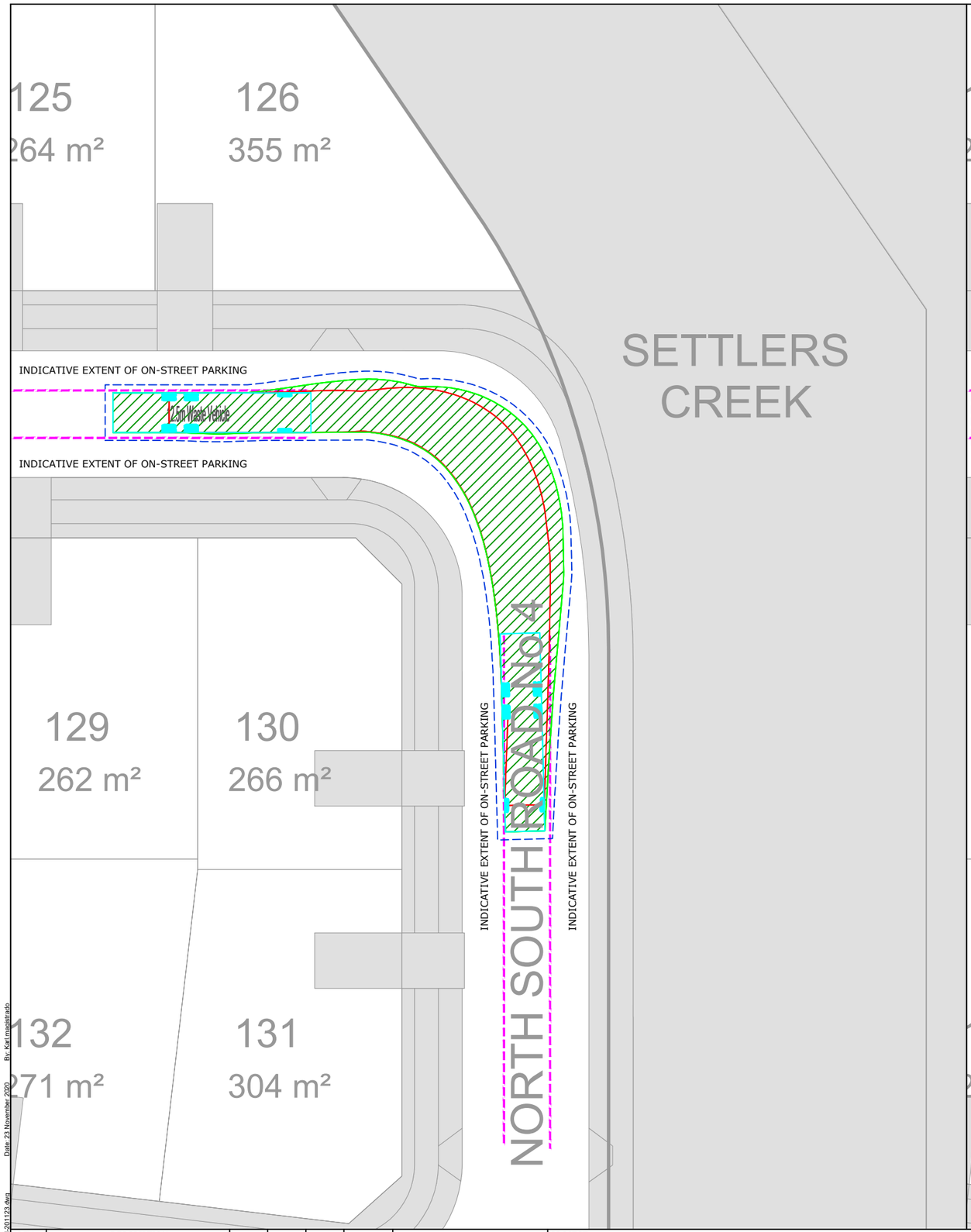
TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #3 - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

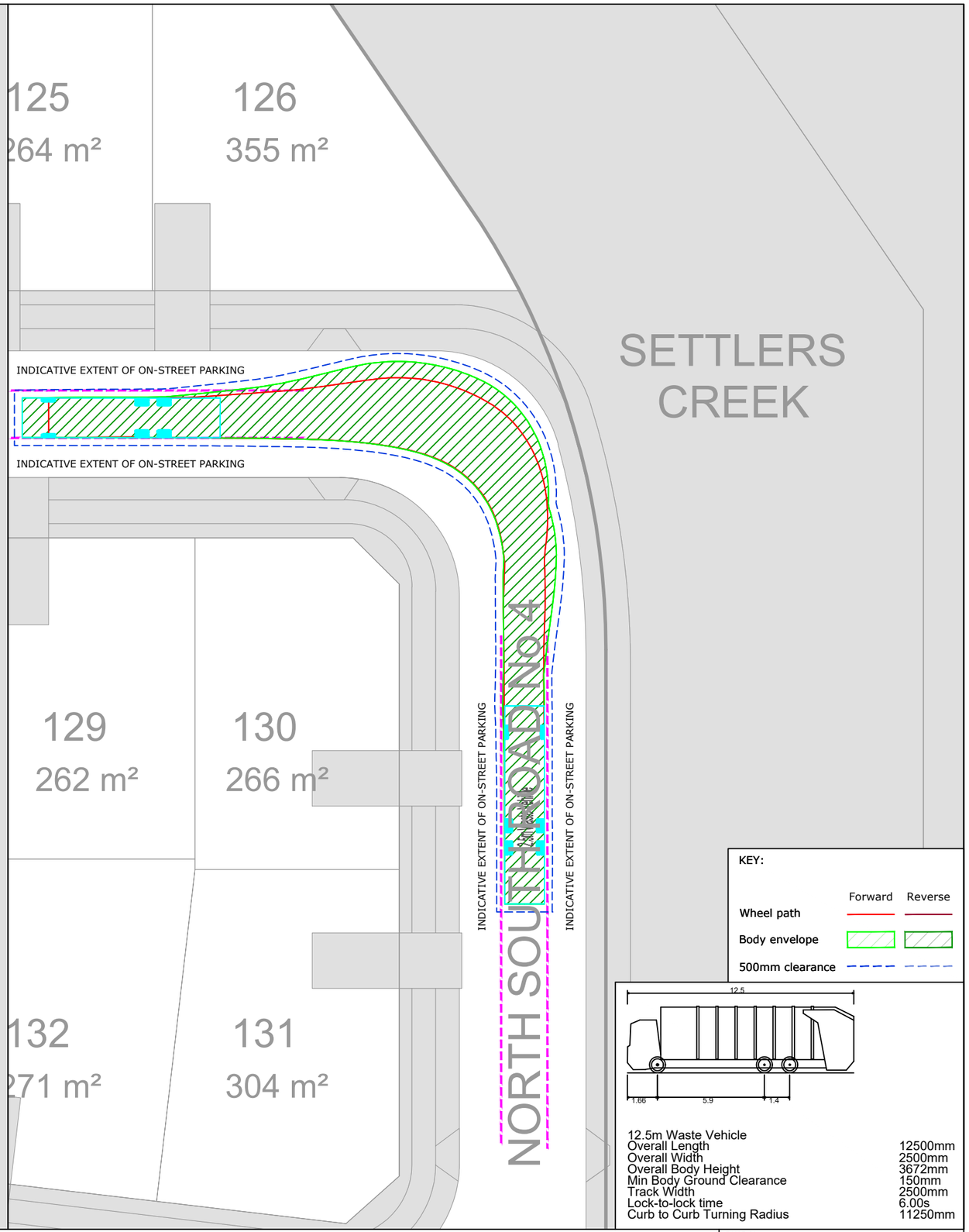
DWG No. 17254DA09
FIGURE 4

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg Date: 23 November 2020 By: Karl.magalltrade





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		

12.5m Waste Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 5

DATE STAMP: 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magdziarz

m²

129
262 m²

130
266 m²

3
m²

132
271 m²

131
304 m²

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

NORTH SOUTH ROAD

12.5m Waste Vehicle

INDICATIVE EXTENT OF ON-STREET PARKING

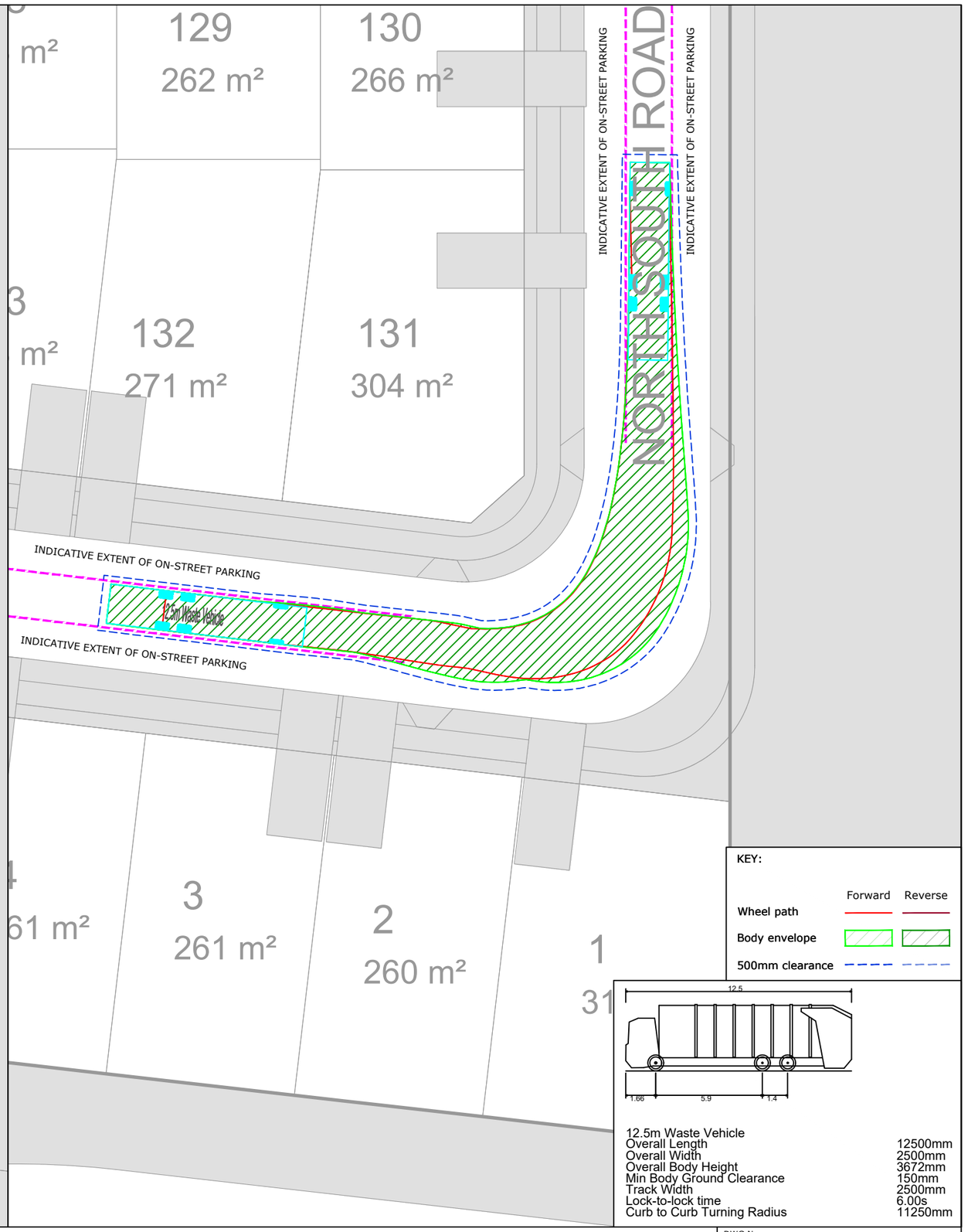
INDICATIVE EXTENT OF ON-STREET PARKING

4
61 m²

3
261 m²

2
260 m²

1
316 m²



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT

731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE

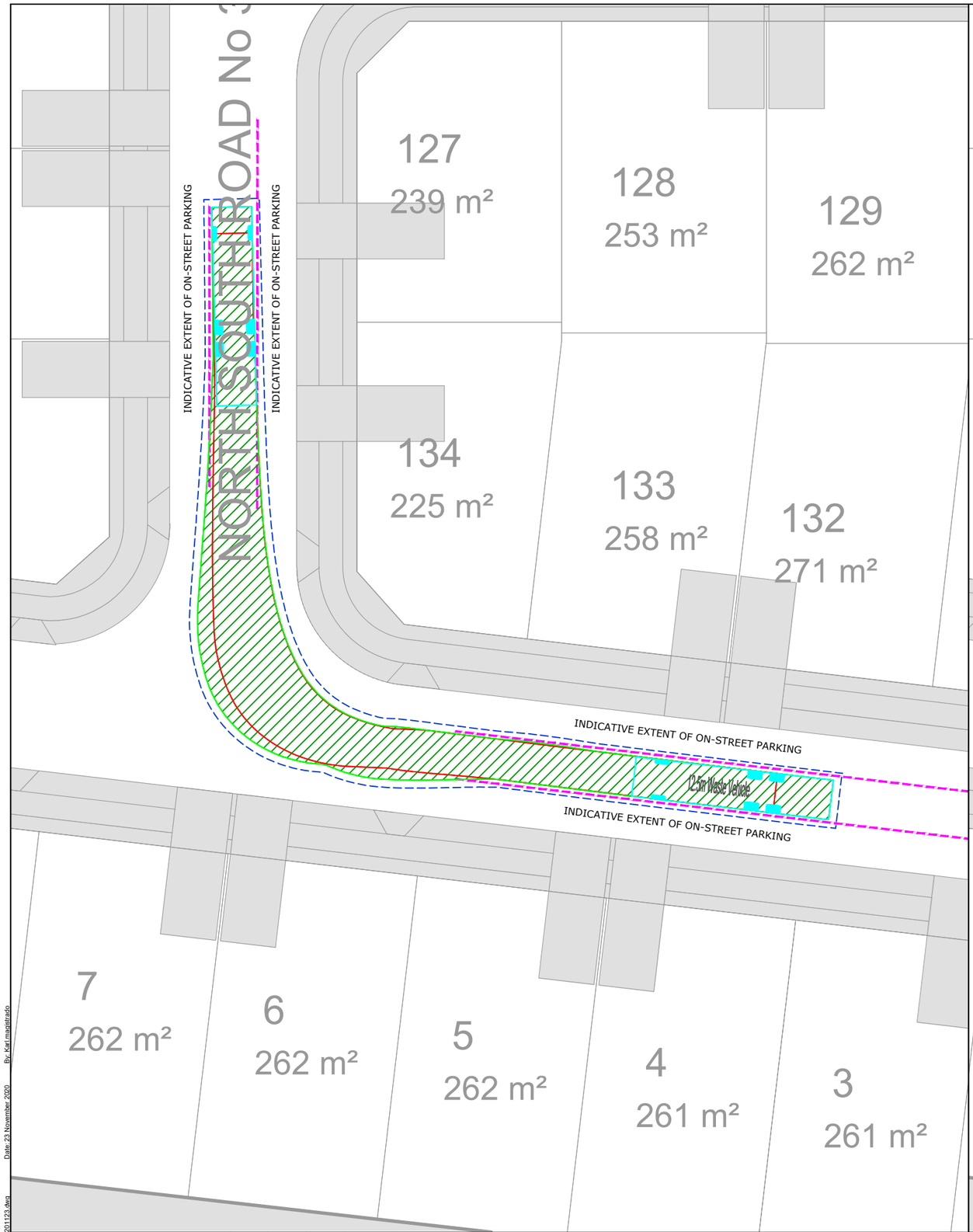
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #4 - EAST WEST ROAD #2
12.5m WASTE TRUCK

