

DATED 5 JUNE 2024

SUFFOLK COUNTY COUNCIL (1)

- and -

SANSOVINO DEVELOPMENTS LIMITED (2)

AGREEMENT

made pursuant to Section 278 of the Highways Act 1980
and any other enabling power relating to
the development of land at Hatchfield Farm, Newmarket, Suffolk
(A14 Newmarket Junction 37)

Nigel Inniss
Head of Governance
Suffolk County Council
8 Russell Road Ipswich
Suffolk IP1 2BX

Ref: 73408/JL

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THIS AGREEMENT is made the 5th day of JUNE 2024
BETWEEN the following parties :-

- (1) SUFFOLK COUNTY COUNCIL of Endeavour House 8 Russell Road Ipswich Suffolk IP1 2BX ("the County Council"); and
- (2) SANSOVINO DEVELOPMENTS LIMITED (company number 11886795) of Carlyle House, 78 Chorley New Road, Bolton, BL1 4BY ("the Developer").

RECITALS AND DEFINITIONS

- (A) In this Agreement unless the context otherwise requires the following words shall have the following meanings :-

"1980 Act"	Means the Highways Act 1980 (as amended)
"Approved Contractor"	Means the contractor(s) approved by the County Council for carrying out the Highway Works of the value and complexity proposed
"Approved Sub-Contractor"	Means the sub-contractor(s) approved by the County Council for carrying out the Highway Works of the value and complexity proposed
"CDM Regulations"	Means the Construction (Design and Management) Regulations 2015 (SI 2015/51)
"Certificate of Final Completion"	Means any of the certificates referred to in paragraph 15.3 of Schedule I
"Certificate of Substantial Completion"	Means any of the certificates referred to in paragraph 14.2 of Schedule I
"Commuted Sums"	Means the sum of 148,869.12 (one Hundred and Forty-Eight Thousand, Eight Hundred and Sixty-Nine Pounds and Twelve Pence) which is calculated, as set out in paragraph 18.1 on Schedule I towards the cost of the County Council's future maintenance liability of the Highway Works

"Completion Certificate"	Means the Completion Certificate issued pursuant to the Section 6 Agreement and as defined therein
"Contract"	Means the contract or contracts in respect of each and all of the Highway Works
"Contractor"	Means the contractor or contractors who have been awarded the Contract to execute the Highway Works. For the avoidance of doubt the aforementioned definition does not include any subcontractor
"County Highway Works"	means the Highway Works in so far as they relate to highway maintained by the County Council as shown edged red on drawing number ST-3031-701-F and not including the Trunk Road Works
"Development"	Means the development to be carried out pursuant to the Permission
"Director"	Means the County Council's Executive Director of Growth, Highways and Infrastructure or other officers of the County Council acting under his hand
"Highway Works"	Means the works collectively or individually as the context requires which are set out in Schedule II of this Agreement and shown in the Works Drawings including the Trunk Road Works
"Highway Works Supervisor"	Means a suitably qualified Highways Engineer with recent experience in the design and construction of major highway improvement works
"Mortgagees"	means both the First Mortgagee and the Second Mortgagee
"National Highways"	Means National Highways Limited the body appointed by the Secretary of State for Transport as a strategic highways company under section 1 of the Infrastructure Act 2015 and statutory instrument 2015/376 or any other body so appointed registered with company number 09346363 of Bridge House 1 Walnut Tree Close Guildford Surrey GU1 4LZ

"Performance Cash Deposit A"	Means the cash deposit for all of the Highway Works being the Performance Figure A such cash deposit to be held by the County Council should the Developer default in the execution of its obligations to carry out the County Highway Works and to maintain the same in accordance with the provisions of this Agreement then the County Council will apply the Performance Cash Deposit A to the necessary works in satisfaction thereof (subject to the provisions hereinafter contained) to carry out the County Highway Works and maintain the same as aforesaid.
"Performance Figure A"	Means the sum of £682,947.10 (Six Hundred and Eighty-Two Thousand, Nine Hundred and Forty-Seven Pounds and Ten Pence) being the relevant Tender Sum plus 10 per cent in respect of the County Highway Works and as set out in each of the Contracts
"Performance Cash Deposit B"	Means the cash deposit for all of the Highway Works being the Performance Figure B such cash deposit to be held by the County Council should the Developer default in the execution of its obligations to carry out the Trunk Road Works and to maintain the same in accordance with the provisions of this Agreement then the County Council will apply the Performance Cash Deposit B to the necessary works in satisfaction thereof (subject to the provisions hereinafter contained) to carry out the Trunk Road Works and maintain the same as aforesaid.
"Performance Figure B"	Means the sum of £209,478.00 (Two Hundred and Nine Thousand, Four Hundred and Seventy-Eight Pounds) being two hundred percent (200%) of the relevant Tender Sum in respect of the Trunk Road Works to the highway and as set out in each of the Contracts
"Permission"	Means the planning permission granted on appeal and dated 12 March 2020 with reference number APP/H3510/V/14/2222871 in respect of the Site together with any modification of it

"Road Safety Audit"	Means the evaluation of each and all of the Highway Works during design and at the end of construction to identify potential road safety problems that may affect any users of the highway and to suggest measures to eliminate or mitigate those problems in accordance with Department for Transport standards or by the County Council as agreed by the Director
"Section 6 Agreement"	Means an agreement entered into pursuant to Section 6 of the 1980 Act between the County Council and National Highways to facilitate the Trunk Road Works as appended to this Agreement
"Site"	Means land situated at Hatchfield Farm, Newmarket Suffolk shown edged red for identification only on the attached plan no ST-3031-130
"Specification"	The County Council's "Specification for Estate Roads" dated May 2007 (or later amendment current at the date of this Agreement) so far as this is consistent with the Works Drawings and description in Schedule II (subject to any variations agreed in writing by the Director)
"Sub-contractor"	Means the sub-contractor(s) working for the Contractor(s) who have been contracted to execute the Highway Works
"Substantial Completion"	Means complete to the reasonable satisfaction of the Director and so that the Highway Works can be used for the purpose and operate in the manner for which they were designed
"Supervision Plan"	Means a plan covering the day-to-day supervision and control of the Highways Works to ensure they are constructed in a safe and efficient manner and in accordance with the Technical Standards, Works Drawings and Specification
"Traffic Management Measures"	means the measures required to ensure the proper management of traffic during the construction of the Highway Works in accordance with the provisions of Chapter 8 Part 1 and 2, including but not limited to section 16 and section 17 of the Traffic Management Act 2004 which must include (but are

not limited to) the signing of diversion routes reasonably anticipated to be used by the public during the construction of the Highway Works

"Technical Standards" Means the standards necessary to ensure complete conformity with all UK primary and secondary legislation (including by-laws) all guidance standards and codes of practice issued by the Department for Transport the County Council statutory undertakers and relevant professional institutes the Road Safety Audit and formal instructions issued by the Director from time to time during the design and implementation of the Highway Works and for the avoidance of doubt this shall include the Traffic Signs Regulations and General Directions 2016 and BS5489 in relation to the design of any street lighting

"Tender Sum" Means (as the context dictates) either the sum of £620,861.00 (Six Hundred and Twenty Thousand, Eight Hundred and Sixty-One Pounds) for the County Highway Works or £104,739 (One Hundred and Four Thousand, Seven Hundred And Thirty-nine Pounds) for the Trunk Road Works (including the costs associated with statutory undertakers work and traffic management) agreed by the Director for carrying out the Contract by the Contractor

"Trunk Road Works" Means the Highway Works in so far as they lie upon the A14 slip roads maintained by National Highways which are shown edged blue on drawing ST-3031 701 Rev F annexed hereto

"Works Drawings" Means the attached drawings bearing the numbers referred to in Schedule III or any subsequent revision of them which has been approved or requested by the Director and which relate to the Highway Works

(B) In this Agreement unless the context otherwise requires :-

- (i) Words importing the singular meaning where the context so admits include the plural meaning and vice versa; and

- (ii) Words of the masculine gender include the feminine and neuter genders and words denoting actual persons include companies, corporations and firms and all such words shall be construed interchangeably in that manner; and
 - (iii) "party" or "parties" means a party or parties to this Agreement; and
 - (iv) references to any party shall include the successors in title and assigns of that party; and in the case of the County Council the successors to its statutory functions; and
 - (v) where a party includes more than one person any obligations of that party can be enforced against all of them jointly and severally unless there is an express provision otherwise; and
 - (vi) the headings and contents list in this Agreement shall not form part of or affect its construction; and
 - (vii) references to clauses schedules and paragraphs are references to clauses in and schedules to this Agreement and paragraphs in schedules to this Agreement; and
 - (viii) where a party or any officer or employee is required to give its consent approval or agreement to any specific provision in this Agreement such consent approval or agreement shall not be unreasonably withheld or delayed; and
 - (ix) any mention herein of any act or of any section regulation or statutory instrument shall be deemed to refer to the same source as at any time amended and where such act section regulation or statutory instrument has been replaced consolidated or re-enacted with or without amendment such mention shall be deemed to refer to the relevant provision of the updating consolidating or re-enacting act or section or regulation or statutory instrument
- (C) The County Council is the highway authority (except for trunk roads) for the purposes of the 1980 Act for the area within which the Site is situated and the Highway Works will be carried out
- (D) The Developer has the benefit of the Permission

- (E) The Developer is the registered proprietor with title absolute of the Site registered at the Land Registry under Title Number SK394724
- (F) National Highways is the highway authority for part of the highway affected by the Highway Works and they are not required to be party to this Agreement due to the Section 6 Agreement
- (G) The County Council and National Highways have entered into the Section 6 Agreement so National Highways can delegate its functions to the County Council for carrying out the Highway Works on the A14 being a trunk road and under this Agreement the County Council enable the Developer to carry out the Highway Works on its behalf
- (H) Having regard to the development plan and other material considerations the County Council considers it expedient in the interests of the proper planning of their area that the Highway Works need to be carried out to facilitate the Development and that entering into this Agreement will be of benefit to the public

NOW THIS DEED WITNESSES as follows:-

1 LEGAL EFFECT

- 1.1. This Agreement and the covenants that appear hereinafter are made pursuant to Section 278 of the 1980 Act Section 111 of the Local Government Act 1972 and Section 1 of the Localism Act 2011 and all other enabling powers to the intent that the provisions of this Agreement shall bind the Site and the parties hereto and all persons deriving title through or under them
- 1.2. This Agreement is a Deed. Any financial default under this Agreement will be registered as a Local Land Charge under section 278(5)(c) of the 1980 Act
- 1.3. No waiver (whether express or implied) by the County Council of any breach or default by the Developer in the performance or observance of any of the covenants, terms or obligations in this Agreement shall constitute a continuing waiver and no such waiver shall prevent the County Council from enforcing any of the covenants, terms or obligations or from acting upon any subsequent breach or default in respect thereof

- 1.4. Any provision of this Agreement which is or may be unlawful void or unenforceable shall to the extent of such unlawfulness invalidity or unenforceability be deemed severable and shall not affect any other provision of this Agreement
- 1.5. This Agreement is governed by and interpreted in accordance with English law and shall be determined in the Courts of England

2 NOTICES

2.1. Any notices or other written communication to be served or given by one party upon or to any other party under the terms of this Agreement shall be deemed to have been validly served or given if delivered by hand or sent by recorded delivery post or sent by the DX service to the party upon whom it is to be served or to whom it is to be given or as otherwise notified for the purpose by notice in writing provided that the notice or other written communication is addressed and delivered by hand or by recorded delivery post or by the DX service to the address of the party concerned as nominated in sub-clause 2.2. below

2.2. The address for any notice or other written communication in the case of each party to this Agreement shall be as follows:-

The County Council	Suffolk County Council Endeavour House 8 Russell Road Ipswich IP1 2BX marked for the attention of the Assistant Director of Governance, Legal and Assurance (or where the context requires the Executive Director of Growth, Highways and Infrastructure, Endeavour House 8 Russell Road Ipswich IP1 2BX)
The Developer	marked for the attention of Richard Gee, Carlyle House, 78 Chorley New Road, Bolton, BL1 4BY

2.3. Any notice or other written communication to be given by the County Council shall be deemed to be valid and effective if on its face it is signed on behalf of the County Council by a duly authorised officer

3 GENERAL

- 3.1. All works and activities to be carried out under the terms of this Agreement (including for the avoidance of doubt such works as are of a preparatory ancillary or of a maintenance nature) are (save where expressly provided otherwise) to be at the sole expense of the Developer and at no cost to the County Council
- 3.2. All consideration given and payments made in accordance with the provisions of this Agreement shall be exclusive of any VAT properly payable in respect thereof and in the event of VAT becoming chargeable at any time in respect of any supply made in accordance with the terms of this Agreement then to the extent that VAT had not previously been charged in respect of that supply the person making the supply shall raise a VAT invoice to the person to whom the supply was made and the VAT shall be paid accordingly
- 3.3. The County Council and their respectively duly authorised officers and agents may enter upon the land on which the Highway Works are being carried out at any reasonable time to ascertain whether the terms of the Agreement are being or have been complied with

