stomor
CIVIL ENGINEERING CONSULTANTS

Transport Feasibility Study

for

Land south of Church Lane, Wormley

Grid Reference: 536155E, 205322N

Prepared on behalf of

Vincent and Gorbing

for

Hertfordshire County Council

November 2015

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APPENDICES

1. Introduction

1.1 Stomor Ltd have been commissioned by Vincent and Gorbing on behalf of Hertfordshire County Council (HCC) to undertake Transport Feasibility Study of a potential school site in Wormley.

1.2 This report addresses feasibility associated with delivery of an 8 Form of Entry (FE) secondary school on the land south of Church Lane in Wormley.

1.3 A site location plan is provided in **Appendix A**, which shows the location of the site in relation to Wormley and the wider road network.

1.4 This Transport Feasibility Study examines the potential impact of the proposed school on the local highway network. It also examines the walking and cycling routes to the school, investigates the measures required to facilitate safe routes from the existing nearby residential areas and considers the potential for park and stride initiatives. The study also identifies potential vehicular access arrangements, plus parking and turning facilities required to support the provision of the secondary school.

1.5 In order to prepare this report, reference has been made to the High Level Highways Assessment (HLHA) prepared by Pell Frischmann in March 2015, which identifies potential scope and constraints in highways terms associated with the site.

2. Existing Conditions

2.1. The Site

2.1.1. The site is located on the southern side of Church Lane, directly adjacent to Wormley Playing Fields. The A10 abuts the western boundary of the site, with a dual carriageway link to the south of the site joining the A10 to the A1170. The New River flows southward along the eastern boundary of the site. The site, which covers a gross area of approximately 20.4ha, is currently undeveloped land used for sheep grazing.

2.2. Existing Highway Network

2.2.1. Church Lane is rural road with an average width of 6.35m along the site frontage. It runs between High Road to the east of site and White Stubbs Lane to the north west of the site. Church Lane is subject to a 30mph speed limit between High Road and the north western corner of the site. The remaining section of the road is under a 40mph speed limit through the small residential area to the north west of the site, and the national speed limit applies beyond that.

2.2.2. Church Lane has waiting restrictions which apply to buses and goods vehicles over 5 tonnes maximum gross weight at any time. Initial investigations indicate that there are currently no weight restrictions in effect across the bridge over New River.

2.2.3. Enquiries were sent to the HCC with regard to potential weight limits over the bridge. Their response dated 1st September 2015, confirms that the bridge can take maximum loading of up to 40 tonnes. Copies of the correspondence between Stomor HCC are provided in **Appendix B.**

2.2.4. A gated field access into the site is currently available in the north eastern corner of the site.

2.2.5. The A10 runs adjacent to the western boundary of the site. To the south, the A10 connects to the M25 motorway approximately 5km south of the site and to the north the A10 provides links to Hoddesdon, Hertford, Ware, Buntingford and Cambridge.

2.2.6. The A1170 High Road is an arterial route through Wormley. It is situated approximately 170m to the east of the site. High Road is a classified 30mph speed limit road and forms a link between the towns of Broxbourne and Hoddesdon to the north and Cheshunt and Waltham Cross to the south.

2.2.7. Church Lane meets High Road at a priority junction with a left turn only onto High Road. Westlea Road joins High Road opposite Church Lane and is also left turn only. Right turn movements are restricted by a raised central island with a pedestrian barrier.

2.2.8. A small 3 arm roundabout is located to the north of this junction between High Road and Cozens Lane East, which enables traffic turning left from Church Lane to return south. For drivers turning south from Westlea Road, the nearest roundabout at which to turn north is at the link between the A1170 and the A10, to the south of the site.

2.2.9. Huntingdon Close, The Oval, Pembroke Close, The Croft, Oaklands Grove and Manor House Grove are cul de sacs serving the residential area on the eastern side of the New River. Huntingdon Close, Oaklands Grove, Manor House Grove and The Butts are directly accessible from High Road, however, Manor House Grove and Oaklands Grove are private roads. The Croft and Pembroke Close are accessed via Church Lane to the north east of the site and The Oval is accessed from High Road via The Butts.

2.3. Existing Public Transport Facilities

2.3.1. Bus stops are located on High Road to the east of the site. These stops are served by routes 310, 410 and 410A. Route 310 is currently operated by Arriva and runs between Hertford and Waltham Cross, Monday to Saturday at various intervals The 310 service operates as 411 on Sundays, and runs every hour.

2.3.2. Trustybus operates routes 410 and 410A which run between Harlow and Waltham Cross. Route 410 currently operates Monday to Friday at various intervals and every 1 hour on Sundays. Route 410A only operates Monday to Friday at hourly intervals. Route 410X is slightly altered single service from Waltham Cross to Harlow which passes The Queens Head stop at 7:59am.

2.3.3. Epping Forest Community Transport operate a community bus, route SB2, which only runs once on Fridays during the day.

2.3.4. The location of existing bus stops have been shown on drawing ST-2462-02 “Highways and Access Appraisal”, provided in **Appendix C**.

2.3.5. Broxbourne Rail Station is located approximately 2.5km north east of the site and lies on the London Liverpool Street to Cambridge and Stansted Airport line.

2.4. Existing Pedestrian and Cycle Links

2.4.1. Existing footways are in place on both sides of Church Lane between High Road and The Croft. The footway on the south side of Church Lane terminates approximately 45m to the east of the bridge between Pembroke Close and the New River bridge. At present, there are no pedestrian facilities to cross the bridge on the south side of the road.

2.4.2. The footway on the north side of Church Lane crosses the New River via a footbridge independent from the carriageway and terminates at a pedestrian access into the Wormley Playing Fields playground, which is approximately 60m west of the bridge.

2.4.3. The New River Path runs alongside the New River on its western side. This path is Public Right of Way (PROW) 50 between Church Lane and PROW 51. PROW 51 links PROW 50 to High Road midway between Oaklands Grove and Huntingdon Close. PROW 51 is a narrow footway running between the rear gardens of properties on Oaklands Grove and Huntingdon Close. The narrowest point on the footway is approximately 1.35m, and the width of the footbridge over New River is approximately 0.94m.

2.4.4. To the south of PROW 51 the path continues as New River Path, passing under the road link between the A10 and the A1170. This section of path is not registered as a PROW.

2.4.5. To the north of Church Lane, New River Path continues as PROW 47 as far as PROW 46 which links back over New River into St Laurence Drive, which is accessed from the A1170 to the north of the former Wormley Primary School site.

2.4.6. There is a public footpath which runs alongside the northern boundary of the site, segregated from the Church Lane carriageway by a hedgerow and bank of varying height. This footpath is lit.

2.4.7. Another footpath, Queens Head Walk, runs between High Road and The Square, which is located at the south eastern corner of Church Lane. Queens Head Walk provides vehicular access to a few properties at either end.

2.4.8. There are on-street cycle lanes on High Road northbound and southbound within the vicinity of the site.

2.4.9. Improvements to footway provision are likely to be necessary to provide safe and attractive pedestrian routes to a new school site. However, the extent of improvements will depend upon the position of the school, origin of pupils and pedestrian desire lines which will be considered later in this report.

2.5. Personal Injury Accident Records

2.5.1. Non-confidential Personal Injury Accident Data was obtained from HCC, which covers the most recent five year period of 1st April 2010 to 31st March 2015. A copy of the accident location plot and associated report are attached in **Appendix D**.

2.5.2. The accident data identifies that there has been a number of personal injury accidents recorded within the vicinity of the site within the period identified.