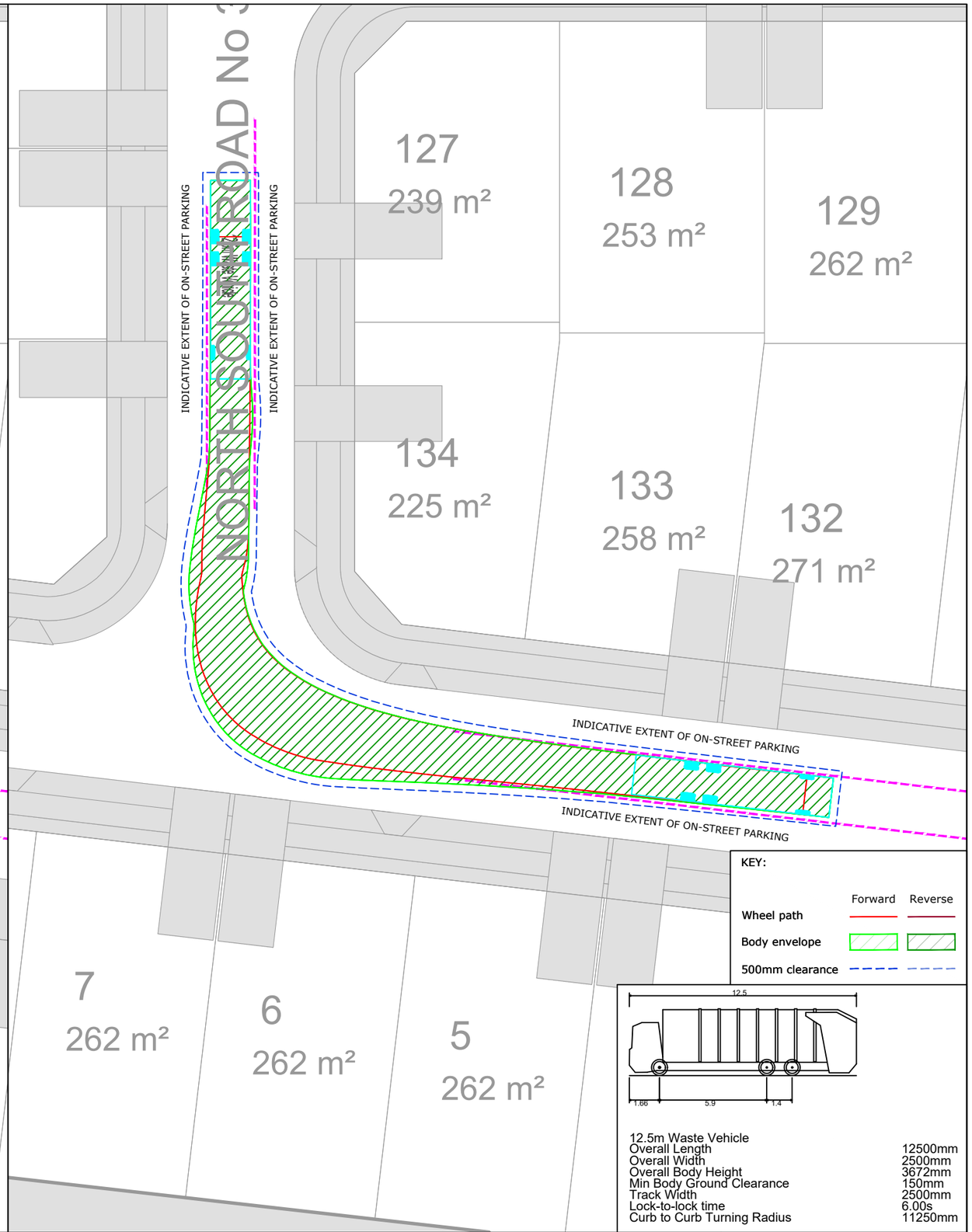
DWG No. 17254DA09
FIGURE 6

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09_SWEPT PATH 201123.dwg
Date: 23 November 2020
By: Karl.mastrando





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

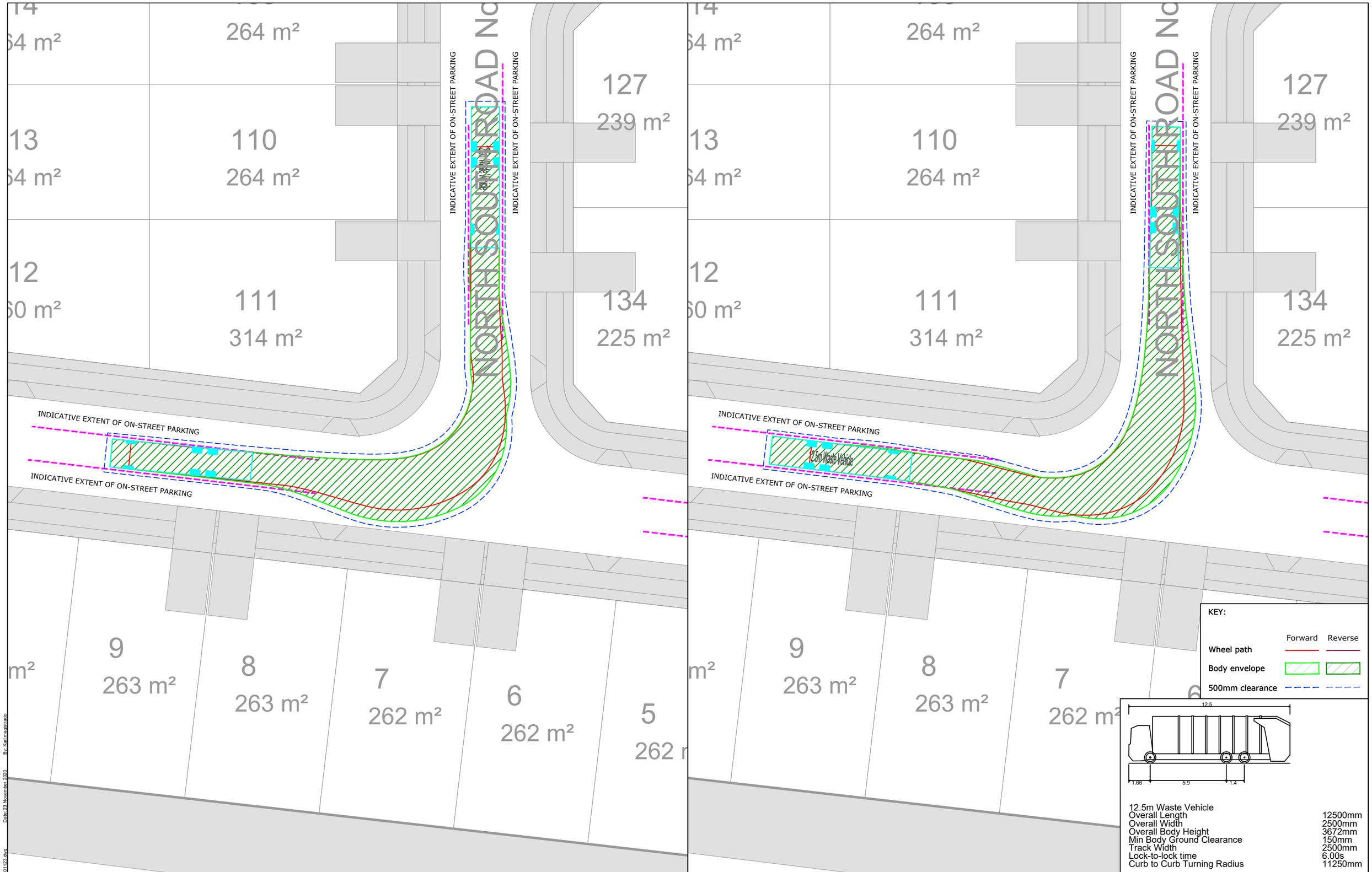
TITLE
SWEPT PATH ANALYSIS - EAST WEST ROAD #2 - NORTH SOUTH ROAD #3
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 7

