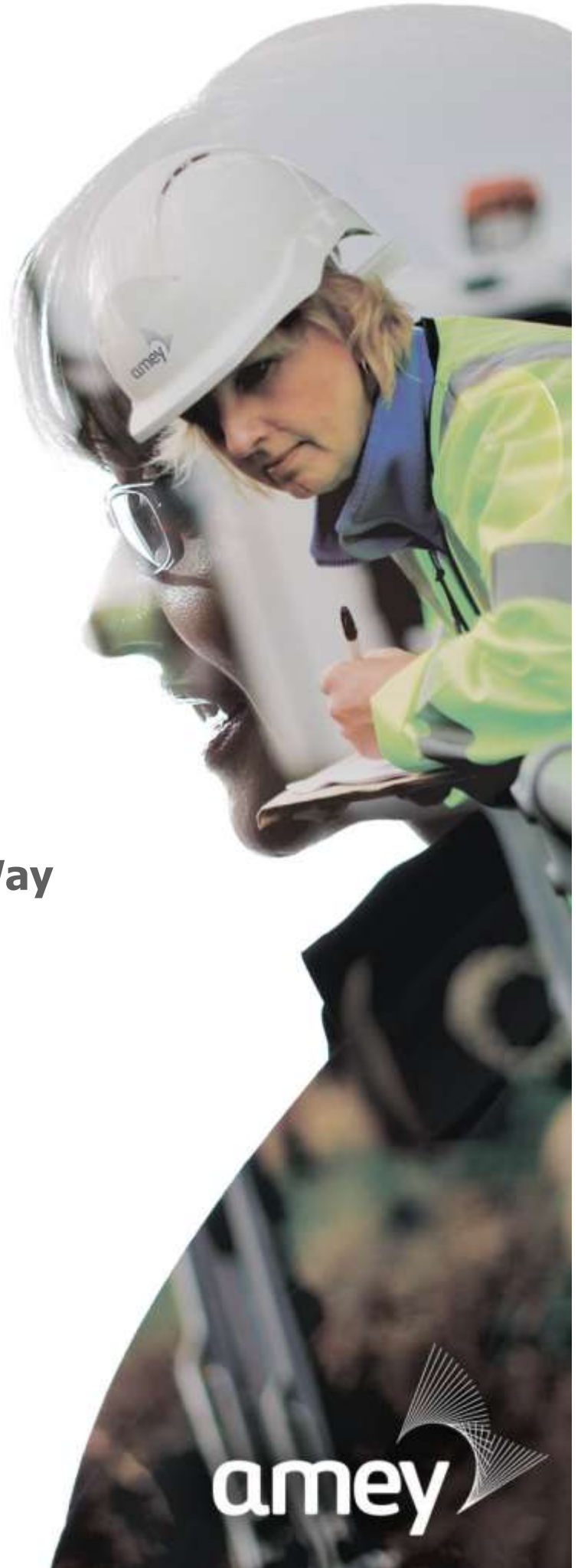


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# Transport Statement Proposed Mixed Use Development, The Dove Way

COSTCDM0015 01

June 2015



**Document Control Sheet**

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## **1 Introduction**

### **1.1 Background**

Amey has been commissioned by East Staffordshire Borough Council to undertake a Transport Statement in support of a proposed mixed use development on land off The Dove Way, Uttoxeter. A previous approved Transport Assessment was submitted by Mewies Engineering Consultants Ltd (MEC) in 2011; however this application has now been amended to include a Household Waste Recycling Centre (HWRC) replacing several of the proposed commercial units. A proposed site layout is highlighted in Figure 1 in Appendix A.

Following a scoping meeting on the 15<sup>th</sup> May 2015 it was agreed that as the principle of the previous MEC Transport Assessment has been accepted, the subsequent amendments as a result of the HWRC will be addressed in this Transport Statement.

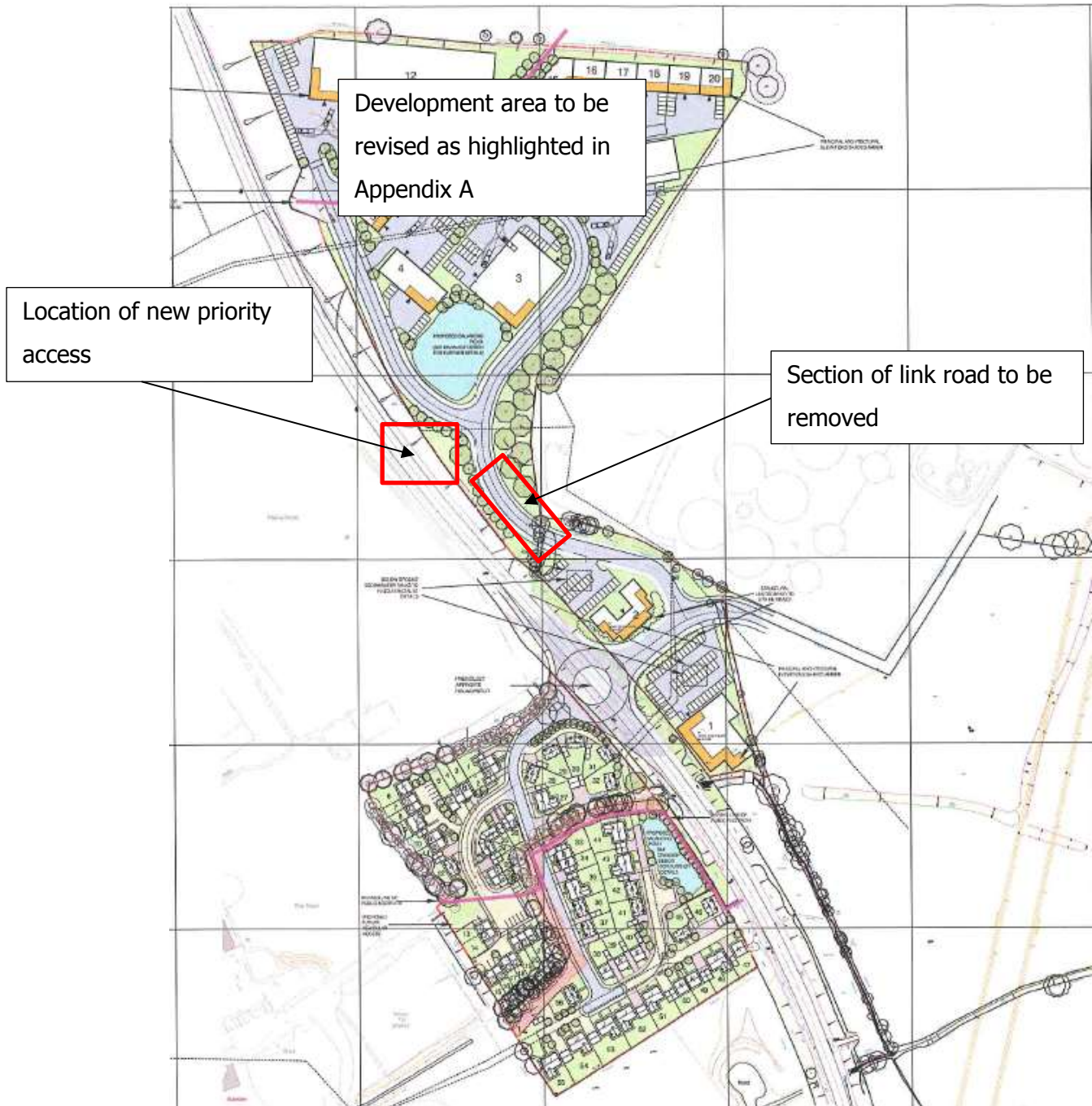
### **1.2 Scheme Proposals**

The previous approved scheme included residential and commercial developments upon which access would be served by a new roundabout on The Dove Way. The residential element was located to the south of The Dove Way whilst the commercial element was located to the north of The Dove Way and included a link road accessed from the new roundabout.

Under the new revised scheme the commercial element will access directly onto The Dove Way via a priority access junction, removing the link road to the roundabout and hence no traffic associated with the HWRC or the revised commercial element will access onto The Dove Way via the roundabout.

It should be noted that two proposed commercial units are located adjacent to the roundabout and will access The Dove Way via the roundabout; however these units are outside the revised scheme and have no access to the priority junction. Figure 1-1 illustrates the comments on the layout submitted in association with the MEC Transport Assessment.

**Figure 1-1:- Proposed Amendments**



As highlighted in Figure 1 in Appendix A, the revised proposals include:-

- B1 – 3,264m<sup>2</sup>;
- B2 – 2,815m<sup>2</sup>;
- B8 – 4,490m<sup>2</sup>; and
- Household Waste (HWRC) – 4570m<sup>2</sup>.

## **2 Methodology**

### **2.1 Introduction**

As a Transport Assessment has been previously submitted in support of the development site and agreed in principle, assessments of the sustainable measures such as public transport, pedestrian facilities and Travel Plan measures, as well as collision information are not discussed in detail in this Transport Statement, but full details are contained within the approved MEC Transport Assessment and Travel Plan. This Transport Statement will address the changes to vehicle trip generations, parking provision and the assessment of the new site access.

As identified in Section 2.2.5 below, the revised development will generate less vehicle trips than those identified in the MEC Transport Assessment. Hence the current year and future year assessments carried out on the existing junctions within the road network are considered valid and robust. Furthermore the mitigation measures proposed within the MEC Transport Assessment remain applicable to the revised development proposals.

#### **2.1.1 *Traffic Count Data***

The MEC Transport Assessment contained traffic count data undertaken in June 2011, for the purposes of this Transport Statement the data is considered valid and applicable to the analysis within this report.

#### **2.1.2 *Committed Developments***

As stated in the MEC Transport Assessment, committed developments have been assumed to be included within the National Transport Model (NTM) and the NTM/TEMPRO data used in the future year analysis will account for committed development flows on the local highway network.



## **2.2 Trip Generations**

### **2.2.1 B1 and B2 Commercial Units**

The approved MEC Transport Assessment contains average trip generations derived from the TRICS 2011(b) v6 database. A comparison of these trips with the trip generations derived from the latest TRICS 2015 v7 database is included in Table 2-1 below. The trip generations have been generated using the same criteria listed within Appendix F of the MEC Transport Assessment, specifically:-

B1 Units – Employment  
Office  
Regions:-

03 South West (CW Cornwall)  
09 North (DH Durham & TV Tees Valley)

GFA m<sup>2</sup>

B2 Units – Employment  
Industrial Estate  
Regions:-

03 South West (BR Bristol City, CW Cornwall & WL Wiltshire)  
04 East Anglia (SF Suffolk)  
05 East Midlands (LN Lincolnshire)  
09 North (CB Cumbria & NM Northumberland)

GFA m<sup>2</sup>

Table 2:1 indicates that, in terms of total trips, the values derived from the 2011 database are greater than or equal to the current 2015 v7 values. As the methodology in the Transport Assessment has been agreed and in order to provide a robust analysis, the 2011 values have been applied to the revised layout.