4 ARBITRATION

- 4.1. Any dispute or difference arising between the parties as a result of this Agreement may be referred to the arbitration of a single arbitrator to be agreed upon between the parties or failing agreement within fourteen days after either of the parties has given to the other a written request requiring the appointment of an arbitrator to a person to be appointed at the request of either of the parties by the President for the time being of The Institution of Civil Engineers
- 4.2. Any reference to arbitration shall be undertaken in accordance with and subject to the provisions of the Arbitration Act 1996 save as follows:-
 - (a) the seat of the arbitration shall be at the County Council's offices in Ipswich Suffolk

- (b) where appropriate the arbitrator may consolidate arbitral proceedings
 - (c) with the parties' agreement the arbitrator may appoint experts or legal advisers
- 4.3 A party wishing to refer any such dispute or difference to arbitration shall notify the other party in writing of such intention without delay
- 4.4 The arbitrator shall act as a referee and not as an expert except in any case where the parties to a dispute or difference agree on the arbitrator when such parties may also agree that such arbitrator shall act as an expert
- 4.5 Subject to Sections 67 68 and 69 of the Arbitration Act 1996 the parties agree to be bound by the decision of the arbitrator

5 COVENANTS

- 5.1 The Developer covenants and warrants to the County Council that they have full power to enter into this Agreement and there is no other person other than the Mortgagees having a charge over or any other interest in the Site whose consent is necessary for the Developer to enter into this Agreement
- 5.2 The Developer hereby covenants and undertakes with the County Council that from the date of this Agreement it will (unless otherwise agreed by the County Council) carry out and comply with the obligations set out in Schedule I and the details set out in Schedules II and III hereto
- 5.3 The County Council without prejudice to its statutory powers and duties hereby appoints the Developer to act as its agent including under the Section 6 Agreement and gives to the Developer licence (in so far as is reasonably necessary for the Developer to perform the obligations under the terms of this Agreement) to enter into and upon and remain upon the highway to carry out the construction of the Highway Works within the timescales referred to in Schedule II hereto or such other period as may be agreed in writing by the Director, provided that this licence shall not extend to the Developer's successors in title or assigns unless otherwise

agreed in writing by the Director prior to that successor or assignee commencing work in the public highway

5.4 The Developer covenants with the County Council not to commence the Highway Works set out in Schedule II unless road space has first been booked with the County Council and National Highways

5.5 The Developer covenants with the County Council as highway authority to give:-

(a) written notice not less than three calendar months prior to works commencing (or as otherwise agreed with the County Council), in order that the County Council as highway authority has sufficient time to ensure that the commencement of works will cause the least disruption possible to road users and the County Council reserves the right to refuse consent and/or to stop or require the stopping of works under the terms of this Agreement and relevant legislation where the aforesaid notice period is not complied with

(b) written notice to the County Council not less than 20 day's prior to any access to any road or lane space required for the execution of the Highway Works to enable the County Council to provide this notice to National Highways in accordance with Clause 4.7 of the Section 6 Agreement

5.6 The Developer covenants with the County Council as highway authority to comply with the provisions of the New Roads and Street Works Act 1991, the Traffic Management Act 2004 and any amendments thereof

5.7 The County Council covenants with the Developer that on the date of issue of the Certificate of Final Completion the roads subject to the Highway Works shall thenceforth be, to the extent they are not already, adopted as highways maintainable at the public expense

6 MORTGAGEES' CONSENT

6.1 The Mortgagees acknowledge and declare that this Agreement has been entered into by the Developer with their consent and that the Site shall be bound by the obligations contained in this Agreement PROVIDED THAT

the Mortgagees shall otherwise have no liability under this Agreement unless they take possession of the Site in which case they too will be bound by the obligations as if they were persons deriving title from the Developer for only so long as they are a mortgagee in possession

7 THIRD PARTY RIGHTS

- 7.1 It is hereby agreed and declared that the provisions of Contracts (Rights of Third Parties) Act 1999 shall not apply to this Agreement

8 LAPSE AND TERMINATION

- 8.1 If the Highway Works have not been commenced within one (1) year from the date of this Agreement, save as this period is otherwise extended in writing by the Director at his discretion, then this Agreement shall lapse and be of no further effect (save to the extent already complied with) and the Developer agrees to pay to the County Council any costs properly and reasonably incurred by the County Council prior to the lapse of this Agreement (which have not already been paid) including but not limited to those costs set out in paragraph 19 of Schedule I to this Agreement
- 8.2 Where, in accordance with clause 8.1 above the Director, at his discretion, agrees in writing to an extension to the period of one (1) year after which this Agreement shall lapse, this Agreement shall lapse at the end of such period as agreed in writing by the Director where the Highway Works have not been commenced by the expiry of that extension period
- 8.3 Where the Section 6 Agreement is terminated this Agreement shall also immediately terminate save that such termination shall be without prejudice to any prior breach of this Agreement by either party to this Agreement or any accrued rights, indemnities, or remedies one party may have against the other

9 SECTION 6 AGREEMENT

- 9.1 Without prejudice to any express reference elsewhere in this Agreement to compliance with obligations contained within the Section 6 Agreement the Developer covenants that:

- (a) subject to clause 9.2 it will comply with the following clauses of the Section 6 Agreement as if the obligations placed upon the County Council were obligations placed upon the Developer: 4.1; 4.2, 4.3, 4.4; 4.5(a-g); 4.6, 4.7; 4.8; 5.2; 5.4; 6.3; 7.4(a-b); 8.2(a-d); 9.1(a-b), 11; 12; 13; and 15
- (b) it will provide whatever reasonable assistance the County Council requires of it (including the payment of any National Highways' costs arising under the Section 6 Agreement) in order for the County Council to comply with any obligations imposed upon the County Council by the Section 6 Agreement including but not limited to the following clauses of the Section 6 Agreement: 4.1; 4.6; 4.7; 4.8; 4.9; 5.1; 5.2; 5.3; 6.1; 6.2; 6.3; 7.1; 7.2, 7.3; 7.4; 8.2; 9.1; 9.2; 11; 12; 13; 14; 15; 16; and 17;

9.2 The County Council shall notify the Developer as soon as reasonably practicable of any notices demands or requests it receives from National Highways that might be reasonably necessary for the Developer to comply with clause 9.1 above.

In witness whereof this Agreement has been executed and delivered as a Deed on the date first written above

The COMMON SEAL of)
SUFFOLK COUNTY COUNCIL)
was hereunto affixed)
in the presence of)

A Duly Authorised Officer

Executed as a deed by)
SANSOVINO DEVELOPMENTS)
LIMITED acting by a director in the)
presence of:

• • • • •

Director

Signature of witness

.....

Name (in BLOCK CAPITALS)

.....

Address

• • • • •

.....

.....

Occupation of witness

.....

SCHEDULE I

1 THE DESIGN OF THE HIGHWAY WORKS

1.1 The design of the Highway Works shall be to the satisfaction of the Director with due consideration of the Technical Standards

1.2 No work on any of the Highway Works shall commence and no Contract for their construction shall be let until

1.2.1 full details of the design of the Highway Works to be commenced in the form of plans, drawings, specifications and other materials have been submitted to the Director together with the name of the principal designer (whom the Developer shall appoint for the full duration of the design and construction of each and all of the Highway Works) in accordance with the CDM Regulations and any codes of practice referred to therein

1.2.2 the Director has given his written approval in respect of the Highway Works Supervisor and Supervision Plan submitted to the County Council by the Developer such approval not to be unreasonably withheld or delayed

1.2.3 the Director has given his written approval and the County Council has obtained National Highway's written approval (in accordance with clause 4.1 of the Section 6 Agreement) to the Highway Works to be commenced and such approval shall not be given if the said plans, drawings, specifications and other documentation have not adequately addressed the issues raised in the pre-construction stages of the Road Safety Audit process and if given shall lapse if the Highway Works are not commenced within twelve (12) months of the date of the said Director's approval

1.3 If the Director does not propose to give his approval in relation to those matters referred to in paragraph 1.2 of this Schedule or the Director becomes aware that National Highways does not propose to give its approval in relation to those same matters he shall in each case as soon as possible in writing inform the Developer and if the Director requires

amendments or additions to the plans drawings specifications and other materials referred to in paragraph 1.2 of this Schedule these amendments shall be undertaken by the Developer at his own expense and a revised set of updated documents shall be re-submitted to the Director for his approval

- 1.4 Without prejudice to paragraph 1.2 of this Schedule, the Director shall not give his approval as referred therein until the Developer has paid the sum referred to in paragraph 19.1.3 towards the cost of checking the design of the Highway Works and inspecting the Highway Works. The Highway Works at all times shall be carried out in accordance with the plans, drawings, specifications and other materials which have received the Director's approval referred to in paragraph 1.2 of this Schedule and the Developer shall in the execution of the Highway Works comply or ensure that the Contractor complies with the Technical Standards

2 LETTING OF THE CONTRACT

- 2.1 No Contract shall be let until the Traffic Management Measures have been prepared by the Developer and approved in writing by the Director and by National Highways (in accordance with clause 4.1 of the Section 6 Agreement) ("the approved programme") and thereafter each of the Contracts will be offered to an Approved Contractor
- 2.2 The Contract to be let under paragraph 2.1 of this Schedule shall be let under JCT suite of contracts (and any amendments thereto shall be approved by the Director) and the Developer shall obtain the agreement of the Contractor to be bound by the agreed drawings in Schedule III
- 2.3 The Contract shall be awarded by the Developer subject to the Director having first given his written approval to the proposed chartered engineer(s) or other suitably qualified person(s) who shall be independent of the Contractor and will supervise the execution of the Highway Works by the Contractor
- 2.4 The Developer shall not award the Contract unless the Approved Contractor and the Approved Sub-Contractor/s concerned are insured throughout the period of the Contract (such period to include the maintenance period detailed in paragraph 15.1 of this Schedule) for public liability risks in the sum of at least ten million pounds (£10,000,000)

in respect of any single claim and the Developer shall ensure that the Contractor remains so insured throughout the period of the Contract and prior to the commencement of each or all of the Highway Works or any maintenance works carried out in accordance with paragraph 15.1 of this Schedule the Developer shall produce to the Director insurance policies fully covering the Developer's liability in respect of the matters set out in this Agreement

- 2.5 The Developer shall not sub-contract or assign the Contract without the written approval of the Director and any sub-contractor shall be an Approved Sub-Contractor

3 INSPECTION OF THE HIGHWAY WORKS

- 3.1 The Developer shall provide the Director with not less than twenty-four (24) hours nor more than seventy-two (72) hours notice (excluding weekends and bank holidays) of any intended execution of the Highway Works specifying the tasks to be carried out in accordance with the approved programme referred to in paragraph 2.1 of this Schedule
- 3.2 Without prejudice to the approved programme the Developer shall notify the Director in writing at least twenty-eight (28) days prior to the commencement of any work connected with statutory undertaker's equipment
- 3.3 The Developer shall during the progress of each and all of the Highway Works give to or procure for the Director and any person or persons duly authorised by him (including National Highways) free access on reasonable notice (being at least seventy-two (72) hours' notice save in case of emergency when no notice shall be required) to every part of the Highway Works and the Site and permit him or them to inspect the same as they proceed and all materials used or intended to be used therein and shall give effect to any reasonable and proper requirements made or reasonable and proper directions given by the Director to conform to the approved detailed plans Works Drawings and specification referred to in paragraph 1.2 of this Schedule
- 3.4 The Developer shall not cover up or put out of view any works forming part of the Highway Works without the approval of the Director and shall afford full opportunity for the Director to examine and measure any work

which is about to be covered up or put out of view and to examine foundations before permanent work is placed thereon and shall give at least seventy-two (72) hours' notice to the Director whenever any such work or foundations is or are ready or about to be ready for examination

3.5 The Director shall without unreasonable delay, unless he considers it unnecessary and advises the Developer accordingly, attend when required by the Developer for the purpose of examining such works or of examining such foundations

3.6 The Director shall for the purposes of paragraphs 3.1 to 3.5 be allowed reasonable access and admission to the Highway Works or the places where materials or plant for the Highway Works may be stored or in the course of preparation manufacture or use (unless such access or admission is refused due to circumstances beyond the control of the Developer)

4 TESTING OF MATERIALS

4.1 The Developer shall reimburse the County Council for all reasonable and proper costs and expenses whatsoever arising from the operation of paragraphs 4.2 to 4.5

4.2 The Director shall require the testing of materials plant and workmanship used or proposed to be used in the Highway Works and in his reasonable discretion have the power to reject any materials plant or workmanship so tested which he may reasonably and properly find to be not in accordance with the approved detailed plans Works Drawings and specification referred to in paragraph 1.2 of this Schedule

4.3 The Developer shall as soon as is reasonably practicable replace or repair any materials plant or workmanship which have been found to be not in accordance with the approved detailed plans Works Drawings and specification referred to in paragraph 1.2 of this Schedule

4.4 The Director shall for the purposes of paragraphs 4.2 to 4.5 be allowed reasonable access and admission to the Highway Works or the places where materials or plant for the Highway Works may be stored or in the course of preparation manufacture or use (unless such access or

admission is refused due to circumstances beyond the control of the Developer)

- 4.5 The Developer shall as soon as is reasonably practicable remove such materials and plant as are rejected by the Director pursuant to paragraph 4.2. of this Schedule which are not capable of repair or remedy from the Site and if the Developer shall wish to continue to store such rejected materials and plant on the Site they shall be stored separately from those materials and plant which have not been so rejected or which the Developer shall wish in future to use in execution of the Highway Works