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magdaraio



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT

731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE

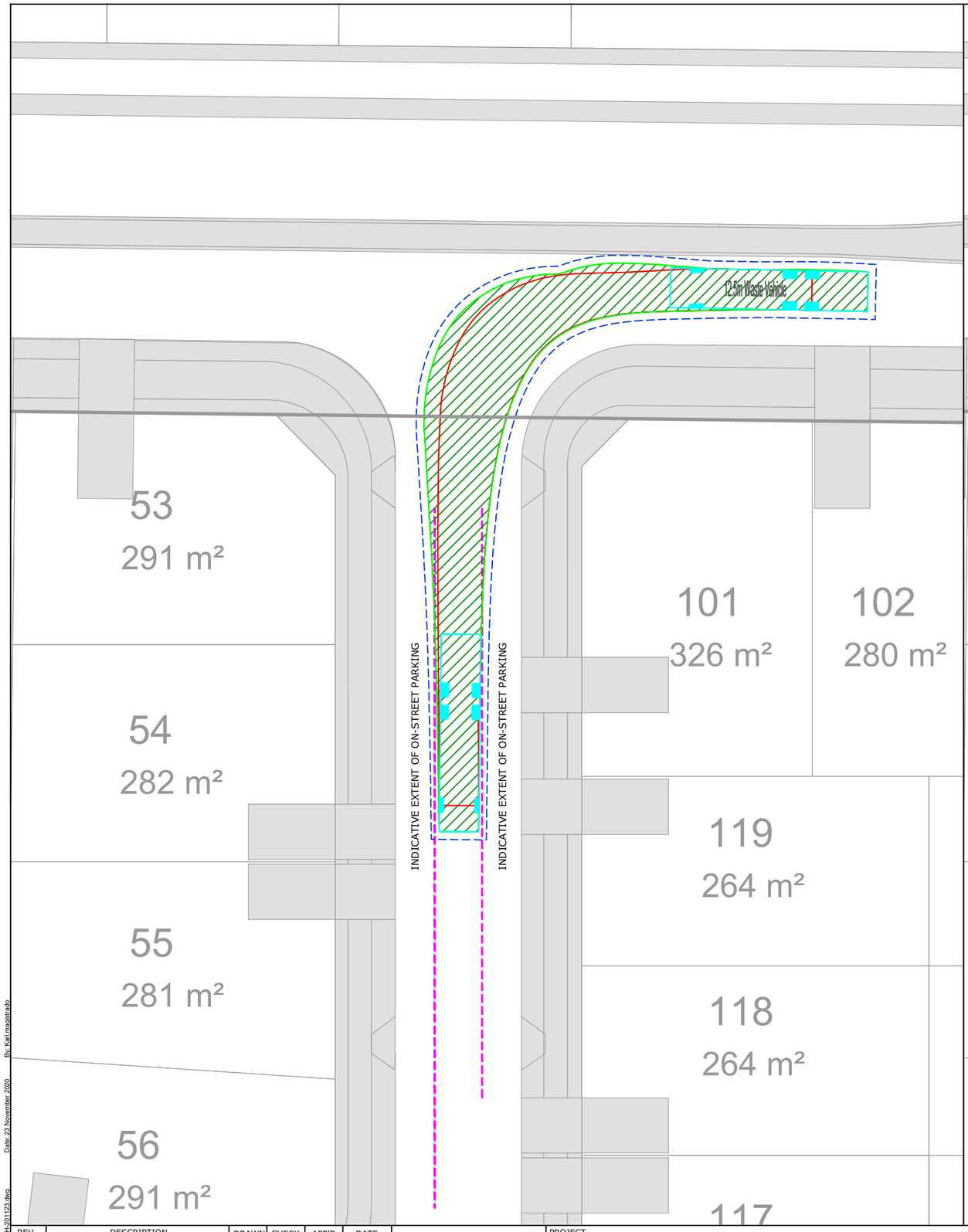
SWEPT PATH ANALYSIS - EAST WEST ROAD #2 - NORTH SOUTH ROAD #3
12.5m WASTE TRUCK

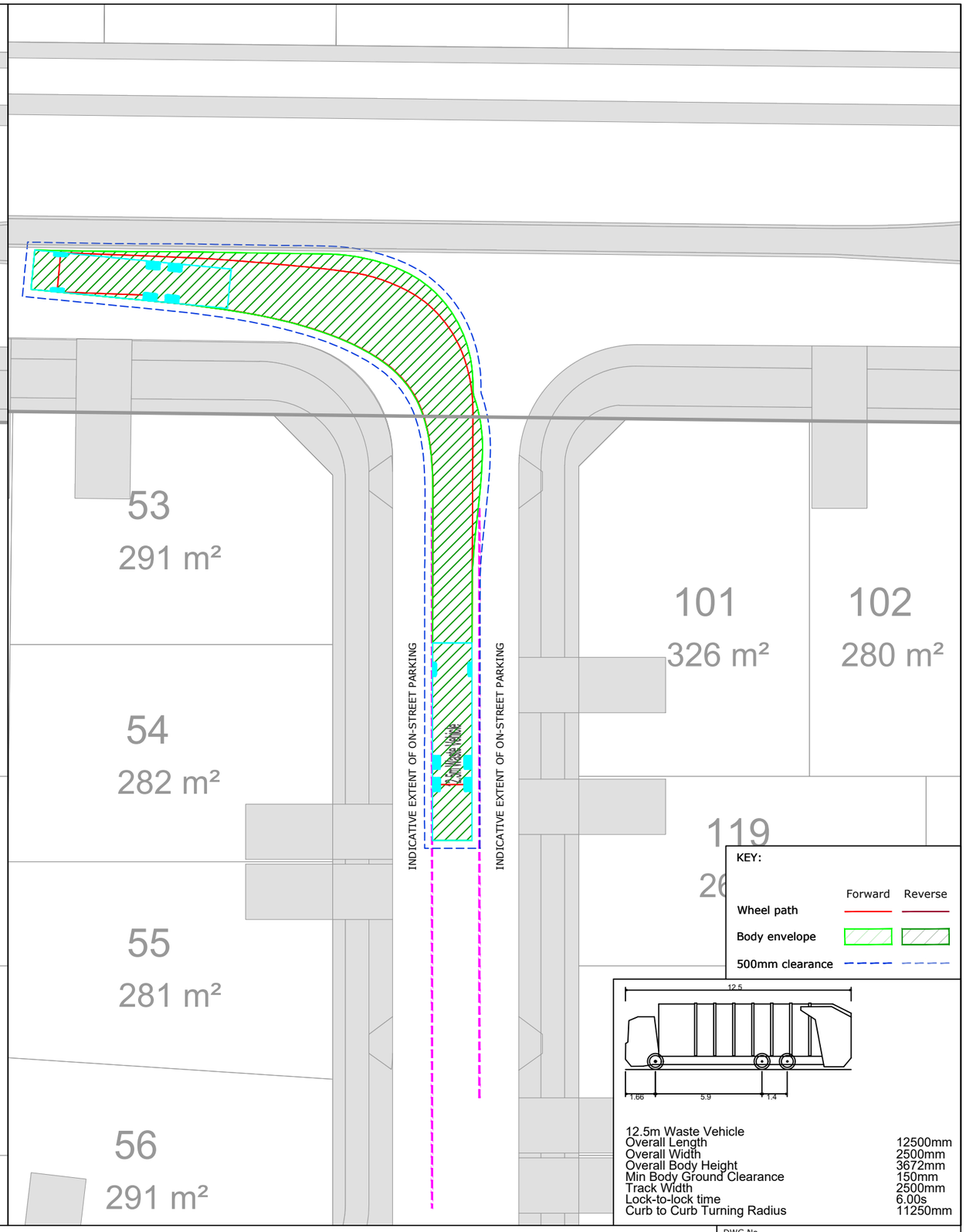
DWG No. 17254DA09
FIGURE 8

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg Date: 23 November 2020 By: Karl.magdtrado





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS - ST CHARBEL BOULEVARD - NORTH SOUTH ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA09 FIGURE 9
DATE STAMP 23 NOVEMBER 2020
PROJECT No. 17254
SCALE 1:300 @A3
REV. A

Filename: 17254DA09_SWEPT PATH-201123.dwg
Date: 23 November 2020
By: Karl.magistrado

55
281 m²

57
295 m²

56
291 m²

84
262 m²

83
264 m²

85
283 m²

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

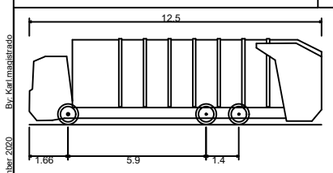
12.5m Waste Vehicle

SOUTH ROAD No 2

SOUTH ROAD No 1

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

By: Karl.maistrato
Date: 23 November 2020
Filename: 17254DA09 -SWEPT PATH-201123.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

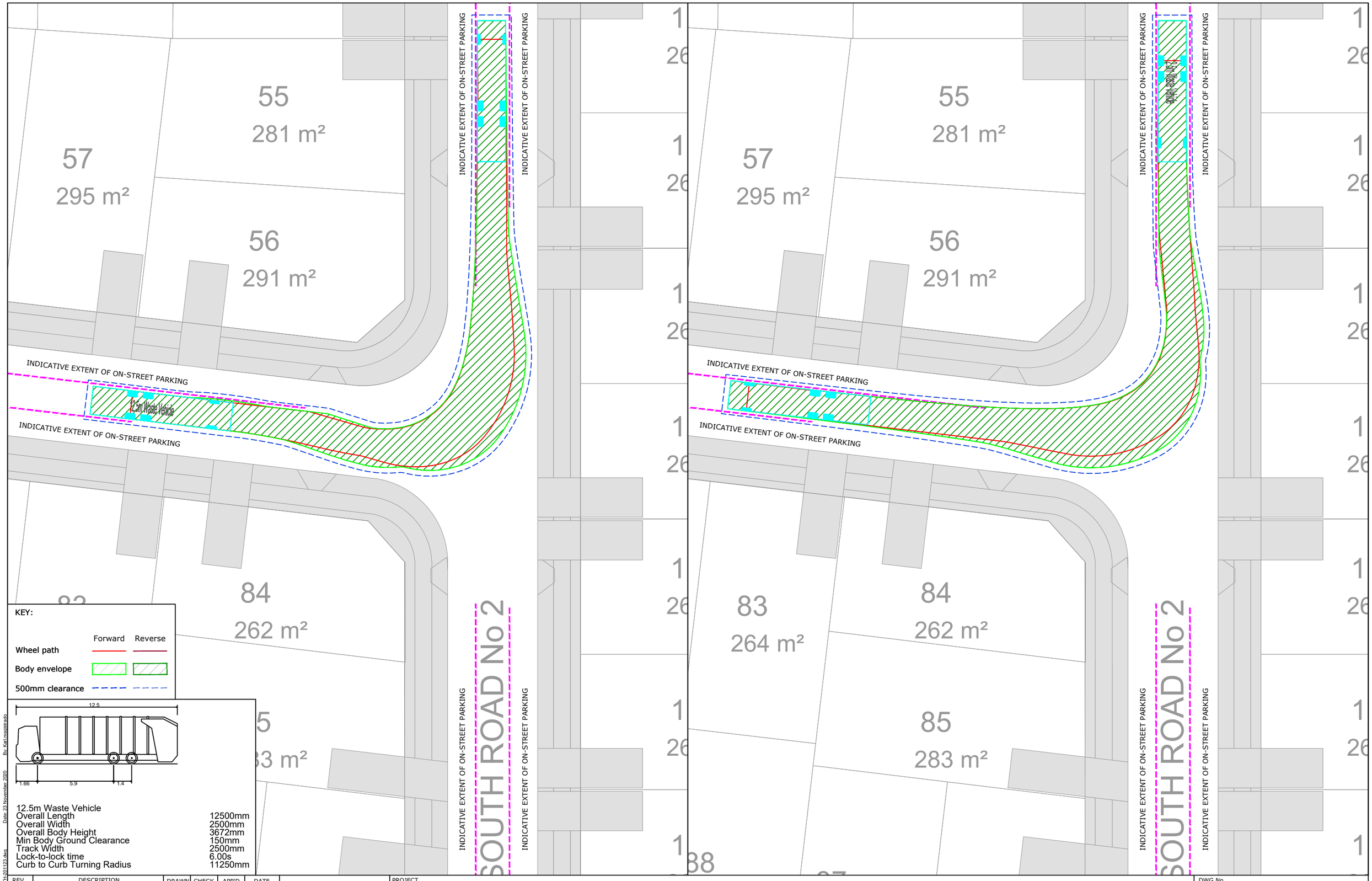
PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #1
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 10

DATE STAMP 23 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:300 @A3 | REV. A



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

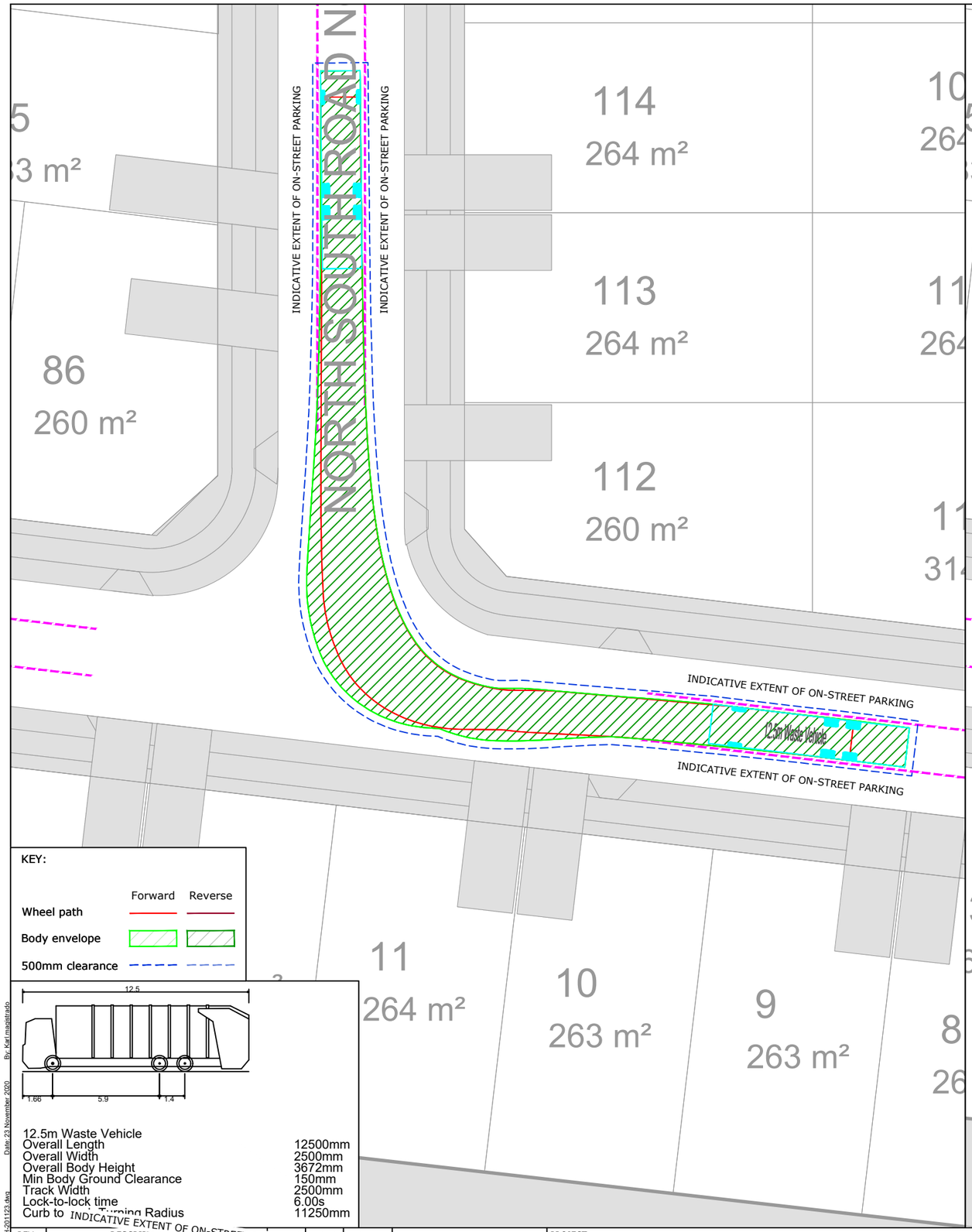
TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #1
12.5m WASTE TRUCK

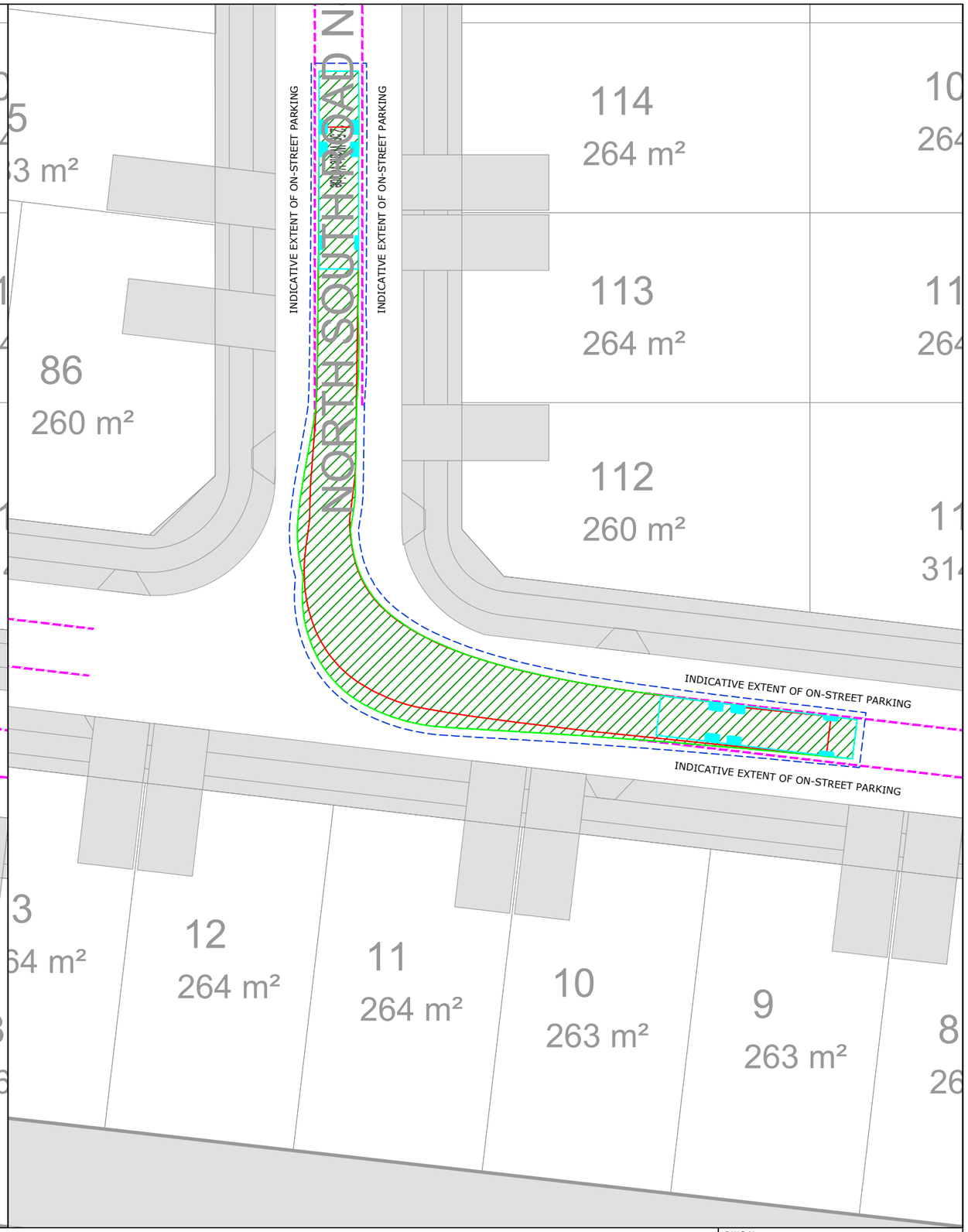
DWG No. 17254DA09
FIGURE 11

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA09_SWEPT PATH 201123.dwg
Date: 23 November 2020
By: Karl magistrado





