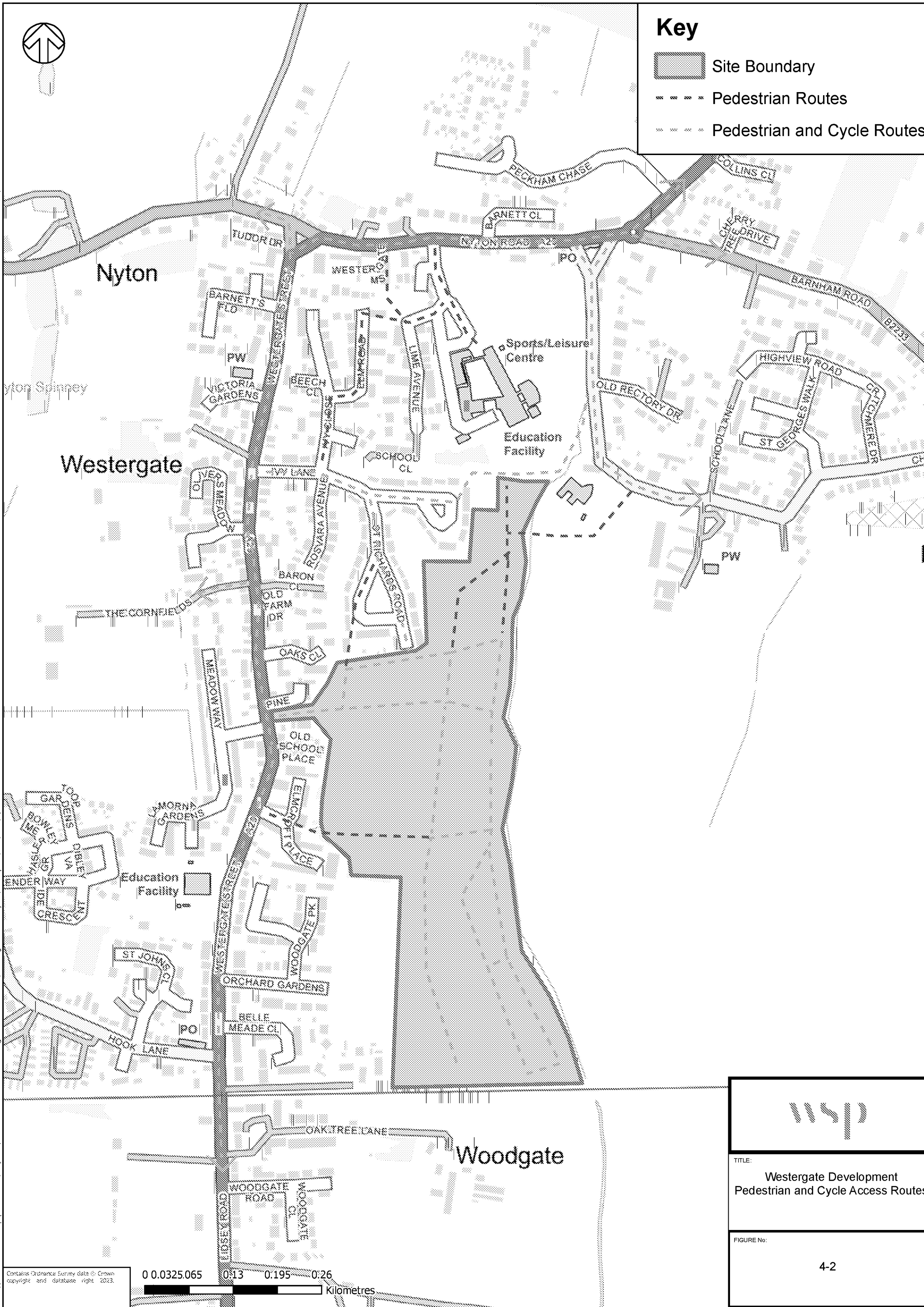




Pedestrian and Cycle Routes

Westergate

Woodgate

Contains Ordnance Survey data © Crown copyright and database right 2023.

0 0.0325.065 0.13 0.195 0.26

Kilometres

TITLE:

Westergate Development Pedestrian and Cycle Access Routes

FIGURE No:

4-2

- 4.4.6. The internal road network proposed for the site will follow Manual for Streets principles and guidance. The street network will naturally reinforce low vehicle speeds through design and the streetscape will provide an attractive environment for walking through the site, giving priority to pedestrian and cycle movement over car movements. Existing rights of way through the site will be protected and pedestrian amenity enhanced as described above.
- 4.4.7. The internal road network also forms the first stage of the East-West link road which will provide a link from the existing A29 Westergate Street, through to the realigned A29 and onto B2233 Barnham Road (near Barnham Station). The creation of the East-West link road as part of Parcel SC1 will provide a direct link for pedestrians and cyclists to Barnham Station, proposed local centres within the site and Barnham village centre. To support such cycling trips, the proposed East-West Link Road includes at LTN1/20 compliant bidirectional cycle route adjacent to the southern side of the carriageway.
- 4.4.8. There are no bus stops proposed within the site the nearest bus stops to the site are on A29 Westergate Street near Elmcroft Place or just south of Ivy Lane. These stops can be access via the new site access or via the PRow direct to Elmcroft Place, St Richards Road and Ivy Lane. For the Elmcroft Place bus stops the distance from the furthest point in the masterplan (the south-east corner) is located approximately 680m via the PRow network, or 1,000m via the proposed site access junction. From the north-east corner of the site the Olivers Meadow bus stops are approximately 650m via St Richards Road and Ivy Lane or 770m via the site access junction. To promote trips by public transport, a financial contribution will be made as part of any planning permission to upgrade the southern bus stops on the A29 to include bus shelters. This takes account of existing footway widths on the A29, noting that it is unlikely to be feasible to install bus shelters at the bus stops norther of the site access.

4.5 SERVICING / REFUSE MANAGEMENT

- 4.5.1. It is proposed that the development will be serviced internally through kerbside bin collection with refuse vehicles accessing and egressing the site layout in a forward gear. Turning heads will be provided within the site layout to ensure the safe manoeuvring of refuse vehicles. As part of the future Reserved Matters application, a swept path analysis will be submitted to illustrate a refuse vehicle accessing and egressing the site in a forward gear.

4.6 CAR AND CYCLE PARKING

- 4.6.1. Car and cycle parking will be subject to a Reserved Matters Application. This will be provided in accordance with standards outlined within the West Sussex County Council Guidance on Parking at New Developments (September 2020). This will be inclusive of car, cycle and electric vehicle charging points. As an initial estimate of likely parking provision on site, **Table 4-1** shows car parking demand for the site based upon the Arun District Council parking standards referenced in **Section 2.8**.

Table 4-1 – Car Parking Demand Requirement

Number of Bedrooms	Proposed Number of Units	Car Parking Demand
1	40	80
2	160	320
3	141	281
4+	59	179
Total		860

4.6.2. Cycle parking will be provided in a safe, secure location which is covered and convenient for access.

5 FRAMEWORK TRAVEL PLAN

5.1 INTRODUCTION

- 5.1.1. This section provides a summary of the Framework Travel Plan (FTP) that has been produced to support the development proposals. The FTP has been prepared to complement the transport strategy submitted within this Transport Assessment. It captures current transport and mobility provision around the Site as well as the provision that will be available post-development. These opportunities will be taken as the basis for a detailed Full Travel Plan at the reserved matters stage of the planning process.
- 5.1.2. A Travel Plan involves identifying an appropriate package of measures aimed at promoting sustainable travel, with an emphasis on reducing reliance on single occupancy car journeys. A travel plan should establish a structured strategy with clear objectives and targets, supported by suitable policies and quality measures for implementation. Whilst the location of a development and its proximity to local amenities, facilities and services create underlying conditions to make sustainable travel choices a natural option amongst future users of this Site, it is acknowledged that communicating, incentivising and monitoring uptake of these opportunities is also critical to the success of any Travel Plan.
- 5.1.3. A Travel Plan is essentially a 'living' document requiring ongoing monitoring, review and revision to ensure it remains relevant to the development and those using the Site and provides continuous improvements for its duration. These aspirations and actions should be documented in a Travel Plan, the structure and content of which are dependent upon a range of factors including location, nature of development, the occupiers, and the end-users.
- 5.1.4. The FTP outlines that a Travel Plan Co-ordinator (TPC) will be appointed who will be responsible for the management and ongoing development of the Travel Plan. The TPC will be responsible for developing the following objectives:
- ✧ Understand baseline travel patterns for different users of the site, as well as the projected future travel patterns following implementation of the Travel Plan measures;
 - ✧ Establish 'inherent' sustainable travel principles for the Proposed Development as a whole;
 - ✧ Minimise single occupancy vehicle trips;
 - ✧ Facilitate tailored travel information;
 - ✧ Encourage healthy and active travel by way of design but also by way of marketing strategies;
 - ✧ Reduce local congestion and associated externalities;
 - ✧ Support car-free lifestyles;
 - ✧ Raise awareness of sustainable modes of transport available for residents and visitors travelling to, from and within the Site;
 - ✧ Promote community integration and the use of local services and facilities;
 - ✧ Contribute towards protecting and enhancing the environment in and around the site.

- 5.1.5. Baseline Travel Surveys will be undertaken for the proposed development following a minimum 50% unit occupation (although the exact threshold will be subject to discussion and agreement) which will provide a reasonable quantum of data from which the breakdown of baseline travel modes can be established. This will allow for any necessary changes to be made to the Full Travel Plan to ensure that it is fit for purpose. Following the identification of baseline mode share, a series of SMART (Specific, Measurable, Achievable, Realistic and Time-Bound) targets will be developed to support the Travel Plan.
- 5.1.6. The Travel Plan will employ a range of 'Hard' and 'Soft' measures to effectuate a modal shift away from single occupancy car use towards more sustainable modes. Hard measures are engineering measures incorporated into the design of the Proposed Development and Soft measures relate to marketing and management-type strategies which would be implemented so that site users' sustainable travel behaviour is maximised.
- 5.1.7. A programme of monitoring and review will be implemented to generate information by which the success of the Travel Plan will be evaluated. This will help establish whether the agreed objectives and targets are being met and how these could potentially be modified. The TPC will be responsible for monitoring the Travel Plan and for reporting any findings and updates to WSCC/ADC as appropriate. The TPC will report the results of baseline monitoring surveys to WSCC/ADC within three months of receipt of the results.
- 5.1.8. To enable specific actions to be monitored and tracked, an Action Plan will be provided as part of the Full Travel Plan, containing measurable outputs, outlining target dates, funding and responsibility for actions.

6 DEVELOPMENT TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

6.1 INTRODUCTION

- 6.1.1. This section summarises the derivation of the trip generation, distribution and assignment for the proposed development.

6.2 TRIP GENERATION

- 6.2.1. An estimate of vehicle trip generation for the Cala Homes development has been calculated using residential trip rates derived from a traffic survey of Meadow Way, opposite the proposed site access. This approach has been agreed with WSCC and National Highways as part of pre-application scoping discussions. The traffic flow recorded was divided by the number of properties located within the Meadow Way cul-de-sac to determine the trip rates recorded in **Table 6-1**. This is deemed to be a more representative method than using the TRICS database due to the close proximity of Meadow Way to the proposed site.

Table 6-1 - Vehicle Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.151	0.382	0.533
PM	0.290	0.142	0.432

- 6.2.2. Person trip rates will be based upon the trip rates shown in Table 5-4 of the Pell Frischmann TA as calculated using 2011 Census data. These trip rates are shown in **Table 6-2** below.

Table 6-2 - Person Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.163	0.427	0.590
PM	0.411	0.212	0.623

- 6.2.3. The Vehicle and Person Trip Rates illustrated in **Table 6-1** and **Table 6-2** have been factored by the proposed 400-unit development to calculate the Vehicle and Person Trip Generation associated with the proposed development. These are shown in **Table 6-3** and **Table 6-4**.

Table 6-3 - Vehicle Trip Generation

Time Period	Arrival	Departure	Two-way
AM	60	153	213
PM	116	57	173

Table 6-4 - Person Trip Generation

Time Period	Arrival	Departure	Two-way
AM	65	171	236
PM	164	85	249

6.3 TRIP DISTRIBUTION

- 6.3.1. In order to calculate the trip distribution for the proposed development trips, it is considered appropriate to use the previously agreed methodology with WSCC as part of the AL/15/17/PL planning application. This is summarised below for convenience.
- 6.3.2. The residential trip distribution has been calculated using three different journey types; the first being travel to work using 2011 census data and Google map directions from the site illustrating the quickest route to any destination. The second and third relate to education and other trips (inclusive of shopping, leisure and visiting family/friend). The percentage split of each type of trip has been derived from National Travel Survey Table NTS0502.
- 6.3.3. The distribution of education trips has been calculated by the location of nearby primary and secondary schools and colleges in relation to the proposed development site. The shopping trips as part of the 'other' category has been split evenly north and south from the site as Chichester and Bognor Regis retail parks are a similar distance from the site. The trips to see friends and family has been split 50:50 from the site and then split evenly in each direction. The leisure trip distribution is based on residents going to The Six Villages Sports Centre and Aldingbourne Tennis Club.
- 6.3.4. The trip distribution from the proposed development site has been calculated as shown in **Table 6-5**.

Table 6-5 – Overall Trip Distribution

	AM Peak		PM Peak	
	Arrival	Departure	Arrival	Departure
A29 (North)	3.1%	3.1%	4.9%	4.9%
A27 (East)	6.1%	6.1%	9.7%	9.7%
A27 (West)	21.4%	21.4%	39.1%	39.1%
Britten's Lane (to A285)	1.0%	1.0%	1.5%	1.5%
B2233 Barnham Road	18.8%	18.8%	5.2%	5.2%
A259 Felpham Relief Road	4.4%	4.4%	8.3%	8.3%
A29 (South)	17.6%	17.6%	19.6%	19.6%
Around the Six Villages	27.6%	27.6%	11.7%	11.7%

6.3.5. Based upon the overall trip distribution from the proposed development site, the following split has been calculated for vehicles departing and arriving at the site access junction across the AM and PM peaks:

- ※ Departures turning right (northbound) – 70.2%;
- ※ Departures turning left (southbound) – 29.8%;
- ※ Arrivals turning right (northbound) – 29.8%; and
- ※ Arrivals turning left (southbound) –70.2%.

6.3.6. All vehicle trip generation will access the site via the proposed A29 site access junction given that the East-West Link road will operate as a pedestrian, cycle and bus link until the full A29 realignment is complete.

6.4 TRAFFIC GROWTH AND COMMITTED DEVELOPMENT

6.4.1. All forecast year assessments will use traffic flows derived from the WSCC CATM. The CATM SATURN model has been developed using the following series of inputs to account for background growth, infrastructure changes and committed development growth as detailed below:

- ※ The background growth consists of predicted traffic growth as a result of general increase in driving over time, calculated by taking account of NTEM-adjusted TEMPRO growth, known committed developments, and the allocated sites within adopted local plans.
- ※ The committed developments consist of other developments which have been approved, such as those not contained within the adopted local plan;
- ※ The wider infrastructure changes are schemes that are committed projects; and

- Other local plan developments consist of sites in adopted Local Plan, including developments by Church Commissioners (Parcel SC1), Barratts, Landacre, Boweries and Pye Homes, which make up the rest of the BEW allocation..

6.5 SCOPE OF JUNCTION ASSESSMENTS

6.5.1. Following Scoping discussions with WSCC it was agreed that the same scope of junction capacity assessments will be undertaken for this Transport Assessment as were used to support the 2017 Planning Application for 350 units. This scope includes the following junctions and is visualised in Figure 3-10:

- A27/A29 Eastern Roundabout
- A27 Arundel Road/A27/Arundel Road/A29 Fontwell Roundabout
- A29/B2233 Barnham Road Roundabout
- A27 Arundel Road/B2233 Nyton Road
- A29 Westergate Street/B2233 Nyton Road Priority Junction (South)
- A29 Westergate Street/B2233 Nyton Road Priority Junction (East)
- A29/A259 Rolls Royce Roundabout; and
- A29 Westergate Street/Meadow Way site access junction

6.5.2. Junction assessments will be carried out using the computer program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions will be assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction.

6.6 ASSESSMENT SCENARIOS

6.6.1. All assessments will be completed using the following peak hours:

- AM Peak: 08:00-09:00; and
- PM Peak: 17:00-18:00.

6.6.2. The following Scenario assessments will be undertaken for each of the junction models:

- Scenario 1 – 2031 Do-Minimum (using “2031 do minimum No Cala” scenario from Pell Frischmann TA). This scenario provides an assessment of how the highway network will operate in 2031 without the Cala Homes development or Parcel SC1;
- Scenario 2 – 2031 Do-Something without BEW Parcel SC1 (using “2031 do minimum” scenario from Pell Frischmann TA). This scenario provides an assessment of how the highway network will operate in 2031 with the Cala Homes development but without BEW Parcel SC1;
- Scenario 3 – 2031 Do-Something with Phase 1 of BEW Parcel SC1 but without the East-West link road connection between the Cala Homes site and Parcel SC1. This scenario provides an assessment of how the highway network will operate with the Cala Homes and Parcel SC1 developments with EW link road bridge operating as a pedestrian, cycle and bus link only; and

- ※ Scenario 4 – 2038 Do Something (using “2038 do something” scenario from Pell Frischmann TA). This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment.

6.6.1. **Table 6-6** presents what is included within each of the assessment scenarios, breaking down each of the elements of development and infrastructure improvements likely to occur in the local area.

Table 6-6 – Breakdown of Assessment Scenarios

	Background Growth	Committed Developments	Infrastructure Improvements	Cala Development Traffic	BEW Parcel SC1 Phase 1*	East-West Link Road	BEW Parcel SC1 Phase 2**
Scenario 1	✓	✓	✓				
Scenario 2	✓	✓	✓	✓			
Scenario 3	✓	✓	✓	✓	✓		
Scenario 4	✓	✓	✓	✓	✓	✓	✓

*Parcel SC1 Phase 1: 1,200 homes, 61 C2 care home units, 3FE primary school and A29 realignment north of Chichester-Barnham railway line.

**Parcel SC2 Phase 2: Phase 1 + 2,000 homes and full realignment of A29.

- 6.6.2. Traffic flows for Scenario 3 (including BEW Parcel SC1 without East-West Link Road) have been extrapolated using the following scenarios included within the Pell Frischmann TA:
- ※ 2031 Do Something No Cala: background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure + BEW development + BEW infrastructure no Cala and No East-West Link Road; and
 - ※ 2031 Do Minimum: background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure.
- 6.6.3. Using a combination of these scenarios will allow an estimate to be made of development traffic flows associated with a scenario whereby the proposed development and BEW parcel SC1 phase 1 are complete but are accessed independently (i.e. without the East-West Link Road providing a connection between the two sites).
- 6.6.4. The traffic flows outputs from the CATM have been input into Junctions 10 / LinSig models to provide a ‘Do Minimum’ assessment of the junction performance. The trip generation from the proposed Cala development will then provide a ‘Do Something’ scenario. Traffic flow diagrams for all scenarios are provided in **Appendix E**.

7 JUNCTION CAPACITY ASSESSMENTS

7.1 INTRODUCTION

- 7.1.1. Junction assessments have been carried out using the program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions have been assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction.
- 7.1.2. The results of the roundabout and priority junction assessments are expressed in terms of the predicted Ratio of Flow to Capacity (RFC) for each arm of the junction. The RFC provides a numerical indication of the likely performance of a junction. Volume 6 Section 2 of Design Manual for Roads and Bridges (Highways England) contains the document TA23/81 Junctions and Access: Determination of Size of Roundabouts and Major/Minor Priority Junctions, which provides advice on the interpretation of RFC values. The document states that if any arm has an RFC ratio of around 0.85 queuing will theoretically be avoided in five out of six cases. Therefore, an RFC below 0.85 is regarded as demonstrating that the junction would work satisfactorily with minimal delay to vehicular traffic. RFC values over 1.0 indicate that the junction is over design capacity and significant delays are likely to result on at least one arm of the junction.
- 7.1.3. The junction assessments also produce an estimate of the maximum queue lengths for each arm. Queue lengths are expressed in the number of vehicles or Passenger Car Units (PCU).
- 7.1.4. LinSig models provide an indication of the Degree of Saturation (DoS) as a percentage and the Mean Maximum Queue (MMQ) in Passenger Car Units (PCUs) for each junction approach, the average delay per vehicle on each approach, recorded in seconds and the Practical Reserve Capacity (PRC), which is a measure of the junction's total capacity (as a percentage). When reviewing the PRC of a junction the following is considered:
- ※ A positive figure indicates the junction operates with reserve capacity;
 - ※ A negative figure less than -10%, suggests that the junction would be broadly at capacity; and
 - ※ A negative figure more than -10% indicates that the junction cannot accommodate the demand.
- 7.1.5. For DoS the thresholds can be categorised as follows:
- ※ Less than 90%: Any queues that have built up will be able to disperse during the relevant stage in each cycle;
 - ※ 90-100%: Indicates that an arm is close to its theoretical capacity and any queue that has built up does not fully clear within each cycle; and
 - ※ More than 100%: Indicates an arm is over its theoretical capacity and significant queues are likely as a result.

- 7.1.6. Where junctions were found to be operating at-capacity or over-capacity in the forecast scenarios these have been assessed using DIRECT traffic flow inputs with a flat profile across the peak hour. This is to reflect how junctions operate in congested conditions and applies a consistent approach to the junction capacity assessments by applying the same methodology as Pell Frischmann Transport Assessment completed for BEW Parcel SC1 (BN/11/22/OUT).

7.2 A27 JUNCTION IMPROVEMENTS

- 7.2.1. As part of evidence base for the adopted Arun Local Plan a number of transport studies were completed to confirm improvements that would be needed to support planned growth in the region. These included the 2016 Arun Transport Study, 2017 Enterprise Bognor Regis Transport Review and the WSCC / ADC Local Plan Transport Mitigation Apportionment Study (2020). The first two of these studies identified and refined a transport mitigation package that would support the Local Plan whilst the Apportionment Study detailed how development across the District should contribute towards the cost of such mitigation.
- 7.2.2. The 2017 Enterprise Bognor Regis Transport Review identified mitigation measures for the following junctions included within the scope of this TA:
- ※ A27 / A29 Eastern Roundabout (site 1 in this TA);
 - ※ A27 / A29 Western Roundabout (site 2 in the TA);
 - ※ A27 / B3322 Nyton Road priority junction (site 4 in this TA); and
 - ※ A29 / A259 Felpham / Bognor Regis Relief Road Roundabout (site 8 in this TA).
- 7.2.3. A brief summary of each of these improvements schemes is discussed below.

A27 / A29 EASTERN ROUNDABOUT

- 7.2.4. The proposals identified for this junction involve the widening and signalisation of the A27 approaches as shown in [Figure 7-1](#) below. As this scheme is yet to be implemented junction capacity assessments for the A27 / A29 junction have been completed in **Section 7.4 to 7.6** with the improvement only where the existing layout is forecast to operate close to capacity or over capacity.

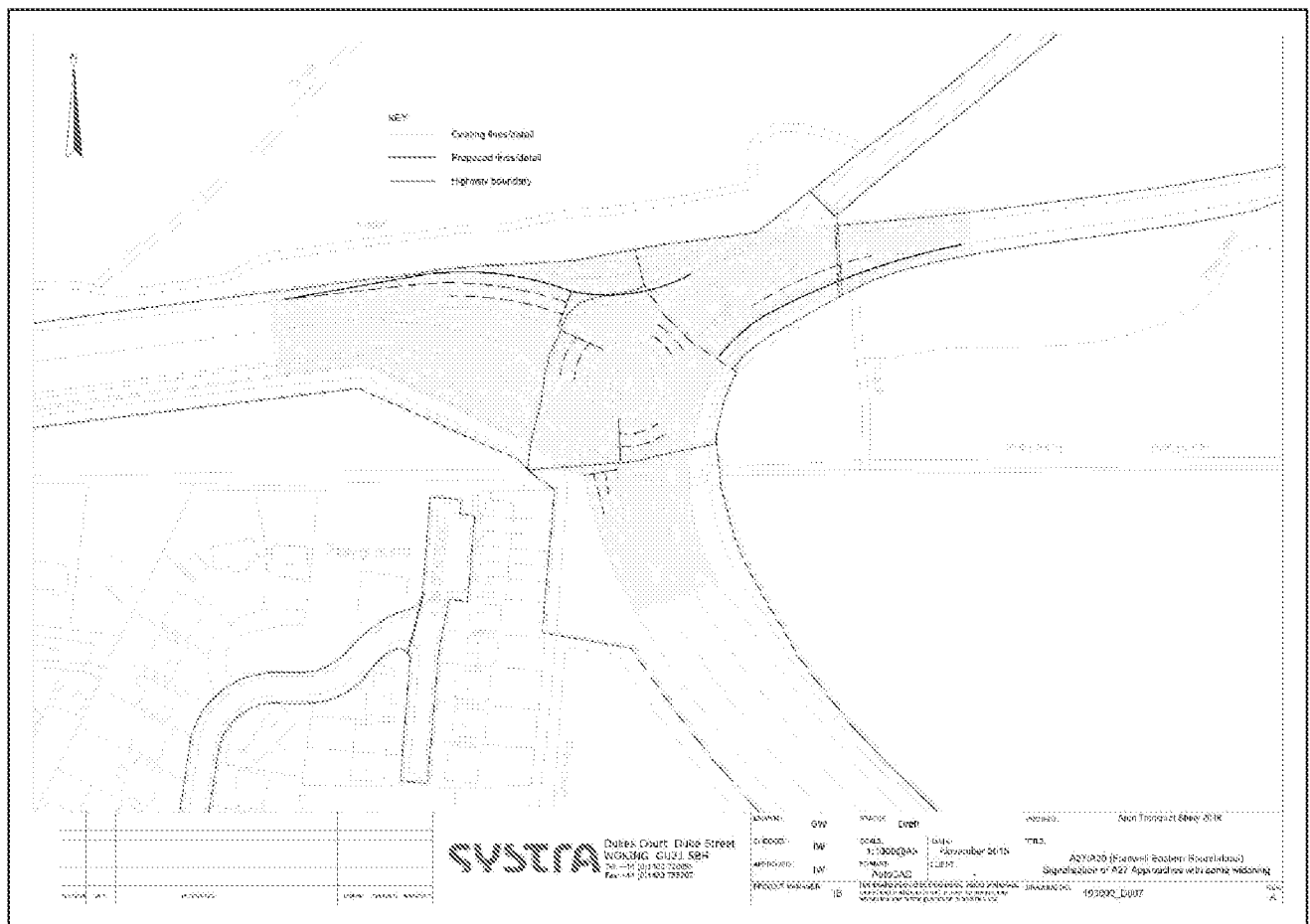


Figure 7-1 - A27/ A29 Eastern Roundabout Improvement Scheme

A27 / A29 WESTERN ROUNDABOUT

- 7.2.5. The committed scheme to convert the A27/ Arundel Road/ A29 Fontwell Avenue roundabout into a signalised roundabout was completed in summer 2023. The improvement scheme was delivered through the Land East of Fontwell Avenue Planning application and is designed to accommodate the developments in the Arun Local Plan and the realignment of the A29.
- 7.2.6. This scheme has signalised the A27 approaches from the west and the north and on the corresponding circulatory arms. Figure 7-2 below.