**Table 2-1: TRICS Trip Generation Comparison**

| Land Use  | AM Peak Hour Weekday<br>(0800 – 0900) |            |        | PM Peak Hour Weekday<br>(1700 – 1800) |            |        |
|---|---------------------------------------|------------|--------|---------------------------------------|------------|--------|
|   | Arrivals                              | Departures | Totals | Arrivals                              | Departures | Totals |
| 2011(b) v6 TRICS Trip Rates (Average) per 100m <sup>2</sup> GFA |                                       |            |        |                                       |            |        |
| B1 Use  | 1.774                                 | 0.256      | 2.030  | 0.350                                 | 1.228      | 1.578  |
| B2 Use  | 0.780                                 | 0.355      | 1.135  | 0.211                                 | 0.611      | 0.822  |
| 2015 v7 TRICS Trip Rates (Average) per 100m <sup>2</sup> GFA    |                                       |            |        |                                       |            |        |
| B1 Use  | 1.741                                 | 0.270      | 2.011  | 0.350                                 | 1.228      | 1.578  |
| B2 Use  | 0.787                                 | 0.288      | 1.075  | 0.166                                 | 0.670      | 0.836  |

On the basis of the revised development with 3,264m<sup>2</sup> B1 units and 2,815m<sup>2</sup> B2 units, Table 2-2 below outlines the subsequent vehicle trip generations.

**Table 2-2: Vehicle Trip Generation**

| Land Use     | AM Peak Hour Weekday<br>(0800 – 0900) |            |           | PM Peak Hour Weekday<br>(1700 – 1800) |            |           |
|--------------|---------------------------------------|------------|-----------|---------------------------------------|------------|-----------|
|              | Arrivals                              | Departures | Totals    | Arrivals                              | Departures | Totals    |
| B1 Use       | 58                                    | 8          | 66        | 11                                    | 40         | 51        |
| B2 Use       | 22                                    | 10         | 32        | 10                                    | 35         | 45        |
| <b>TOTAL</b> | <b>80</b>                             | <b>18</b>  | <b>98</b> | <b>21</b>                             | <b>75</b>  | <b>96</b> |

As shown above the B1 and B2 units will generate a total of 98 two way vehicle trips in the AM peak and 96 in the PM peak.

**2.2.2 B8 Commercial Units**

The previously submitted MEC Transport Assessment did not include B8 land use units in the proposals. As such no trip generation derived from TRICS was provided. However Appendix B of the MEC Transport Assessment contains correspondence from the Highways Agency Planning Manager dated 12<sup>th</sup> April 2011 which states that:-

- London and Northern Ireland should be omitted from the TRICS sample;
- 'Suburban' and 'Edge of Town' sites should be used;
- 'Edge of Town Centre' should not be used; and
- A wider variation of site size should be used to allow for a broader range of sites.

These factors have therefore been applied to the TRICS generations used to calculate the B8 units trip rates. In terms of the Sub Land Use criteria, Warehousing (Commercial) (F) has been considered appropriate for the proposed development. The resultant number of surveys selected from these criteria is thirteen and under TRICS Good Practice, where data sets are below twenty it is not recommended to use 85th percentile rates as the results can be misleading, hence average rates have been applied. Table 2-3 below details the values derived.

**Table 2-3: B8 Units Vehicle Trip Generation**

| Land Use   | AM Peak Hour Weekday<br>(0800 – 0900) |            |        | PM Peak Hour Weekday<br>(1700 – 1800) |            |        |
|--|---------------------------------------|------------|--------|---------------------------------------|------------|--------|
|  | Arrivals                              | Departures | Totals | Arrivals                              | Departures | Totals |
| 2015 v7 TRICS Trip Rates (Average) per 100m <sup>2</sup> GFA |                                       |            |        |                                       |            |        |
| B8 Use   | 0.086                                 | 0.049      | 0.135  | 0.035                                 | 0.089      | 0.124  |
| Vehicle Generations (4,490m <sup>2</sup> )                   |                                       |            |        |                                       |            |        |
| B8 Use   | 4                                     | 2          | 6      | 2                                     | 4          | 6      |

In summary the B8 units will generate a total of 6 two way vehicle trips in the AM peak and 6 in the PM peak.

**2.2.3 Household Waste Recycling Centre (HWRC)**

The proposed HWRC will involve the relocation of the existing Uttoxeter Recycling Centre located on Pennycroft Lane, Uttoxeter. East Staffordshire Borough Council have provided Automatic Number Plate Recognition (ANPR) data from March 2014 to September 2014. The data lists the total number of recorded vehicles entering the premises per month. Average daily arrivals have therefore been extrapolated from this data; these average values were then compared to the daily generations obtained from the TRICS database. For the TRICS analysis the same criteria for the B8 units, as described in Section 2.2.2, have been applied to the HWRC and the Sub Land use Civic Amenity Site has been used. Table 2-4 compares the ANPR and TRICS average daily values and it can be seen that the average daily recorded vehicle trips from the ANPR data are less than those generated by TRICS. Therefore in order to generate peak hour flows, it is considered that the TRICS database will provide robust flows.

**Table 2-4: ANPR Data and TRICS Comparison**

|   | <b>ARRIVALS</b> | <b>DEPARTURES</b> | <b>TOTALS</b> |
|---|-----------------|-------------------|---------------|
| Average Daily Derived from ANPR             | 191             | 191               | 382           |
| TRICS Daily Trip Rate (Average) Per Hectare | 482.354         | 490.039           | 972.393       |
| TRICS Daily Vehicle Generations             | 220             | 224               | 444           |
| <i>Difference between TRICS and ANPR</i>    | <i>+29</i>      | <i>+33</i>        | <i>+62</i>    |

Table 2-5 below summarises the peak hour generations on the basis of a 4570m<sup>2</sup> (0.457ha) HWRC. Similar to the B8 units, under the criteria only four surveys are available within in the TRICS database and therefore average rates have been applied.

**Table 2-5: HWRC Vehicle Trip Generation**

| <b>Land Use</b>                                | <b>AM Peak Hour Weekday<br/>(0800 – 0900)</b> |            |        | <b>PM Peak Hour Weekday<br/>(1700 – 1800)</b> |            |        |
|--|---|------------|--------|---|------------|--------|
|  | Arrivals                                      | Departures | Totals | Arrivals                                      | Departures | Totals |
| 2015 v7 TRICS Trip Rates (Average) per hectare |   |            |        |   |            |        |
| HWRC   | 37.727  | 38.182     | 75.909 | 4.545   | 7.727      | 12.272 |
| Vehicle Generations (0.457ha)                  |   |            |        |   |            |        |
| HWRC   | 17  | 18         | 35     | 2   | 4          | 6      |

Therefore it is anticipated that the HWRC will generate a total of 35 two way vehicle flows in the AM peak and 6 in the PM peak.

Reference to the opening hours of the existing Uttoxeter Recycling Centre indicates that the facility doesn't currently open til 09:00hrs and therefore it is unlikely that this facility will generate 35 vehicles in the AM peak (08:00hrs-09:00hrs). However, for a robust assessment we have included the generated totals (Table 2-5) in the AM peak analysis.

In the PM peak, the existing Uttoxeter Recycling Centre is only open to 18:00hrs during the summer months (March to October), outside these months the facility closes at 17:00hrs. Therefore the PM peak generations (Table 2-5) is more fitting for the traffic during the summer months.

**2.2.4 Proposed Development Total Vehicle Generations**

Table 2-6 highlights the total peak hour vehicles generated from the revised scheme development aspects

**Table 2-6: Development Total Vehicle Generations**

|                            | <b>AM Peak Hour Weekday<br/>(0800 – 0900)</b> |            |            | <b>PM Peak Hour Weekday<br/>(1700 – 1800)</b> |            |            |
|----------------------------|---|------------|------------|---|------------|------------|
|                            | Arrivals                                      | Departures | Totals     | Arrivals                                      | Departures | Totals     |
| B1 – 3,264m <sup>2</sup>   | 58  | 8          | 66         | 11  | 40         | 51         |
| B2 – 2,815m <sup>2</sup>   | 22  | 10         | 32         | 10  | 35         | 45         |
| B8 – 4,490m <sup>2</sup>   | 4   | 2          | 6          | 2   | 4          | 6          |
| HWRC – 4,570m <sup>2</sup> | 17  | 18         | 35         | 2   | 4          | 6          |
| <b>TOTAL</b>               | <b>101</b>                                    | <b>38</b>  | <b>139</b> | <b>25</b>                                     | <b>83</b>  | <b>108</b> |

Hence overall the development will generate a total of 139 two way vehicle trips in the AM peak and 108 in the PM peak.

**2.2.5 Total Vehicle Trip Comparison**

The MEC Transport Assessment noted vehicle trip generations as highlighted in Table 2-7 below. On the basis of the revised development details described above, it can be seen that the resultant total vehicle trip generations are approximately 40% lower in the AM peak and PM peak. Therefore the assessments carried out in the MEC Transport Assessment for the associated existing junctions on the road network are considered valid and robust.

**Table 2-7: Proposed Development Vehicle Flow Comparison**

|  | <b>AM Peak Hour Weekday<br/>(0800 – 0900)</b> |            |        | <b>PM Peak Hour Weekday<br/>(1700 – 1800)</b> |            |        |
|--|---|------------|--------|---|------------|--------|
|  | Arrivals                                      | Departures | Totals | Arrivals                                      | Departures | Totals |
| Previous MEC TA Generations (B1 + B2 Only) | 169   | 60         | 229    | 42  | 134        | 176    |

|   | <b>AM Peak Hour Weekday<br/>(0800 – 0900)</b> |            |            | <b>PM Peak Hour Weekday<br/>(1700 – 1800)</b> |            |            |
|---|---|------------|------------|---|------------|------------|
|   |   |            |            |   |            |            |
| Revised Layout Generations                  | 101   | 38         | 139        | 25  | 83         | 108        |
| <i>Difference from Previous Generations</i> | <i>-68</i>                                    | <i>-22</i> | <i>-90</i> | <i>-17</i>                                    | <i>-51</i> | <i>-68</i> |

### 2.3 Trip Distribution

As outlined in the MEC Transport Assessment the commercial trips have been assigned to the surrounding road network using a gravity model. For the purposes of this Transport Statement the previous trip distributions have been applied. Details of the gravity model and trip distributions can be found in Appendix G of the MEC Transport Assessment. In the AM peak this equates to 84% of trips arriving from the south and 73% departing to the south, similarly in the PM peak 81% arrive from the south and 78% depart to the south.

In terms of the distributions of the HWRC, as it is an existing facility being relocated it is expected that the majority of trips will travel to/from Uttoxeter. Figure 2-1 overleaf indicates the existing and proposed locations of the HWRC. In terms of residents accessing the new HWRC it can be considered that those residing to the north are likely to travel via the Ashbourne Road and approach from The Dove Way (North), whilst those to the south are likely to approach from The Dove Way (South). Therefore for the HWRC a 50/50 distribution has been applied with 50% to/from the north and 50% to/from the south.

**Figure 2-1:- HWRC Relocation**



## 2.4 Future Year

As per the MEC Transport Assessment the future year assessment has been identified as 2021.

### 3 Access and Parking

#### 3.1 Access

It is proposed to provide a priority access onto The Dove Way as highlighted in Figure 1 in Appendix A. Footways are provided on the access road linking the development to The Dove Way.

In order to observe the capacity and queues at the proposed site access onto The Dove Way an assessment has been carried out using the TRL program PICADY 5. Table 3-1 below provides a summary of predicted capacity (RFC) and queues for the future year scenario of 2021 including development flows. Summary diagrams of the associated traffic flows are included in Appendix B and output analysis can be found in Appendix C.

