WOODLAND ENVIRONMENTAL

CHERRY LODGE GOLF CLUB, BIGGIN HILL

REVISED CONSTRUCTION TRAFFIC MANAGEMENT STATEMENT

REPORT REF. F990-02A
PROJECT NO. F990
OCTOBER 2011

CHERRY LODGE GOLF CLUB, BIGGIN HILL

REVISED CONSTRUCTION TRAFFIC MANAGEMENT STATEMENT

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DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	1st Draft Client Issue	SAF	CMB	DJR	11/03/11
-	Final	SAF	CMB	DJR	14/07/11
A	Revised draft to address LBB concerns	ML	SAF	ML	11/10/11
A	Final Revision	ML	SAF	ML	18/10/11
A	Final Revision with amendments for submission	ML	SAF	ML	20/10/11

1.0 INTRODUCTION

1.1 Ardent Consulting Engineers (ACE) has been appointed by Woodland Environmental (WE) to advise on construction traffic management for the upgrading and modernisation of the Cherry Lodge Golf Club, Biggin Hill.

1.2 A Construction Traffic Management Statement (CTMS) was prepared in support of the planning application (ref 11/02499) for submission to the local planning and highway authority, the London Borough of Bromley (LBB) in July 2011. This Revised CTMS has been prepared to address concerns raised by LBB on highways grounds in their response dated 30th August 2011.

1.3 The planning application is also supported by a Transport Statement, also prepared by ACE, which has also been revised to address comments made by LBB.

1.4 Following this introduction, the remainder of this report is structured as follows:

- **Section 2.0** describes the existing situation;
- **Section 3.0** outlines the proposed management of construction traffic and;
- **Section 4.0** provides a summary and sets out the conclusions.

2.0 EXISTING SITUATION

Site Location

2.1 The site which forms the subject of this planning application is located on the eastern fringe of Biggin Hill, as shown at **Plate 1**.

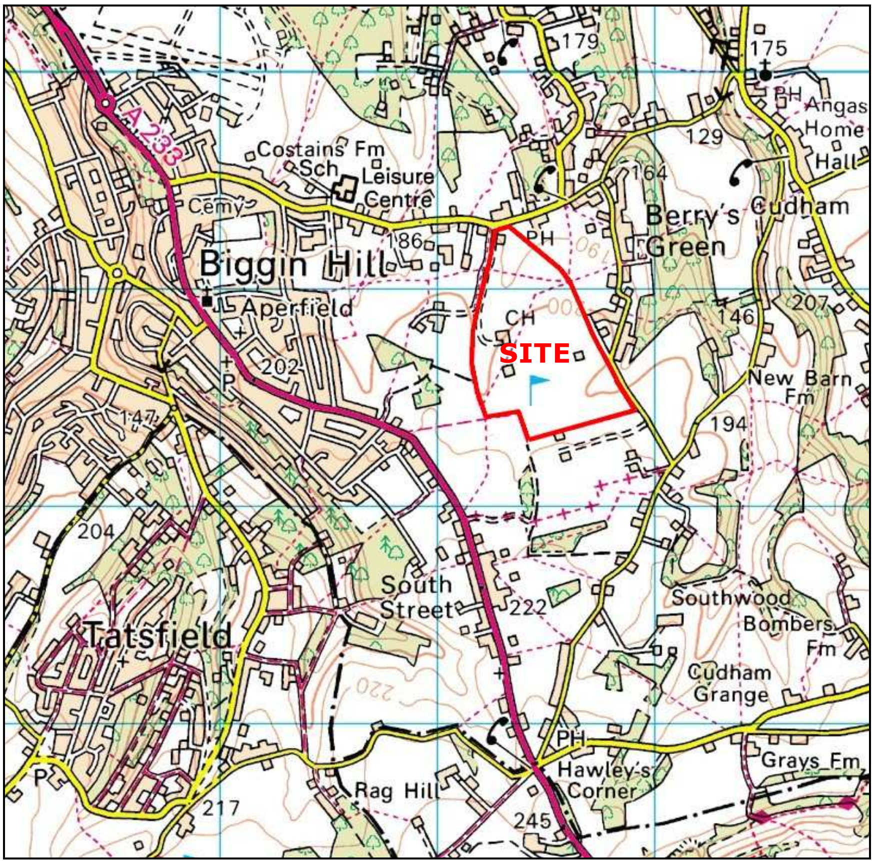


Plate 1: Site Location

Site Access

2.2 The site is accessed from Jail Lane, which runs on an east-west alignment to the immediate north of the site. Jail Lane varies in character along its length, it being a circa 7m wide urban single carriageway road with footways as it passes through residential development immediately east of the A233, and narrowing to a circa 4.3m wide semi-rural lane beyond this. The site access is taken from the semi-rural lane section, the width of which allows two cars to pass only.

Local Highway Network

2.3 The A223 Main Road is a circa 7.3m wide single carriageway road that is subject to a 30mph speed limit. It also has a local weight restriction, with access restricted to sub 5-tonne vehicles only in the hours 6:30pm – 8:00am. In addition, LBB is part of the Transport for London (TfL) Low Emission Zone (LEZ).

Strategic Highway Network

2.4 The A223 connects to the A232 at Bromley Common to the north and the A25 at Westerham to the south, both via priority 'T' junctions. The A25 connects to Junction 5 of the M25 near Sundridge. The M26 and A21 also connect with the M25 at this junction. There is no exit from the M26 to the M25 and all traffic must join the clockwise (westbound) M25. **Plate 2** illustrates the strategic highway network in the wider local area.

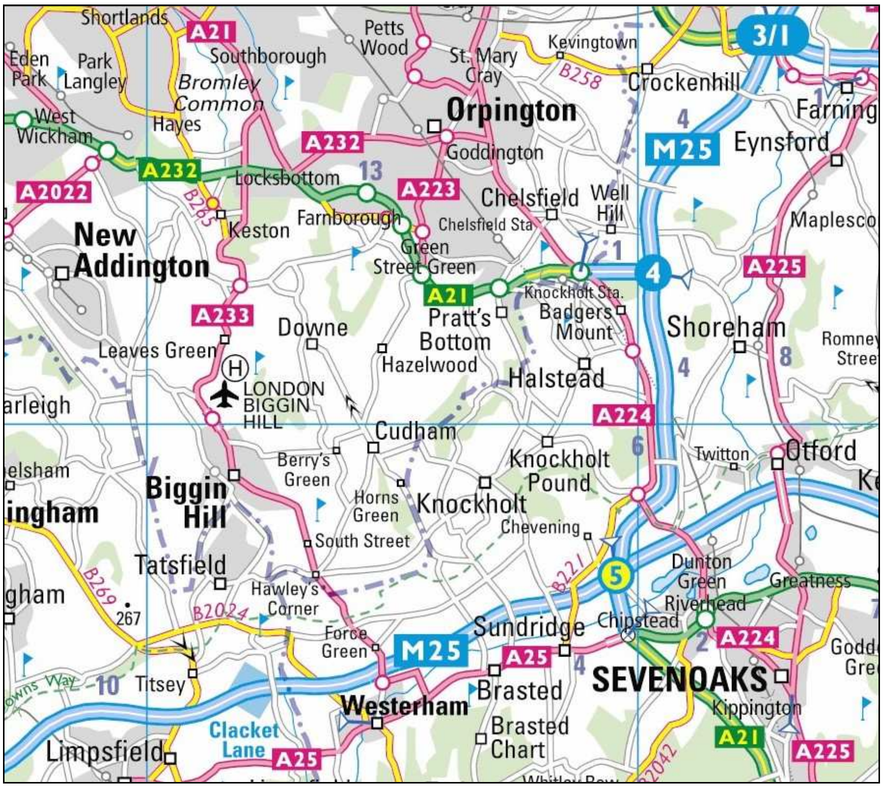


Plate 2: Strategic Highway Network

3.0 CONSTRUCTION TRAFFIC MANAGEMENT

Site Access

3.1 Jail Lane is considered unsuitable for frequent HGV use given that its narrow width in the vicinity of the existing Golf Club access does not allow for a HGV to pass a car. Therefore, it is not intended to use the existing site access for construction access.

3.2 It is proposed to provide temporary construction access to the site from the A223 Main Road in proximity to an existing farm access on Main Road (see **Plate 3**). WE has agreed a haul road route that borders agricultural land with the landowner; this has been revised since the original scheme proposals, as shown in WE drawing nos 100.23 rev C and 100.24 Rev C, attached at **Appendix A**.

3.3 The revised proposals now include a compound inside the site, thought the wheel washing facility has been provided close to the site entrance and on the haul road itself to avoid unnecessary crossings of the Byway. A small ticketing office (6m x 3m) is located next to the wheel washing facility to supervise access and ticket vehicles upon entry.

3.4 The haul road would be at least 6m wide along its initial section to allow for two-way HGV movements and would route alongside and segregated from an existing byway, with a 10-15m wide buffer between the two.

Plate 3: Site Access Location

3.5 The temporary haul road is proposed to connect to Main Road via a new priority 'T' junction arrangement. Proposed radii between Main Road and the haul road are 10m to ensure that vehicles turning left-in or out do not conflict with traffic travelling northbound on Main Road, and this is demonstrated in the swept path assessment shown on **Drawing no. F990-003A**.

3.6 The proposed temporary junction arrangement is located close to the points at which Byway BR283 and Bridleway BR275B (upgraded from Footpath status in 2010) meet and connect to Main Road (see map enclosed at **Appendix B**). The junction design includes footways around its radii to provide alternative connections to these Public Rights of Way (PRoW) for walkers, whilst the Byway/Bridleway connection to Main Road is retained as a vehicular crossover. Banksmen will be deployed during site operating hours to ensure the safety of walkers crossing the haul road.

3.7 A gate will be provided across the haul road behind the point where Byway BR283 crosses, and this will be closed outside of site operating hours to prevent unauthorised access.

3.8 Main Road is subject to a 30mph speed limit in the vicinity of the proposed access. In pre-application discussions, LBB requested that a speed survey be undertaken to verify 85^{th} percentile traffic speeds to inform junction visibility splay requirements.

3.9 A traffic speed survey on a sample of 100 vehicles in each direction was undertaken at Main Road in dry weather on two days in June 2009 in accordance with guidance set out in *TA 22/81 Vehicle Speed Measurement on All Purpose Roads*. This showed 85^{th} percentile northbound and southbound dry weather speeds of 37mph (60kph) and 39mph (63kph) respectively. The speed survey results are included at **Appendix C**.

3.10 The required 'y' distances for visibility splays at junctions on an existing road are based on the stopping site distance (SSD) of vehicles travelling on the major road at the observed 85^{th} percentile speed in wet weather conditions. Subtracting 4kph from the dry weather speeds (as stipulated in *TA 22/81*) gives 85^{th} percentile wet weather speeds of 35mph (56kph) northbound and 37mph (59kph) southbound.

3.11 In pre-application discussions with LBB, it was established that the use of the parameters recommended in the *Manual for Streets* (*MfS*) may be acceptable to derive the SSD on Main Road. In this respect, *MfS* states that its guidance on SSDs applies where 85^{th} percentile speeds do not exceed 37mph (60kph), as is the case at Main Road.

3.12 The visibility requirements in the *MfS* are based on a driver perception/reaction time of 1.5 seconds, and a deceleration rate of 0.45g. Applying these constants to the 85^{th} percentile wet weather speeds gives SSDs (adjusted for bonnet length) of 53m for northbound vehicles and 57m for southbound vehicles.

3.13 Given the nature of the use of the temporary construction access, and as agreed with LBB, an 'x' distance of 2.4m is considered appropriate. Pending the cutting back of hedgerow, visibility splays of 2.4m x 53m and 57m are achievable looking left (south) and right (north), respectively, along Main Road for drivers egressing the site, as shown on **Drawing no. F990-003B**. It is relevant to note that the hedgerow located within the visibility splay to the right is already maintained at a low level to allow for greater visibility for vehicles egressing the Byway.

3.14 In terms of visibility in the vertical plane, *TD 9/93 Highway Link Design* identifies that SSD should be measured from a driver's eye height of between 1.05m and 2.00m, to an object height of between 0.26m and 2.00m above the road surface. These eye height dimensions are relevant to a car driver and HGV driver respectively. Given that the access will be used exclusively by HGVs, it was originally anticipated that the hedgerow would be cut back to allow visibility from a 2.00m driver eye height. However, following comments raised in the Safety Audit requested by LBB, which is attached at **Appendix D**, sufficient visibility will be provided in each direction along Main Road from a car driver's eye height of 1.05m, requiring the hedge height to be reduced further. This also addresses a request made by LBB that visibility splays be provided for this eye height.

3.15 As requested by LBB, despite the very low volume of traffic turning into and out of the haul road at the proposed access, a capacity assessment has been undertaken using the industry-standard software PICADY. The analysis is based on the maximum two-way hourly flow observed on Main Road during the inter-peak period (between 09:00 and 17:00) on a weekday on Tuesday 27th

September 2011 (during school term time). This was 915 vehicles and occurred between 16:00-17:00 (i.e. partly outside the hours of site operation so use of the flows in this period is an onerous assumption). The survey results are attached at **Appendix E**.

3.16 To be robust we have assumed 15 HGVs arriving at the site from the south and turning right into the haul road in an hour, with 15 HGVs departing the site and turning right onto Main Road during this hour. This compares with the average of 10 arrivals and 10 departures per hour expected during each weekday throughout the construction period (see below). We have also used the *ODTab* facility to model a 90-minute period (the peak hour itself plus 15 minutes either side) with a synthesised peak flow profile within this time, which is robust. The results of the assessment are summarised in **Table 3.1** with full program output attached at **Appendix E**. This shows the maximum Ratio of Flow to Capacity (RFC) value, delay and queue per vehicle predicted by the model for each give way manoeuvre during any 15-minutes within the modelled period.

