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**70020522: Cheltenham Borough Council, Proposed Crematorium****Technical Note 02: Egress Route Option Appraisal – Existing Gardens of Remembrance****06<sup>th</sup> February, 2017**

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## Introduction

WSP | Parsons Brinckerhoff has been commissioned by Cheltenham Borough Council (CBC) to provide transport and highways advice in support of proposals to provide a new Crematorium on land located to the east of the existing Cemetery and Crematorium, in Cheltenham.

WSP | Parsons Brinckerhoff previously undertook an independent Options Appraisal and Impact Assessment Study (dated October, 2016) to identify potential vehicular access and egress routes to and from the proposed Crematorium and their associated opportunities and constraints.

This Technical Note (02) has been prepared at the request of CBC, to consider the feasibility of using the existing Gardens of Remembrance and Cemetery and Crematorium access roads (from Bouncers Lane) as an egress route (only) to serve the proposed Crematorium as a temporary route for operational traffic (and not construction traffic). To achieve this, it is recognised by CBC that a new road link would need to be provided between the existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium, and the internal access roads that currently serve the Gardens of Remembrance. For reference, the proposed egress route is shown on WSP | Parsons Brinckerhoff's drawing number **SK-05**. It should be noted that this route was not considered as part of the initial Options Appraisal and Impact Assessment Study (on the grounds that the use of the Gardens of Remembrance was politically sensitive and potentially fraught with safety related issues, namely to pedestrians).

Following this introduction, this TN provides:

- A description of the proposed egress route;
- An overview of the potential opportunities and constraints presented by the proposed egress route; and
- A summary of the suitability of the proposed egress route to accommodate traffic associated with the proposed Crematorium.

For clarity, this TN does not provide details of potential geometries, or preliminary drawings of the proposed new road link, as detailed above.

## Overview of Proposed Egress Route

The proposed egress route comprises, in part:

- The existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium;
- The internal access roads that currently serve the Gardens of Remembrance (namely the southern section of the road that loops around the Gardens of Remembrance);
- The existing internal access roads that currently serve the older, eastern section of the Cemetery and Crematorium (namely the southern section of the road which loops around the existing North and South Chapels); and
- The existing section of road between the main and inner gates to the existing Cemetery and Crematorium, from Bouncers Lane.

In addition to the above, it should also be noted that the proposed route also incorporates the existing Cemetery and Crematorium car park.

The existing internal access roads that serve the eastern section of the Cemetery and Crematorium are newer in nature than those in the western section of the Cemetery and Crematorium, and as such have been built to accommodate two-way vehicle movements.

The existing internal road that currently serves the Gardens of Remembrance operates as a one-way clockwise loop road, and is accessed through the existing Cemetery and Crematorium car park. The Gardens of Remembrance internal access road is wide enough to accommodate one-way traffic movements only. It should be noted that the carriageway is kerbed, and lined with remembrance plaques (mounted along the kerbs

along both sides of the carriageway). The nature of the road, in that it is used by visitors to view the remembrance plaques, lends itself to low vehicular speeds.

The existing internal access roads that currently serve the older, eastern section of the Cemetery and Crematorium (in particular the section which forms part of the route being considered) is wide enough to accommodate one-way traffic movements only, and as such operates as a one-way route (westbound from the car park). At its western extent it links to the existing section of road between the main and inner gates to the existing Cemetery and Crematorium, from Bouncers Lane.

For reference, the existing roads widths along the route are also shown on WSP | Parsons Brinckerhoff's drawing number **SK-05**.

## Opportunities and Constraints

The following section considers the opportunities and constraints presented by using the route to egress the proposed Crematorium.

For ease of reference, the opportunities and constraints noted along the route have been numbered, and have been marked on WSP | Parsons Brinckerhoff's drawing number **SK-06**. Where the points identified are generic to the route, these are highlighted in the key.

Where applicable, the safety implications associated with each of the identified constraints are also detailed in the following section.

### Swept Path Analysis

The following swept path assessments have been undertaken to determine the suitability of the proposed egress route to accommodate vehicular movements associated with the proposed Crematorium.

- Limousine (see WSP | Parsons Brinckerhoff drawing number **ATR-01**, attached to this report);
- Hearse (see WSP | Parsons Brinckerhoff drawing number **ATR-02**, attached to this report);
- Small Skip Lorry (see WSP | Parsons Brinckerhoff drawing number **ATR-03**, attached to this report);
- Rigid Vehicle (7m in length) (see WSP | Parsons Brinckerhoff drawing number **ATR-04**, attached to this report);
- Fire Tender (see WSP | Parsons Brinckerhoff drawing number **ATR-05**, attached to this report);

The results of the assessment demonstrate that all of the above vehicles could be accommodated along the proposed route. However, it should be noted that the route is extremely tight in places (particularly within the Gardens of Remembrance) for the larger vehicles detailed above (including a small skip lorry, rigid vehicle, and fire tender).

### Opportunities

- 1) This proposed egress route would not result in any displacement of traffic onto any other roads on the local highway network, above that currently used (i.e. Bouncers Lane);
- 2) Albeit the need to provide a new road link (between the existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium, and the internal access roads that currently serve the Gardens of Remembrance), the majority of the proposed egress route relies on the use of existing roads which currently serve the existing Cemetery and Crematorium;
- 3) It is not considered that there are any significant barriers (albeit an existing hedgerow and potential tree routes – see Point 22) to providing a new road link between the existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium, and the internal access roads that currently serve the Gardens of Remembrance;
- 4) The existing internal access road that currently serves the older, eastern section of the Cemetery and Crematorium (namely the southern section of the road which loops around the existing North and South Chapels) has recently been resurfaced. As such the carriageway in this location is in good condition;
- 5) It is assumed that, given the relocation of the existing Crematorium (North and South Chapels) and associated services, the level of use of the existing car park would drop significantly. As such, any issues that are currently experienced relating to the over-use of parking (which could otherwise impede egress), would potentially subside; and

- 6) Further to point 5, it is assumed that fewer vehicles (associated with services) would park along the older, eastern section of the Cemetery and Crematorium access road (namely the southern section of the road which loops around the existing North and South Chapels) in the future. As such, the potential for obstruction would be reduced.

#### Constraints

- 7) As detailed by the Options Appraisal and Impact Assessment Study, the proposed egress route would still rely on the use of the existing section of road between the main and inner gates to the Cemetery and Crematorium, from Bouncers Lane. Although there is not anticipated to be any uplift in traffic, it is worth noting that this section of road is understood to already experience congestion, owing to parked cars (particularly during services) and also the restrictive nature of the gates (which currently restrict traffic movements to one-way);
- 8) Owing to the fact that the egress route proposes use of the existing car park, there is potential for increased conflict and blocking (leading to delays) to occur, particularly during busy periods of the day / larger services. This is exacerbated by the narrow nature of the aisles in the car park, and the angle in which traffic enters the car park from the Gardens of Remembrance internal access road. This could also be exacerbated by the larger nature of the vehicles (limousine and hearse) which are proposed to use the route on a frequent basis in the future;
- 9) Further to point 8, it is not clear how well utilised the car park would be once the Crematorium is relocated (i.e. would it continue to be well used for burials?). On-site observations reveal that the car park is over-used during services, leading to vehicles parking haphazardly around the entrance / exit to the car park and along the existing internal access roads that currently serve the older, eastern section of the Cemetery and Crematorium. Again this could lead to potential issues with conflict / and blocking (leading to delays);
- 10) It is considered that there is potential that vehicles could stop, to visit memorial plaques (or even break down), along the Gardens of Remembrance internal access road, which could lead to potential blocking (given the route is one-way with limited passing points), and subsequent delays. Also, although it is not clear how well utilised the existing layby is located along the southern section of the Gardens of Remembrance internal access road, should this be over-used, or should a vehicle be awkwardly parked, this again could lead to potential blocking and delays;
- 11) Vehicles were observed to park along the verges of the internal access road that currently serves the older, eastern section of the Cemetery and Crematorium (namely the southern section of the road which loops around the existing North and South Chapels). There is potential for blocking / delays to occur as a result of this;
- 12) There are currently no road markings / physical barriers (such as kerbs) to denote the point where the Gardens of Remembrance internal access road (when entering from the car park) splits to travel north (to the immediate east of the kerbed island). There is potential for motorists to get confused here, resulting in increased potential for conflict (especially given the uplift in traffic movements associated with the proposed Crematorium);
- 13) Further to point 12, it is considered that the current road width (5.75m) and curvature of the road at the point where the Gardens of Remembrance internal access road splits (to the immediate east of the kerbed island) lends itself to a natural pinch point. As a result, there is potential for increased conflict at this point (especially when used by larger vehicles);
- 14) Sections of the carriageway along the Gardens of Remembrance internal access road were observed to be in poor condition (i.e. broken up, pot holed, ponding). The carriageway condition could be worsened by the potential increase in traffic movements along the route;
- 15) Owing to the projected increase in traffic movements through the Gardens of Remembrance, there is increased potential of damage occurring to the memorial plaques that currently line the kerbs.
- 16) Although the swept path analysis demonstrates that the existing route could accommodate all vehicles assessed, it should be noted that the route is extremely tight in places (in particularly for larger service vehicles within the Gardens of Remembrance). As such, there is increased risk of larger vehicles colliding with and damaging the kerbs;
- 17) The carriageway is currently narrow (approximately 2.75m wide) at the point where it is proposed to link into the Gardens of Remembrance internal access road (at the northern extent). There is potential for vehicles to clip the kerb in this location;

- 18) Visibility is somewhat restricted when looking right (by existing foliage) at the point where it is proposed to link into the Gardens of Remembrance internal access road (at the northern extent). Furthermore (given the current layout) there are no priority workings in this location. Combined, these points could lead to motorists failing to give-way in this location, leading to potential conflict;
- 19) Forward visibility for vehicles at the southwest extent of the Gardens of Remembrance internal access road (when travelling westbound toward the car park) is somewhat limited by the curvature of the road and existing furniture / foliage lining the route. On exiting the proposed Crematorium, there is potential for motorists not to see a pedestrian in the road at this point, leading to increased potential for vehicle to pedestrian conflict;
- 20) Further to point 19, it should also be noted that pedestrian to vehicle visibility is also poor when looking left towards oncoming westbound traffic at the point where the existing footways intersect the road (at the southwest extent of the Gardens of Remembrance). Again, owing to the projected increased vehicle movements associated with the proposed Crematorium, there is increased potential for vehicle to pedestrian conflict in this location; and
- 21) Owing to the nature of the route, in particular through the Gardens of Remembrance, and the intensification of traffic movements, there is potential for increased safety risk to pedestrians. This is exacerbated by:
  1. The position of the memorial plaques (which currently line the kerbs along the Gardens of Remembrance internal roads), which encourage residents to stand in the road for viewing;
  2. The narrow road widths along the Gardens of Remembrance internal roads (which varies between 3.0m and 3.5m), in which there is insufficient space for a pedestrian to stand in the road whilst a vehicle passes;
  3. The network of footways within the Gardens of Remembrance, in which there are numerous points where pedestrians can cross the internal access road; and
  4. Where the route travels through the car park, there is potential for increased conflict with pedestrians entering / exiting vehicles.
- 22) There is currently an existing hedgerow and tree-routes which would likely be impacted where it is proposed to provide road link between the existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium, and the internal access roads that currently serve the Gardens of Remembrance.