5 OPENING OF THE HIGHWAY WORKS

- 5.1 During the construction of each and all of the Highway Works and prior to the issue of the Certificate of Substantial Completion:

- (a) the Director may issue instructions to the Developer to open or expose any of the Highway Works which has been covered up without previously being inspected by the Director
- (b) should the Developer fail to comply with any such instructions the County Council may so take up or expose the relevant part of the Highway Works causing as little damage or inconvenience as is possible in respect of any other part or parts of the Highway Works the reasonable and proper cost of such taking up or exposure and reinstatement to be met by the Developer

PROVIDED THAT if the Highway Works or any part or parts thereof are covered up by the Developer after giving the notice referred to in paragraph 3.5 of this Schedule and the Director shall have failed to inspect in the period therein referred to and the Director shall subsequently require the Highway Works or any part of them to be uncovered for the purposes of inspection:-

- (a) if inspection reveals the relevant part or parts of the Highway Works to have been completed in accordance with the approved detailed plans drawings and specification referred to in paragraph 1.2 of this Schedule all costs in respect of such uncovering and inspection and of reinstating the part or parts of the Highway Works uncovered shall be borne by the County Council; or

- (b) if inspection reveals the relevant part or parts of the Highway Works not to have been completed in accordance with the approved detailed plans drawings and specifications referred to in paragraph 1.2 of this Schedule all reasonable and proper costs in respect of uncovering and inspection and of reinstating the part or parts of the Highway Works uncovered shall be borne by the Developer

6 UNDERTAKERS

6.1 Insofar as the County Council as Highway Authority is required by any legislation regulation direction or code of practice (including in particular but without prejudice to the generality of the foregoing the New Roads and Street Works Act 1991) to serve a notice or notices in respect of the Highway Works on undertakers or other persons the Developer shall comply with such requirement on behalf of the County Council before the Highway Works commence and shall thereafter assume on behalf of the County Council such responsibilities as follow on therefrom in particular during the construction of the Highway Works and prior to the issue of the Certificate of Substantial Completion the Developer shall also:-

- (a) carry out or procure the carrying out of such works and activities in regard to the plant and equipment of undertakers as are required by undertakers in accordance with their statutory powers under the New Roads and Street Works Act 1991 as a result of the construction or intended construction of each and all of the Highway Works
- (b) cause all public sewers, highway drains gas and water mains electric cables and telecommunications ducts or other apparatus which are to be laid by the Developer under the Highway Works together with all necessary connections from them to the boundary of the Highway Works to be laid so far as is practicable under the Highway Works before the foundation of the Highway Works are laid and shall also in so far as is practicable cause the connections from electric cables to any street lamp to be laid before the paving of the footways comprised in the Highway Works is carried out
- (c) cause all trench works within the highway to be backfilled and reinstated in accordance with the Specification for the

Reinstatement of Openings in the Highway as determined from time to time under the New Roads and Street Works Act 1991

- (d) not at any time give consent to the erection by any telecommunications operator of telegraph poles or telephone poles or to the erection by any statutory undertaker or public or private company firm or individual of any over ground or underground equipment without the consent in writing of the Director

7 PROTECTION OF THE PUBLIC

- 7.1 The Developer shall give due consideration to adjoining owners and occupiers at all times and shall organise activities relating to the Highway Works, and Traffic Management Measures in such a manner as to cause the least practicable disruption
- 7.2 Prominent notices shall be displayed and maintained around the perimeter of the site of each and all of the Highway Works to warn the public of the dangers of entering the Site
- 7.3 The Developer shall nominate a member of the site management team as the contact point for the Director in the event of an emergency and shall advise a daytime and twenty-four (24) hour contact number to the Director for the same purpose
- 7.4 The Developer shall take or procure the taking of all necessary steps to avoid creating a nuisance from noise and in particular:
 - 7.4.1 the Developer shall afford all reasonable facilities to enable the Director to carry out such site investigations as he may deem necessary in order to determine noise emission levels
 - 7.4.2 all vehicles and plant including compressors shall be fitted with effective silencers and acoustic covers as appropriate and maintained in good working order and all static plant shall be located to minimise nuisance to persons living or working in the vicinity

7.4.3 all portable traffic signals and pumps shall be operated from mains electricity unless otherwise agreed with the Director

7.4.4 noisy activities shall not be permitted on Sundays and Bank Holidays and except as agreed in writing by the Director shall not be permitted outside the hours of 9.30 a.m. to 4.30 p.m. Monday to Friday and 9.30 a.m. to 1 p.m. on Saturdays

PROVIDED THAT if in the reasonable opinion of the Director the Developer is not dealing adequately with the control of noise the Developer shall carry out or procure the carrying out of such additional measures as the Director considers necessary at the Developer's expense

7.5 Compliance with the provisions of paragraph 7.4 shall not relieve the Developer of any of his obligations and liabilities under this Agreement the Control of Pollution Act 1974 or the Environmental Protection Act 1990

7.6 The Developer shall take or procure the taking of all necessary steps to avoid creating a nuisance from dust and as far as practicable works are to be carried out in such a way that dust is kept to a minimum PROVIDED THAT if in the reasonable opinion of the Director the Developer is not dealing adequately with the control of dust the Developer shall carry out or procure the carrying out of such additional measures as the Director considers necessary at the Developer's expense

7.7 The Developer shall arrange the regular removal of refuse likely to encourage vermin and arrange for suitable secure storage containers to be provided for collection

7.8 The Developer shall keep a log book on site to record all complaints received from the public and the action taken in response and the log book shall be available for inspection by the Director

8 PREVENTION OF MUD BEING CARRIED ON THE PUBLIC HIGHWAY

8.1 Provision shall be made at the Site to limit in so far as is practicable the amount of mud dust and other materials carried on to adjacent public highways by vehicles and plant leaving the Site

8.2 The Developer shall keep or procure the keeping of all roads footpaths rights of way and other means of passage leading to or from or crossing the Site free from mud slurry or other hazardous substances that are deposited through the construction of the Highway Works and any such substance so deposited on any such road footpath right of way or other means of passage shall be promptly removed by or at the direction of the Developer

8.3 The Director may close any associated crossings entrances and exits if such substances deposited are not promptly removed by the Developer and any losses or expenses incurred as a result shall be borne by the Developer and on removal of such substances the Director shall reopen such crossings entrances and exits and the Developer shall bear the costs incurred

9 TRAFFIC CONTROL

9.1 During the periods when the Highway Works are being executed the Developer shall institute at his own expense measures previously approved in writing by the Director and National Highways to maintain the safe flow of traffic on the highways in the vicinity of the site of the Highway Works

9.2 The Highway Works shall be signed and protected to at least the standards of Chapter 8 of the Traffic Signs Manual published by His Majesty's Stationery Office and the proposed arrangements shall be approved in writing by the Director before the Highway Works commence

10 TIMING

10.1 No Highway Works within or affecting existing public highways or temporary diversions which could interfere with the traffic flow will be permitted within the morning and evening peak periods i.e. 7.30 - 9.30 a.m. and 4.30 - 6.30 p.m. Monday to Friday except as agreed in writing by the Director

11 SAFETY

11.1 During the periods when the Highway Works are being carried out the Developer shall provide all watching and lighting as required and shall

maintain all lights, guards, fencing, warning signs when and, where necessary, undertake such further measures as may be reasonably required by the Director

12 ACCOMMODATION WORKS

12.1 The Developer shall carry out or ensure that there shall be carried out all related accommodation works associated with the Highway Works

13 CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

13.1 The Developer shall be the only client for the purpose of the CDM Regulations and the Developer agrees to undertake the obligations of a client under the CDM Regulations and to use all reasonable endeavours to ensure that the Highway Works are carried out in accordance with the CDM Regulations

13.2 The Highway Works shall not commence until the Developer as the only client has provided to the Director:

13.2.1 an estimate of the number of working days and/or person days of construction work and the number of workers working on site simultaneously at any one point in the project which the Contract will entail

13.2.2 written details of the principal designer and the principal contractor appointed for the project and also provide copies of the Construction Phase Plan and Health & Safety File

13.2.3 a copy of the Notification of Project (form HSE F10) to the HSE pursuant to Regulation 6 of the CDM Regulations

13.3 Throughout the Highway Works the Developer shall provide to the Director copies of the updates and revisions to the construction phase plan and Health and Safety File pursuant to Regulation 12

13.4 Within twenty-eight (28) days of issue of the Certificate of Substantial Completion for any or all of the Highway Works the Developer shall provide to the Director

- 13.4.1 a plan showing the land over which those Highways Works have been constructed and
- 13.4.2 a Health and Safety file conforming in all respects with the CDM Regulations and which shall accord with the current format used by the County Council
- 13.5 The Director shall be at liberty to delay issue of the Certificate of Final Completion in respect of any of the Highway Works if the Developer fails to provide the Director with the documents referred to in 13.4.1 and 13.4.2 above within twenty-eight (28) days of issue of any Certificate of Substantial Completion for any of the Highway Works equivalent to the number of days after the twenty-eight (28) day period that the documents were submitted
- 13.6 In respect of the Highway Works generally the Developer shall provide to the Director the final information in both paper and electronic format and shall at least comprise:
 - 13.6.1 1:500 scale (or alternative scale as may be specified by the Director) "as built" drawings
 - 13.6.2 records of the earthworks showing sources of material used in areas of fill description of fill materials descriptions of sub-grades in cut areas copies of results of tests of material carried out as part of the supervision of the construction of the earthworks
 - 13.6.3 records of the sources of supply of all deliveries of road construction materials with details of the location of the Highway Works at which each load is placed
 - 13.6.4 records of the sources of supply of all other manufactured materials (e.g. drainage goods, fencing materials, traffic signs, electrical components and cables etc).
- 13.7 The Developer shall indemnify and keep the County Council indemnified against any breach of the Developer's obligations under this paragraph

14 SITE CLEARANCE AND CERTIFICATE(S) OF SUBSTANTIAL COMPLETION

14.1 On Substantial Completion of the Highway Works the Developer shall:-

14.1.1 clear away and remove from the site of the Highway Works all constructional plant and temporary works of every kind and leave the site of the Highway Works in a neat and tidy condition to the satisfaction of the Director and

14.1.2 carry out stage 3 of the Road Safety Audit process and comply to the satisfaction of the Director with recommendations arising thereunder prior to the opening of the Highway Works to the public

14.2. Upon Substantial Completion of the Highway Works including any additional work resulting from stage 3 of the Road Safety Audit process and any requirements of National Highways pursuant to the Section 6 Agreement having been met such as to enable issuing of the Completion Certificate to the satisfaction in all respects of the Director he shall issue a Certificate of Substantial Completion in respect of those Highway Works to the Developer provided that all costs and expenses owing to the County Council have been paid in respect of those Highway Works

14.3. Without unreasonable delay after the issue of the Certificate of Substantial Completion the County Council will approve a reduction of 90% of the Performance Figure A (less any sums previously drawn upon by the County Council in accordance with the provisions of this Agreement) and return that amount plus interest applied at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end to the Developer in respect of the relevant Highway Works and the County Council shall release the Developer from its obligations under that Performance Cash Deposit A in respect of the relevant Highway Works to such extent and if for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

14.4. Without unreasonable delay after the issue of the Certificate of Substantial Completion the County Council will approve a reduction of 80% of the Performance Figure B (less any sums previously drawn upon by the County Council in accordance with the provisions of this

Agreement) and return that amount plus interest applied at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end to the Developer in respect of the relevant Highway Works and the County Council shall release the Developer from its obligations under that Performance Cash Deposit B in respect of the Trunk Road Works to such extent and if for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

15 DEFECTS CORRECTION PERIOD AND CERTIFICATE OF FINAL COMPLETION

- 15.1 From commencement of the Highway Works until the issue of the Completion Certificate in accordance with clause 7 of the Section 6 Agreement the Developer shall maintain the entirety of the Trunk Road Works to ensure the Traffic Management Measures are complied with.
- 15.2 From Substantial Completion the Developer shall maintain each and all of the Highway Works for a minimum period of twelve (12) months until the issue of the related Certificate of Final Completion and prior to the expiration of this period the Developer shall reinstate and make good any damage or defect which may have arisen from any cause whatsoever or be discovered until the issue of the Certificate of Final Completion (including any defect in or damage to the surface water drainage system) so as to place the highway and the Highway Works in a condition satisfactory to the Director
- 15.3 After the expiration of the period of twelve (12) months from Substantial Completion or the date the Development becomes operational (whichever is the latter) the Developer shall carry out stage 4 of the Road Safety Audit and comply to the satisfaction of the Director with any recommendations arising thereunder
- 15.4 After the expiration of the period of twelve (12) months from the issue of the Certificate of Substantial Completion and after any defects have been made good as therein provided including any improvements arising under stage 4 of the Road Safety Audit to the satisfaction of the Director and after the provisions of paragraph 13.4 and paragraph 20.4 of this