Table 3.1: Summary of results of PICADY capacity assessment of Main Road/Haul Road access junction

Manoeuvre	**Weekday pm peak hour**		
	RFC	*Delay (mins/veh)*	*Queue (vehs)*
Egress from Haul Road	0.046	0.16	0.0
Main Road northbound ahead + right turn	0.047	0.10	0.1
Overall junction delay (mins/veh)		***0.01***	

3.17 **Table 3.1** shows that the proposed junction with the Haul Road is expected to operate well within capacity, with maximum RFC values of under 0.1 and so well below the desirable maximum of 0.85 and negligible queuing and delays (a few seconds per vehicle).

3.18 The provision of the access will require an existing lighting column to be relocated. Since site operating hours will be only until 16:30, vehicles would only be entering and leaving the site during darkness during 3 months in the Winter (namely in November, December and January), and the site will be closed for over a week around the Christmas and New Year period. The access will be signed appropriately.

Vehicle Routing

3.19 Construction vehicles could route to the site via either: the A232 and then south on the A223; or alternatively via the A25 and then north on the A223.

Wash-down Facilities

3.20 The A223 will be kept free of soils resulting from the movement of tipper wagons on the site. This will be achieved with a wheel cleaning spinner on egress from the site compound and road sweeper(s) at the site access when required.

3.21 In addition, a mobile water bowser will be available on site and will be used to suppress dust arising during dry periods. The regular washing of vehicles and dampening of surfaces and materials in dry conditions, will ensure that dust does not have any significant impact beyond the application site boundaries.

Construction Vehicle Sizes

3.22 The recovered inert soils would be brought to the site by Woodland Environmental using 4-axle tipper spoil wagons.

3.23 A variety of plant may be needed during the course of operations, although it is unlikely that all of the plant will be required at the same time. It is proposed that a tracked bulldozer and/or excavator suitable for grading of inert spoils will remain on site for the duration of the tipping operations. At other times a dumper truck and a 360 degree excavator will be required and these would be brought in or hired as appropriate.

3.24 All plant and machinery required for the earthworks operations will be stationed on the course itself.

Construction Schedule

3.25 The duration of the construction phase is anticipated to be in the order of 18 months, depending on the availability of suitable inert soils, and also restricted hours of operation due to adverse weather conditions, which may result in the period being extended to 24 months. This excludes the construction and disposal of the haul road and site compound.

3.26 Normal operating hours for the fill importation will be restricted to 09:30 – 16:30 Mondays to Fridays, outside of the busiest highway network morning and evening peak periods, which can be enforced by means of a planning condition. These restrictions on operating times seek to negate the need for a right-turn lane at the site access. The operating hours also avoid weekends when use of the PRoWs is highest, and when residents of houses on Main Road near to the proposed junction with the haul road are most likely to be at home, so minimising disturbance. There will be no construction activity in the evenings, overnight or early mornings which again are sensitive periods when residents are most likely to be at home.

3.27 In terms of construction vehicle movements, it is anticipated that the site will receive 70 deliveries per weekday, which equates to a total of 350 deliveries per week and 10 an hour on average.

On-Site Management Strategy

3.28 Between 4 and 8 WE employees would be on-site every day of construction. An employee would be present at all times when the site is open to accept imported soils.

3.29 Site control during the landscape works will be undertaken by an experienced member of WE and all vehicles delivering fill to the site would report to him. Records would be kept of all loads deposited at the site and this would be retained by the site supervisor. Records would be available for inspection by officers of the appropriate regulatory authority as necessary.

3.30 A representative of WE will be available for liaison with LBB should issues arise during the works.

3.31 In order to limit congestion on-site, deliveries of materials will be co-ordinated to ensure that vehicle arrive on a staggered basis.

Overhang of the Public Highway

3.32 There would be no overhang of the public highway by cranes etc as part of the construction works.

Proposed Hoarding

3.33 If LBB sees fit, hoarding is proposed around the works to limit any instances of dust entering the public highway. This would be secured by means of a planning condition.

Pedestrian, Cyclist and Equestrian Safety

3.34 As identified earlier, the proposed temporary junction arrangement at Main Road includes footways around its radii to provide safe connections to the PRoW for pedestrians.

3.35 The PRoW routes would be retained as existing and there would be a suitable buffer between these and the haul road, with protective fencing provided as necessary to ensure safety to the public.

3.36 At the points where the haul road crosses a PRoW, a safe crossing area with good visibility will be provided on the approaches, with vegetation cut back as necessary, as well as warning signs to the public and lorry drivers. The speed limit on the road will be 10mph, and with two-way traffic permitted along the length of the road HGVs will be able to travel at this speed continuously so heavy braking will not be ncessary. Speed reducing ramps could be provided at points where the road crosses PRoWs if LBB considers this necessary.

3.37 The golf course will remain open to the public for the duration of the construction works. During the operations all necessary steps would be taken to ensure that the public using the golf course are fully aware of the operations and are safe from manoeuvring vehicles. This will take the form of protective fencing around the works and appropriately located warning signs to the public and lorry drivers.

3.38 Possible conflicts between construction traffic and pedestrians, cyclists and equestrians will be minimised through on-site management. If required, trained banksmen would supervise reversing vehicles. As highlighted above, during site operating hours, a banksman would be deployed at the points where the existing PRoWs cross the haul road to ensure the safety of walkers, cyclists and equestrians. As **Plate 3** shows, only one access into the site is now to be provided across Bridleway BR277 (the easternmost of the two originally proposed) in order to limit the impact on the PRoWs.

3.39 LBB has requested that WE indemnify the Council against any claims for injury or damage that may arise as a result of the proposed crossing of the existing public rights of way by the haul road. WE has confirmed that this could be dealt with by means of a Unilateral Undertaking.

Haul Road route construction and decommissioning

3.40 The initial section of the Haul Road will be surfaced with concrete to minimise dust during the dry summer months.

3.41 WE is prepared to accept a condition requiring the route of the haul road to be made good following the cessation of its use.

4.0 SUMMARY AND CONCLUSIONS

4.1 This Revised Construction Traffic Management Statement has been prepared for submission to LBB to provide additional information in support of the planning application for the upgrading and modernisation of the Cherry Lodge Golf Club, Biggin Hill.

4.2 The works will comprise the importation of recovered inert soils brought to the site by WE using 4-axle tipper spoil wagons. The duration of the construction phase is anticipated to be in the order of 18-24 months, depending on the availability of suitable inert soils and weather conditions. Normal operating hours for the fill importation will be 09:30 – 16:30 Mondays to Fridays, outside of the busiest highway network morning and evening periods.

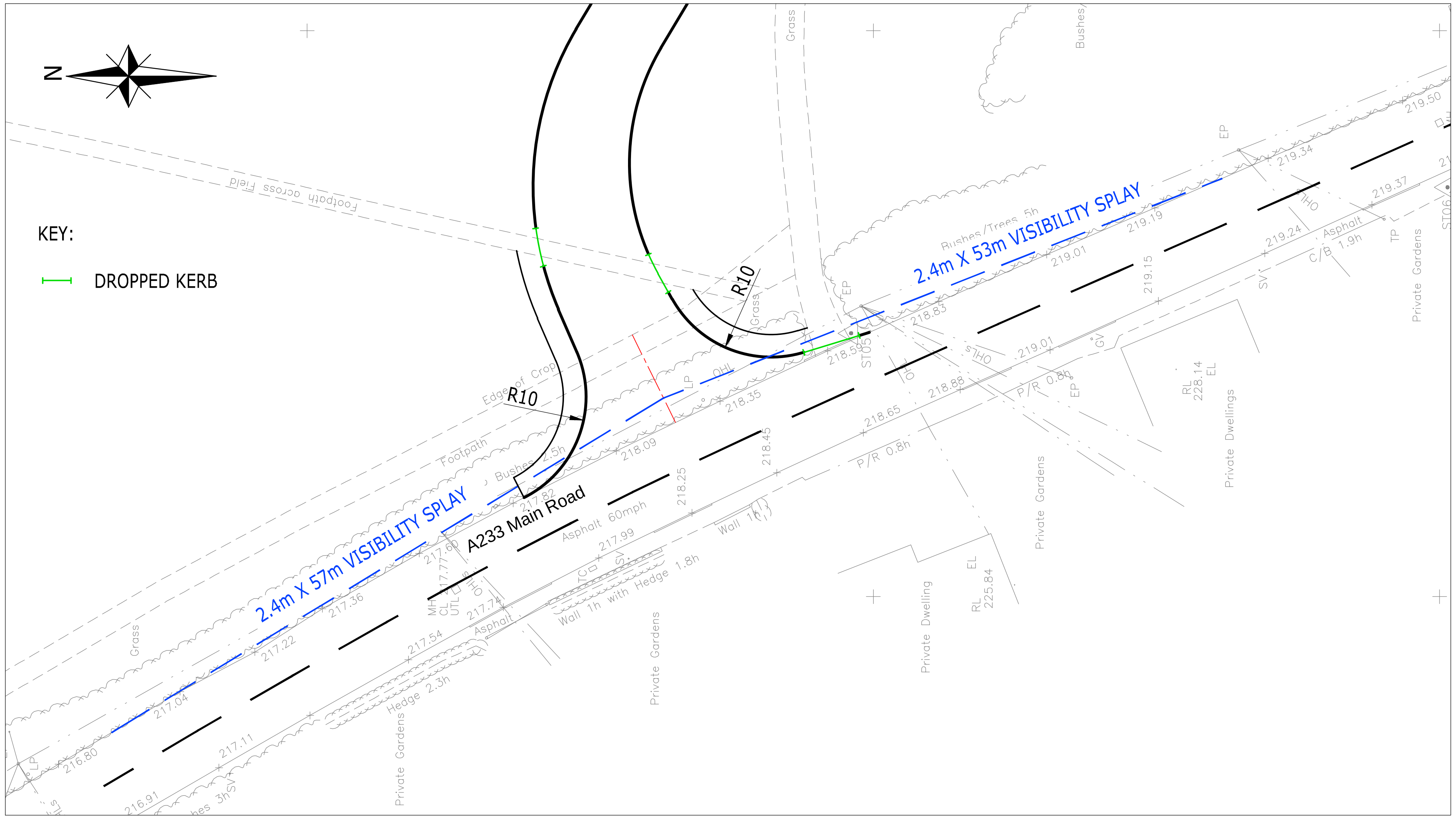
4.3 The temporary haul road is proposed to connect to Main Road via a new priority 'T' junction arrangement. The proposed junction arrangement respects the PRoWs and includes footways around its radii to provide alternative connections to these for walkers, whilst the Byway/Bridleway connection to Main Road is retained as a vehicular crossover. A gate will be provided behind the point where Bridleway BR275B crosses and will be closed outside of site operating hours to ensure no use by unauthorised vehicles.

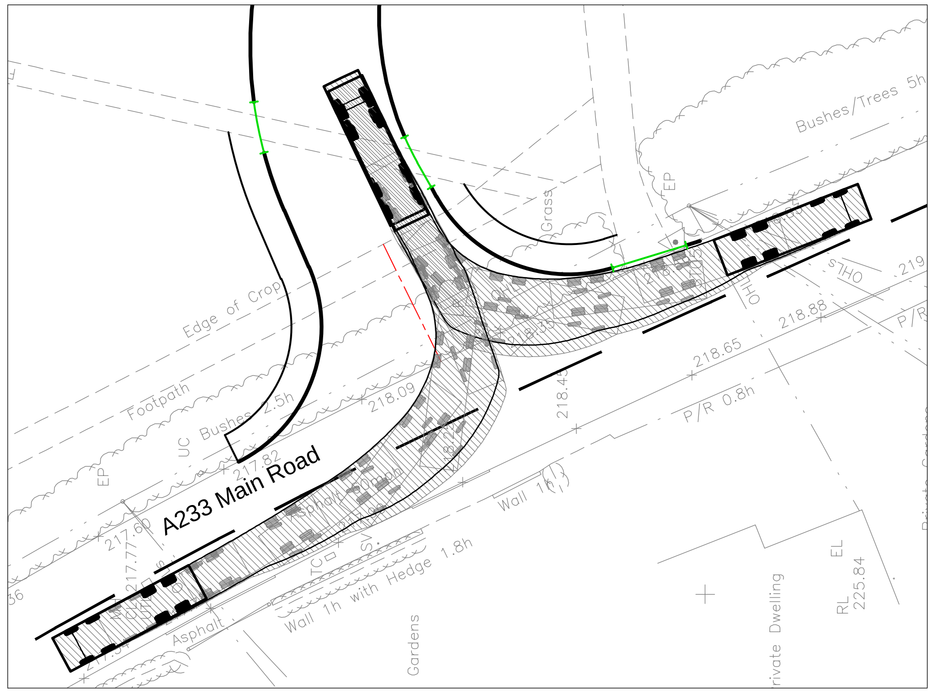
4.4 Vehicle flow and speed surveys have been undertaken on Main Road to inform junction visibility splay requirements, which are 2.4m x 53m and 57m looking left (south) and right (north), respectively. The restrictions on operating times seek to negate the need for a right-turn lane at the site access. A safety audit of the proposed junction has been undertaken, which does not highlight any issues which cannot be easily addressed. A robust PICADY capacity assessment, which demonstrates that the junction would operate well within capacity with the expected flows (on the basis of the onerous assumption that 15 HGVs will enter, and 15 will leave, the site each hour, compared to the 10 expected) has also been undertaken.

4.5 The PRoW routes would be retained as existing and there would be a suitable 10-15m wide buffer between these and the haul road, with protective fencing provided to ensure safety to the public. On occasion when the haul road crosses a PRoW, a safe crossing area with good visibility will be provided, as well as warning signs to the public and lorry drivers. A 10mph speed limit will apply on the haul road, and during site operating hours banksmen will be deployed where it crosses PRoWs to ensure the safety of walkers, cyclists and equestrians.