2.5.3. A slight accident occurred on Church Lane at the entrance to Wormley Playing Fields. The accident involved a cyclist travelling westbound on Church Lane being hit by a car as it was turning right onto Church Lane. It is noted that visibility along Church Lane from the existing accesses into the playing fields is poor due to overgrown vegetation.

2.5.4. A slight accident occurred on Church Lane at the junction with High Road. The accident was a rear-end collision between two cars travelling eastbound on Church Lane.

2.5.5. Approximately 50m to the south of the Church Lane/High Road junction, a slight accident occurred as a cyclist travelling north east on Church Lane hit the back of a car also travelling in the same direction.

2.5.6. It appears there has been clusters of accidents at several junctions along High Road. The majority of the accidents are slight accidents involving cars and motorcyclists. There is also a significant number of accidents between cars at junctions either slowing down to turn into a side road or slowing down for the traffic ahead. The few accidents involving pedestrians are mainly concentrated around Cozens Lane near The Broxbourne School.

2.5.7. The above data gives rise to concern regarding highway safety along High Road. The HLHA produced by Pell Frischman identifies High Road as a potential ‘rat-run’ through Wormley for commuting vehicles heading towards the A10 and then to the M25.

3. Proposed Development

3.1. Site Proposals

3.1.1. This report considers the proposals for 8FE Secondary School on the land south of Church Lane, Wormley.

3.2. Pupil and Staff Numbers

3.2.1. The proposed school will have overall capacity for 1200 secondary school pupils in Years 7 to 11, plus in the region of 259 sixth form places based upon the average stay-on rate of 54%.

3.2.2. This assessment considers the feasibility of a fully occupied school, although it is anticipated that the school roll will increase over a period of time in conjunction with housing developments in the surrounding area.

3.3. Vehicular Access and Circulation

3.3.1. Various access arrangements have been considered in relation to the surrounding highway network and are shown on drawing ST-2462-02 “Highway and Access Appraisal”.

3.3.2. The following vehicular access options have been considered:

Option 1 – Access off Church Lane, north east corner of site.

Option 2 – Access off Church Lane, opposite Wormley Playing Fields Car Pavilion.

Option 3 – Access off Huntingdon Close.

Option 4 – Access directly off the A10.

Option 5 – Access off the link between the A10 and the A1170 to the south of the site.

Option 6 – Access via Pembroke Close and a private garage court.

3.3.3. Access arrangements were then considered in more detail and presented on drawing ST-2462-06, Means of Access Options Appraisal – Whole Site, provided in **Appendix E**. The following paragraphs summarise our assessment of each access option in terms of potential issues.

3.3.4. **Options 1 and 2** – Church Lane

Potential issues have been identified as follows:

- Church Lane is too narrow to accommodate 2-way bus/coach movements.
- Widening will have significant impact on conservation area.
- No scope to widen road between The Croft and High Road.
- Narrow carriageway over existing New River Bridge. Priority system required.

Access from Church Lane has been considered in further detail on drawing ST-2462-03-Means of Access - Church Lane, identifying the local impact of an access into the site. This drawing is provided in **Appendix F**.

3.3.5. **Option 3** – Huntingdon Close

Access off Huntingdon Close is considered to have the following issues:

- Huntingdon Close could be widened to 6.1m with 2No 2m wide footways (subject to survey), to allow 2-way bus movements
- Significant impact on nature of Huntingdon Close.
- New bridge required across New River.
- Significant impact on trees.
- Mini roundabout or signal controls with associated junction enlargement may be required at junction with High Road.

3.3.6. **Option 4** – Access direct from A10

Potential issues associated with access from the A10 are as follows:

- 70mph dual carriageway. Safety issues with deceleration and acceleration particularly for buses/coaches.
- Significant level difference between site and A10 to be overcome.
- Nearest location for northbound traffic to turn south is 3.8km away at Hoddesdon.
- Proximity of merging lane with slip road for A1170 - risk of accidents due to weaving traffic.
- Significant impact on trees.
- New access to primary and main distributor routes will only be considered where special circumstances can be demonstrated in favour of the proposals. This will include consideration of why alternative proposals are not viable

3.3.7. **Option 5** – Access from Link Road between A10 and A1170

Access off the link between the A10 and the A1170 to the south of the site is considered to have the following issues:

- Derestricted dual carriageway. Safety issues with deceleration and acceleration particularly for buses/coaches.
- TRO likely to be required to reduce speed limit on link.
- Major level difference between site and road to be overcome.
- Proposed road will pass through flood plain. Flood flow routes and flood plain compensation required.
- New access to primary and main distributor routes will only be considered where special circumstances can be demonstrated in favour of the proposals. This will include consideration of why alternative proposals are not viable.
- Significant impact on trees.

Depending upon the potential flood levels in relation to the proposed access road, an emergency access may be required via Church Lane, to enable vehicular access during flood events.

3.3.8. **Option 6** - Pembroke Close

Access via Pembroke Close and a private garage court was not considered in further detail due to the issues described above associated with Church Lane, and the additional complication associated with third party land through the garage court and need for a new bridge over New River.

3.3.9. **Combined Options**

Further consideration was given to potential one-way routes between the accesses identified above, as this would potentially avoid the issue road widening required to accommodate two-way bus or coach movements.

3.3.10. **Options 1 and 3** - A link through the site between Huntingdon Close and Church Lane would create a significant increase in traffic on the Huntingdon Close residential cul-de-sac, altering the nature of the road, although major widening may not be necessary. A new bridge would be required across New River, with a significant impact on trees in this location. A substantial road link would be required through the site.

3.3.11. **Options 4 and 2** - A link between the A10 and Church Lane would have safety issues primarily associated with deceleration of vehicles on the 70mph A10 dual carriageway, and the nearest location for northbound traffic to turn south is 3.8km

away at Hoddesdon. The reverse route from Church Lane to the A10 may be possible but traffic would be merging onto the A10 which could potentially be more dangerous than vehicles diverging from the A10. There is a significant level difference between site and A10 to be overcome. Depending upon site security arrangements, this route could generate potential for traffic to rat-run through site between Church Lane and the A10 during peak periods. New access to primary and main distributor routes will only be considered where special circumstances can be demonstrated in favour of the proposals. This will include consideration of why alternative proposals are not viable.

3.3.12. Drawing ST-2462-06 was submitted to the HCC Highways for their consideration and a meeting was held on 17th November 2015 to discuss the options. This meeting was attended by representatives from Stomor Ltd, Vincent and Gorbing and HCC Highways.

3.3.13. Discussions confirmed that access directly from the A10 (Option 4) is unlikely to be acceptable in terms of both highway policy and highway safety. It was agreed that while access via Huntingdon Close (Option 3) would be technically achievable, environmental impact would be significant. The potential for access via Church Lane was discussed at length in terms of potential widening and priority control systems, but the impact on the conservation area and traffic flows along Church Lane would be significant.

3.3.14. As a result, it was generally considered that access from the Link Road between the A10 and A1170 would be the most suitable subject to the following considerations and further work:

i. Site visit to review existing conditions and inspect surrounding area.

ii. Obtain topographical information for A10 Turnford Junction, the link road, the roundabout to the south east of the site and the land to the north of the link road and south of the designated development site.

iii. Obtain tree survey.

iv. Check visibility splays in both horizontal and vertical planes.

v. Obtain traffic counts during peak hours (including school pm peak) for A10 Turnford Junction and the junction with the A1170 to the south east of the site. Radar speed surveys and queue surveys would also be required.

vi. Undertake assessment of traffic flows and queuing on the roundabouts to the east and west of the proposed access, particularly on the A10 slip roads.

vii. Preparation of a Means of Access Plan identifying suitable safe and access for cars and buses, cycles and pedestrians. Undertake analysis with regard to visibility, geometry, road gradients, acceleration and deceleration lanes etc.

viii. Review existing lighting arrangements and identify proposed improvements.

ix. Review potential for speed limit reduction from derestricted to 40mph.

x. Undertake a Stage 1 Road Safety Audit for the proposed access arrangement.

xi. Obtain EA flood level data and review the impact of the proposed access in terms of the flood plain. Compare flood level data with topographical information.

xii. Assess flood flow routes and potential impact of access arrangements on existing ground levels. Calculate flood compensation required and identify suitable solution.