## Potential Mitigation Measures

Consideration has been given to possible measures to mitigate against the constraints identified above. For ease of reference, where applicable, reference is made to the specific constraints.

### Points 8 and 9

Consideration could be given to removing the car parking within the central aisle of the car park. This would ease egress for vehicles exiting the proposed Crematorium.

Furthermore, consideration could be given to managing the use of the car park, particularly during peak times of operation of the proposed Crematorium (subject to its projected level of use in the future).

### Point 10

Consideration could be given to formalising the existing layby (by introducing white lining), to discourage vehicles from parking within the extents of the running carriageway.

### Point 11

This is considered to be an internal management issue.

### Points 12 and 13

Consideration could be given to:

- Introducing formal road markings in this location to denote entry / exit lanes;
- Introducing improved signage to make motorists aware of the current arrangement; and
- Widening this section of road / or, if not possible, introducing give-way road markings on entry / exit, which would discourage two-way traffic from using the pinch point.



#### Point 14

Consider repairing / resurfacing the areas of poor / damaged road surface.

#### Point 15

Consider relocating the memorial plaques.

#### Point 16

Consideration could be given to using an alternative route to egress the proposed Crematorium for larger vehicles (namely service vehicles).

#### Point 17

Consideration could be given to widening the existing carriageway in this location. However, it is not known the extent of memorial plaques / ash scatterings in this location, and the issues surrounding any impacts on these.

#### Point 18

Consideration could be given to:

- Trimming the existing foliage in this location to improve visibility (looking right); and
- Introducing formal give-way road markings.

#### Points 19 and 20

Consideration could be given to introducing signage and / or physical measures (i.e. speed humps) to further slow speeds in this location (thus reducing the potential for conflict to occur).

#### Point 21

Consider relocating the memorial plaques. See also potential mitigation measures detailed above for points 8, 9, 19 and 20.

#### General

In addition to the above, consideration could also be given to deploying a member of staff to manage traffic flows along the route (particularly through the Gardens of Remembrance) during service times.

## Suitability of Proposed Egress Route

Further to the above assessment, it is considered that there are no significant physical constraints (in terms of geometry) that would otherwise restrict the use of the route by general vehicles (i.e. large cars, limousines, and hearses) to egress the proposed Crematorium. However, there are potential physical constraints (in terms of existing road widths, particularly within the Gardens of Remembrance) to using the route for larger vehicles (namely service vehicles). As such, an alternative route should be considered for service vehicles.

There are a number of potential safety related reasons in which the route may not be suitable to serve the proposed Crematorium, including the potential for increased risk to pedestrians, and also other motorists using and / or parked along the route.

It is considered that there are no major physical constraints to providing a road link between the existing internal access roads that currently serve the newer, eastern section of the Cemetery and Crematorium, and the internal access roads that currently serve the Gardens of Remembrance. Following the site visit it was observed that part of the fields in the southeast section of the cemetery, where it is proposed to provide the new road link, were occupied by graves. However, it is considered that, at present, there is still sufficient space to the west of this area to accommodate the road link (albeit there may be a requirement to provide a non-straight road link, which would skirt around the existing graves in this location). There was also observed to be a slight difference in levels between the field and Gardens of Remembrance internal road. However, this was not considered significant.

# Conclusion

This Technical Note (02) has been prepared at the request of CBC, to consider the feasibility of using the existing Gardens of Remembrance and Cemetery and Crematorium access roads (from Bouncers Lane) as an egress route (only) to serve the proposed Crematorium.

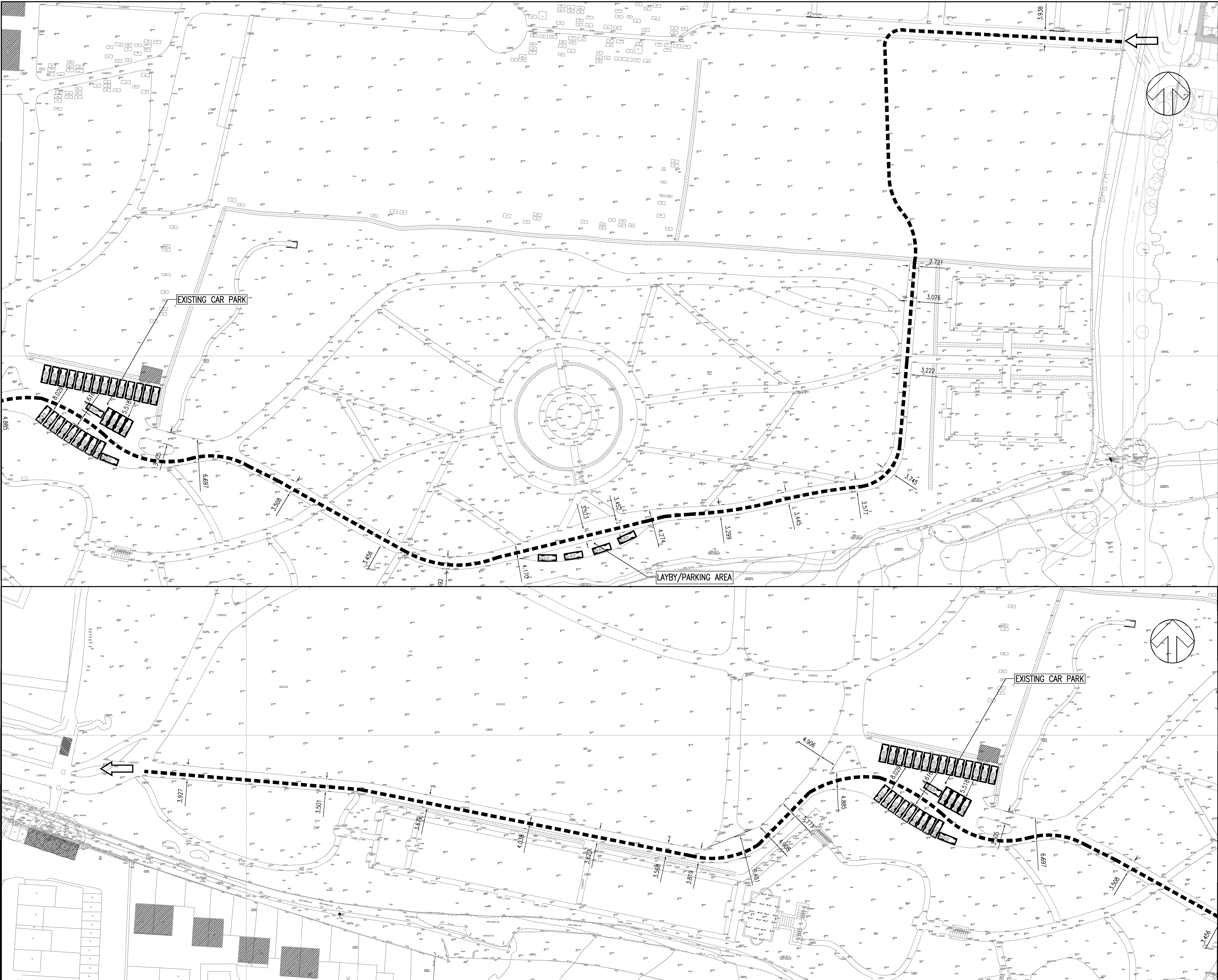
The following key points can be concluded from this TN:

- It is considered that there are no significant physical constraints (in terms of geometry) that would otherwise restrict the use of the route by general vehicles associated with services (i.e. large cars, limousines, and hearses) to egress the proposed Crematorium;
- It is recognised that there are potential physical constraints to using the route for larger vehicles (namely by a service vehicles). As such, an alternative route should be considered for service vehicles; and
- There are a number of potential safety related reasons in which the route may not be deemed suitable to serve the proposed Crematorium, including the potential for increased risk to pedestrians, and also other motorists using and / or parked along the route.

## Figures



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KEY

INDICATIVE EGRESS ROUTE

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REV	DATE	BY	DESCRIPTION	CHK	APD

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PROJECT:

CHELTENHAM CREMATORIAL

TITLE:

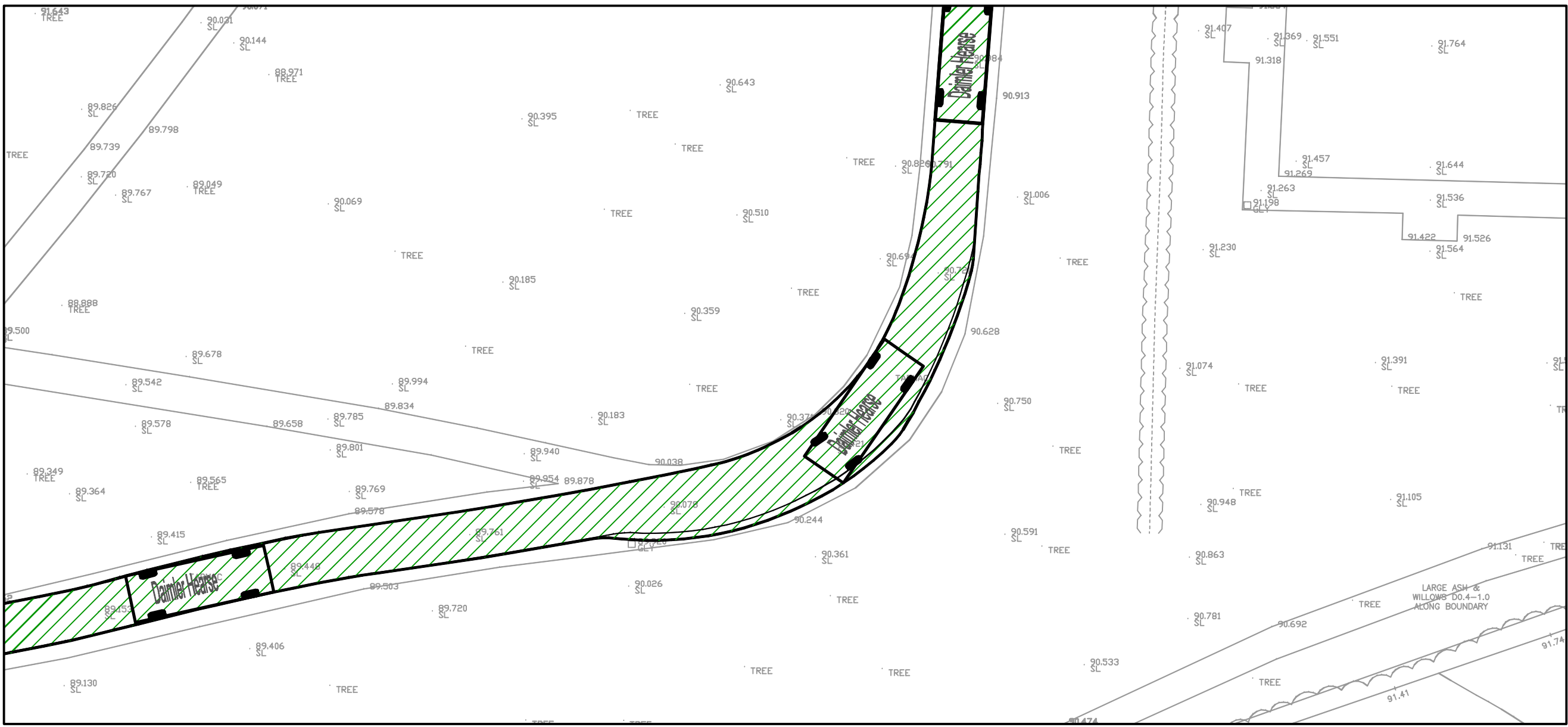
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PROJECT NO:	70020522	DRAWING NO:	SK-05	REV:	A