**Table 3-1: Assessment of 2021 Plus Development Flows**

| ARM/<br>MOVEMENT            | MAX RFC (%) |       | MAX QUEUE (VEH) |      |
|-----------------------------|-------------|-------|-----------------|------|
|                             | AM          | PM    | AM              | PM   |
| The Dove Way<br>Ahead/Right | 0.234       | 0.059 | 0.56            | 0.10 |
| Site Access Left<br>Out     | 0.044       | 0.122 | 0.05            | 0.14 |
| Site Access Right<br>Out    | 0.046       | 0.062 | 0.05            | 0.07 |

Table 3-1 illustrates that the proposed site access is predicted to operate well within capacity in the future year 2021. The Dove Way access displays values well under the desired 0.850 (85%) threshold. Queueing is nominal with a maximum queue of 0.56 vehicles noted on The Dove Way in the AM peak.

#### 3.2 Parking

Parking provision will be in accordance with the East Staffordshire Borough Councils (ESBC) Supplementary Planning Guidance: Parking Standards document. Due to the proposed HWRC and the revised B1, B2, and B8 units, the parking layout has been amended to comply with Table 3-2.



**Table 3-2: Parking Requirements**

| USE                              |                                    | PARKING PROVISION FOR BUILDING SIZE  |
|----------------------------------|------------------------------------|--|
| USE TYPE                         | TOTAL FLOORSPACE PER BUILDING TYPE |  |
| B1 Offices                       | 3,264 m <sup>2</sup>               | 0 – 235m <sup>2</sup> - 1 space per 20m <sup>2</sup><br>235m <sup>2</sup> + - 1space per 30m <sup>2</sup>  |
| B2 Non-office & General Industry | 2,815 m <sup>2</sup>               | 0 – 235m <sup>2</sup> - 1 space per 20m <sup>2</sup><br>235m <sup>2</sup> - 1,000m <sup>2</sup> - 1space per 30m <sup>2</sup><br>1000m <sup>2</sup> + - 1 space per 80m <sup>2</sup> |
| B8 Storage & Distribution        | 4,490 m <sup>2</sup>               | 0 – 235m <sup>2</sup> - 1 space per 20m <sup>2</sup><br>235m <sup>2</sup> - 1,000m <sup>2</sup> - 1space per 50m <sup>2</sup><br>1000m <sup>2</sup> + - 1 space per 80m <sup>2</sup> |
| Household Waste Recycling Centre | 4,570m <sup>2</sup>                | The existing Pennycroft Lane site contains 3 parking spaces for staff and it is expected that the relocated site will provide the same provision.                                    |

On the basis of the above and in accordance with the development breakdown, the following has been identified as the maximum parking:-

- B1 Offices – 112 spaces;
- B2 General Industry – 61 spaces; and
- B8 – Storage & Distribution – 71 spaces.

Therefore a maximum 244 spaces are being provided to accommodate the development site. As required by the ESBC Parking Standards 5% of the total parking provision will be allocated as disabled spaces.

### **3.2.1 Cycle Parking**

Under the ESBC guidelines B1, B2 and B8 uses are required to have 1 stand per 300m<sup>2</sup> GFA in a secure, weatherproof shelter. Hence for a combined GFA of 10,569m<sup>2</sup> a total of 35 cycle stands are required. This provision will be provided in the form of cycle stands and covered shelters which are identified in Figure 1 in Appendix A.

## **4 Servicing**

### **4.1 Introduction**

As the development includes a mixture of B1 offices, B2 industrial units and B8 commercial warehousing units, there will be a mixture of service vehicles arriving to the development. The HWRC has a separate internal access and as such service vehicles accessing this area will not generally interact with the B1, B2 and B8 layout, except for the main access road. For this reason the two areas are reviewed separately below.

### **4.2 B1, B2 and B8 Units**

Given the mixed nature of the development and that a dedicated service yard will not be provided, service vehicles will interact with staff/customers of the units proposed. Therefore a Service Management Plan (SMP) will be implemented when the scheme is completed and in co-ordination with the occupying tenants. The following outlines the framework to develop the SMP.

#### **4.2.1 Service Vehicles**

The largest vehicles expected to site for each style of unit are listed below:-

- B1 Units: - 7.5t box van or 10m rigid lorry;
- B2 Units: - 7.5t box van or 10m rigid lorry; and
- B8 Units: - 10m rigid lorry or 16.5m articulated lorry.

### **4.3 Service Management Plan**

Once the site is fully operational a range of measures and management systems will be implemented to formalise the arrival pattern and duration of service vehicles.

#### **4.3.1 General Delivery Operation Procedure**

Key to efficiency is to minimise the time any service vehicle is on site in front of the units by providing a smooth offloading process. A delivery operation can be broken down into:-

- Initial processing time (where most time can be saved by developing an efficient plan);
- Actual offloading time; and

- Final processing time.

The SMP will address these periods separately seeking to minimise each of them and thus contribute to an overall reduction in time in three ways.

#### **4.3.2 Scheduling of Deliveries**

In an ideal situation every service vehicle arriving should have an allotted time and fixed duration period to undertake servicing. Whilst such a regime is difficult to implement for a development of this nature, it should be possible to provide 'tight' scheduling which would prevent a 'free for all' situation where drivers can turn up whenever they like causing access issues and internal movement issues. This 'demand smoothing' will help to reduce the occurrence of conflicts but should require continual monitoring and reviewing.

An effective method should be to schedule deliveries from larger articulated lorries to outside peak periods of when the internal car park is utilised to ensure minimal conflicts or manoeuvring difficulties.

Communication of delivery schedules between tenants will enhance the above and further reduce conflicts.

#### **4.3.3 Surveillance and Recording**

Regular surveillance of the designated servicing areas either through physical patrolling or CCTV is recommended to ensure unexpected arrivals are dealt with efficiently. Furthermore recording vehicle arrivals can be useful in terms of safety and the identification of extended stayers. Both aspects can form part of reviewing delivery patterns and allow a fine tuning of the overall SMP.

#### **4.3.4 Waste**

The proposed development will have five separate units comprising a mix of B1, B2 and B8 uses. A bin store area has been identified for each unit and they are identified in Figure 1 of Appendix A and will likely contain standard large 4-wheel bins (Eurobins). It is anticipated that, as the proposals consist of a private commercial development, waste will be removed via private waste management companies, which will be responsible for manoeuvring the bins to/ from the bin lorry.

#### **4.3.5 Service Vehicle Swept Path Analysis**

Figure 2 of Appendix A demonstrates that a bin lorry can manoeuvre without issue to the various bin stores associated with the B1 and B8 units. The bin lorry can enter and exit the area in a forward gear.

Figure 3 of Appendix A indicates the likely service routes for a 10m rigid lorry accessing Units 1, 2 and 3. To reach the units the rigid lorry will be required to reverse over short distances and in relation to Unit 3 it will be required to perform a three point turn manoeuvre. However it is anticipated that the frequency of these vehicles will be minimal and the majority of deliveries will be via 7.5t box van. Furthermore, as part of the SMP deliveries associated with this vehicle will be planned in advance to ensure they occur either during out of hours periods or periods when the associated car parking is minimal.

The B8 units will be serviced by articulated lorries and will occur outside operational hours of the B1 and B2 units to ensure the vehicles can manoeuvre without issue. Again as part of the SMP deliveries via articulated lorries will be planned in advance. Figure 4 of Appendix A illustrates how the articulated vehicles will service the B8 units.

#### **4.4 Household Waste Recycling Centre**

Service vehicles accessing the HWRC will be a mixture of bin lorries and rigid lorries to remove full waste containers. Service vehicle arrivals and departures will occur outside of peak hours to minimise impact on the associated commercial development elements.

In terms of internal site manoeuvres HGV loading and unloading will occur to the north of the site at the rear of the waste containers, thereby minimising interaction and conflict with the general public users of the HWRC.

A swept path analysis has been conducted for the largest vehicle (rigid tipper) accessing the site to ensure that they can manoeuvre to/ from the HWRC without issue and is illustrated in Figure 5 of Appendix A.

## **5 Sustainable Measures**

### **5.1 Introduction**

As part of the previous submission, MEC submitted a Travel Plan in support of the application. It is anticipated that the measures detailed in the Travel Plan will be applied to the proposed development, however for completeness the key aspects of the Travel Plan and MEC Transport Assessment are discussed below.

### **5.2 Pedestrian Improvements**

Currently a footway is located on the west side of The Dove Way only, however a pedestrian link from the proposed commercial development to the opposite side of The Dove Way will be provided utilising the existing walkway under The Dove Way.

### **5.3 Public Transport Improvements**

An additional two bus stops will be provided on The Dove Way to enhance the access to Service 32/32A. These bus stops will ensure that the majority of the commercial development will be within the preferred 400m walking distance from a bus stop.

### **5.4 Cycle Facilities**

An off road section of the National Cycle Route 549 runs to the north of the development parallel to the A50, with The Dove Way identified as a local cycle route. Hence cycle access to the surrounding area is excellent.

In terms of the development it is proposed to include a shared cycleway/ footway on the main access road.

## **6 Summary and Conclusions**

### **6.1 Summary**

This Transport Statement has considered the impact of the revised proposals for the mixed use development at Uttoxeter to include B1 units, B2 units, B8 units and a Household Waste Recycling Centre with a new priority junction access onto The Dove Way.

The analysis has shown that traffic generation associated with the revised development will be lower than that proposed and analysed in the previous approved MEC Transport Assessment; therefore the analysis and mitigation measures proposed in the MEC Transport Assessment and Travel Plan are considered robust and applicable.

The proposed site access has been analysed and found to operate in capacity for the future year 2021. Nominal queueing and delay is predicted in the AM and PM peak.

Swept Paths of the different service vehicles accessing the site are provided in Appendix A.

### **6.2 Conclusion**

The above analysis has shown that the proposed revised development will have nominal impact on the surrounding road network, in the context that the mitigation measures proposed in the approved MEC Transport Assessment are carried forward.