3.3.15. Should any of the above investigations identify that access cannot be technically achieved via this route, further consideration may need to be given to one-way routes between Huntingdon Close and Church Lane.

3.4. Pedestrian Access

3.4.1. The position of pedestrian entrances will be dependent upon pedestrian desire lines which is be considered in more detail in Section 4.2.

3.4.2. The location of pedestrian entrances will have an impact upon proposed pedestrian crossings and traffic calming features on the surrounding road network.

3.4.3. It is noted that there are limited existing pedestrian access options within the southern part of the site. Therefore, in order to make use of existing public rights of way and existing pedestrian infrastructure, the school buildings would be best located within the north eastern part of the site.

3.5. Staff Parking

3.5.1. Parking on each site will be required for staff, students and possibly coaches, with turning areas required for service and delivery vehicles. Parent parking is considered in Section 4.

3.5.2. Parking provision has been determined based upon the parking standards from the Broxbourne Local Plan. The table below demonstrates maximum parking provision for the 8FE capacity of 1200 secondary pupils plus 259 sixth form students as follows;

Maximum Car Parking Provision – Broxbourne Borough Council		
Max Car Parking Standards	**Number of Staff or Pupils**	**Total Car Parking Spaces**
1 space per full-time member of staff (assuming 1 member for each 30 pupils, plus head teacher)	50 Staff	50 spaces
1 space per 100 pupils	1459 Pupils	15 spaces
1 space per 5 pupils under 17 years old (Assume Yrs 7 to 11 plus ¼ of total 6th Form)	1265 Pupils	253 spaces
1 space per 8 pupils over 17 years old (Assume ¾ of total 6th Form)	194 Pupils	24 spaces
	Total	**342 spaces**

3.5.3. Based upon the Broxbourne Local Plan standards, up to 342 spaces would need to be provided on the site.

3.5.4. This figure is extremely high when comparing parking provision to the HCC Supplementary Planning Guidance, Car Parking which suggests the following maximum parking provision.

Maximum Car Parking Provision – HCC SPG, Car Parking		
Max Car Parking Standards	**Number of Staff or Pupils**	**Total Car Parking Spaces**
1 space per full-time member of staff (assuming 1 member for each 30 pupils, plus head teacher)	50 Staff	50 spaces

1 space per 100 pupils	1459 Pupils	15 spaces
1 space per 20 pupils under 17 years old (Assume Yrs 7 to 11 plus ¼ of total 6th Form)	1265 Pupils	63 spaces
1 space per 8 pupils over 17 years old (Assume ¾ of total 6th Form)	194 Pupils	24 spaces
	Total	**152 spaces**

3.5.5. Experience of parking surveys at secondary schools in Hertfordshire suggests that the HCC SPG maximum standard is generally relatively reflective of observed parking demand on sites.

3.5.6. Therefore, it is assumed that the Broxbourne standard makes full allowance for parent parking as well as staff and visitor parking.

3.5.7. It should be noted that the HCC SPG also makes allowance for 6th form parking. If these are removed from the calculation, we would expect staff only parking as follows:

Maximum Car Parking Provision – HCC SPG, Car Parking		
Max Car Parking Standards	**Number of Staff or Pupils**	**Total Car Parking Spaces**
1 space per full-time member of staff (assuming 1 member for each 30 pupils, plus head teacher)	50 Staff	50 spaces
1 space per 100 pupils	1459 Pupils	15 spaces
1 space per 20 pupils	1459 Pupils	73 spaces
	Total	**138 spaces**

3.5.8. Based upon the above calculations we would suggest the following total parking requirements for the site:

- Staff Parking: **138 Spaces**
- 6th Form Parking: 152 – 138 = **14 spaces**
- Parent Parking: 342 - 152 = **190 spaces**

3.5.9. It should be noted that if no parking is provided for 6th Form pupils on site, it is highly likely that pupils will park their cars on local roads surrounding the site, which has an impact on local residents. Therefore, it is strongly recommended that a small area is provided on site for 6th form parking, and that a permit system is utilised to ensure that pupils are not encouraged to utilise their car when they live within easy walking distance of the site.

3.5.10. Based upon DfE guidance, the Pupil:Adult Ratio at Local Authority Maintained Secondary Schools is 10.4:1, and at Secondary Academies is 10.6:1. This includes assistants, admin and other staff as well as qualified teachers. Therefore, 1459 pupils would be expected to have a total staff number of around 140. On this basis, maximum parking provision of 138 spaces for staff would seem reasonable, with the additional 14 spaces provided for 6th form pupils to prevent overspill onto surrounding roads.

Monitoring

3.5.11. Monitoring of parking demand will be carried out to determine whether there is an overprovision of spaces following full occupation of the site. At that time, any surplus parking spaces should be considered for landscaping or additional cycle parking in coordination with the School Travel Plan (STP), to encourage travel by means alternative to the private car.

Disabled Parking

3.5.12. There is a requirement to provide disabled parking spaces at 5% of the total parking on site. Based upon a total of 152 spaces to be provided on site, 8 disabled spaces will be required.

Electric Vehicle Parking

3.5.13. It is recommended that electric vehicle charging points are provided for 10% of the parking spaces to encourage the use of electric vehicles over petrol and diesel vehicles. On this basis, 15 spaces would have electric charging points.

3.6. Cycle Parking

3.6.1. Broxbourne Borough Council cycle parking standards state that the minimum requirement is 1 space per 10 full time staff plus 1 space per 5 students. Assuming 2 full time members of staff for each class, plus the head teacher, there would be

approximately 98 full time members of staff. Therefore, cycle parking provision should be as follows:

- 1 space for every 10 staff = 10 spaces
- 1 space per 5 students = 291 spaces

3.6.2. High provision of cycle parking will reflect HCC's aspiration to minimise travelling to school by car to this site, particularly bearing in mind the very local catchment area associated with the school.

3.6.3. Cycling will be promoted through the STP. Showers and changing facilities including lockers should be provided to encourage staff to cycle to school.

3.7. Bus and Coach Access

3.7.1. In order to accommodate buses and coaches, suitable waiting and turning facilities will need to be provided on, or in the vicinity of the school site. Final arrangements will be dependent upon the location of the access, which will need to be agreed with HCC Highways and the Planning Authority.

3.7.2. The proposed minimum road width assumed for two-way bus movements is 6.1m. Assessment of the local road network has identified that Church Lane is currently too narrow in parts to accommodate the required width, particularly as footways would also need to ideally be wider to accommodate the increase in pedestrians travelling to and from the school site. Alternative routes into the site have been considered in Section 3.3.

3.8. Community Uses

3.8.1. There is potential for some community uses to take place at the school during evenings and weekends. Given that the activities will generally be outside the typical peak periods on the network, and peak periods associated with school travel, no further assessment has been undertaken in terms of highways impact and parking provision relating to community uses on the site at this stage.

4. Appraising the Highways Impact of the Proposals

4.1. Approach

4.1.1. The proposed school is intended to cater for current and future demand in the local area. Drawing ST-2462-04-Pupil Distribution, provided in **Appendix G**, has been prepared to identify an assumed distribution of pupils based upon information provided by HCC which relates to possible future developments in the area. For confidentiality reasons, we are unable to present the HCC information in our report.