REV.	DESCRIPTION			APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

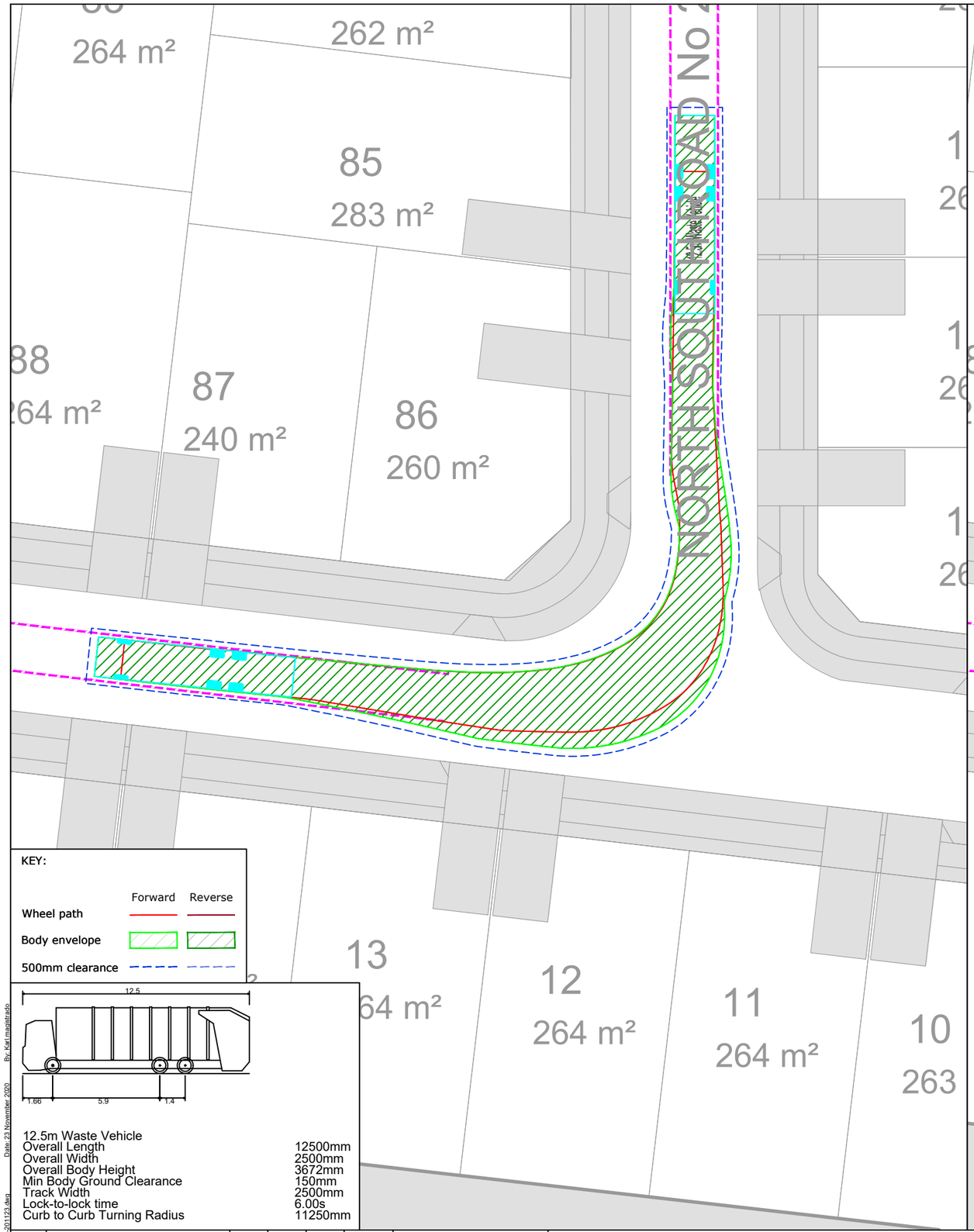
TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #2
12.5m WASTE TRUCK

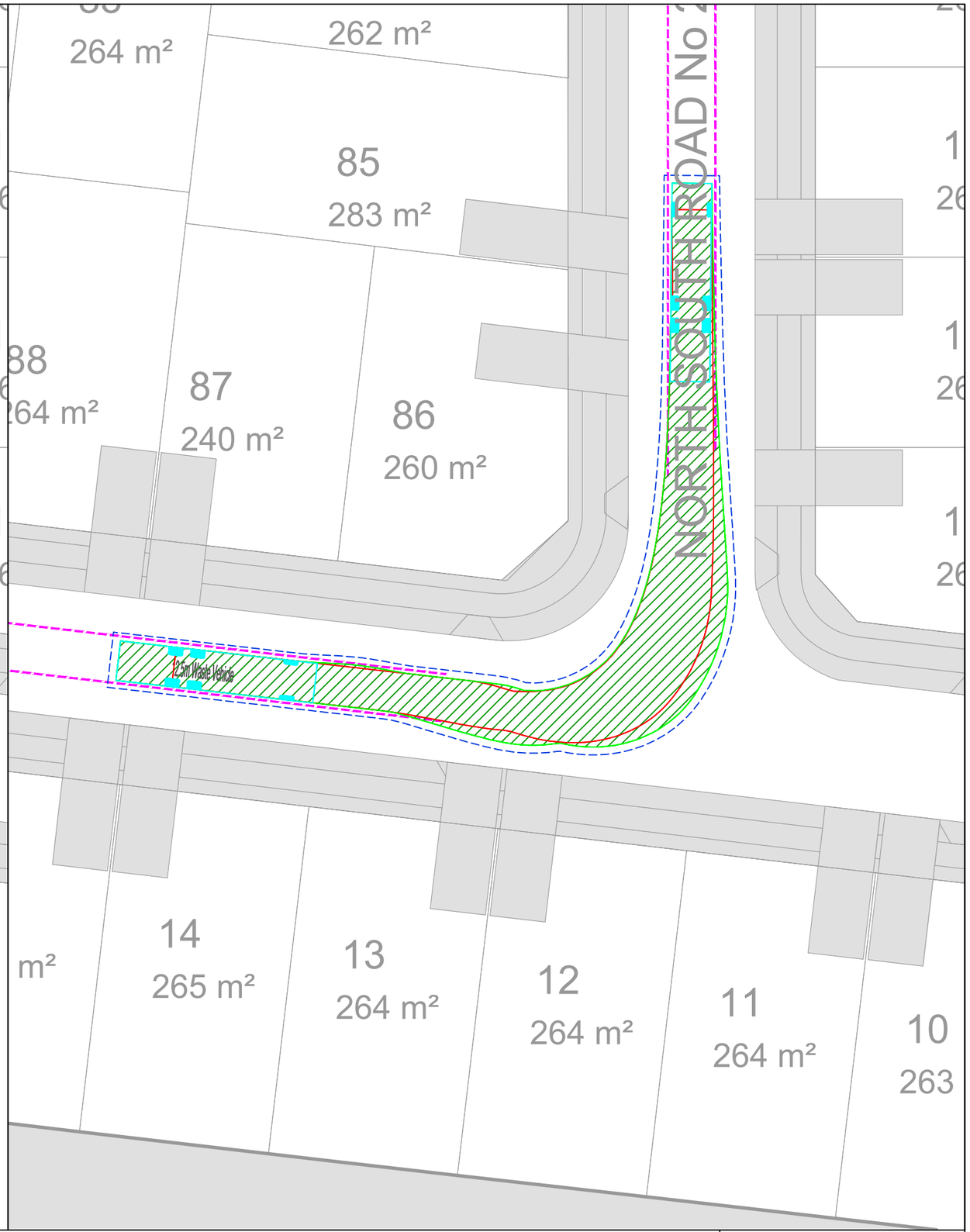
DWG No. 17254DA09
FIGURE 12

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

By: Karl.maistrado
Date: 23 November 2020
Filename: 17254DA09 -SWEPT PATH-201123.dwg





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

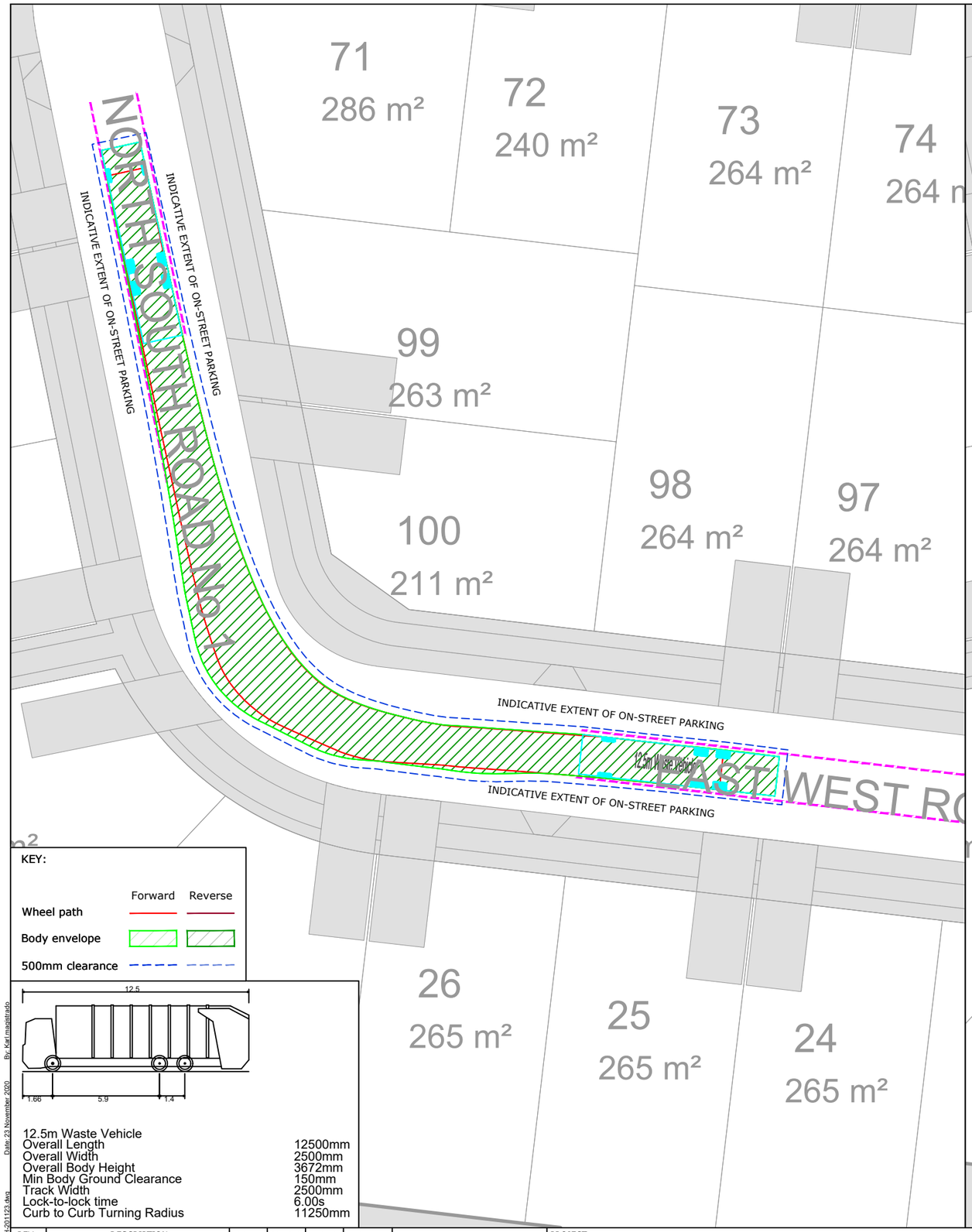
TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 13

DATE STAMP 23 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:300 @A3 | REV. A

Filename: 17254DA09 -SWEPT PATH-201123.dwg Date: 23 November 2020 By: Karl.maistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		