---

**Appendix A: - Site Layout and Swept Path Analysis**

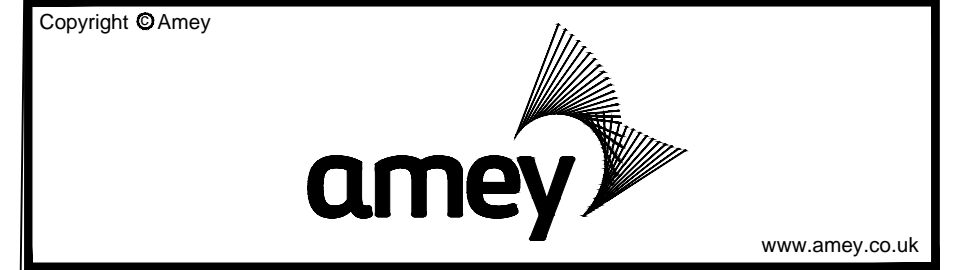




**NOTES**  
1. DESIGN SUPPLIED BY OTHERS.

- DEVELOPMENT GFAs**
- B1 - 3,264m<sup>2</sup>
  - B2 - 2,815m<sup>2</sup>
  - B8 - 4,490m<sup>2</sup>
  - HWRC - 4,750m

| Rev          | Revision details | Chkd | Appd | Date            |
|--------------|------------------|------|------|-----------------|
| Designed: MF |                  |      |      | Date: JUNE 2015 |
| Drawn: PC    |                  |      |      | Date: JUNE 2015 |
| Checked: JR  |                  |      |      | Date: JUNE 2015 |
| Approved: MB |                  |      |      | Date: JUNE 2015 |



Project Name  
**Proposed Mixed Use Development  
The Dove Way**

Drawing Title  
**PROPOSED SITE LAYOUT**

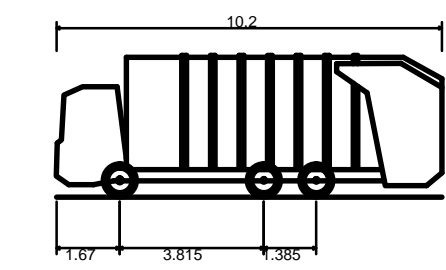
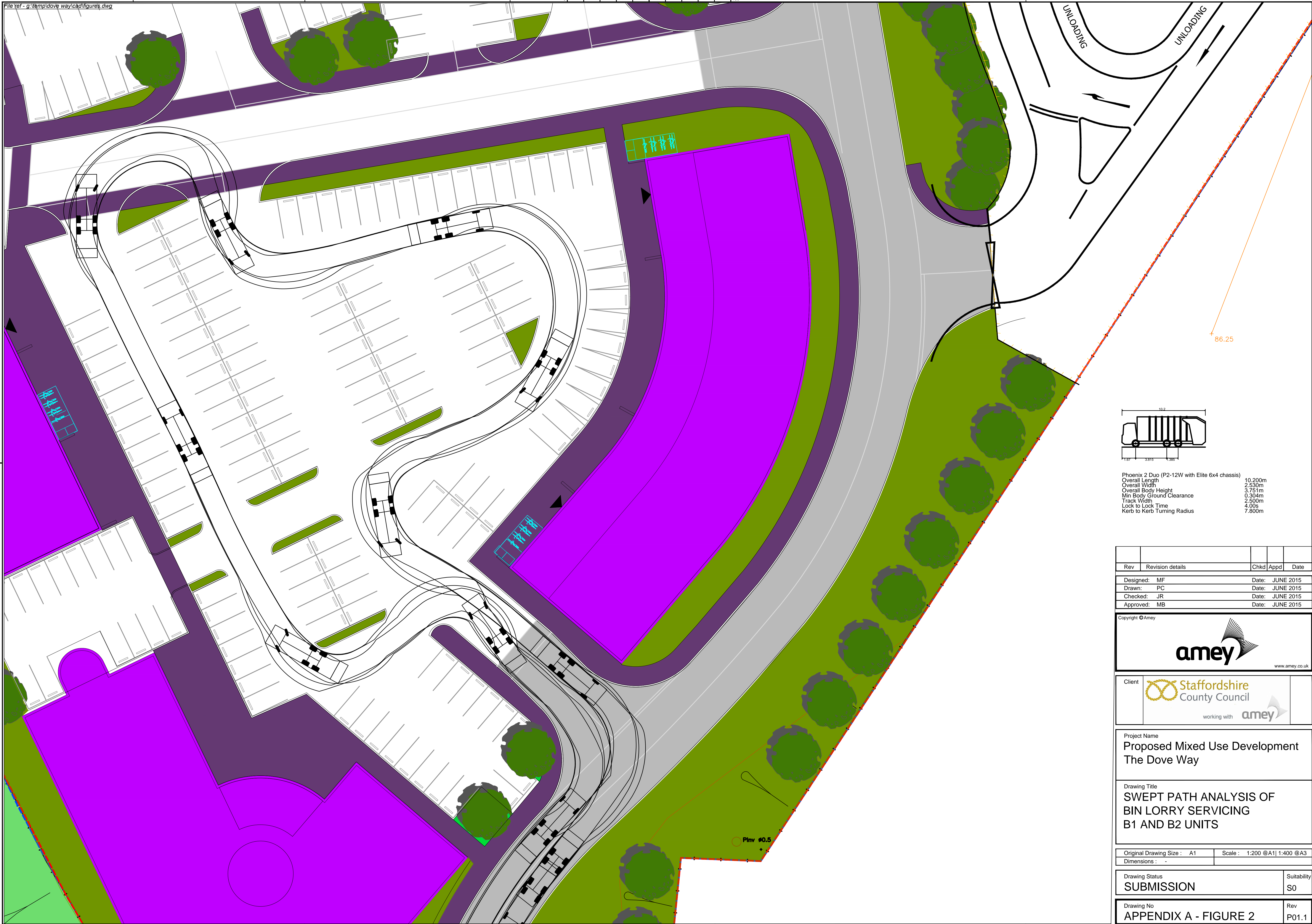
Original Drawing Size : A1      Scale : 1:500 @A1| 1:100 @A3  
Dimensions : -

Drawing Status  
**SUBMISSION**      Suitability  
S0

Drawing No  
**APPENDIX A - FIGURE 1**      Rev  
P01.1

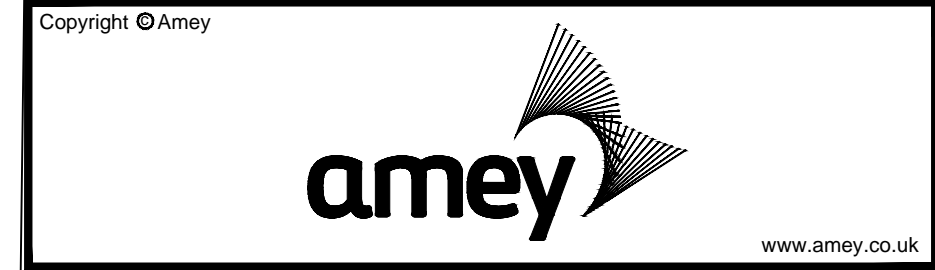
Playing Fields





Phoenix 2 Duo (P2-12W with Elite 6x4 chassis)  
 Overall Length 10.200m  
 Overall Width 2.530m  
 Overall Body Height 3.751m  
 Min Body Ground Clearance 0.304m  
 Track Width 2.500m  
 Lock to Lock Time 4.00s  
 Kerb to Kerb Turning Radius 7.800m

| Rev | Revision details | Chkd | Appd | Date            |
|-----|------------------|------|------|-----------------|
|     |                  |      |      |                 |
|     | Designed: MF     |      |      | Date: JUNE 2015 |
|     | Drawn: PC        |      |      | Date: JUNE 2015 |
|     | Checked: JR      |      |      | Date: JUNE 2015 |
|     | Approved: MB     |      |      | Date: JUNE 2015 |



Client **Staffordshire County Council**  
 working with **amey**

Project Name  
**Proposed Mixed Use Development  
 The Dove Way**

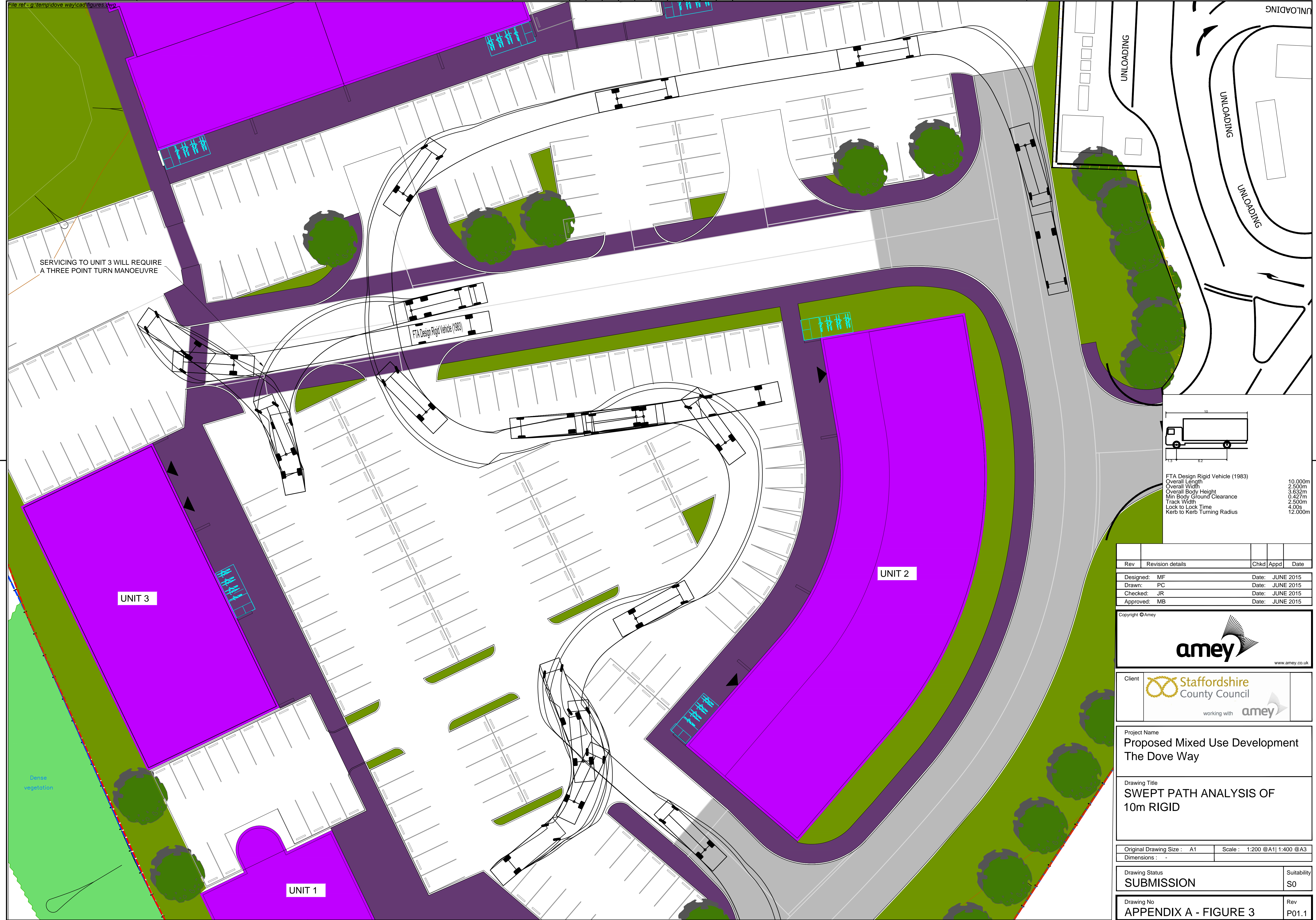
Drawing Title  
**SWEPT PATH ANALYSIS OF  
 BIN LORRY SERVICING  
 B1 AND B2 UNITS**

Original Drawing Size : A1      Scale : 1:200 @A1| 1:400 @A3  
 Dimensions : -

Drawing Status      Suitability  
**SUBMISSION**      S0

Drawing No      Rev  
**APPENDIX A - FIGURE 2**      P01.1





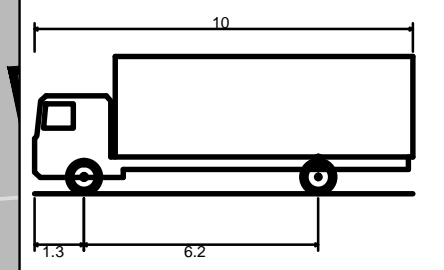
SERVICING TO UNIT 3 WILL REQUIRE A THREE POINT TURN MANOEUVRE

FTA Design Rigid Vehicle (1983)