4.2. Pupil Trip Generation

4.2.1. It has been identified from similar assessments that the modal travel choices by pupils travelling from certain distances may be as follows:

Typical Secondary School	Percentage of Pupils Travelling by each mode within specific distance band		
	Car	Walk/Cycle	Bus
0 – 1km	5%	95%	0%
1km – 2km	17%	79%	4%
2km – 5km	34%	20%	46%
5km +	57%	0%	43%

4.2.2. Drawing ST-2462-04-Pupil Distribution identifies potential modal trip generation associated with the assumed pupil distribution, enabling an assessment of the likely number of vehicles likely to arrive at the site. This assessment suggests that 301 pupils would travel by car, which equates to 20.6% of the total number of pupils. This is considered reasonable in terms of secondary school travel.

4.2.3. As there would be a level of car share, the 301 pupils travelling by car would be expected to generate 215 parent/pupil cars. Parking calculations have identified that 14 of these cars are expected to be 6th form vehicles which would be parked on site.

4.2.4. Of the remaining 201 cars, these would not be expected to arrive all at the same time, due to varying travel patterns, school clubs and the like. The parking calculations identify a requirement for 190 parent/pupil parking spaces, which would

allow for 95% of parents to be parked at any one time. Stomor consider this to be excessive. The maximum amount of parent parking provision recommended would be 70%, which would equate to 141 vehicles. It should also be noted that many parents will not leave their car parked to accompany children into or out of school. Therefore, providing there is space for vehicles to be stacked, formal parking would not be necessary for all 141 vehicles.

4.2.5. The vast majority of pupil trips (61.4%) would be expected to travel on foot or by bicycle. Analysis of likely desire lines has been carried out and are identified on drawing ST-2462-05, provided in **Appendix H**, based upon the pupil origins identified on drawing ST-2462-04.

4.2.6. Drawing ST-2462-05-Desire Line Analysis, identifies alternative routes which would need to be considered at later stages in terms of suitability for the predicted volumes of pupils and suitability for cyclists. For example, Public Footpath 51 (PROW 51) is very narrow and while it provides a direct link from High Road into the centre of the site, it would be unsuitable for cyclists or large volumes of pedestrians. Widening would not be possible as the path is constrained in width by private properties on either side.

4.2.7. Therefore, it is anticipated that the majority of pedestrians travelling from the south would travel via Queens Head Walk and Church Lane, unless a new pedestrian/cycle access is provided via Huntingdon Close. Access via Church Lane would require footway widening, and possibly also a new footbridge (accommodating pedestrians and cyclists) over New River on the south side of Church Lane. Access via Huntingdon Close would require a new footbridge (accommodating pedestrians and cyclists), and would potentially attract parents' parking within the cul-de-sac dropping off or collecting pupils.

4.2.8. During preparation of a Transport Assessment for the site taken forward for development, further consideration will need to be given to the suitability of walking routes, the potential for parent drop-off in the vicinity of pedestrian access points, and the impact that unsatisfactory walking routes could have on car trip generation.

4.3. Parent Parking

4.3.1. In order to minimise congestion in the vicinity of the school site, use of nearby car parks for drop off and collection of pupils is strongly recommended. However, where no suitable park and stride facilities are within a reasonable distance of the school,

parent parking and turning facilities should be provided on-site to avoid congestion on the highway and maximise the safety of vehicle turning movements.

4.3.2. Directly to the north of the site is a large car park associated with Wormley Playing Fields. This car park has capacity for approximately 100 parked vehicles, and would be suitable for parent parking subject to the following:

- Agreement with Broxbourne Borough Council for use of the car park by parents.
- Improvements to the existing access arrangements in terms of visibility and possibly other geometric features.
- Improved pedestrian facilities within the car park
- Provision of a suitable crossing on Church Lane.

4.3.3. As identified in paragraph 4.2.4, providing there is space for vehicles to be stacked, formal parking would not be necessary for all vehicles. Therefore, the Wormley Playing Fields car park could potentially accommodate a significant majority, if not all parents' vehicles during pick up and drop off periods.

4.3.4. However, if the proposed staff and bus access to the site is taken from the southern side of the site from the link road between the A10 and A1170, it would be prudent to provide a parent drop-off and turning facility via this access in order to distribute traffic as much as possible. This would reduce the two way flow of traffic along High Road associated with the school, and minimise the volume of school traffic passing along Church Lane.

4.4. Staff Trip Generation

4.4.1. The staff trip generation assessment is based upon an assumption that staff car trips to the site will be equal to the proposed parking provision on the site. Based upon calculations in Section 3.5, approximately 138 staff vehicles would be expected to arrive at the site although not all of these movements would be expected during the peak hours.

4.4.2. Movements into and out of the school throughout the day are expected to be minimal, associated with part-time staff, midday supervisors, visitors and some deliveries and services vehicles arriving and departing.

4.4.3. It should be assumed for the sake of robustness that all of the trips are single-occupancy, however, there will be a target in the STP to encourage staff car sharing.

4.5. Staff Trip Distribution

4.5.1. The distribution of staff trips has been determined by consulting the most recent data for method of travel to and from work extracted from the 2001 Census though the 'Nomis' website. Incoming commuting flows to places of work in Broxbourne from local authority area are identified as follows:

Broxbourne	39.0%
East Hertfordshire	12.1%
Enfield	7.4%
Epping Forest	6.0%
Harlow	4.7%
Welwyn Hatfield	2.4%
North Hertfordshire	1.5%
Stevenage	1.5%
Other London	9.7%
Other Essex	3.1%
Other Hertfordshire	3.0%
Other elsewhere	9.6%

4.5.2. From the above information, it has been assumed that based upon an access off Church Lane, approximately 80% of staff would arrive from south of the school and 20% would arrive from the north. Vehicle trip distribution will need to be considered in further detail during preparation of a Transport Assessment in order to assess the impact of vehicle movements on links and junctions in the vicinity of the site.

4.6. Impact on the Highway Network

4.6.1. The predicted staff and parent vehicles along with potential additional school buses generated by the proposed 8FE school, have been identified on Drawing ST-2462-07-Junction Assessment, based upon the distributions described above. This drawing is provided in **Appendix I.**

4.6.2. Calculations of pupil trip distribution have taken into account the following assumptions/factors:

- Assumed 14 vehicles are 6th form vehicles, which will remain on site.

- Assumed 50% of parents return home and 50% continue with an onward journey. Onward journeys have been considered in relation to Census Data relating to commuting movements out of Broxbourne.

- Some vehicles are already on the network, travelling to/from work. These have been deducted from the onward movements at the junction between Church Lane and High Road.

- Assumed all traffic is distributed along Church Lane.

- All traffic approaching High Road from Church Lane must turn left. This results in a large number of U-turns at the roundabout with Cozens Lane East to the north. This junction will need to be assessed as part of a Full Transport Assessment.

4.6.3. Existing traffic flows were surveyed on Wednesday 30th September 2015, and traffic flow diagrams associated with these surveys are provided in **Appendix J**. The table below summarises existing traffic flows on High Road and Church Lane.

	AM Flows 8:00am – 9:00am			School PM Flows 2:45pm –3:45pm		
	N-bound	S-bound	Two-Way	N-bound	S-bound	Two-Way
High Road (north)	843	810	1653	842	864	1706
High Road (south)	876	790	1666	803	875	1678
	E-bound	W-bound	Two -Way	E-bound	W-bound	Two -Way
Church Lane	63	143	206	80	68	148

4.6.4. At this stage, consideration has been given to the impact on the Church Lane junction with High Road and Westlea Road, assuming that all traffic was to travel via this route. However, assessment of the potential access locations and constraints on Church Lane suggest that access for all vehicle via this route may not be suitable.