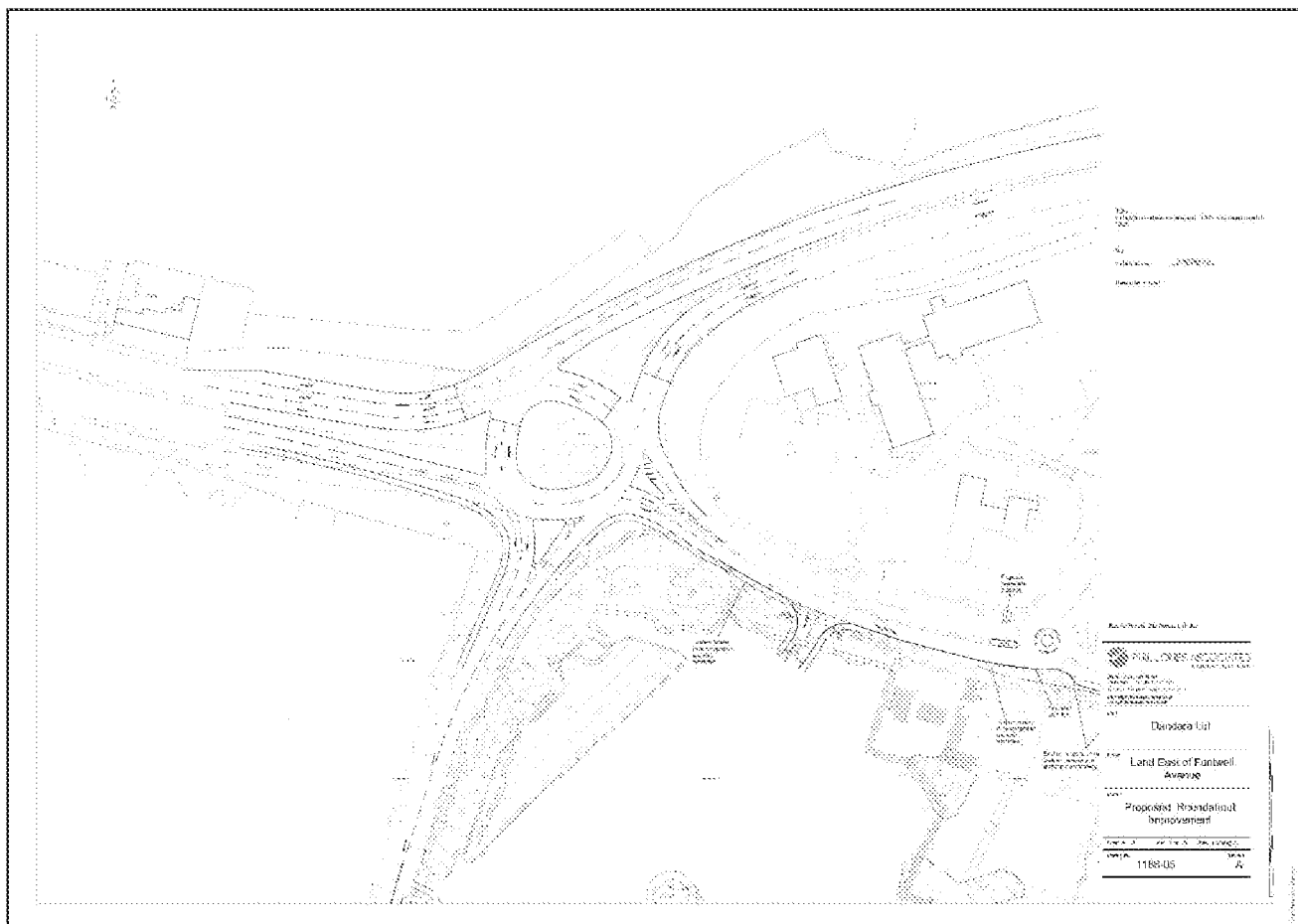


Figure 7-2 - A27/ A29 Western Roundabout Improvement Scheme

- 7.2.7. As this scheme is already operational it has been used within all junction capacity assessments for the A27/ Arundel Road/ A29 Fontwell Avenue roundabout in **Section 7.3 to 7.6** with and without the improvements.

A27 / B3322 NYTON ROAD PRIORITY JUNCTION

- 7.2.8. The 2017 Enterprise Bognor Regis Transport Review considered mitigation for this junction that including lengthening the acceleration / auxiliary lane for the left turn from the Nyton Road and removing the A27 eastbound right turn from Nyton Road. However, it was noted that this scheme was unable to mitigate 'severe' impacts at this junction and therefore the preferred approach was to close the right the right turn from the A27 without implementing any changes to Nyton Road.
- 7.2.9. This was confirmed during pre-determination discussions with National Highways as part of planning application AL/15/17/PL. However, as a timeframe for this closure has not been confirmed all junction capacity assessments included in **Section 7.4 to 7.6** assume that the right turn remains open.

Cala Homes development or Parcel SC1. Full junction capacity outputs are provided in **Appendix F**.

Table 7-1 – A27 / A29 Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.58	8	2	0.78	18	4
B	A27 (East)	0.57	3	2	0.46	3	1
C	A27 (West)	0.53	3	2	0.59	3	2

- 7.3.2. The Scenario 1 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and PM peak period. The maximum RFC of 0.73 is recorded on the approach from the A29 in the PM peak with an associated queue of 4 vehicles and delay of 18 seconds suggests the junction arm is at capacity.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.3.3. The 2031 Scenario 2 modelling results for the roundabout are presented in **Table 7-2**.

Table 7-2 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Av Delay	MMQ	UQ ED	DoS %	Av Delay	MMQ	UQ ED
A	A27 (East)	72	10	13	5	80	19	15	7
B	Arundel Road	10	2	0	-	9	2	0	-
C	A29 Fontwell Avenue	93	30	14	-	47	6	3	-
D	A27 Arundel Road	67	15	4	3	94	17	15	4
E	Northern Circ	84	55	8	5	83	30	12	6
F	Western Circ	41	17	4	3	49	37	3	2
Overall PRC/ Cycle Time		-2.8% PRC and 60s Cycle Time				-4% PRC and 60s Cycle Time			

- 7.3.4. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The maximum Degree of Saturation is 94% on the approach from the A27 Arundel Road in the PM peak, this equates to a delay of 17 seconds with a mean max queue of 15PCUs and 4PCUs at the back of a uniform queue at the end of a red phase.

SITE 3: A29 – BARNHAM ROAD

- 7.3.5. The modelling results from the A29/ Barnham Road roundabout for Scenario 1 is presented in **Table 7-3**.

Table 7-3 - A29 / Barnham Road (War Memorial) Roundabout Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.53	7	2	0.40	6	1
B	A29 Nyton Road	0.52	4	2	0.45	4	1
C	A29 Fontwell Avenue	0.52	8	2	0.65	10	2

- 7.3.6. The A29/ B2233 Barnham Road modelling results indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.65 occurs on the approach from Barnham Road with an associated delay of ten seconds and a queue of two vehicles.

SITE 4: A27 – NYTON ROAD

- 7.3.7. **Table 7-4** presents the modelling results from Scenario 1 for the A27/ Nyton Road priority junction.

Table 7-4 - A27 / Nyton Road Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.13	1	1	0.15	1	1
C	A27 (West)	0.39	17	1	0.43	19	2

- 7.3.8. The modelling results summarised above indicates that the junction will operate within capacity in the AM peak and PM peak. The maximum RFC of 0.43 occurs in the PM peak on the approach from

the A27 (west) with an associated delay of 19 seconds and a queue of two vehicles, which highlights that the arm is at capacity.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

- 7.3.9. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 1 is presented in **Table 7-5**.

Table 7-5 –A29 / Nyton Road East Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.46	14	1	0.58	15	2
C	Nyton Road A29	0.80	36	4	0.33	11	1

- 7.3.10. The Scenario 1 modelling results forecasts the priority junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.80 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 36 seconds and an associated queue of four vehicles.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.3.11. **Table 7-6** presents the modelling results from Scenario 1 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-6 –A29 / Nyton Road South Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.3	20	1	0.53	23	2
C	Nyton Road A29	0.0	0	0	0.0	0	0

- 7.3.12. The Scenario 1 modelling results indicates the priority junction will operate within capacity in the AM and PM peaks. The maximum RFC of 0.53 occurs on the approach from B2233 Nyton Road in the PM peak with a total delay of 23 seconds and an associated queue of two vehicles.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.3.13. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 1 are presented in **Table 7-7**.

Table 7-7 –A29 / Nyton Road North Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.48	13	1	0.28	8	1
C	Nyton Road A29	0.16	9	1	0.31	10	1

- 7.3.14. The modelling results forecasts the junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.48 is forecast on the approach from the B2233 Nyton Road in the AM peak with an associated delay 13 seconds and a queue of a single vehicle.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.3.15. The junction modelling for Scenario 1 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-8**.

Table 7-8 – A29 / A259 Roundabout Scenario 1 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.84	20	6	0.63	10	2
B	Rolls Royce Access	0.41	9	1	0.69	16	3
C	A29 (South)	0.69	6	3	0.64	5	2
D	Saltbox Road	0.05	3	1	0.32	6	1
E	A29 (North)	0.38	3	1	0.53	5	2

- 7.3.16. The Scenario 1 modelling results forecasts the five-arm roundabout operates within capacity in the AM and PM peaks. The maximum RFC of 0.84 occurs on the approach from A259 in the AM peak with a total delay of 20 seconds and an associated queue of six vehicles.

SCENARIO 1 JUNCTION ASSESSMENT SUMMARY

- 7.3.17. The junction capacity assessments highlights that the following junction are forecast to operate at capacity in Scenario 1:

※ Site 2: A27 / Arundel Road / A29 Fontwell Signalised Roundabout.

- 7.3.18. None of the junctions are forecast to over their theoretical capacity in the 2031 Do-Minimum scenario.

7.4 SCENARIO 2 – 2031 DO SOMETHING

- 7.4.1. The results from the junctions are shown below with Scenario 2 being 2038 do minimum AM and PM peaks. This scenario provides an assessment of how the highway network will operate in 2031 with the Cala Homes development but without BEW Parcel SC1. Full junction capacity outputs are provided in **Appendix G**.

SITE 1: A27 – A29

- 7.4.2. **Table 7-9** summarises the Scenario 2 modelling results for the A27 A29 roundabout for Scenario 2.

Table 7-9 – A27 / A29 Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.58	8	2	0.78	22	4
B	A27 (East)	0.57	3	2	0.46	3	1
C	A27 (West)	0.53	3	2	0.59	3	2

- 7.4.3. The Scenario 2 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and PM peak period. The maximum RFC of 0.78 is recorded on the approach from the A29 in the PM peak with an associated queue of four vehicles on the A29 approach. The development proposals increase traffic delay by a maximum of one second in comparison with the 2031 Do Minimum scenario.
- 7.4.4. As the junction is forecast to operate within capacity the proposed identified improvements scheme does not need to be implemented in the 2031 Do Something scenario.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.4.5. The junction modelling for Scenario 2 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in **Table 7-10**.

Table 7-10 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	72	10	13	5	80	19	14	7
B	Arundel Road	9	2	0	-	9	2	0	-
C	A29 Fontwell Avenue	93	31	14	-	46	6	3	-
D	A27 Arundel Road	61	11	7	4	94	17	15	4
E	Northern Circ	85	48	8	4	83	31	12	7
F	Western Circ	51	19	5	3	49	36	3	2

Overall PRC/ Cycle Time	-3.1% PRC and 60s Cycle Time	-3.9% PRC and 60s Cycle Time
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- 7.4.6. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The results present that the development traffic will have a negligible impact on the operation of the signalised roundabout in the AM and PM peak. The approach that operates with the highest Degree of Saturation continues to be The A27 Arundel Road approach in Scenario 2 during the PM peak but has no impact on delay or forecasting queueing.

SITE 3: A29 – BARNHAM ROAD

- 7.4.7. The modelling results from the A29/ Barnham Road roundabout for Scenario 2 is presented in **Table 7-11**.

Table 7-11 A29 / Barnham Road (War Memorial) Roundabout Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.55	8	2	0.41	6	1
B	A29 Nyton Road	0.55	5	2	0.46	4	1
C	A29 Fontwell Avenue	0.54	8	2	0.68	11	3

- 7.4.8. The A29/ B2233 Barnham Road modelling results for Scenario 2 indicates the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.68 occurs on the approach from Barnham Road with an associated delay of 11 seconds and a queue of three vehicles.

SITE 4: A27 – NYTON ROAD

- 7.4.9. **Table 7-12** presents the modelling results from Scenario 2 for the A27/ Nyton Road priority junction.

Table 7-12 - A27 / Nyton Road Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue

B	B2233 Nyton Road	0.15	1	1	0.08	1	1
C	A27 (West)	0.43	18	1	0.66	23	2

- 7.4.10. The modelling results summarised above indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.66 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 23 seconds and a queue of two vehicles. Whilst traffic associated with the proposed development is forecast to increase delay by four seconds the queue length remains at two vehicles.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

- 7.4.11. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 2 is presented in **Table 7-13**.

Table 7-13 - A29 / Nyton Road East Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.48	15	1	0.58	15	2
C	A29 Nyton Road	0.83	43	5	0.33	11	1

- 7.4.12. The Scenario 2 modelling results forecasts the priority junction operates within capacity in the AM and PM peaks. The maximum RFC of 0.83 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 43 seconds and an associated queue of five vehicles. In comparison with the 2031 Do Minimum scenario, the development traffic is predicted to increase delay by seven seconds with a queue length increase by a single vehicle.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.4.13. **Table 7-14** presents the modelling results from Scenario 2 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-14 –A29 / Nyton Road South Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue

B	Nyton Road B2233	0.39	25	1	0.71	38	3
C	Nyton Road A29	0.00	0	0	0.00	0	0

- 7.4.14. The Scenario 2 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak. The maximum RFC of 0.71 occurs on the approach from the B2233 Nyton Road with a total delay of 38 seconds and a queue of three vehicles. The proposed development is forecast to have a negligible impact on the operation of this junction.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.4.15. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 2 are presented in **Table 7-15**.

Table 7-15 –A29 / Nyton Road North Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.54	14	2	0.32	9	1
C	Nyton Road A29	0.19	10	1	0.39	11	1

- 7.4.16. The modelling results indicates the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.54 occurs on the approach from the B2233 Nyton Road with a total delay of 14 seconds and a queue of two vehicles. The proposed development is forecast to have a negligible impact on the operation of this junction.

SITE 8: A29 - A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.4.17. The junction modelling for Scenario 2 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-16**.

Table 7-16 – A29 / A259 Roundabout Scenario 2 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.86	22	6	0.65	11	2
B	Rolls Royce Access	0.42	9	1	0.71	17	3

C	A29 (South)	0.70	6	3	0.65	5	2
D	Saltbox Road	0.05	4	1	0.32	6	1
E	A29 (North)	0.40	4	1	0.54	5	2

- 7.4.18. The Scenario 2 modelling results indicates the five-arm roundabout is approaching capacity in the AM peak and operates within capacity in the PM peaks. The maximum RFC of 0.86 occurs on the approach from A259 in the AM peak with a total delay of 22 seconds which is an increase two seconds compared to Scenario 1 and an associated queue of six vehicles which does not increase compared to Scenario 1.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

- 7.4.19. The modelling results for the Site Access junction are presented in Table 7-17 below.

Table 7-17 – A29 Westergate Street/ Meadow Way/ Access Road Scenario 2 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS %	Av Delay (s)	MMQ	DoS %	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	84	44	19	86	41	26
B	Site Access	82	101	7	50	85	3
C	A29 Westergate Street (South)	79	34	23	56	22	13
D	Meadow Way	79	116	5	72	109	4
Overall Junction		PRC: 7.9% Cycle Time: 120s			PRC: 5.7% Cycle Time: 120s		

- 7.4.20. The junction modelling results forecast that the site access junction will operate within capacity in the AM and PM peak. The maximum Degree of Saturation is 86% on the approach from the A29 Westergate Street (North) in the PM peak, this equates to a delay of 41 seconds with a mean max queue of 26PCUs. The forecast queue lengths will not block back to the A29 level crossing.

SCENARIO 2 JUNCTION ASSESSMENT SUMMARY

- 7.4.21. The junction capacity assessments highlight that all of the junctions operate either within or at capacity with the proposed development traffic included.

7.5 SCENARIO 3 – 2031 DO SOMETHING + BEW DEVELOPMENT

- 7.5.1. The results from the junctions are shown below with Scenario 3 – 2031 Do Something with the BEW Development for the AM and PM peaks. This scenario provides an assessment of how the highway network will operate with the Cala Homes and Parcel SC1 developments with EW link road bridge operating as a pedestrian, cycle and bus link only. Full junction capacity outputs are provided in Appendix H.

SITE 1: A27 – A29

- 7.5.2. Table 7-18 summarises the Scenario 3 modelling results for the A27 A29 roundabout for Scenario 3.

Table 7-18 – A27 / A29 Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.57	8	2	0.82	22	5
B	A27 (East)	0.59	3	2	0.45	3	1
C	A27 (West)	0.53	3	2	0.49	3	2

- 7.5.3. The Scenario 3 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and is approaching capacity in the PM peak period. The maximum RFC of 0.82 is recorded on the approach from the A29 in the PM peak with an associated queue of five which is an increase of one vehicle compared to Scenario 2 and delay of 22 seconds which is an increase of four seconds compared to Scenario 2.
- 7.5.4. As the junction is forecast to operate within capacity the proposed identified improvements scheme does not need to be implemented in the 2031 Do Something + BEW Development scenario.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.5.5. The junction modelling for Scenario 3 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in Table 7-19.

Table 7-19 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	73	11	13	6	84	23	16	8

B	Arundel Road	11	2	0	-	6	2	0	-
C	A29 Fontwell Avenue	96	40	18	-	45	6	2	-
D	A27 Arundel Road	65	14	8	5	94	16	15	4
E	Northern Circ	88	57	9	6	87	31	14	7
F	Western Circ	40	17	4	3	51	38	3	2
Overall PRC/ Cycle Time		-6.2% PRC and 60s Cycle Time				-3.5% PRC and 60s Cycle Time			

- 7.5.6. The modelling results for the signalised roundabout forecasts that the junction will operate at capacity in both the AM and PM peak. The results show that the addition of the BEW development traffic will have slight negative impact on the roundabout operation in the AM peak and a negligible impact in the PM peak. The approach that operates with the highest Degree of Saturation in the A29 Fontwell Avenue with a DoS of 96% in Scenario 2 during the AM peak, with associated delay of 40 seconds and a MMQ of 18PCUs. This means that queuing built up during the red stage will not fully disperse during the greens stage for A29 Fontwell Avenue but this is not an uncommon situation during peak traffic periods.

SITE 3: A29 – BARNHAM ROAD

- 7.5.7. The modelling results from the A29/ Barnham Road roundabout for Scenario 3 is presented in **Table 7-20**.

Table 7-20 - A29 / Barnham Road (War Memorial) Roundabout Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.70	11	3	0.51	7	1
B	A29 Nyton Road	0.55	5	2	0.54	4	2
C	A29 Fontwell Avenue	0.55	8	2	0.70	13	3

- 7.5.8. The A29/ B2233 Barnham Road modelling results forecasts the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 13 seconds and a queue of three vehicles.

SITE 4: A27 – NYTON ROAD

7.5.9. Table 7-21 presents the modelling results from Scenario 3 for the A27/ Nyton Road priority junction.

Table 7-21 –A27 / Nyton Road Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.16	1	1	0.07	1	1
C	A27 (West)	0.42	18	1	0.70	26	3

7.5.10. The modelling results summarised above indicates that the junction will operate within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 26 seconds and a queue of three vehicles.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

7.5.11. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 3 is presented in Table 7-22.

Table 7-22 –A29 / Nyton Road East Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.52	15	2	0.72	23	3
C	A29 Nyton Road	1.03	229	32	0.45	13	1

7.5.12. The Scenario 3 modelling results indicates the priority junction operates overcapacity in the AM peak and within capacity in the PM peak. The maximum RFC of 1.03 occurs on the approach from A29 Nyton Road for the right turn movement into the B2233 Nyton Road in the AM peak with a total delay of 229 seconds and an associated queue of 32 vehicles. This is a significant increase in comparison with 2031 Do-Minimum scemarop. This reflects the additional traffic associated with Parcel SC1 using the A29 to access the A27 (departures) but also the traffic that now has to route past this junction as a result of the East-West Link Road being closed to through traffic between the Cala site and Parcel SC1.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.5.13. **Table 7-23** presents the modelling results from Scenario 3 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-23 –A29 / Nyton Road South Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.38	25	1	0.74	46	3
C	Nyton Road A29	0.00	0	0	0.00	0	0

- 7.5.14. The Scenario 3 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.5.15. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 3 are presented in **Table 7-24**.

Table 7-24 –A29 / Nyton Road North Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.52	14	2	0.31	9	1
C	Nyton Road A29	0.19	10	1	0.38	11	1

- 7.5.16. The modelling results forecast the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.52 occurs on the approach from the B2233 Nyton Road with a total delay of 14 seconds and a queue of two vehicles.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.5.17. The junction modelling for Scenario 3 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-25**.

Table 7-25 – A29 / A259 Roundabout Scenario 3 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.87	28	7	0.81	22	5
B	Rolls Royce Access	0.48	12	1	0.90	57	8
C	A29 (South)	0.75	7	4	0.73	6	5
D	Saltbox Road	0.06	4	1	0.39	8	1
E	A29 (North)	0.58	5	2	0.70	7	3

- 7.5.18. The Scenario 3 modelling results forecasts the five-arm roundabout is approaching capacity in the AM and PM peaks. The maximum RFC of 0.90 occurs on the approach from A259 in the AM peak with a total delay of 57 seconds which is an increase 40 seconds compared to Scenario 1 and an associated queue of eight vehicles which is an increase five vehicles compared to Scenario 1.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

- 7.5.19. The modelling results for the Site Access junction are presented in **Table 7-26** below.

Table 7-26 – A29 Westergate Street/ Meadow Way/ Access Road Scenario 3 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS %	Av Delay (s)	MMQ	DoS %	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	89	50	23	92	50	30
B	Site Access	83	102	8	56	88	3
C	A29 Westergate Street (South)	83	36	25	65	25	17
D	Meadow Way	89	157	6	73	109	4
Overall Junction		PRC: 1.1% Cycle Time: 120s			PRC: -1.4% Cycle Time: 120s		

- 7.5.20. The junction modelling results forecast that the site access junction will operate within capacity in the AM and at capacity in the PM peak. The maximum Degree of Saturation is 92% on the approach from the A29 Westergate Street (North) in the PM peak, this equates to a delay of 50 seconds which is an increase of nine seconds compared to Scenario 2 with a mean max queue of 30PCUs which is an increase of four PCUs compared to Scenario 2.

SCENARIO 3 JUNCTION ASSESSMENT SUMMARY

- 7.5.21. The junction capacity assessments within Scenario 3 highlight that several the junctions operate close to capacity or at capacity with the proposed development traffic and the phase one of Parcel SC1. The A29 / Nyton Road (East) junction also operates just over capacity in this scenario. This highlights the impact of Phase 1 of the BEW development on the local highway network. It is also noted that Scenario 3 provides an interim assessment as represents a position before the full A29 is complete and before the East-West Link Road is open to all traffic.

7.6 SCENARIO 4 – 2038 DO SOMETHING

- 7.6.1. The results from the junctions are shown below with Scenario 4 - 2038 Do Something AM and PM peaks. This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment. Full junction capacity outputs are provided in **Appendix I**.

SITE 1: A27 – A29

- 7.6.2. **Table 7-27** summarises the Scenario 4 modelling results for the A27 A29 roundabout for Scenario 4.

Table 7-27 – A27 / A29 Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A29	0.63	10	2	0.92	48	11
B	A27 (East)	0.66	4	2	0.50	4	2
C	A27 (West)	0.59	3	2	0.62	3	2

- 7.6.3. The Scenario 4 modelling results indicate that the junction will operate within theoretical capacity in the AM peak and approaching capacity in the PM peak period. The maximum RFC of 0.92 is recorded on the approach from the A29 in the PM peak with an associated queue of 11 vehicles which is an increase of six vehicles compared to Scenario 3 and delay of 48 seconds which is an increase of 26 seconds compared to Scenario 3.

- 7.6.4. Taking account of these results a further junction capacity assessment has been completed using the identified improvement scheme discussed in **Section 7.2**. **Table 7-28** below summarises the results of the LinSig assessment completed for the junction.

Table 7-28 – A27 / A29 Scenario 4 Improvement Scheme Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A29	61	10	3	-	92	47	11	-
B	A27 (East)	87	19	17	5	64	16	8	5
C	A27 (West)	70	10	6	4	80	10	9	4
D	Southern Circ	80	42	8	5	66	31	8	6
E	Western Circ	65	28	5	3	16	35	1	1
Overall PRC/ Cycle Time		3.9% PRC and 60s Cycle Time				-1.7% PRC and 60s Cycle Time			

- 7.6.5. The results show that with the mitigation in place the junction will operate within capacity in the AM peak and at capacity in the PM peak. The approach with the highest degree of saturation is the A29 uncontrolled approach with an associated delay of 47 seconds and a MMQ of 11 vehicles in the PM peak.

SITE 2: A27 – ARUNDEL ROAD – A29 FONTWELL AVENUE

- 7.6.6. The junction modelling for Scenario 4 of A27/ Arundel Road/ A29 Fontwell Avenue signalised roundabout is presented in **Table 7-29**. This provides an assessment of the highway network with the Cala Homes development, Phase 1 and 2 of BEW Parcel SC1, full East-West link road and A29 realignment.