12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

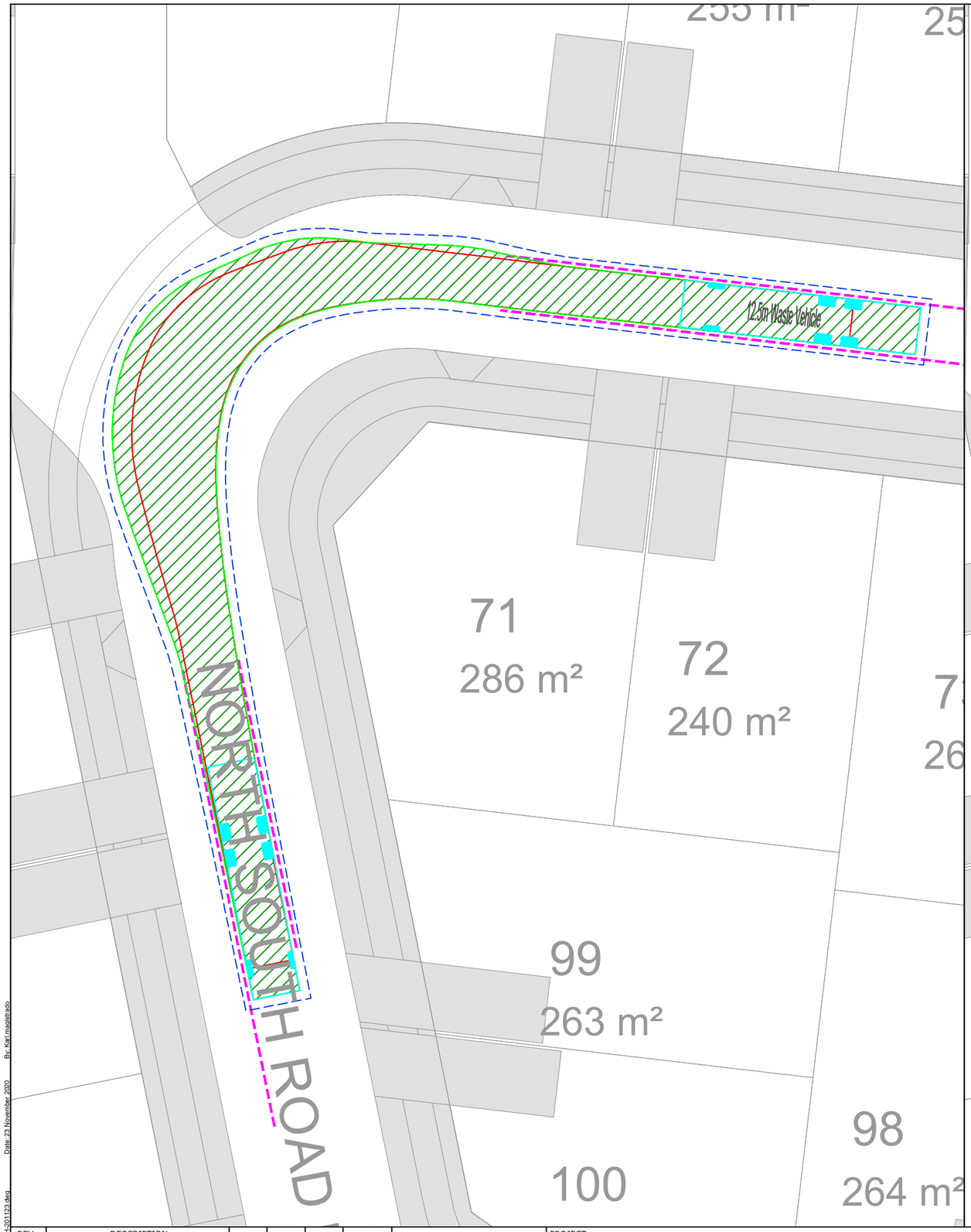
TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #1 - EAST WEST ROAD #2
12.5m WASTE TRUCK

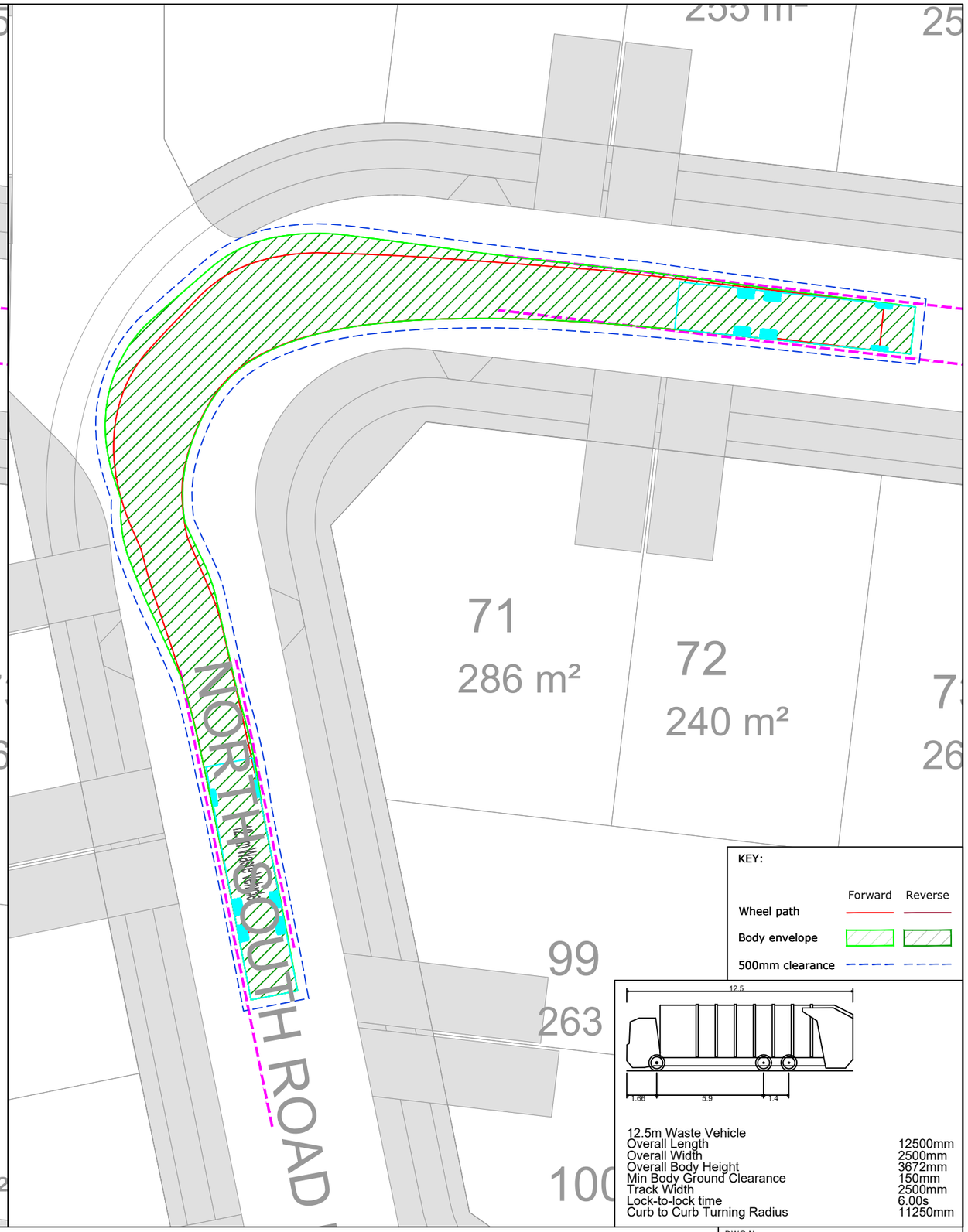
DWG No. 17254DA09
FIGURE 14

DATE STAMP: 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

By: Karl.maistrato
Date: 23 November 2020
Filename: 17254DA09 -SWEPT PATH-201123.dwg





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	23/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #1 - EAST WEST ROAD #1
12.5m WASTE TRUCK

DWG No. 17254DA09
FIGURE 15

DATE STAMP 23 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:250 @A3	A

Filename: 17254DA09 -SWEPT PATH-201123.dwg Date: 23 November 2020 By: Karl.magistrado

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

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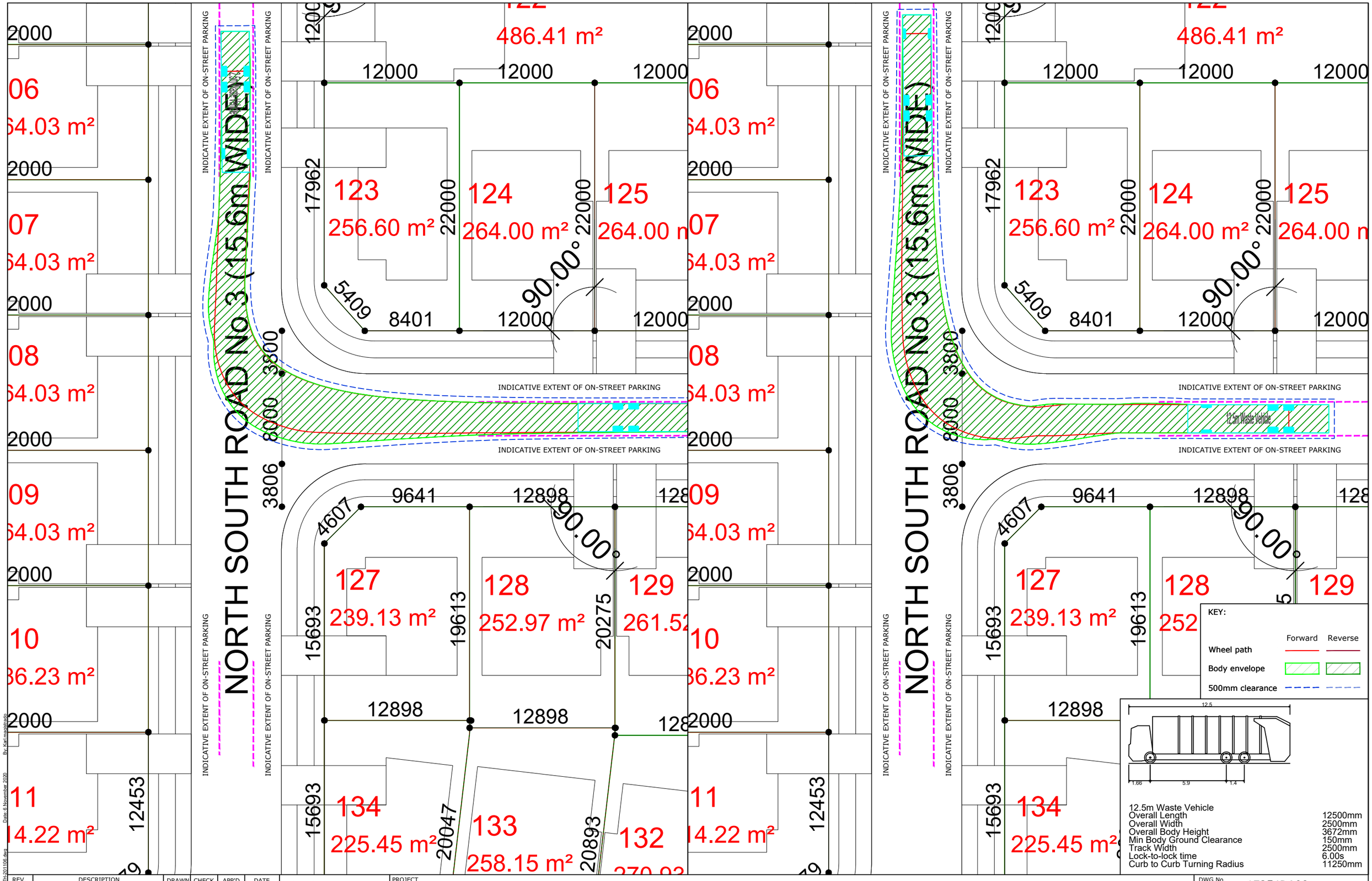


REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

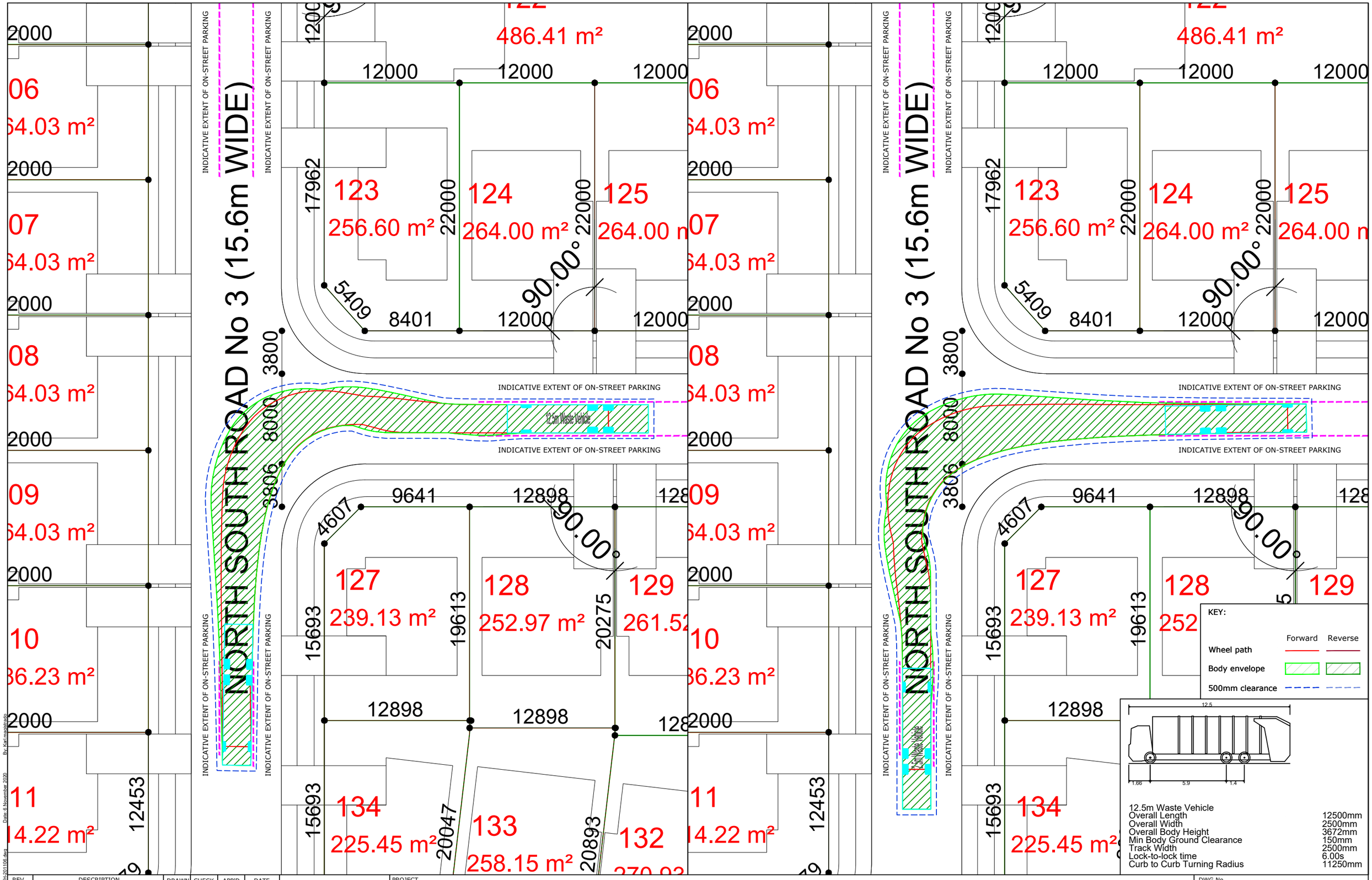
TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #3 - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 1

DATE STAMP 06 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:300 @A3 | REV. A

By: Karl.magistrado
Date: 6 November 2020
Filename: 17254DA08 -SWEPT PATH-201106.dwg