4.6.5. Analysis of this junction has been carried out using the Junctions9 software. The junction has been assessed in the base year of 2015, in the future year of 2020 with just background growth and also in the future year with school traffic added.

4.6.6. Tempro (Version 6.2) was used to forecast the growth from 2015 to 2020. Using the average origin-destination rates for car drivers in the Cheshunt area (26UB1) the AM peak growth rate is 2.5% and the Interpeak (covering the school PM peak) growth rate is 4.1%.

4.6.7. The results of the analysis are presented below in terms of the maximum queue, delay and Ratio of Flow to Capacity (RFC) on each arm. Full output files can be provided upon request.

4.6.8. An RFC of 0.85 indicates that the junction is operating with approximately 15% of spare capacity, and is the value normally used to assess that new junctions would operate satisfactorily. This value of 0.85 will therefore be used as a benchmark to assess this junction.

4.6.9. AM Peak 2015 Base Model

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	0.1	9.73	0.10
Westlea Road	0.1	9.73	0.10
High Road South	0.0	0.00	0.00
Church Lane	0.2	8.99	0.15

4.6.10. AM Peak 2020 Background

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	0.1	9.78	0.11
Westlea Road	0.1	9.96	0.10
High Road South	0.0	0.00	0.00
Church Lane	0.2	9.18	0.15

4.6.11. AM Peak 2020 Total Traffic with Development

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	1.1	17.57	0.49
Westlea Road	0.2	14.68	0.14
High Road South	0.0	0.00	0.00
Church Lane	0.2	25.48	0.68

4.6.12. School PM Peak 2015 Base Model

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	0.1	8.85	0.06
Westlea Road	0.1	9.23	0.10
High Road South	0.0	0.00	0.00
Church Lane	0.2	9.30	0.19

4.6.13. School PM Peak 2020 Background

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	0.1	9.09	0.07
Westlea Road	0.1	9.60	0.11
High Road South	0.0	0.00	0.00
Church Lane	0.2	9.59	0.20

4.6.14. School PM Peak 2020 Total Traffic with Development

Arm	Queue (Veh)	Delay (s)	RFC
High Road North	0.3	11.47	0.21
Westlea Road	0.1	11.55	0.13
High Road South	0.0	0.00	0.00
Church Lane	3.2	34.04	0.77

4.6.15. The tables above show that the junction should continue to operate within its capacity in both the AM and School PM peak hours in the future year of 2020 with development traffic added. The Church Lane arm may be expected to have a short queue of on average 2 to 3 vehicles in the AM and School PM peaks respectively, but this is sufficiently short that the junction would continue to provide an acceptable level of service. The maximum RFC values are 0.68 and 0.77 in the AM and School PM peaks, which are under the 0.85 threshold previously established.

4.6.16. As Church Lane is left turn only onto High Road, it is expected that the roundabout between High Road and Cozens Lane East is likely to experience further 'U' turning in future. It is recommended that this junction is assessed at during preparation of the Transport Assessment prior to submission of a planning application. It would

also be prudent to assess the junction between High Road, the A10 and Great Cambridge Road.

4.6.17. The distribution of traffic will be dependent upon the position of the site access for staff and buses, and proposed parent drop-off facilities. Therefore, once the site access and parking arrangements are agreed new analysis will need to be carried out on affected junctions.

5. Summary

5.1.1. Church Lane is currently too narrow in parts to accommodate two-way bus movements, particularly as footways would also need to ideally be wider to accommodate the increase in pedestrians travelling to and from the school site.

5.1.2. It is generally considered that access from the Link Road between the A10 and A1170 could be the most suitable option, subject to a number of considerations and significant amount of further work in order to determine its viability.

5.1.3. Should any investigations identify that access cannot be technically achieved via this route, further consideration may need to be given to one-way routes between Huntingdon Close and Church Lane.

5.1.4. It is noted that there are limited existing pedestrian access options within the southern part of the site. Therefore, in order to make use of existing public rights of way and existing pedestrian infrastructure, the school buildings would be best located within the north eastern part of the site.

5.1.5. Pedestrian/cycle access via Church Lane would require footway widening, and possibly also a new footbridge (accommodating pedestrians and cyclists) over New River on the south side of Church Lane. Pedestrian/cycle access via Huntingdon Close would require a new footbridge and would potentially attract parents' parking within the cul-de-sac dropping off or collecting pupils.

5.1.6. The following parking provision is recommended for the site:

- Staff Parking: **138 Spaces**, including 8 disabled spaces.
- 6th Form Parking: **14 spaces**

5.1.7. The maximum amount of parent parking provision recommended equates to 141 vehicles. Providing there is space for vehicles to be stacked, formal parking would not be necessary for all 141 vehicles. On this basis, the Wormley Playing Fields car park could potentially accommodate a significant majority, if not all parents' vehicles during pick up and drop off periods. However, if the proposed staff and bus access to the site is taken from the southern side of the site from the link road between the A10 and A1170, it would be prudent to provide a parent drop-off and turning facility via this access in order to distribute traffic as much as possible. This would reduce the two way flow of traffic along High Road associated with the school, and minimise the volume of school traffic passing along Church Lane.

SITE

Rev	Description	Date	Drawn	Checked

Revisions

stomor
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Project

Land South of Church Lane, Wormley

Drawing Description

Site Location Plan

Scale	Date	Drawn By	Checked By
1:5000@A3	18.08.15	YK	-

Client

Architect

Notes
Do not scale off the drawing.
Only written dimensions should be taken.
Any discrepancies or errors should be brought to the attention of the engineer immediately.

Drawing Number

ST-2462-01

Nicola Morris

Subject: FW: Church Lane, Wormley - Bridge Weight Limit

-----Original Message-----
From: cschighways@hertfordshire.gov.uk [mailto:cschighways@hertfordshire.gov.uk]
Sent: 15 September 2015 15:35
To: Yolanda Kwaramba <Y.Kwaramba@stomor.com>
Cc: highway.structures@hertfordshire.gov.uk
Subject: Re: Church Lane, Wormley - Bridge Weight Limit

Hello Yolanda,

Thank you for your enquiry. We have checked the HCC records for Bridge No 1435 'White Horse' on Church Lane, Wormley. The bridge was constructed in 1976 to current design standards which are designed to take a 40 tonne loading. Any loading should be confined to the carriageway, not on the verges and If you are planning to take an abnormal load over the structure then we would ask that to follow current 'ab loads' procedures advising of the movement dates, load, vehicle & axle weights etc. HCC can then check and approve the movement.

HCC Structures can be contacted directly by email at highway.structures@hertfordshire.gov.uk if you require any further information.

Regards,

Kehoe Woodford
Engineering Assistant - Bridges and Structures Hertfordshire County Council, County Hall, Pegs Lane, Hertford, SG13 8DN
t: 01992 658299 Comnet / Internal: 58299

-----Original Message-----
From: Y.Kwaramba@stomor.com
Sent: 02-Sep-2015 12:51:56
To: cschighways@hertfordshire.gov.uk
Subject: Church Lane, Wormley - Bridge Weight Limit

Dear Sirs,

I am trying to determine whether an existing weight limit is in effect across the bridge over the New River as part of Church Lane, Wormley. I have attached a location plan for your reference.

There is currently no signage in place in the vicinity of the bridge, or adjacent road network, which indicate that a weight limit is in place. Could you please confirm whether there are weight restrictions over the bridge.