Schedule have been fulfilled and any requirements of National Highways have been satisfied such as to enable such certificate to be issued the Director shall issue forthwith to the Developer the Certificate of Final Completion in respect of the Highway Works provided that the Certificate of Final Completion shall in the case of road gullies extend only as far as their points of entry to the surface water sewers where those are not being adopted by the County Council as highway drains and upon the issue of the Certificate of Final Completion the County Council shall:

15.4.1 release the Developer from all subsisting obligations under the Performance Cash Deposit A and shall release to the Developer the remainder of that deposit and interest applied at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end on receipt of a written request. If for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

15.4.2 approve a further reduction of 16% of the Performance Figure B (less any sums previously drawn upon by the County Council in accordance with the provisions of this Agreement) and return that amount plus interest applied at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end to the Developer in respect of the Trunk Road Works and the County Council shall release the Developer from its obligations under Performance Cash Deposit B in respect of the Trunk Road Works to such extent and if for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

16 INDEMNITY

16.1 The Developer shall from the date of this Agreement indemnify the County Council against all claims charges costs expenses liability or loss whatsoever arising out of and incidental to any or all of the Highway Works carried out by the Developer (or on its behalf) including but not limited to:

16.1.1 those arising out of any legally sustainable claims for payments under Section 10 of the Compulsory Purchase Act 1965 and Part I of

the Land Compensation Act 1973 (as amended) in connection with those Highway Works provided that the Developer's indemnity will not extend to any claims submitted to the County Council arising out of the negligence of the County Council's employees or arising out of any works of alteration carried out to any of the Highway Works by the County Council after the issue of the related Certificate of Final Completion

- 16.1.2 those arising out of any breach of the Section 6 Agreement where the breach results from the Developer's breach of their duties under this Agreement including but not limited to payment of interest pursuant to clause 11.8 of the section 6 Agreement
- 16.2 The County Council shall notify the Developer forthwith upon receipt of any such claim or liability
- 16.3 The County Council shall not accept or settle any valid claim without first having given the Developer the opportunity to provide the County Council with representations as to the validity of such claim
- 16.4 The indemnification referred to in paragraph 16.1 includes:
 - 16.4.1 all fees incurred by claimants which the County Council is obliged to pay, and those of the County Council or its agent or contractor, in negotiating any claims (together with VAT payable on the claimants' professional advisors' fees);
 - 16.4.2 statutory interest payments to claimants and their professional advisors; and
 - 16.4.3 the County Council's reasonable and proper legal costs in making the compensation, fees and interest payments
- 16.5 For the avoidance of doubt, the indemnity in paragraph 16.1 shall cease to apply in respect of any claim arising following the issue of the Certificate of Final Completion, SAVE FOR where the event or cause of action giving rise to the claim occurred prior to the date of issue of the Certificate of Final Completion, in which case the indemnity will continue to apply to such claim, AND SAVE FOR claims arising out of any failure to carry out the Highway Works in full accordance with the requirements of

this Agreement, AND SAVE FOR any claim made against the County Council pursuant to the Land Compensation Act 1973 in accordance with paragraph 16.1.

17 PERFORMANCE CASH DEPOSIT A

17.1 The Developer shall on the date of this Agreement pay the Performance Cash Deposit A to the County Council for each and all of the County Highway Works and the Developer shall be bound to the County Council in the amount of the Performance Figure A for the County Highway Works

17.2 Should the Developer default in the execution of its obligations to carry out any or all of the County Highway Works and to maintain the same in accordance with the provisions of this Agreement and the Section 6 Agreement then the County Council may (subject to the provisions hereinafter contained) itself carry out the County Highway Works and maintain the same as aforesaid having first called upon the Performance Cash Deposit A for the cost to be expended in so doing

17.2.1 Unless there is a danger to users of the highway the County Council shall give twenty (20) working days prior written notice (except in the case of an emergency) of its intention to commence work under Paragraph 17.2

17.2.2 any notice served under this paragraph shall specify the period of the notice ("the Notice Period") the extent of the work which the County Council proposes to carry out and full details of all matters in respect of which the Director considers that the County Highway Works have not been carried out in accordance with the terms of this Agreement

17.2.3 if before the expiry of the Notice Period the Developer serves written notice upon the County Council that the Developer intends diligently to execute the works specified in the notice in accordance with the terms of this Agreement and specifies a time to complete that the County Council considers reasonable in the circumstances the County Council shall not be entitled to execute the relevant part or parts of the County Highway Works specified in the notice served under this paragraph unless the

Developer then fails to execute those works within the agreed time scale

17.3 If the Developer should default in the execution of its obligations to carry out any or all of the Highway Works and to maintain the same in accordance with the provisions of this Agreement and the Section 6 Agreement then the County Council will call upon the Performance Cash Deposit A to provide the full Performance Figure A (or such sum that remains following any reduction of the Performance Cash Deposit A in accordance with Paragraph 14.3 of this Schedule) in accordance with this Agreement. Save that the County Council after all works are completed and all contracts and any contract claims settled will return any Performance Cash Deposit A sum unused with interest at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end on receipt of a written request to the Developer within one month of all the aforementioned completing and settling. If for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

18 PERFORMANCE CASH DEPOSIT B

18.1 The Developer shall on the date of this Agreement pay the Performance Cash Deposit B to the County Council for each and all of the Trunk Road Works and the Developer shall be bound to the County Council in the amount of the Performance Figure B for the Trunk Road Works

18.2 Should the Developer default in the execution of its obligations to carry out any or all of the Trunk Road Works and to maintain the same in accordance with the provisions of this Agreement and the Section 6 Agreement then the County Council may (subject to the provisions hereinafter contained) itself carry out the Trunk Road Works and maintain the same as aforesaid having first called upon the Performance Cash Deposit B for the cost to be expended in so doing

18.2.1 Unless there is a danger to users of the highway the County Council shall give twenty (20) working days prior written notice (except in the case of an emergency) of its intention to commence work under Paragraph 17.2

18.2.2 any notice served under this paragraph shall specify the period of the notice ("the Notice Period") the extent of the work which the County Council proposes to carry out and full details of all matters in respect of which the Director considers that the Trunk Road Works have not been carried out in accordance with the terms of this Agreement

18.2.3 if before the expiry of the Notice Period the Developer serves written notice upon the County Council that the Developer intends diligently to execute the works specified in the notice in accordance with the terms of this Agreement and specifies a time to complete that the County Council considers reasonable in the circumstances the County Council shall not be entitled to execute the relevant part or parts of the Trunk Road Works specified in the notice served under this paragraph unless the Developer then fails to execute those works within the agreed time scale

18.3 If the Developer should default in the execution of its obligations to carry out any or all of the Trunk Road Works and to maintain the same in accordance with the provisions of this Agreement and the Section 6 Agreement then the County Council will call upon the Performance Cash Deposit B to provide the full Performance Figure B (or such sum that remains following any reduction of the Performance Cash Deposit B in accordance with Paragraph 14.4 of this Schedule) in accordance with this Agreement. Save that the County Council after all works are completed and all contracts and any contract claims settled will return any Performance Cash Deposit B sum unused with interest at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end on receipt of a written request to the Developer within one month of all the aforementioned completing and settling. If for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement

19 COMMUTED SUMS FOR MAINTENANCE

19.1 Prior to the date of this Agreement the Developer shall pay to the County Council the Commuted Sums calculated as follows:

Carriageway	£3,319.25
Footway	£5,000.00
Drainage	£16,404.01
Traffic Signals	£120,593.00
Traffic signs and Lines	£3,552.00

20 LEGAL AND ADMINISTRATIVE COSTS

20.1 The Developer shall pay to the County Council:-

20.1.1 the whole of the costs of the County Council's Legal Services Department reasonably and properly incurred in connection with the preparation and completion of this Agreement and the Section 6 Agreement and these costs shall be payable prior to sealing of this Agreement;

20.1.2 interest at four per cent above the Bank of England Base Rate from time to time on any sum due to the County Council under this Agreement which is outstanding for more than twenty-eight (28) days from the date on which it was demanded or in the event that a dispute or difference regarding such payment is referred to arbitration pursuant to clause 4.1 of this Agreement the said twenty-eight (28) day period shall run from the date of the decision of the arbitrator (such interest to be charged on the amount outstanding each day from the date of issue of a written demand for any sum due or in the event that a dispute or difference regarding such payment is referred to arbitration pursuant to clause 4.1 of this Agreement such interest to be charged on the amount outstanding each day from the date of issue of the decision of the arbitrator)

- 20.1.3 The greater of £5000 (Five thousand pounds) or 7½% of the Performance Figure (excluding the costs associated with statutory undertakers work and traffic management) for the Highway Works towards the costs and expenses of the County Council of checking the design of each and all of the Highway Works and inspecting each and all of the Highway Works such sum shall be payable prior to sealing of this Agreement
- 20.1.4 the reasonable and proper cost to the County Council of undertaking Road Safety Audits and also the cost of the safety checks of details submitted which sum shall be payable prior to the safety audit commencing
- 20.1.5 the cost of any temporary and permanent traffic regulation orders which sum shall be payable prior to any work on the making of such order being commenced
- 20.1.6 the full cost of any other road traffic orders or notices required to facilitate the Highway Works which sum shall be payable prior to any work on the making of such order being commenced
- 20.1.7 the costs as set out at clause 11 of the Section 6 Agreement within 14 days of the County Council providing the Developer with the costs provided by National Highways in accordance with clause 11 of the Section 6 Agreement

21 PARTS I AND II OF THE LAND COMPENSATION ACT 1973

Part I and II Claims

- 21.1 The Performance Cash Deposit B shall provide that should the Developer default in any way in his obligation to pay to the County Council the sums specified in paragraph 16 of this Schedule for claims in respect of the Trunk Road Works the County Council may call upon the Performance Cash Deposit B to pay the sums due under paragraph 16 and paragraph

21.3 of this Schedule to the County Council or any shortfall in the event that some of the monies have already been paid to the County Council

Part I Claims - Depreciation Caused By Public Works

21.2 Upon the date which falls seven (7) years from the point at which the last of the Highway Works is first open to public traffic and if all duly made claims are settled the County Council shall without unreasonable delay release the Developer from all subsisting obligations under the Performance Cash Deposit B and the remainder of said cash deposit shall be returned together with interest as applied at the Bank of England Base Rate minus 2 basis points, compounding annually at financial year end on receipt of a written request. If for any period the Bank of England Base Rate is at or below 0.02% then no interest shall be payable for that period by any party to this Agreement save that if all duly made claims are not settled all but an amount reasonably sufficient to settle such claims will be released

21.3 The Developer hereby undertakes and agrees with the County Council that in the event of any claim for compensation or otherwise or costs or charges arising in connection with or incidental to or in consequence of the carrying out of the Highway Works whether mandatory or discretionary which may be incurred by virtue of any enactment or statutory instrument and otherwise hereby provided for he will hold the County Council fully indemnified from and against all claims charges costs and expenses in connection therewith or arising therefrom

Part II Claims

21.4 The Developer covenants with the County Council to comply with the requirements of the Noise Insulation Regulations 1975 (SI 1975/1763) as amended and to provide to the County Council such evidence as is required by the Director to demonstrate compliance with the Noise Insulation Regulations 1975 prior to the issuing by the County Council of the Certificate of Final Completion in accordance with paragraph 15.3 of this Schedule

SCHEDULE II

The Highways Works comprising the following works:

Location	Description of Works
A142 Fordham Road Newmarket	<ul style="list-style-type: none">• Signalisation of the A14 eastbound and westbound exit slip roads with the A142.• Minor widening of the slip roads with resurfacing of the carriageway on the approaches to the traffic signal stop lines.• Road markings are to be amended to suit the revised layout.