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

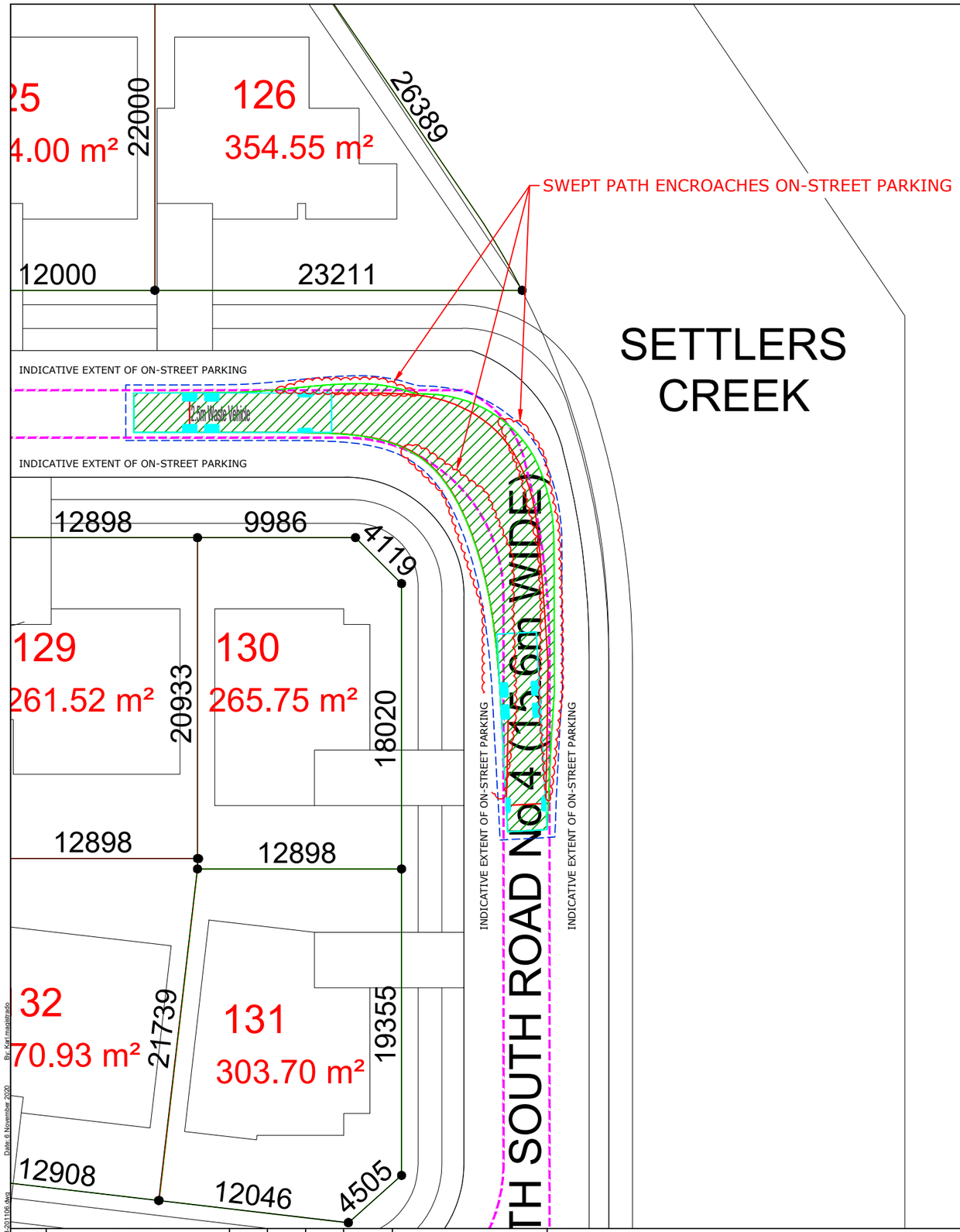
TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #3 - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

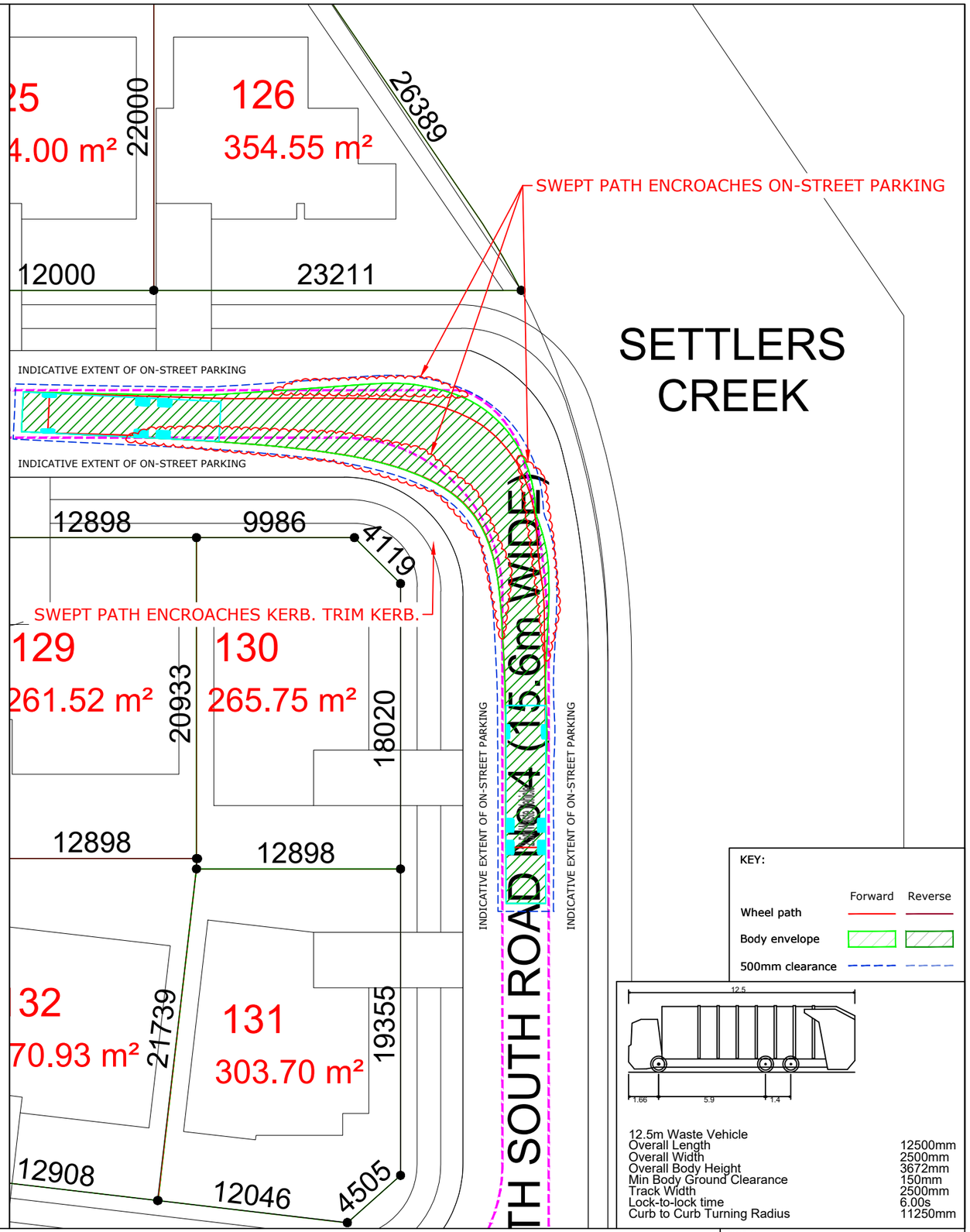
DWG No. 17254DA08
FIGURE 2

DATE STAMP 06 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:300 @A3 | REV. A

By: Karl.magistrado
Date: 6 November 2020
Filename: 17254DA08 -SWEPT PATH-201106.dwg





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		

12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

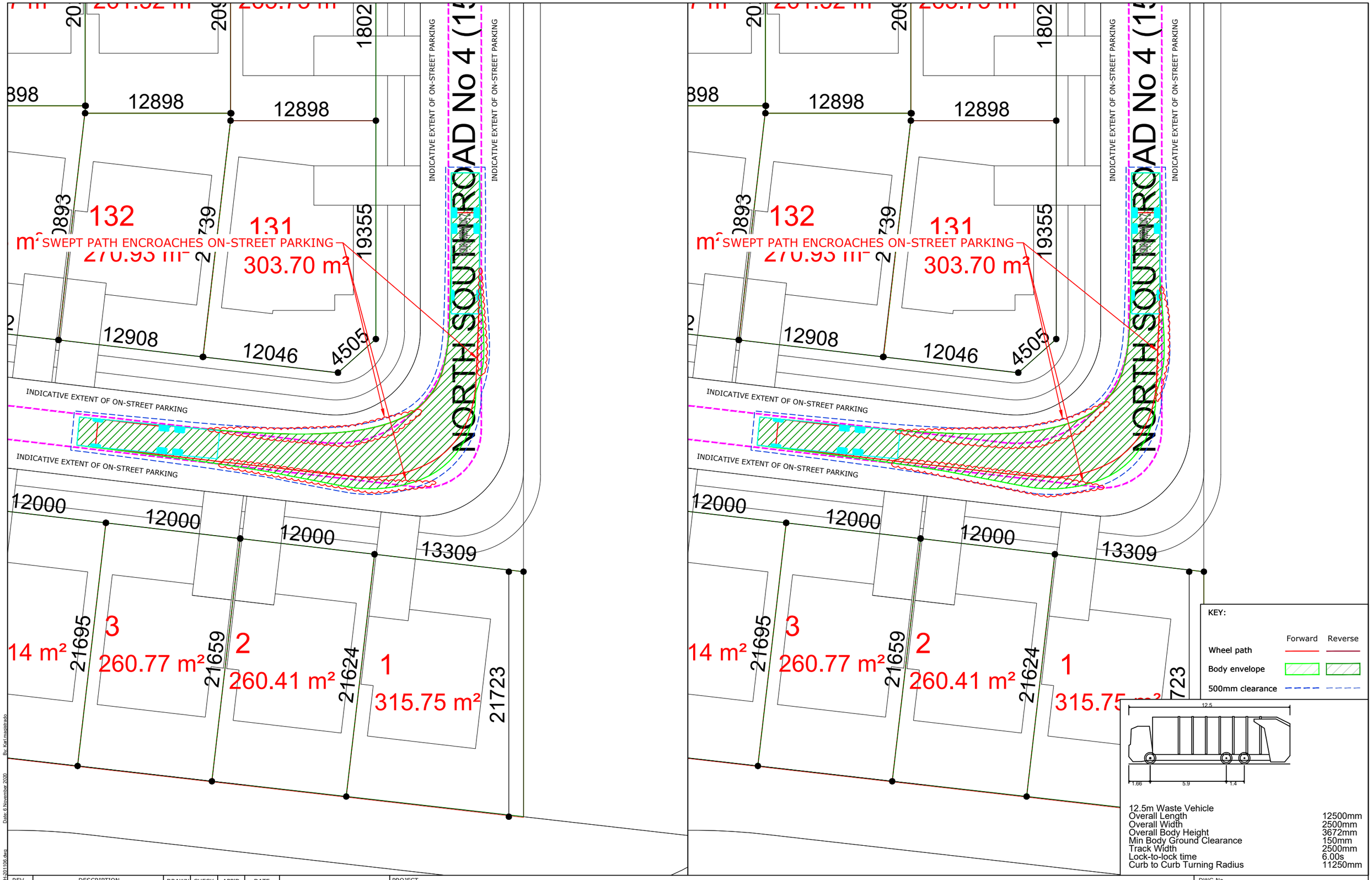
TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #4
12.5m WASTE TRUCK

DWG No. 17254DA08 FIGURE 3

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA08 -SWEPT PATH-201106.dwg Date: 6 November 2020 By: Karl.maistrado



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

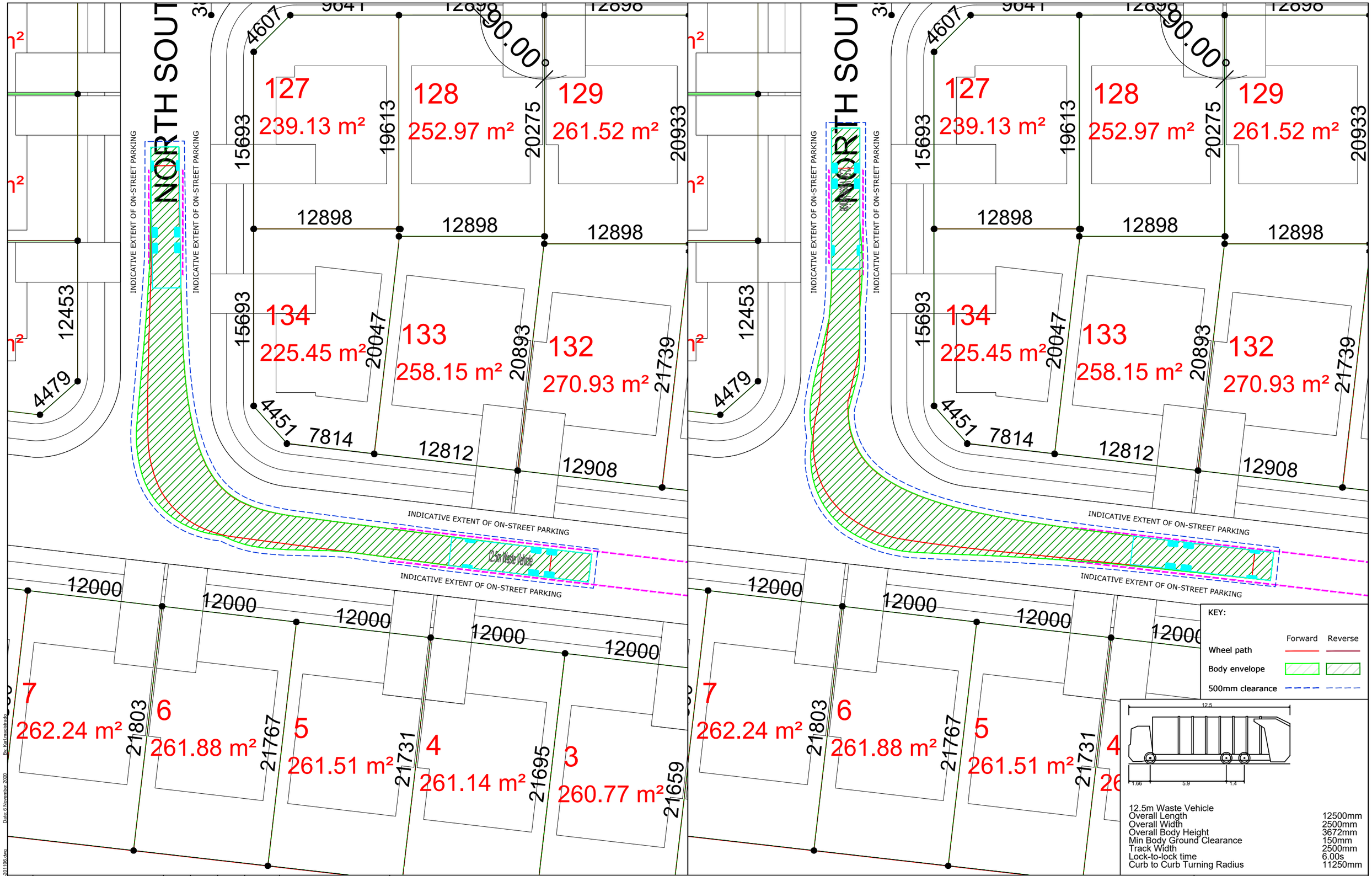
TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #4 - EAST WEST ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 4