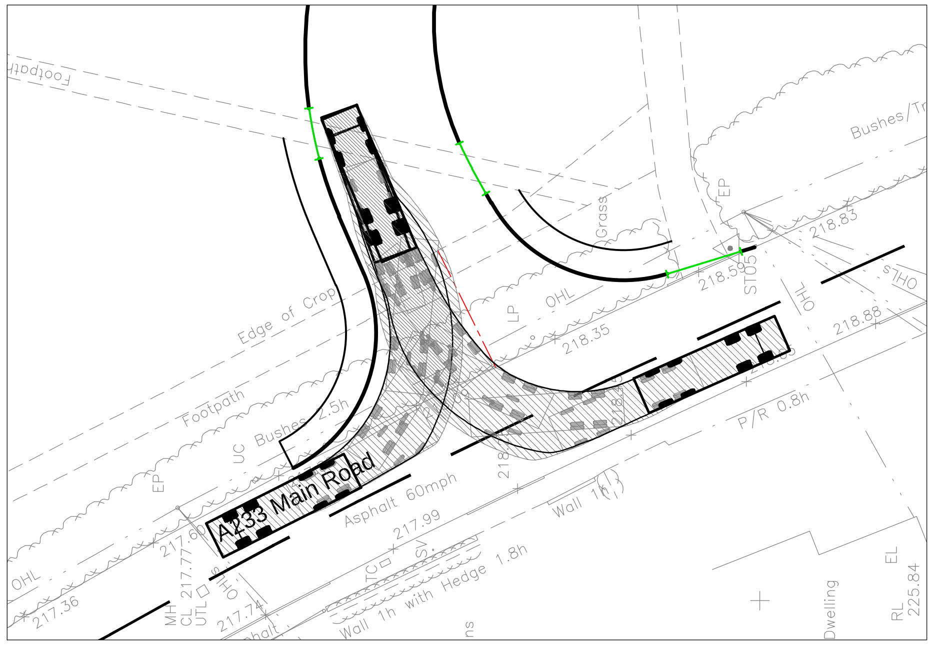
4.6 The golf course will remain open to the public for the duration of the construction works. During the operations all necessary steps would be taken to ensure that the public using the golf course are fully aware of the operations and are safe from manoeuvring vehicles.

Drawings

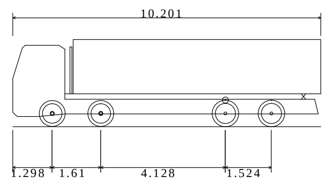




LARGE TIPPER TRUCK SWEPT PATHS
EGRESSING TEMPORARY SITE ACCESS



LARGE TIPPER TRUCK SWEPT PATHS
ENTERING TEMPORARY SITE ACCESS



Large Tipper	
Overall Length	10.201m
Overall Width	2.500m
Overall Body Height	2.893m
Min Body Ground Clearance	0.343m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.550m

ISO 9001 BUREAU VERITAS Certification

REV.	AMENDMENTS	DRN	CHK	APP	DATE
A	FOOTWAYS AND ACCESS EXTENDED	RMA	SAF	ML	23-02-11

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PROJECT TITLE:
CHERRY LODGE GOLF CLUB, BIGGIN HILL

DRAWING TITLE:
PROPOSED TEMPORARY ACCESS

CLIENT:
WOODLAND ENVIRONMENTAL

SCALE:	DATE:	DESIGNED:
1:500 @ A3	JUNE 2009	RMA
DRAWN: RMA	CHECKED: SAF	APPROVED: DJR
DRAWING NO. F990-003		REV: A

Appendix A

Woodland Environmental Haul Road Routes Drawing nos 100.23 Rev C and 100.24 Rev C

KEY

INFRASTRUCTURE

	A233 MAIN ROAD
	EXISTING BYWAY 283
	EXISTING RIGHT OF WAY 275B RECENTLY UPGRADED TO BRIDLEWAY
	EXISTING PERMISSIVE ROUTES
	ALTERNATIVE TEMPORARY ROUTES FOR HORSE RIDERS, WALKERS AND CYCLISTS
	PROPOSED HAUL ROAD
	ADDITIONAL BUFFER STRIP TO PERMIT 2 WAY FLOW OF TRAFFIC

NOTES:

Site Access / Haul Road Details

- Site access from the A233 main road
- Haul road branches from A233 - bellmouth width 35m (straight line)
- Grill - covered drainage channel with an oil separator discharges surface water from hard surfaces into temporary filter strips (drain dimensions 0.5 wide x 0.3 deep)
- Haul road between wheel bath and entrance, a distance of 75m, constructed to specification detailed below:

1. Strip topsoil to 150mm & subsoil to 300mm
2. Capping layer 200mm type 1 crushed concrete laid on terrain and compacted
3. 200mm of 35/ strength ready mix concrete with reinforced steel thoughout to floated finish

- Haul road between wheel wash facility and golf course access point, a distance of 1060m, will be constructed as per the specification outlined on plan CLGC - Crossing Point BW277 -100.24 (Rev C)

Cleaning Facilities

- Positioned so that vehicles leaving wheel bath will be on surfaced haul road until exit, minimising risk of mud adhearing to tyres
- Three - stage cleaning process
- Dry spinner, powered by vehicles's drive wheels to remove debris with centrifugal force - supplied by Wheelwash Ltd (see accompanying specification) - dimensions 2.44m long x 3.4m wide
- Wheel bath : Drive through bath supplied by Wheelwash Ltd (see accompanying specification) - dimensions 20m long (10m bath + ramps) 3.5m wide
- Pressure washer: hand held jet wash system for cleaning any remaining debris from wheels
- Additionally a road - sweeper will be used to ensure public highway is kept free of dirt and grit

0m 30m 60m 90m 120m 150m

SCALE 1:1000

GENERAL NOTES

1. HAUL ROAD TO BE REMOVED FOLLOWING COMPLETION OF DEVELOPMENT, AND ALL VEGETATION REINSTATED. HEIGHTS, SPECIES AND WHIP SIZES TO BE AGREED WITH BROMLEY COUNCIL

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shaping a future in golf
Sherborne, Dorset
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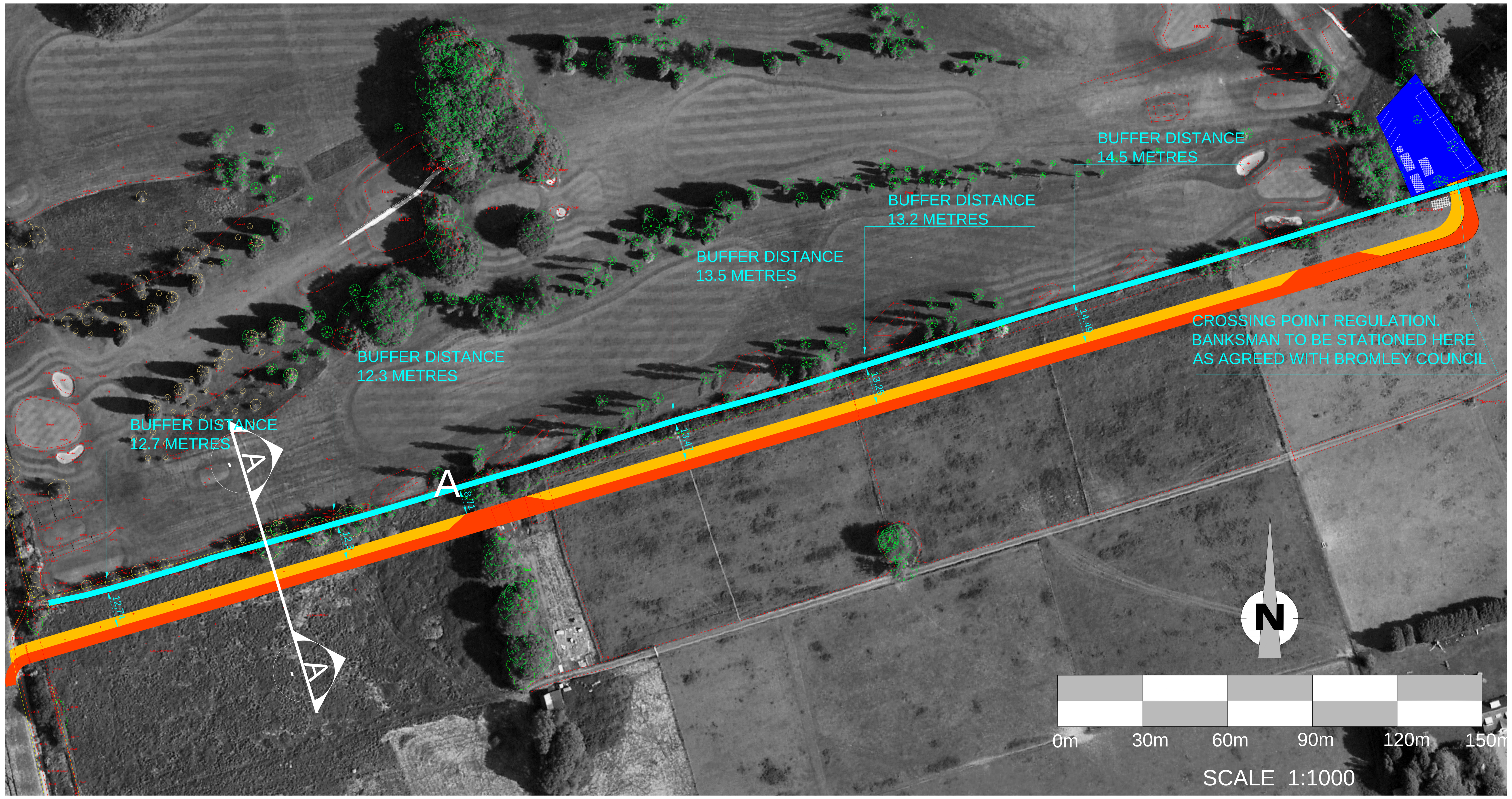
e.enquiries@woodland.uk.com

project: Remodel	drawing title: PROPOSED ROW ACCESS
date: 13.10.2011	
scale: 1:1000	

CLGC - Proposed ROW Access - 100.23 (Rev C)



KEY

INFRASTRUCTURE

	BRIDLEWAY 277
	PROPOSED HAUL ROAD
	ADDITIONAL BUFFER STRIP TO PERMIT 2 WAY FLOW OF TRAFFIC
	GREEN BUFFER BETWEEN PATHS AND HAUL ROAD
	SITE COMPOUND

Compound Details

- Site office, mess room and meeting room all single - storey portakabins: Portakabin Pacemaker PK202 or similar - dimensions 6.08 x 3.27m (2.57 high)
- Steel storage container no larger than portakabins: Cleveland sitesafe 88 size or similar - dimensions 6.10m x 3.1m (2.64m high)
- Single toilet and hand basin facility
- Perimeter fencing 2m high Heras panel with anti - climb mesh compliant with HSG151
- Gated access to compound across haul road at both ends

GENERAL NOTES

1. REDUCED SITE COMPOUND BY 5500m2, NO PLANT OR MACHINERY TO BE PERMANENTLY STATIONED OR OPERATED IN THE SITE COMPOUND

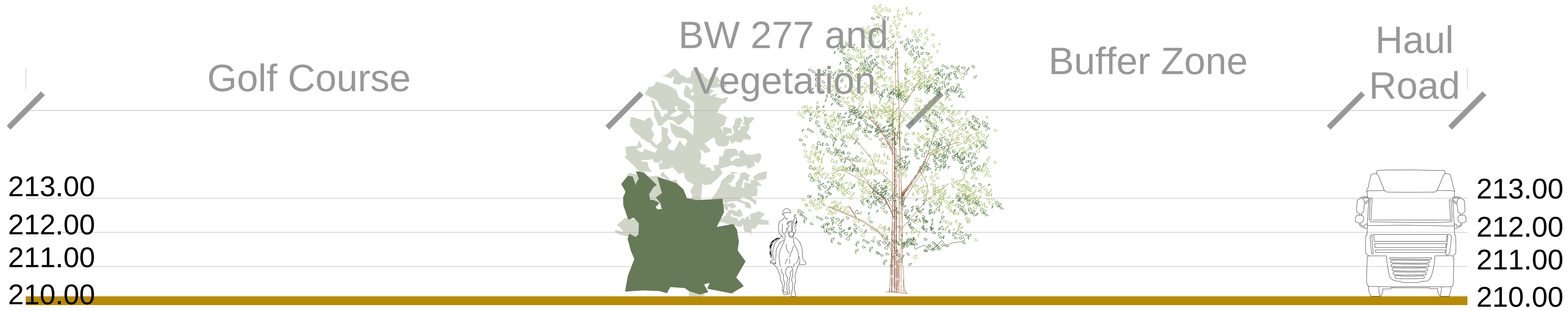
2. HAUL ROAD TO BE REMOVED FOLLOWING COMPLETION OF DEVELOPMENT, AND ALL VEGETATION REINSTATED. HEIGHTS, SPECIES AND WHIP SIZES TO BE AGREED WITH BROMLEY COUNCIL

Proposed Site Compound

SCALE 1:200

Section A - A (Typical)

SCALE 1:100

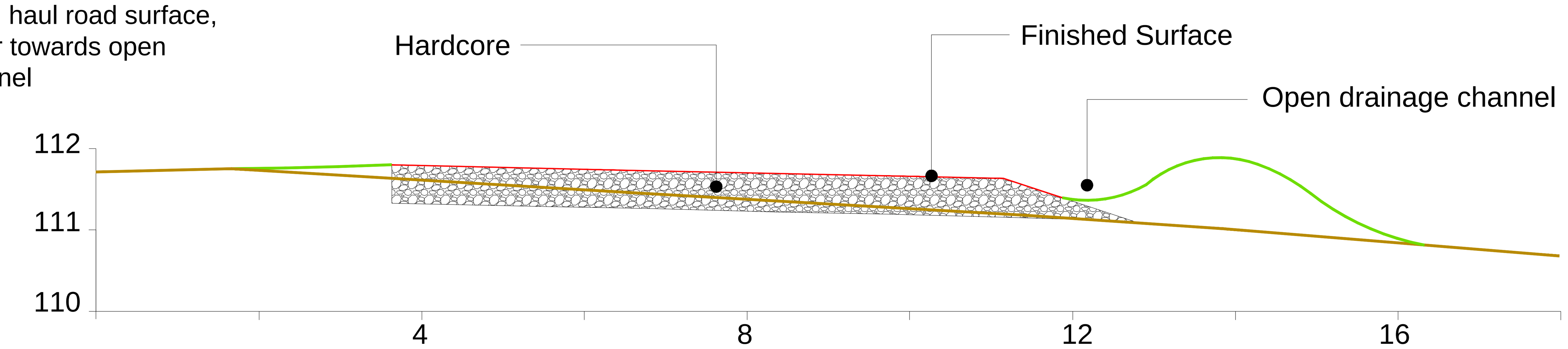


CERTAIN STRETCHES OF BRIDLEWAY 277 ARE EXPOSED TO THE ADJACENT FIELDS, A TEMPORARY SCREEN IN THE FORM OF MINOR 2.5 METRE MOUNDING AND/OR SITE HOARDING WILL ENSURE THAT PATH USERS ARE NOT DISTURBED BY PASSING TRUCKS.