UNIT 3

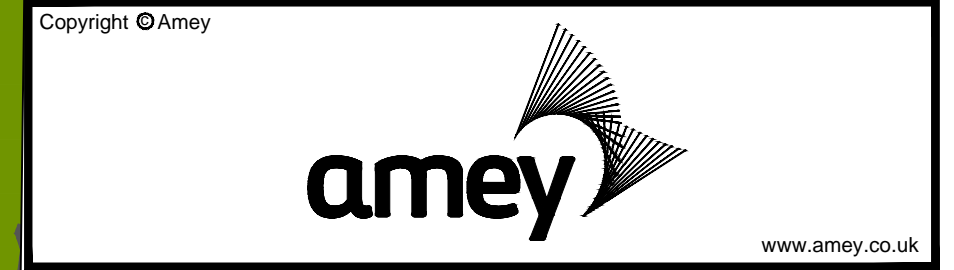
UNIT 2

UNIT 1



FTA Design Rigid Vehicle (1983)  
 Overall Length 10.000m  
 Overall Width 2.500m  
 Overall Body Height 3.632m  
 Min Body Ground Clearance 0.427m  
 Track Width 2.500m  
 Lock to Lock Time 4.00s  
 Kerb to Kerb Turning Radius 12.000m

| Rev       | Revision details | Chkd | Appd | Date            |
|-----------|------------------|------|------|-----------------|
| Designed: | MF               |      |      | Date: JUNE 2015 |
| Drawn:    | PC               |      |      | Date: JUNE 2015 |
| Checked:  | JR               |      |      | Date: JUNE 2015 |
| Approved: | MB               |      |      | Date: JUNE 2015 |



Project Name  
**Proposed Mixed Use Development  
 The Dove Way**

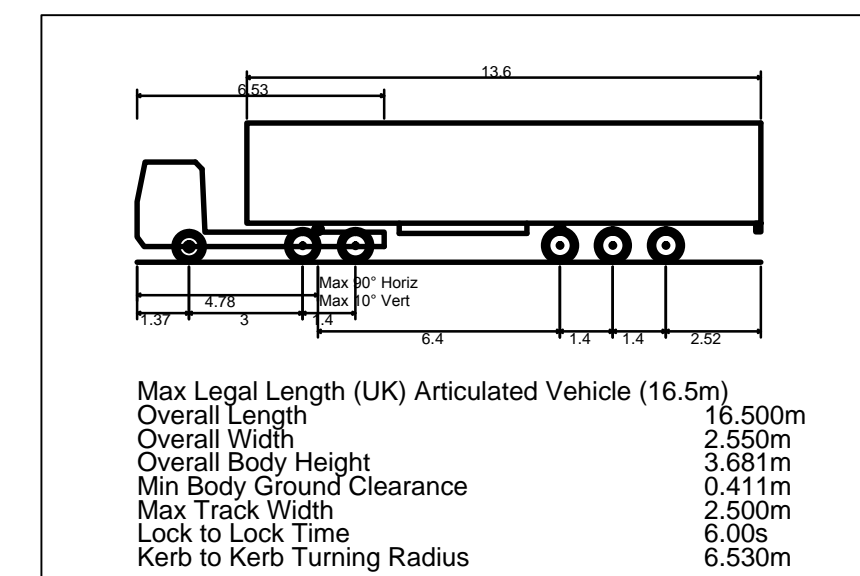
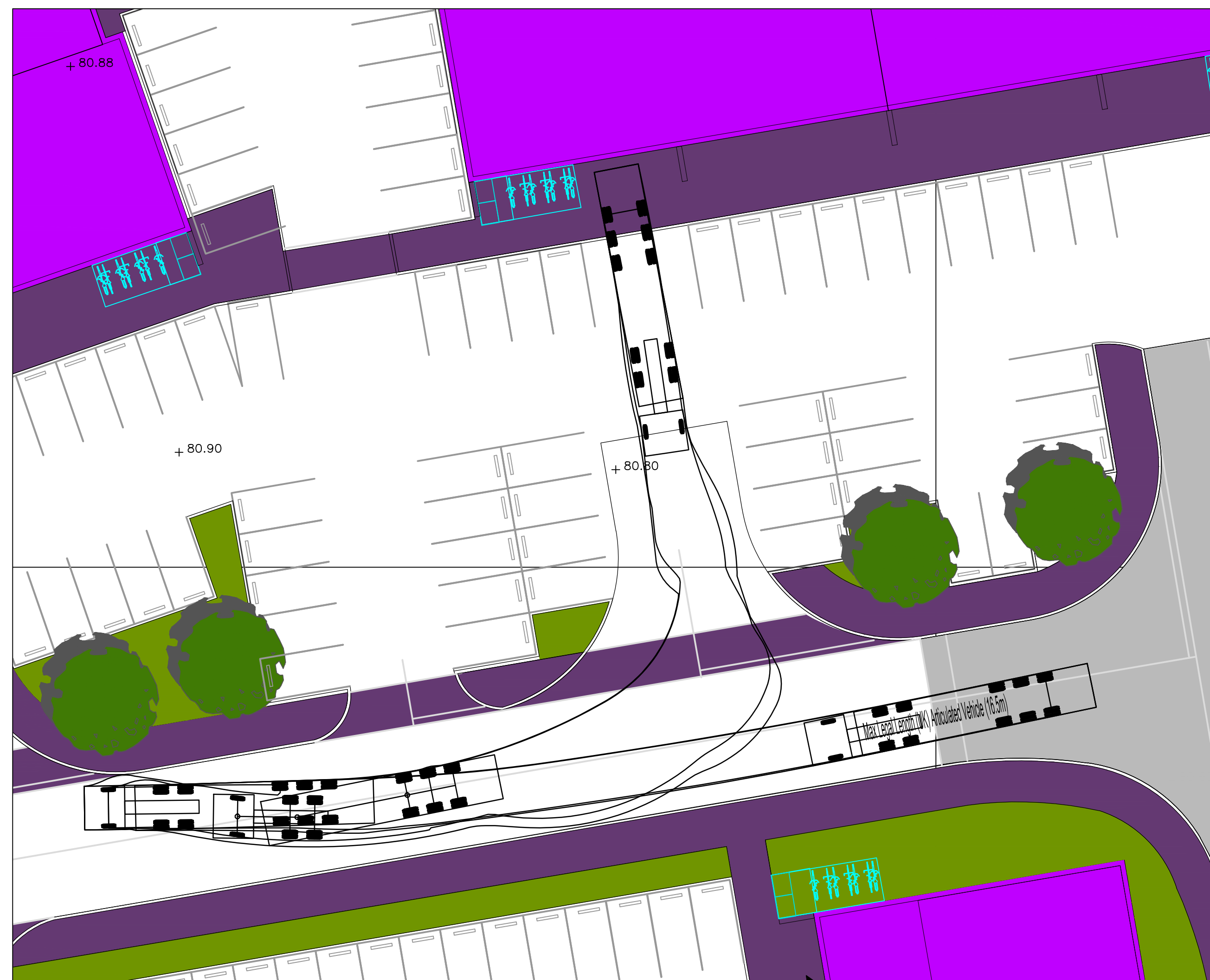
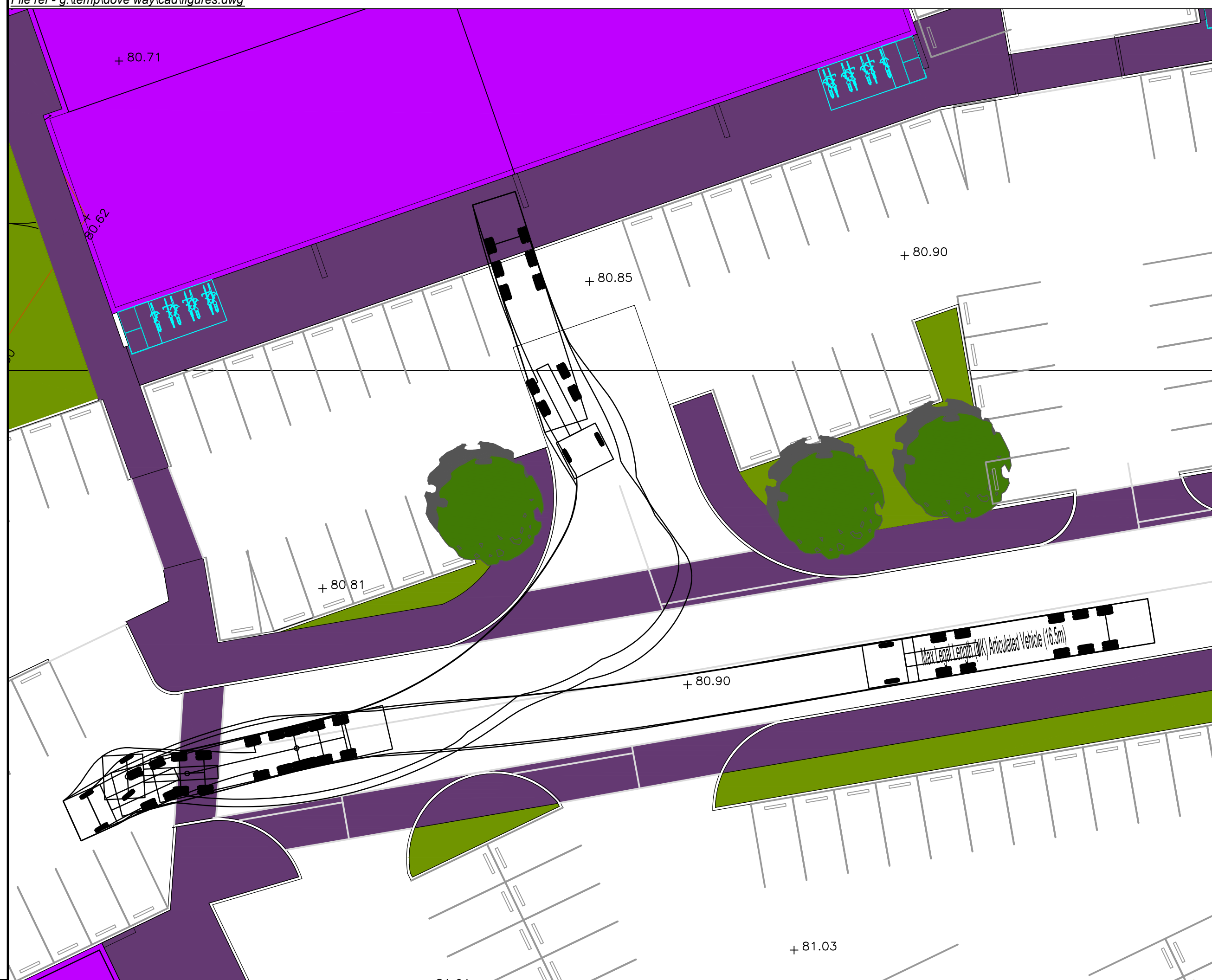
Drawing Title  
**SWEPT PATH ANALYSIS OF  
 10m RIGID**

Original Drawing Size : A1      Scale : 1:200 @A1 1:400 @A3  
 Dimensions : -

Drawing Status      Suitability  
**SUBMISSION**      S0

Drawing No      Rev  
**APPENDIX A - FIGURE 3**      P01.1





| Rev          | Revision details | Chkd | Appd | Date            |
|--------------|------------------|------|------|-----------------|
| Designed: MF |                  |      |      | Date: JUNE 2015 |
| Drawn: PC    |                  |      |      | Date: JUNE 2015 |
| Checked: JR  |                  |      |      | Date: JUNE 2015 |
| Approved: MB |                  |      |      | Date: JUNE 2015 |