DATE STAMP 06 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:300 @A3 | REV. A

Filename: 17254DA08 -SWEPT PATH-201106.dwg
Date: 6 November 2020
By: Karl.magistrado



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

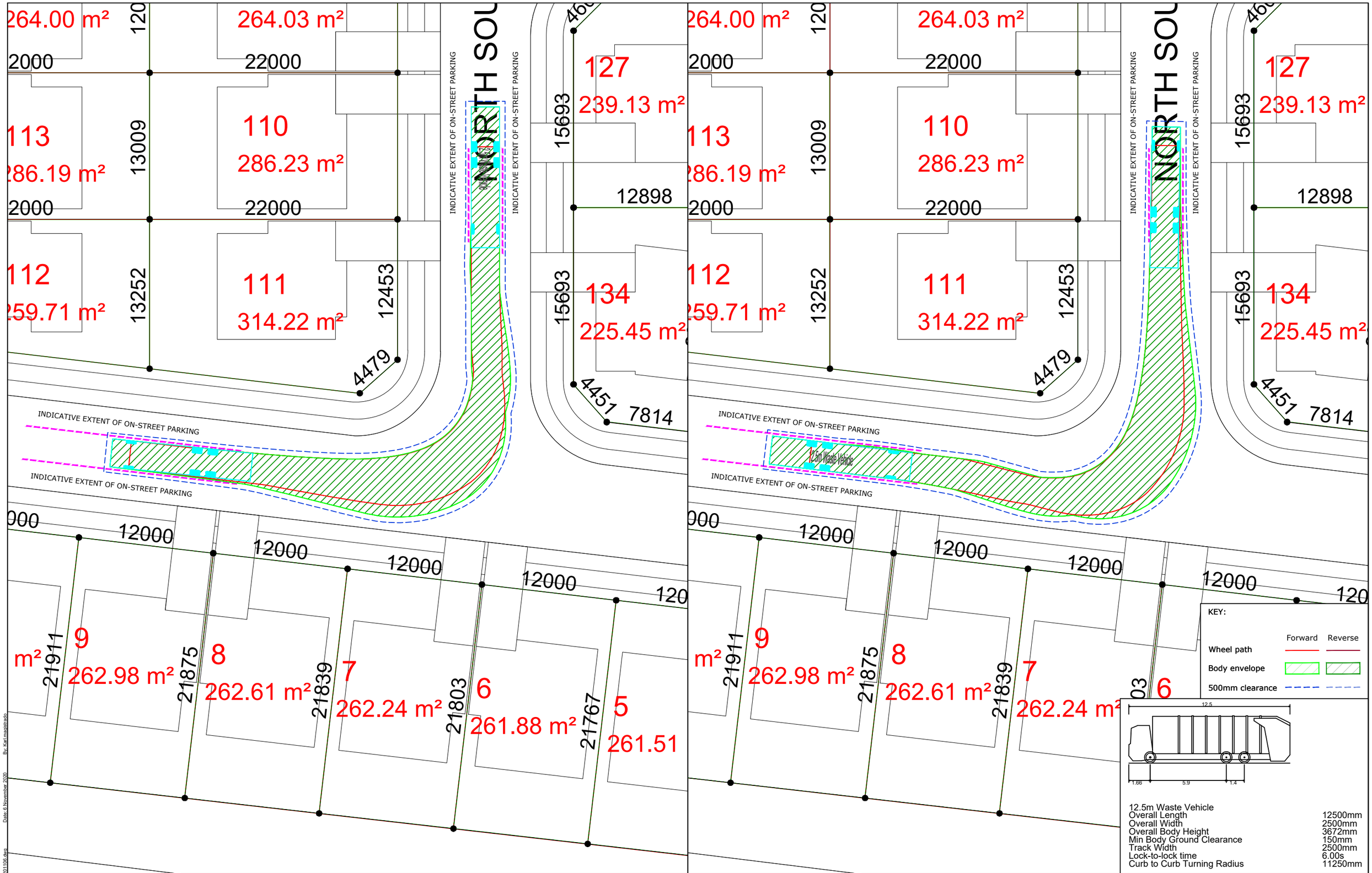
TITLE
SWEPT PATH ANALYSIS - EAST WEST ROAD #2 - NORTH SOUTH ROAD #3
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 5

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

By: Karl magistrado
Date: 6 November 2020
Filename: 17254DA08_SWEPT PATH-201106.dwg



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT

731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE

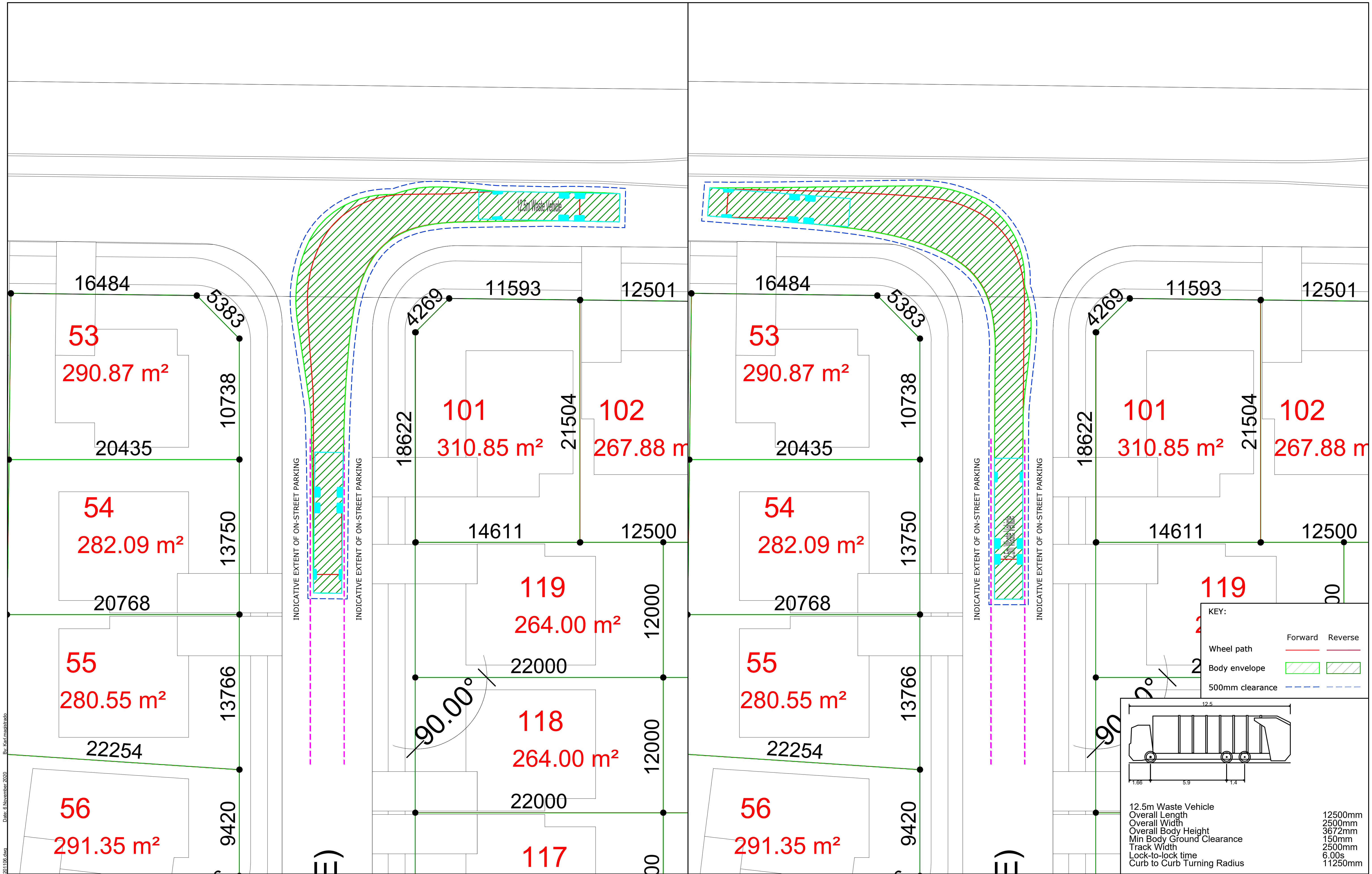
SWEPT PATH ANALYSIS - EAST WEST ROAD #2 - NORTH SOUTH ROAD #3
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 6

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA08 -SWEPT PATH-201106.dwg
Date: 6 November 2020
By: Karl.magalltrade



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

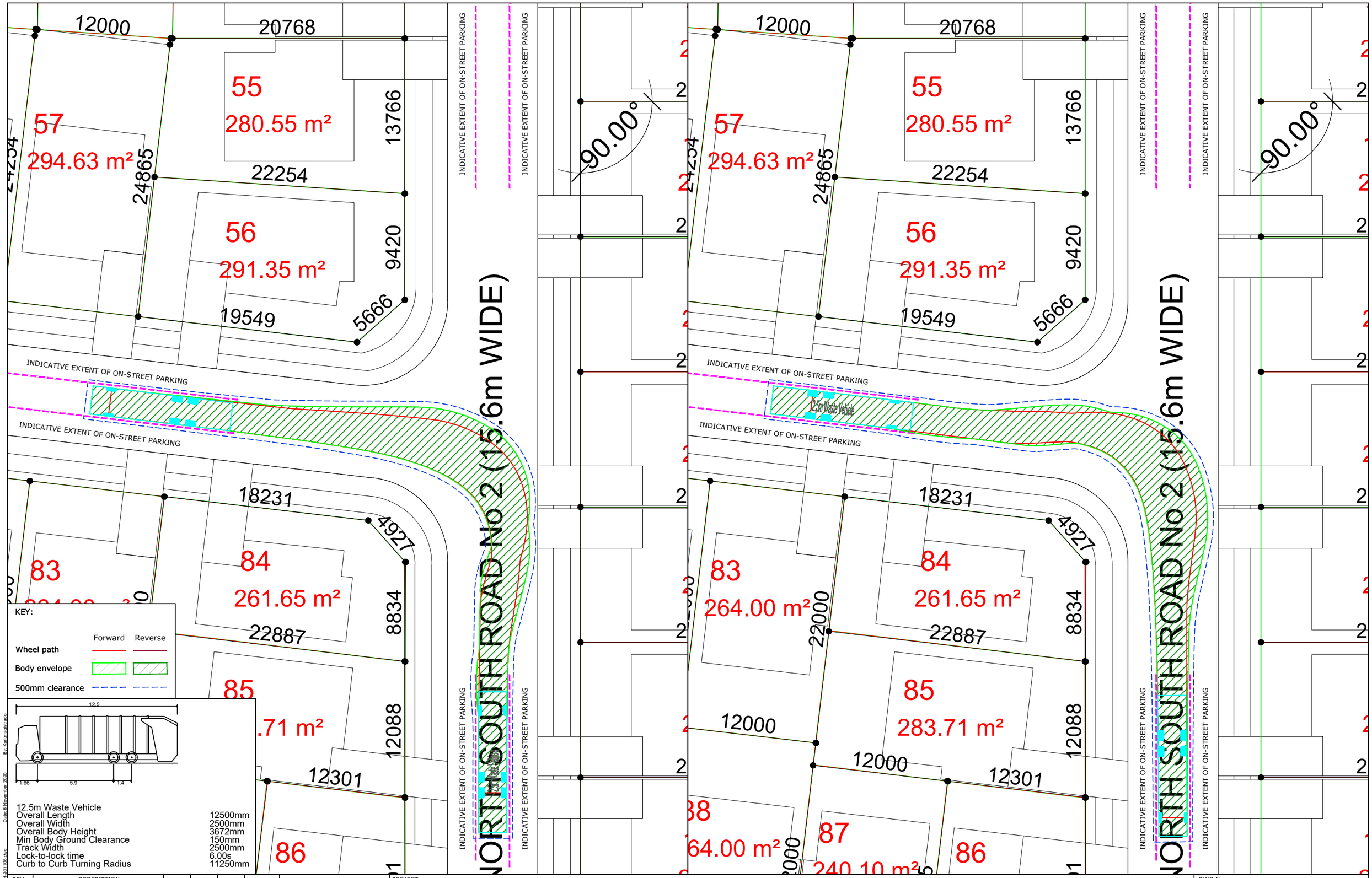
TITLE
SWEPT PATH ANALYSIS - ST CHARBEL BOULEVARD - NORTH SOUTH ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 7

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

Filename: 17254DA08 - SWEPT PATH-201106.dwg Date: 6 November 2020 By: Karl.magistrado



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #1
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 8

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

By: Karl.maistrado
Date: 6 November 2020
Filename: 17254DA08_SWEPT PATH-201106.dwg

12000
20768
55
280.55 m²
57
294.63 m²
13766
24865
22254
56
291.35 m²
9420
19549
5666
INDICATIVE EXTENT OF ON-STREET PARKING
INDICATIVE EXTENT OF ON-STREET PARKING
12.5m Waste Vehicle
INDICATIVE EXTENT OF ON-STREET PARKING
NORTH SOUTH ROAD No 2 (15.6m WIDE)
90.00°
18231
4927
84
261.65 m²
83
8834
22887
85
12088
12301
86
KEY:
Forward
Reverse
Wheel path
Body envelope
500mm clearance
12.5
1.66
5.9
1.4
12.5m Waste Vehicle
Overall Length 12500mm
Overall Width 2500mm
Overall Body Height 3672mm
Min Body Ground Clearance 150mm
Track Width 2500mm
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 11250mm
By: Karl.maistrado
Date: 6 November 2020
Filename: 17254DA08 - SWEPT PATH-201106.dwg