Haul Road (Typical)

SCALE 1:50

- Existing surface cut as necessary to create excavated depth of 450mm, to which crushed hardcore is added to create finished haul road surface, Gentle camber towards open drainage channel



client:

CHERRY LODGE GOLF CLUB

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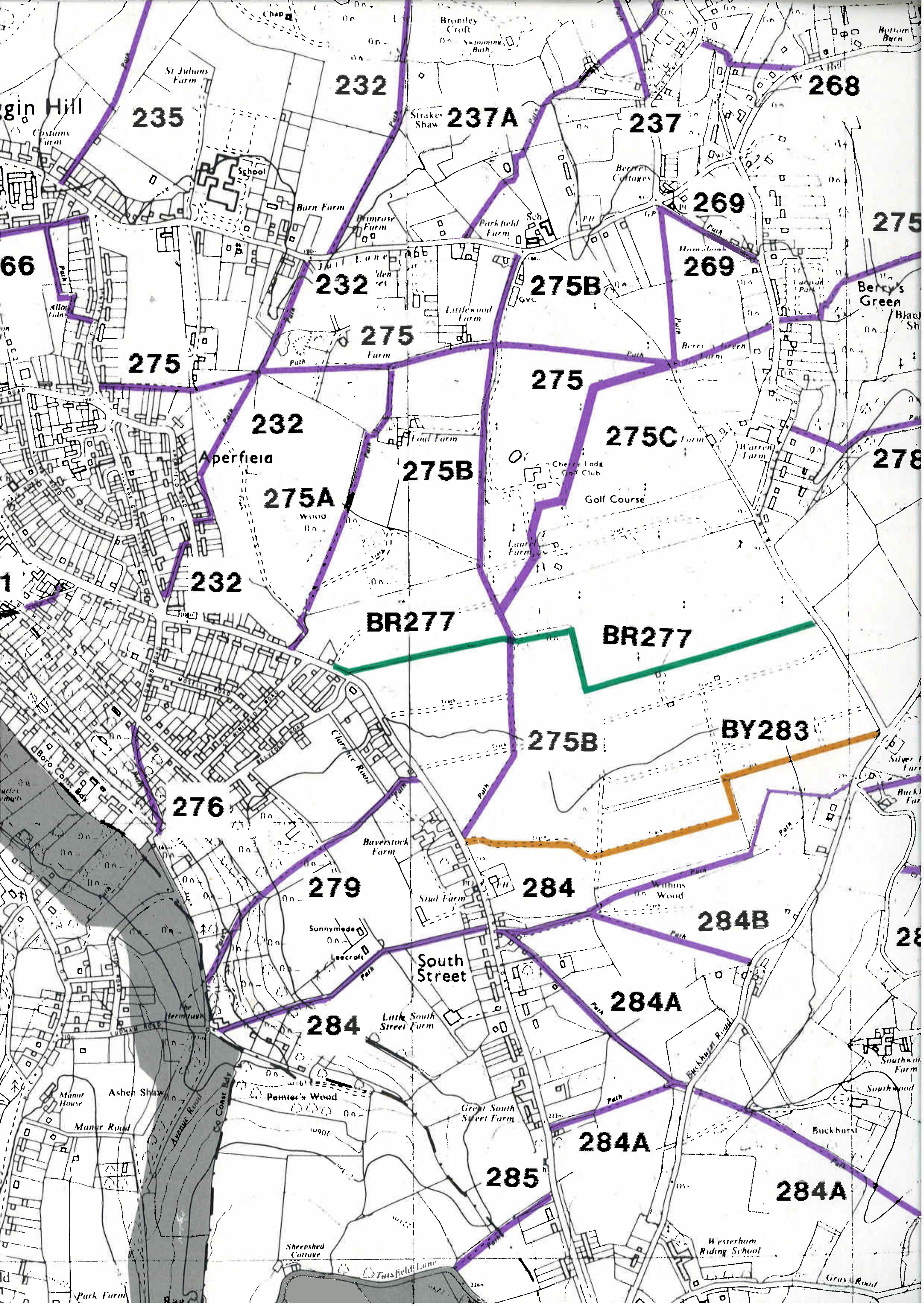
project:	drawing title:
Remodel	CROSSING POINT OF BW 277 AT SITE ACCESS
date: 14.10.2011	
scale: 1:1000	

Appendix B

Public Rights of Way Map



ggin Hill
235
232
237A
237
268
269
275
275A
275B
275C
66
St Julians Farm
Costains Farm
School
Barn Farm
Primrose Farm
Parkfield Farm
Bromley Croft
Strakes Shaw
Bottom Barn
Berrys Cottages
Berry's Green
Littlewood Farm
Foal Farm
Aperfield
Wood
Cherry Lodge Golf Club
Golf Course
Laurel Farm
Warren Farm
BR277
275B
BY283
276
279
284
284A
284B
285
Baverstock Farm
Stud Farm
Sunnymede
Leecroft
South Street
Little South Street Farm
Withins Wood
Painter's Wood
Great South Street Farm
Buckhurst Road
Buckhurst
Southwood
Southwood Farm
Westerham Riding School
Sheepshed Cottage
Tatsfield Lane
Manor House
Ashen Shaw
Manor Road
Avenue Road
The Hermitage
Park Farm
Path

Appendix C

Traffic Speed Survey Results

Countsequential
SURVEYS

Speed Surveys at

Main Road, Biggin Hill

Tuesday 02nd & Friday 05th June 2009

for:

Ardent Consulting Engineers

Countsequential Ltd

3 Lewes Road - Bromley
Kent - BR1 2RN

T 020 8819 5809
F 020 8819 5617
M 07973 280966
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REF: ARD/286


point of survey

Main Road, Biggin Hill - Point of survey photos

Countsequential

SURVEYS

SPEED SURVEY RESULTS:

MAIN ROAD, BIGGIN HILL

TUESDAY 02nd JUNE 2009

Countsequential Ltd

3 Lewes Road - Bromley
Kent - BR1 2RN

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Countsequential SURVEYS

DATE : 02nd JUNE 2009 DAY: TUESDAY

LOCATION : MAIN ROAD, BIGGIN HILL (OPPOSITE NO. 344)

WEATHER : DRY

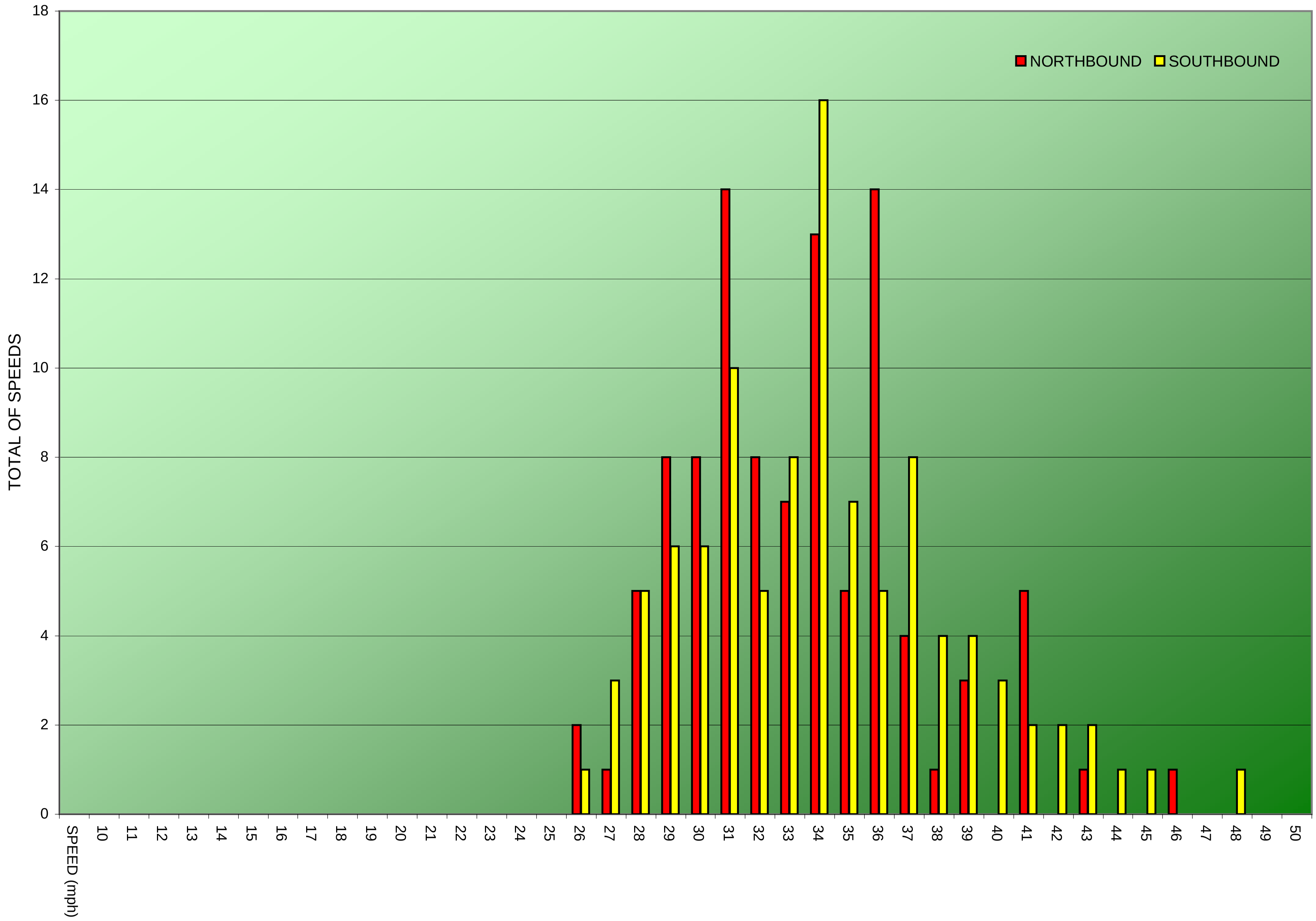
CARRIAGEWAY : SINGLE ROADWORKS : NONE

MA[illegible] ROAD[illegible] H[illegible] [illegible]M[illegible] [illegible]1[illegible] [illegible]11[illegible]			
	NORTHBOUND	SOUTHBOUND	
SPEED (mph)	NUMBER OF VEHICLES	NUMBER OF VEHICLES	SPEED (kph)
10			16
11			18
12			19
13			21
14			23
15			24
16			26
17			27
18			29
19			31
20			32
21			34
22			35
23			37
24			39
25			40
26	2	1	42
27	1	3	43
28	5	5	45
29	8	6	47
30	8	6	48
31	14	10	50
32	8	5	51
33	7	8	53
34	13	16	55
35	5	7	56
36	14	5	58
37	4	8	60
38	1	4	61
39	3	4	63
40		3	64
41	5	2	66
42		2	68
43	1	2	69
44		1	71
45		1	72
46	1		74
47			76
48		1	77
49			79
50			80
[illegible]O[illegible]A[illegible]	1[illegible]	1[illegible]	
[illegible]t[illegible] ile [illegible]dr[illegible]	[illegible]	[illegible]	[illegible] p[illegible]
	[illegible]	[illegible]	[illegible]p[illegible]
[illegible]t[illegible] ile [illegible]et	[illegible]	[illegible]	[illegible]p[illegible]
SSD [illegible]DMR[illegible]	[illegible]1	[illegible]	[illegible]
SSD [illegible]M[illegible]S[illegible]	[illegible]	[illegible]	[illegible]

LOWEST SPEED	26 mph	26 mph
MEAN SPEED	33 mph	34 mph
MEDIAN SPEED	33 mph	34 mph
HIGHEST SPEED	46 mph	48 mph

* SSD based on Design Manual for Roads and Bridges
** SSD based on Manual for Streets

MAIN ROAD, BIGGIN HILL (Tuesday 02nd June 2009)



SPEED SURVEY RESULTS:

MAIN ROAD, BIGGIN HILL

FRIDAY 05th JUNE 2009

Countsequential Ltd

3 Lewes Road - Bromley
Kent - BR1 2RN

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Countsequential SURVEYS

DATE : 05th JUNE 2009 DAY: FRIDAY

LOCATION : MAIN ROAD, BIGGIN HILL (OPPOSITE NO. 344)