Table 7-29 – A27 / Arundel Road / A29 Fontwell Avenue Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak				PM Peak			
		DoS %	Total Delay	MMQ	UQ ED	DoS %	Total Delay	MMQ	UQ ED
A	A27 (East)	87	20	19	8	95	42	24	9
B	Arundel Road	12	2	0	-	7	2	0	-
C	A29 Fontwell Avenue	88	23	11	-	57	8	4	-
D	A27 Arundel Road	61	10	7	4	97	25	20	5
E	Northern Circ	79	33	6	4	96	48	48	8
F	Western Circ	68	32	7	6	55	35	4	3
Overall PRC/ Cycle Time		3.1% PRC and 60s Cycle Time				-7.3% PRC and 60s Cycle Time			

- 7.6.7. The results present that in 2038 following the completion of the entire BEW development and the realignment of the A29, that the signalised roundabout is forecasts to operate within capacity in the AM peak and at capacity in the PM peak. In the AM peak, the approach at the highest level of Degree of Saturation is the A29 Fontwell Avenue, which has an associated delay of 23 seconds and a MMQ of 11. In the PM peak, the approach closest to capacity is the A27 Arundel Road, which has an associated delay of 25 seconds, a MMQ of 20PCUs and UQ ED of 5PCUs.

SITE 3: A29 – BARNHAM ROAD

- 7.6.8. The modelling results from the A29/ Barnham Road roundabout for Scenario 4 is presented in **Table 7-30**.

Table 7-30 – A29 / Barnham Road (War Memorial) Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.51	6	2	0.32	5	1
B	A29 Nyton Road	0.31	3	1	0.32	3	1
C	A29 Fontwell Avenue	0.24	5	1	0.37	6	1

- 7.6.9. The A29/ B2233 Barnham Road modelling results indicates the junction is operating within capacity in the AM and PM peak. The maximum RFC of 0.51 occurs on the approach from the B2233 Barnham Road with an associated delay of six seconds and a queue of two vehicles.

SITE 4: A27 – NYTON ROAD

- 7.6.10. **Table 7-31** presents the modelling results from Scenario 4 for the A27/ Nyton Road priority junction.

Table 7-31 –A27 / Nyton Road Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.20	1	1	0.10	1	1
C	A27 (West)	0.48	20	1	0.70	27	3

- 7.6.11. The modelling results summarised above indicates the junction operates within capacity in the AM and PM peak. The maximum RFC of 0.70 occurs in the PM peak on the approach from the A27 (west) with an associated delay of 27 seconds and a queue of three vehicles.

SITE 5: WESTERGATE STREET – NYTON ROAD (EAST JUNCTION)

- 7.6.12. The modelling results from Westergate Street/ Nyton Road (East Junction) priority junction for Scenario 4 is presented in **Table 7-32**.

Table 7-32 –A29 / Nyton Road East Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.38	10	1	0.65	15	2
C	Nyton Road A29	0.97	111	18	0.44	11	1

- 7.6.13. The Scenario 4 modelling results indicates the priority junction operates at capacity in the AM peak and within capacity in the PM peak. The maximum RFC of 0.97 occurs on the approach from A29 Nyton Road in the AM peak with a total delay of 111 seconds a decrease of 118 seconds compared to Scenario 3 and an associated queue of 18 vehicles which is a decrease of 15 vehicles compared to Scenario 3.

SITE 6: WESTERGATE STREET – NYTON ROAD (SOUTH JUNCTION)

- 7.6.14. **Table 7-33** presents the modelling results from Scenario 4 for Westergate Street/ Nyton Road (South Junction) priority junction.

Table 7-33 –A29 / Nyton Road South Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.21	11	1	0.44	13	1
C	A29 Nyton Road	0.00	0	0	0.00	0	0

- 7.6.15. The Scenario 4 modelling results indicates the priority junction operates well within at capacity in the AM and PM peak.

SITE 7: WESTERGATE STREET – NYTON ROAD (NORTH JUNCTION)

- 7.6.16. Westergate Street/ Nyton Road (North Junction) modelling results for Scenario 4 are presented in **Table 7-34**.

Table 7-34 –A29 / Nyton Road North Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	B2233 Nyton Road	0.66	21	2	0.33	9	1
C	A29 Nyton Road	0.21	11	1	0.43	12	1

- 7.6.17. The modelling results forecast the junction operates within capacity in the AM and PM Peaks. The maximum RFC of 0.66 occurs on the approach from the B2233 Nyton Road with a total delay of 21 seconds and a queue of two vehicles.

SITE 8: A29/A259 FELPHAM RELIEF/INDUSTRIAL ESTATE

- 7.6.18. The junction modelling for Scenario 4 of A29/ A259 Felpham Relief Road/ Industrial Estate is presented in **Table 7-35**.

Table 7-35 – A29 / A259 Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	1.03	109	32	0.99	84	18
B	Rolls Royce Access	0.59	16	2	1.17	252	46
C	A29 (South)	0.83	10	5	0.80	8	5
D	Saltbox Road	0.07	4	1	0.50	11	1
E	A29 (North)	0.65	6	2	0.80	11	4

- 7.6.19. The Scenario 4 modelling results forecasts the five-arm roundabout operates at capacity in the AM and PM peaks. The maximum RFC of 1.17 occurs on the approach from Rolls Royce Access in the PM peak with a total delay of 252 seconds which is an increase 213 seconds compared to Scenario 3 and an associated queue of 46 vehicles which is an increase 40 vehicles compared to Scenario 3. The significant worsening performance of the roundabout in the AM and PM peaks is likely due to

the completion of the BEW scheme and realignment of the A29 and should not be attributed solely to the Cala Homes proposed development.

- 7.6.20. Taking account of these results a further junction capacity assessment has been completed using the identified improvement scheme discussed in **Section 7.2**. **Table 7-36** below summarises the results of the LinSig assessment completed for the junction.

Table 7-36 – A29 / A259 Roundabout Scenario 4 Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	A259	0.64	8	2	0.57	8	2
B	Rolls Royce Access	0.44	10	1	0.82	31	5
C	A29 (South)	0.59	4	2	0.57	3	2
D	Saltbox Road	0.10	7	1	0.60	17	2
E	A29 (North)	0.42	3	1	0.52	4	2

- 7.6.21. The table above shows that the mitigation scheme forecasts a significant improvement to the roundabout operation. The roundabout will operate within capacity in the AM and PM peaks. The maximum RFC of 0.82 occurs on the approach from Rolls Royce in the PM peak with an associated delay of 31 seconds and a queue of five vehicles. This demonstrates a reduction of delay of 221 seconds and the queue reduces by 41 vehicles.

SITE 9: A29 WESTERGATE STREET/ MEADOW WAY/ ACCESS ROAD (ACCESS JUNCTION)

- 7.6.22. The modelling results for the Site Access junction are presented in **Table 7-37** below.

Table 7-37 – A29 Westergate Street/ Meadow Way/ Access Road Scenario 4 Junction Capacity Assessment.

Arm	Approach	AM Peak			PM Peak		
		DoS	Av Delay (s)	MMQ	DoS	Av Delay (s)	MMQ
A	A29 Westergate Street (North)	55	47	6	46	30	9
B	Site Access	57	54	7	45	78	3
C	A29 Westergate Street (South)	59	37	12	42	27	8
D	Meadow Way	56	74	4	44	64	4
Overall Junction		PRC: 54.2% Cycle Time: 120s			PRC: 96.6% Cycle Time: 120s		

- 7.6.23. The junction modelling results forecast that the site access junction will operate well within capacity in the AM and PM peaks. The maximum Degree of Saturation is 59% on the approach from the A29 Westergate Street (South) in the AM peak, this equates to a delay of 37 seconds, with a mean max queue of 12PCUs. These results show a significant improvement in junction capacity. This is a result of the reduction in traffic flows on the A29 associated with completion of the full A29 realignment.

SCENARIO 4 JUNCTION ASSESSMENT SUMMARY

- 7.6.24. The junction capacity assessments within Scenario 4 highlight that that several the junctions operate close to capacity or at capacity with the proposed development traffic and the completed BEW development and associated infrastructure, in either the AM or PM peak. Improvements schemes identified to accommodate development associated with the Local Plan mitigate these impacts.
- 7.6.25. The site access junction to the Cala Homes development will operate well within capacity. The impact of the proposed development is minimal across the network compared to the adjacent BEW scheme.

7.7 INTERIM SCENARIOS

- 7.7.1. An interim assessment has also been undertaken to understand that the how many units could be occupied on the Cala Homes site prior to completion of the first phase of the A29 realignment (between A29 Fontwell Avenue and B2233 Barnham Road), which is due to be completed in Spring 2026. Phase 1 of the A29 realignment will provide a route that bypasses the A29 / Barnham Road (War Memorial) roundabout whilst also having the potential to remove traffic from the A29 / Nyton Road priority junctions due to it offering a more direct route to the A27.

- 7.7.2. Taking this into account and Cala Homes' anticipated build-out rate, interim junction capacity assessments have been completed for the A29 / Barnham Road (War Memorial) roundabout and A29 / Nyton Road priority junctions for the following scenarios:
- ✱ 2026 with 200 units occupied on the Cala Homes development; and
 - ✱ 2028 with 300 units occupied on the Cala Homes development.
- 7.7.3. Figure 7-4 below, taken from the WSCC website, shows the proposed extent of phase in comparison with the full A29 realignment.

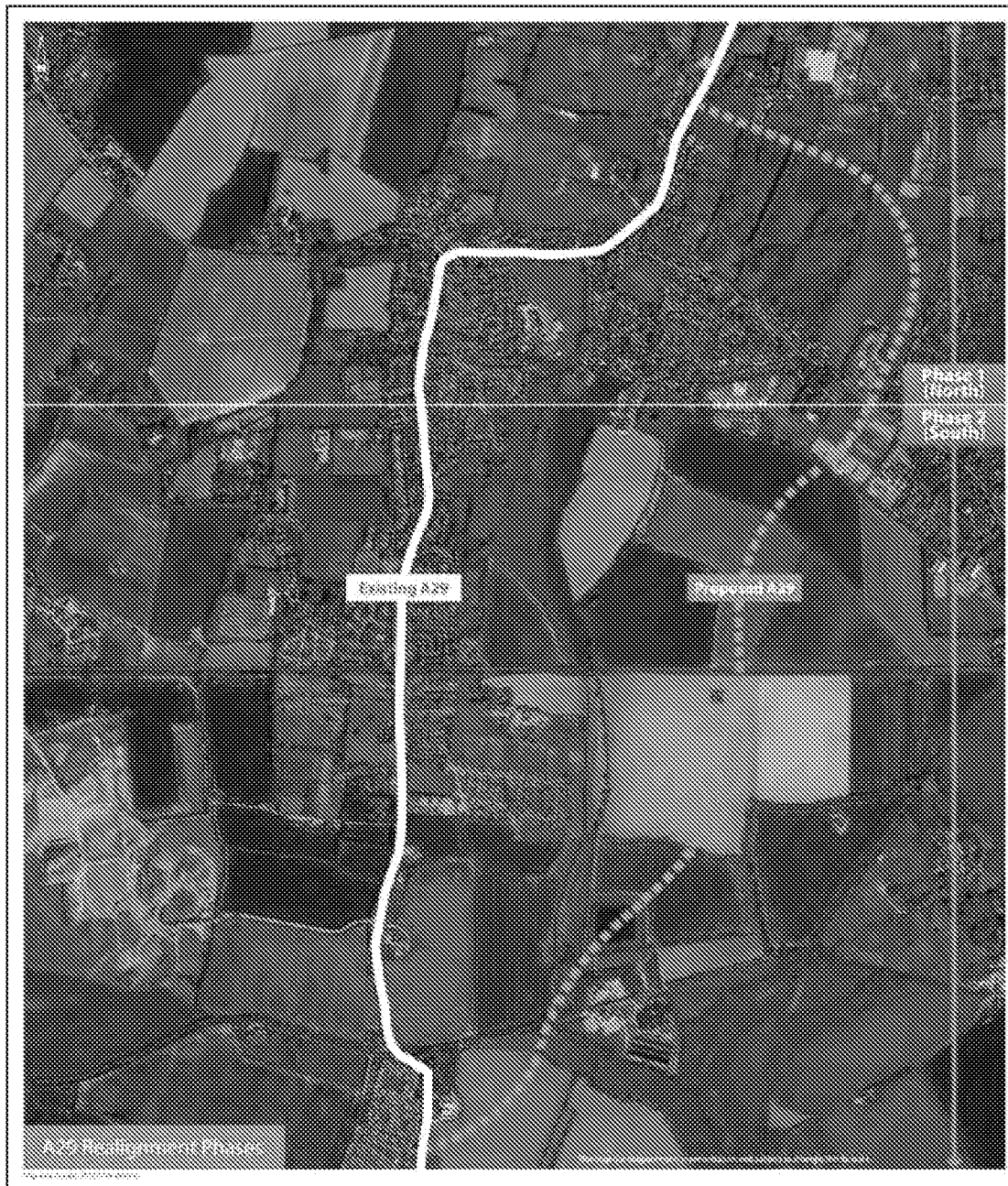


Figure 7-4 – A29 Realignment Phase 1 and Phase 2

- 7.7.4. The 2026 and 2028 traffic flows has been generated by providing a TEMPRO growth factor to the 2019 baseline and adding a 50% and 75% of the development trip generation calculated in **Section 6**. The use of TEMPRO is deemed appropriate as it will account for all the forecast local plan development in the vicinity of the site. **Table 7-38** and **Table 7-39** presents the 2026 baseline and

2026 baseline with 50% development modelling results respectively. Full junction capacity outputs are provided in **Appendix J**.

2026 ASSESSMENT (200 UNITS)

- 7.7.5. **Tables 7-38** shows how the A29 / Barnham Road roundabout will operate in 2026 with 200 units occupied on the proposed development site.

Table 7-38 – A29 / Barnham Road (War Memorial) Roundabout 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.66	9	2	0.56	9	2
B	A29 Nyton Road	0.53	4	2	0.50	5	1
C	A29 Fontwell Avenue	0.58	9	2	0.87	27	7

- 7.7.6. The A29/ B2233 Barnham Road interim scenario modelling results indicates the junction is operating within capacity in the AM peak and at capacity in the PM peak with the development. The maximum RFC of 0.87 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 27 seconds. This demonstrates that the junction can accommodate the traffic generated from half of the development in 2026 alongside the baseline traffic growth.

- 7.7.7. **Table 7-39** and **Table 7-40** presents how the A29 / Nyton Road (East) junction will operate in 2026 with and without 200 units occupied on the proposed development site.

Table 7-39 – A29 / Nyton Road East 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.56	14	2
C	Nyton Road A29	0.98	138	19	0.36	11	1

Table 7-40 – A29 / Nyton Road East 2026 Baseline + 50% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.57	15	2
C	Nyton Road A29	1	165	23	0.37	11	1

- 7.7.8. **Table 7-39** and **Table 7-40** above forecasts that in the AM peak the junction is at its theoretical capacity with and with development traffic and in the PM peak the junction is within capacity. The development traffic is forecast to increase the total delay by 28 seconds and increase the queue by four vehicles. It is worth noting that the development traffic flows through the junction only increase the overall flow by just under 2.5%.

2028 ASSESSMENT (300 UNITS)

- 7.7.9. **Tables 7-41** shows how the A29 / Barnham Road roundabout will operate in 2026 with 300 units occupied on the proposed development site.

Table 7-41 – A29 / Barnham Road (War Memorial) Roundabout 2028 Baseline + 75% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
A	B2233 Barnham Road	0.68	10	3	0.58	9	2
B	A29 Nyton Road	0.54	5	2	0.51	5	2
C	A29 Fontwell Avenue	0.59	10	2	0.90	32	8

- 7.7.10. The A29/ B2233 Barnham Road 2028 interim scenario modelling results forecasts the roundabout to operate within capacity in the AM peak and at capacity in the PM peak with the development. The maximum RFC of 0.90 occurs on the approach from the A29 Fontwell Avenue with an associated delay of 42 seconds. This demonstrates the occupation of 300 units can be completed without the leading to the junction operating over capacity.

- 7.7.11. **Table 7-42** and **Table 7-43** presents how the A29 / Nyton Road (East) junction will operate in 2026 with and without 300 units occupied on the proposed development site.

Table 7-42 –A29 / Nyton Road North 2028 Baseline Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.44	13	1	0.57	14	2
C	Nyton Road A29	1.00	170	24	0.36	11	1

Table 7-43 –A29 / Nyton Road North 2028 Baseline + 75% Development Junction Capacity Assessment

Arm	Approach	AM Peak			PM Peak		
		RFC	Total Delay	Modelled Queue	RFC	Total Delay	Modelled Queue
B	Nyton Road B2233	0.45	14	1	0.58	15	2
C	Nyton Road A29	1.03	220	31	0.37	11	1

- 7.7.12. The tables above shows that the priority junction will operate at capacity in the AM peak without the development and over capacity with the development traffic, whilst in the PM peak the junction will operate within capacity with and without the development. The development traffic is forecast to increase the total delay by 50 seconds and increase the queue by seven vehicles. It is worth noting that the development traffic flows through the junction only increase the overall flow by just under 4% in this scenario.

SUMMARY OF INTERIM SCENARIO

- 7.7.13. The capacity assessments from the interim scenario present that the A29 / Barnham Road roundabout accommodate 200 and 300 units of the development in 2026 and 2028. The A29/ Nyton Road junction is forecast to operate over capacity with 300 units, before the realignment of Phase 1 of the A29, but the impact of the additional traffic is not significant when considered against the 2028 baseline position.

8 A29 LEVEL CROSSING ASSESSMENT

8.1 INTRODUCTION

- 8.1.1. This section provides an assessment of the impact of the proposed development on traffic flows on the highway network surrounding the development, focusing on the operation of the Woodgate level crossing as associated traffic and traffic levels on the A29.

8.2 A29 WOODGATE LEVEL CROSSING

- 8.2.1. The level crossing of the A29 at Westergate Street approximately 550m south of the site entrance has been assessed in the future year scenarios. An assumption has been made that train times remain the same and as such occurrences of the closure of the road will be the same in future years as the observed base year.

IMPACT OF PROPOSED DEVELOPMENT ON LEVEL CROSSING QUEUE LENGTHS

- 8.2.2. Taking account of the survey described above this section provides an assessment of the impact of the proposed development in relation to queue lengths associated with the A29 level crossing. For assessment purposes it is assumed that train times remain the same and, as such, occurrences of the closure of the road will be the same in future years as the observed base year.

Development Traffic Impact

- 8.2.3. The proposed development will result in an increase in the arrival rate of vehicles that approach the level railway crossing per hour but the service rate of the level railway crossing (the amount of traffic that can pass through the level railway crossing in any given hour) will remain the same given the assumptions above. As such, vehicle queues associated with closure times at the level railway crossing are expected to increase as traffic volumes increase on A29 Westergate Street.
- 8.2.4. A traffic queue survey was undertaken of the level crossing on the 1st March 2022 to ascertain a baseline operation of the crossing. The survey identified a maximum queue of 96 PCU in the AM peak at the crossing, and a maximum queue of 127 PCU in the PM peak during the barrier closure period.
- 8.2.5. For the proposed development only, the increases shown in **Table 8-1** would be observed at the level crossing. Note that numbers presented are in PCU.

Table 8-1 – Increase in Traffic at the Level Crossing (Development Traffic Only)

Time	Northbound Increase at level crossing	Southbound Increase at level crossing	Southbound Increase north of junction (at site access junction)
AM Peak Hour	22	55	39
PM Peak Hour	39	19	77

- 8.2.6. This shows that, at most, this is the equivalent to an additional 55 vehicles in the southbound direction during the AM peak.

Impact on A29 Northbound Level Crossing Queueing

- 8.2.7. For the northbound direction approach to the level crossing, it is noted that the street function is different to the southbound direction. The road streetscape is more rural in nature, with limited properties fronting the road. There is a lower number of junctions south of the railway line and the nearest major junction control is a considerable distance away (2.8km) at the junction of A29 and A259 relief road. As such, it is considered no assessment is required for the northbound direction (south of the level railway crossing) as there is adequate capacity for queueing vehicles.

Impact on A29 Southbound Level Crossing Queueing

- 8.2.8. In the southbound direction, existing queues created by the level crossing barrier closure that do not extend past the proposed access junction (less than 550 metres) will increase only as a result of southbound traffic leaving the site. Existing queues that extend past the access junction will increase by a larger amount as a result of the additional traffic which is accessing the development from the north as well as the traffic leaving the site heading south.
- 8.2.9. To assess the impact of the proposed development an assumption has been made that development traffic will depart or arrive on a uniform basis across the peak hour based upon the additional vehicles presented in **Table 8-2**.

Table 8-2 – Impact of Development Traffic on Level Crossing Queue Lengths

Time Period	Average Closure Time	Development Traffic Arrival / Departure Rate	Increase in Queue Length	Maximum Closure Time	Development Traffic Arrival / Departure Rate (North of Access)	Increase in Queue Length
08:00-09:00	00:02:53	0.9 per minute	+3 PCU (18m)	00:06:27	0.65 per minute	+4 PCU (24m)
17:00-18:00	00:02:24	0.3 per minute	+1 PCU (6m)	00:03:48	1.3 per minute	+5 PCU (30m)

- 8.2.10. **Table 8-2** shows that during the average closure times experienced during the AM and PM peak hours, the proposed development will increase queue lengths by 6-18m. This assumes that during an 'average' barrier closure queue lengths do not extend past the site access junction as is the case the vast majority of barrier closures surveyed. For the maximum barrier closures recorded, it is predicated that the proposed development would increase queue lengths by 24m during the AM and 30m during the PM peak hour, this is based on development traffic travelling southbound north of the site access. This represents a 4.2% increase in the maximum queue length recorded in the AM peak and a 3.9% increase in the PM peak.
- 8.2.11. It is therefore considered that the proposed development would not result in a severe impact upon the operation or capacity of the A29 Level Crossing as shown within the 2031 future year assessment scenario.

Impact of the A29 / Meadow Way Site Access Junction

- 8.2.12. In order to deal effectively with the potential for a large platoon of traffic approaching the junction from the upstream level crossing, a MOVA control system is proposed for the signalised site access junction. Once MOVA control has been set up successfully, the system will generate its own signal timings cycle-by-cycle, varying continuously with traffic conditions to offer full flexibility in traffic management. The timings under this system are optimised both in the short term (hour to hour, day to day for events like level crossing releases) and in the long term following annual trends and longer term traffic growth.
- 8.2.13. MOVA has two operational modes; the first deals with uncongested conditions, the second with situations when the junction becomes overloaded/congested with large queues on one or more approaches. MOVA determines which mode is appropriate and which approach(es), if any, are overloaded. In the uncongested mode, MOVA seeks to disperse any queue which has built up on red, and then carries out a delay-and-stops minimising procedure every half second. If there would be a benefit from extending the green, then the green would continue and the calculations repeated. If no benefit were predicted, the signals would change to the next stage. In the congested mode, MOVA operates a capacity-maximising routine. This routine takes into account which approaches are overloaded, the efficiency of green use, and determines the signal timings which will maximise the junction throughput under the actual flow conditions prevailing.
- 8.2.14. Therefore by using MOVA, a queue clearing sequence will include additional green time signal phase for A29 Westergate Street northbound traffic to reduce the instances of stopping twice at the level crossing and at the signalised access junction. In addition, the assessment of the operation of the traffic signals in future years does not predict a queue length for northbound vehicles that would extend to the level railway crossing.
- 8.2.15. MOVA control is considered the optimum control method for this site. The system will detect the surge in traffic from the level crossing and deal with throughput as efficiently as possible.

- 8.2.16. The introduction of an additional queue clearing sequence at the signalised access point will result in the skipping of the east-west phase, which will reduce the ability for traffic exiting the site to clear the junction. Whilst queues may extend past the junction of the access road with Pine Close, and it is proposed to provide line-marking Diagram 1026 'KEEP CLEAR' across this junction to assist in side road access.

9 SUMMARY AND CONCLUSIONS

9.1 SUMMARY

- 9.1.1. WSP have been appointed by Cala Homes to provide transportation and highways advice in support of a planning application for the development on land at Westergate, West Sussex. The proposed development will provide up to 2,300 dwellings. Pre-Application discussion has been undertaken with West Sussex County Council and National Highways and has influenced the production of the Transport Assessment.

EXISTING CONDITIONS

- 9.1.2. The site will be accessed via A29 Westergate Street which provides a link from Fontwell onto Bognor Regis to the south. In the vicinity of the site the A29 has a posted speed limit of 30mph and street lighting. A29 Westergate Street has a level crossing to the south of Hook Lane approximately 550 metres from the site entrance.
- 9.1.3. The existing Public Rights of Way network provides links to St Richards Road and Ivy Lane, Ormiston Six Villages Academy School, Eastergate Church of England School, and Aldingbourne Primary School via Elmcroft Place. There is no existing dedicated cycle network in the vicinity of the development. The nearest NCN route is found along A259 linking Chichester to Bognor Regis, There is a shared-use path that routes along the northern boundary of the development site, which connects Ivy Lane and Church Lane and provides access to Six Villages Sports Centre and Ormiston Six Villages Academy and Eastergate Church of England Primary School.
- 9.1.4. The closest bus stop is 150 metres to the south of the access point along A29 Westergate Street. There are both northbound and southbound bus stops in this location. The stops are served by bus Route 66 provided by Compass Bus which travels from Bognor Regis to Yapton via Barnham as a loop service. The closest rail station is located at Barnham Station which is located two miles along the road network from the site and is serviced by the West Coastway line which runs between Southampton and Brighton, and a spur line to Bognor Regis.
- 9.1.5. Personal Injury Collision (PIC) data has been obtained from the WSCC recorded by Sussex Police for the previous five years for a three kilometre radius around the site. The data showed a total of 112 collisions that has occurred during the past five years of which one was classified as fatal, 33 collisions were classified as serious and the remaining 78 were classified as slight in terms of severity. The PIC records indicate that driver behaviour is the main cause of crashes at these locations, with drivers misjudging other vehicles or losing of control of their vehicles.
- 9.1.6. To determine the level of accessibility (with regard to public transport, cycling and walking) TRACC and ACCESSION GIS modelling has been undertaken to determine and calculate journey times and distances for all modes of transport. This showed that the villages of Eastergate, Woodgate and Westergate (and their associated facilities) can be reached within a 30 minute walk. Barnham and Barnham Station are accessible within a 10 minute cycle journey and all of Bognor Regis, plus the majority of Felpham and the outskirts of Arundel and Chichester within 30 minutes.