Timescales: The Highways Works are to be commenced within 12 (twelve) months of the date of this Agreement and completed within 6 (six) months of commencement of the Highway Works

SCHEDULE III**Approved List of drawings**

	Title	Drawing number
1.	S278 General Arrangement-Sheet 1	ST-3031-701F
2.	S278 Works Kerb and Edging Layout Sh1	ST-3031-711B
3.	S278 Works Kerb and Edging Layout Sh2	ST-3031-712
4.	S278 Construction Areas Sh1	ST-3031-721B
5.	S278 Works Contours	ST-3031-731 21
6.	S278 Highway Setting Out Sh1	ST-3031-741
7.	S278 Drainage Layout Sh1	ST-3031-751B
8.	S278 Existing Signs Sh1	ST-3031-771B
9.	S278 Existing Signs Sh2	ST-3031-772A
10.	S278 Works Proposed Signs and Linings Sh1	ST-3031-781D
11.	S278 Works Proposed Signs and Linings Sh2	ST-3031-782B
12.	S278 Works Construction Details Sh1	ST-3031-798E
13.	S278 Works Construction Details Sh2	ST-3031-799A
14.	SPA-A14 Maintenance Bay	ST-3031-870
15.	S278 Works Sign Schedules - Northern Access and A14 Slip Roads	ST-3031-910C
16.	East Bound Off Slip Signals Drawing	21062-101A
17.	Hatchfield Farm Development_ Newmarket 5-2 v2	
18.	Hatchfield Farm Development_ Newmarket 12-5v2	
19.	21062-101 ITS1827D V2	
20.	West Bound Slip Signals Drawing	21062-201A
21.	21062-201 ITS1827D V2	



KEY PLAN

- NOTES**
1. ALL WORKS IN THE PUBLIC HIGHWAY MUST BE CARRIED OUT WITH THE PRIOR APPROVAL AND TO THE SATISFACTION OF THE LOCAL AUTHORITY.
 2. ANY TRAFFIC MANAGEMENT REQUIRED TO UNDERTAKE WORKS IN THE PUBLIC HIGHWAY MUST BE APPROVED BY THE LOCAL AUTHORITY PRIOR TO THESE WORKS COMMENCING.
 3. THE CONTRACTOR IS TO COMPLY WITH THE NEW ROAD AND STREET WORKS ACT, 1997 FOR ALL WORKS IN THE PUBLIC HIGHWAY.
 4. EXISTING TREE STUMPS & ROOTS TO BE GRUBBED UP AND REMOVED FROM SITE. ANY RESULTING EXCAVATIONS ARE TO BE BACK-FILLED WITH WELL COMPACTED TYPE 1 GRANULAR MATERIAL TO FORMATION LEVEL TO ENSURE FULL DEPTH CONSTRUCTION ABOVE.
 5. CONTRACTOR IS TO ALLOW FOR ALL ABANDONED DRAINAGE RUNS, REMOVED TREES AND MANHOLES / SOAKWAYS / GULLIES TO BE BACK-FILLED WITH WELL COMPACTED TYPE 1 GRANULAR MATERIAL TO FORMATION LEVEL TO ENSURE FULL CONSTRUCTION DEPTH ABOVE.
 6. ALL BURIED MANHOLES IDENTIFIED ON SITE TO BE NOTIFIED TO STOMOR LTD WITH INVERT LEVELS.
 7. PRIOR TO COMMENCING WORKS THE CONTRACTOR IS TO REVIEW THE GROUND INVESTIGATION REPORT.
 8. CONSTRUCTION DETAILS TO BE IN COMPLIANCE WITH SUFFOLK COUNTY COUNCIL HIGHWAYS STANDARD DRAWINGS.
 9. ALL CONSTRUCTION WORKS ARE TO BE FULLY COMPLIANT WITH THE REQUIREMENTS OF THE SUFFOLK COUNTY COUNCIL SPECIFICATION FOR ESTATE ROADS - 2007.
 10. TRAFFIC SIGNAL LOOPS TO BE INSTALLED IN SAW CUT GROOVES. THEY ARE TO BE SEALED WITH EPOXY RESIN AND RECOATED WITH CHIPPED BITUMEN FOLLOWING ROADSIDE CONNECTIONS AND TESTING.
 11. FOR CONSTRUCTION DETAILS REFER TO DRAWINGS S2031-798 & 799.
- BURIED SERVICES**
1. PRIOR TO ANY WORKS BEING UNDERTAKEN, THE CONTRACTOR IS TO REFER TO UTILITIES RECORDS TO IDENTIFY APPROXIMATE LOCATION OF BURIED SERVICES.
 2. HAND DUG TRIAL HOLES SHOULD BE CARRIED OUT IN ORDER TO IDENTIFY EXACT POSITION AND DEPTH. WITH REASONABLE NOTICE GIVEN TO STATUTORY UNDERTAKERS AS APPROPRIATE PRIOR TO CARRYING OUT ANY EXCAVATIONS.
 3. LOCATIONS AND DEPTHS OF EXISTING SERVICES TO BE CONFIRMED TO THE ENGINEER PRIOR TO WORKS BEING CARRIED OUT.
 4. APPROPRIATE PERMITS TO WORK WILL BE REQUIRED TO CARRY OUT ANY WORK IN THE HIGHWAY INCLUDING TRIAL HOLES.
- HOTSPOT PROTOCOL**
1. THERE IS A POSSIBILITY THAT AN UNKNOWN AREA OF SOIL CONTAMINATION MAY BE ENCOUNTERED DURING CONSTRUCTION/GROUNDWORKS WORKS.
 2. SHOULD AN AREA OF CONTAMINATION BE IDENTIFIED BY VISUAL OR OLFACTORY MEANS THE FOLLOWING PROTOCOL WILL BE FOLLOWED:
 - IMMEDIATELY STOP ALL WORKS IN THE AREA WHERE CONTAMINATION IS SUSPECTED.
 - IMMEDIATELY INFORM THE SITE PROJECT MANAGER.

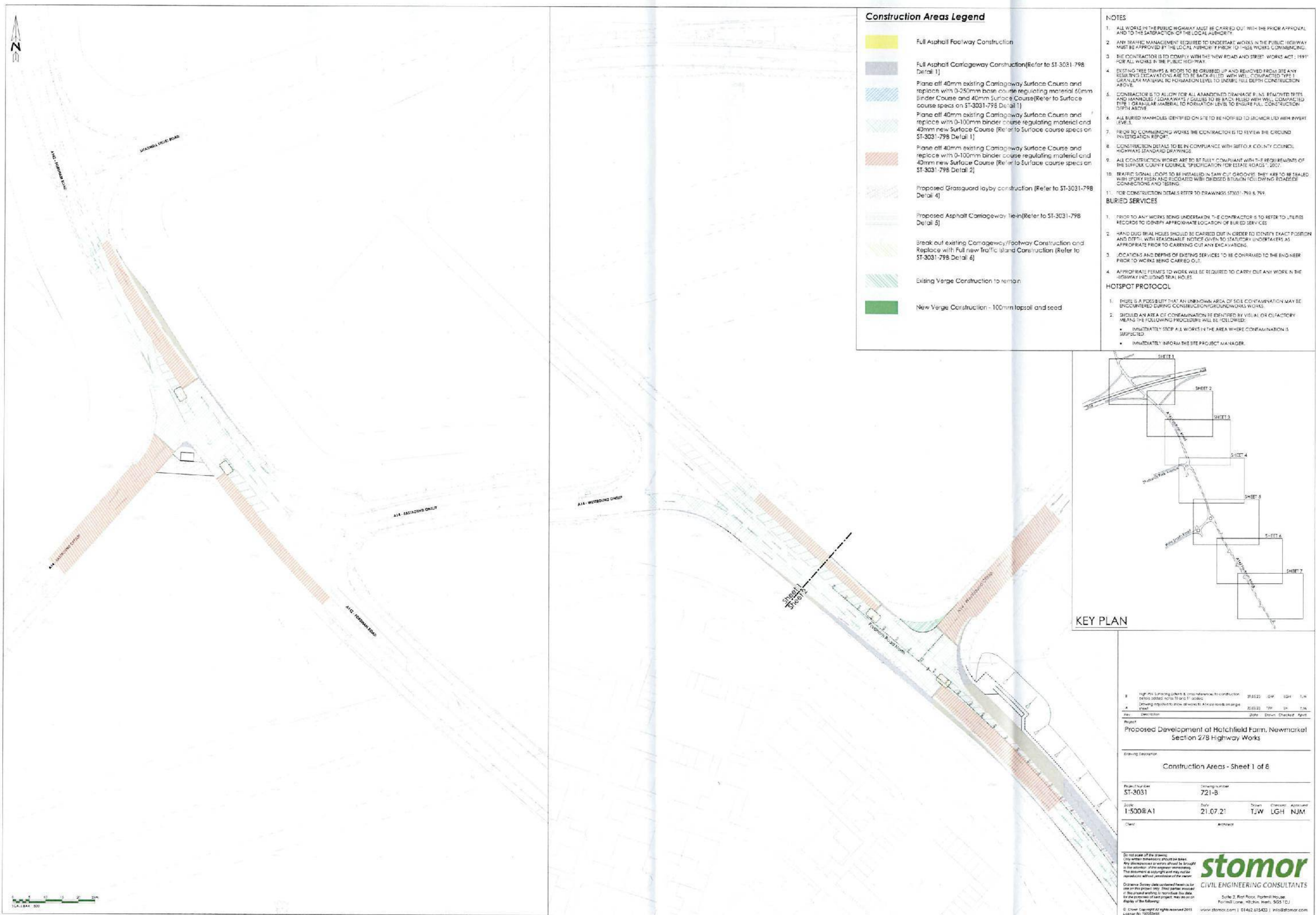
- Kerb Legend**
- Precast Concrete Half Batter (H82) Kerb with 125mm Upstand
 - Precast Concrete Channel Block (C53)
 - Precast Concrete 45° Splay (SP) Kerb with 100mm Upstand
 - Precast Concrete Edging Kerb (EF)
 - Precast Concrete Bullnose Kerb (BN3) with 0-6mm Upstand of pedestrian crossings and 25mm at vehicle crossings
 - Precast Concrete Half Batter (H82) to Bullnose (BN3) or Channel Block (C53) Transition Kerb

Revised by: [Name] Date: [Date] Description: [Description]				
Drawing Description: Kerb and Edging Layout - Sheet 1 of 8				
Project Number: ST-3031	Drawing Number: 711-B			
Scale: 1:500@A1	Date: 21.07.21	Drawn: TJW	Checked: LGH	Approved: NM
Client:	Architect:			

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.
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Distance Survey data contained herein is for use on this project only. The data is not to be used for any other purpose without the written consent of the owner.

stomor
CIVIL ENGINEERING CONSULTANTS
Suite 2, First Floor, Portmell House
Portmell Lane, Blyth, North, S55 1DZ
www.stomor.com | 01452 615433 | info@stomor.com
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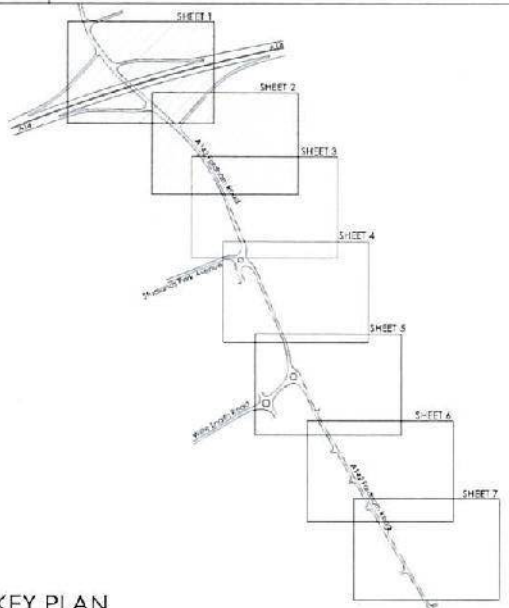


Construction Areas Legend

- Full Asphalt Footway Construction
- Full Asphalt Carriageway Construction (Refer to ST-3031-798 Detail 1)
- Plane off 40mm existing Carriageway Surface Course and replace with 0-250mm base course regulating material 60mm Binder Course and 40mm Surface Course (Refer to Surface course specs on ST-3031-798 Detail 1)
- Plane off 40mm existing Carriageway Surface Course and replace with 0-100mm binder course regulating material and 40mm new Surface Course (Refer to Surface course specs on ST-3031-798 Detail 1)
- Plane off 40mm existing Carriageway Surface Course and replace with 0-100mm binder course regulating material and 40mm new Surface Course (Refer to Surface course specs on ST-3031-798 Detail 2)
- Proposed Grassguard layby construction (Refer to ST-3031-798 Detail 4)
- Proposed Asphalt Carriageway Trench (Refer to ST-3031-798 Detail 5)
- Break out existing Carriageway/Footway Construction and Replace with Full new Traffic Island Construction (Refer to ST-3031-798 Detail 6)
- Existing Verge Construction to remain
- New Verge Construction - 100mm topsoil and seed

NOTES

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- THERE IS A POSSIBILITY THAT AN UNKNOWN AREA OF SOIL CONTAMINATION MAY BE ENCOUNTERED DURING CONSTRUCTION/GROUNDWORKS WORKS.
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KEY PLAN

B	High Risk Limiting Levels & consequences from construction before added works to area 11/12/2020	30.05.22	GW	LGH	TJW
A	Drawing updated to show all works to A14 slip roads on orange sheet	20.03.22	TJW	LH	TJW

Date	Description	Date	Drawn	Checked	Agreed
	Project				

Proposed Development of Hatchfield Farm, Newmarket Section 2/8 Highway Works

Drawing Description

Construction Areas - Sheet 1 of 8

Project Number	ST-3031	Drawing Number	721-B
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Scale	1:500@A1	Date	21.07.21	Drawn	TJW	Checked	LGH	Approved	NJM
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Client Architect