WEATHER : DRY

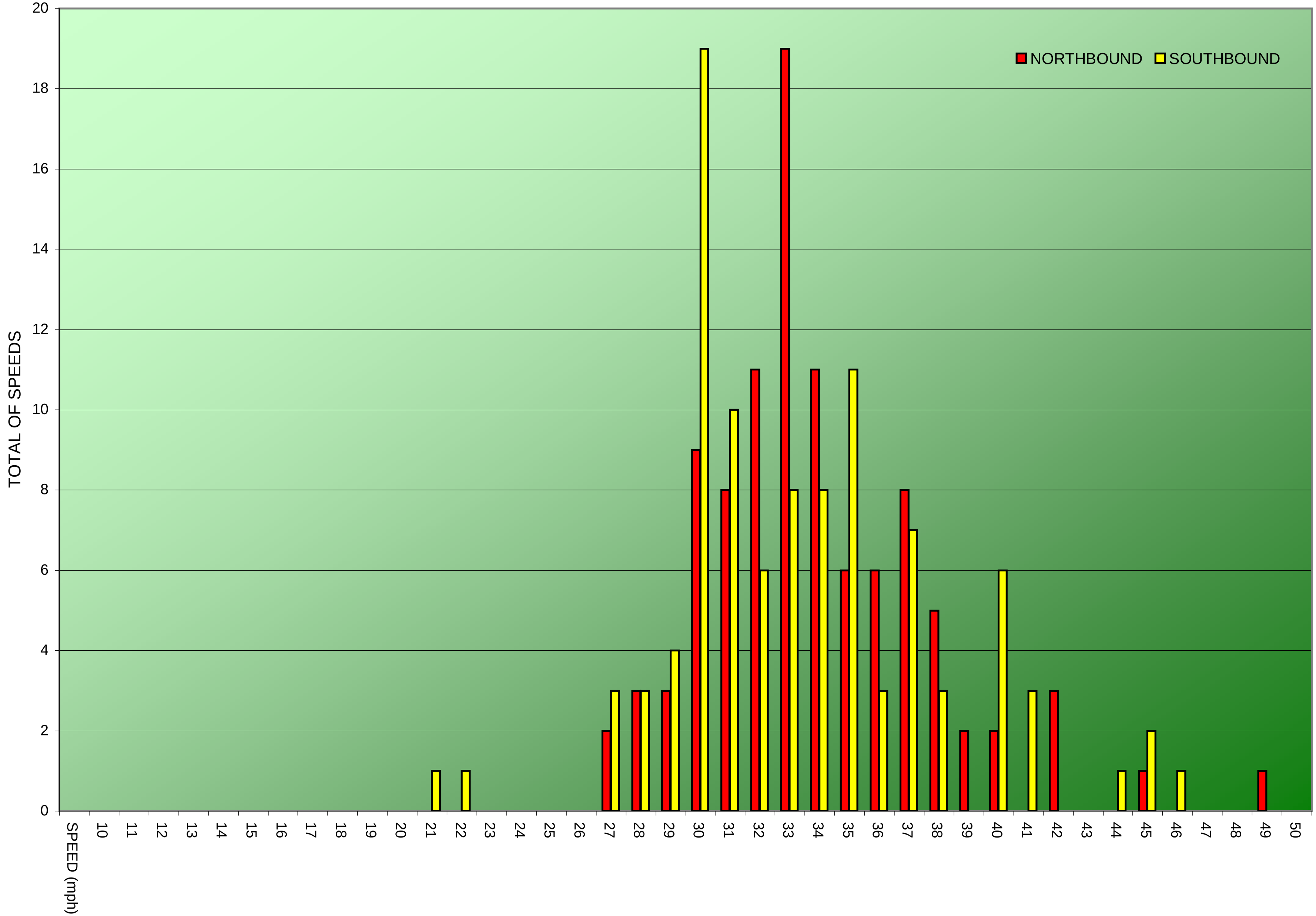
CARRIAGEWAY : SINGLE ROADWORKS : NONE

MA[illegible] ROAD[illegible] H[illegible] [illegible]M[illegible] [illegible]1[illegible]1[illegible] [illegible]1[illegible]2[illegible]			
SPEED (mph)	NORTHBOUND NUMBER OF VEHICLES	SOUTHBOUND NUMBER OF VEHICLES	SPEED (kph)
10			16
11			18
12			19
13			21
14			23
15			24
16			26
17			27
18			29
19			31
20			32
21		1	34
22		1	35
23			37
24			39
25			40
26			42
27	2	3	43
28	3	3	45
29	3	4	47
30	9	19	48
31	8	10	50
32	11	6	51
33	19	8	53
34	11	8	55
35	6	11	56
36	6	3	58
37	8	7	60
38	5	3	61
39	2		63
40	2	6	64
41		3	66
42	3		68
43			69
44		1	71
45	1	2	72
46		1	74
47			76
48			77
49	1		79
50			80
[illegible]O[illegible]A[illegible]	1[illegible]	1[illegible]	
[illegible]t[illegible] ile [illegible]dr[illegible]	[illegible]	[illegible]	[illegible] p[illegible]
	[illegible]	[illegible]1	[illegible]p[illegible]
[illegible]t[illegible] ile [illegible]et	[illegible]	[illegible]	[illegible]p[illegible]
SSD [illegible]DMR[illegible]	[illegible]1	[illegible]	[illegible]
SSD [illegible]M[illegible]S[illegible]	[illegible]	[illegible]	[illegible]

LOWEST SPEED	27 mph	21 mph
MEAN SPEED	34 mph	33 mph
MEDIAN SPEED	33 mph	33 mph
HIGHEST SPEED	49 mph	46 mph

* SSD based on Design Manual for Roads and Bridges
** SSD based on Manual for Streets

MAIN ROAD, BIGGIN HILL (Friday 05th June 2009)



Appendix D

Stage 1 Road Safety Audit

M & S Traffic Ltd

Road Safety Audit Stage 1

A233 Main Road

Proposed Temporary Access

Biggin Hill

Date: 9th October 2011

Report produced for: Ardent Consulting Engineers

Report produced by: M & S Traffic Ltd

M & S Traffic Ltd
Aeolus house
32 Hamelin Road
Gillingham
Kent ME7 3EX

Tel: +44 1634 307498

Directors:
Martin Morris & Bryan Shawyer
Company Reg. No. 06730905
Registered Office: 32 Hamelin Road, Gillingham, Kent ME7 3EX

DOCUMENT CONTROL SHEET

Project Title	A233 Main Road, Biggin Hill Proposed Temporary Access for Cherry Lodge Golf Club
Report Title	Road Safety Audit Stage 1
Revision	
Status	Final
Reference	F990/1/MM

Record of Issue

Issue	Status	Author	Date	Check	Date	Authorised	Date
1	Draft	MM	05/10/11	BS	06/10/11	MM	06/10/11
1	Final	MM	09/10/11	BS	09/10/11	MM	09/10/11

Distribution

Organisation	Contact	Copies
Ardent Consulting Engineers	Matthew Last	–

CONTENTS

1 INTRODUCTION

1.1 This report describes a Stage 1 Road Safety Audit carried out on a proposed temporary HGV access for the redevelopment of Cherry Lodge Golf Club on the A233 Main Road, Biggin Hill. The Audit was requested by the design organisation, Ardent Consulting Engineers, 4th Floor, Diamond House, 36/38 Hatton Garden, London EC1N 8EB.

1.2 The Audit Team membership was as follows:

Martin Morris PGD, MCIHT, Audit Team Leader

Bryan Shawyer BEng (Hons), MSc, MCIHT, Audit Team Member

1.3 The audit was undertaken in accordance with the audit brief and HD 19/03, The Design Manual for Roads and Bridges. The documents available at the time of the report was compiled are detailed in Appendix A.

1.4 A site visit and inspection was undertaken during the afternoon of the 5th October 2011, weather conditions at the time were dry and overcast. Traffic flows on Main Road were moderate and free flow speeds were also moderate.

1.5 The report has been compiled, only with regard to the safety implications for road users of the layout presented in the supplied drawings. It has not been examined or verified for compliance with any other standards or criteria. This safety audit does not perform any "Technical Check" function on these proposals. It is assumed that the Project Sponsor is satisfied that such a "Technical Check" has been successfully completed prior to requesting this safety audit.

1.6 The auditors have not been informed of any Departures from Standards in this scheme construction.

1.7 All comments and recommendations are referenced to the detailed drawings and the locations have been detailed relating to the plans supplied with the audit brief, Appendix B.

1.8 The Designer's Response to this audit has been included in Appendix C.

2 THE SCHEME

2.1 The scheme proposes to construct a temporary HGV access for the redevelopment of Cherry Lodge Golf Club, on the A233 Main Road, Biggin Hill.

2.2 The junction design includes footways around its radii to provide alternative connections to these Public Rights of Way for walkers, whilst the Byway/Bridleway connection to Main Road is retained as a vehicular crossover.

3 TRAFFIC CONDITIONS

3.1 This section of the A233 Main Road, Biggin Hill is rural in nature and is fronted by both residential development and local businesses. Main Road performs the role of a local distributor route and is subject to a 30mph speed restriction. The proposed temporary junction arrangement is located close to the points at which Byway 283 and Bridleway 275B connect to the A233 Main Road.

3.2 Observed traffic flows and speeds on Main Road were moderate.

3.3 There were no movements on the Byway or Bridleway.

3.4 No traffic or pedestrian data was supplied at the time of the audit.

4 ITEMS RAISED AT THE STAGE 1

4.1 General

4.1.1 No comment.

4.2 Local Alignment

4.2.1 **PROBLEM**

Location: Junction of the Access Road and Main Road

Summary: Ponding of surface water could lead to loss of control accidents.

No details of drainage or vertical profiles have been provided for the junction, any ponding on Main Road could lead to loss of control accidents.

RECOMMENDATION

That drainage details and carriageway profiles be provided at safety audit stage 2.

4.3 Junctions

4.3.1 **PROBLEM**

Location: Junction of the Access Road and Main Road.

Summary: Lack of visibility may lead to side impact accidents.

It is proposed that the visibility splays are 57m and 53m and are based on a 2m height above carriageway level. It was noted that from the Construction Traffic Management Statement that the visibility distances from Manual for Streets have been used. It would appear that greater visibility distances in accordance or possibly in excess of the requirements of TD42/95 could be achieved with minimal vegetation trimming.

RECOMMENDATION

That as the haul route will be used for a 18-24 month period, with slow moving traffic exiting the junction that consideration be given to increasing the visibility splays.

4.3.2 **PROBLEM**

Location: Junction of the Access Road and Main Road.

Summary: Lack of visibility may lead to side impact accidents.

In the Construction Traffic Management Statement, it is stated that the haul route is to be used exclusively by HGVs. However, it is unclear how this will be enforced and should other traffic egress from the site then the visibility splays would be insufficient.

RECOMMENDATION

That details be provided, as to how HGV only controls would be introduced or that consideration be given to introduce visibility splays suitable for all vehicle types.

4.4 Non Motorised User Provision

4.4.1 No comment.

4.5 Road Signs, Carriageway Markings and Lighting

4.5.1 **PROBLEM**

Location: Junction of the Access Road and Main Road.

Summary: Absence of street lighting may lead to accidents during the hours of darkness.

The proposal places the junction where there is an existing street lighting column. No details have been supplied, as to additional lighting or where the removed column is to be repositioned. A reduction in the luminance on Main Road may give rise to accidents during the hours of darkness. Furthermore should the spacing between columns be too great then the current 30mph speed limit may not apply.

RECOMMENDATION

That street lighting details be provided at safety audit stage 2.

5 AUDITOR TEAM STATEMENT

I certify that this audit has been carried out in accordance with HD 19/03.

Audit Team Leader

Martin Morris PGD, MCIHT
M & S Traffic Ltd
Aeolos House
32 Hamelin Road
Gillingham
Kent ME7 3EX

Signed……………………………………

Date………………………………..…...

Audit Team Member

Bryan Shawyer, BEng (Hons), MSc, MCIHT
M & S Traffic Ltd
Aeolos House
32 Hamelin Road
Gillingham
Kent ME7 3EX