DEVELOPMENT PROPOSALS

- 9.1.7. Cala Homes is submitting an application to develop the site for residential use in the order of 400 dwellings with access via a new all moves traffic signal junction located at A29 Westergate Street / Meadow Way junction, to the south of Pine Close. It is proposed that the junction will operate with Microprocessor Optimised Vehicle Actuation (MOVA) to minimise vehicle delays on all approaches.
- 9.1.8. The site will form the first phase of the Barnham / Eastergate / Westergate strategic development site, which is allocated for at least 2,300 dwellings as part of the draft Local Plan. Proposals for the strategic development site include the realignment of the A29 and the provision of an East-West Link Road which will link the existing A29 Westergate Street onto B2233 Barnham Road (near Barnham Station). The site access junction and access road proposed as part of this development application forms the first stage of the East-West Link Road. A connection to this East-West Link Road from the Cala Homes site will be facilitated by a bridge over the Lindsey Rife which will be constructed as part of the Cala Homes development.
- 9.1.9. As part of pre-application discussion with WSCC, it has agreed that the East-West Link Road bridge will operate as a bus, pedestrian and cycle only route until the full A29 realignment is complete. This strategy mitigates concerns raised by WSP related to the impact of traffic associated with Parcel SC1 on the operation of the site access junction prior to the full A29 realignment being completed.
- 9.1.10. The proposed site access junction has been designed in accordance with standards contained in the Traffic Signs Manual Chapter 6 (Traffic Control) (2019). Access into the site for pedestrians and cyclists will be provided at the main access junction as described above plus through a number of existing PRow connecting into the site. As part of this junction a pedestrian footway will be provided on the southern side of the site access road to link the existing footway on A29 Westergate Street into the site. From the north pedestrian access will be through Pine Close, which will be closed to through traffic.
- 9.1.11. To promote trips by public transport, a financial contribution will be made as part of any planning permission to upgrade the southern bus stops on the A29 to include bus shelters.

DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

- 9.1.12. The trip rate for the Development has been calculated using traffic surveys undertaken on Ivy Lane and Meadow Way. The total number of trips associated with the development is 213 two-way trips in the AM peak and 173 PM peak. The residential trip distribution has been calculated using three different journey types; the first being travel to work using 2011 census data and Google map directions from the site illustrating the quickest route to any destination. The second journey type is education trips and the third trip type is 'other' this includes shopping, leisure and trips to see friends and family.

DEVELOPMENT IMPACT ASSESSMENT

- 9.1.13. To assess the impact of the development a series of junction assessments have been carried out for the AM and PM peak periods for the following scenarios:
- ※ 2019 Base Year;
 - ※ 2031 Do-Minimum. This scenario provides an assessment of how the highway network will operate in 2031 without the Cala Homes development or Parcel SC1;
 - ※ 2031 Do-Something;
 - ※ Scenario 3 – 2031 Do-Something with Phase 1 of BEW Development; and
 - ※ 2038 Do Something.
- 9.1.14. The assessment showed that traffic associated with the proposed development can be accommodated on the local highway network in 2031 without any leading to any junctions operating over capacity. In 2038, when assessed with Phase 1 and 2 of BEW Parcel SC1, the A27 / Arundel Road / A29 Fontwell Avenue roundabout operates at capacity whilst the A27 / A29 roundabout and A29 / A259 roundabout are forecast to operate close to capacity. The improvements schemes identified to support the Arun Local Plan however provide suitable mitigation measures.
- 9.1.15. The traffic queue survey completed in 2022 at the Woodgate level crossing identified a maximum queue of 576m in the AM peak at the crossing, and a maximum queue of 762m in the PM peak during the barrier closure period. Averages queue lengths were recorded at 328m for the AM peak and 388m for the PM peak. Taking account of the trip generation associated with the proposed development, it is predicated that during the maximum barrier closures recorded the recorded queue lengths would increase queue lengths by 24m during the AM and 30m during the PM peak hour. During the average closure times experienced during the AM and PM peak hours, the proposed development will increase queue lengths by 6-18m. For the vast majority of time, the southbound queue length will not extend back to the site access junction.
- 9.1.16. In order to deal effectively with the potential for a large platoon of traffic approaching the site access junction from the upstream level crossing, a MOVA control system is proposed for the signalised site access junction. This will include a queue clearing sequence that will provide additional green time signal phase for A29 Westergate Street northbound traffic to reduce the instances of stopping twice at the level crossing and at the signalised access junction.

9.2 CONCLUSION

- 9.2.1. This TA has considered the development of 400 dwellings on land east of Westergate, which will be accessed via a new traffic signal junction at the A29 / Meadow Way. The Transport Assessment has demonstrated that the local and strategic highway network can accommodate the proposed development, once improvement measures identified to support the Arun Local Plan have been implemented.
- 9.2.2. For trips being made by alternative modes of transport the site is well located to make use of the existing PRoW and pedestrian network that will be enhanced as it crosses the site, providing routes to local schools and services, Eastergate and Barnham. In addition the proposed development also

provides an LTN1/20 compliant bidirectional cycle route which will connect into the wider BEW development and associated facilities, Barnham village and railway station. This network will allow a number of trips to be made without accessing the A29 and will also reduce the dependence on car travel for short distance trips. The Framework Travel Plan accompanying this TA will also encourage trips by sustainable modes of transport.

- 9.2.3. Paragraph 111 of the National Planning Policy Framework states that, “development should only be prevented or refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe”. Taking this into account and the conclusions of this TA, there are no reasons why the planning application should be refused on highways and transport grounds.

Appendix A

SCOPING REPORTS AND EMAILS

11/5/11



Cala Homes

LAND AT WESTERGATE

Transport Assessment Scoping Note





Cala Homes

LAND AT WESTERGATE

Transport Assessment Scoping Note

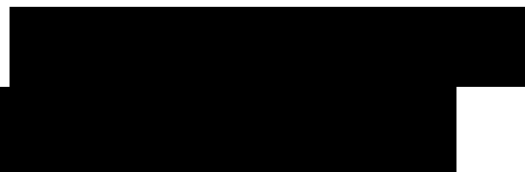
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DATE: JULY 2023

WSP

Grosvenor House
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CONFIDENTIAL



QUALITY CONTROL

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1 INTRODUCTION

1.1 OVERVIEW

- 1.1.1. WSP has been appointed by Cala Homes to provide Transportation and Highways advice in support of a planning application for the development of land located at Westergate, West Sussex.
- 1.1.2. The site is located on land to the east of the A29 Westergate Street, accessed via a new traffic signal junction at Meadow Way / Pine Close. The proposed development will provide up to 400 dwellings with associated car parking. The site is bordered by existing residential development to the west and by agricultural land to the east and forms part of the Barnham / Eastergate / Westergate (BEW) strategic development site. Proposals for the BEW strategic development includes the realignment of the A29 to the east of the Cala Homes site to bypass the existing railway level crossing at Woodgate and provide a grade separated crossing to eliminate vehicle queues associated with the level crossing. The realignment of the A29 will run from the existing A29 to the north of Eastergate and connect to the existing alignment to the south of the railway. The realigned A29 will connect with the Cala Homes site and existing A29 alignment, via an East-West Link Road.
- 1.1.3. It is noted that a planning application (ref. BN/11/22/OUT) was validated by Arun District Council on 4th February 2022 relating the BEW Parcel SC1 (directly adjacent to the Cala Homes site that forms the scope of this report) which was outlined as follows:
- Outline application with all matters reserved (except for the A29 Realignment) for the demolition of existing structures and mixed use development to provide up to 1,250 residential dwellings (Use Class C3), Care Home/Senior Living Accommodation (Use Class C2/C3), flexible retail and community floorspace (Use Classes E/F2/Sui Generis), a Primary School plus open space, landscaping, drainage and all other associated ancillary works; and realignment of the A29 and early connection to existing A29 including construction of a new road carriageway, junctions and associated infrastructure.*
- 1.1.4. The proposals contained within this planning application have been reviewed and taken into account within this Scoping Report, which has been prepared to aid discussion and agreement between WSP and West Sussex County Council, as the local highway authority, and National Highways as the authority responsible for the strategic road network (A27). The Local Planning Authority is Arun District Council. The Report has been updated to reflect responses from West Sussex County Council and National Highways to the original Scoping Note received on 22/06/22 and 11/07/22 and a follow up meeting held with WSCC on 01/06/23.
- 1.1.5. A previous application for Cala Homes site was submitted, for a development of 350 dwellings, under the reference AL/15/17/PL. The planning application was refused by Arun District Council on 26th March 2020 for reasons relating to mineral safeguarding, impact on ecology and trees and ensuring that the development complies with the Lifetime Homes Standard. In relation to Highway matters, the District Council stated that insufficient information had been submitted to demonstrate that kerbside collection is possible for municipal vehicles, contrary to Policy WM DM1(a) of the Arun Local Plan. It is noted however that a 'no objection' response subject to securing of relevant S106 contributions was issued by WSCC and Highways England (now National Highways) as confirmed in the Planning Committee Officers Report dated 26/03/20.



2 DEVELOPMENT PROPOSALS

2.1 DEVELOPMENT DESCRIPTION

- 2.1.1. Cala Homes are proposing to develop the site for residential use to provide up to 400 dwellings, with associated car parking and a new vehicular and pedestrian site access via a four-arm signalised junction with Meadow Way and A29 Westergate Street.

2.2 SITE ACCESS

- 2.2.1. The proposed site access will be achieved via a four-arm signalised junction with Meadow Way and A29 Westergate Street as shown on Drawing 3258-GA-006 included in Appendix A. The proposed access junction is the same layout which supported the 2017 planning application, which was subject to an independent Stage 1 Road Safety Audit and Designers Response provided in Appendix B of this Scoping Report for reference. Given the proposed layout, the access junction was also subject to a Design Statement and Departures from Standards application (included in Appendix C as part of the Site Access Design Audit) related to the following aspects:
- ✦ Intervisibility between junction stop lines on A29 southern arm, Meadow Way and site access;
 - ✦ Forward visibility (SSD) on the A29 northbound approach to the traffic signals; and
 - ✦ Forward visibility (SSD) to the back of queuing traffic on the A29 northbound approach to the traffic signals.
- 2.2.2. These Departures from Standards were approved by WSCC as reflected in their 'no objection' response to planning application AL/15/17/PL. However, given that relevant aspects of the DMRB has been updated since submission of the Departures from Standards application in 2017, it has been necessary to complete a review of the design guidance to ensure that all aspects are still applicable to the proposed site access junction.
- 2.2.3. Since 2017 TD50/04 guidance document has been replaced by the CD 123 "Geometric design of at-grade priority and signal-controlled junctions" (November 2021) document, whilst the Traffic Signs Manual Chapter 6 (Traffic Control) (2019) also now provides general guidance on the layout of traffic signal junctions with a speed limit of 40mph or below. Following a review of the newly published guidance, it has been determined that the current design standards do not alter the Departure from Standards requirements related to the proposed layout. Therefore, no updated site access design is required and the proposed four-arm signalised junction with Meadow Way and A29 Westergate Street as shown on Drawing 3258-GA-006 remains the same as per the 2017 planning application.
- 2.2.4. It is recommended that the junction will operate with Microprocessor Optimised Vehicle Actuation (MOVA) to minimise vehicle delays on all approaches. The proposed junction will operate in three stages with the A29 running together in each direction before Meadow Way and the site access run independently. To aid right turning movements from the A29 ghost-island right turn lanes are provided and northbound traffic will also benefit from the extension of the green phase whilst southbound traffic is held. This will ensure any traffic turning right into the site will clear the junction if they have not found a suitable gap during the normal phase.
- 2.2.5. It is noted that, as part of the BEW strategic development site an East – West Link Road is proposed between the site and the BEW Parcel SC1 that is subject to the BN/11/22/OUT application. A connection to this East-West Link Road from the Cala Homes site will be facilitated by a bridge over the Lindsey Rife, which will operate as a bus, pedestrian and cycle route only until the full A29 realignment is complete. This approach for the East-West Link Road has been discussed and



agreed with WSCC based upon the transport modelling discussed in Section 4 and Appendix E of this Scoping Note.

2.3 SERVICING

- 2.3.1. The Transport Assessment will provide a swept path analysis to illustrate a refuse vehicle safely accessing and egressing all necessary areas within the internal site layout to undertake refuse collection. The site layout will accord with waste collection distances, by both residents and waste operatives, as outlined within Part H6 of the Building Regulations Merged Approved Documents (July 2021 update).

2.4 EMERGENCY SERVICE ACCESS

- 2.4.1. The Transport Assessment will provide a swept path analysis to illustrate an emergency service vehicle (Fire Engine) accessing and egressing all areas of the site to demonstrate safe access and manoeuvrability.

2.5 CAR AND CYCLE PARKING

- 2.5.1. Car and cycle parking will be provided in accordance with the West Sussex County Council – Guidance on Parking at New Developments (September 2020) document.
- 2.5.2. A swept path analysis will be undertaken to illustrate an estate car accessing and egressing the internal site layout to demonstrate a safe and achievable site and car parking layout in the interest of Highway safety.
- 2.5.3. The main access into the site for pedestrians and cyclists will be provided at the main development site access, as described in Section 2.2. As part of the access junction, a pedestrian footway will be provided on the southern side of the site access road to link the existing footway on A29 Westergate Street into the site. From the north, pedestrian access will be through Pine Close which will be closed to through traffic.
- 2.5.4. The internal road network for the proposed site will follow Manual for Streets principles and guidance. The street network will naturally reinforce low vehicle speeds through design and streetscape will provide an attractive environment for walking through the site and giving priority to pedestrian and cycle movements over that of vehicles.
- 2.5.5. The proposed development site masterplan will be reviewed in conjunction with the guidance outlined in LTN 1/20. This will ensure that high quality cycle infrastructure design is embedded throughout the site layout. The development site will also accord with the principles outlined in the West Sussex Cycling Design Guide (2019) to establish cycling as the mode of choice for as many journeys as possible to/from the site.

3 TRANSPORT ASSESSMENT SCOPE

3.1 INTRODUCTION

- 3.1.1. A comprehensive Transport Assessment will be prepared to support the Planning Application for the development, which will be inclusive of the following elements.

3.2 POLICY REVIEW

- 3.2.1. The Transport Assessment will provide a review of National, Regional and Local Policy documents in context of the proposed development and how it conforms with the overall spatial and planning context for the development proposal. The following national and local planning documents will be reviewed:

National Policy

- ✧ The National Planning Policy Framework (NPPF) (2021); and
- ✧ National Planning Guidance: Travel Plans, Transport Assessments and Statements (2014).

Local Policy

- ✧ West Sussex Local Transport Plan (2011-2026);
- ✧ West Sussex County Council: Guidance on Parking at New Developments (September 2020);
- ✧ West Sussex Walking and Cycling Strategy 2016 to 2026;
- ✧ Arun District Council Local Plan 2011-2031 (2018);
- ✧ Arun District Council – Parking Standards Supplementary Planning Document (January 2020);
- ✧ Barnham & Eastergate Neighbourhood Development Plan (2014-2029) and emerging Neighbourhood Plan 2019-2031; and
- ✧ Aldingbourne Neighbourhood Plan (2019-2031).

Other background transport reports

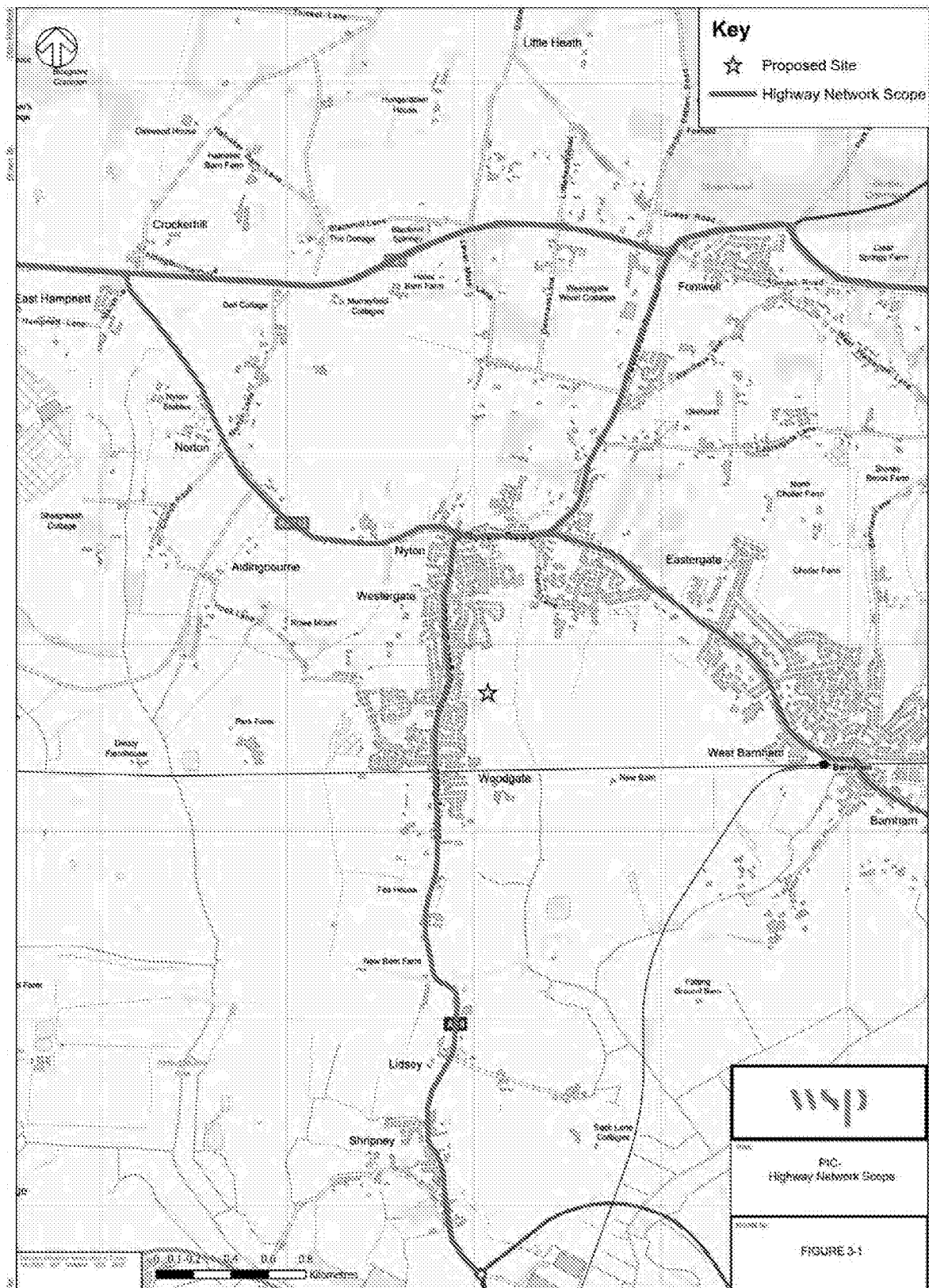
- ✧ WSCC/ADC Local Plan Transport Mitigation Apportionment Study (June 2020);
- ✧ Arun Transport Study 2016 Stage 3 report;
- ✧ The Enterprise Bognor Regis Transport Review 2017;
- ✧ WSCC Comet Corner and Oystercatcher Report December 2019; and
- ✧ West Sussex Cycling Design Guide August 2019.

3.3 BASELINE CONDITIONS

- 3.3.1. The Transport Assessment will undertake a review of the baseline highway network, public transport infrastructure and walking and cycling infrastructure in relation to the proposed development site.
- 3.3.2. The baseline conditions review will also include a detailed land use audit of the local area and demonstrate how key local facilities, such as retail / employment / and education, can be accessed from the site by walking, cycling, public transport and private car trips.
- 3.3.3. Personal Injury Collision (PIC) records for the most recently available five-year period will be obtained from the Safer Sussex Roads Partnership for the local highway network within the vicinity of the proposed development site. The PIC data will be reviewed to determine if there currently exists any trends or clusters of collisions that might indicate an operational safety issue associated with the local highway network. The extent of highway network to be considered is identified in Figure 3-1.



Figure 3-1 – PIC – Highway Network Scope





3.4 TRAFFIC FLOWS

3.4.1. The following baseline traffic surveys have been undertaken within the vicinity of the site access on A29 Westergate Street:

- ※ Manual Classified Count on A29 Westergate Street / Meadow Way on Tuesday 1st March 2022;
- ※ Manual Classified Count on A29 Westergate Street / Ivy Lane on Tuesday 1st March 2022;
- ※ A queue and barrier closure survey at the A29 Westergate Street Level Crossing on Tuesday 1st March 2022; and
- ※ An Automatic Traffic Count (ATC) survey on A29 Westergate Street between Pine Close and Oaks Close between 1st March and 9th March 2022.

3.4.2. These surveys have been undertaken to provide a baseline of the existing highway network, although they will not be used for future assessments within the Transport Assessment as detailed below.

3.4.3. The ATC survey data was compared against data provided by WSCC for March 2023 for the same area of highway network. The results of this comparison are summarised in Table 3-1 below.

Table 3-1 - A29 Westergate ATC Comparison

	Mar-22			Mar-23			Difference			% Difference		
	Northbound	Southbound	Two-way	Northbound	Southbound	Two-way	Northbound	Southbound	Two-way	Northbound	Southbound	Two-way
AM Peak 07:00 - 08:00	779	272	1051	738	333	1071	41	-61	-20	-5%	22%	2%
PM Peak 16:00 - 17:00	415	730	1145	471	712	1183	-56	18	-38	13%	-2%	3%
24h	6756	6693	13449	6809	6934	13744	-54	-241	-295	1%	4%	2%

3.4.4. The summary of data in Table 3-1 has identified a minor change in traffic flows on the A29 between 2022 and 2023 with traffic flows remaining broadly similar. This has represented an AM two-way decrease of 20 vehicles (representing 2% difference) and a decrease of 38 two-way vehicle flows in the PM peak (representing 3%).

3.5 HIGHWAY NETWORK IMPACT

ASSESSMENT SCENARIOS

3.5.1. It is proposed that the Transport Assessment will follow the assessment methodology utilised within the BN/11/22/OUT application, through use of the Chichester Area Transport Model (CATM) all traffic growth, development trip generation and trip distribution information. This will be derived from the BEW Parcel SC1 Transport Assessment completed by Pell Frischmann that has been submitted in support of planning application BN/11/22/OUT. The key parameters to be used within the Transport Assessment are set-out below:

TRIP GENERATION

3.5.2. An estimate of vehicle trip generation for the Cala Homes development will be calculated using residential trip rates provided shown in Table 5-1 of the Pell Frischmann TA as replicated in Table 3-2 below.



Table 3-2 – Vehicle Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.124	0.324	0.448
PM	0.312	0.161	0.473

- 3.5.3. These trip rates will be used to calculate the difference in traffic flows associated with 350 units included in the CATM SATURN model and the 400 units now proposed.
- 3.5.4. Person trip rates will be based upon the trip rates shown in Table 5-4 of the Pell Frischmann TA as calculated using 2011 Census data. These trip rates are replicated in Table 3-3 below.

Table 3-3 – Person Trip Rates

Time Period	Arrival	Departure	Two-way
AM	0.163	0.427	0.590
PM	0.411	0.212	0.523

TRIP DISTRIBUTION

- 3.5.5. Trip distribution will be calculated using CATM SATURN model junction turning count outputs included within Appendix D of the Pell Frischmann TA. The development trip distribution has been calculated within the CATM SATURN using 'donor zones' to replicate likely trip patterns between origin and destination.

TRAFFIC GROWTH AND COMMITTED DEVELOPMENT

- 3.5.6. The CATM SATURN model has been developed using the following series of inputs to account for background growth, infrastructure changes and committed development growth. This approach was agreed by West Sussex County Council as part of scoping process for the BN/11/22/OUT application and will be used to assess forecast years for the proposed development.
- ※ The background growth consists of predicted traffic growth as a result of general increase in driving over time, calculated by taking account of NTEM-adjusted TEMPRO growth, known committed developments, and the allocated sites within adopted local plans.
 - ※ The committed developments consist of other developments which have been approved, such as those not contained within the adopted local plan; and
 - ※ The wider infrastructure changes are schemes that are committed projects.

ASSESSMENT SCENARIOS

- 3.5.7. All assessments will be completed using the following peak hours:
- ※ AM Peak: 08:00-09:00; and
 - ※ PM Peak: 17:00-18:00.



- 3.5.8. The CATM SATURN model has provided a number of modelling scenarios for the Pell Frischmann TA, which will be used as a basis for assessing the proposed development. Below are the details of the proposed assessment scenarios which will be used within the Transport Assessment for the proposed development, along with how these relate those reported in the Pell Frischmann TA:
- ※ Scenario 1 – 2031 Do Minimum (using “2031 do minimum No Cala” scenario from Pell Frischmann TA);
 - ※ Scenario 2 – 2031 Do Something without BEW Parcel SC1 (using “2031 do minimum” scenario from Pell Frischmann TA)
 - ※ Scenario 3 – 2031 Do Something with BEW Parcel SC1 (using “2031 do something” scenario from Pell Frischmann TA but without East-West Link Road); and
 - ※ Scenario 4 – 2038 Do Something (using “2038 do something” scenario from Pell Frischmann TA).
- 3.5.9. Table 3-4 presents what is included within each of the assessment scenarios, breaking down each of the elements of development and infrastructure improvements likely to occur in the local area.

Table 3-4 – Breakdown of each Assessment Scenario

	Background Growth	Committed Developments	Infrastructure Improvements	Cala Development Traffic	BEW Parcel SC1 Phase 1*	East- West Link Road	BEW Parcel SC1 Phase 2**
Scenario 1	✓	✓	✓				
Scenario 2	✓	✓	✓	✓			
Scenario 3	✓	✓	✓	✓	✓		
Scenario 4	✓	✓	✓	✓	✓	✓	✓

*Parcel SC1 Phase 1: 1,200 homes, 61 C2 care home units, 3FE primary school and A29 realignment north of Chichester-Barnham railway line.