Project Name  
Proposed Mixed Use Development  
The Dove Way

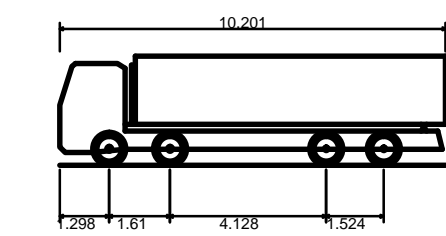
Drawing Title  
SWEEP PATH ANALYSIS OF  
TIPPER LORRY MANOEUVRING  
THROUGH HWRC

Original Drawing Size : A1      Scale : 1:200 @A1| 1:400 @A3  
Dimensions : -

Drawing Status      Suitability  
**SUBMISSION**      S0

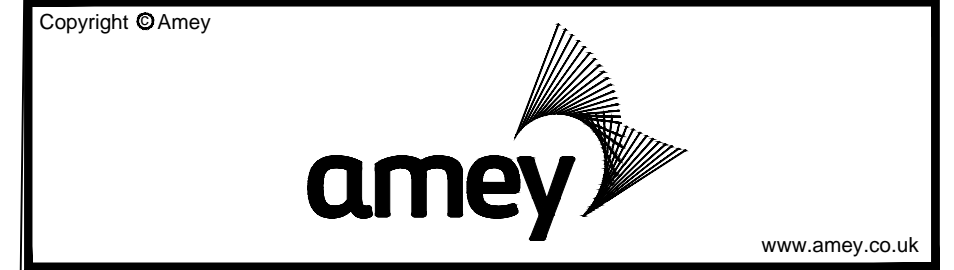
Drawing No      Rev  
**APPENDIX A - FIGURE 4**      P01.1





Large Tipper  
 Overall Length 10.201m  
 Overall Width 2.495m  
 Overall Body Height 2.890m  
 Min Body Ground Clearance 0.341m  
 Track Width 2.471m  
 Lock to Lock Time 6.00s  
 Kerb to Kerb Turning Radius 11.550m

| Rev          | Revision details | Chkd | Appd | Date            |
|--------------|------------------|------|------|-----------------|
| Designed: MF |                  |      |      | Date: JUNE 2015 |
| Drawn: PC    |                  |      |      | Date: JUNE 2015 |
| Checked: JR  |                  |      |      | Date: JUNE 2015 |
| Approved: MB |                  |      |      | Date: JUNE 2015 |



Project Name  
**Proposed Mixed Use Development  
 The Dove Way**

Drawing Title  
**SWEPT PATH ANALYSIS OF  
 TIPPER LORRY MANOEUVRING  
 THROUGH HWRC**

Original Drawing Size : A1      Scale : 1:200 @A1 1:400 @A3  
 Dimensions : -

Drawing Status      Suitability  
**SUBMISSION**      S0

Drawing No      Rev  
**APPENDIX A - FIGURE 5**      P01.1

## **Appendix B: - Flow Diagrams**

The Dove Way (North)

13



71



Development

5  
15



The Dove Way (South)

B1, B2 AND B8 DEVELOPMENT FLOWS  
AM PEAK



The Dove Way (North)

4



19



Development

17  
62



The Dove Way (South)

B1, B2 AND B8 DEVELOPMENT FLOWS  
PM PEAK

The Dove Way (North)

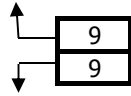
8



9



Development



The Dove Way (South)

HOUSEHOLD WASTE RECYCLING CENTRE  
AM PEAK

The Dove Way (North)

1



1



2  
2



Development

The Dove Way (South)

HOUSEHOLD WASTE RECYCLING CENTRE  
PM PEAK

The Dove Way (North)

21



80



Development

14  
24



The Dove Way (South)

TOTAL DEVELOPMENT FLOWS  
AM PEAK

The Dove Way (North)

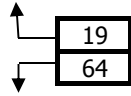
5



20



Development



The Dove Way (South)

TOTAL DEVELOPMENT FLOWS  
PM PEAK

The Dove Way (North)

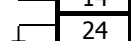
|     |    |
|-----|----|
| 408 | 21 |
|-----|----|



|     |    |
|-----|----|
| 430 | 80 |
|-----|----|



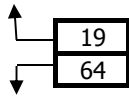
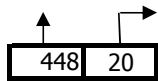
|    |
|----|
| 14 |
| 24 |



The Dove Way (South)

2021 AM BASE PLUS DEVELOPMENT FLOWS

The Dove Way (North)



The Dove Way (South)

2021 PM BASE PLUS DEVELOPMENT FLOWS



## **Appendix C: - PICADY Output**

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM  
RELEASE 5.0 (JUNE 2010)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT  
BY PERMISSION OF THE CONTROLLER OF HMSO

-----  
FOR SALES AND DISTRIBUTION INFORMATION,  
PROGRAM ADVICE AND MAINTENANCE CONTACT:  
TRL SOFTWARE SALES  
TEL: CROWTHORNE (01344) 770758, FAX: 770356  
EMAIL: software@trl.co.uk  
-----

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS  
IN NO WAY RELIEVED OF HIS/HER RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

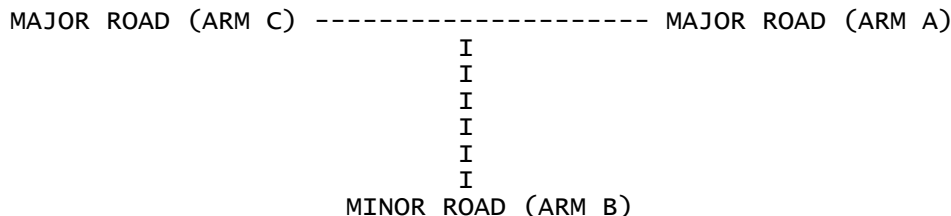
Run with file:- "G:\Temp\Dove way\PICADY\Dove way\Dove way\PICADY5.vpi" (drive-on-the-left) at 10:43:17 on  
Friday, 5 June 2015

.RUN INFORMATION  
\*\*\*\*\*

RUN TITLE : DOVE WAY  
LOCATION : Uttoxeter  
DATE : 27/05/15  
CLIENT : East Staffordshire County Council  
ENUMERATOR : 136254 [AMEYDT700507]  
JOB NUMBER :  
STATUS : TIA  
DESCRIPTION :

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY  
\*\*\*\*\*

INPUT DATA  
-----



ARM A IS The Dove Way (North)  
ARM B IS Access  
ARM C IS The Dove Way (South)

.STREAM LABELLING CONVENTION  
-----

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B  
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C  
ETC.

.GEOMETRIC DATA  
-----

| I | DATA ITEM                          | I | MINOR ROAD B     | I |
|---|------------------------------------|---|------------------|---|
| I | TOTAL MAJOR ROAD CARRIAGEWAY WIDTH | I | ( W ) 7.30 M.    | I |
| I | CENTRAL RESERVE WIDTH              | I | (WCR ) 0.00 M.   | I |
| I |                                    | I |                  | I |
| I | MAJOR ROAD RIGHT TURN - WIDTH      | I | (WC-B) 2.20 M.   | I |
| I | - VISIBILITY                       | I | (VC-B) 250.00 M. | I |
| I | - BLOCKS TRAFFIC (SPACES)          | I | YES ( 0)         | I |
| I |                                    | I |                  | I |
| I | MINOR ROAD - VISIBILITY TO LEFT    | I | (VB-C) 150.0 M.  | I |
| I | - VISIBILITY TO RIGHT              | I | (VB-A) 150.0 M.  | I |
| I | - LANE 1 WIDTH                     | I | (WB-C) -         | I |
| I | - LANE 2 WIDTH                     | I | (WB-A) -         | I |
| I | WIDTH AT 0 M FROM JUNCTION         | I | 10.00 M.         | I |
| I | WIDTH AT 5 M FROM JUNCTION         | I | 8.80 M.          | I |
| I | WIDTH AT 10 M FROM JUNCTION        | I | 5.00 M.          | I |
| I | WIDTH AT 15 M FROM JUNCTION        | I | 3.75 M.          | I |
| I | WIDTH AT 20 M FROM JUNCTION        | I | 3.65 M.          | I |
| I | - LENGTH OF FLARED SECTION         | I | DERIVED: 2 PCU   | I |

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

| I | Intercept For | Slope For | Opposing | Slope For | Opposing | I |
|---|---------------|-----------|----------|-----------|----------|---|
| I | STREAM B-C    | STREAM    | A-C      | STREAM    | A-B      | I |
| I | 0.00          |           | 0.00     |           | 0.00     | I |

\* Due to the presence of a flare, data is not available

| I | Intercept For | Slope For | Opposing | Slope For | Opposing | Slope For | Opposing | Slope For | Opposing | I |
|---|---------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|---|
| I | STREAM B-A    | STREAM    | A-C      | STREAM    | A-B      | STREAM    | C-A      | STREAM    | C-B      | I |
| I | 0.00          |           | 0.00     |           | 0.00     |           | 0.00     |           | 0.00     | I |

\* Due to the presence of a flare, data is not available

| I | Intercept For | Slope For | Opposing | Slope For | Opposing | I |
|---|---------------|-----------|----------|-----------|----------|---|
| I | STREAM C-B    | STREAM    | A-C      | STREAM    | A-B      | I |
| I | 718.74        |           | 0.26     |           | 0.26     | I |

(NB These values do not allow for any site specific corrections)

.TRAFFIC DEMAND DATA

| I | ARM | I | FLOW | SCALE(%) | I |
|---|-----|---|------|----------|---|
| I | A   | I | 100  |          | I |
| I | B   | I | 100  |          | I |
| I | C   | I | 100  |          | I |

.Demand set: DOVE WAY AM

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MIN.  
LENGTH OF TIME SEGMENT - 15 MIN.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

| I | ARM   | I | NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE | I | TOP OF PEAK IS REACHED | I | FLOW STOPS FALLING | I | RATE OF FLOW (VEH/MIN) BEFORE PEAK | I | AT TOP OF PEAK | I | AFTER PEAK | I |
|---|-------|---|---|---|------------------------|---|--------------------|---|------------------------------------|---|----------------|---|------------|---|
| I | ARM A | I | 15.00   | I | 45.00                  | I | 75.00              | I | 5.36                               | I | 8.04           | I | 5.36       | I |
| I | ARM B | I | 15.00   | I | 45.00                  | I | 75.00              | I | 0.47                               | I | 0.71           | I | 0.47       | I |
| I | ARM C | I | 15.00   | I | 45.00                  | I | 75.00              | I | 6.38                               | I | 9.56           | I | 6.38       | I |

.Demand set: DOVE WAY AM

| I | TIME          | I | FROM/TO | I | ARM     | A | I       | ARM | B       | I | ARM | C | I |
|---|---------------|---|---------|---|---------|---|---------|-----|---------|---|-----|---|---|
| I | 07.45 - 09.15 | I | ARM A   | I | 0.000   | I | 0.049   | I   | 0.951   | I |     | I |   |
| I |               | I |         | I | 0.0     | I | 21.0    | I   | 408.0   | I |     | I |   |
| I |               | I |         | I | ( 0.0)  | I | ( 10.0) | I   | ( 10.0) | I |     | I |   |
| I |               | I | ARM B   | I | 0.368   | I | 0.000   | I   | 0.632   | I |     | I |   |
| I |               | I |         | I | 14.0    | I | 0.0     | I   | 24.0    | I |     | I |   |
| I |               | I |         | I | ( 10.0) | I | ( 0.0)  | I   | ( 10.0) | I |     | I |   |
| I |               | I | ARM C   | I | 0.843   | I | 0.157   | I   | 0.000   | I |     | I |   |
| I |               | I |         | I | 430.0   | I | 80.0    | I   | 0.0     | I |     | I |   |
| I |               | I |         | I | ( 10.0) | I | ( 10.0) | I   | ( 0.0)  | I |     | I |   |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA  
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS  
AND FOR TIME PERIOD 1