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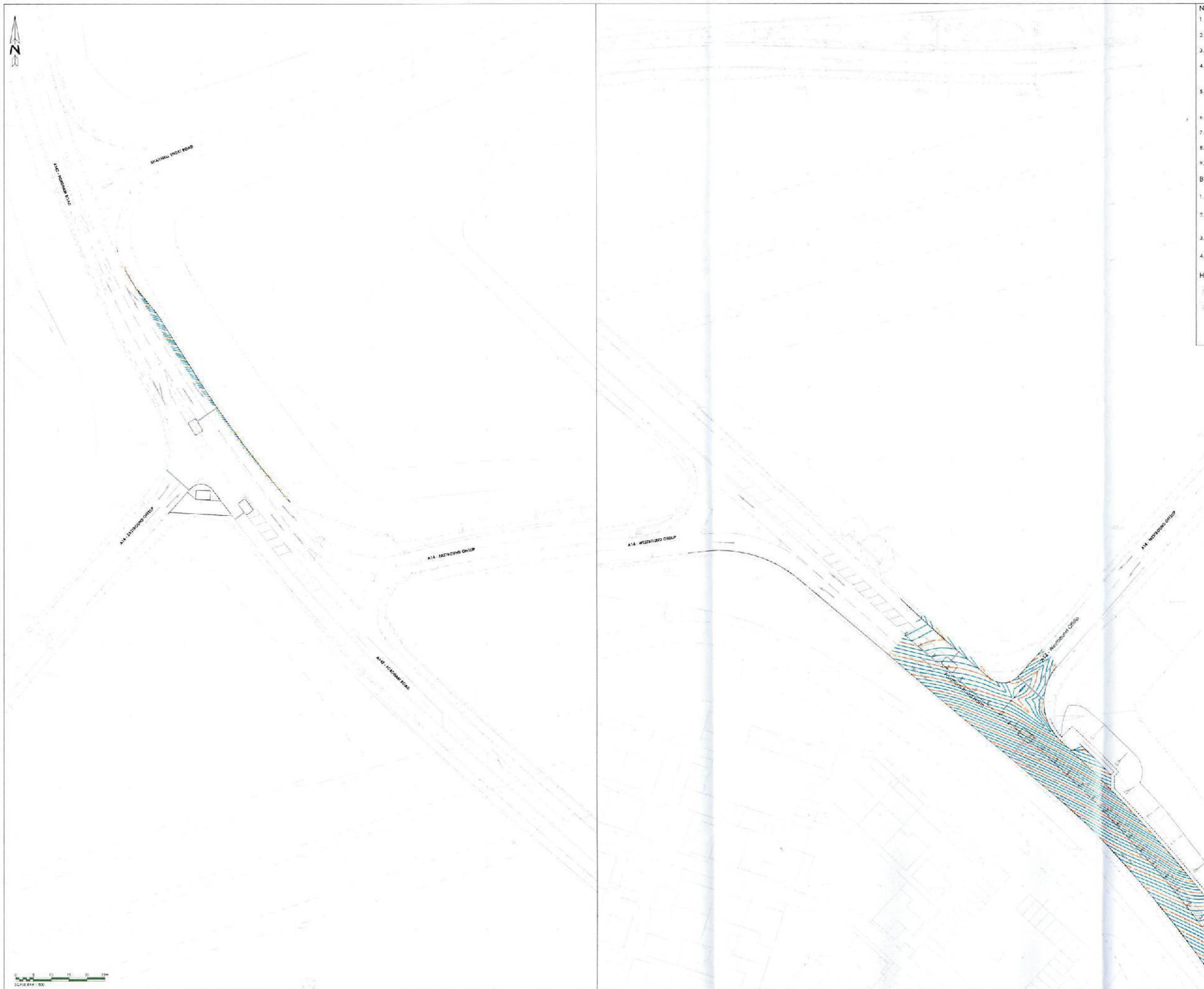
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Porton Hill, Salisbury, Wiltshire, SP4 6JY

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Rev	Description	Date	Drawn	Checked	Approved
Project Proposed Development at Hatchfield Farm, Newmarket Section 278 Highway Works					
Drawing Description Construction Areas - Sheet 1 of 8					
Project Number ST-3031		Drawing Number 721			
Scale 1:500 @ A1	Date 21.07.21	Drawn TJW	Checked XXX	Approved XXX	
Client		Architect			

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Sign to remain



Sign to be relocated - See proposed signs layout for position



Sign to remain



Sign to remain



Signs to remain



Signs to be removed



Sign to be removed



Sign to remain



Signs to be replaced



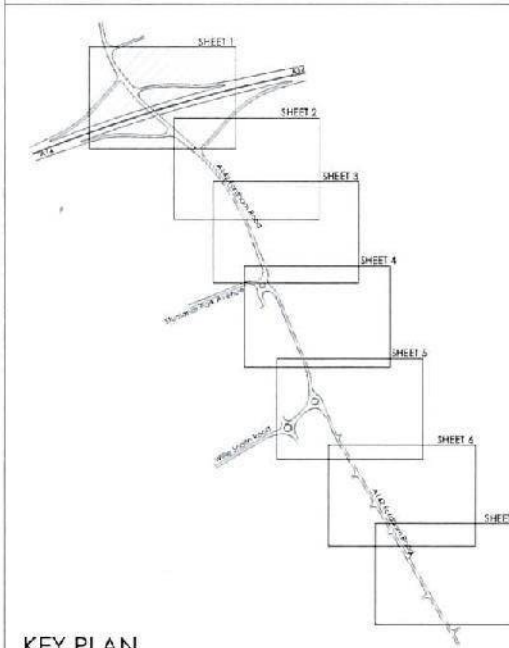
Sign removed as part of the bridge works carried out by National Highways, sign to be replaced



Sign to remain



Sign to remain



KEY PLAN

Signs Legend

- Signs to Remain
- Signs to be Removed

NOTES

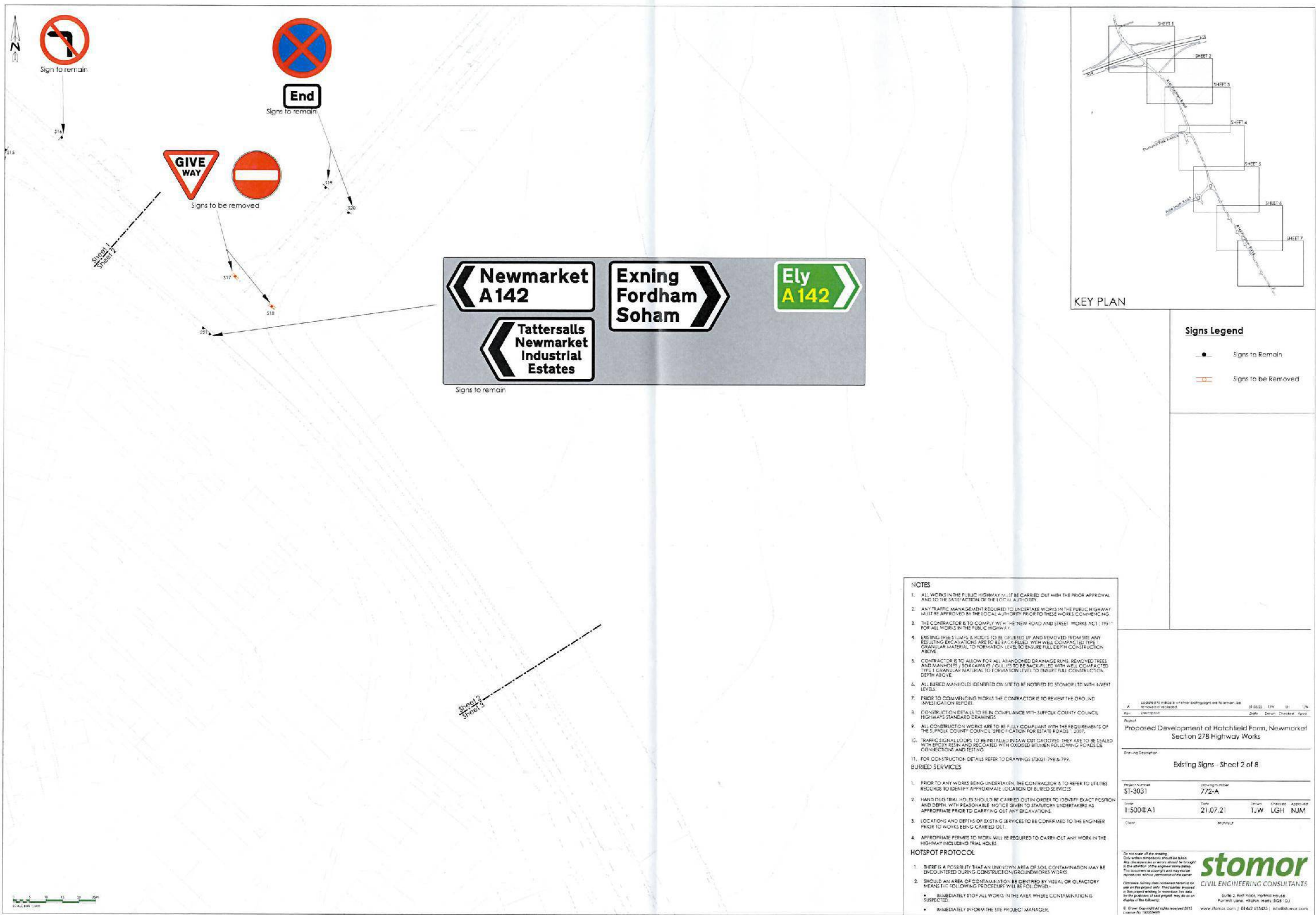
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Existing signs to be removed or replaced	28.06.23	TJW	DN	LM
Updated to indicate whether existing signs are to remain, be removed or replaced	31.03.23	TJW	DN	LM
Date	Description	Date	Drawn	Checked
2023	2023	2023	2023	2023

Project: Proposed Development at Hatchfield Farm, Newmarket
Section 278 Highway Works

Project Number	ST-3031	Drawing Number	771-B
Scale	1:500 @ A1	Date	21.07.21
Client	As above	Drawn	TJW
		Checked	LGH
		Approved	NM

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SCALE BAR 1:500

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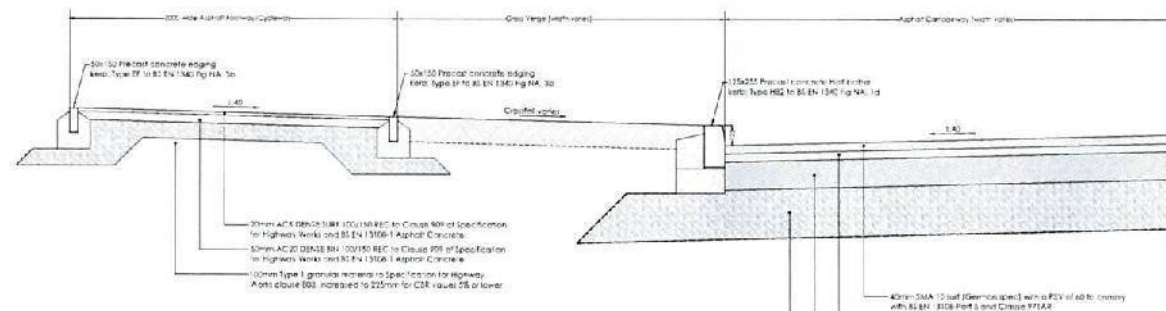
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HOTSPOT PROTOCOL

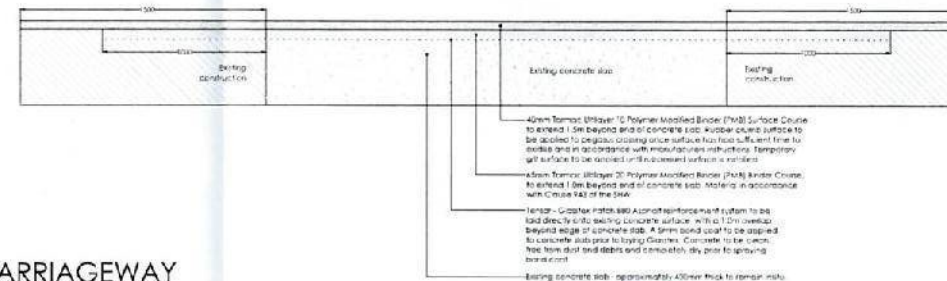
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Updated to indicate whether existing signs are to remain, be removed or replaced.		ST 03 02	UNW	ST	UNW
Author	Drawn	Check	Drawn	Checked	Agreed
Project					
Proposed Development at Hatchfield Farm, Newmarket Section 278 Highway Works					
Drawing Description					
Existing Signs - Sheet 2 of 8					
Project Number	ST-3031	Drawing Number	772-A		
Scale	1:500 @ A1	Date	21.07.21	Drawn	Checked
Client	Highway			TJW	LGH
				NUM	
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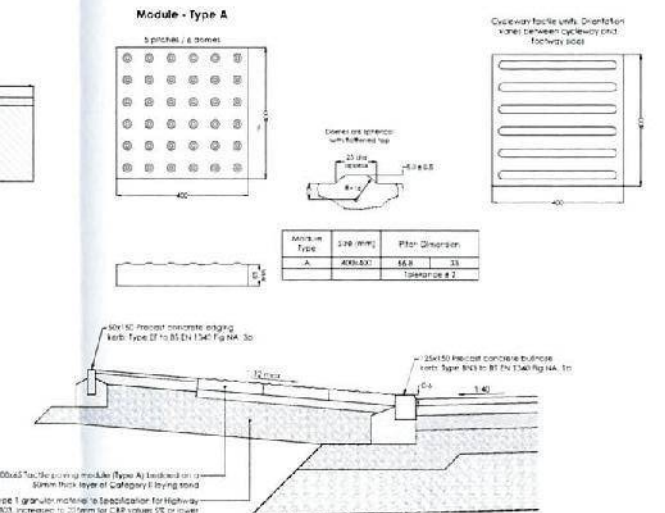


DETAIL 1 - SECTION A THROUGH ASPHALT CARRIAGEWAY (PSV 60)