**Parcel SC2 Phase 2: Phase 1 + 2,000 homes and full realignment of A29.

- 3.5.10. Traffic flows for Scenario 3 (including BEW Parcel SC1 without East-West Link Road) will be extrapolated using the following scenarios included within the Pell Frischmann TA:
- ✧ 2031 Do Something No Cala: background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure + BEW development + BEW infrastructure no Cala and No East-West Link Road; and
 - ✧ 2031 Do Minimum: background growth + committed developments + wider infrastructure changes + other local plan developments and associated infrastructure.
- 3.5.11. Using a combination of these scenarios will allow an estimate to be made of development traffic flows associated with a scenario whereby the proposed development and BEW parcel SC1 phase 1 are complete but are accessed independently (i.e. without the East-West Link Road providing a connection between the two sites).
- 3.5.12. The traffic flows outputs from the SATURN model will be input into Junctions 10 / LinSig models to provide a 'Do Minimum' assessment of the junction performance. The trip generation from the proposed Cala development will then provide a 'Do Something' scenario.
- 3.5.13. Traffic flow diagrams illustrating the scenarios above on the local highway network have been presented in *Appendix D* to this Scoping Report.

Interim Assessment Scenario

- 3.5.14. Following discussions with WSCC it is understood that the first phase of the A29 realignment north of the B2233 Barnham Road (A29 Fontwell Avenue to B2233 Barnham Road) is programmed to be completed by 2026. Given the potential for construction to have commenced on the Cala Homes site ahead of this date (subject to planning permission) an additional junction capacity assessment scenario will be undertaken at the A29 Westergate Street / Nyton Road and at the A29 / B2233 War Memorial Roundabout.
- 3.5.15. The will provide an interim assessment of the previously mentioned junctions for a scenario without realignment of the A29 being completed between the A29 Fontwell Avenue and B2233 Barnham



Road. This will demonstrate the number of units that can be occupied on the Cala Homes site without there being an unacceptable impact on the local highway network.

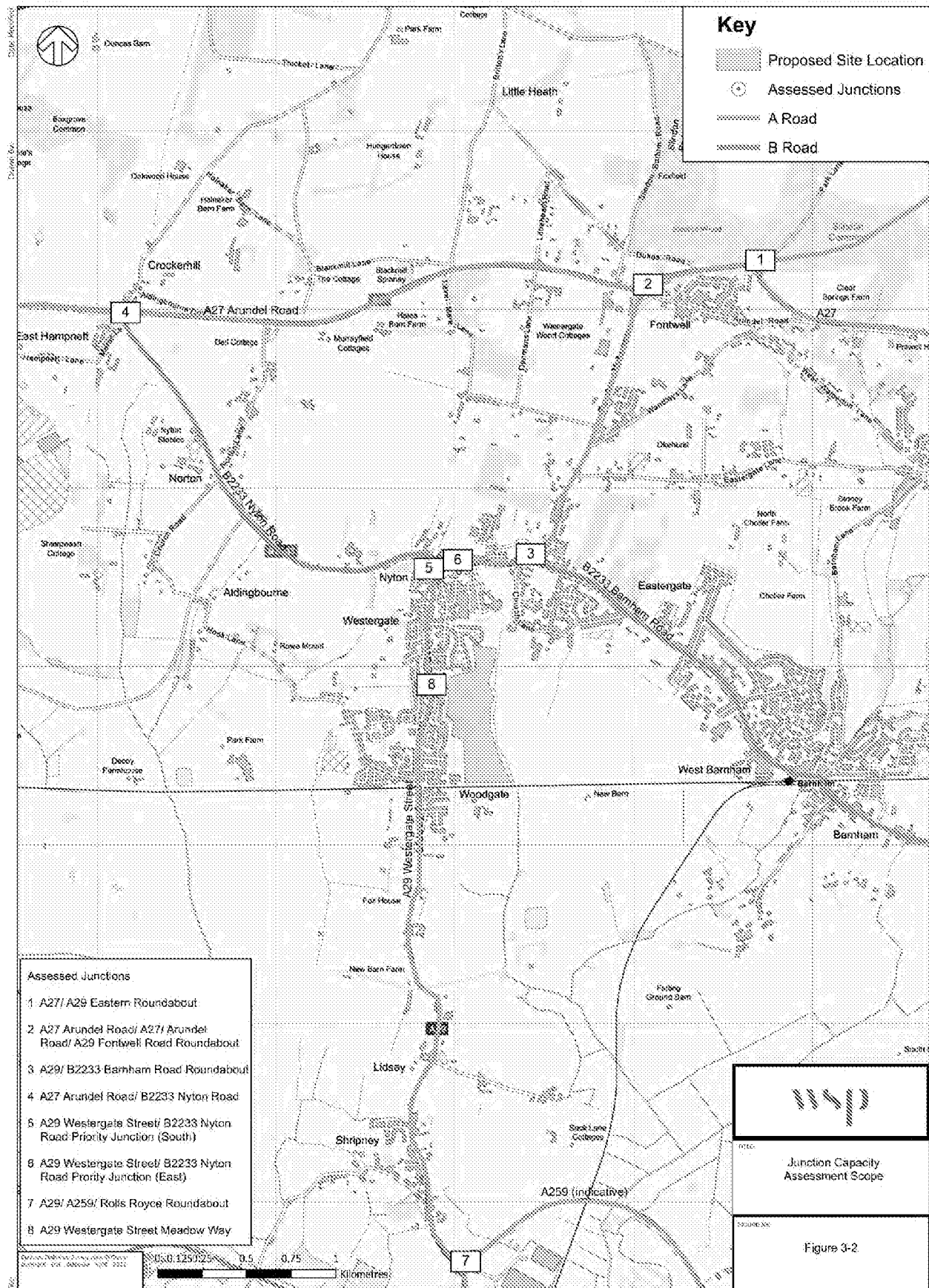
JUNCTION CAPACITY ASSESSMENTS

- 3.5.16. Figure 3-2 identifies the scope of junction capacity assessments that will be undertaken as part of the Transport Assessment.
- 3.5.17. All junction capacity and highway network assessments within the Transport Assessment will use traffic flows from the CATM SATURN model.

Junction assessments will be carried out using the computer program Junctions 10 developed by Transport Research Laboratory. Junctions 10 includes the ARCADY and PICADY computer modelling software modules which assesses the traffic capacity, queues and delays at roundabouts and priority junctions. Signalised junctions will be assessed using the program LinSig 3 by JCT Consultancy. LinSig provides an assessment of the impact of traffic signals on traffic capacity, queues and delays at a junction. Geometry measurements for the junction capacity assessments will be derived from OS mapping. The junction capacity models will be calibrated using traffic surveys undertaken as part of the previous planning application to ensure the accuracy of the junction models and results.



Figure 3-2 - Junction Capacity Assessment Scope





4 SITE ACCESS JUNCTION CAPACITY ASSESSMENT

4.1 OVERVIEW

- 4.1.1. This Chapter of the Scoping Report provides a junction capacity assessment of the proposed site access junction which will be achieved via a four-arm signalised junction with Meadow Way and A29 Westergate Street and the A29 Westergate Street level crossing.

4.2 SITE ACCESS TECHNICAL NOTE

- 4.2.1. A site access Technical Note has been prepared, appended as **Appendix E**, to provide an assessment of the proposed A29 Westergate Street / Meadow Way / Pine Close site access junction using the CARM SATURN model flows included within the Pell Frischmann TA. This has been completed with and without the BEW SC1 parcel and associated infrastructure improvements (with / without realignment of A29 and East-West Link Road). This Technical Note provided a comparison between the Parcel SC1 Transport Assessment LinSig results and the WSP approach to modelling the site access junction.
- 4.2.2. Through WSP's experience in working with WSCC it would not be acceptable for Development Access and Meadow way to operate together in one stage with the staging ultimately needing to be changed during detailed design to have Meadow Way and Development Access operating as independent stages. This is because of the skewed nature of the junction and also the limited demand from Meadow Way leading to drivers exiting the Development Access believing they had unopposed priority, thereby increasing the potential for vehicle collisions to occur and overall safety concern.
- 4.2.3. Additionally, the Parcel SC1 TA transport modelling has made no allowance for the number of right turn movements between A29 southern approach and Development Access despite the additional demand created by the provision of the East-West Link Road. This resulted in a revised traffic signal staging as shown in Figure 2 of the Technical Note.
- 4.2.4. The Technical Note concluded the following:
1. The proposed site access junction is able to accommodate the proposed Cala Homes development of 400 units as a standalone site, when assessed using both traffic flows from the Parcel SC1 TA and 2022 traffic survey data uplifted to 2031 using TEMPRO;
 2. The proposed site access junction cannot accommodate the additional traffic associated with the East-West Link Road, Cala Homes development of 400 units and phase 1 of Parcel SC1. This is because of the reassignment of traffic through the Cala Homes site as a result of new connection to the A29 formed by the East-West Link Road;
 3. The site access junction operates within capacity with the Cala Homes development of 400 units, Parcel SC1 without the East-West Link Road between the two sites; and
 4. The access junction operates within capacity with the Cala Homes development of 400 units and phase 1 and 2 of Parcel SC1, including the East-West Link Road and full realignment of the A29.
- 4.2.5. These conclusions support the access strategy whereby the East-West Link Road operates as a bus, pedestrian and cycle route only until the full A29 realignment is complete. This approach for



the East-West Link Road has been discussed and agreed with WSCC as part of the TA Scoping Process.

4.3 A29 LEVEL CROSSING ASSESSMENT

- 4.3.1. A survey was completed at the A29 level crossing on the 1st March 2022 which recorded the barrier closure time and associated queue length between 07:00-10:00 and 16:00-19:00. The operation of the barrier is a manual process and such the amount of time the barrier down is variable. Additionally, the barrier can be closed for longer periods when there are trains approaching from each direction, as the time taken to initiate the raising and lowering sequence between trains may not meet the minimum requirements for safe operation. A summary of the observed closing times is shown in Table 4-1 below along with a comparison of how this date compares to a survey completed in 2016.

Table 4-1 – Level Crossing Closures

Time Period	Average Closure Time	Maximum Closure Time	Total Time Closed During Time Period	Comparison of Total Closure Time to 2016 Survey
07:00-10:00	00:02:31	00:06:27	1:10:23	+0:17:29
08:00-09:00	00:02:53	00:06:27	0:28:54	+0:16:36
16:00-19:00	00:02:09	00:03:48	0:53:47	+0:12:31
17:00-18:00	00:02:24	00:03:48	0:19:08	+0:02:45

- 4.3.2. Table 4-1 shows that on average the level crossing is closed for between 2-3 minutes during peak periods but with a maximum closure time of six and half minutes in the morning and nearly four minutes in the evening. The surveys recorded a longer closure time than recorded in 2017 although this was a result of there being four additional barrier closures across each of the AM and PM peak periods. These barrier closures resulted in resulted in the A29 southbound queue lengths shown on Figure 4-1 and 4-2 below.



Figure 4-1 - A29 Level Crossing AM Peak Queue Lengths

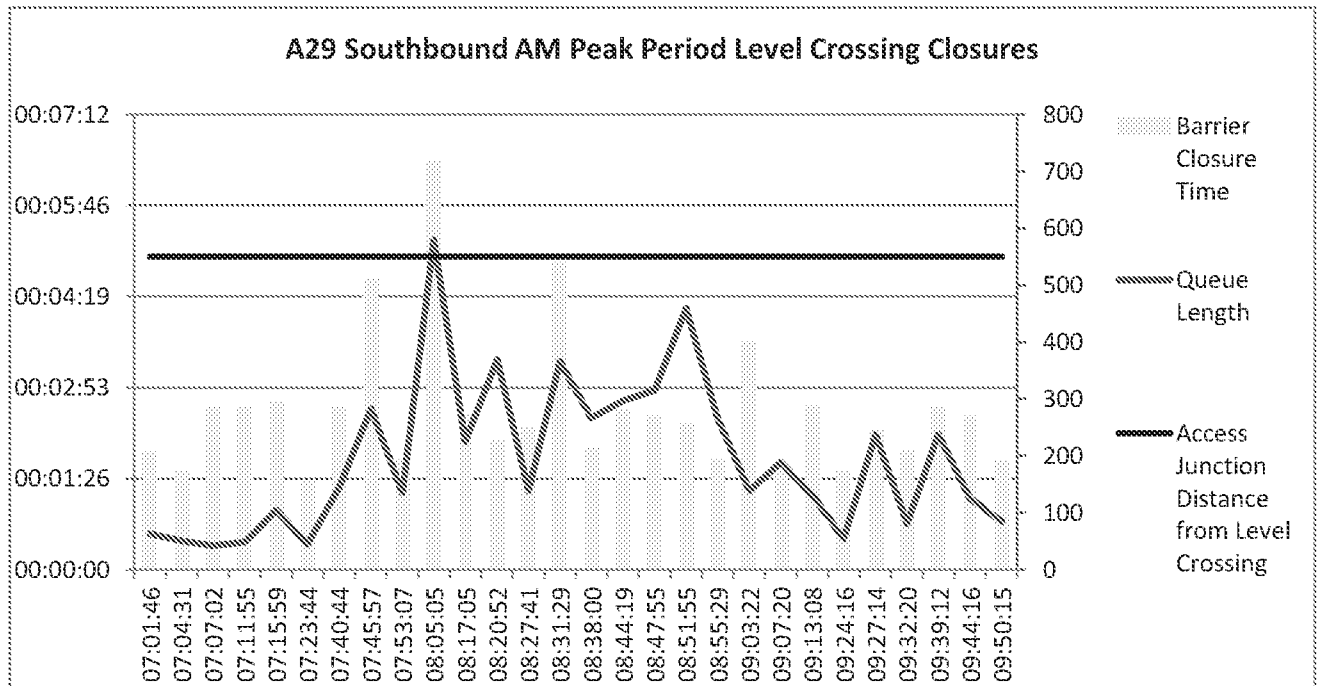
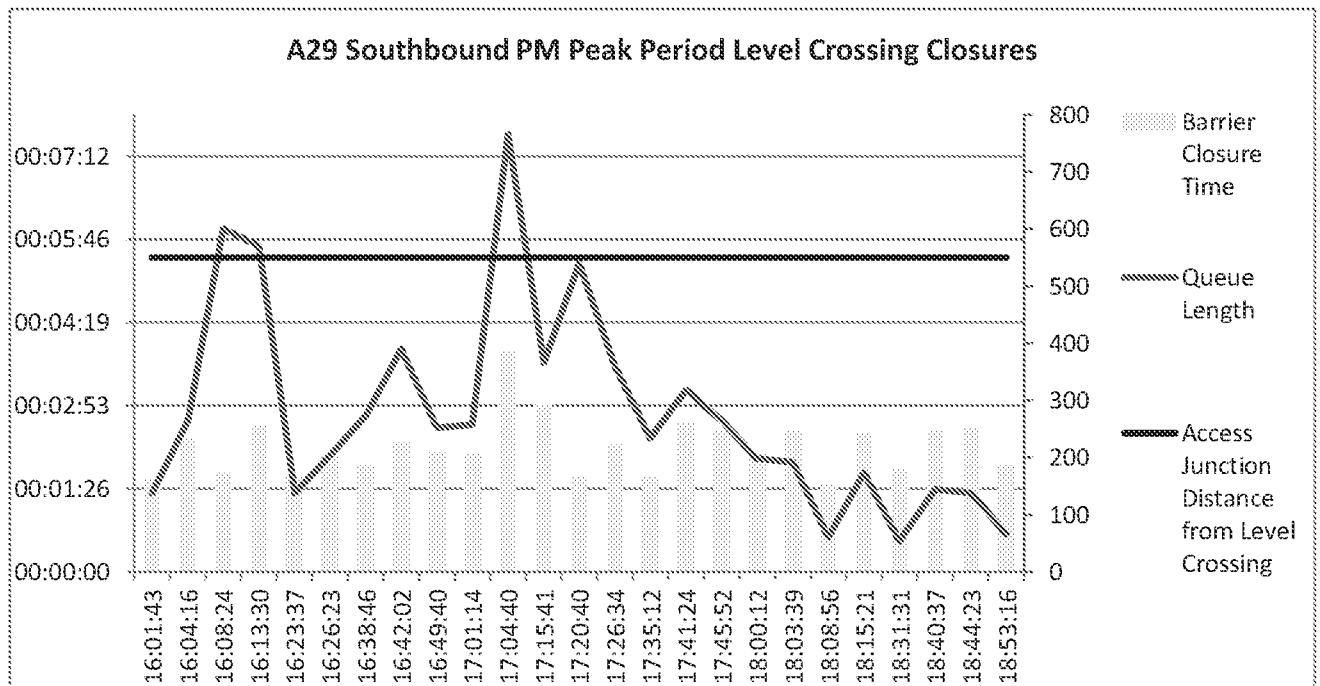


Figure 4-2 - A29 Level Crossing PM Peak Queue Lengths



- 4.3.3. Figures 4-1 and 4-2 show that recorded queue lengths vary across each peak period but generally correlate with the length of the time the level crossing barrier is closed, with longer closures resulting in longer queue lengths. In the AM peak period, the queue length reaches the location of the proposed site access once, albeit this is a result of a six and a half minute barrier closure. This is one and a half minutes longer than any other closure time recorded and nearly four minutes longer than the average for the AM peak period. In the PM peak the recorded queue length extends

beyond the proposed access junction location on two occasions as a result of multiple barrier closures over a short space of time (three times in seven minutes at worst).

4.3.4. Overall closures of the level crossing result in average of queue lengths as follows:

- ※ 07:00-10:00 – 200m;
- ※ 08:00-09:00 – 328m;
- ※ 16:00-19:00 – 287m; and
- ※ 17:00-18:00 – 388m.

IMPACT OF PROPOSED DEVELOPMENT ON LEVEL CROSSING QUEUE LENGTHS

4.3.5. Taking account of the survey described above this section provides an assessment of the impact of the proposed development in relation to queue lengths associated with the A29 level crossing. For assessment purposes it is assumed that train times remain the same and, as such, occurrences of the closure of the road will be the same in future years as the observed base year.

Development Traffic Impact

4.3.6. The proposed development will result in an increase in the arrival rate of vehicles that approach the level railway crossing per hour but the service rate of the level railway crossing (the amount of traffic that can pass through the level railway crossing in any given hour) will remain the same given the assumptions above. As such, vehicle queues associated with closure times at the level railway crossing are expected to increase as traffic volumes increase on A29 Westergate Street.

4.3.7. A traffic queue survey was undertaken of the level crossing on the 1st March 2022 to ascertain a baseline operation of the crossing. The survey identified a maximum queue of 96 PCU in the AM peak at the crossing, and a maximum queue of 127 PCU in the PM peak during the barrier closure period.

4.3.8. For the proposed development only, the increases shown in Table 4-2 would be observed at the level crossing. Note that numbers presented are in PCU.

Table 4-2 – Increase in Traffic at the Level Crossing (Development Traffic Only)

Time	Northbound Increase at level crossing	Southbound Increase at level crossing	Southbound Increase north of junction (at site access junction)
AM Peak Hour	18	45	42
PM Peak Hour	35	17	81

4.3.9. This shows that, at most, this is the equivalent to an additional 45 vehicles in the southbound direction during the AM peak.

Impact on A29 Northbound Level Crossing Queueing

4.3.10. For the northbound direction approach to the level crossing, it is noted that the street function is different to the southbound direction. The road streetscape is more rural in nature, with limited properties fronting the road. There is a lower number of junctions south of the railway line and the nearest major junction control is a considerable distance away (2.8km) at the junction of A29 and A259 relief road. As such, it is considered no assessment is required for the northbound direction (south of the level railway crossing) as there is adequate capacity for queueing vehicles.

Impact on A29 Southbound Level Crossing Queueing

- 4.3.11. In the southbound direction, existing queues created by the level crossing barrier closure that do not extend past the proposed access junction (less than 550 metres) will increase only as a result of southbound traffic leaving the site. Existing queues that extend past the access junction will increase by a larger amount as a result of the additional traffic which is accessing the development from the north as well as the traffic leaving the site heading south.
- 4.3.12. To assess the impact of the proposed development an assumption has been made that development traffic will depart or arrive on a uniform basis across the peak hour based upon the additional vehicles presented in Table 4-3.

Table 4-4 – Impact of Development Traffic on Level Crossing Queue Lengths

Time Period	Average Closure Time	Development Traffic Arrival / Departure Rate	Increase in Queue Length	Maximum Closure Time	Development Traffic Arrival / Departure Rate	Increase in Queue Length
08:00-09:00	00:02:53	0.8 per minute	+2 PCU (12m)	00:06:27	0.7 per minute	+5 PCU (30m)
17:00-18:00	00:02:24	0.3 per minute	+1 PCU (6m)	00:03:48	1.4 per minute	+5 PCU (30m)

- 4.3.13. Table 4-7 shows that during the average closure times experienced during the AM and PM peak hours, the proposed development will increase queue lengths by 6-12m. This assumes that during an 'average' barrier closure queue lengths do not extend past the site access junction as is the case the vast majority of barrier closures surveyed. For the maximum barrier closures recorded, it is predicated that the proposed development would increase queue lengths by 30m during the AM and PM peak hours. This represents a 5.2% increase in the maximum queue length recorded in the AM peak and a 3.9% increase in the PM peak.
- 4.3.14. It is therefore considered that the proposed development would not result in a severe impact upon the operation or capacity of the A29 Level Crossing as shown within the 2027 future year assessment scenario.

Impact of the A29 / Meadow Way Site Access Junction

- 4.3.15. In order to deal effectively with the potential for a large platoon of traffic approaching the junction from the upstream level crossing, a MOVA control system is proposed for the signalised site access junction. Once MOVA control has been set up successfully, the system will generate its own signal timings cycle-by-cycle, varying continuously with traffic conditions to offer full flexibility in traffic management. The timings under this system are optimised both in the short term (hour to hour, day to day for events like level crossing releases) and in the long term following annual trends and longer term traffic growth.
- 4.3.16. MOVA has two operational modes; the first deals with uncongested conditions, the second with situations when the junction becomes overloaded/congested with large queues on one or more

approaches. MOVA determines which mode is appropriate and which approach(es), if any, are overloaded. In the uncongested mode, MOVA seeks to disperse any queue which has built up on red, and then carries out a delay-and-stops minimising procedure every half second. If there would be a benefit from extending the green, then the green would continue and the calculations repeated. If no benefit were predicted, the signals would change to the next stage. In the congested mode, MOVA operates a capacity-maximising routine. This routine takes into account which approaches are overloaded, the efficiency of green use, and determines the signal timings which will maximise the junction throughput under the actual flow conditions prevailing.

- 4.3.17. Therefore, by using MOVA, a queue clearing sequence will include additional green time signal phase for A29 Westergate Street northbound traffic to reduce the instances of stopping twice at the level crossing and at the signalised access junction. In addition, the assessment of the operation of the traffic signals in future years does not predict a queue length for northbound vehicles that would extend to the level railway crossing.
- 4.3.18. MOVA control is considered the optimum control method for this site. The system will detect the surge in traffic from the level crossing and deal with throughput as efficiently as possible.
- 4.3.19. The introduction of an additional queue clearing sequence at the signalised access point will result in the skipping of the east-west phase, which will reduce the ability for traffic exiting the site to clear the junction. At worst case, queue lengths will double from the modelled results of 2.8 PCU to be approximately 5.6PCU / 35 metres in the 2021 scenario. Queues may extend past the junction of the access road with Pine Close, and it is proposed to provide line-marking Diagram 1026 'KEEP CLEAR' across this junction to assist in side road access. The first uncontrolled access point within the development site (off-road parking spaces) is located approximately 70 metres from the junction and as such the anticipated impact of the queue clearing sequence will not impact on this access point.



5 SUMMARY

5.1 OVERVIEW

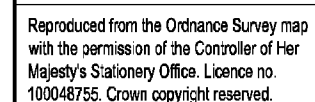
- 5.1.1. WSP has been appointed by Cala Homes to provide Transportation and Highways advice in support of a planning application for the proposed development on land located at Westergate, West Sussex. The site is located on land to the east of the A29 Westergate Street, close to the junction with Meadow Way. The proposed development will provide up to 400 dwellings with associated car parking.
- 5.1.2. The proposed site access will be achieved via a four-arm signalised junction with Meadow Way and A29 Westergate Street. The proposed access junction is the same layout which supported the 2017 planning application, which was subject to an independent Stage 1 Road Safety Audit, Designers Response and three Departures from Standards applications which were approved by WSCC. A review of the proposed site access has been undertaken against current design guidance (CD 123 and Traffic Signs Manual Chapter 6) which has shown that this does not alter the Departure from Standards requirements related to the proposed layout.
- 5.1.3. This Scoping Report has also provided a capacity assessment of the proposed site access junction and shown that it is necessary for the East-West Link to operate as a bus, pedestrian and cycle route until the full A29 realignment is complete. This allows the junction to operate within the capacity with t with the Cala Homes development of 400 units and phase 1 of Parcel SC1 being complete. The assessments have also demonstrated that access junction operates within capacity with the Cala Homes development of 400 units and phase 1 and 2 of Parcel SC1, including the East-West Link Road and full realignment of the A29.
- 5.1.4. The capacity assessment has shown that the queuing associated with the site access junction is unlikely to have a material impact on the operation of the A29 level crossing. Based upon the predicted arrival / departure rates of vehicles, the proposed development is also predicted to have a negligible impact on queue lengths associated with closure of the level crossing barrier.

Appendix A

SITE ACCESS DRAWING

115/1

CONFIDENTIAL



CLIENT:	CALA HOMES
ARCHITECT:	OSP ARCHITECTURE

SCALE @ A1:	1:250	CHECKED:	LRB	APPROVED:	WH
CAD FILE:	3258-GA-006.DWG	DESIGN-DRAWN:	MFB	DATE:	November 16
PROJECT No:	70013258	DRAWING No:	3258/GA/006	REV:	B

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Appendix B

ROAD SAFETY AUDIT

115/1

CONFIDENTIAL

REPORT N° 70013258-RSA

LAND AT WESTERGATE

STAGE 1 ROAD SAFETY AUDIT DESIGNERS
RESPONSE

PUBLIC

APRIL 2017

LAND AT WESTERGATE

STAGE 1 ROAD SAFETY AUDIT DESIGNERS RESPONSE

Cala Homes

Type of document (version)
Public

Project no: 70013258
Date: April 2017

WSP | Parsons Brinckerhoff
Regus House
George Curl Way
Southampton
Hampshire



QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	First Issue			
Date	April 2017			
Prepared by	Chris Williams			
Signature				
Checked by	Luke Beeching			
Signature				
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Project number	70013258			
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File reference	J:\70013258 - Land at Westergate -Cala Homes\C Documents\Road Safety Audit\Land at Westergate - RSA Designers Response.docx			

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APPENDICES

A P P E N D I X A ROAD SAFETY AUDIT

1

DESIGNERS RESPONSE

1.1 INTRODUCTION

1.1.1 This document provides a designer's response to a Stage 1 Road Safety Audit carried out by Ted Smith Traffic Safety Consultants on behalf of Cala Homes in January 2017. The audit was completed on the proposed signalised site access junction at the existing A29 / Meadow Way junction, as shown on Drawing 3258/GA/004 Revision C. This junction will be used to access a development of 350 residential dwellings on land east of the A29.