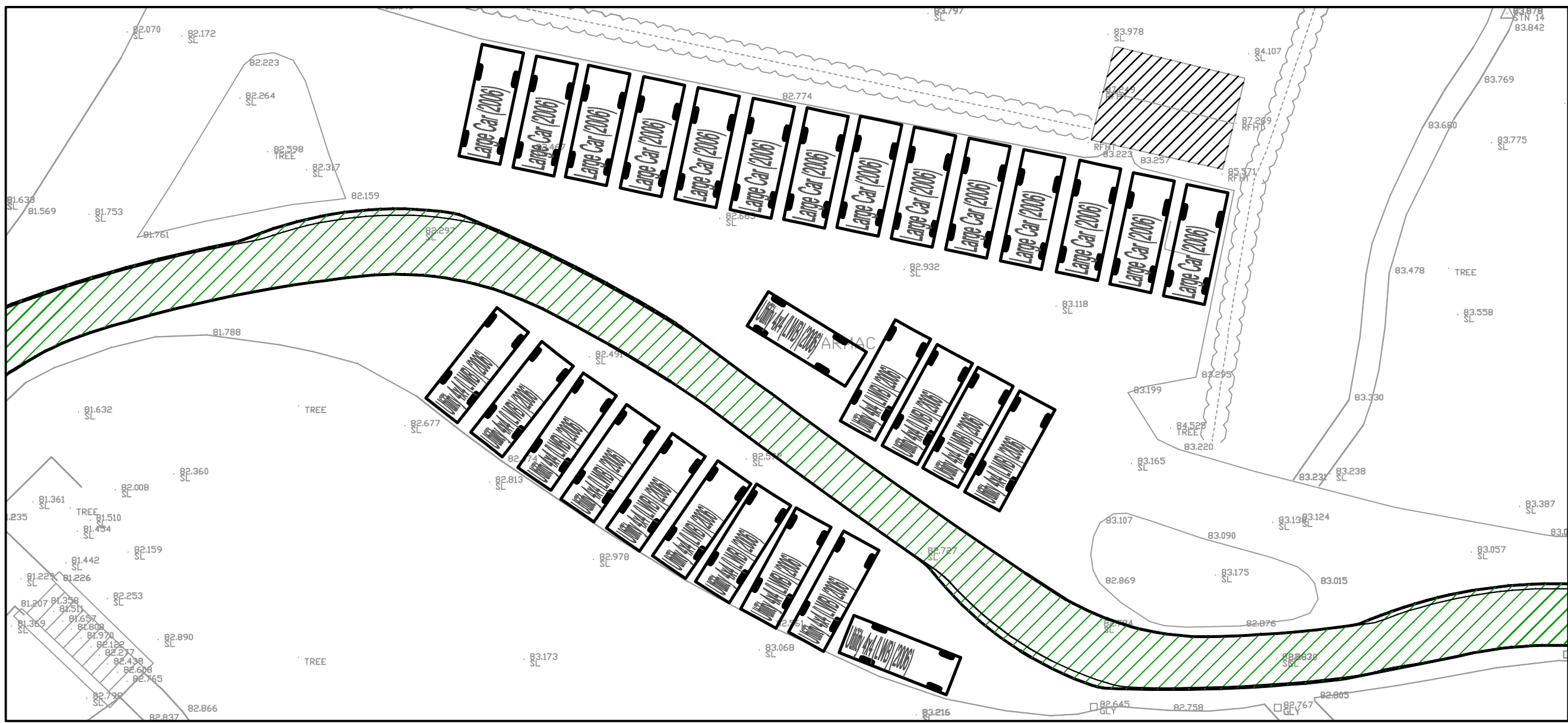
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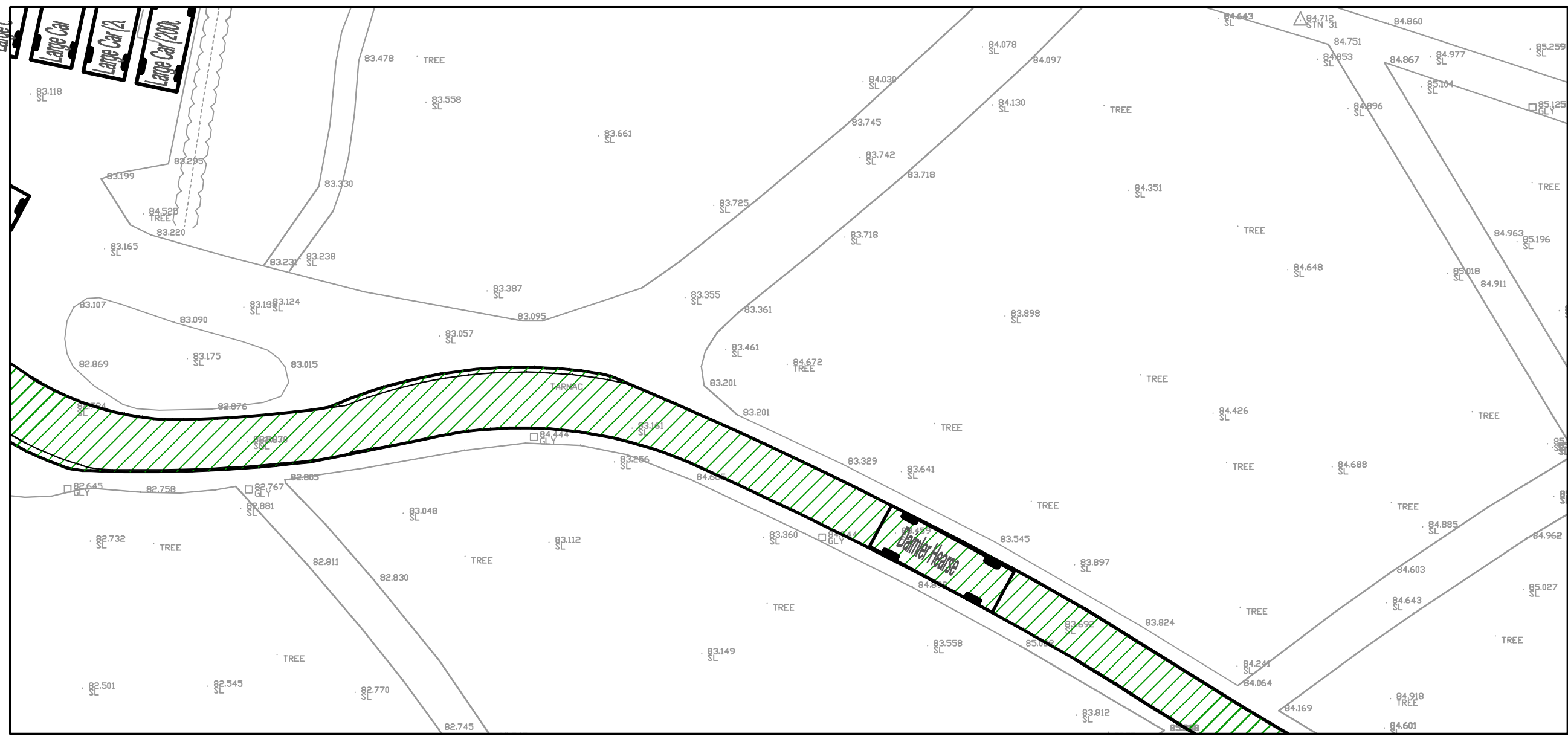
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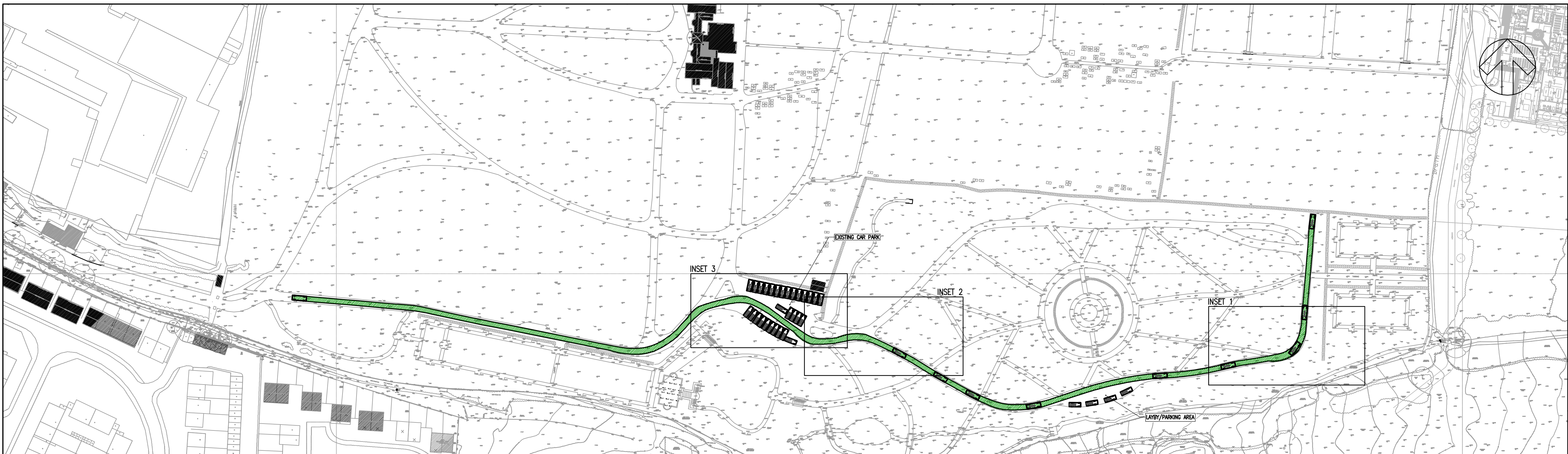
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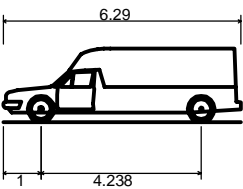


INSET 2  
SCALE 1:200



SWEPT PATH ANALYSIS - HEARSE  
SCALE 1:1000

DO NOT SCALE



Daimler Hearse  
Overall Length 6.290m  
Overall Width 2.108m  
Overall Body Height 1.950m  
Min Body Ground Clearance 0.251m  
Track Width 2.100m  
Lock to Lock Time 6.00s  
Wall to Wall Turning Radius 7.450m