DISTRIBUTOR ROAD SPECIFICATION - CYCLEWAY FALLING TOWARDS CARRIAGEWAY



RAYES LANE - CONCRETE SLAB OVERLAY DETAIL



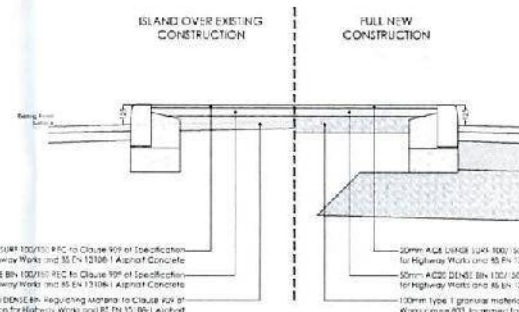
CROSSING SECTION

TACTILE PAVING DETAILS

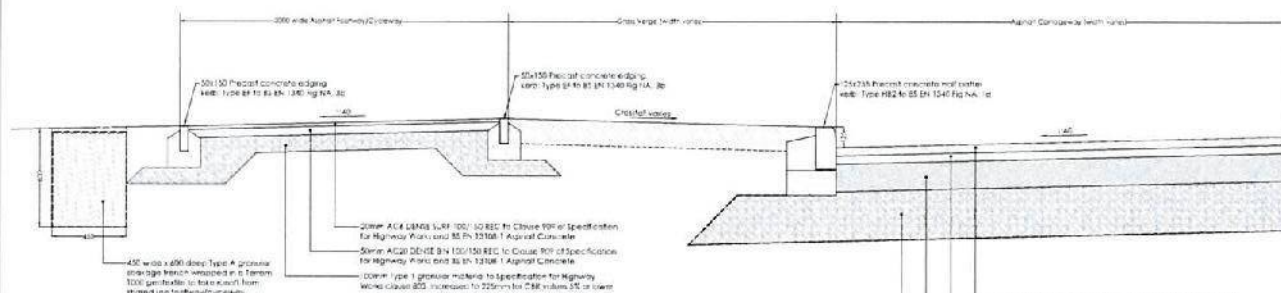
DETAIL 2 - SECTION THROUGH ASPHALT CARRIAGEWAY (PSV 68+)

DISTRIBUTOR ROAD SPECIFICATION - CYCLEWAY FALLING TOWARDS CARRIAGEWAY

DETAIL 5 - SECTION THROUGH CARRIAGEWAY TIE-IN DETAIL

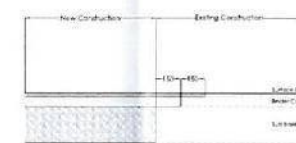


TRAFFIC ISLAND CONSTRUCTION DETAIL

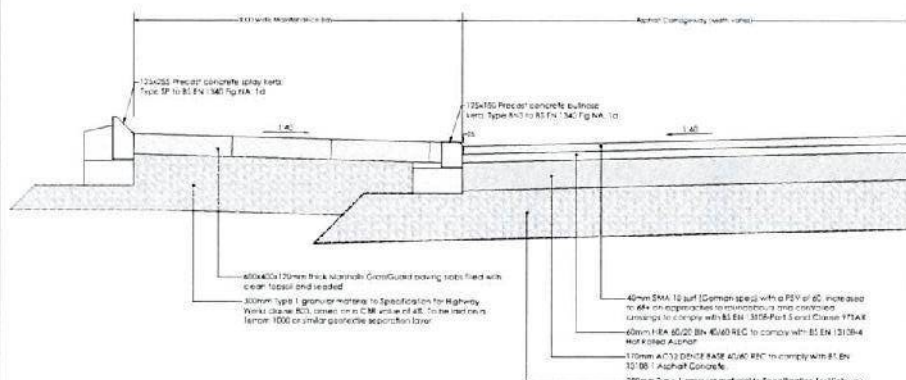


DETAIL 3 - SECTION THROUGH ASPHALT CARRIAGEWAY (60 PSV)

DISTRIBUTOR ROAD SPECIFICATION - CYCLEWAY FALLING AWAY FROM CARRIAGEWAY



FOOTWAY TIE-IN DETAIL

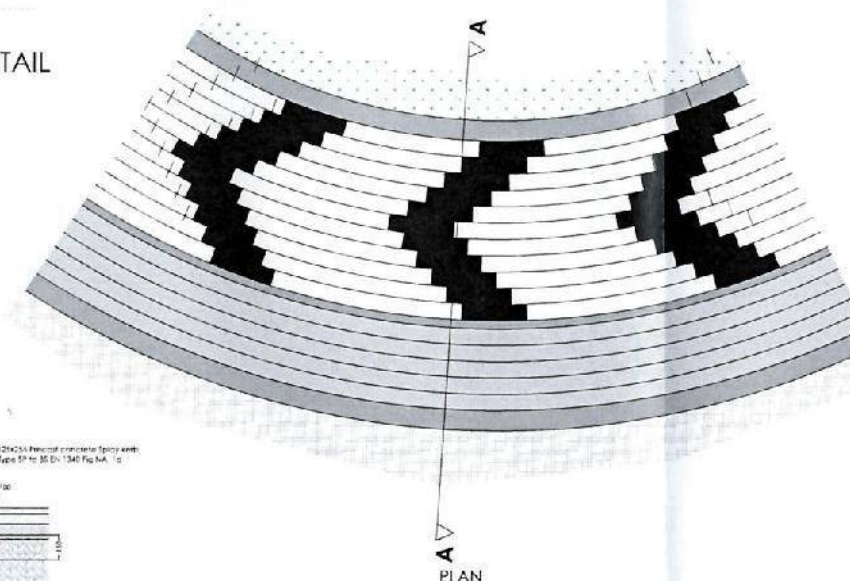


DETAIL 4 - SECTION THROUGH GRASSGUARD MAINTENANCE BAY

Distributor Road	Major Access Road	Sub-base
40mm	40mm	40mm
40mm	40mm	40mm
40mm	40mm	40mm
40mm	40mm	40mm
40mm	40mm	40mm

Note: 1. Special design to be undertaken.
2. CBR tests are to be taken at 30m centres along the centreline of all roads.

SUB-BASE THICKNESS TABLE



DETAIL 6 - SECTION THROUGH ROUNDABOUT CENTRAL ISLAND DETAIL

TRAPPED GULLY

Project	Description	Date	Drawn	Checked	Approved
SI-3031	Proposed Development of Holfield Farm, Newmarket Section 278 Highway Works	21.07.21	TJW	NJM	NJM

Proposed Development of Holfield Farm, Newmarket Section 278 Highway Works

Construction Details - Sheet 1 of 2

Project Number	Drawing Number	Date	Drawn	Checked	Approved
SI-3031	798-E	21.07.21	TJW	NJM	NJM

Client: Architect

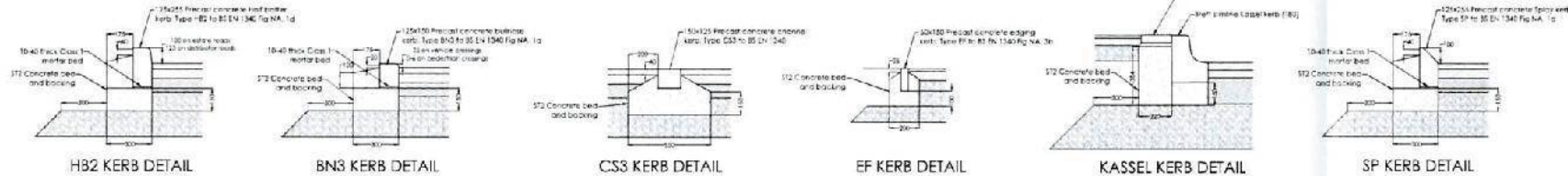
Scale: 1:500 @ A1

Notes: 1. All dimensions are in millimetres unless otherwise stated.
2. All dimensions are to be taken to the centreline of the road.
3. All dimensions are to be taken to the centreline of the road.
4. All dimensions are to be taken to the centreline of the road.

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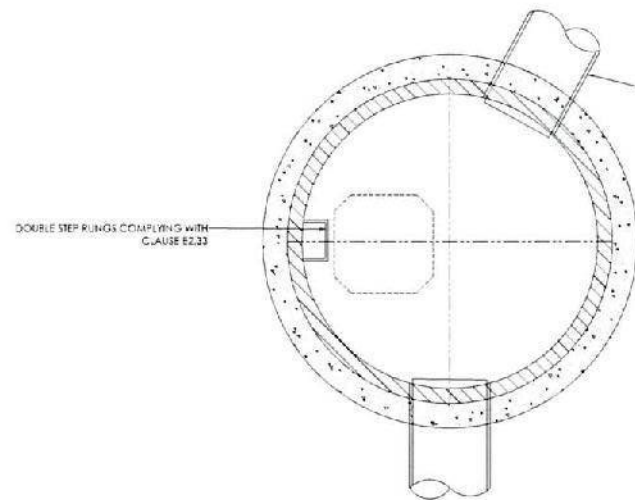
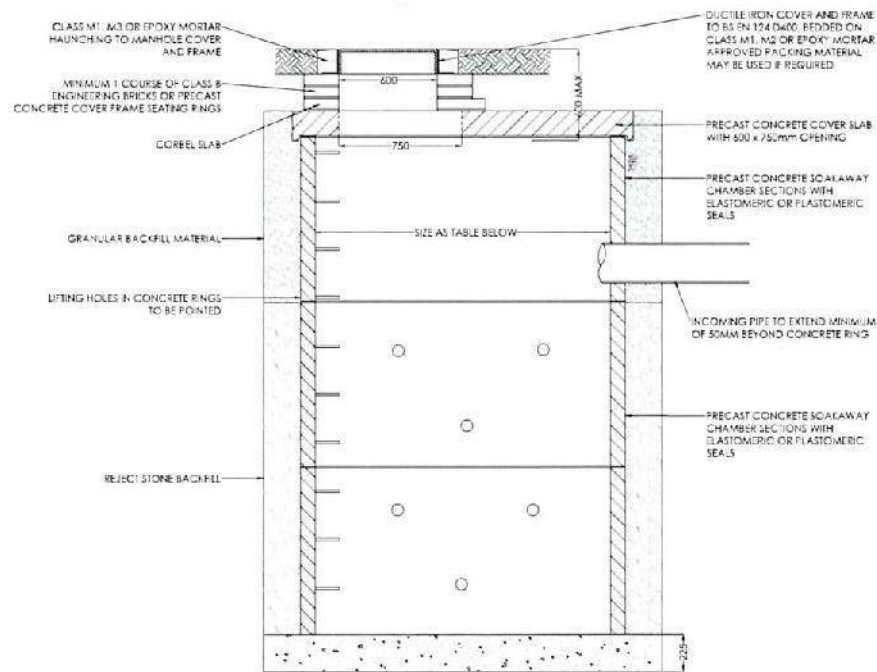
Suite 2, 1st Floor, Portmole House, Portmole Lane, Hinchin, Herts, SG5 1JZ

01462 515453 | info@stomor.com



KERB DETAILS

PRECAST CONCRETE RING SOAKAWAY

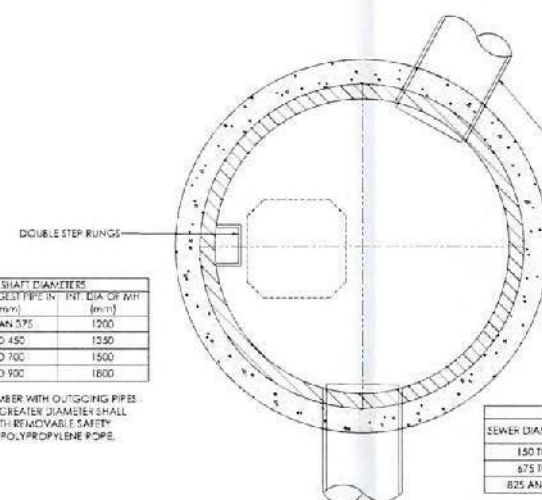
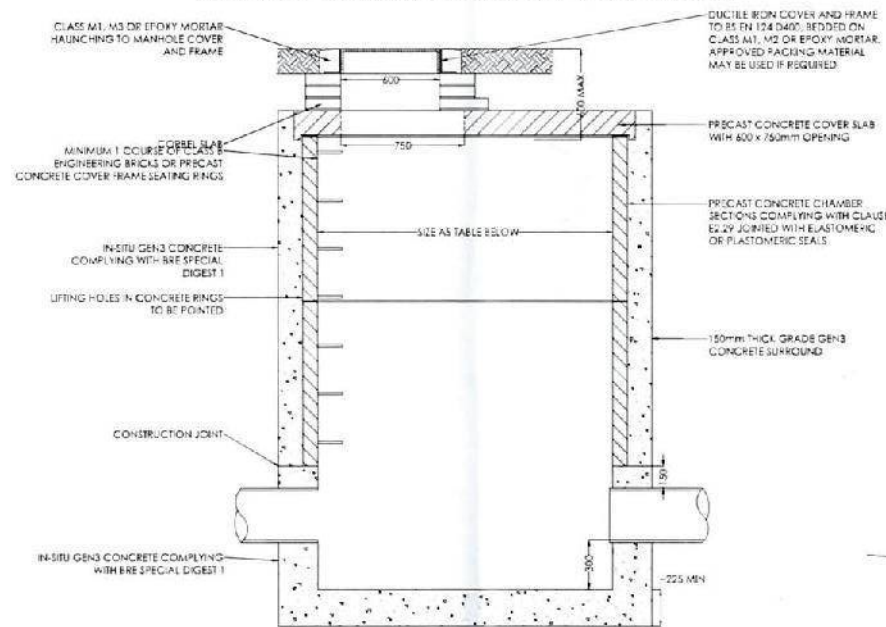