---

| TIME DELAY I<br>ARRIVING I<br>(MIN) I | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE<br>PER<br>VEHICLE |
|---------------------------------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|---|---------------------------|
| I 07.45-08.00                         |                     |                       |                              |                                  |                          |                        |                                     |   |                           |
| I B-C                                 | 0.30                | 10.76                 | 0.028                        |                                  | 0.00                     | 0.03                   | 0.4                                 |   | 0.10                      |
| I B-A                                 | 0.18                | 6.88                  | 0.026                        |                                  | 0.00                     | 0.03                   | 0.4                                 |   | 0.15                      |
| I C-AB                                | 1.70                | 12.97                 | 0.131                        |                                  | 0.00                     | 0.25                   | 3.7                                 |   | 0.09                      |
| I C-A                                 | 4.70                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-B                                 | 0.26                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-C                                 | 5.12                |                       |                              |                                  |                          |                        |                                     |   |                           |

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| TIME DELAY I<br>ARRIVING I<br>(MIN) I | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE<br>PER<br>VEHICLE |
|---------------------------------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|---|---------------------------|
| I 08.00-08.15                         |                     |                       |                              |                                  |                          |                        |                                     |   |                           |
| I B-C                                 | 0.36                | 10.44                 | 0.034                        |                                  | 0.03                     | 0.04                   | 0.5                                 |   | 0.10                      |
| I B-A                                 | 0.21                | 6.33                  | 0.033                        |                                  | 0.03                     | 0.03                   | 0.5                                 |   | 0.16                      |
| I C-AB                                | 2.27                | 13.43                 | 0.169                        |                                  | 0.25                     | 0.35                   | 5.3                                 |   | 0.09                      |
| I C-A                                 | 5.37                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-B                                 | 0.31                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-C                                 | 6.11                |                       |                              |                                  |                          |                        |                                     |   |                           |

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| TIME DELAY I<br>ARRIVING I<br>(MIN) I | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE<br>PER<br>VEHICLE |
|---------------------------------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|---|---------------------------|
| I 08.15-08.30                         |                     |                       |                              |                                  |                          |                        |                                     |   |                           |
| I B-C                                 | 0.44                | 9.99                  | 0.044                        |                                  | 0.04                     | 0.05                   | 0.7                                 |   | 0.10                      |
| I B-A                                 | 0.26                | 5.58                  | 0.046                        |                                  | 0.03                     | 0.05                   | 0.7                                 |   | 0.19                      |
| I C-AB                                | 3.30                | 14.14                 | 0.234                        |                                  | 0.35                     | 0.55                   | 8.3                                 |   | 0.09                      |
| I C-A                                 | 6.06                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-B                                 | 0.39                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-C                                 | 7.49                |                       |                              |                                  |                          |                        |                                     |   |                           |

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| TIME DELAY I | DEMAND | CAPACITY | DEMAND/<br>CAPACITY | PEDESTRIAN<br>FLOW | START<br>QUEUE | END<br>QUEUE | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE<br>PER<br>VEHICLE |
|--------------|--------|----------|---------------------|--------------------|----------------|--------------|-------------------------------------|---|---------------------------|
|--------------|--------|----------|---------------------|--------------------|----------------|--------------|-------------------------------------|---|---------------------------|

| PICADY5    |             |           |          |            |        |        |               |               |         |      |
|------------|-------------|-----------|----------|------------|--------|--------|---------------|---------------|---------|------|
| ARRIVING I | (VEH/MIN)   | (VEH/MIN) | CAPACITY | FLOW       | QUEUE  | QUEUE  | (VEH.MIN/     | (VEH.MIN/     | PER     |      |
| (MIN) I    |             |           | (RFC)    | (PEDS/MIN) | (VEHS) | (VEHS) | TIME SEGMENT) | TIME SEGMENT) | VEHICLE |      |
| I          | 08.30-08.45 |           |          |            |        |        |               |               |         |      |
| I          | B-C         | 0.44      | 9.99     | 0.044      | 0.05   | 0.05   | 0.7           |               |         | 0.10 |
| I          | B-A         | 0.26      | 5.58     | 0.046      | 0.05   | 0.05   | 0.7           |               |         | 0.19 |
| I          | C-AB        | 3.31      | 14.15    | 0.234      | 0.55   | 0.56   | 8.5           |               |         | 0.09 |
| I          | C-A         | 6.05      |          |            |        |        |               |               |         |      |
| I          | A-B         | 0.39      |          |            |        |        |               |               |         |      |
| I          | A-C         | 7.49      |          |            |        |        |               |               |         |      |
| I          |             |           |          |            |        |        |               |               |         |      |
| I          |             |           |          |            |        |        |               |               |         |      |

| ARRIVING I | (VEH/MIN)   | (VEH/MIN) | CAPACITY | PEDESTRIAN | START | END   | DELAY     | GEOMETRIC DELAY | AVERAGE |         |
|------------|-------------|-----------|----------|------------|-------|-------|-----------|-----------------|---------|---------|
| (MIN) I    |             |           | (RFC)    | FLOW       | QUEUE | QUEUE | (VEH.MIN/ | (VEH.MIN/       | PER     | VEHICLE |
| I          | 08.45-09.00 |           |          |            |       |       |           |                 |         |         |
| I          | B-C         | 0.36      | 10.44    | 0.034      | 0.05  | 0.04  | 0.5       |                 |         | 0.10    |
| I          | B-A         | 0.21      | 6.33     | 0.033      | 0.05  | 0.03  | 0.5       |                 |         | 0.16    |
| I          | C-AB        | 2.28      | 13.44    | 0.169      | 0.56  | 0.36  | 5.4       |                 |         | 0.09    |
| I          | C-A         | 5.37      |          |            |       |       |           |                 |         |         |
| I          | A-B         | 0.31      |          |            |       |       |           |                 |         |         |
| I          | A-C         | 6.11      |          |            |       |       |           |                 |         |         |
| I          |             |           |          |            |       |       |           |                 |         |         |
| I          |             |           |          |            |       |       |           |                 |         |         |

| ARRIVING I | (VEH/MIN)   | (VEH/MIN) | CAPACITY | PEDESTRIAN | START | END   | DELAY     | GEOMETRIC DELAY | AVERAGE |         |
|------------|-------------|-----------|----------|------------|-------|-------|-----------|-----------------|---------|---------|
| (MIN) I    |             |           | (RFC)    | FLOW       | QUEUE | QUEUE | (VEH.MIN/ | (VEH.MIN/       | PER     | VEHICLE |
| I          | 09.00-09.15 |           |          |            |       |       |           |                 |         |         |
| I          | B-C         | 0.30      | 10.76    | 0.028      | 0.04  | 0.03  | 0.4       |                 |         | 0.10    |
| I          | B-A         | 0.18      | 6.87     | 0.026      | 0.03  | 0.03  | 0.4       |                 |         | 0.15    |
| I          | C-AB        | 1.71      | 12.98    | 0.132      | 0.36  | 0.26  | 3.8       |                 |         | 0.09    |
| I          | C-A         | 4.69      |          |            |       |       |           |                 |         |         |
| I          | A-B         | 0.26      |          |            |       |       |           |                 |         |         |
| I          | A-C         | 5.12      |          |            |       |       |           |                 |         |         |
| I          |             |           |          |            |       |       |           |                 |         |         |
| I          |             |           |          |            |       |       |           |                 |         |         |

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---------------------|--------------------------|
| 08.00               | 0.0                      |
| 08.15               | 0.0                      |
| 08.30               | 0.0                      |
| 08.45               | 0.0                      |
| 09.00               | 0.0                      |
| 09.15               | 0.0                      |

QUEUE FOR STREAM B-A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---------------------|--------------------------|
| 08.00               | 0.0                      |
| 08.15               | 0.0                      |
| 08.30               | 0.0                      |
| 08.45               | 0.0                      |
| 09.00               | 0.0                      |
| 09.15               | 0.0                      |

QUEUE FOR STREAM C-AB

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |   |
|---------------------|--------------------------|---|
| 08.00               | 0.2                      |   |
| 08.15               | 0.3                      |   |
| 08.30               | 0.6                      | * |
| 08.45               | 0.6                      | * |
| 09.00               | 0.4                      |   |
| 09.15               | 0.3                      |   |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| I STREAM | I | TOTAL DEMAND | I       | * QUEUEING *<br>* DELAY * | I         | * INCLUSIVE QUEUEING *<br>* DELAY * | I         | I | I |
|----------|---|--------------|---------|---------------------------|-----------|-------------------------------------|-----------|---|---|
|          |   | (VEH)        | (VEH/H) | (MIN)                     | (MIN/VEH) | (MIN)                               | (MIN/VEH) |   |   |
| I B-C    | I | 33.0         | I 22.0  | I 3.3                     | I 0.10    | I 3.3                               | I 0.10    | I | I |
| I B-A    | I | 19.3         | I 12.8  | I 3.2                     | I 0.17    | I 3.2                               | I 0.17    | I | I |
| I C-AB   | I | 218.5        | I 145.6 | I 34.9                    | I 0.16    | I 34.9                              | I 0.16    | I | I |
| I C-A    | I | 483.5        | I 322.3 | I                         | I         | I                                   | I         | I | I |
| I A-B    | I | 28.9         | I 19.3  | I                         | I         | I                                   | I         | I | I |
| I A-C    | I | 561.6        | I 374.4 | I                         | I         | I                                   | I         | I | I |
| I ALL    | I | 1344.8       | I 896.5 | I 41.5                    | I 0.03    | I 41.5                              | I 0.03    | I | I |

\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
 \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
 \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

| I Intercept | For Slope | For Opposing | Slope For Opposing | I |
|-------------|-----------|--------------|--------------------|---|
| I STREAM    | B-C       | STREAM A-C   | STREAM A-B         | I |
| I           | 0.00      | 0.00         | 0.00               | I |

\* Due to the presence of a flare, data is not available

| I Intercept | For Slope | For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing | I |
|-------------|-----------|--------------|--------------------|--------------------|--------------------|---|
| I STREAM    | B-A       | STREAM A-C   | STREAM A-B         | STREAM C-A         | STREAM C-B         | I |
| I           | 0.00      | 0.00         | 0.00               | 0.00               | 0.00               | I |

\* Due to the presence of a flare, data is not available

| I Intercept | For Slope | For Opposing | Slope For Opposing | I |
|-------------|-----------|--------------|--------------------|---|
| I STREAM    | C-B       | STREAM A-C   | STREAM A-B         | I |
| I           | 718.74    | 0.26         | 0.26               | I |

(NB These values do not allow for any site specific corrections)

.TRAFFIC DEMAND DATA

| I ARM | I FLOW SCALE (%) | I |
|-------|------------------|---|
| I A   | I 100            | I |
| I B   | I 100            | I |