REV	DATE	BY	DESCRIPTION	CHK	APD
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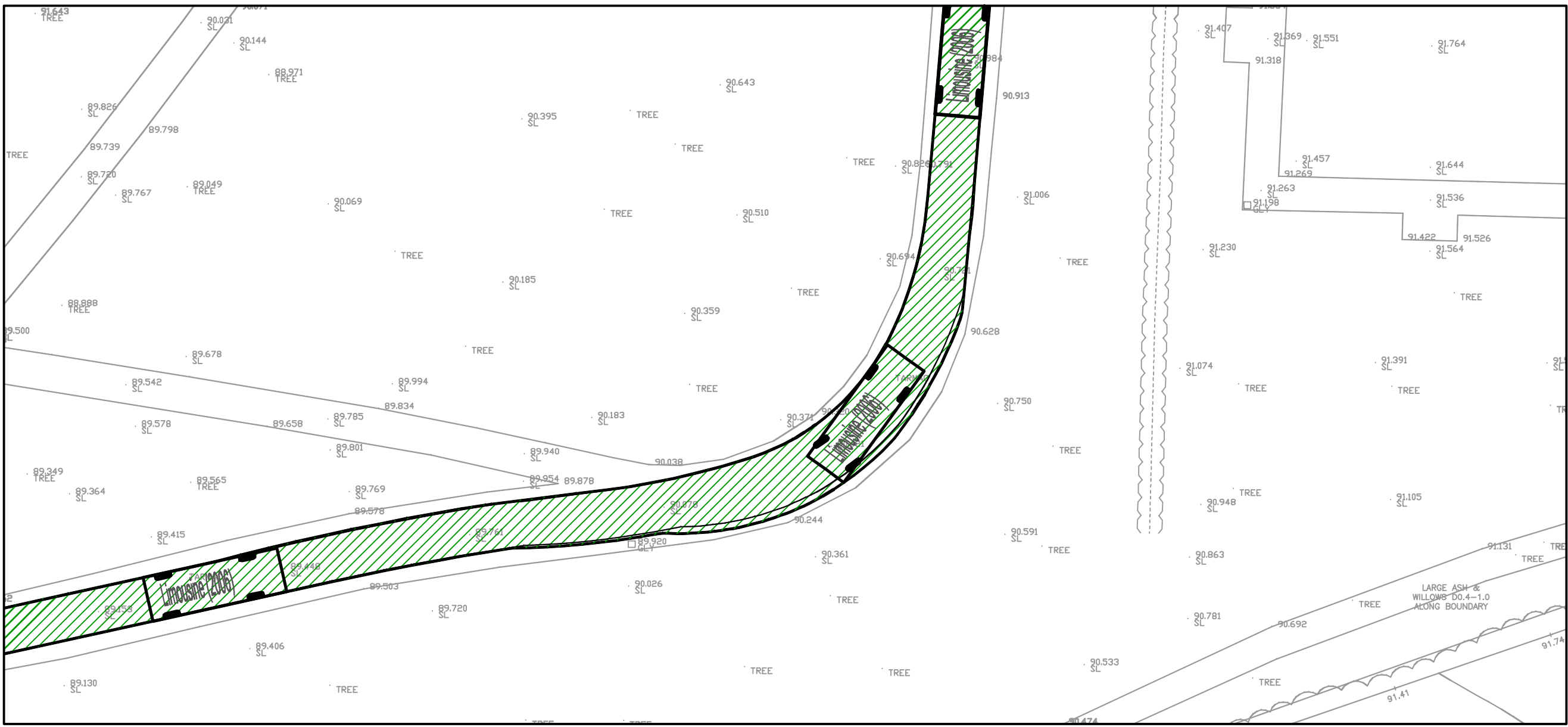
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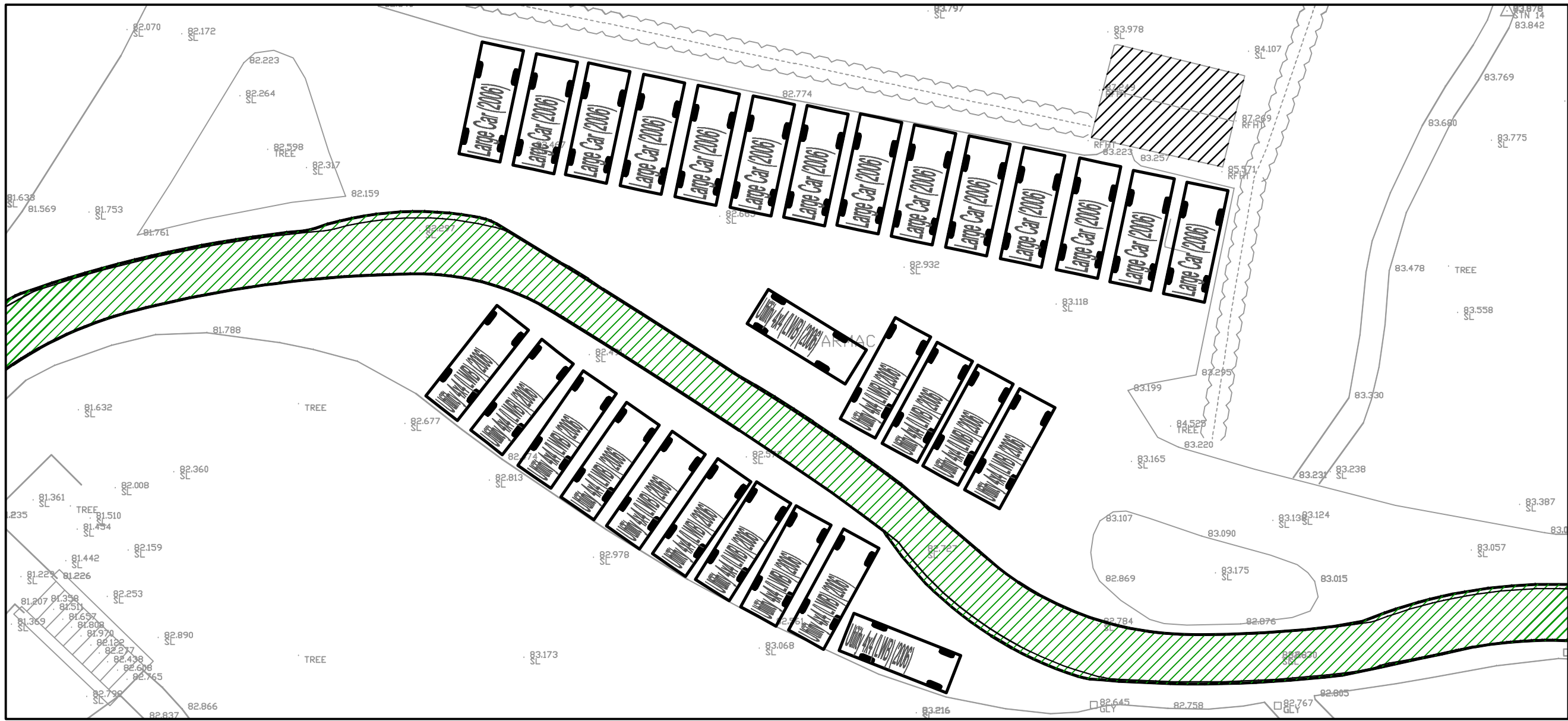
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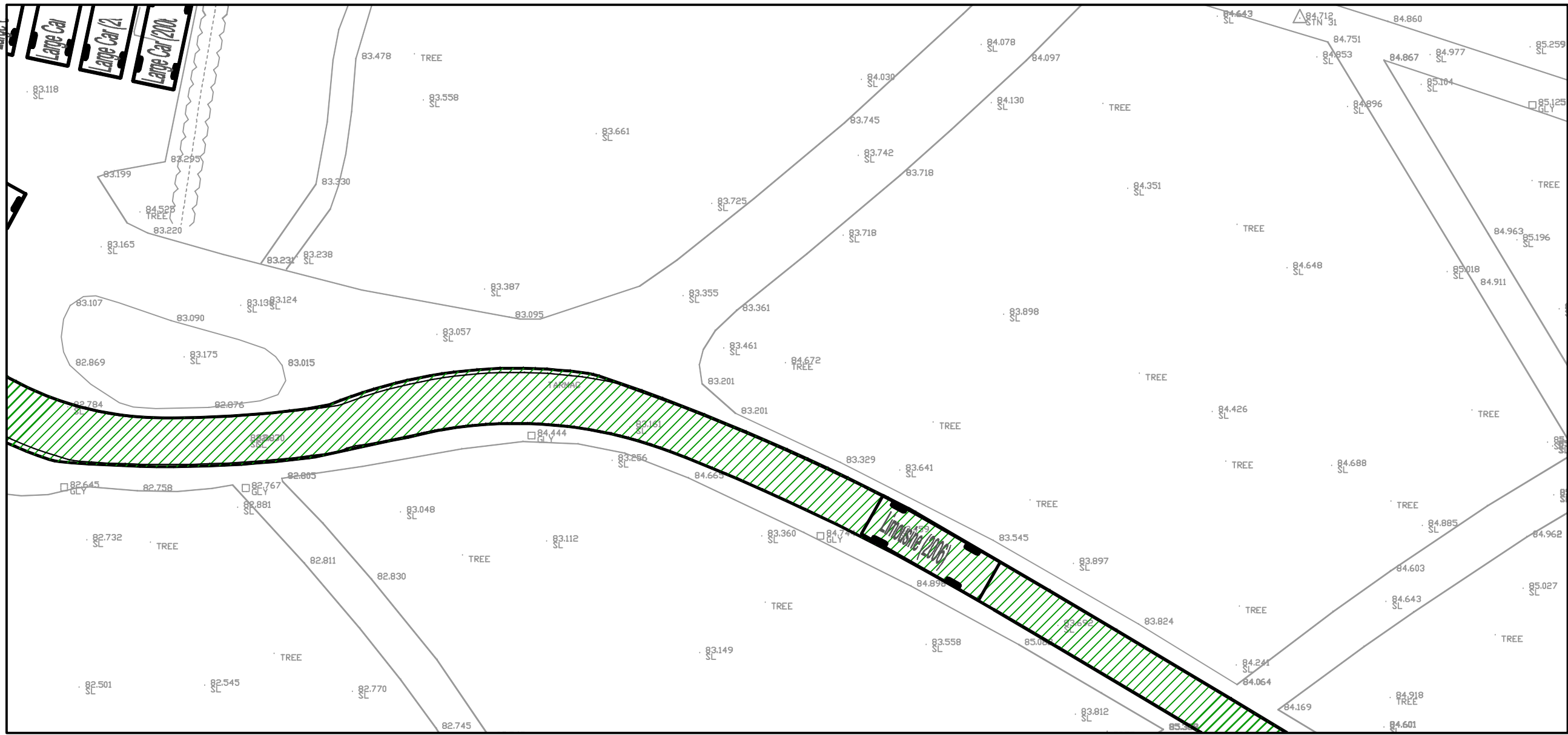
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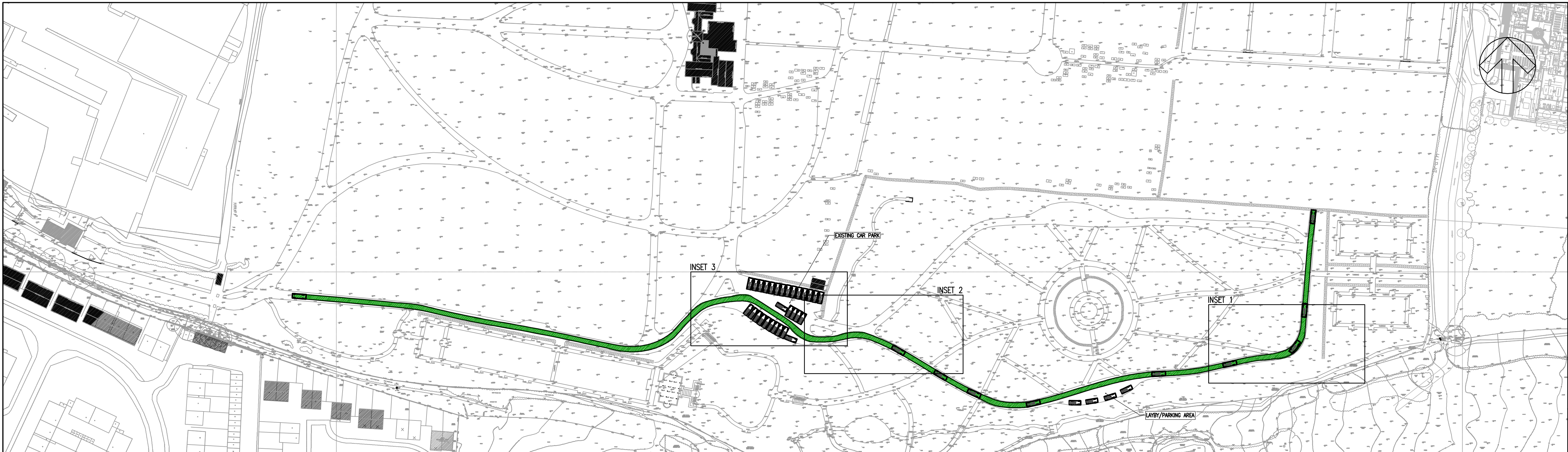
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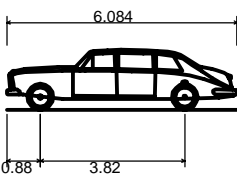