12000
20768
55
280.55 m²
57
294.63 m²
13766
24865
22254
56
291.35 m²
9420
19549
5666
INDICATIVE EXTENT OF ON-STREET PARKING
INDICATIVE EXTENT OF ON-STREET PARKING
INDICATIVE EXTENT OF ON-STREET PARKING
NORTH SOUTH ROAD No 2 (15.6m WIDE)
90.00°
18231
4927
84
261.65 m²
83
264.00 m²
22000
8834
22887
85
283.71 m²
12088
12000
12000
12301
87
240.10 m²
86

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

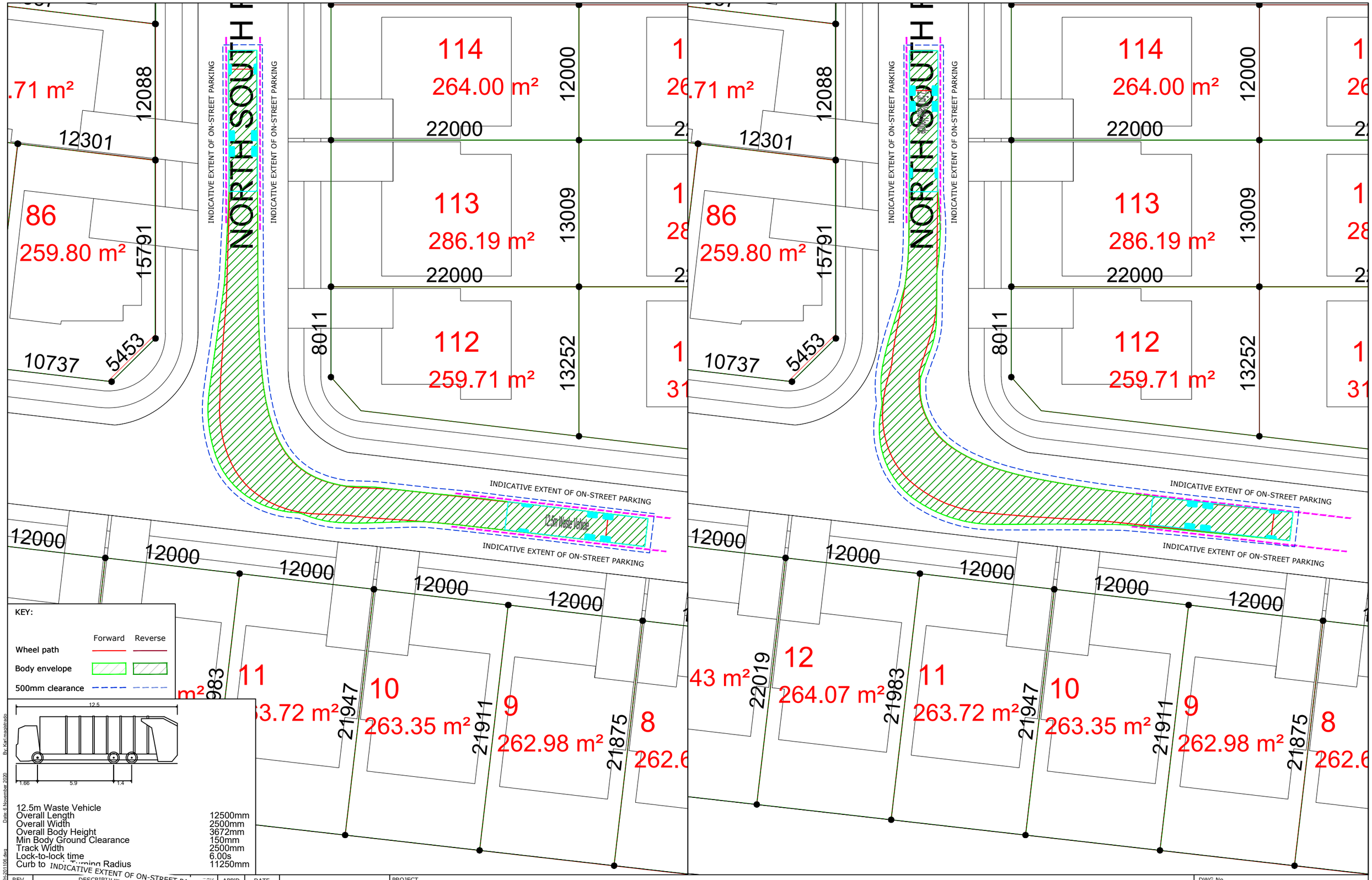
PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #1
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 9

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A



By: Karl.maidstrado
Date: 6 November 2020
Filename: 17254DA08_SWEPT PATH-201106.dwg

REV.	DESCRIPTION			APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

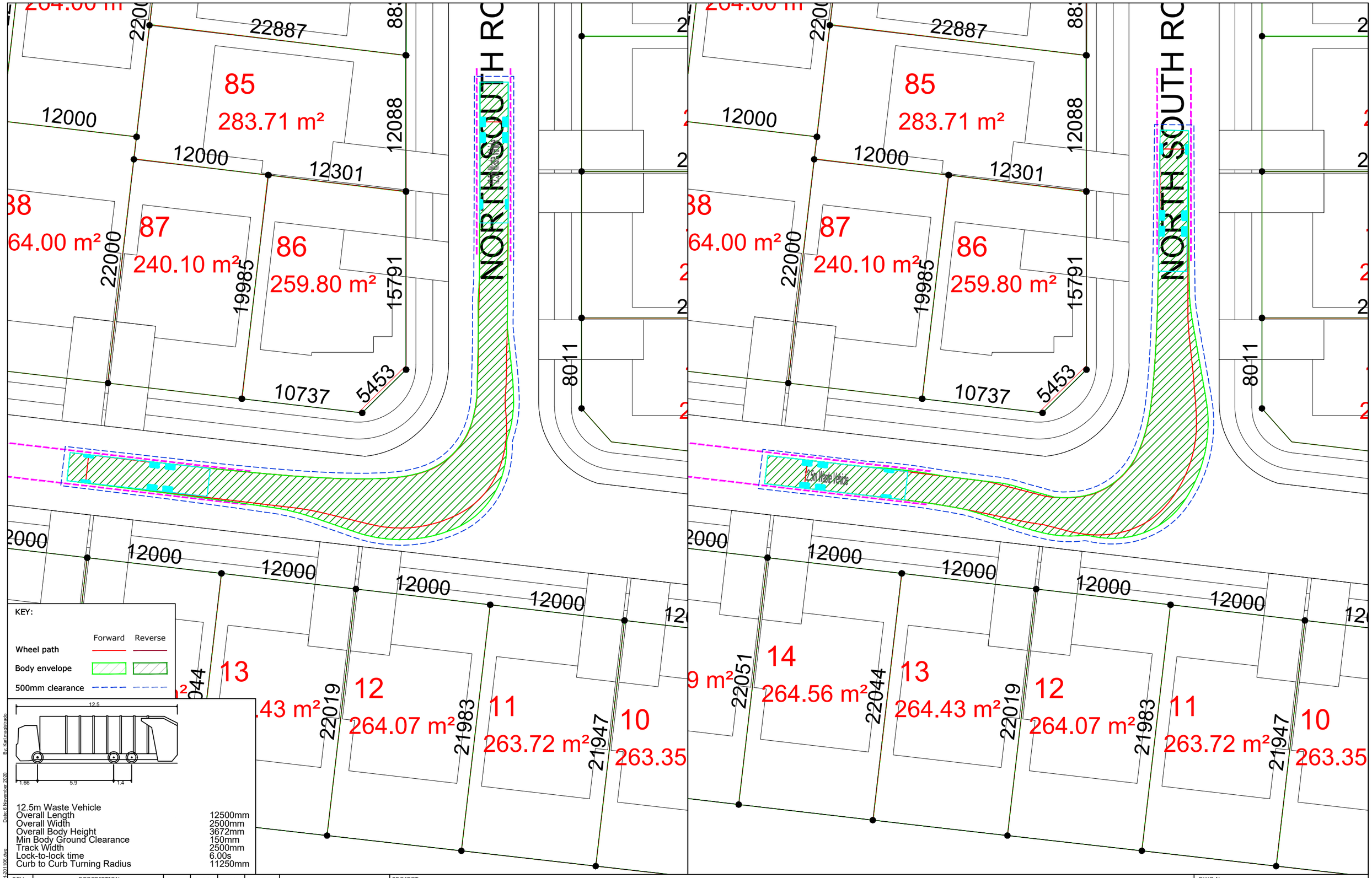
PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 10

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A



Date: 6 November 2020 By: Karl.maistrado

filename: 17254DA08 -SWEPT PATH-201106.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #2 - EAST WEST ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 11

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A

NORTH SOUTH ROAD NO 1 (15.6m WIDE)

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

SWEPT PATH ENCROACHES ON-STREET PARKING

EAST WEST RO

INDICATIVE EXTENT OF ON-STREET PARKING

INDICATIVE EXTENT OF ON-STREET PARKING

71
285.55 m²

72
240.00 m²

73
263.90 m²

74
263.97

99
263.07 m²

100
211.36 m²

97
264.10 m²

98
264.03 m²

26
265.00 m²

25
264.99 m²

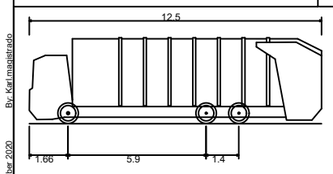
24
264.95 m²

27
448.96 m²

14731
11955
12000
12578
9598
6040
11784
10739
10217
22000
22082
22080
22074
22085
3000
8060
28322
24283

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



12.5m Waste Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	3672mm
Min Body Ground Clearance	150mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11250mm

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REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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ttpp transport planning

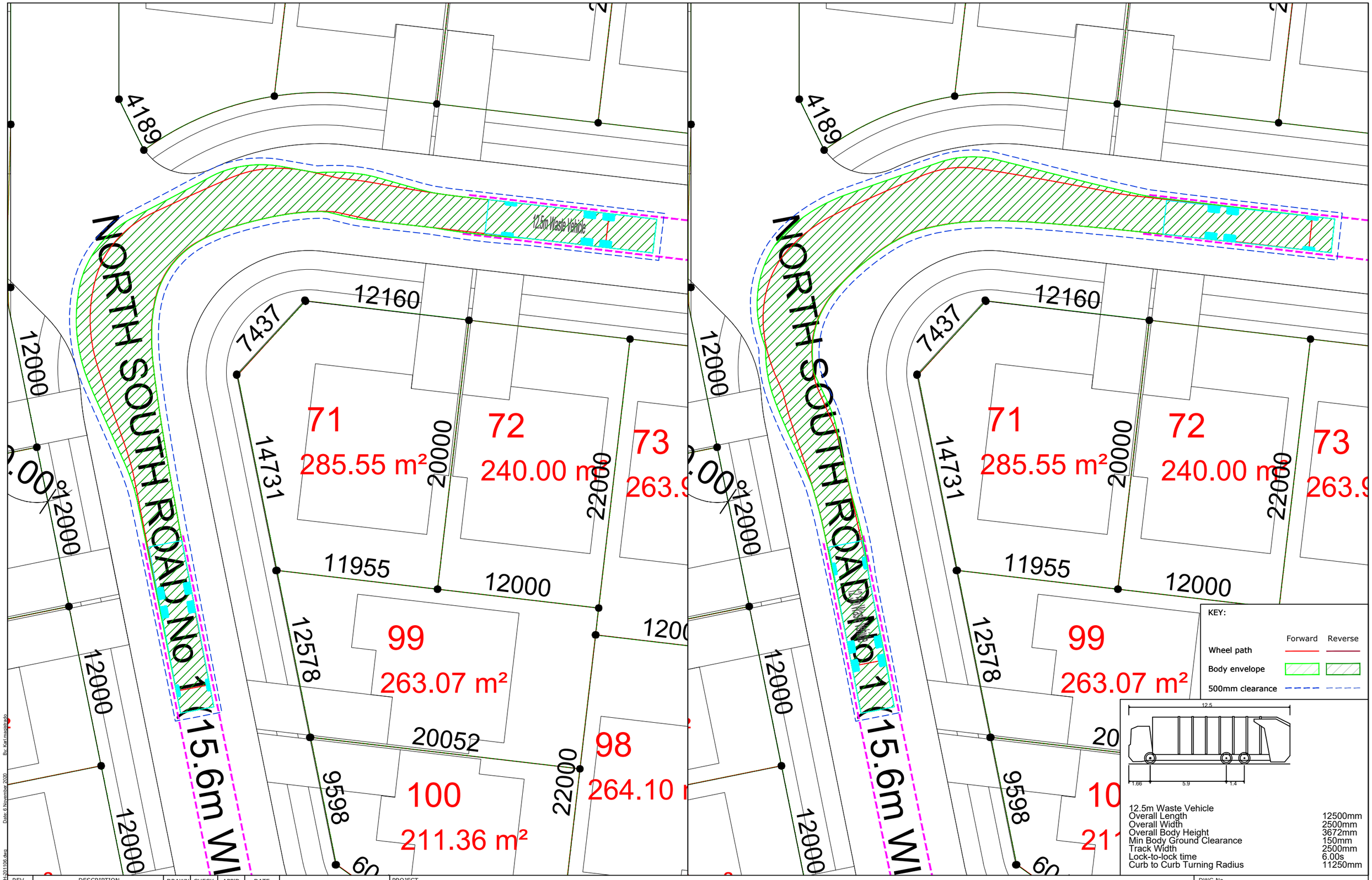
PROJECT
731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE
SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #1 - EAST WEST ROAD #2
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 12

DATE STAMP 06 NOVEMBER 2020

PROJECT No.	SCALE	REV.
17254	1:300 @A3	A



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	OF	KH	06/11/20

ttpp transport planning

PROJECT: 731-769 GREAT WESTERN HIGHWAY, WERRINGTON

TITLE: SWEPT PATH ANALYSIS - NORTH SOUTH ROAD #1 - EAST WEST ROAD #1
12.5m WASTE TRUCK

DWG No. 17254DA08
FIGURE 13

DATE STAMP 06 NOVEMBER 2020

PROJECT No. 17254 | SCALE 1:250 @A3 | REV. A

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