I C I 100 I

.Demand set: DOVE WAY PM

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MIN.  
LENGTH OF TIME SEGMENT - 15 MIN.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

| I ARM   | NUMBER OF MINUTES FROM START WHEN |                          |                      | RATE OF FLOW (VEH/MIN) |                  |              |
|---------|-----------------------------------|--------------------------|----------------------|------------------------|------------------|--------------|
|         | I FLOW STARTS TO RISE             | I TOP OF PEAK IS REACHED | I FLOW STOPS FALLING | I BEFORE PEAK          | I AT TOP OF PEAK | I AFTER PEAK |
| I ARM A | I 15.00                           | I 45.00                  | I 75.00              | I 5.75                 | I 8.63           | I 5.75       |
| I ARM B | I 15.00                           | I 45.00                  | I 75.00              | I 1.04                 | I 1.56           | I 1.04       |
| I ARM C | I 15.00                           | I 45.00                  | I 75.00              | I 5.85                 | I 8.77           | I 5.85       |

.Demand set: DOVE WAY PM

| I TIME          | TURNING PROPORTIONS                  |           |           |           |   |   |
|-----------------|--------------------------------------|-----------|-----------|-----------|---|---|
|                 | TURNING COUNTS (PERCENTAGE OF H.V.S) |           |           |           |   |   |
| I FROM/TO       | I ARM A                              | I ARM B   | I ARM C   | I         | I | I |
| I 16.45 - 18.15 | I ARM A                              | I 0.000   | I 0.011   | I 0.989   | I | I |
|                 |                                      | I 0.0     | I 5.0     | I 455.0   | I | I |
|                 |                                      | I ( 0.0)  | I ( 10.0) | I ( 10.0) | I | I |
|                 | I ARM B                              | I 0.229   | I 0.000   | I 0.771   | I | I |
|                 |                                      | I 19.0    | I 0.0     | I 64.0    | I | I |
|                 |                                      | I ( 10.0) | I ( 0.0)  | I ( 10.0) | I | I |
|                 | I ARM C                              | I 0.957   | I 0.043   | I 0.000   | I | I |
|                 |                                      | I 448.0   | I 20.0    | I 0.0     | I | I |
|                 |                                      | I ( 10.0) | I ( 10.0) | I ( 0.0)  | I | I |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA  
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS AND FOR TIME PERIOD 2

| I TIME DELAY I ARRIVING I (MIN) I | I DEMAND (VEH/MIN) I | I CAPACITY (VEH/MIN) I | I DEMAND/CAPACITY (RFC) I | I PEDESTRIAN FLOW (PEDS/MIN) I | I START QUEUE (VEHS) I | I END QUEUE (VEHS) I | I DELAY (VEH.MIN/ TIME SEGMENT) I | I GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) I | I AVERAGE PER VEHICLE I |
|-----------------------------------|----------------------|------------------------|---------------------------|--------------------------------|------------------------|----------------------|-----------------------------------|---|-------------------------|
| I 16.45-17.00                     |                      |                        |                           |                                |                        |                      |                                   |   |                         |
| I B-C                             | I 0.80               | I 10.46                | I 0.077                   |                                | I 0.00                 | I 0.08               | I 1.2                             |   | I 0.10                  |
| I B-A                             | I 0.24               | I 6.84                 | I 0.035                   |                                | I 0.00                 | I 0.04               | I 0.5                             |   | I 0.15                  |
| I C-AB                            | I 0.42               | I 12.94                | I 0.032                   |                                | I 0.00                 | I 0.04               | I 0.6                             |   | I 0.08                  |
| I C-A                             | I 5.45               |                        |                           |                                |                        |                      |                                   |   |                         |
| I A-B                             | I 0.06               |                        |                           |                                |                        |                      |                                   |   |                         |
| I A-C                             | I 5.71               |                        |                           |                                |                        |                      |                                   |   |                         |

| I TIME DELAY I ARRIVING I (MIN) I | I DEMAND (VEH/MIN) I | I CAPACITY (VEH/MIN) I | I DEMAND/CAPACITY (RFC) I | I PEDESTRIAN FLOW (PEDS/MIN) I | I START QUEUE (VEHS) I | I END QUEUE (VEHS) I | I DELAY (VEH.MIN/ TIME SEGMENT) I | I GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) I | I AVERAGE PER VEHICLE I |
|-----------------------------------|----------------------|------------------------|---------------------------|--------------------------------|------------------------|----------------------|-----------------------------------|---|-------------------------|
| I 17.00-17.15                     |                      |                        |                           |                                |                        |                      |                                   |   |                         |

| TIME DELAY I ARRIVING I (MIN) I | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE PER VEHICLE |
|---------------------------------|------------------|--------------------|-----------------------|----------------------------|--------------------|------------------|-------------------------------|---|---------------------|
| I B-C                           | 0.96             | 10.11              | 0.095                 |                            |                    |                  | 0.08 0.10                     | 1.5                                     | 0.11                |
| I B-A                           | 0.28             | 6.33               | 0.045                 |                            |                    |                  | 0.04 0.05                     | 0.7                                     | 0.17                |
| I C-AB                          | 0.55             | 13.35              | 0.041                 |                            |                    |                  | 0.04 0.06                     | 0.9                                     | 0.08                |
| I C-A                           | 6.46             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-B                           | 0.07             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-C                           | 6.82             |                    |                       |                            |                    |                  |                               |   |                     |

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| TIME DELAY I ARRIVING I (MIN) I | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE PER VEHICLE |
|---------------------------------|------------------|--------------------|-----------------------|----------------------------|--------------------|------------------|-------------------------------|---|---------------------|
| I 17.15-17.30                   |                  |                    |                       |                            |                    |                  |                               |   |                     |
| I B-C                           | 1.17             | 9.61               | 0.122                 |                            | 0.10               | 0.14             | 2.0                           |   | 0.12                |
| I B-A                           | 0.35             | 5.63               | 0.062                 |                            | 0.05               | 0.07             | 0.9                           |   | 0.19                |
| I C-AB                          | 0.84             | 14.17              | 0.059                 |                            | 0.06               | 0.10             | 1.4                           |   | 0.07                |
| I C-A                           | 7.75             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-B                           | 0.09             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-C                           | 8.35             |                    |                       |                            |                    |                  |                               |   |                     |

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| TIME DELAY I ARRIVING I (MIN) I | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE PER VEHICLE |
|---------------------------------|------------------|--------------------|-----------------------|----------------------------|--------------------|------------------|-------------------------------|---|---------------------|
| I 17.30-17.45                   |                  |                    |                       |                            |                    |                  |                               |   |                     |
| I B-C                           | 1.17             | 9.61               | 0.122                 |                            | 0.14               | 0.14             | 2.1                           |   | 0.12                |
| I B-A                           | 0.35             | 5.62               | 0.062                 |                            | 0.07               | 0.07             | 1.0                           |   | 0.19                |
| I C-AB                          | 0.84             | 14.17              | 0.059                 |                            | 0.10               | 0.10             | 1.4                           |   | 0.08                |
| I C-A                           | 7.75             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-B                           | 0.09             |                    |                       |                            |                    |                  |                               |   |                     |
| I A-C                           | 8.35             |                    |                       |                            |                    |                  |                               |   |                     |

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| TIME DELAY I ARRIVING I (MIN) I | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE PER VEHICLE |
|---------------------------------|------------------|--------------------|-----------------------|----------------------------|--------------------|------------------|-------------------------------|---|---------------------|
| I 17.45-18.00                   |                  |                    |                       |                            |                    |                  |                               |   |                     |
| I B-C                           | 0.96             | 10.11              | 0.095                 |                            | 0.14               | 0.11             | 1.6                           |   | 0.11                |
| I B-A                           | 0.28             | 6.33               | 0.045                 |                            | 0.07               | 0.05             | 0.7                           |   | 0.17                |
| I C-AB                          | 0.55             | 13.35              | 0.041                 |                            | 0.10               | 0.06             | 0.9                           |   | 0.08                |
| I C-A                           | 6.46             |                    |                       |                            |                    |                  |                               |   |                     |



I  
 I A-B 0.07  
 I  
 I A-C 6.82  
 I  
 I  
 I

| TIME<br>DELAY I<br>ARRIVING I<br>(MIN) I | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE<br>PER<br>VEHICLE |
|--|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|---|---------------------------|
| I 18.00-18.15                            |                     |                       |                              |                                  |                          |                        |                                     |   |                           |
| I B-C                                    | 0.80                | 10.46                 | 0.077                        |                                  | 0.11                     | 0.08                   | 1.3                                 |   | 0.10                      |
| I B-A                                    | 0.24                | 6.84                  | 0.035                        |                                  | 0.05                     | 0.04                   | 0.6                                 |   | 0.15                      |
| I C-AB                                   | 0.42                | 12.94                 | 0.032                        |                                  | 0.06                     | 0.04                   | 0.7                                 |   | 0.08                      |
| I C-A                                    | 5.45                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-B                                    | 0.06                |                       |                              |                                  |                          |                        |                                     |   |                           |
| I A-C                                    | 5.71                |                       |                              |                                  |                          |                        |                                     |   |                           |

QUEUE FOR STREAM B-C

| TIME<br>SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |
|---------------------------|--------------------------------|
| 17.00                     | 0.1                            |
| 17.15                     | 0.1                            |
| 17.30                     | 0.1                            |
| 17.45                     | 0.1                            |
| 18.00                     | 0.1                            |
| 18.15                     | 0.1                            |

QUEUE FOR STREAM B-A

| TIME<br>SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |
|---------------------------|--------------------------------|
| 17.00                     | 0.0                            |
| 17.15                     | 0.0                            |
| 17.30                     | 0.1                            |
| 17.45                     | 0.1                            |
| 18.00                     | 0.0                            |
| 18.15                     | 0.0                            |

QUEUE FOR STREAM C-AB

| TIME<br>SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |
|---------------------------|--------------------------------|
| 17.00                     | 0.0                            |
| 17.15                     | 0.1                            |
| 17.30                     | 0.1                            |
| 17.45                     | 0.1                            |
| 18.00                     | 0.1                            |
| 18.15                     | 0.0                            |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| STREAM | TOTAL DEMAND<br>(VEH) | DEMAND<br>(VEH/H) | * QUEUEING *<br>* DELAY * | (MIN) | (MIN/VEH) | * INCLUSIVE QUEUEING *<br>* DELAY * | (MIN) | (MIN/VEH) |
|--------|-----------------------|-------------------|---------------------------|-------|-----------|-------------------------------------|-------|-----------|
| B-C    | 88.1                  | 58.7              | 9.7                       | 0.11  | 9.7       | 0.11                                |       |           |
| B-A    | 26.2                  | 17.4              | 4.4                       | 0.17  | 4.4       | 0.17                                |       |           |
| C-AB   | 54.2                  | 36.2              | 5.9                       | 0.11  | 5.9       | 0.11                                |       |           |
| C-A    | 589.9                 | 393.3             |                           |       |           |                                     |       |           |
| A-B    | 6.9                   | 4.6               |                           |       |           |                                     |       |           |
| A-C    | 626.3                 | 417.5             |                           |       |           |                                     |       |           |

I ALL I 1391.6 I 927.7 I 20.1 I 0.01 I 20.1 I 0.01 I

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\* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD  
\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES  
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD  
\* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS  
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

\*\*\*\*\*END OF RUN\*\*\*\*\*