INSET 2  
SCALE 1:200



SWEPT PATH ANALYSIS - HEARSE  
SCALE 1:1000

DO NOT SCALE



Limousine (2006)  
Overall Length 6.084m  
Overall Width 1.990m  
Overall Body Height 1.583m  
Min Body Ground Clearance 0.276m  
Max Track Width 1.950m  
Lock to Lock Time 4.00s  
Wall to Wall Turning Radius 7.000m

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TITLE: PROPOSED EGRESS ROUTE - SWEEP PATH ANALYSIS OF A LIMOUSINE

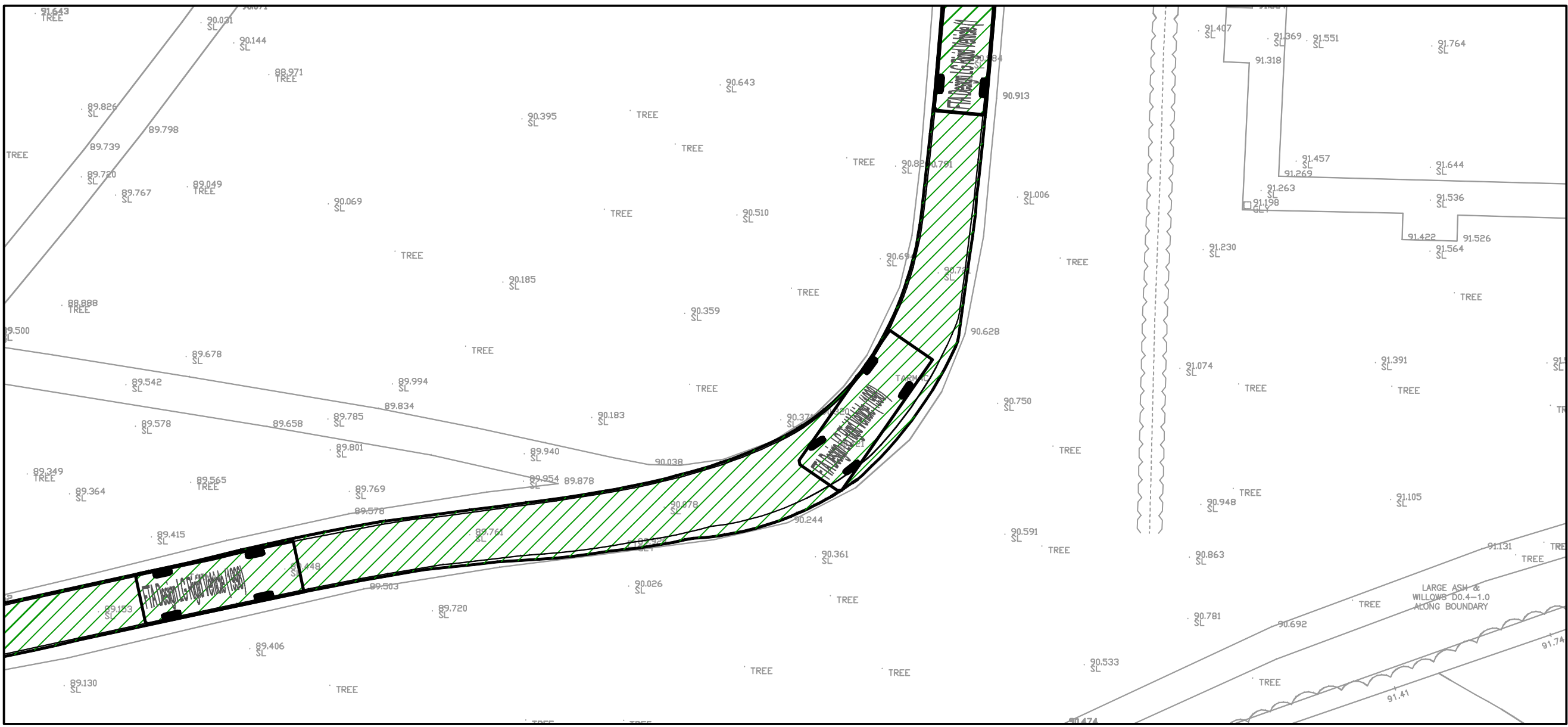
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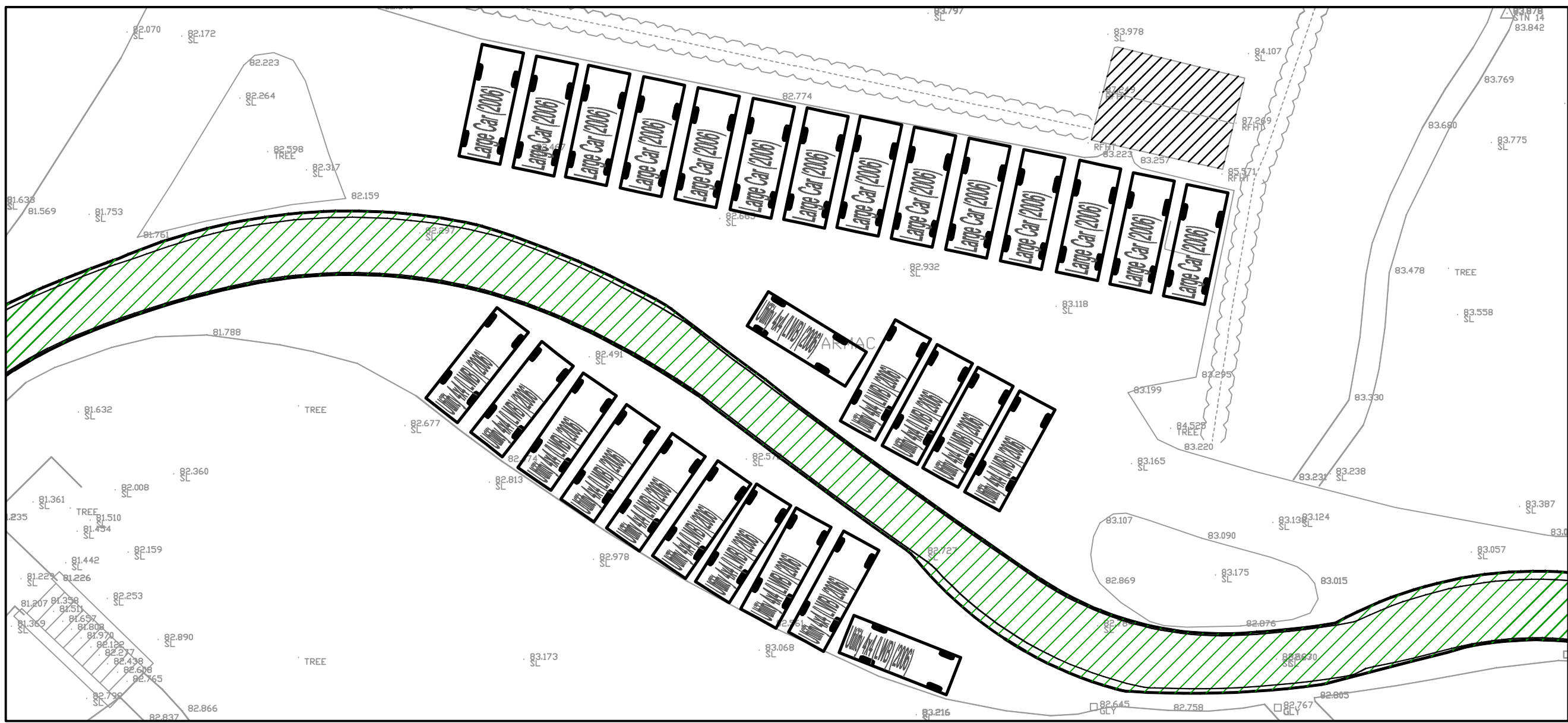
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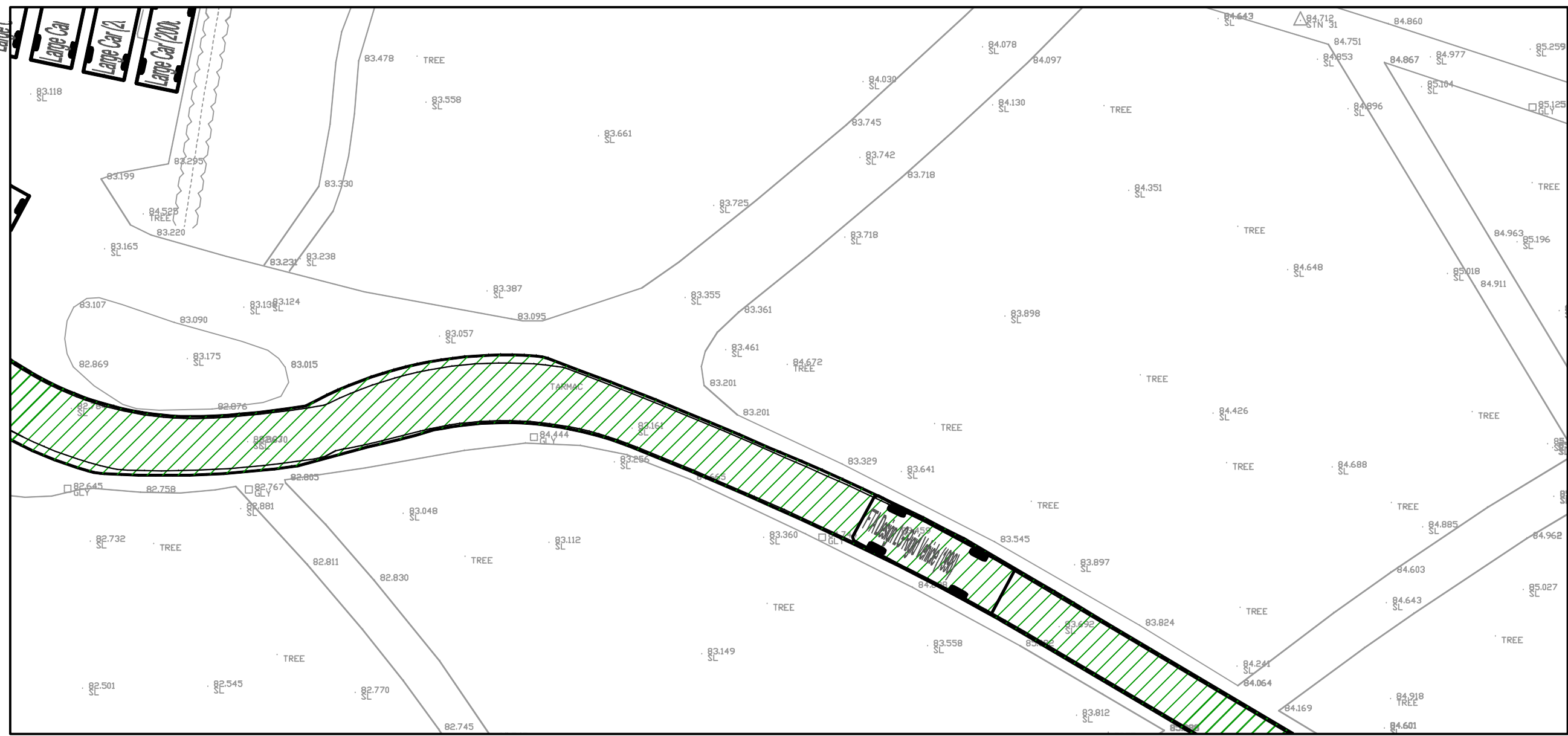
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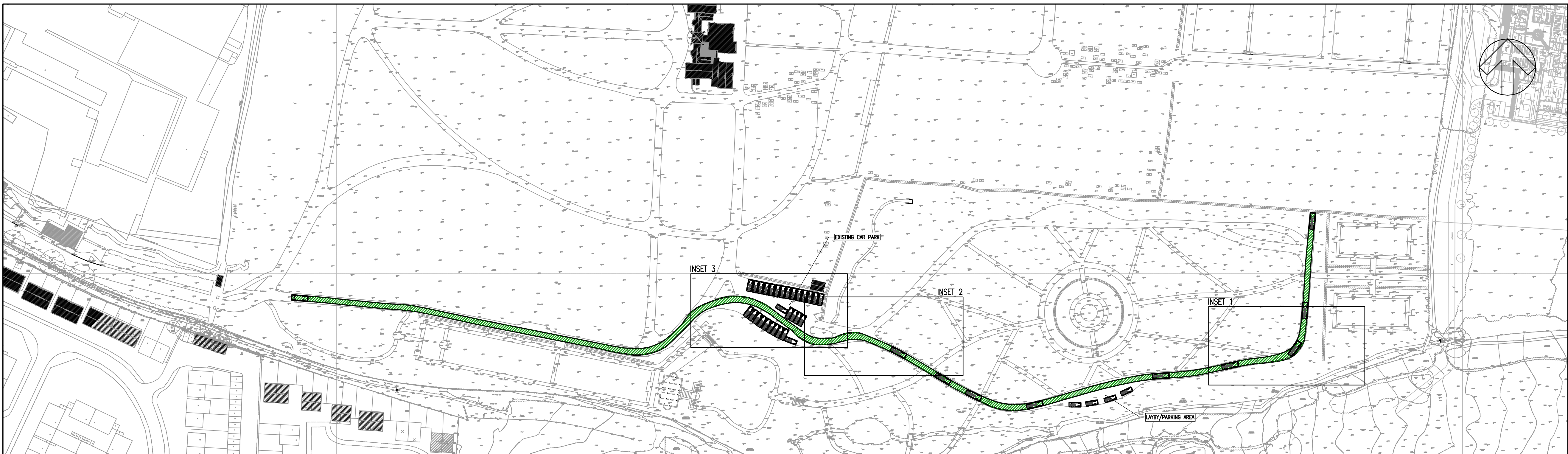
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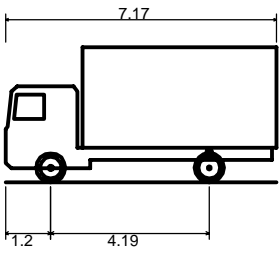