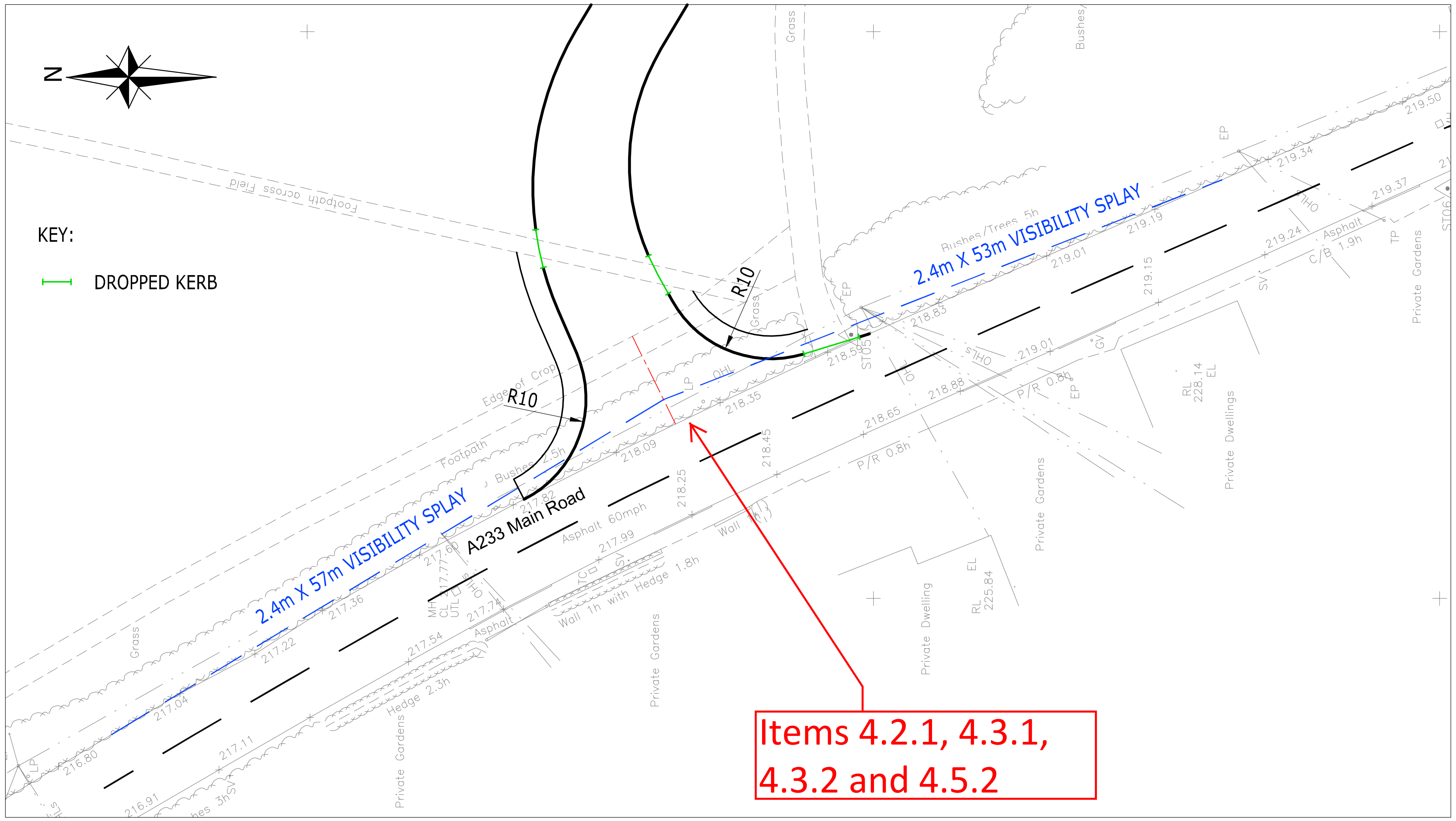
APPENDIX A

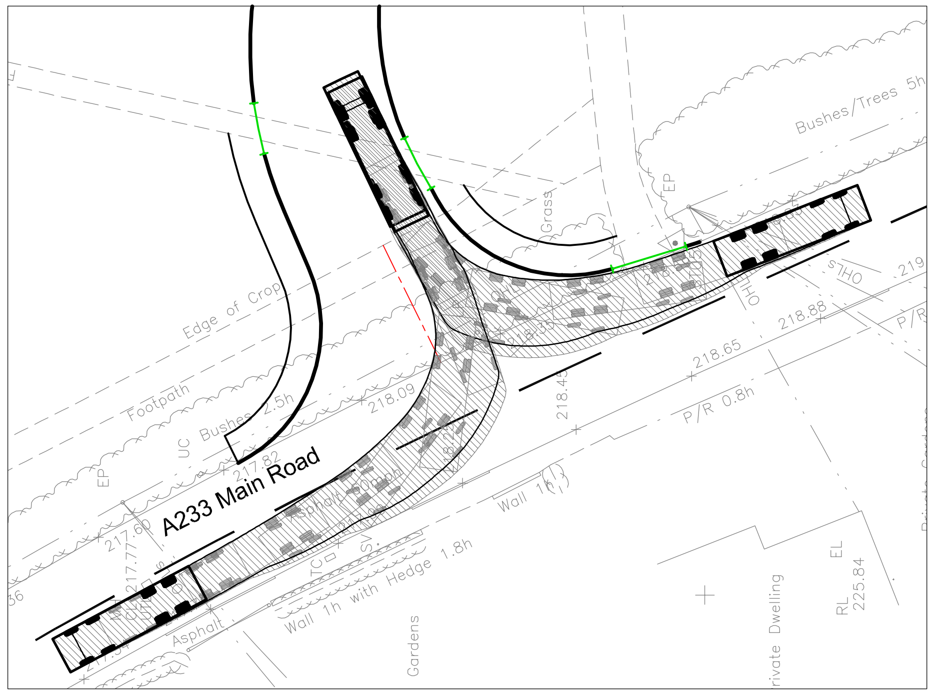
List of Drawings submitted for auditing:

- Drawing No. F990-003: Proposed Temporary Access.
- Report No. F990-02 Cherry Lodge golf Club, Construction Traffic Management Statement.

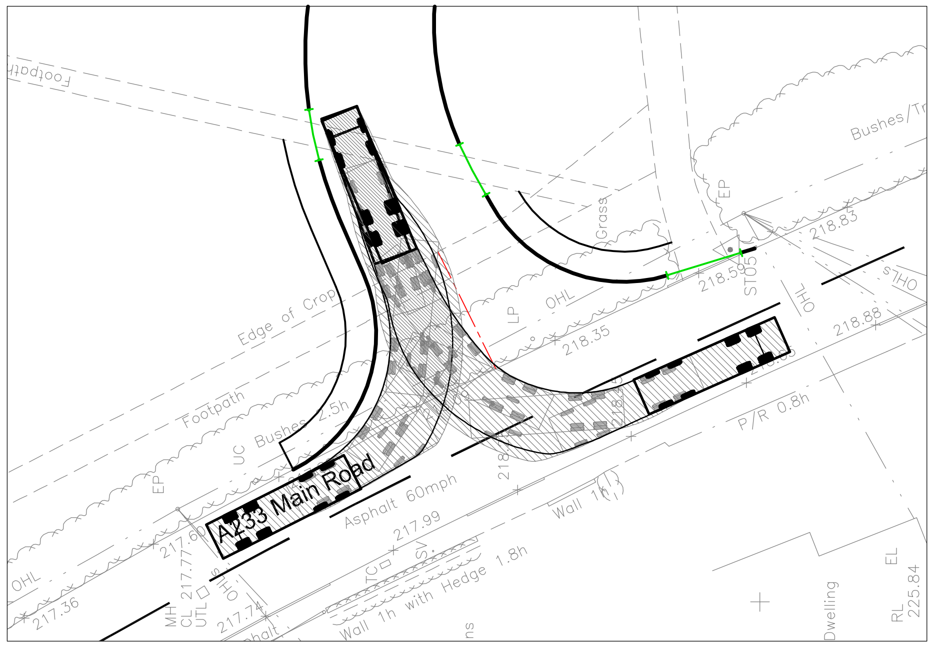
APPENDIX B

Plan attached showing the locations of the problems identified as part of this audit (location numbers refer to paragraph numbers in the report).

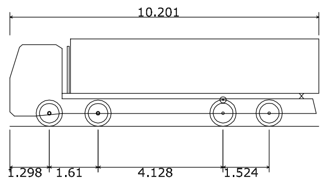




LARGE TIPPER TRUCK SWEPT PATHS
EGRESSING TEMPORARY SITE ACCESS



LARGE TIPPER TRUCK SWEPT PATHS
ENTERING TEMPORARY SITE ACCESS



Large Tipper	
Overall Length	10.201m
Overall Width	2.500m
Overall Body Height	2.893m
Min Body Ground Clearance	0.343m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.550m

REV.	AMENDMENTS	DRN	CHK	APP	DATE
A	FOOTWAYS AND ACCESS EXTENDED	RMA	SAF	ML	23-02-11

ARDENT
CONSULTING ENGINEERS
4th Floor, Diamond House, 36/38 Hatton Garden, London, EC1N 8EB
t 020 7430 1209 f 020 7430 0318
w www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE:
CHERRY LODGE GOLF CLUB, BIGGIN HILL

DRAWING TITLE:
PROPOSED TEMPORARY ACCESS

CLIENT:
WOODLAND ENVIRONMENTAL

SCALE: 1:500 @ A3	DATE: JUNE 2009	DESIGNED: RMA
DRAWN: RMA	CHECKED: SAF	APPROVED: DJR
DRAWING NO. F990-003		REV: A

APPENDIX C – DESIGNER'S RESPONSE

DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
	1st Draft for project team review	ML	SAF	ML	07/10/11
	Final	ML	SAF	ML	09/10/11

Audit Item No.	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative Measures (describe)	Alternative measures accepted by Audit Team (yes/no)
4.2.1	Yes	Yes	N/A	
4.3.1	Yes	Yes	Visibility splay "Y" distance requirements are based on Stopping Sight Distances commensurate with observed 85th percentile speeds derived from the Manual for Streets, as agreed with LBB. If LBB consider that the "Y" distances should be increased to 90m (for a road with a 30mph speed limit) in accordance with TD 42/95 then this could be achieved by cutting back more of the exising hedgerow.	Yes
4.3.2	Yes	Yes	Visibility splay requirements will be based on standard car driver eye heights of 1.05m with the hedgerow trimmed above this height. In addition, gates will be provided behind the route of the public footpath which will be closed outside of site operating hours.	Yes
4.5.1	Yes	Yes	N/A	

Appendix E

Results of traffic survey on Main Road and PICADY capacity assessment of proposed junction with Haul Road

Countsequential Ltd

Report Id - CustomList-269
Site Name - 2666-001
Description - A233 MAIN ROAD <40M>
Direction - North

27 September 2011

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
0000	17	0	16	0	1	0	0	0	0	0	0		0000	0	0	0	0	1	6	4	2	2	0	2	0	0	0	39.7	45.4	6	35.3	3	17.6	2	11.8
0100	9	0	8	0	1	0	0	0	0	0	0		0100	0	0	0	0	1	1	2	2	2	1	0	0	0	0	41.8	-	5	55.6	2	22.2	1	11.1
0200	6	0	5	0	1	0	0	0	0	0	0		0200	0	0	0	0	0	1	1	2	1	1	0	0	0	0	42.9	-	4	66.7	2	33.3	0	0
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0500	46	2	38	0	5	1	0	0	0	0	0		0500	0	0	0	0	4	5	10	13	12	2	0	0	0	0	40.7	47	27	58.7	10	21.7	0	0
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0700	412	10	358	1	40	1	1	1	0	0	0		0700	1	1	3	10	49	154	143	39	9	3	0	0	0	0	34.6	39.1	51	12.4	7	1.7	1	0.2
0800	421	4	380	2	31	1	1	0	1	1	0		0800	0	7	10	13	59	158	133	32	9	0	0	0	0	0	33.5	38.9	41	9.7	4	1	0	0
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1600	507	6	451	2	41	1	2	0	2	0	2		1600	0	0	5	15	72	251	133	23	6	2	0	0	0	0	33.4	37.4	31	6.1	7	1.4	0	0
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2300	54	2	49	0	3	0	0	0	0	0	0		2300	0	0	0	0	4	10	22	9	6	2	1	0	0	0	38.7	45.4	18	33.3	6	11.1	2	3.7
07-19	**4439**	**60**	**3910**	**18**	**408**	**8**	**14**	**4**	**10**	**3**	**4**		**07-19**	**3**	**15**	**40**	**102**	**672**	**1894**	**1300**	**332**	**65**	**15**	**1**	**0**	**0**	**0**	**33.8**	**38.5**	**413**	**9.3**	**54**	**1.2**	**3**	**0.1**
06-22	**5098**	**73**	**4512**	**20**	**444**	**11**	**14**	**4**	**12**	**4**	**4**		**06-22**	**3**	**15**	**41**	**105**	**750**	**2122**	**1517**	**424**	**94**	**25**	**2**	**0**	**0**	**0**	**34.1**	**38.7**	**545**	**10.7**	**84**	**1.6**	**7**	**0.1**
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00-00	**5339**	**78**	**4730**	**20**	**461**	**12**	**14**	**4**	**12**	**4**	**4**		**00-00**	**3**	**15**	**41**	**107**	**769**	**2176**	**1593**	**472**	**124**	**34**	**5**	**0**	**0**	**0**	**34.3**	**38.9**	**635**	**11.9**	**116**	**2.2**	**14**	**0.3**

Virtual Day (1)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
0000	17	0	16	0	1	0	0	0	0	0	0		0000	0	0	0	0	1	6	4	2	2	0	2	0	0	0	39.7	45.4	6	35.3	3	17.6	2	11.8
0100	9	0	8	0	1	0	0	0	0	0	0		0100	0	0	0	0	1	1	2	2	2	1	0	0	0	0	41.8	-	5	55.6	2	22.2	1	11.1
0200	6	0	5	0	1	0	0	0	0	0	0		0200	0	0	0	0	0	1	1	2	1	1	0	0	0	0	42.9	-	4	66.7	2	33.3	0	0
0300	5	0	3	0	2	0	0	0	0	0	0		0300	0	0	0	0	0	1	1	2	1	0	0	0	0	0	40.5	-	3	60	1	20	0	0
0400	19	1	16	0	2	0	0	0	0	0	0		0400	0	0	0	0	2	3	7	3	2	2	0	0	0	0	39.2	46.8	7	36.8	4	21.1	1	5.3
0500	46	2	38	0	5	1	0	0	0	0	0		0500	0	0	0	0	4	5	10	13	12	2	0	0	0	0	40.7	47	27	58.7	10	21.7	0	0
0600	159	4	137	0	14	3	0	0	0	1	0		0600	0	0	1	1	32	35	45	29	11	5	0	0	0	0	36.3	42.9	45	28.3	11	6.9	2	1.3
0700	412	10	358	1	40	1	1	1	0	0	0		0700	1	1	3	10	49	154	143	39	9	3	0	0	0	0	34.6	39.1	51	12.4	7	1.7	1	0.2
0800	421	4	380	2	31	1	1	0	1	1	0		0800	0	7	10	13	59	158	133	32	9	0	0	0	0	0	33.5	38.9	41	9.7	4	1	0	0
0900	327	1	281	0	39	2	2	2	0	0	0		0900	0	1	2	10	63	139	83	22	7	0	0	0	0	0	33.6	38.3	29	8.9	4	1.2	0	0
1000	291	1	254	1	32	0	1	1	1	0	0		1000	1	1	1	8	70	139	58	10	1	2	0	0	0	0	32.2	36.2	13	4.5	3	1	0	0
1100	263	1	229	2	29	0	2	0	0	0	0		1100	0	0	2	3	39	109	75	25	8	2	0	0	0	0	34.6	39.6	35	13.3	8	3	0	0
1200	295	3	265	0	26	1	0	0	0	0	0		1200	0	1	1	2	45	144	82	17	2	1	0	0	0	0	33.6	37.8	20	6.8	1	0.3	0	0
1300	269	2	231	1	33	0	0	0	2	0	0		1300	0	0	5	11	50	118	61	19	3	2	0	0	0	0	33.1	38.5	24	8.9	5	1.9	1	0.4
1400	331	6	277	4	38	0	4	0	1	0	1		1400	0	0	1	6	67	140	87	27	2	1	0	0	0	0	33.5	38.3	30	9.1	2	0.6	0	0
1500	386	11	327	1	44	0	0	0	1	2	0		1500	0	1	2	17	62	147	122	29	6	0	0	0	0	0	33.7	38.3	35	9.1	4	1	0	0
1600	507	6	451	2	41	1	2	0	2	0	2		1600	0	0	5	15	72	251	133	23	6	2	0	0	0	0	33.4	37.4	31	6.1	7	1.4	0	0
1700	574	12	527	0	31	2	0	0	2	0	0		1700	0	2	7	5	53	278	183	39	6	0	1	0	0	0	34.2	38.5	46	8	3	0.5	1	0.2
1800	363	3	330	4	24	0	1	0	0	0	1		1800	1	1	1	2	43	117	140	50	6	2	0	0	0	0	35.2	40	58	16	6	1.7	0	0
1900	242	4	223	1	13	0	0	0	1	0	0		1900	0	0	0	0	26	97	90	23	5	1	0	0	0	0	35.3	38.9	29	12	5	2.1	0	0
2000	149	1	141	0	6	0	0	0	1	0	0		2000	0	0	0	2	15	51	48	21	8	3	1	0	0	0	36.2	42.1	33	22.1	9	6	1	0.7
2100	109	4	101	1	3	0	0	0	0	0	0		2100	0	0	0	0	5	45	34	19	5	1	0	0	0	0	36.4	41.6	25	22.9	5	4.6	1	0.9
2200	85	0	83	0	2	0	0	0	0	0	0		2200	0	0	0	2	7	27	29	15	4	1	0	0	0	0	36.5	41.8	20	23.5	4	4.7	1	1.2
2300	54	2	49	0	3	0	0	0	0	0	0		2300	0	0	0	0	4	10	22	9	6	2	1	0	0	0	38.7	45.4	18	33.3	6	11.1	2	3.7