1.1.2 For a full overview of the proposals, this document should be read in conjunction with the Transport Assessment completed for the site.

1.2 DESIGNERS RESPONSE

1.2.1 The table below provides extracts from the Stage 1 Road Safety Audit and a Designer's Response in italics to the right of each item raised.

Table 1.1 - RSA Issues Raised and Designer's Response

REF.	COMMENT	DESIGNERS RESPONSE
3.3.1	Location: (A) A29 Westergate Street, south of the junction with Meadow Way and the new access road. Summary: Risk of inadequate forward visibility of stop-line for waiting vehicles and/ or waiting pedestrians. Recommendation: The proposed junction design may need to be revisited with a view to investigating scope for shifting the northbound stop line and corresponding signal poles a few more metres furthers southwards of the currently shown position which may also provide safer scope for large vehicles turning sharp left manoeuvre from the new site access road. A high level off-side secondary signal head may also need to be included. The yellow box markings indicated for the southbound traffic flow may also need to be extended to also include the northbound through flows. It is further recommended that high friction surfacing should also be incorporated on the northbound approach for sufficient length to mitigate the potential northbound vehicle queuing and risk of failure to perceive the red lights associated with the signalised junction and pedestrian crossing facility.	<i>It has not been possible to relocate the A29 northbound stop-line further southwards due to the need to maintain junction inter-visibility between stop-lines. While full inter-visibility as measured in DMRB is not possible the current arrangement allows visibility between the A29 northbound and site access stop-line, which includes the extent of access road pedestrian crossing. Moving the A29 northbound stop-line further south would remove visibility between stop-lines.</i> <i>The ability to relocate the northbound stop-line further south is also limited by the residential property located on the south eastern corner of the junction, whereby such a modification would obstruct the visibility between the A29 northbound and site access road stop-line.</i> <i>The option of relocating the access road stop-line slightly westwards (to extend the limits of the junction inter-visibility further southwards on the A29 northbound) has been explored but this is not possible due to proximity of the pedestrian crossing on the access road to the A29 southbound lane.</i> <i>High friction surfacing will be incorporated into detailed design stages of the proposed junction.</i>

REF.	COMMENT	DESIGNERS RESPONSE
3.5.1	Location: (B) A29 Westergate Street, at the approaches to the new signalised junction. Summary: Risk of failure to perceive new junction control ahead. Recommendation: The proposed signing works should also include appropriate temporary warning signs to TSRGD Diagram 7014 for a slightly longer period of say six months to alert visiting drivers to the new signalised junction.	<i>It is agreed that temporary warning signs should be erected but timescales will need to be agreed with WSCC as part of the technical approval process.</i> <i>The junction design also includes provision of signage to Diagrams 543, 572, 584.1 of TSRGD to warn drivers on the A29 northbound of the traffic signal junction. This should help non-local drivers identify the junction ahead.</i>

Appendix A

ROAD SAFETY AUDIT

**“A29 WESTERGATE STREET/MEADOW WAY”
WESTERGATE, WEST SUSSEX**

PROPOSED S278 SIGNALISED JUNCTION

**Road Safety Audit
Stage 1 - Preliminary Design**

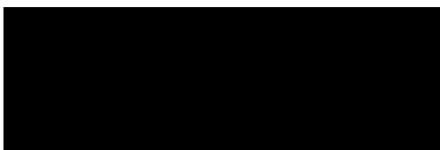
January 2017

Report Ref: 1703

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2 Items raised at the previous Stage 1 Road Safety Audit	5
3 Items raised at this Stage 1 Road Safety Audit	6
4 Audit Team Statement	8
Appendix A List of Drawings & Documents Examined	9
Appendix B Key Plan	10

TED SMITH
Traffic Safety Consultant
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PO20 8BN



1 INTRODUCTION

- 1.1 This report describes the results of a Stage 1 Preliminary Design Road Safety Audit of the proposed S278 Amended Signalised Access Junction Highway Works at the A29 Westergate Street at its existing junction with Meadow Way, north of Bognor Regis, West Sussex and proposed new access road into new Residential Development at the east side of the A29. The Road Safety Audit was carried out at the request of WSP UK, Regus House, Southampton International Business Park, George Curl Way, Southampton, Hampshire, SO18 2RZ, on behalf of Cala Homes.
- 1.2 The proposed works examined within this Stage 1 Audit of the Amended Design, consist of constructing a new access junction linking the A29 with the new Development Site that will serve up to approximately 350 dwellings and control of vehicular movements to and from Meadow Way. The traffic signals would also provide new controlled pedestrian crossing facilities around the junction.
- 1.3 Initially the access will serve 350 units (Detailed planning application for 101 dwellings and outline permission will be sought for the remaining 249 dwellings). However, in the longer term the signalised junction will form part of the proposed Barnham / Eastergate / Westergate Strategic Development Site involving approximately 2000 new dwellings east of the current Development Site and re-routing the A29, including closing the A29 at the Woodgate level crossing and bypassing it through the larger site.
- 1.4 The Road Safety Audit Team membership comprised as follows:
- | | |
|--|---------------------------|
| Ted Smith, CoC | Traffic Safety Consultant |
| Martin Brownsey, BSc, DipEM, MCIHT, CoC
Director, MB Projects Ltd | Highways Consultancy |
- Each member specialises in Highway Safety and Traffic Engineering and have operated independently of the design team responsible for the scheme and have had no involvement with the design of the proposals.
- 1.5 This Audit was carried out in the offices of the Team Members during January 2017, comprising of an examination of the drawings and documents listed in Appendix A and in accordance with the Audit Brief and instructions dated 13th October 2016 and 9th and 17th January 2017 from WSP. Since an inspection of the site was jointly carried out on the morning of Monday 25th November 2013 in connection with an earlier Design, during which time light to moderate traffic flows were observed and generally considered to be travelling at speeds within the low to middle range between 30mph and 40mph, a further site inspection was considered unnecessary at present. Whereas at that time a few pedestrians were also seen using the existing footways, no cyclists were seen in the near vicinity of proposed works.

- 1.6 The terms of reference of the Road Safety Audit are as described in HD 19/15 (DMRB Volume 5: Section 2, Part 2) and the incorporated categories of checklists, as appropriate. The Road Safety Audit Team has examined and reported only on the road safety implications of this scheme as presented in the drawings and documents listed in the Appendix to this report, and has not examined or verified compliance of the design with any other criteria or standard.
- 1.7 The object of this Audit is to identify any existing road safety related problems that may be exacerbated or any new problems that may be introduced by the proposals.
- 1.8 Whereas details of any recorded injury accidents were not provided, a search of 'Crashmap' data system identified that within the five year period 1st January 2011 to 31st December 2015, one injury accident classified as 'Slight' is shown to have occurred in December 2013, some distance north of the junction with Meadow Way. A further three injury accidents were shown to have occurred south of Meadow Way, close to the junction with Elmcroft Place, in which one of those events was classified as Serious involving one vehicle during April 2015, whilst the other two were classified as Slight, one involving two vehicles during May 2011 and the other during June 2015 also with two vehicles. Consequently, there would not appear to be any existing problems that might be exacerbated by the proposals.
- 1.9 Details of predicted traffic flows were provided for this Audit, together with description of proposed traffic signal operations that were incorporated into the provided Extract of the Transport Assessment document.
- 1.10 Regarding Departures from Standards, notation on the Design Drawing indicates that "TD50/04 relating to allowance for Exceptions to Standards at traffic signalised at existing junctions within urban areas". Consequently, "Agreement from the Highway Authority would need to be sought for a Departure from Standard".
- 1.11 Any problems and recommendations identified in this report are considered of sufficient importance to warrant attention and where feasible, each are uniquely referenced on the Key Plans attached at Appendix B.

** ** *

2 ITEMS RAISED AT THE PREVIOUS STAGE 1 ROAD SAFETY AUDIT

- 2.1 A previous Road Safety Audit Report on the proposed S278 Highway Works was available for this amended Stage 1 Road Safety Audit.
- 2.2 The Road Safety related items raised at paragraphs A3.1 and A5.2 of that previous Stage 1 Report appear resolved in the Amended Design. However, items previously raised at paragraphs A3.2 and A5.1 appear to partially remain problems and are referred to again in this current Road Safety Audit Report.

** ** ** ** ** ** **

3 ITEMS RAISED AT THIS STAGE 1 ROAD SAFETY AUDIT.

3.1 GENERAL

3.1.1 No road safety related items are identified in this category at this Stage 1.

3.2 LOCAL ALIGNMENT

3.2.1 No road safety related items are identified in this category at this Stage 1.

3.3 JUNCTIONS

3.3.1 **PROBLEM** *(Drawing ref: 3258/GA/004 Rev C & /ATR/003 Rev B)*

Location: (A) A29 Westergate Street, south of the junction with Meadow Way and the new access road.

Summary: Risk of inadequate forward visibility of stop line, waiting vehicle(s) and/or waiting pedestrians.

The proposed forward visibility distances indicated on the Design Drawings are shown as below Standard and will require a Departure to be sought. Whereas the current proposals for northbound drivers forward visibility of the offside primary signal head is shown as 59m and notation included that it accords with MfS SSD for a speed of 37mph, (which during the site inspection was generally observed as such passing speeds), the nearside primary signal head is shown to only be 37m. Whilst it appears that since the earlier Stage 1 some changes to the northbound stop line position may have been carried out, northbound drivers forward visibility of a vehicle waiting at the stop line or of any pedestrians waiting at the west side to cross the A29 carriageway or in the process stepping off the footway, may still be hidden from clear view. It also appears likely that the offside signal head may at times be hidden from view by passing southbound buses and other high sided vehicles.

It is also understood from the Designer that “the junction would serve approximately 350 dwellings and operate within capacity when assessed up to 2017. Queuing on the A29 reached 18 vehicles in the Northbound direction and 14 vehicles in the southbound direction in the AM peak and 11 vehicles in the Northbound direction and 21 vehicles in the Southbound direction in the PM peak”. Consequently, concern arises that risk of northbound tail-end shunt conflicts at this junction may be higher than other signalised junctions, especially when large numbers of vehicles previously queuing at the level crossing are released when gates are opened and also congestion may result, or danger arise if northbound vehicles unexpectedly swerve into the bellmouth of Meadow Way when passing stationary right turning traffic, as indicated on the Swept Path Analysis Drawing.

RECOMMENDATION

The proposed junction design may need to be revisited with a view to investigating scope for shifting the northbound stop line and corresponding signal poles a few more metres further southwards of the currently shown position, which may also provide safer scope for large vehicles turning sharp left manoeuvre from the new site access road. A high level off-side secondary signal head may also need to be included.

The yellow box markings indicated for the southbound traffic flow may also need to be extended to also include the northbound through flows.

It is further recommended that high friction surfacing should also be incorporated on the northbound approach for sufficient length to mitigate the potential northbound vehicle queuing and risk of failure to perceive the red lights associated with the signalised junction and pedestrian crossing facility.

3.4 NON MOTOR VEHICLE PROVISIONS

3.4.1 No road safety related items are identified in this category at this Stage 1.

3.5 SIGNS, ROAD MARKINGS AND STREET LIGHTING

3.5.1 **PROBLEM** *(Drawing ref: 3258/GA/004 Rev C)*

Location: (B) A29 Westergate Street, at the approaches to the new signalised junction.

Summary: Risk of failure to perceive new junction control ahead.

The proposed new signalised junction may not be perceived by some drivers, particularly those who may be non-local or visiting tourists using this annual holiday route.

RECOMMENDATION

The proposed signing works should also include appropriate temporary warning signs to TSRGD Diagram 7014 for a slightly longer period of say six months to alert visiting drivers to the new signalised junction.

** ** No further road safety related items are identified at this Stage 1. ** **

4 AUDIT TEAM STATEMENT

- 4.1 We certify that this Road Safety Audit has been carried out in accordance with HD 19/15.

ROAD SAFETY AUDIT TEAM LEADER

Ted Smith CoC
Traffic Safety Consultant
1a The Parade
East Wittering
Chichester
West Sussex
PO20 8BN

Signed

Date

23rd January 2017

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Grants Lane
Oxted
Surrey
RH8 0RH

Signed

Date

23rd January 2017

APPENDIX A

LIST OF DOCUMENTS EXAMINED

Drawing No	Date	Scale	Description
3258/GA/04 Rev C	09/11/2016	1:250 @ A1	Site Access General Arrangement Option 3
3258/ATR/003 Rev B	13/01/2017	1:250 @ A1	Site Access A29 Northbound Swept Path Analysis
3258/ATR/010 Rev A	09/11/2017	1:250 @ A1	Site Access – Option 3 Swept Path Analysis for Bus, Articulated HGV, Large Refuse Truck and Car
Sketch Diagram----	--	--	AM & PM Peak Hour Traffic Flows
Report	30/11/2013	--	Stage 1 Road Safety Audit Report of a previous Design. (No Designers Response available)
Search of Crashmap	--	--	Recorded Injury Accident Plot 01/01/2011 to 31/12/2015
Report	January 2017	--	Extract of Section 4 (Development Proposal) from Transport Assessment Includes description of how the access junction and traffic signals will operate.
Email	13/10/2016, 09/01/2017 & 17/01/2017	--	Audit Brief Amended Design Drawings and Instructions (WSP)
** ** ** ** ** ** ** ** ** ** **			

APPENDIX B

KEY PLAN

Copy of Drawing numbered 3258/GA/004 Rev C

Appendix C

DEPARTURES FROM STANDARDS

11/5/11

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REPORT N° 70013258-002

LAND AT WESTERGATE

SITE ACCESS DESIGN STATEMENT

PUBLIC

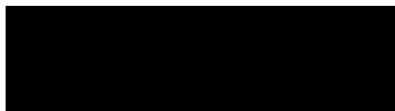
JANUARY 2017

LAND AT WESTERGATE
SITE ACCESS DESIGN STATEMENT
Cala Homes

Public

Project no: 70013258
Date: January 2017

WSP | Parsons Brinckerhoff
Regus House
Southampton International Business Park
George Curl Way
Southampton, Hampshire
SO18 2RZ



QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	First Issue	Second Issue	Third Issue	Forth Issue
Date	10/04/14	10/11/16	13/01/17	03/02/2017
Prepared by	Jason Tipler	Mark Baty	Mark Baty	Mark Baty
Signature				
Checked by	Chris Williams	Chris Williams	Chris Williams	Chris Williams
Signature				
Authorised by	Rhod MacLeod	Luke Beeching	Luke Beeching	Luke Beeching
Signature				
Project number	11790134	70013258	70013258	70013258
File reference	J:\11790134 - Westergate\TEXT\REPORTS\Site Access Design Statement.doc	\\uksou1ser01.uk.wspgroup.com\Projects\70013258 - Land at Westergate -Cala Homes\C Documents\Design Statement and Departures from Standards\Design Statement.docx		

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2	RELEVANT DESIGN STANDARDS.....	2

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A P P E N D I X I DEPARTURES FROM STANDARDS FORMS

A P P E N D I X I I SITE ACCESS DRAWINGS

1

INTRODUCTION

- 1.1.1 This document has been prepared to assist West Sussex County Council in the review of the proposed site access junction for the development of land at Westergate, east of the A29. The proposed access junction is shown on Drawing 3258/GA/004 and will initially serve up to 350 dwellings. In preparing the design, consideration has also been given to the potential future use of the access as a bus route for an East-West link to Barnham Station via the larger Barnham Eastergate Westergate strategic allocation. A swept path analysis for the junction is shown on Drawings 3258/ATR/003 and 3258/ATR/010. This document should be read in conjunction with the Transport Assessment completed for the site, plus the completed WSCC Departures from Standard Form included as an Appendix to this document.
- 1.1.2 The proposed access junction has been designed to a preliminary design standard only, and should be subject to detailed design and a Stage Two Road Safety Audit prior to construction.

2

RELEVANT DESIGN STANDARDS

- 2.1.1 Table 1 overleaf provides a summary of the relevant design standards which have been applied to the proposed site access junction and also identifies where a relaxation or departure from standard is required.
- 2.1.2 It is worth noting that the A29 to the south of the proposed access junction is already subject to Stopping Sight Distance (SSD) values which are two steps below the Desirable Minimum standards for an Urban Road with a 60kph (30mph speed limit) design speed (based on Table 3 of DMRB TD 9/93). The maximum achievable SSD is 50m for parts of the A29 northbound carriageway to the south of the proposed junction, due to the curvature of the road and residential properties located on the west of the A29.
- 2.1.3 The installation of traffic signals at this location will lead to stationary traffic at the junction where the existing situation seldom has waiting traffic. There will, however, be sufficient warning of this stationary traffic through warning signs and the traffic signals. The risk of conflict between vehicles on the A29 and vehicles exiting Meadow Way will be reduced.
- 2.1.4 A speed survey of the site has been carried out from which an 85%ile wet weather speed of 46.7kph has been calculated for northbound traffic. This corresponds to a Manual for Streets SSD of 40.9m. This visibility is achievable in both the existing and proposed situations.
- 2.1.5 It therefore follows that the safety of the proposed junction design is consistent with the existing situation. SSD values will be similar before and after the works. There will be stationary traffic at the junction where before there was little, but there will be sufficient warning of the junction. The proposed pedestrian crossings are signalised, further mitigating the reduced SSD.

Table 1 – Review of Relevant Design Standards

DMRB REFERENCE	TITLE	PARAGRAPH / TABLE	DESIGN STANDARDS	DESIGN OUTCOME	HOW WAS DESIGN CHECKED AGAINST STANDARD?	RELAXATION OR DEPARTURE FROM STANDARD REQUIRED?
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraph 2.2	Design Speed. Reference to TD 9/93 Table 2 (DMRB 6.1.1)	Design speed of 60kph selected for design based upon existing 30mph speed limit in an urban area.	N/A	No
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraphs 2.6 to 2.8	Visibility on the Approach to Junctions. Reference to TD 9/93 Table 3 (DMRB 6.1.1) shows that the Desirable Minimum Sight Stopping Distance (SSD) for a 60kph road is 90m, one stop below is 70m and two steps below is 50m. Visibility on the Approach to Junctions, to the back of queue	The SSD on the northbound approach to the offside primary signal head is approximately 65m. The SSD on the northbound approach to the nearside primary signal head is approximately 37m. The Desirable Minimum SSD of 90m is achieved to the back of queue on the A29 southbound, but not northbound. Minimum northbound SSD to back of queue = 50m	Geometry check	Yes
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraphs 2.10 to 2.18	Junction Intervisibility Zone. 2.5m behind the stop-line across the full carriageway width for each arm.	The required junction intervisibility zone is achieved between the northern and side arms, but not between the southern and side arms.	Geometry check	Yes

DMRB REFERENCE	TITLE	PARAGRAPH / TABLE	DESIGN STANDARDS	DESIGN OUTCOME	HOW WAS DESIGN CHECKED AGAINST STANDARD?	RELAXATION OR DEPARTURE FROM STANDARD REQUIRED?
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraphs 2.19 to 2.21	Corner Radii. Minimum radius of 6m in urban areas.	Corner radii of 8m or greater are provided on all approaches.	Geometry check.	No
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraphs 2.22 to 2.24	Carriageway Widths. For new junctions entry lane widths should be between 3m and 3.65m. The widths for straight ahead entry lanes may be reduced to 2.5m where an uncontrolled junction is being improved or modified.	Entry lane widths on the two A29 approaches are 3.0m, which are continued through the junction. The entry lane width on the new site access is 3.25m and on Meadow way is 2.5m.	Geometry check	No
Volume 6, Section 2, Part 3	TD 50/04 The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	Paragraphs 2.34 to 2.37	Swept Path Requirements. Adequate turning radii should be provided for the swept paths of all types of vehicles using the junction, including the design vehicle where provision is to be made for large goods vehicles.	The junction geometry is able to accommodate the swept path of a 10.0m long rigid HGV and bus. Refer to drawing 3258/ATR/010.	Use of 'Autotrack' computer software	No

Appendix I

DEPARTURES FROM STANDARDS FORMS

SUBMISSION TO WEST SUSSEX COUNTY COUNCIL FOR DEPARTURES FROM STANDARD

Project Name	Land at Westergate, West Sussex
Applicant Organisation	WSP Parsons Brinckerhoff
Applicant Ref	70013258
Highway Authority Ref	
Applicant Contact Details	mark.baty@wspgroup.com 02380 302 638
Date Submitted	10/11/16

1) PROJECT DETAILS

A	Description	Proposed S278 traffic signal site access junction at the existing A29 / Meadow Way junction and proposed new access road into residential development east of the A29. The junction will serve up to 350 dwellings.
B	Location	As above
C	Road Category	TA 79/99 UAP3
D	Road Type	S2
E	Design Speed	60 kph (determined by TD 9/93 Urban Road Speed Limit)
F	Speed Limit	30mph
G	Traffic Flows	AAWT 14154 two way
H	NMU Flows	-

2) DEPARTURE DETAILS

A	Discipline	Road Geometry
	Type	Intervisibility between junction stop lines
B	Relevant Standard(s)	Junction intervisibility zone, DMRB Vol 6 Section 2 Part 3 TD50/04 Para 2.10 to 2.16
	Clause	
C	Difference Between Standard(s) and proposed design	The standard requires visibility from a line 2.5m behind each stop line to a line 2.5m behind the adjacent stop lines. Between the southern A29 arm, Meadow Way and the eastern junction arm there are obstructions blocking this intervisibility.
D	Reason for Departure (overview)	Existing residential boundary fences and hedges on A29. Proposed controlled pedestrian crossings at junction require stoplines to be set back further than a standard crossroads configuration.
E	Associated Project Departures	N/A
F	Other Options Considered	Location of stop-lines located further forward to improve intervisibility. This however leads to confusing tactile paving layouts for adjacent crossings on south western site of the junction.

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	Safety	Obstructed intervisibility will mean vehicles turning cannot see some potential hazards from the stationary waiting location, such as crossing pedestrians or stopped cars. Vehicles turning south from the eastern arm will be most affected. Controlled pedestrian crossings will reduce chance of pedestrians crossing road in conflict with vehicles. Proposed signal staging configured so pedestrian stage operates following main road or Meadow Way to minimise potential conflict between site access and pedestrian crossing on southern arm.
B	Congestion/ Delay	
C	Environmental / sustainability	Provision of pedestrian crossings on all approaches encourages walking trips to / from the site.
D	Capital and whole life cost/value	Can be delivered within land owned by WSCC or developer.
E	Accessibility	
F	Integration	
G	Structural	
H	Network resilience & Maintenance	

4) COMPENSATORY MEASURES

A	Included Measures	Yellow box junction marking provided to assist with precautionary approach by west bound vehicles. All red extending detector loops to be considered during detailed design to ensure junction is clear before allowing movements with poor intervisibility. MOVA detection will facilitate precise stage change operation thereby reducing possibility of vehicles running amber lights and conflicting with pedestrian movements.
B	Rejected Options	

5) DESIGN ORGANISATIONS CONCLUDING REMARKS

Given the constrained location of the junction it is considered that the benefits of providing the junction and pedestrian crossings outweigh the potential risks, especially if the compensatory measures discussed above are installed.

6) ATTACHMENTS AND OTHER INFORMATION

A	List of Attachments	3258/GA/004 Rev C (Appendix 2 of Site Access Design Statement) 3258/ATR/010 Rev A (Appendix 2 of Site Access Design Statement)
B	Consultations	WSCC
C	Other Information	

7) DECISION – (HIGHWAY AUTHORITY USE ONLY)

NAME 1			
ROLE			
SIGNED		DATE	
NAME 2			
ROLE			
SIGNED		DATE	
MARK ONE BOX:	1- APPROVED ☐	2-APPROVED WITH COMMENTS ☐	3- REJECTED ☐
COMMENTS			

SUBMISSION TO WEST SUSSEX COUNTY COUNCIL FOR DEPARTURES FROM STANDARD

Project Name	Land at Westergate, West Sussex
Applicant Organisation	WSP Parsons Brinckerhoff
Applicant Ref	70013258
Highway Authority Ref	
Applicant Contact Details	mark.baty@wspgroup.com 02380 302 638
Date Submitted	10/11/16

1) PROJECT DETAILS

A	Description	Proposed S278 traffic signal site access junction at the existing A29 / Meadow Way junction and proposed new access road into residential development east of the A29. The junction will serve up to 350 dwellings.
B	Location	As above
C	Road Category	TA 79/99 UAP3
D	Road Type	S2
E	Design Speed	60 kph (determined by TD 9/93 Urban Road Speed Limit)
F	Speed Limit	30mph
G	Traffic Flows	AAWT 14154 two way
H	NMU Flows	-

2) DEPARTURE DETAILS

A	Discipline	Road Geometry
	Type	Forward visibility (SSD) on northbound approach to traffic signals
B	Relevant Standard(s)	DMRB desirable minimum of 90m, DMRB Vol 6 Section 1 Part 1 TD9/93 Junction visibility, DMRB Vol 6 Section 2 Part 3 TD50/04 Para 2.8
	Clause	
C	Difference Between Standard(s) and proposed design	The forward visibility (SSD) to the back of queue is approximately 50m. Forward visibility to nearside primary signal is 37m. The DMRB desirable minimum of 90m is not achievable. One step below the desirable minimum is 70m for a road with a 30mph speed limit and two steps below the desirable minimum is 50m.
D	Reason for Departure (overview)	Existing residential boundary fences on western side of A29.
E	Associated Project Departures	N/A
F	Other Options Considered	

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	Safety	Limited visibility of queuing traffic and primary signal heads in northbound direction may lead to rear-shunt accidents. Existing safety issue associated with visibility to and from the A29 northbound carriageway at the junction with Meadow Way, although signalised junction will increase amount of stationary traffic at this location. Provision of controlled pedestrian crossings on all approaches will improve safety for pedestrians.
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B	Congestion/ Delay	
C	Environmental / sustainability	Provision of pedestrian crossings on all approaches encourages walking trips to / from the site.
D	Capital and whole life cost/value	Can be delivered within land owned by WSCC or developer.
E	Accessibility	
F	Integration	
G	Structural	
H	Network resilience & Maintenance	

4) COMPENSATORY MEASURES

A	Included Measures	Installation of signs to Diagram 543 and Diagram 584 (TSRGD) to be provided on A29 northbound approach to signals. The use of coloured high friction surfacing will be reviewed during detailed design. Offside primary signal head to be provided facilitating 65m SSD. MOVA control to affectively manage queues as efficiently as possible reducing queue length. Junction could be configured to rest on main road green to further minimise vehicle stops.
B	Rejected Options	

5) DESIGN ORGANISATIONS CONCLUDING REMARKS

Given the constrained location of the junction and the existing sub-standard visibility on the A29 northbound approach, it is considered that the benefits of providing the junction outweigh the potential risks, provided that the compensatory measures discussed above are installed. The ATC undertaken on the A29 in September 2016 showed a seven-day 85th percentile speed of 31.5mph northbound, which corresponds to sight-stopping distances of 46m (based on Manual for Streets guidance), which can be achieved.