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SCALE 1:200



SWEPT PATH ANALYSIS - HEARSE  
SCALE 1:1000

DO NOT SCALE



FTA Design LG Rigid Vehicle (1998)  
Overall Length 7.170m  
Overall Width 2.300m  
Overall Body Height 3.580m  
Min Body Ground Clearance 0.375m  
Track Width 2.120m  
Lock to Lock Time 3.00s  
Kerb to Kerb Turning Radius 7.000m

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PROJECT: CHELTENHAM CREMATORIUM

TITLE: PROPOSED EGRESS ROUTE - SWEEP PATH ANALYSIS OF A RIGID VEHICLE

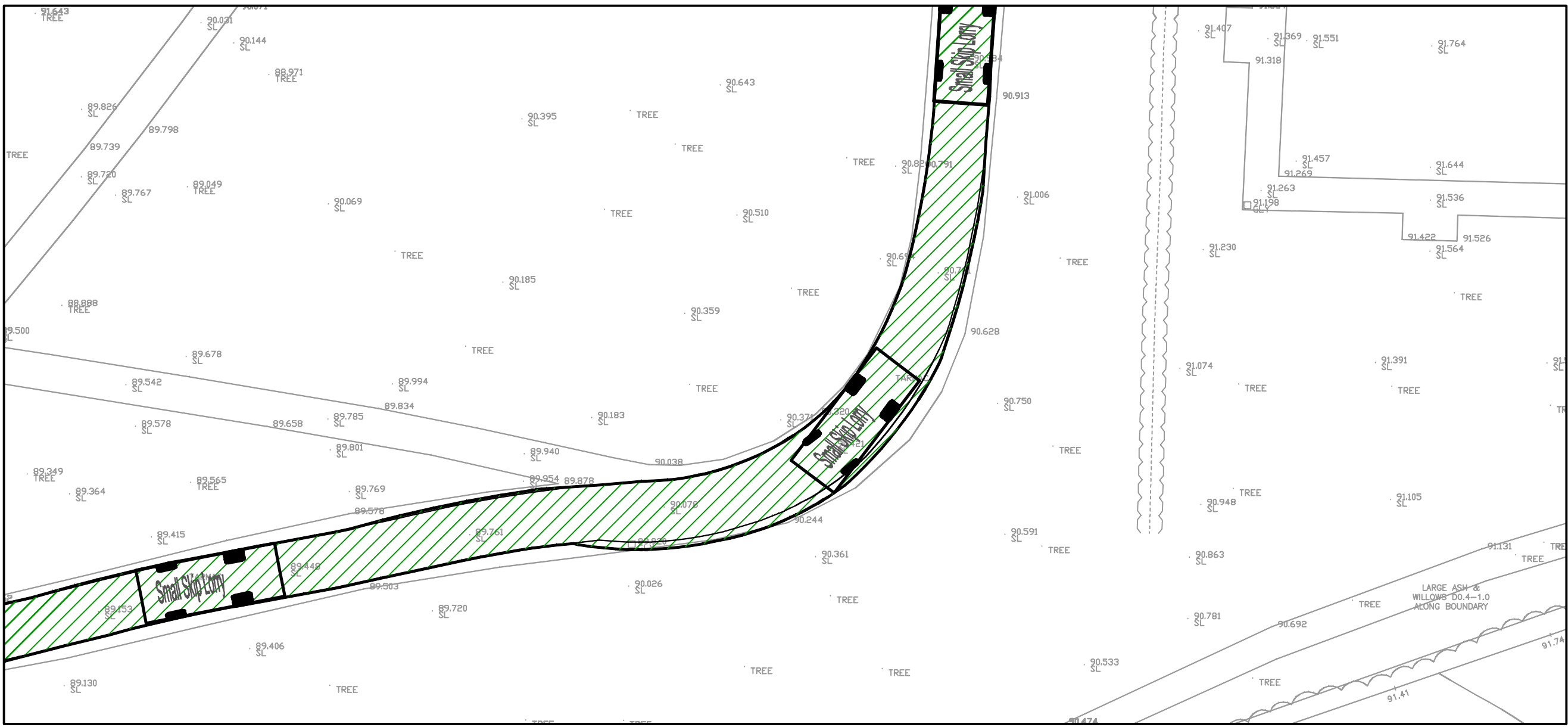
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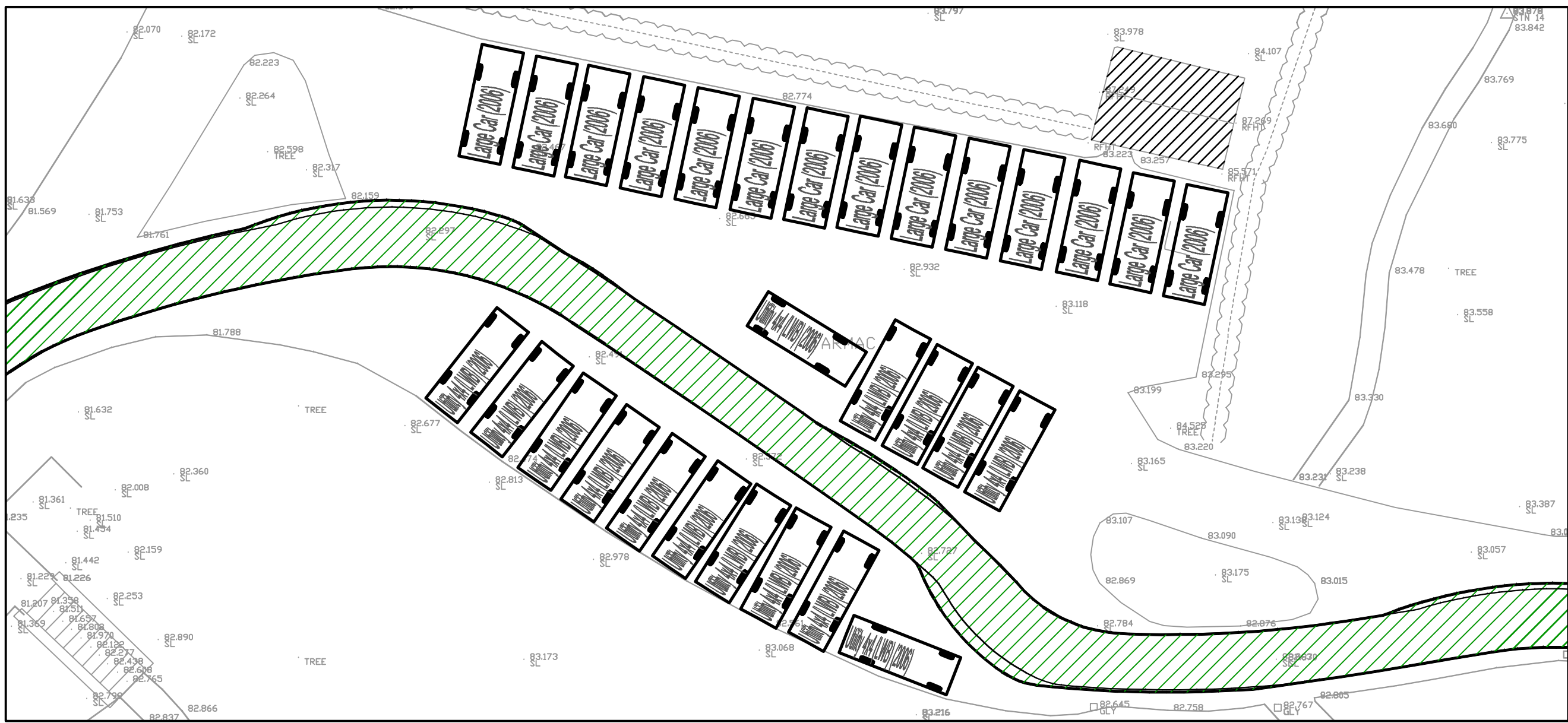
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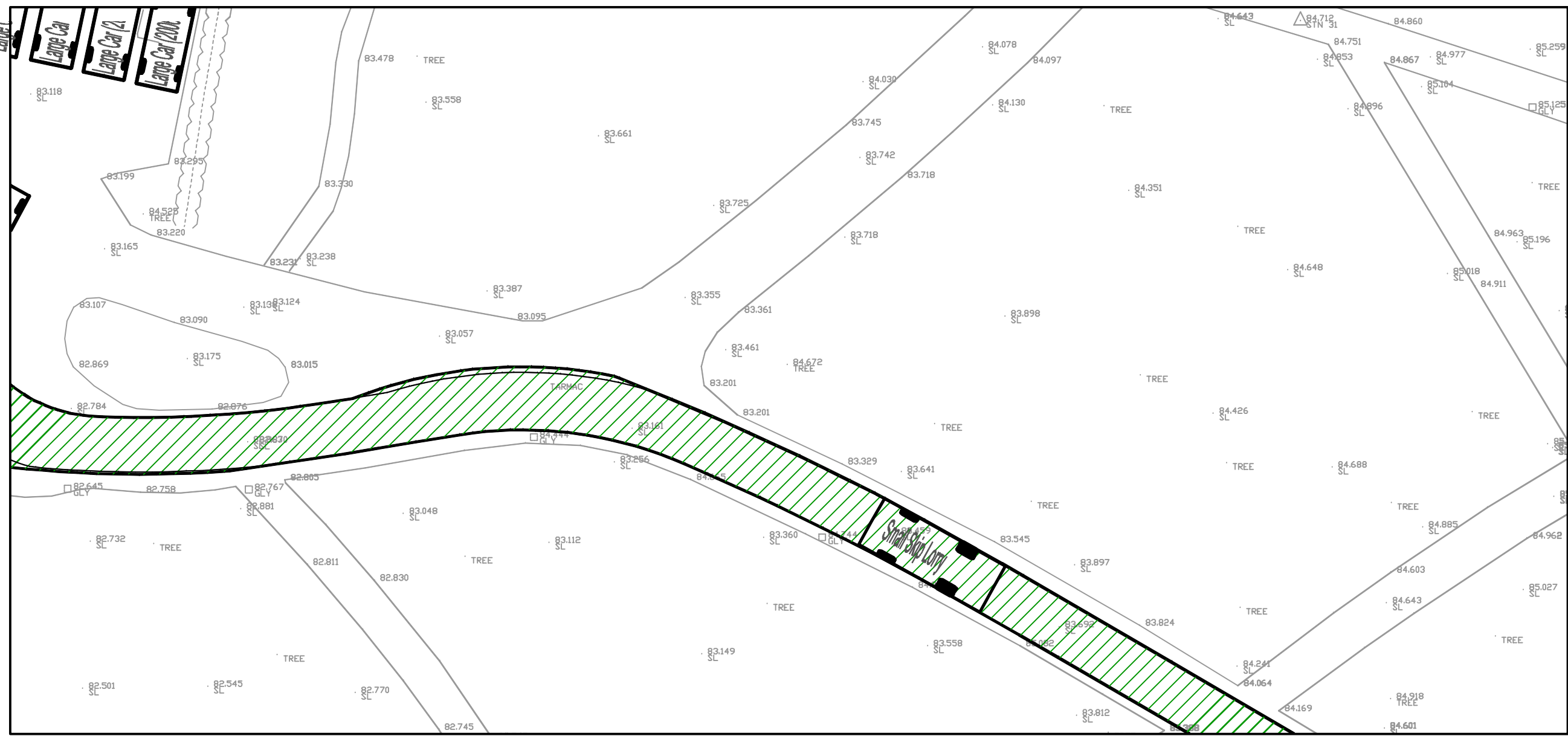
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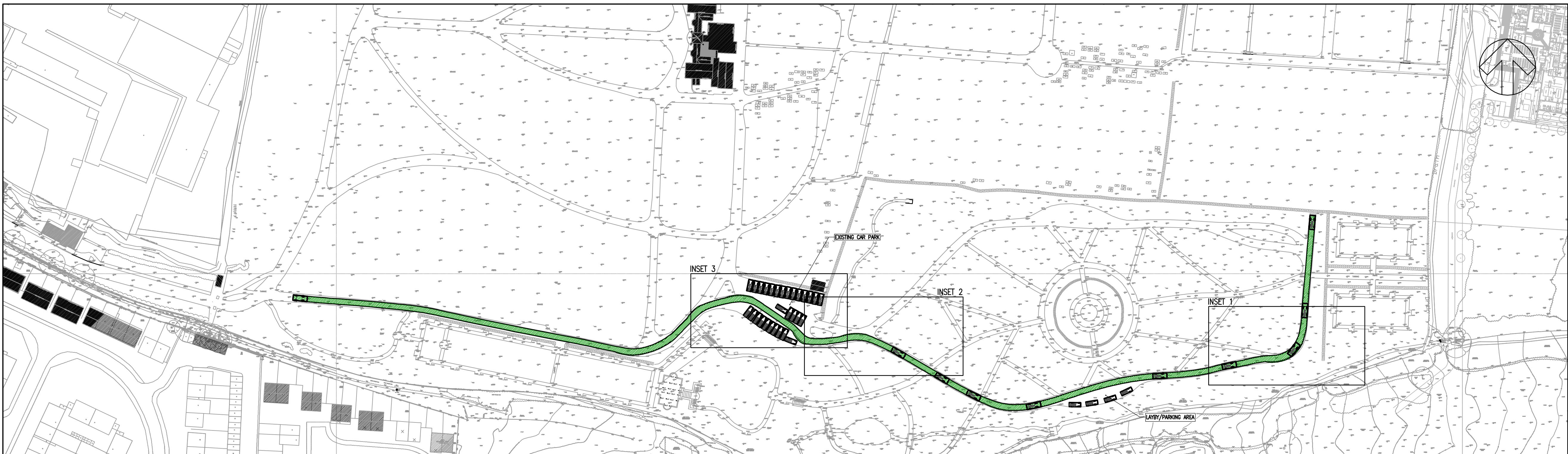
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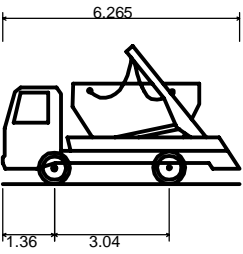