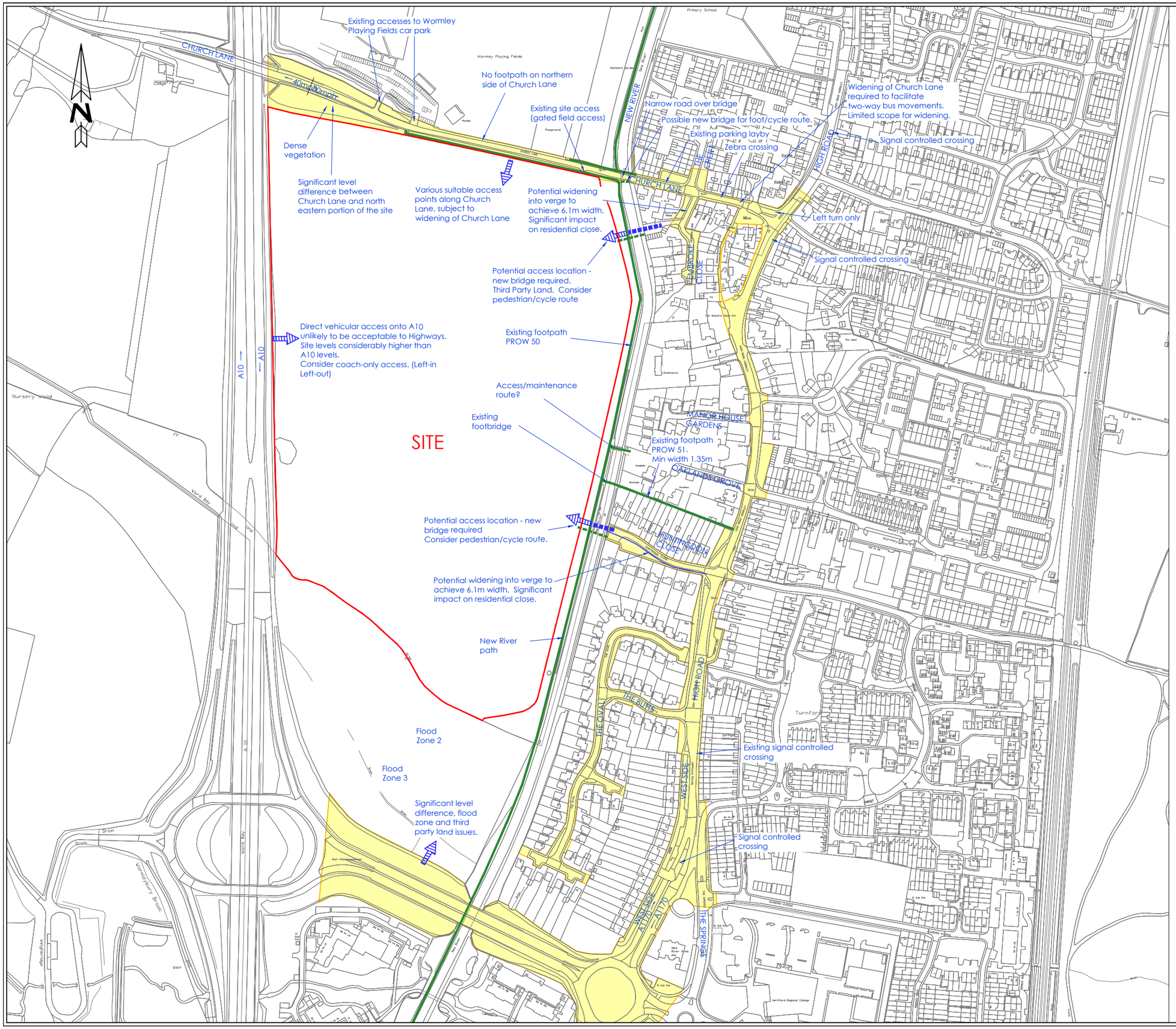
I would be grateful if you could provide me with the relevant information.

If you have any queries please do not hesitate to contact me.

Kind regards,

Yolanda Kwaramba

Graduate Engineer



Rev	Description	Date	Drawn	Checked

Revisions

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Project

Land South of Church Lane, Wormley

Drawing Description

Highways and Access Appraisal

Scale	Date	Drawn By	Checked By
1:4000@A3	19.08.15	YK	-

Client

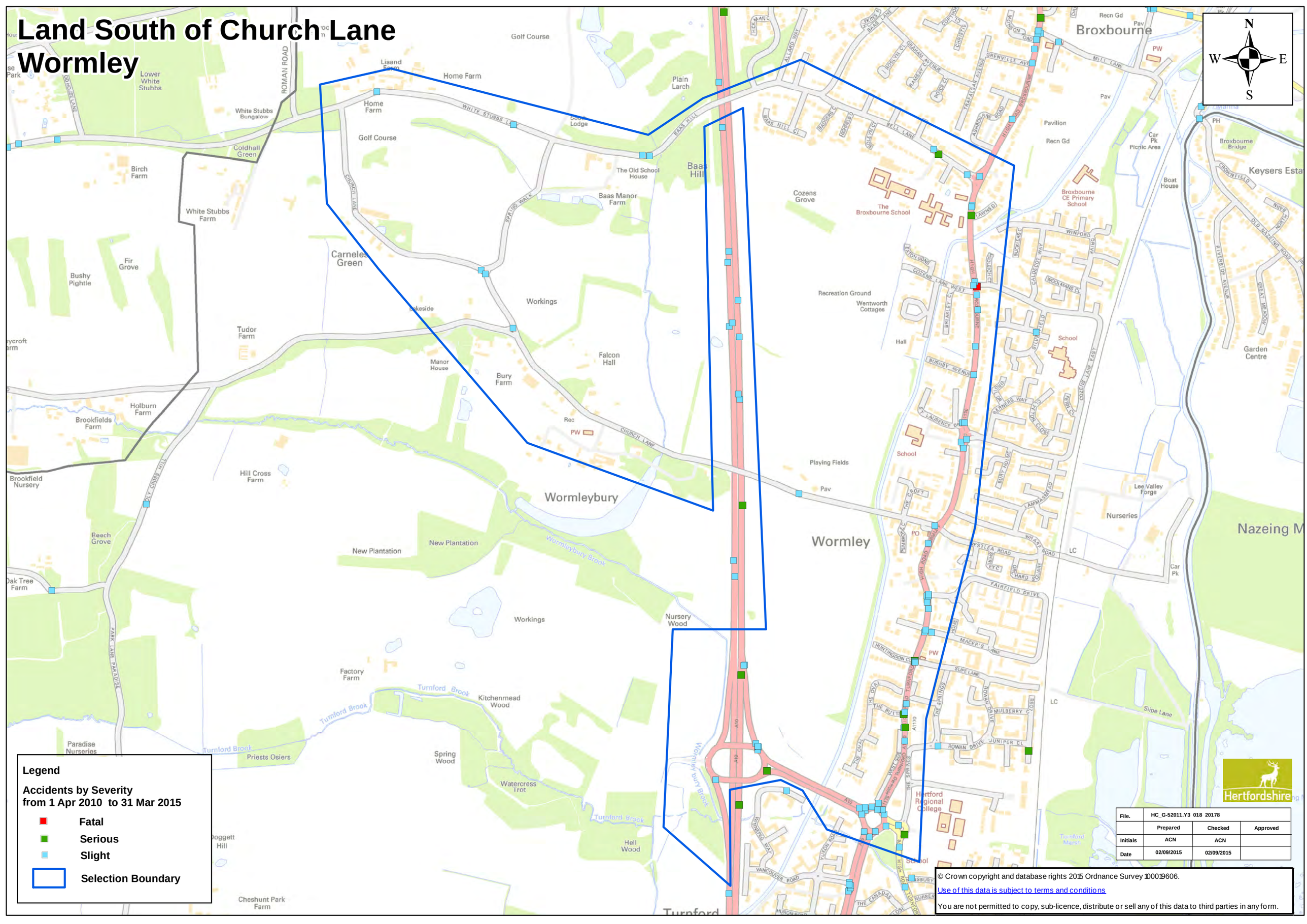
Architect

Notes
Do not scale off the drawing.
Only written dimensions should be taken.
Any discrepancies or errors should be brought to the attention of the engineer immediately.