6) ATTACHMENTS AND OTHER INFORMATION

A	List of Attachments	3258/GA/004 Rev C (Appendix 2 of Site Access Design Statement) 3258/ATR/010 Rev A (Appendix 2 of Site Access Design Statement)
B	Consultations	WSCC
C	Other Information	

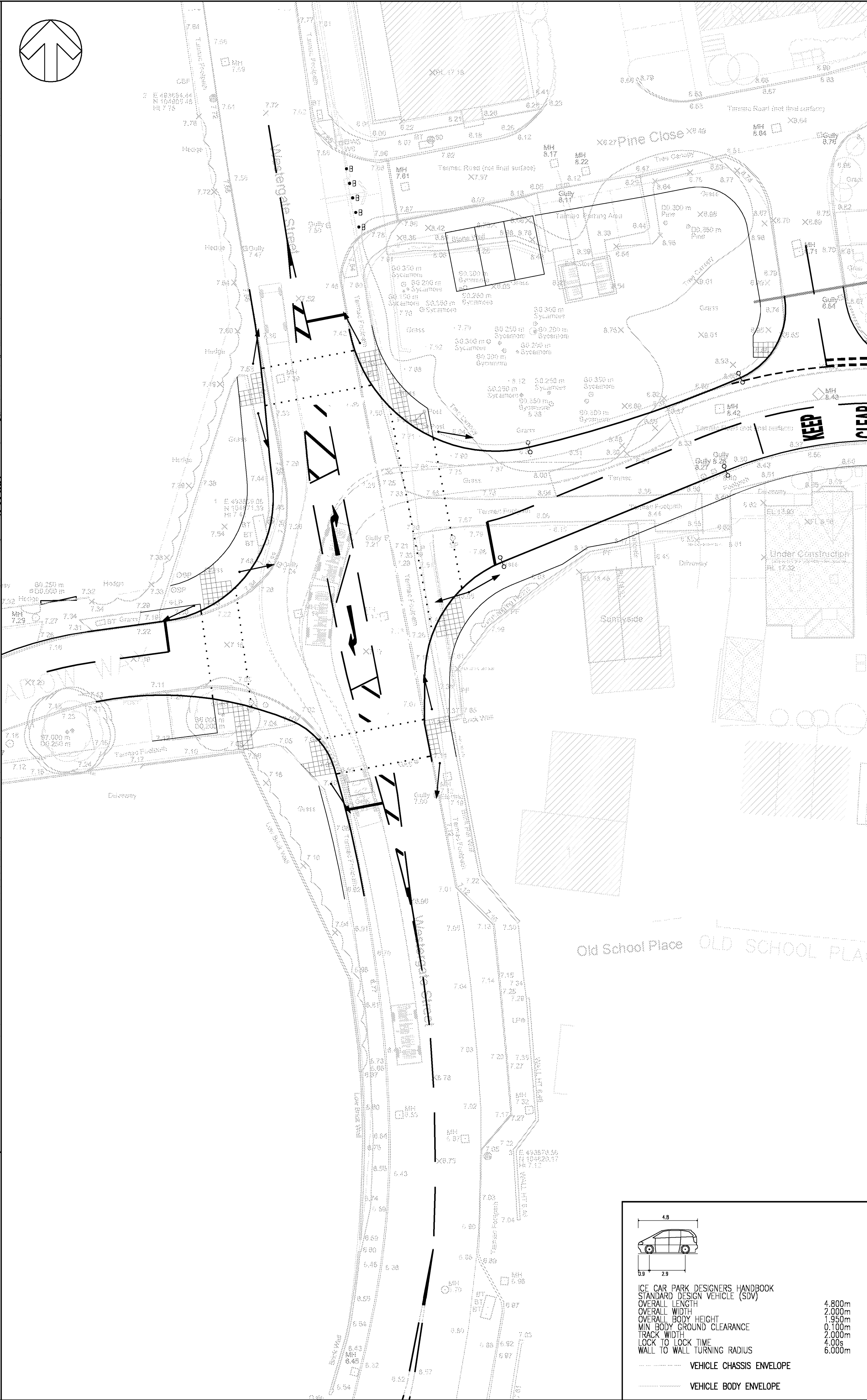
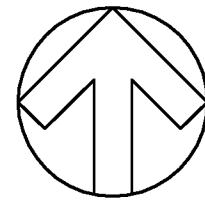
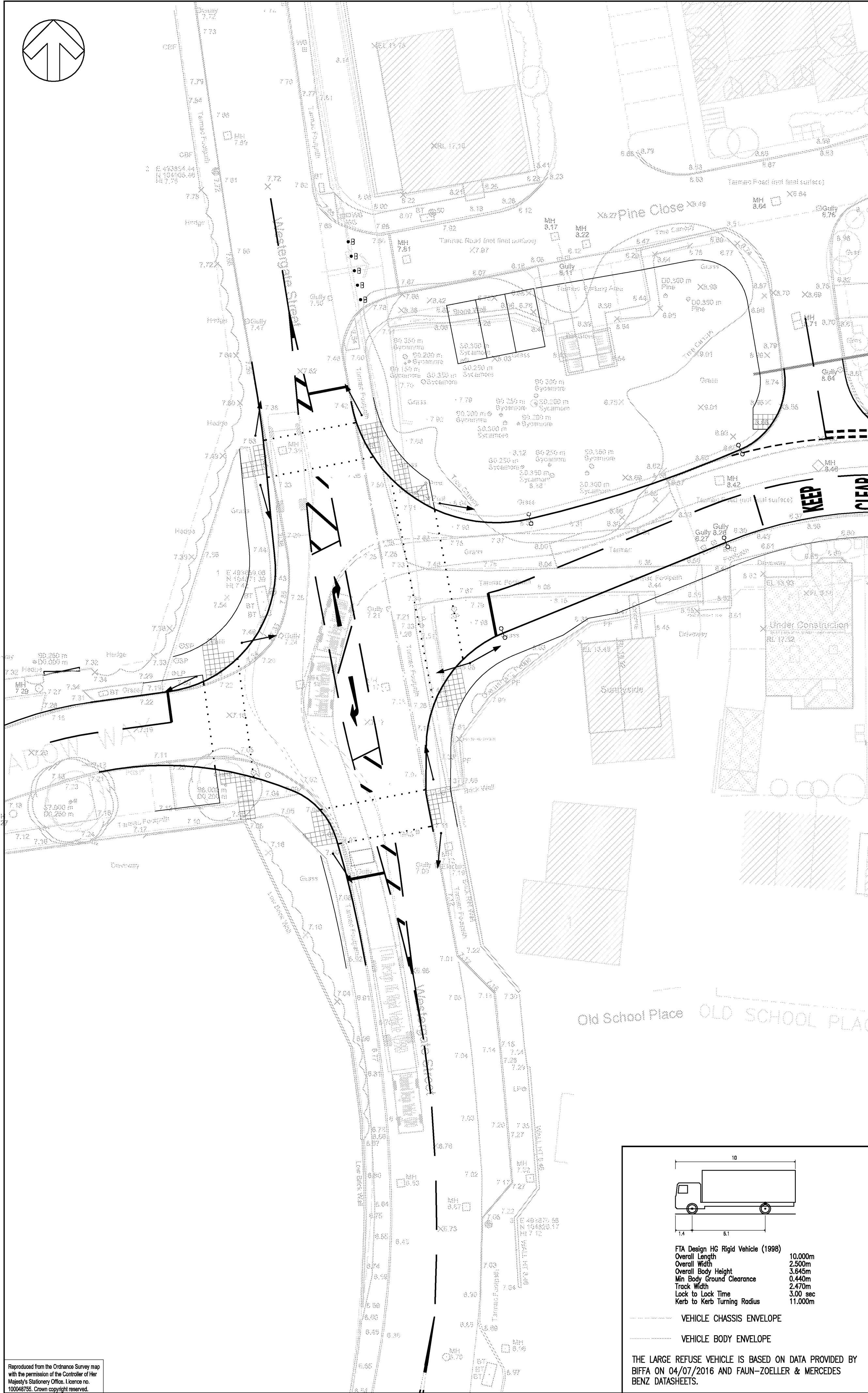
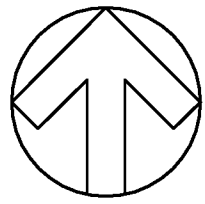
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NAME 1			
ROLE			
SIGNED		DATE	

NAME 2			
ROLE			
SIGNED		DATE	
MARK ONE BOX:	1- APPROVED ☐	2-APPROVED WITH COMMENTS ☐	3- REJECTED ☐
COMMENTS			

Appendix II

SITE ACCESS DRAWINGS



DO NOT SCALE

NOTES

- VEHICLES HAVE BEEN TRACKED AT 16kph, EXCEPT FOR THE 10M RIGID HGV, WHICH WAS TRACKED AT 10kph.
- THIS DESIGN IS BASED ON THE COLE & COLE TOPOGRAPHICAL SURVEY DATED JANUARY 2016 AND THE ADP ARCHITECTS MASTERPLAN DATED NOVEMBER 2012.
- THE 2016 TOPOGRAPHICAL SURVEY COORDINATE SYSTEM HAS BEEN USED; THE ADP MASTERPLAN WAS MOVED AND ALIGNED TO MATCH BASED ON THE PROPOSED HOUSE LOCATIONS AND THE SURVEYED HOUSE CONSTRUCTION OUTLINES.
- REFER TO WSP | PARSONS BRINCKERHOFF DRAWING 3258/GA/006 FOR GENERAL ARRANGEMENT OF JUNCTION OPTION 3 (OR DRAWING 3268/GA/004 FOR DETAILED GENERAL ARRANGEMENT).

KEY

- SIGNAL HEAD
- PEDESTRIAN BOLLARD
- TACTILE PAVING (BUFF)
- TACTILE PAVING (RED)

B	13/01/2017	PM	SECOND ISSUE	CW	CW
A	19/08/2016	PM	FIRST ISSUE	CW	CW
REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FOR INFORMATION ONLY

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CLIENT: CALA HOMES

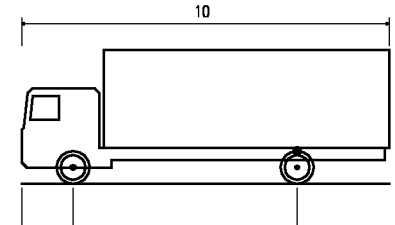
ARCHITECT: OSP

PROJECT: LAND AT WESTERGATE

TITLE: SITE ACCESS - A29 NORTHBOUND SWEPT PATH ANALYSIS

SCALE @ A1: 1:250	CHECKED: CW	APPROVED: CW
CAD FILE: 3258-ATR-003	DESIGN-DRAWN: PM	DATE: January 2017
PROJECT No: 70013258	DRAWING No: 3258/ATR/003	REV: B

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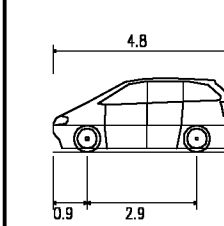


FTA Design HG Rigid Vehicle (1998)
Overall Length 10.000m
Overall Width 2.500m
Overall Body Height 3.645m
Min Body Ground Clearance 0.440m
Track Width 2.470m
Lock to Lock Time 3.00 sec
Kerb to Kerb Turning Radius 11.000m

VEHICLE CHASSIS ENVELOPE

VEHICLE BODY ENVELOPE

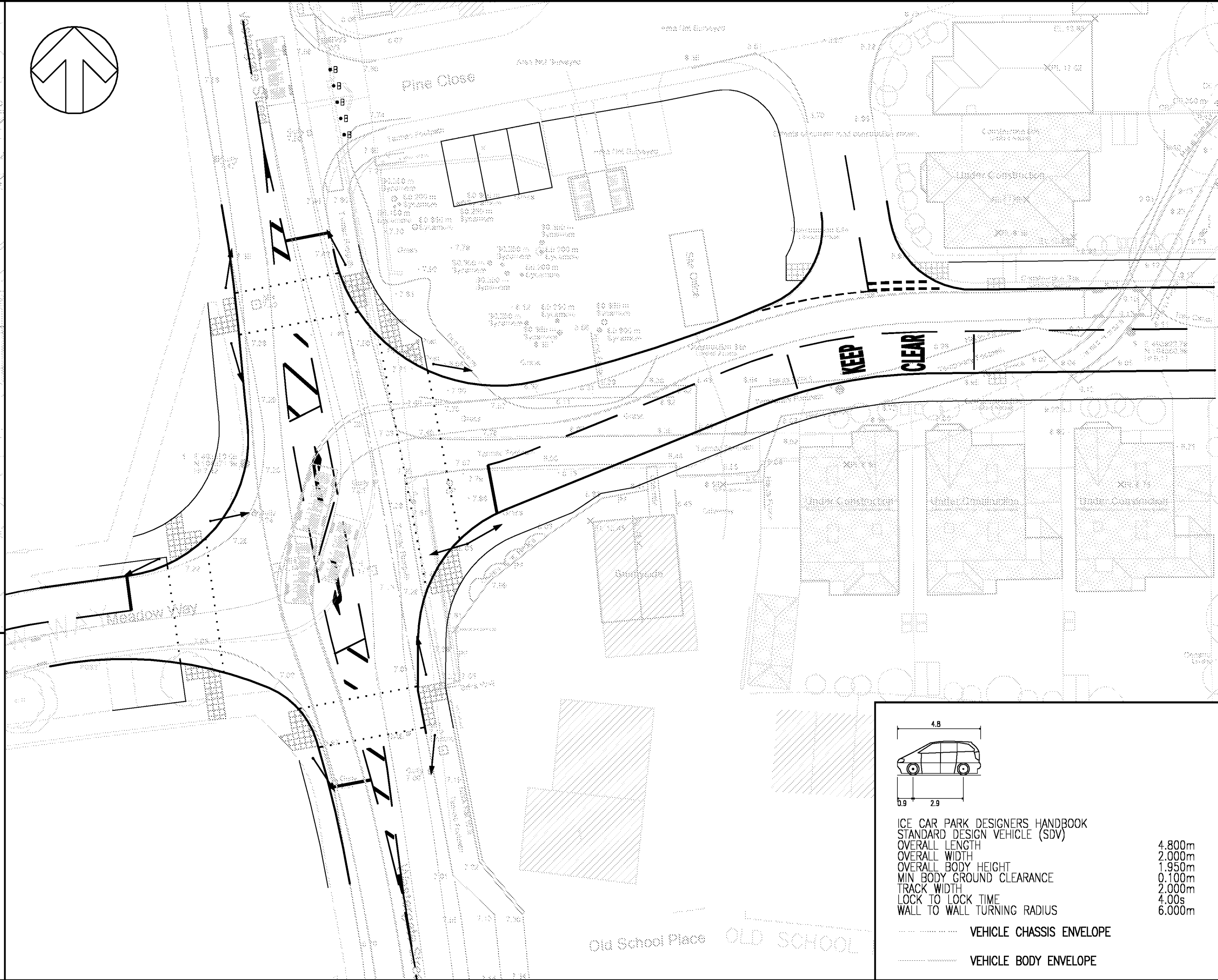
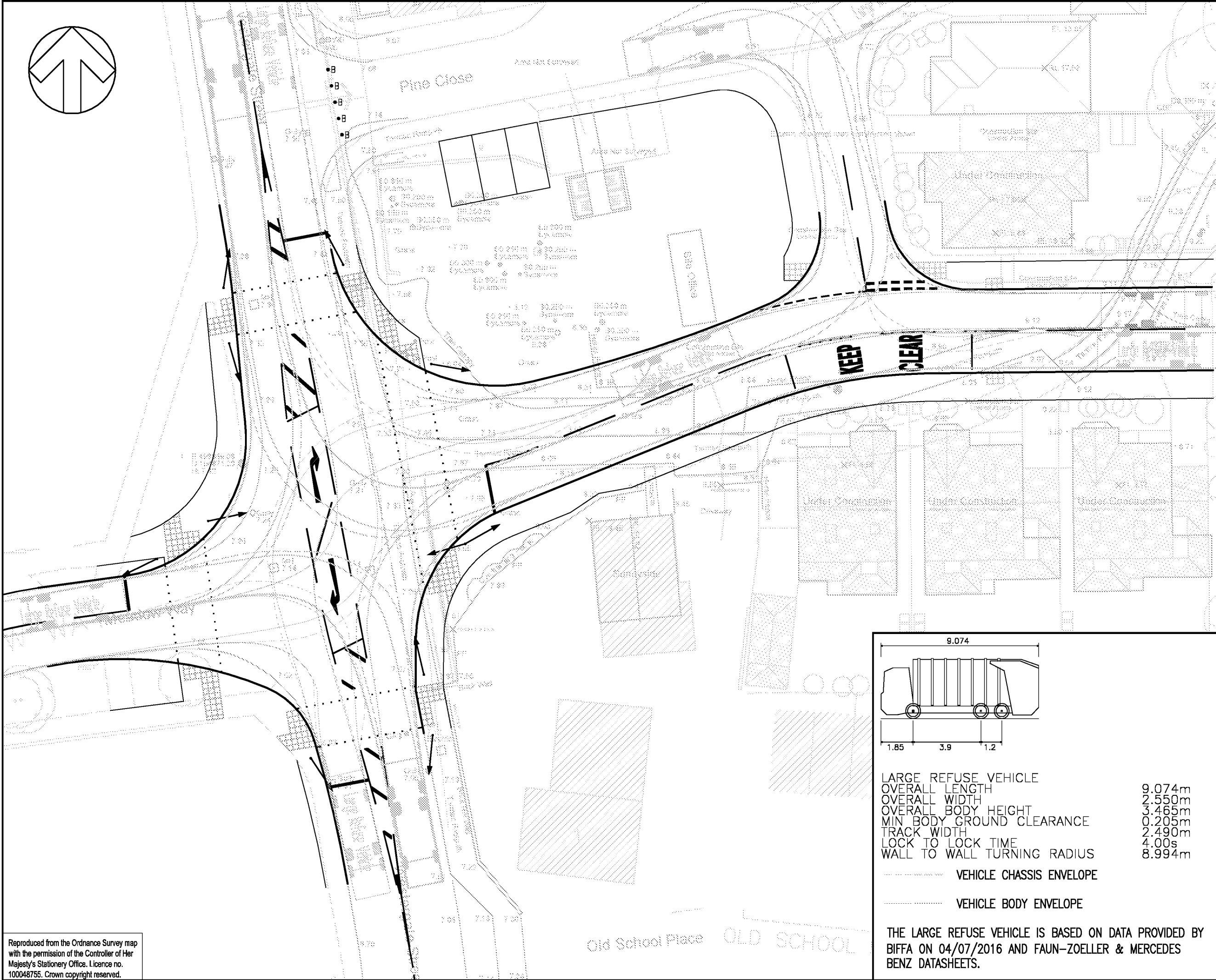
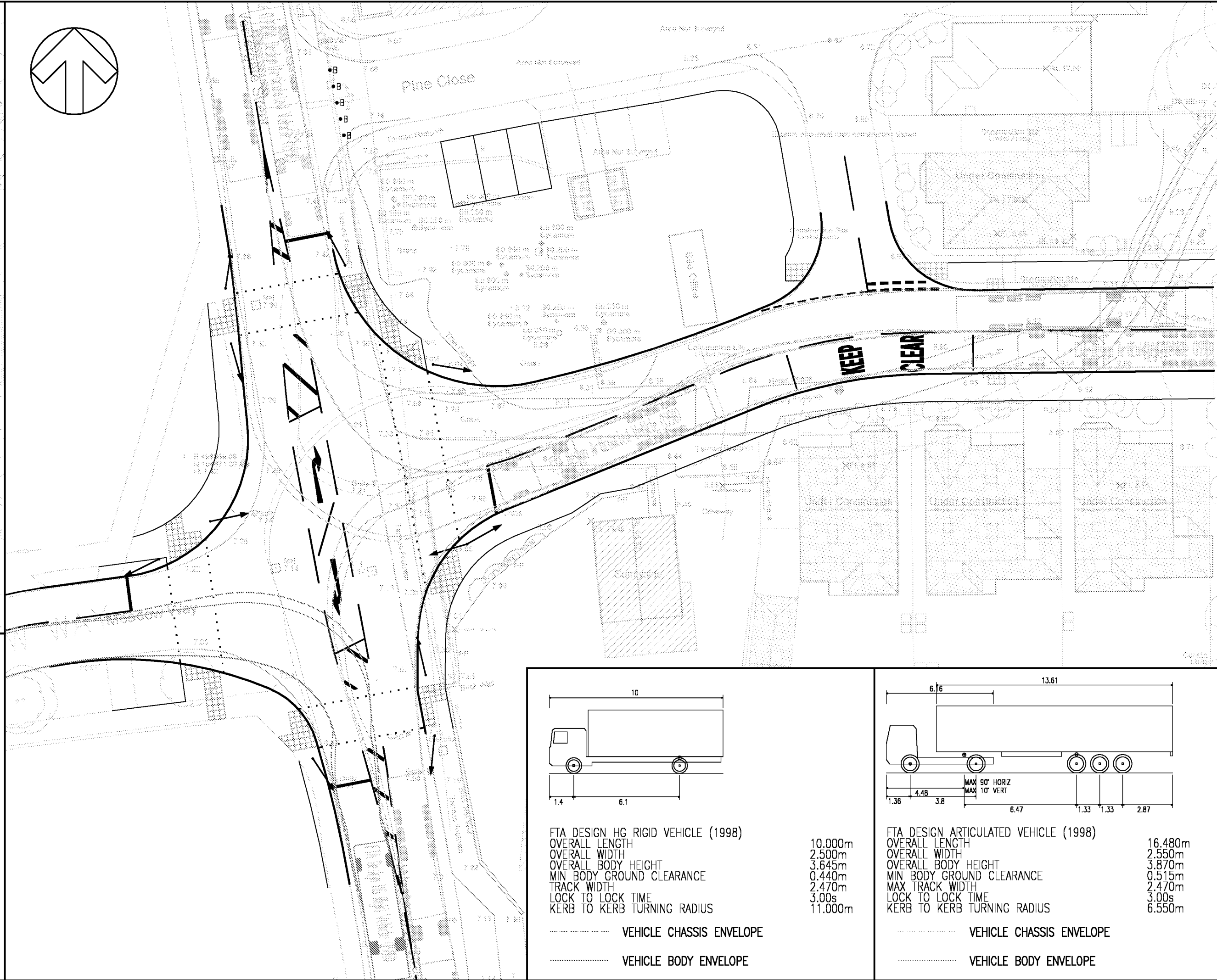
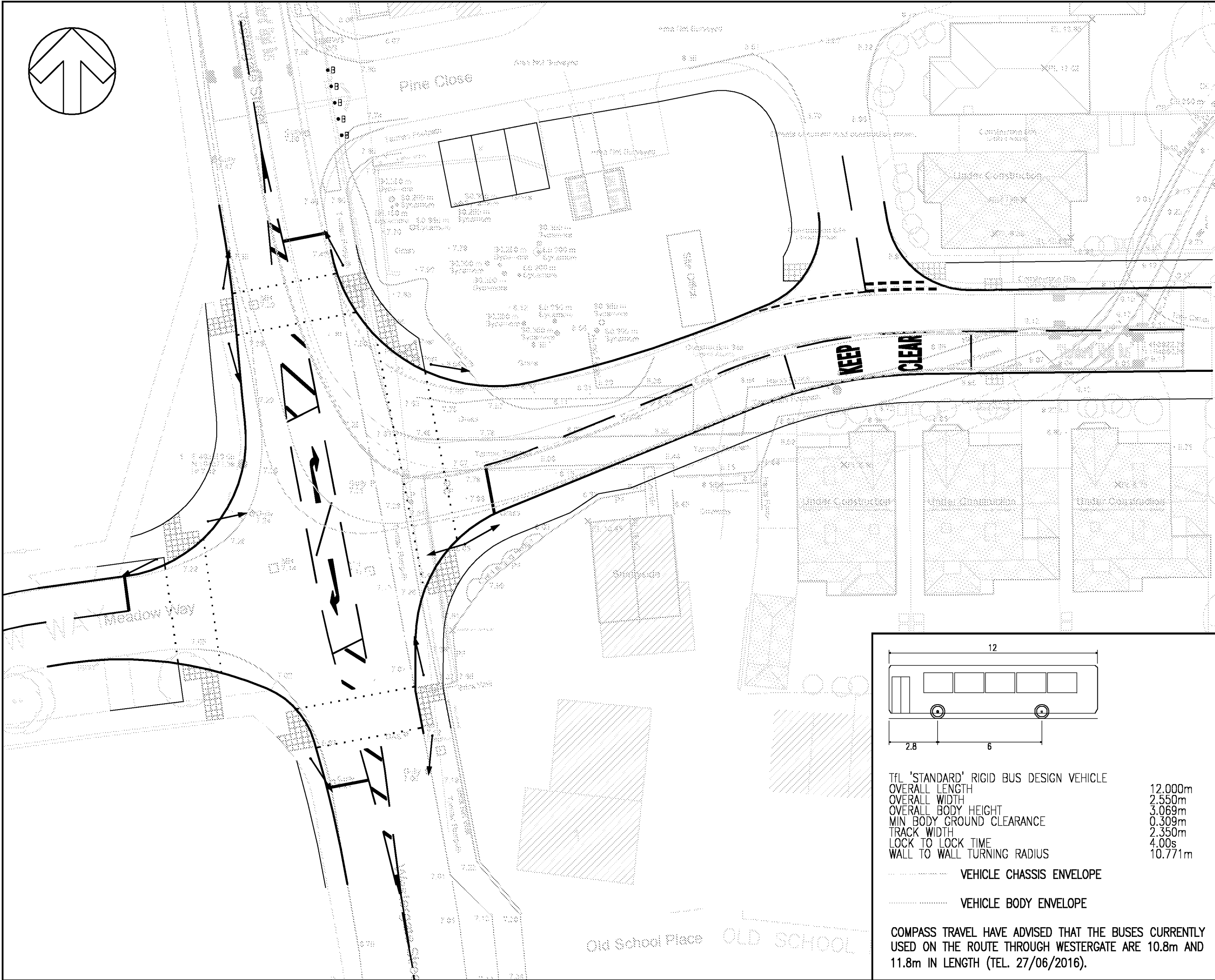
THE LARGE REFUSE VEHICLE IS BASED ON DATA PROVIDED BY BIFFA ON 04/07/2016 AND FAUN-ZOELLER & MERCEDES BENZ DATASHEETS.