INSET 2  
SCALE 1:200



SWEPT PATH ANALYSIS - HEARSE  
SCALE 1:1000

DO NOT SCALE



Small Skip Lorry  
Overall Length 6.265m  
Overall Width 2.390m  
Overall Body Height 3.650m  
Min Body Ground Clearance 0.385m  
Max Track Width 2.435m  
Lock to Lock Time 6.00s  
Kerb to Kerb Turning Radius 6.340m

REV	DATE	BY	DESCRIPTION	CHK	APD
A	06/02/2017	KK	FIRST ISSUE	JM	DB

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CLIENT: CHELTENHAM BOROUGH COUNCIL

ARCHITECT:

PROJECT: CHELTENHAM CREMATORIUM

TITLE: PROPOSED EGRESS ROUTE - SWEPT PATH ANALYSIS OF A SMALL SKIP LORRY

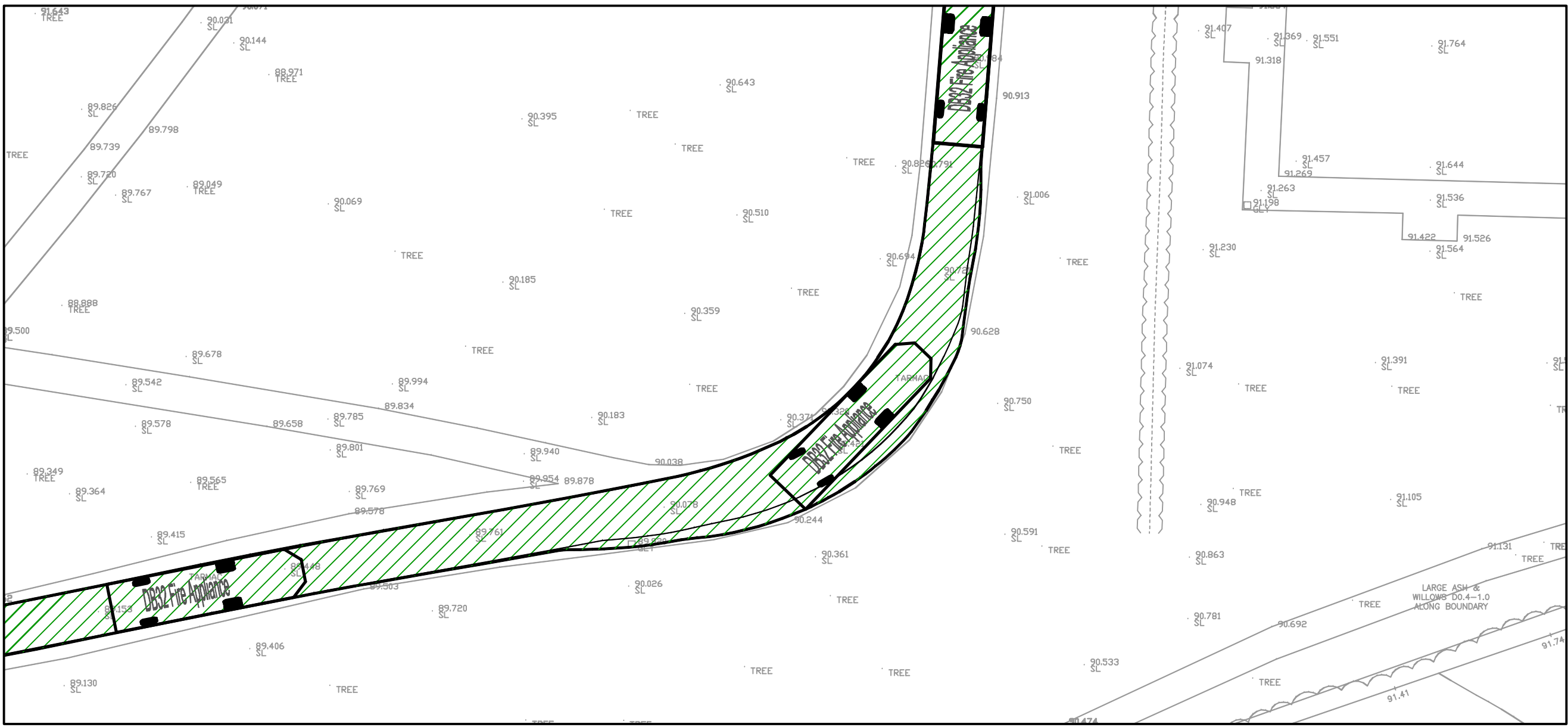
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CAD FILE:	0522-ATR-04	DESIGN-DRAWN:	KK	DATE:	February 2017