Drawing Number

ST-2462-02

Land South of Church Lane Wormley

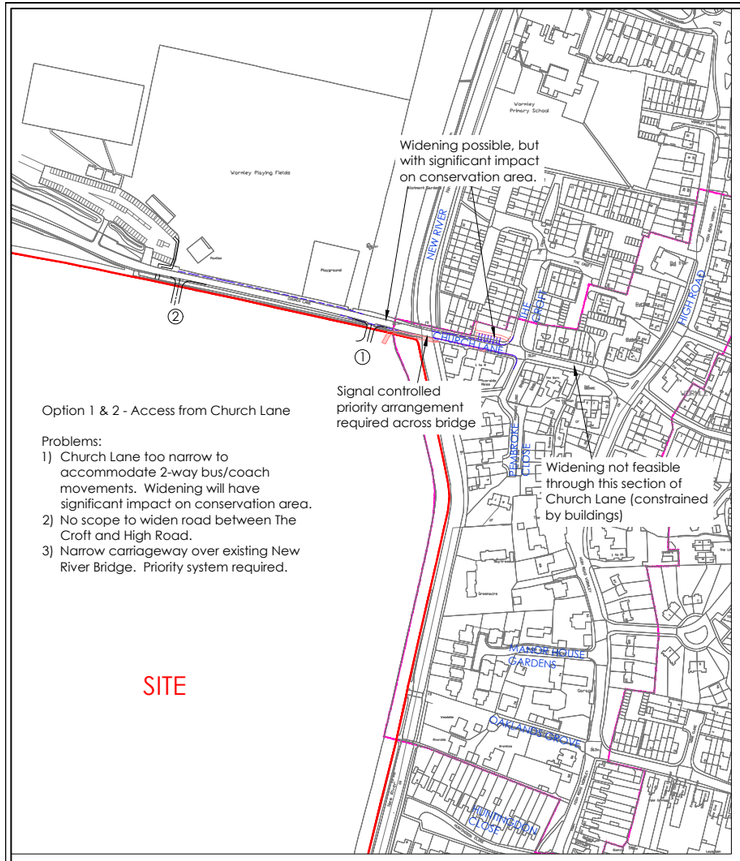


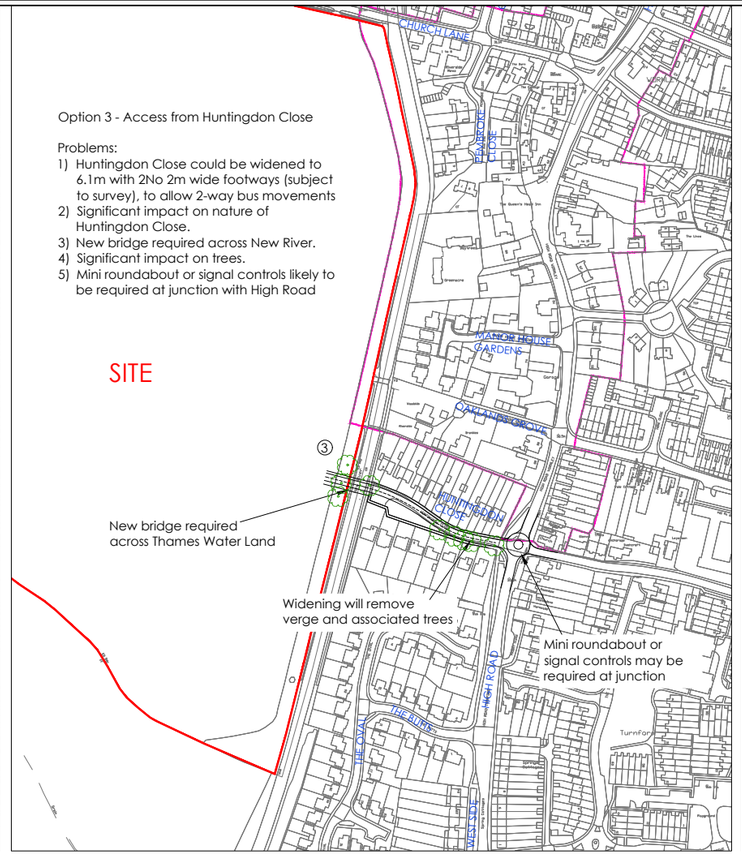
Legend

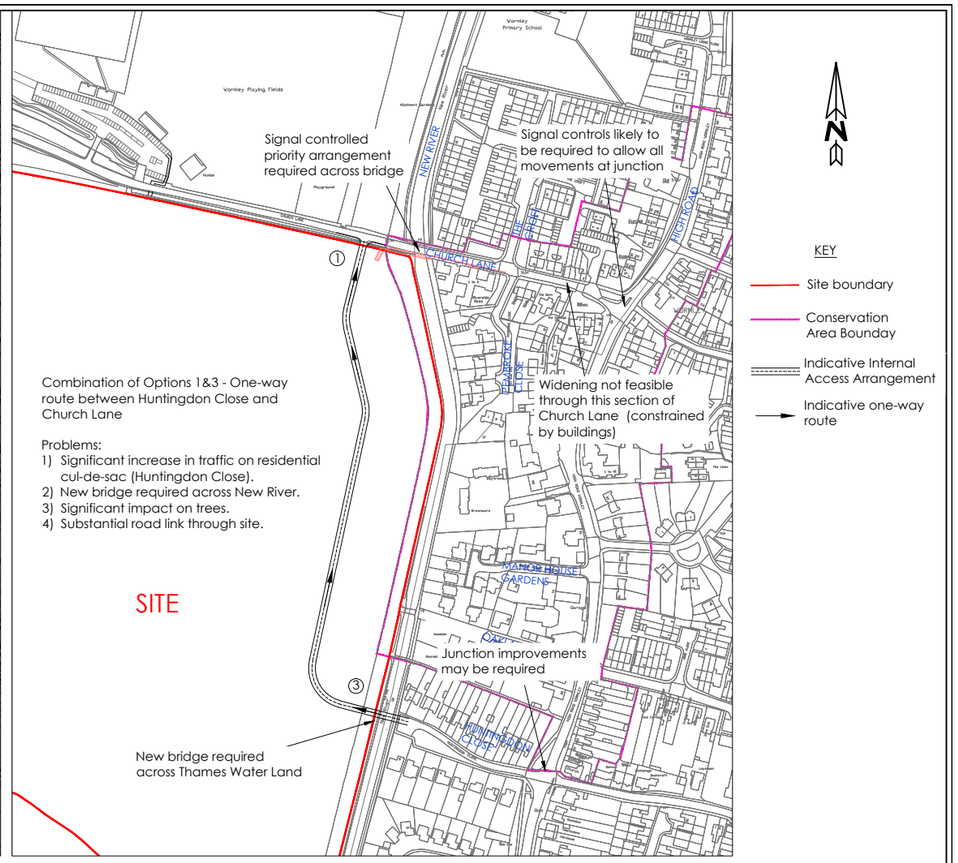
Accidents by Severity from 1 Apr 2010 to 31 Mar 2015