ICE CAR PARK DESIGNERS HANDBOOK
STANDARD DESIGN VEHICLE (SDV)
OVERALL LENGTH 4.800m
OVERALL WIDTH 2.000m
OVERALL BODY HEIGHT 1.950m
MIN BODY GROUND CLEARANCE 0.100m
TRACK WIDTH 2.000m
LOCK TO LOCK TIME 4.00s
WALL TO WALL TURNING RADIUS 6.000m

VEHICLE CHASSIS ENVELOPE

VEHICLE BODY ENVELOPE



DO NOT SCALE

NOTES

- VEHICLES HAVE BEEN TRACKED AT 16kph, EXCEPT FOR THE ARTICULATED HGV, THE NORTHBOUND LARGE REFUSE VEHICLE TURNING WESTBOUND AND PARKING CAR WHICH WERE TRACKED AT 5kph.
- THIS DESIGN IS BASED ON THE COLE & COLE TOPOGRAPHICAL SURVEY DATED JANUARY 2016 AND THE ADP ARCHITECTS MASTERPLAN DATED NOVEMBER 2012.
- THE 2016 TOPOGRAPHICAL SURVEY COORDINATE SYSTEM HAS BEEN USED; THE ADP MASTERPLAN WAS MOVED AND ALIGNED TO MATCH BASED ON THE PROPOSED HOUSE LOCATIONS AND THE SURVEYED HOUSE CONSTRUCTION OUTLINES.
- REFER TO WSP | PARSONS BRINCKERHOFF DRAWING 3258/GA/006 FOR GENERAL ARRANGEMENT OF JUNCTION OPTION 3.

KEY

- SIGNAL HEAD
- PEDESTRIAN BOLLARD
- TACTILE PAVING (BUFF)
- TACTILE PAVING (RED)

REV	DATE	BY	DESCRIPTION	CHK	APD
A	9/11/2016	MFB	FIRST ISSUE		

DRAWING STATUS:

FOR INFORMATION ONLY

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CLIENT:

CALA HOMES

ARCHITECT:

OSP ARCHITECTURE

PROJECT:

LAND AT WESTERGATE

TITLE:

**SITE ACCESS - OPTION 3 - SWEEP PATH ANALYSIS:
BUS, ARTICULATED HGV,
LARGE REFUSE TRUCK, CAR**

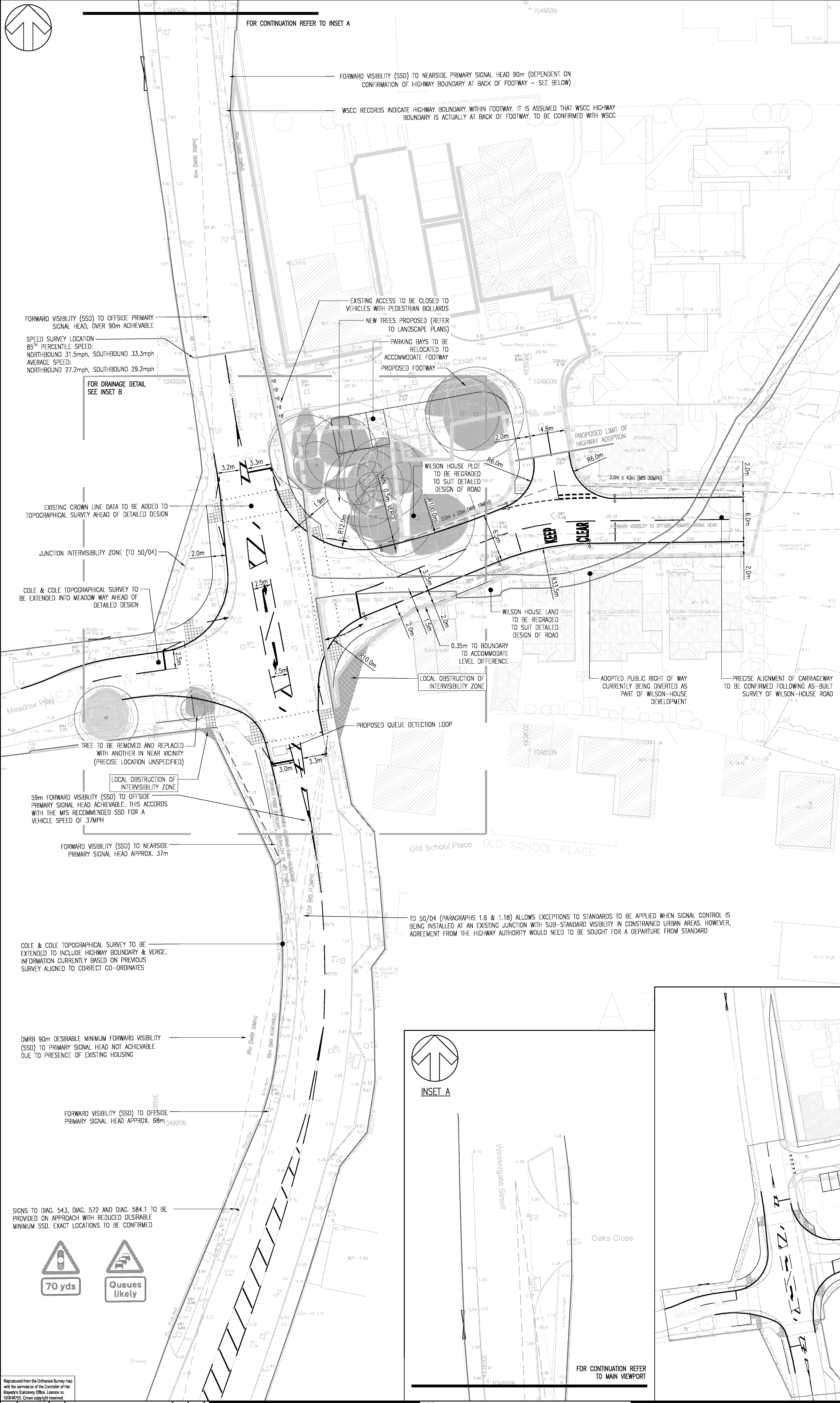
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1:250	LRB	CW

CAD FILE:	DESIGN DRAWN:	DATE:
3258-ATR-010	MFB	November 2016

PROJECT No:	DRAWING No:	REV:
70013258	3258/ATR/010	A

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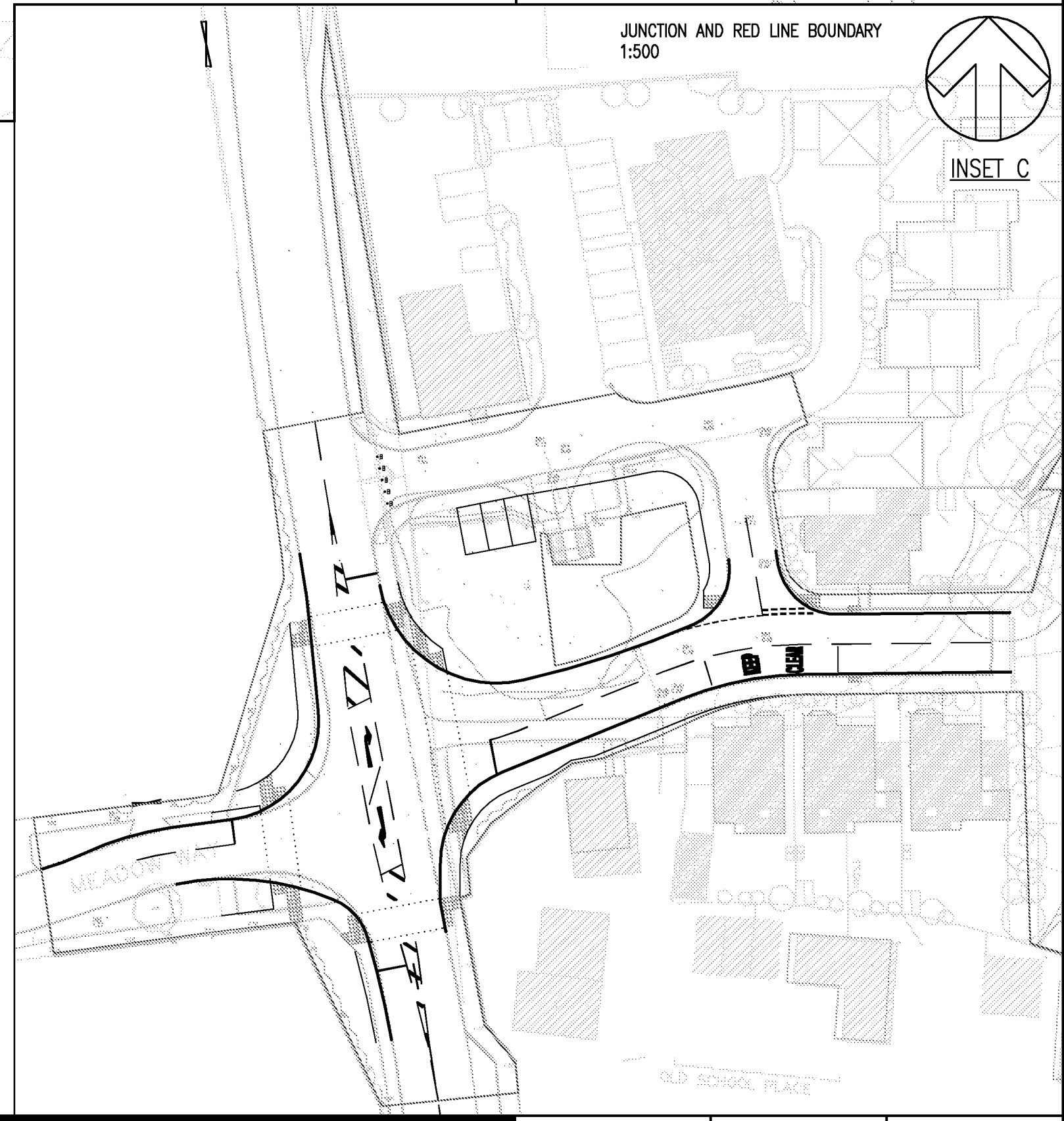
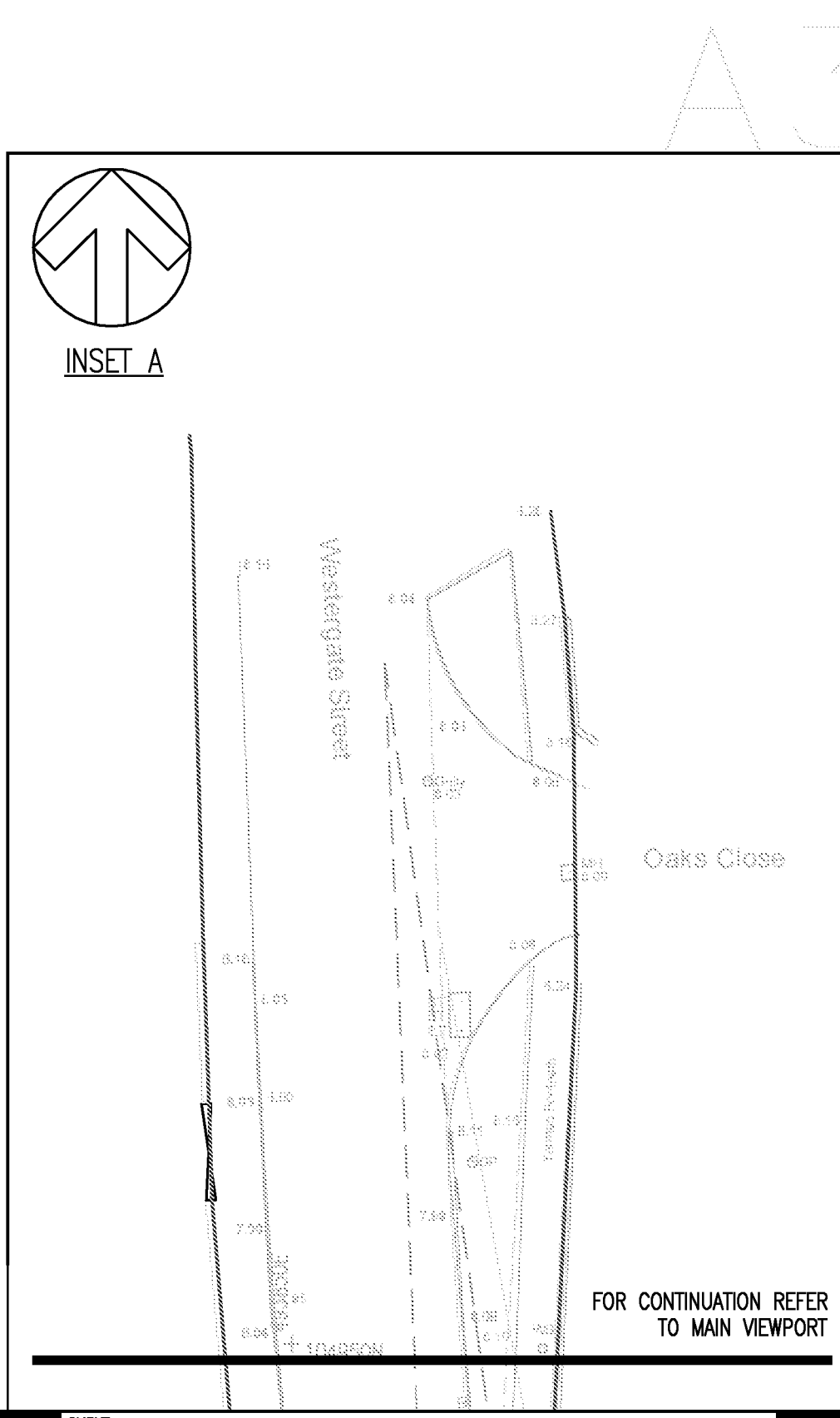
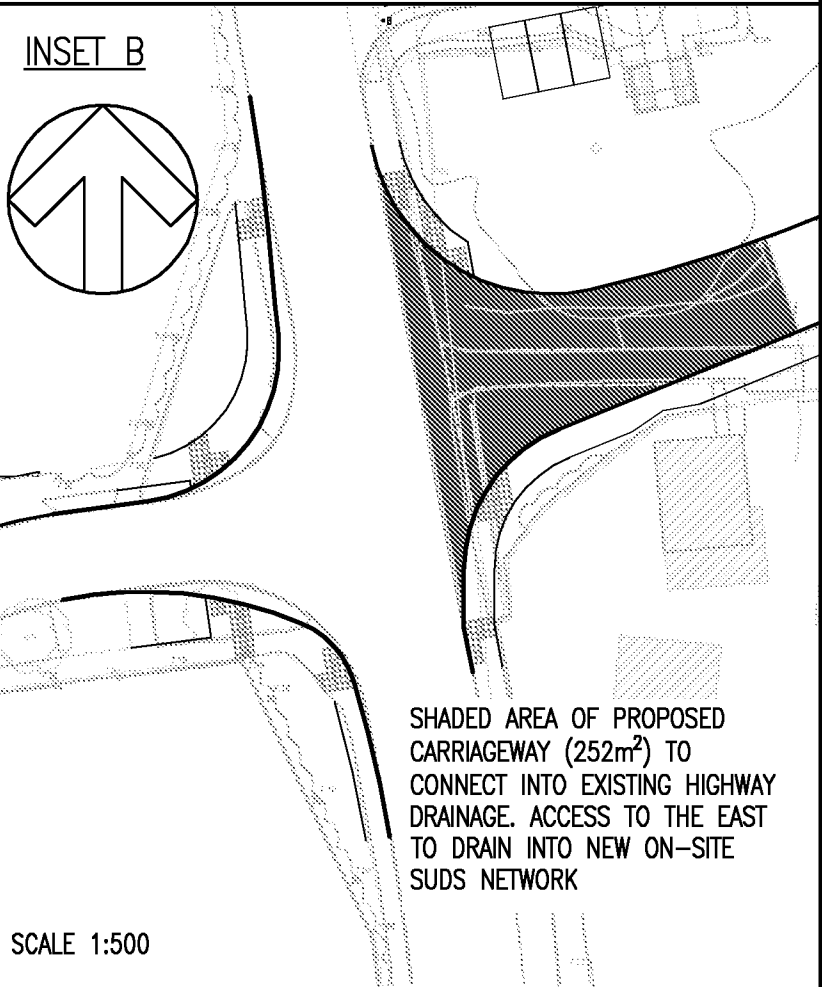
DO NOT SCALE

NOTES

- DMRB DESIRABLE MINIMUM SIGHT STOPPING DISTANCE (SSD) IS 90m FOR A ROAD WITH A 30MPH SPEED LIMIT (60KPH DESIGN SPEED). ONE STEP BELOW THE DESIRABLE MINIMUM IS 70m FOR A ROAD WITH A 30MPH SPEED LIMIT. ON THE NORTHBOUND APPROACH AGREEMENT FROM THE HIGHWAY AUTHORITY WILL THEREFORE NEED TO BE SOUGHT FOR A DEPARTURE FROM STANDARDS. MANUAL FOR STREETS GUIDANCE GIVES AN SSD OF 59m FOR A ROAD WITH A 37MPH DESIGN SPEED.
- WE HAVE NOT SOUGHT TO BECOME AWARE OF ANY INFORMATION RELATED TO HAZARDS THAT MIGHT AFFECT THE CONSTRUCTION OR MAINTENANCE OF THIS PROJECT. UNDER THE CDM REGULATIONS ANY DESIGNERS WHO PROGRESS THESE PROPOSALS FURTHER WILL NEED TO RECONSIDER THE DESIGN BASED UPON ANY INFORMATION WHICH SUBSEQUENTLY BECOMES AVAILABLE.
- THIS DESIGN IS BASED ON THE COLE & COLE TOPOGRAPHICAL SURVEY DATED JANUARY 2016 AND THE ADP ARCHITECTS MASTERPLAN DATED NOVEMBER 2012.
- THE 2016 TOPOGRAPHICAL SURVEY COORDINATE SYSTEM HAS BEEN USED; THE ADP MASTERPLAN WAS MOVED AND ALIGNED TO MATCH BASED ON THE PROPOSED HOUSE LOCATIONS AND THE SURVEYED HOUSE CONSTRUCTION OUTLINES.
- ALL LAND BOUNDARY INFORMATION IS INDICATIVE AND TO BE CONFIRMED BY ALL RELEVANT PARTIES.

KEY

- HIGHWAY BOUNDARY (BASED ON TOPOGRAPHIC SURVEY (COLE & COLE, JANUARY 2016) AND WSSC HIGHWAY BOUNDARY INFORMATION (RECEIVED 29/06/2016))
- OBSTRUCTION TO VISIBILITY ALONG HIGHWAY BOUNDARY (E.G. UNTRIMMED HEDGEROWS)
- RED LINE BOUNDARY (FROM OSP SITE LAYOUT PLAN RECEIVED 02/02/2017)
- SUB-SALE BOUNDARY (BASED ON .dwg FILE OF DRAWING 'B1 SUB-SALE PLAN 1' RECEIVED FROM CALA HOMES ON 07/03/2016). BOUNDARY IS OUTSIDE EDGE OF GREEN DASHED LINE WHEN SHOWN AT 0.5m WIDTH
- LAND IN OWNERSHIP OF MR N PINE (BASED ON DRAWING SHOWING ORANGE BOUNDARY RECEIVED FROM CALA HOMES ON 23/06/2016)
- JUNCTION INTERVISIBILITY ZONE (TO TD 50/04; 2.5m OFFSET FROM STOP LINES)
- VISIBILITY SPILL (AS SHOWN)
- FORWARD VISIBILITY TO SIGNAL (TO TD 50/04 AND TD 9/93)
- SPEED SURVEY LOCATION
- SIGNAL HEAD
- TACTILE PAVING (BUFF)
- TACTILE PAVING (RED)
- EXISTING TREE CANOPIES (BASED ON BOSKY TREES SURVEY DATED 22/06/2016)
- TREES TO BE REMOVED
- TREES TO BE RETAINED
- ROOT PROTECTION AREAS
- PEDESTRIAN BOLLARD



REV	DATE	BY	DESCRIPTION	CHK	APD
E	02/02/2017	MPB	REDLINE UPDATED		
D	19/11/2016	FL	PROPOSED QUEUE DETECTION LOOP ADDED		
C	09/11/2016	SL	CHANGED TREES TO BE RETAINED TO REMOVE		
B	21/10/2016	MPB	NOTES AMENDED		
A	17/10/2016	MPB	FIRST ISSUE		

DRAWING STATUS: FOR INFORMATION ONLY

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CLIENT: CALA HOMES

ARCHITECT: OSP ARCHITECTURE

PROJECT: LAND AT WESTERGATE

TITLE: SITE ACCESS GENERAL ARRANGEMENT OPTION 3

SCALE @ A1: 1:250

CHECKED: LRB

APPROVED: LRB

CAO FILE: 3258-GA-004.DWG

DESIGN/DRAWN: MPB

DATE: February 17

PROJECT No: 70013258

DRAWING No: 3258/GA/004

REV: E

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SUBMISSION TO WEST SUSSEX COUNTY COUNCIL FOR DEPARTURES FROM STANDARD

Project Name	Land at Westergate, West Sussex
Applicant Organisation	WSP Parsons Brinckerhoff
Applicant Ref	70013258
Highway Authority Ref	
Applicant Contact Details	mark.baty@wspgroup.com 02380 302 638
Date Submitted	24/05/2017

1) PROJECT DETAILS

A	Description	Proposed S278 traffic signal site access junction at the existing A29 / Meadow Way junction and proposed new access road into residential development east of the A29. The junction will serve up to 350 dwellings.
B	Location	As above
C	Road Category	TA 79/99 UAP3
D	Road Type	S2
E	Design Speed	60 kph (determined by TD 9/93 Urban Road Speed Limit)
F	Speed Limit	30mph
G	Traffic Flows	AAWT 14154 two way
H	NMU Flows	-

2) DEPARTURE DETAILS

A	Discipline	Road Geometry
	Type	Forward visibility (SSD) to the back of queuing traffic on northbound approach to traffic signals
B	Relevant Standard(s)	DMRB desirable minimum of 90m, DMRB Vol 6 Section 1 Part 1 TD9/93 Table 3 and Para 1.26 Junction visibility, DMRB Vol 6 Section 2 Part 3 TD50/04 Para 2.6, 2.7 and 2.8 Manual for Streets Table 7 and Para 7.5.3
	Clause	
C	Difference Between Standard(s) and proposed design	The forward visibility (SSD) must be the TD9/93 desirable minimum in the immediate approach to the junction (1.5 x desirable minimum SSD) and to the back of queue.
		For this junction the immediate approach to the junction is the 135m preceeding the stop line, and the longest average mean max queue length is 207m long (36 cars in the morning, assumed to be 5.75m long each).
		The DMRB desirable minimum of 90m is not achievable. The achievable forward visibility is limited by the lefthand bend on the approach to the junction. This limits the visibility in the immediate approach to the junction, and to the back of queues shorter than 5 cars, to 49m.
		The back of any queue longer than 5 cars will be visible for 90m.
D	Reason for Departure (overview)	An ATC undertaken on the A29 in September 2016 showed a seven-day 85th percentile speed of 31.5mph northbound, which corresponds to sight-stopping distances of 46m (based on Manual for Streets guidance). The achievable SSD of 49m is greater than this.
		Existing residential boundary fences on western side of A29.

E	Associated Project Departures	N/A
F	Other Options Considered	

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	Safety	Limited visibility of queuing traffic and primary signal heads in northbound direction may lead to rear-shunt accidents. Existing safety issue associated with visibility to and from the A29 northbound carriageway at the junction with Meadow Way, although signalised junction will increase amount of stationary traffic at this location. Provision of controlled pedestrian crossings on all approaches will improve safety for pedestrians.
B	Congestion/ Delay	
C	Environmental / sustainability	Provision of pedestrian crossings on all approaches encourages walking trips to / from the site.
D	Capital and whole life cost/value	Can be delivered within land owned by WSCC or developer.
E	Accessibility	
F	Integration	
G	Structural	
H	Network resilience & Maintenance	

4) COMPENSATORY MEASURES

A	Included Measures	Installation of signs to Diagram 543 and Diagram 584 (TSRGD) to be provided on A29 northbound approach to signals. The use of coloured high friction surfacing will be reviewed during detailed design. Offside primary signal head to be provided facilitating 65m SSD and additional warning of queuing vehicles. MOVA control to effectively manage queues as efficiently as possible reducing queue length. Junction could be configured to rest on main road green to further minimise vehicle stops.
B	Rejected Options	

5) DESIGN ORGANISATIONS CONCLUDING REMARKS

Given the constrained location of the junction and the existing sub-standard visibility on the A29 northbound approach, it is considered that the benefits of providing the junction outweigh the potential risks, provided that the compensatory measures discussed above are installed. The ATC undertaken on the A29 in September 2016 showed a seven-day 85th percentile speed of 31.5mph northbound, which corresponds to sight-stopping distances of

46m (based on Manual for Streets guidance), which can be achieved.

6) ATTACHMENTS AND OTHER INFORMATION

A	List of Attachments	3258/GA/004 Rev E 3258/SK/017 Rev A
B	Consultations	WSCC
C	Other Information	

7) DECISION – (HIGHWAY AUTHORITY USE ONLY)

NAME 1			
ROLE			
SIGNED		DATE	
NAME 2			
ROLE			
SIGNED		DATE	
MARK ONE BOX:	1- APPROVED ☐	2-APPROVED WITH COMMENTS ☐	3- REJECTED ☐
COMMENTS			