PROJECT No:	70020522	DRAWING No:	0522-ATR-04	REV:	A
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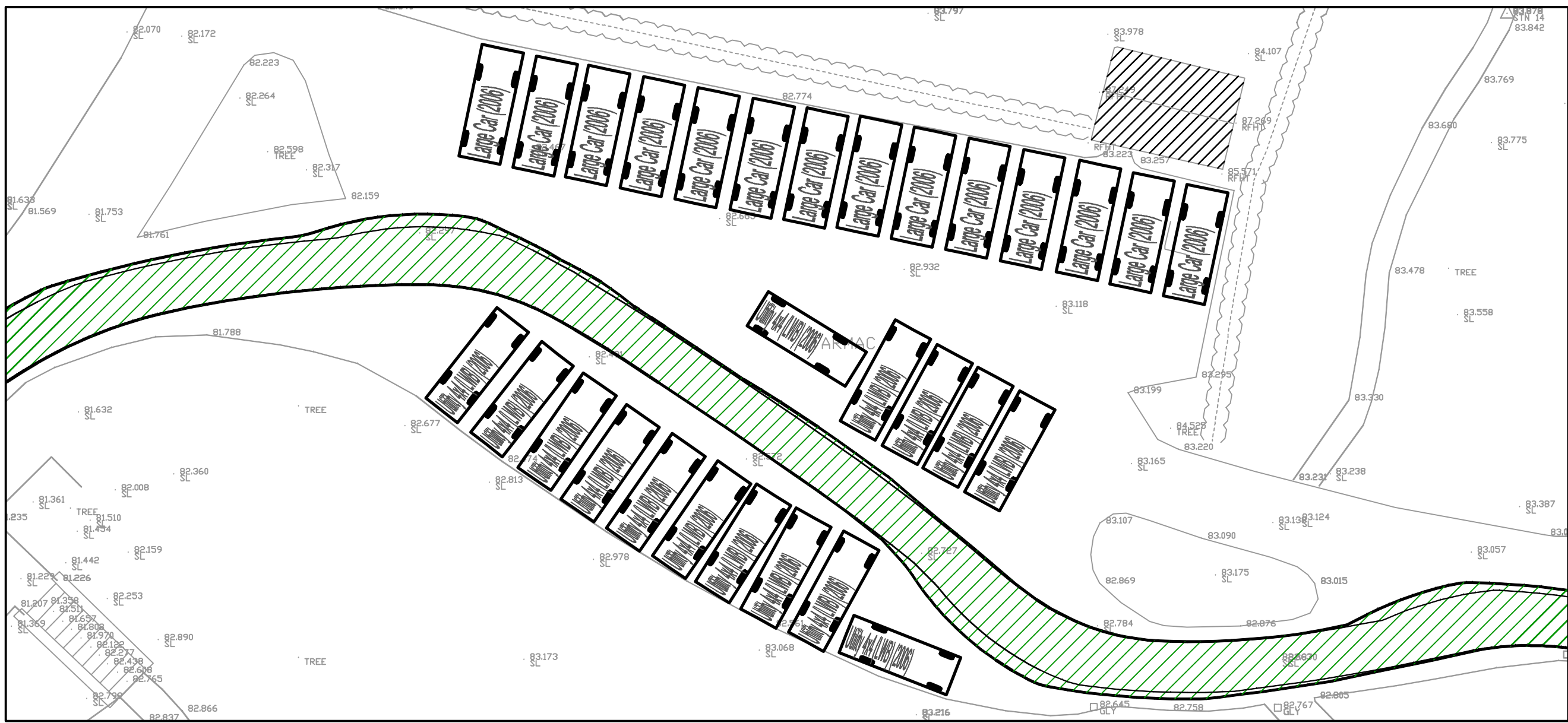
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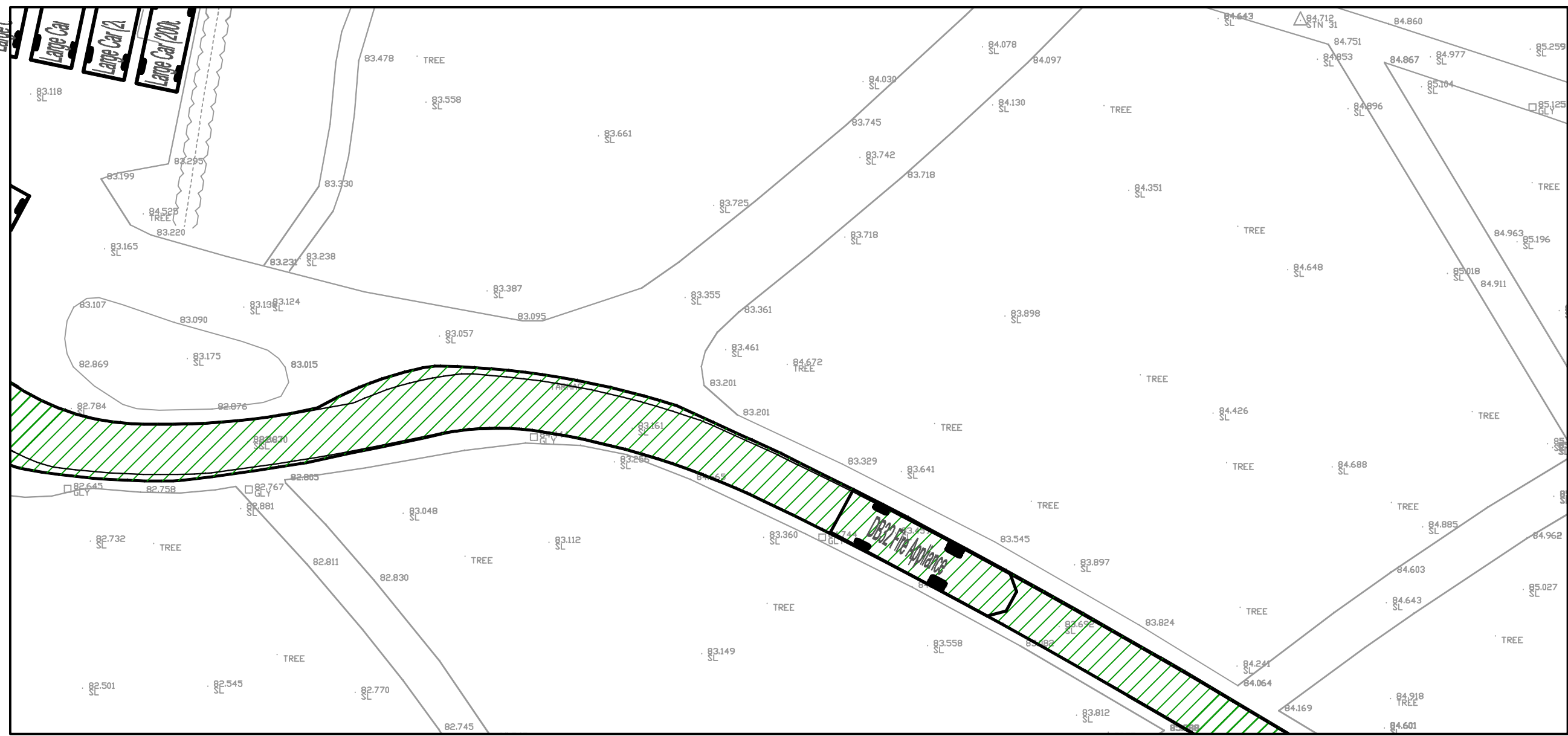
\\UK.WSPGROUP.COM\CENTRAL DATA\PROJECTS\700205XX\70020522 - CHELTENHAM CREMATORIUM\A.E MODELS AND DRAWINGS\DEVELOPMENT\AUTOCAD\ATR VEHICLE TRACKING\0522-ATR-01-05.DWG 06/02/2017 16:23:37 McGiechrist, Drew



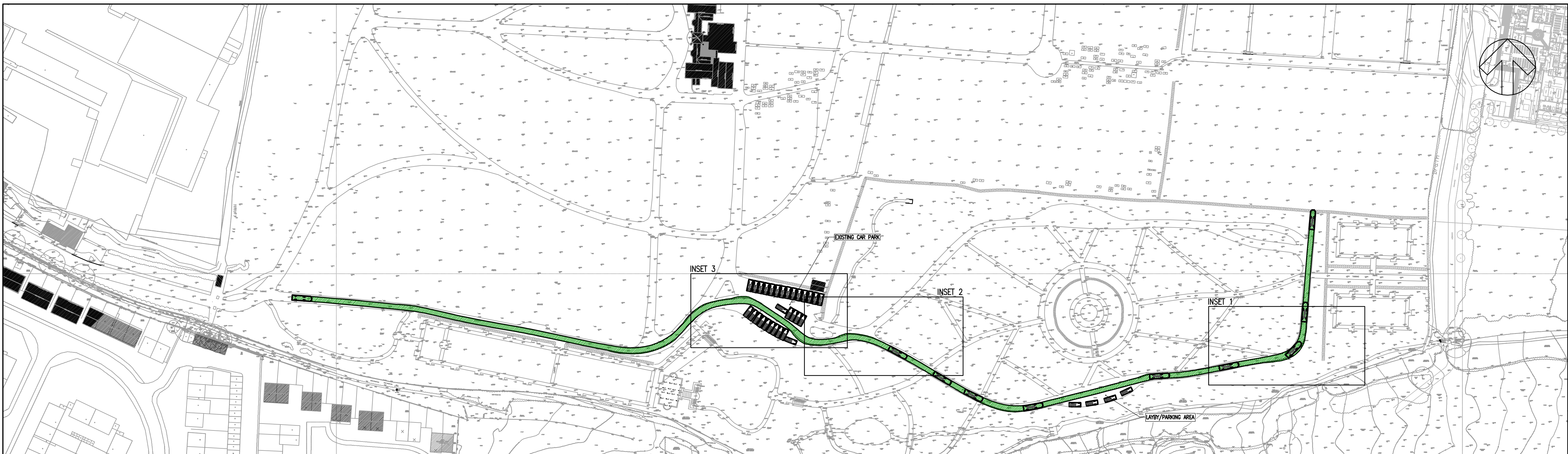
INSET 1  
SCALE 1:200



INSET 3  
SCALE 1:200

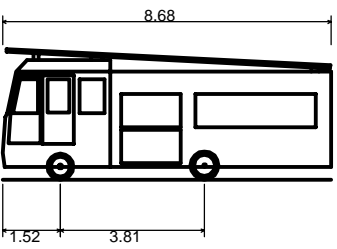


INSET 2  
SCALE 1:200



SWEPT PATH ANALYSIS - HEARSE  
SCALE 1:1000

DO NOT SCALE



DB32 Fire Appliance  
Overall Length 8.680m  
Overall Width 2.180m  
Overall Body Height 3.452m  
Min Body Ground Clearance 0.337m  
Max Track Width 2.121m  
Lock to Lock Time 6.00s  
Kerb to Kerb Turning Radius 7.910m

REV	DATE	BY	DESCRIPTION	CHK	APD
A	06/02/2017	KK	FIRST ISSUE	JM	DB

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CLIENT: CHELTENHAM BOROUGH COUNCIL

ARCHITECT:

PROJECT: CHELTENHAM CREMATORIUM

TITLE: PROPOSED EGRESS ROUTE - SWEEP PATH ANALYSIS OF A FIRE TENDER

SCALE @ A1: AS SHOWN	CHECKED: JM	APPROVED: DB
CAD FILE: 0522-ATR-05	DESIGN-DRAWN: KK	DATE: February 2017

PROJECT No: 70020522	DRAWING No: 0522-ATR-05	REV: A
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CLIENT: CHELTENHAM BOROUGH COUNCIL

ARCHITECT:

PROJECT:

CHELTENHAM CREMATORIUM

TITLE: PROPOSED EGRESS ROUTE - OPPORTUNITIES + CONSTRAINTS

SCALE @ A1: 1:500	CHECKED: JM	APPROVED: DB
CAD FILE: SK-06	DESIGN-DRAWN: KK	DATE: February 2017

PROJECT No: 70020522	DRAWING No: SK-06	REV: A
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