07-19	**4439**	**60**	**3910**	**18**	**408**	**8**	**14**	**4**	**10**	**3**	**4**		**07-19**	**3**	**15**	**40**	**102**	**672**	**1894**	**1300**	**332**	**65**	**15**	**1**	**0**	**0**	**0**	**33.8**	**38.5**	**413**	**9.3**	**54**	**1.2**	**3**	**0.1**
06-22	**5098**	**73**	**4512**	**20**	**444**	**11**	**14**	**4**	**12**	**4**	**4**		**06-22**	**3**	**15**	**41**	**105**	**750**	**2122**	**1517**	**424**	**94**	**25**	**2**	**0**	**0**	**0**	**34.1**	**38.7**	**545**	**10.7**	**84**	**1.6**	**7**	**0.1**
06-00	**5237**	**75**	**4644**	**20**	**449**	**11**	**14**	**4**	**12**	**4**	**4**		**06-00**	**3**	**15**	**41**	**107**	**761**	**2159**	**1568**	**448**	**104**	**28**	**3**	**0**	**0**	**0**	**34.2**	**38.9**	**583**	**11.1**	**94**	**1.8**	**10**	**0.2**
00-00	**5339**	**78**	**4730**	**20**	**461**	**12**	**14**	**4**	**12**	**4**	**4**		**00-00**	**3**	**15**	**41**	**107**	**769**	**2176**	**1593**	**472**	**124**	**34**	**5**	**0**	**0**	**0**	**34.3**	**38.9**	**635**	**11.9**	**116**	**2.2**	**14**	**0.3**

Virtual Week (1)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
Mon	0	0	0	0	0	0	0	0	0	0	0		Mon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Tue	5339	78	4730	20	461	12	14	4	12	4	4		Tue	3	15	41	107	769	2176	1593	472	124	34	5	0	0	0	34.3	38.9	635	11.9	116	2.2	14	0.3
Wed	0	0	0	0	0	0	0	0	0	0	0		Wed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Thu	0	0	0	0	0	0	0	0	0	0	0		Thu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Fri	0	0	0	0	0	0	0	0	0	0	0		Fri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
|Sat	0	0	0	0	0	0	0	0	0	0	0		|Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
|Sun	0	0	0	0	0	0	0	0	0	0	0		|Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
--	**5339**	**78**	**4730**	**20**	**461**	**12**	**14**	**4**	**12**	**4**	**4**		**--**	**3**	**15**	**41**	**107**	**769**	**2176**	**1593**	**472**	**124**	**34**	**5**	**0**	**0**	**0**	**34.3**	**38.9**	**635**	**11.9**	**116**	**2.2**	**14**	**0.3**

Grand Total

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
--	**5339**	**78**	**4730**	**20**	**461**	**12**	**14**	**4**	**12**	**4**	**4**		**--**	**3**	**15**	**41**	**107**	**769**	**2176**	**1593**	**472**	**124**	**34**	**5**	**0**	**0**	**0**	**34.3**	**38.9**	**635**	**11.9**	**116**	**2.2**	**14**	**0.3**

Countsequential ltd

Report Id - CustomList-269
Site Name - 2666-001
Description - A233 MAIN ROAD <40M>
Direction - South

27 September 2011

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
0000	8	1	6	0	1	0	0	0	0	0	0		0000	0	0	0	0	0	1	2	5	0	0	0	0	0	0	40.2	-	5	62.5	0	0	0	0
0100	8	0	8	0	0	0	0	0	0	0	0		0100	0	0	0	0	0	0	3	4	1	0	0	0	0	0	41.5	-	5	62.5	1	12.5	0	0
0200	4	1	3	0	0	0	0	0	0	0	0		0200	0	0	0	0	0	0	0	2	0	2	0	0	0	0	48.6	-	4	100	2	50	1	25
0300	10	0	10	0	0	0	0	0	0	0	0		0300	0	0	0	0	0	1	2	3	0	4	0	0	0	0	44.7	-	7	70	4	40	1	10
0400	15	0	13	0	2	0	0	0	0	0	0		0400	0	0	0	1	1	1	3	3	3	1	2	0	0	0	43.7	57.7	9	60	5	33.3	3	20
0500	48	1	39	0	7	1	0	0	0	0	0		0500	0	0	0	0	3	8	8	12	13	4	0	0	0	0	41.5	49	29	60.4	15	31.3	1	2.1
0600	185	4	150	0	28	1	2	0	0	0	0		0600	0	0	2	0	1	20	64	61	24	13	0	0	0	0	40.8	45.6	98	53	28	15.1	2	1.1
0700	453	4	412	3	31	2	0	1	0	0	0		0700	1	1	12	6	17	110	182	103	16	4	1	0	0	0	36.7	41.6	124	27.4	11	2.4	2	0.4
0800	443	3	401	5	32	2	0	0	0	0	0		0800	0	1	1	4	30	114	185	90	15	3	0	0	0	0	36.7	41.4	108	24.4	13	2.9	0	0
0900	320	3	282	1	31	0	1	0	0	1	1		0900	0	0	1	6	19	91	152	39	8	3	1	0	0	0	36.2	40	51	15.9	10	3.1	3	0.9
1000	307	1	268	2	35	0	0	0	1	0	0		1000	1	2	3	4	35	101	119	30	6	6	0	0	0	0	35	39.6	42	13.7	11	3.6	1	0.3
1100	342	4	294	2	40	1	0	0	0	1	0		1100	0	1	1	1	24	138	131	38	7	1	0	0	0	0	35.4	39.6	46	13.5	5	1.5	1	0.3
1200	329	3	293	1	27	1	3	0	0	1	0		1200	0	2	1	4	30	116	120	39	15	2	0	0	0	0	35.7	40.5	56	17	12	3.6	1	0.3
1300	329	6	273	5	42	1	1	0	1	0	0		1300	0	0	2	4	35	131	113	42	2	0	0	0	0	0	34.9	39.6	44	13.4	2	0.6	0	0
1400	327	6	287	0	33	0	0	1	0	0	0		1400	1	0	2	1	22	117	120	51	9	4	0	0	0	0	36.2	40.5	64	19.6	11	3.4	2	0.6
1500	335	7	286	1	40	0	0	1	0	0	0		1500	0	0	4	8	22	108	137	36	12	8	0	0	0	0	35.9	40.3	56	16.7	16	4.8	1	0.3
1600	408	8	348	2	46	1	0	1	2	0	0		1600	0	3	10	9	36	121	156	62	6	5	0	0	0	0	35.3	40.7	73	17.9	8	2	1	0.2
1700	472	5	442	5	19	0	0	0	1	0	0		1700	0	1	1	5	29	161	155	92	24	3	1	0	0	0	36.5	41.6	120	25.4	20	4.2	1	0.2
1800	383	5	356	2	19	1	0	0	0	0	0		1800	0	5	3	11	38	106	134	63	16	7	0	0	0	0	35.7	41.8	86	22.5	17	4.4	3	0.8
1900	271	8	245	1	16	0	0	0	0	0	1		1900	0	0	0	0	9	78	117	48	13	6	0	0	0	0	37.4	42.5	67	24.7	14	5.2	1	0.4
2000	151	4	135	1	11	0	0	0	0	0	0		2000	0	0	0	0	5	38	45	35	15	11	2	0	0	0	39.9	45.6	63	41.7	22	14.6	7	4.6
2100	91	1	85	1	3	0	0	0	1	0	0		2100	0	0	0	0	0	17	25	27	14	7	1	0	0	0	41	47.9	49	53.8	18	19.8	2	2.2
2200	75	1	69	0	5	0	0	0	0	0	0		2200	0	0	0	0	3	15	26	22	7	1	1	0	0	0	39.2	44.5	31	41.3	8	10.7	1	1.3
2300	38	1	34	0	3	0	0	0	0	0	0		2300	0	0	0	0	1	6	12	7	4	4	3	1	0	0	43.2	52.3	19	50	10	26.3	4	10.5
07-19	**4448**	**55**	**3942**	**29**	**395**	**9**	**5**	**4**	**5**	**3**	**1**		**07-19**	**3**	**16**	**41**	**63**	**337**	**1414**	**1704**	**685**	**136**	**46**	**3**	**0**	**0**	**0**	**35.9**	**40.7**	**870**	**19.6**	**136**	**3.1**	**16**	**0.4**
06-22	**5146**	**72**	**4557**	**32**	**453**	**10**	**7**	**4**	**6**	**3**	**2**		**06-22**	**3**	**16**	**43**	**63**	**352**	**1567**	**1955**	**856**	**202**	**83**	**6**	**0**	**0**	**0**	**36.4**	**41.4**	**1147**	**22.3**	**218**	**4.2**	**28**	**0.5**
06-00	**5259**	**74**	**4660**	**32**	**461**	**10**	**7**	**4**	**6**	**3**	**2**		**06-00**	**3**	**16**	**43**	**63**	**356**	**1588**	**1993**	**885**	**213**	**88**	**10**	**1**	**0**	**0**	**36.5**	**41.6**	**1197**	**22.8**	**236**	**4.5**	**33**	**0.6**
00-00	**5352**	**77**	**4739**	**32**	**471**	**11**	**7**	**4**	**6**	**3**	**2**		**00-00**	**3**	**16**	**43**	**64**	**360**	**1599**	**2011**	**914**	**230**	**99**	**12**	**1**	**0**	**0**	**36.6**	**41.8**	**1256**	**23.5**	**263**	**4.9**	**39**	**0.7**

Virtual Day (1)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
0000	8	1	6	0	1	0	0	0	0	0	0		0000	0	0	0	0	0	1	2	5	0	0	0	0	0	0	40.2	-	5	62.5	0	0	0	0
0100	8	0	8	0	0	0	0	0	0	0	0		0100	0	0	0	0	0	0	3	4	1	0	0	0	0	0	41.5	-	5	62.5	1	12.5	0	0
0200	4	1	3	0	0	0	0	0	0	0	0		0200	0	0	0	0	0	0	0	2	0	2	0	0	0	0	48.6	-	4	100	2	50	1	25
0300	10	0	10	0	0	0	0	0	0	0	0		0300	0	0	0	0	0	1	2	3	0	4	0	0	0	0	44.7	-	7	70	4	40	1	10
0400	15	0	13	0	2	0	0	0	0	0	0		0400	0	0	0	1	1	1	3	3	3	1	2	0	0	0	43.7	57.7	9	60	5	33.3	3	20
0500	48	1	39	0	7	1	0	0	0	0	0		0500	0	0	0	0	3	8	8	12	13	4	0	0	0	0	41.5	49	29	60.4	15	31.3	1	2.1
0600	185	4	150	0	28	1	2	0	0	0	0		0600	0	0	2	0	1	20	64	61	24	13	0	0	0	0	40.8	45.6	98	53	28	15.1	2	1.1
0700	453	4	412	3	31	2	0	1	0	0	0		0700	1	1	12	6	17	110	182	103	16	4	1	0	0	0	36.7	41.6	124	27.4	11	2.4	2	0.4
0800	443	3	401	5	32	2	0	0	0	0	0		0800	0	1	1	4	30	114	185	90	15	3	0	0	0	0	36.7	41.4	108	24.4	13	2.9	0	0
0900	320	3	282	1	31	0	1	0	0	1	1		0900	0	0	1	6	19	91	152	39	8	3	1	0	0	0	36.2	40	51	15.9	10	3.1	3	0.9
1000	307	1	268	2	35	0	0	0	1	0	0		1000	1	2	3	4	35	101	119	30	6	6	0	0	0	0	35	39.6	42	13.7	11	3.6	1	0.3
1100	342	4	294	2	40	1	0	0	0	1	0		1100	0	1	1	1	24	138	131	38	7	1	0	0	0	0	35.4	39.6	46	13.5	5	1.5	1	0.3
1200	329	3	293	1	27	1	3	0	0	1	0		1200	0	2	1	4	30	116	120	39	15	2	0	0	0	0	35.7	40.5	56	17	12	3.6	1	0.3
1300	329	6	273	5	42	1	1	0	1	0	0		1300	0	0	2	4	35	131	113	42	2	0	0	0	0	0	34.9	39.6	44	13.4	2	0.6	0	0
1400	327	6	287	0	33	0	0	1	0	0	0		1400	1	0	2	1	22	117	120	51	9	4	0	0	0	0	36.2	40.5	64	19.6	11	3.4	2	0.6
1500	335	7	286	1	40	0	0	1	0	0	0		1500	0	0	4	8	22	108	137	36	12	8	0	0	0	0	35.9	40.3	56	16.7	16	4.8	1	0.3
1600	408	8	348	2	46	1	0	1	2	0	0		1600	0	3	10	9	36	121	156	62	6	5	0	0	0	0	35.3	40.7	73	17.9	8	2	1	0.2
1700	472	5	442	5	19	0	0	0	1	0	0		1700	0	1	1	5	29	161	155	92	24	3	1	0	0	0	36.5	41.6	120	25.4	20	4.2	1	0.2
1800	383	5	356	2	19	1	0	0	0	0	0		1800	0	5	3	11	38	106	134	63	16	7	0	0	0	0	35.7	41.8	86	22.5	17	4.4	3	0.8
1900	271	8	245	1	16	0	0	0	0	0	1		1900	0	0	0	0	9	78	117	48	13	6	0	0	0	0	37.4	42.5	67	24.7	14	5.2	1	0.4
2000	151	4	135	1	11	0	0	0	0	0	0		2000	0	0	0	0	5	38	45	35	15	11	2	0	0	0	39.9	45.6	63	41.7	22	14.6	7	4.6
2100	91	1	85	1	3	0	0	0	1	0	0		2100	0	0	0	0	0	17	25	27	14	7	1	0	0	0	41	47.9	49	53.8	18	19.8	2	2.2
2200	75	1	69	0	5	0	0	0	0	0	0		2200	0	0	0	0	3	15	26	22	7	1	1	0	0	0	39.2	44.5	31	41.3	8	10.7	1	1.3
2300	38	1	34	0	3	0	0	0	0	0	0		2300	0	0	0	0	1	6	12	7	4	4	3	1	0	0	43.2	52.3	19	50	10	26.3	4	10.5