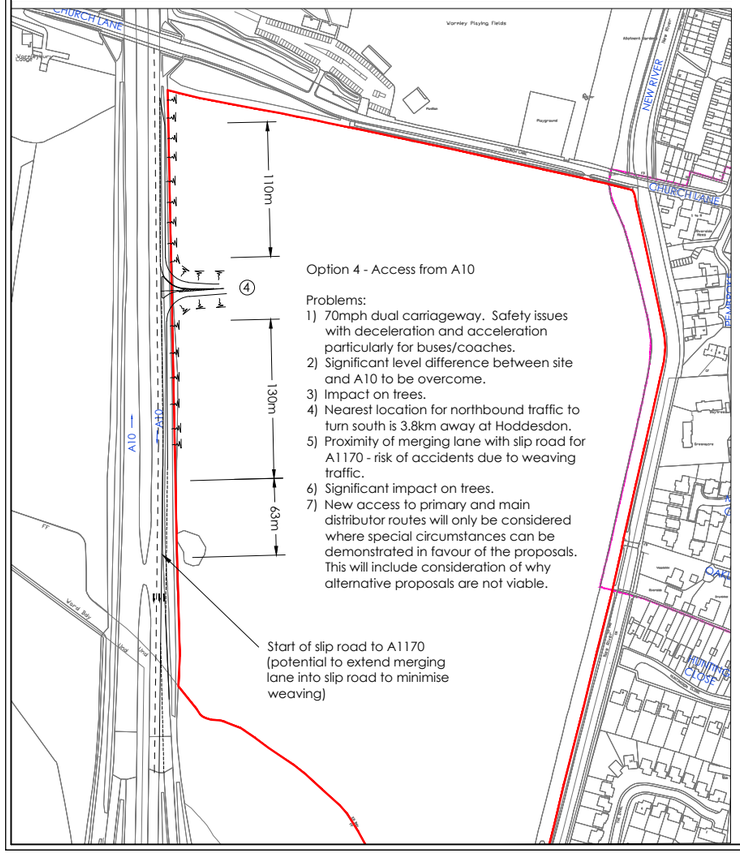
- Fatal
- Serious
- Slight
- Selection Boundary

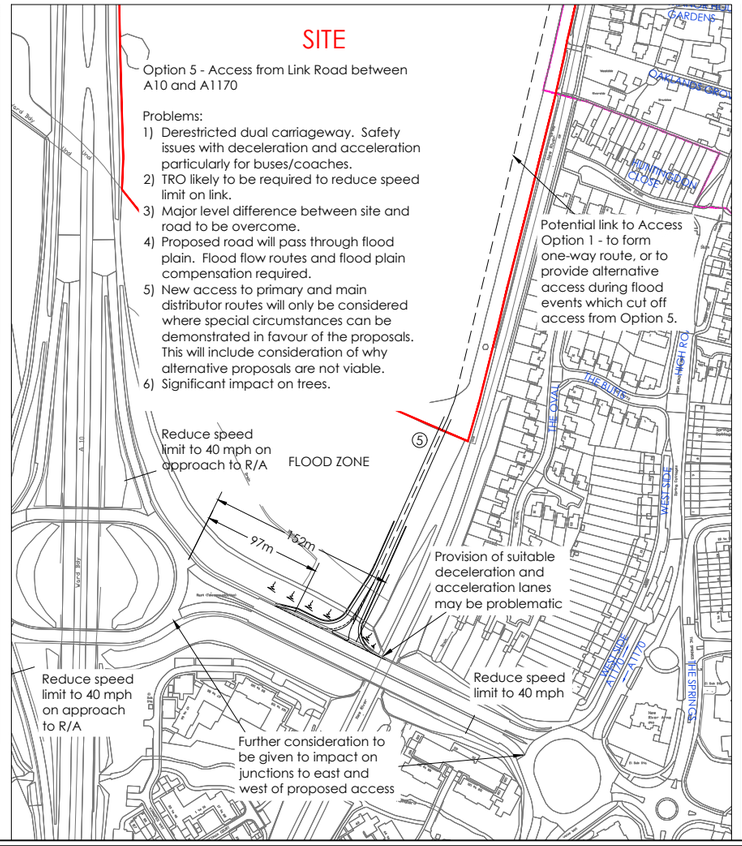
File.	HC_G-52011.Y3 018 20178		
	Prepared	Checked	Approved
Initials	ACN	ACN	
Date	02/09/2015	02/09/2015	

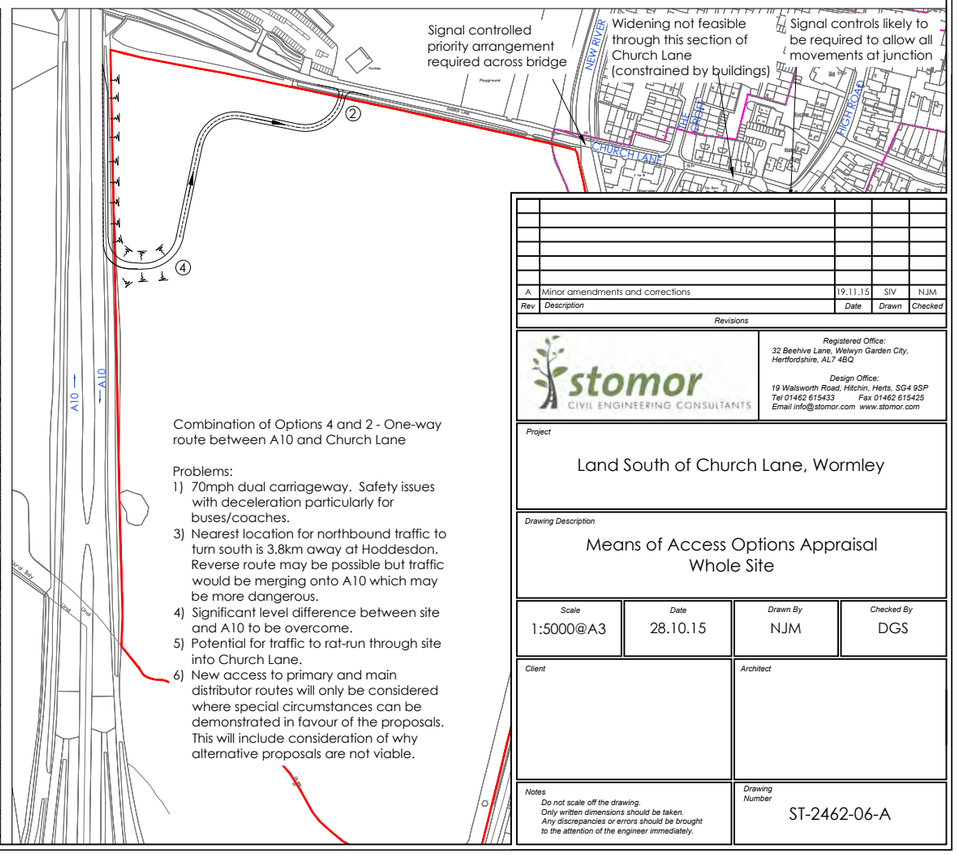












Rev	Description	Date	Drawn	Checked
A	Minor amendments and corrections	19.11.15	SIV	NJM

Revisions

stomor
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Project

Land South of Church Lane, Wormley

Drawing Description

Means of Access Options Appraisal
Whole Site

Scale	Date	Drawn By	Checked By
1:5000@A3	28.10.15	NJM	DGS

Client

Architect

Notes
Do not scale off the drawing.
Only written dimensions should be taken.
Any discrepancies or errors should be brought to the attention of the engineer immediately.

Drawing Number
ST-2462-06-A