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
07-19	**4448**	**55**	**3942**	**29**	**395**	**9**	**5**	**4**	**5**	**3**	**1**		**07-19**	**3**	**16**	**41**	**63**	**337**	**1414**	**1704**	**685**	**136**	**46**	**3**	**0**	**0**	**0**	**35.9**	**40.7**	**870**	**19.6**	**136**	**3.1**	**16**	**0.4**
06-22	**5146**	**72**	**4557**	**32**	**453**	**10**	**7**	**4**	**6**	**3**	**2**		**06-22**	**3**	**16**	**43**	**63**	**352**	**1567**	**1955**	**856**	**202**	**83**	**6**	**0**	**0**	**0**	**36.4**	**41.4**	**1147**	**22.3**	**218**	**4.2**	**28**	**0.5**
06-00	**5259**	**74**	**4660**	**32**	**461**	**10**	**7**	**4**	**6**	**3**	**2**		**06-00**	**3**	**16**	**43**	**63**	**356**	**1588**	**1993**	**885**	**213**	**88**	**10**	**1**	**0**	**0**	**36.5**	**41.6**	**1197**	**22.8**	**236**	**4.5**	**33**	**0.6**
00-00	**5352**	**77**	**4739**	**32**	**471**	**11**	**7**	**4**	**6**	**3**	**2**		**00-00**	**3**	**16**	**43**	**64**	**360**	**1599**	**2011**	**914**	**230**	**99**	**12**	**1**	**0**	**0**	**36.6**	**41.8**	**1256**	**23.5**	**263**	**4.9**	**39**	**0.7**

Virtual Week (1)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
Mon	0	0	0	0	0	0	0	0	0	0	0		Mon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Tue	5352	77	4739	32	471	11	7	4	6	3	2		Tue	3	16	43	64	360	1599	2011	914	230	99	12	1	0	0	36.6	41.8	1256	23.5	263	4.9	39	0.7
Wed	0	0	0	0	0	0	0	0	0	0	0		Wed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Thu	0	0	0	0	0	0	0	0	0	0	0		Thu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
Fri	0	0	0	0	0	0	0	0	0	0	0		Fri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
|Sat	0	0	0	0	0	0	0	0	0	0	0		|Sat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
|Sun	0	0	0	0	0	0	0	0	0	0	0		|Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0
--	**5352**	**77**	**4739**	**32**	**471**	**11**	**7**	**4**	**6**	**3**	**2**		**--**	**3**	**16**	**43**	**64**	**360**	**1599**	**2011**	**914**	**230**	**99**	**12**	**1**	**0**	**0**	**36.6**	**41.8**	**1256**	**23.5**	**263**	**4.9**	**39**	**0.7**

Grand Total

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Fix1	Time	Vbin 0 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 60	Vbin 60 70	Vbin 70 80	Vbin 80 90	Vbin 90 100	Mean	Vpp 85	>PSL 40	>PSL% 40	>SL1 46 ACPO	>SL1% 46 ACPO	>SL2 55 DFT	>SL2% 55 DFT
--	**5352**	**77**	**4739**	**32**	**471**	**11**	**7**	**4**	**6**	**3**	**2**		**--**	**3**	**16**	**43**	**64**	**360**	**1599**	**2011**	**914**	**230**	**99**	**12**	**1**	**0**	**0**	**36.6**	**41.8**	**1256**	**23.5**	**263**	**4.9**	**39**	**0.7**

TRL LIMITED

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

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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

Run with file:-
"Y:\ARDENT PROJECTS\F990 - Cherry Lodge Golf Club, Aperfield\Transport\PICADY\Main Road - Access\
F990_Main Rd_2011_PM_Ex plus dev right turn.vpi"
(drive-on-the-left) at 14:37:22 on Monday, 10 October 2011

.RUN INFORMATION
****

```
RUN TITLE       : A223 Main Road_Access_ 2011_PM
LOCATION        : Biggin Hill, Westerham
DATE            : 05/10/11
CLIENT          : Wooodland Environmental
ENUMERATOR      : rfisher [ARDENT45]
JOB NUMBER      : F990
STATUS          : Preliminary
DESCRIPTION     :
```

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

INPUT DATA

```
                    MAJOR ROAD (ARM C) --------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                         MINOR ROAD (ARM B)
```

ARM A IS A233 Main Road (North)
ARM B IS Access Road
ARM C IS A233 Main Road (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

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.90 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	2.20 M.
- VISIBILITY	(VC-B)	140.00 M.
- BLOCKS TRAFFIC (SPACES)		YES (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	53.0 M.
- VISIBILITY TO RIGHT	(VB-A)	57.0 M.
- LANE 1 WIDTH	(WB-C)	4.80 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

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

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
778.73	0.28	0.11

Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing

STREAM B-A	STREAM A-C	STREAM A-B	STREAM C-A	STREAM C-B
617.24	0.26	0.10	0.16	0.37

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
655.04	0.23	0.23

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

.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

.Demand set: A223 Main Road_Access_ 2011_PM

TIME PERIOD BEGINS 16.00 AND ENDS 17.30

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

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.10	7.65	5.10
ARM B	15.00	45.00	75.00	0.19	0.28	0.19
ARM C	15.00	45.00	75.00	6.53	9.79	6.53

.Demand set: A223 Main Road_Access_ 2011_PM

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
16.00 - 16.15				
	ARM A	0.000	0.000	1.000
		0.0	0.0	408.0
		(0.0)	(0.0)	(12.8)
	ARM B	1.000	0.000	0.000
		15.0	0.0	0.0
		(3.8)	(0.0)	(0.0)
	ARM C	0.971	0.029	0.000
		507.0	15.0	0.0
		(12.0)	(3.8)	(0.0)
16.15 - 16.30				
	ARM A	0.000	0.000	1.000
		0.0	0.0	0.0
		(0.0)	(0.0)	(12.8)
	ARM B	1.000	0.000	0.000
		0.0	0.0	0.0
		(3.8)	(0.0)	(0.0)
	ARM C	0.971	0.029	0.000
		0.0	0.0	0.0
		(12.0)	(3.8)	(0.0)
16.30 - 16.45				
	ARM A	0.000	0.000	1.000
		0.0	0.0	0.0
		(0.0)	(0.0)	(12.8)
	ARM B	1.000	0.000	0.000
		0.0	0.0	0.0
		(3.8)	(0.0)	(0.0)
	ARM C	0.971	0.029	0.000
		0.0	0.0	0.0
		(12.0)	(3.8)	(0.0)
16.45 - 17.00				
	ARM A	0.000	0.000	1.000
		0.0	0.0	0.0
		(0.0)	(0.0)	(12.8)
	ARM B	1.000	0.000	0.000
		0.0	0.0	0.0

```
I                    I        I (  3.8)I (  0.0)I (  0.0)I
I                    I        I        I        I        I
I                    I ARM  C I  0.971 I  0.029 I  0.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I ( 12.0)I (  3.8)I (  0.0)I
I                    I        I        I        I        I
-----------------------------------------------------------
I   17.00 - 17.15    I        I        I        I        I
I                    I ARM  A I  0.000 I  0.000 I  1.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I (  0.0)I (  0.0)I ( 12.8)I
I                    I        I        I        I        I
I                    I ARM  B I  1.000 I  0.000 I  0.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I (  3.8)I (  0.0)I (  0.0)I
I                    I        I        I        I        I
I                    I ARM  C I  0.971 I  0.029 I  0.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I ( 12.0)I (  3.8)I (  0.0)I
I                    I        I        I        I        I
-----------------------------------------------------------
I   17.15 - 17.30    I        I        I        I        I
I                    I ARM  A I  0.000 I  0.000 I  1.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I (  0.0)I (  0.0)I ( 12.8)I
I                    I        I        I        I        I
I                    I ARM  B I  1.000 I  0.000 I  0.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I (  3.8)I (  0.0)I (  0.0)I
I                    I        I        I        I        I
I                    I ARM  C I  0.971 I  0.029 I  0.000 I
I                    I        I    0.0 I    0.0 I    0.0 I
I                    I        I ( 12.0)I (  3.8)I (  0.0)I
I                    I        I        I        I        I
-----------------------------------------------------------
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES BETWEEN TIME SEGMENTS
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

.              QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
               --------------------------------------------------------
                FOR COMBINED DEMAND SETS
                AND FOR TIME PERIOD        1
.------------------------------------------------------------------------------------------------------------------
I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY     GEOMETRIC DELAY   AVERAGE DELAY I
I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/       (VEH.MIN/      PER ARRIVING  I
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT)    VEHICLE (MIN) I
I 16.00-16.15                                                                                                    I
I  B-AC      0.19      7.26    0.026               0.00   0.03        0.4                               0.14      I
I  C-AB      0.33     13.24    0.025               0.00   0.03        0.5                               0.08      I
I  C-A       6.22                                                                                                I
I  A-B       0.00                                                                                                I
I  A-C       5.12                                                                                                I
I                                                                                                                I
.------------------------------------------------------------------------------------------------------------------

.------------------------------------------------------------------------------------------------------------------
I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY     GEOMETRIC DELAY   AVERAGE DELAY I
I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/       (VEH.MIN/      PER ARRIVING  I
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT)    VEHICLE (MIN) I
I 16.15-16.30                                                                                                    I
I  B-AC      0.22      6.75    0.033               0.03   0.03        0.5                               0.15      I
I  C-AB      0.44     13.76    0.032               0.03   0.04        0.6                               0.08      I
I  C-A       7.38                                                                                                I
I  A-B       0.00                                                                                                I
I  A-C       6.11                                                                                                I
I                                                                                                                I
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I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY     GEOMETRIC DELAY   AVERAGE DELAY I
I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/       (VEH.MIN/      PER ARRIVING  I
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT)    VEHICLE (MIN) I
I 16.30-16.45                                                                                                    I
I  B-AC      0.28      6.04    0.046               0.03   0.05        0.7                               0.17      I
I  C-AB      0.69     14.77    0.047               0.04   0.07        1.0                               0.07      I
I  C-A       8.88                                                                                                I
I  A-B       0.00                                                                                                I
I  A-C       7.49                                                                                                I
I                                                                                                                I
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I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY     GEOMETRIC DELAY   AVERAGE DELAY I
I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/       (VEH.MIN/      PER ARRIVING  I
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT)    VEHICLE (MIN) I
I 16.45-17.00                                                                                                    I
I  B-AC      0.28      6.04    0.046               0.05   0.05        0.7                               0.17      I
I  C-AB      0.69     14.77    0.047               0.07   0.07        1.1                               0.07      I
I  C-A       8.88                                                                                                I
I  A-B       0.00                                                                                                I
I  A-C       7.49                                                                                                I
I                                                                                                                I
.------------------------------------------------------------------------------------------------------------------

.------------------------------------------------------------------------------------------------------------------
I  TIME      DEMAND  CAPACITY  DEMAND/   PEDESTRIAN  START   END       DELAY     GEOMETRIC DELAY   AVERAGE DELAY I
I         (VEH/MIN) (VEH/MIN) CAPACITY      FLOW     QUEUE  QUEUE    (VEH.MIN/       (VEH.MIN/      PER ARRIVING  I
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT)    VEHICLE (MIN) I
I 17.00-17.15                                                                                                    I
I  B-AC      0.22      6.75    0.033               0.05   0.03        0.5                               0.15      I
I  C-AB      0.44     13.76    0.032               0.07   0.04        0.7                               0.08      I
```

C-A	7.38
A-B	0.00
A-C	6.11

TIME	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 DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	0.19	7.26	0.026		0.03	0.03	0.4		0.14
C-AB	0.34	13.24	0.025		0.04	0.03	0.5		0.08
C-A	6.21								
A-B	0.00								
A-C	5.12								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.1
17.00	0.1
17.15	0.0
17.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-AC	20.6	13.8	3.2	0.16	3.2	0.16
C-AB	44.2	29.5	4.3	0.10	4.3	0.10
C-A	674.3	449.5				
A-B	0.0	0.0				
A-C	561.6	374.4				
ALL	1300.7	867.1	7.6	0.01	7.6	0.01

* 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*******