SEWER DIAMETER (mm)	EFFECTIVE LENGTH (mm)
150 TO 400	600
475 TO 750	1000
825 AND OVER	1250

SHAFT DIAMETERS	INT. DIA. OF R/W
150 TO 400	1200
475 TO 750	1350
825 TO 1000	1500
1050 TO 1300	1600

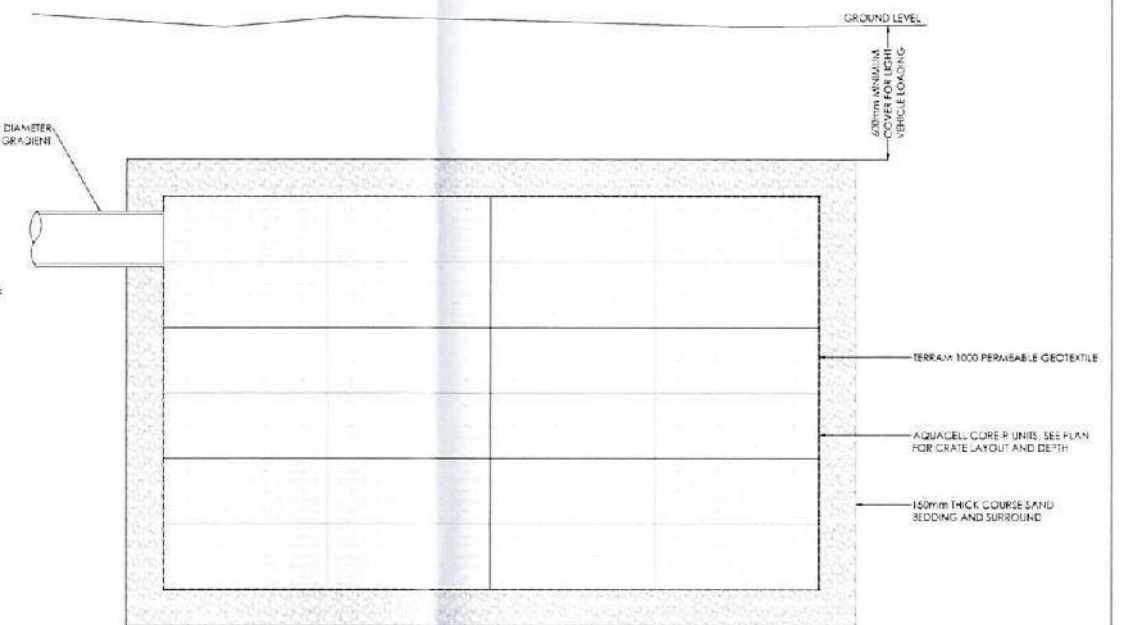
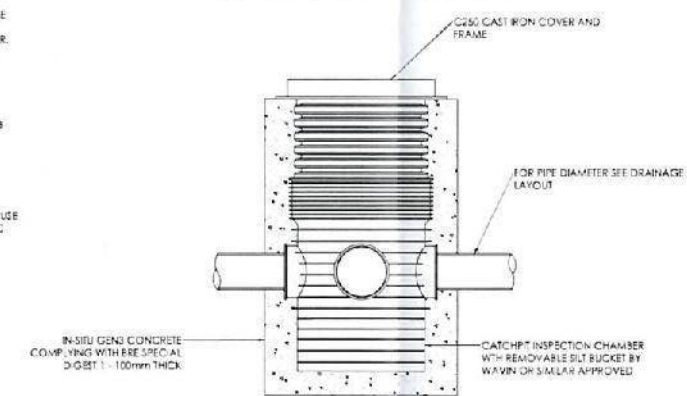
NOTE: CHAMBER WITH OUTGOING PIPES 600mm OR GREATER DIAMETER SHALL BE FITTED WITH REMOVABLE SAFETY CHAINS OR POLYPROPYLENE POPS.

PRECAST CONCRETE CATCHPIT MANHOLE



SEWER DIAMETER (mm)	EFFECTIVE LENGTH (mm)
150 TO 400	600
475 TO 750	1000
825 AND OVER	1250

450 CATCHPIT MANHOLE



AQUACELL SOAKAWAY DETAIL

IN MACHINE DUG UNIFORM SOILS

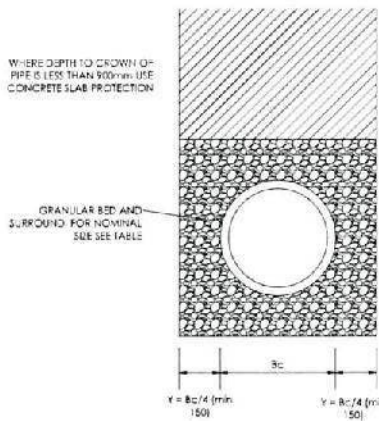
SLEEVE JOINTED PIPES, MIN 50mm SOCKETTED PIPES 116 BC OR 100mm, WHICHEVER IS THE GREATER UNDER BARRELS BUT NOT LESS THAN 50mm UNDER SOCKETS (400mm MAX).

IN ROCK OR MIXED SOILS SLEEVE JOINTED PIPES, MIN 50mm SOCKETTED PIPES 116 BC OR 100mm, WHICHEVER IS THE GREATER UNDER BARRELS AND 150mm MIN UNDER SOCKETS (400mm MAX).

WITH CONCRETE BEDDING 100mm MIN FOR ALL TYPES OF PIPE

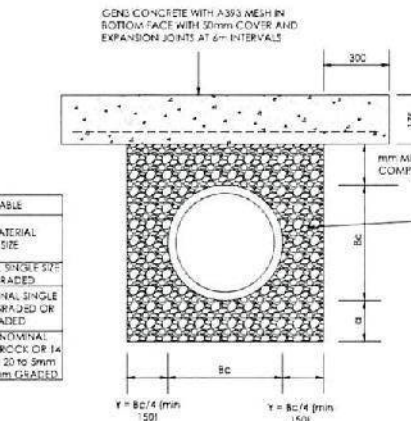
CLASS A1, A2 AND A3 PRECAST CONCRETE SETTING BLOCKS AS SEWERS FOR ADOPTION TO BE USED FOR PIPE SUPPORT.

FOR CLASS A REINFORCEMENT CONCRETE CRADLE ARE ARCH TRANSVERSE STEEL TO BE 0.4% MIN OF CONCRETE CROSS SECTIONAL AREA. IF THE STEEL IS INCREASED UP TO 1%, THE BEDDING FACTOR MAY INCREASE UP TO 4.0.

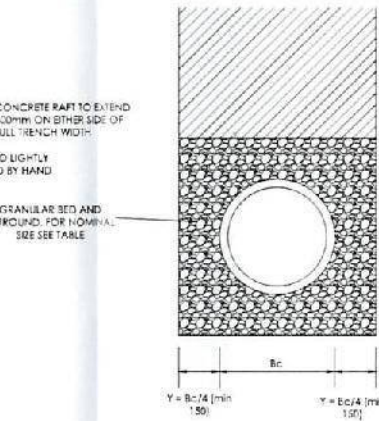


CLASS S BED AND SURROUND
For pipes outside of public highway

INT PIPE DIAMETER	PIPE BEDDING MATERIAL AGGREGATE SIZE
150	10 or 14mm NOMINAL SINGLE SIZE OR 14 to 5mm GRADED
225 TO 325	10, 14 or 20mm NOMINAL SINGLE SIZE OR 14 to 5mm GRADED OR 20 to 5mm GRADED
OVER 325	10, 14 or 20mm NOMINAL SINGLE SIZE CRUSHED ROCK OR 14 to 5mm GRADED OR 20 to 5mm GRADED OR 40 to 5mm GRADED



CONCRETE SLAB PROTECTION



CLASS S BED AND SURROUND
For pipes within public highway

BACKFILL MATERIAL IN ACCORDANCE WITH HIGHWAY AUTHORITY SPECIFICATION

WHERE DEPTH TO CROWN OF PIPE IS LESS THAN 1200mm USE CONCRETE SLAB PROTECTION

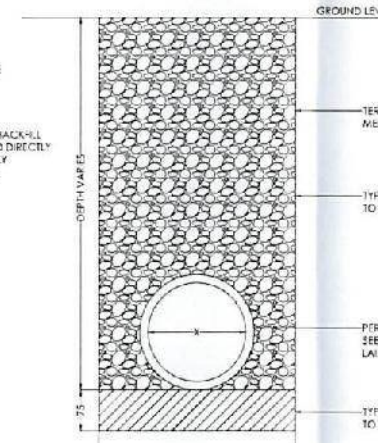
300mm MIN BEDDING/BACKFILL MATERIAL TO BE PLACED DIRECTLY ABOVE PIPE AND LIGHTLY COMPACTED BY HAND

150mm MIN. COVER FOR LIGHT VEHICLE LOADING

150mm THICK GRADE 3 CONCRETE SURROUND

225mm MIN. CONSTRUCTION JOINT

IN-SITU GENS CONCRETE COMPLYING WITH BRE SPECIAL DIGEST 1



FILTER DRAIN

Proposed Development at Hatchfield Farm, Newmarket
Section 278 Highway Works

Construction Details - Sheet 2 of 2

Project Number: 51-3031
Drawing Number: 799-A

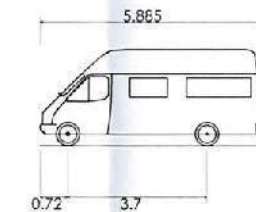
Date: 21.07.21
Drawn: TJW
Checked: NJM
Approved: NJM

Client: NIS@A1

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4.6t Light Van	
Overall Length	5.885m
Overall Width	2.000m
Overall Body Height	2.526m
Min Body Ground Clearance	0.299m
Track Width	1.765m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.000m

Rev	Description	Date	Drawn	Checked	Apvd.
-----	-------------	------	-------	---------	-------

Project:
Proposed Development at Hatchfield Farm, Newmarket
Section 278 Highway Works

Drawing Description:
A14 Signals
Swept Path Analysis - Maintenance Van

Project Number	Drawing Number
ST-3031	870

Scale	Date	Drawn	Checked	Approved
1:500@A3	26.05.23	JRD	LGH	TJW

Client	Architect
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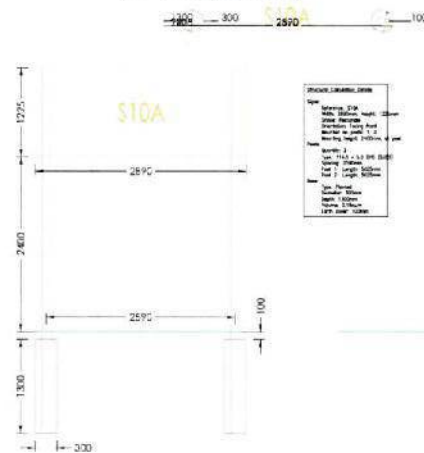
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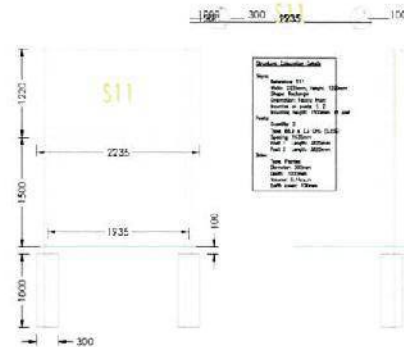
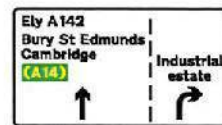
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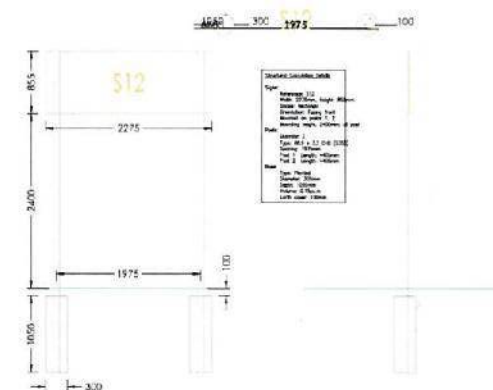
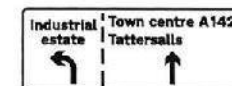
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SCC SIGN



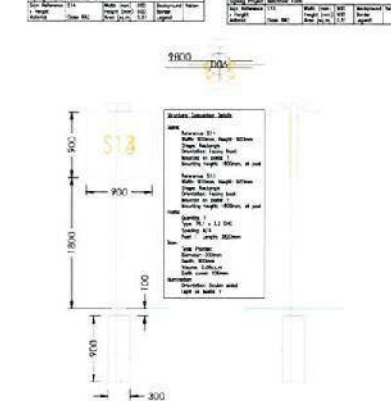
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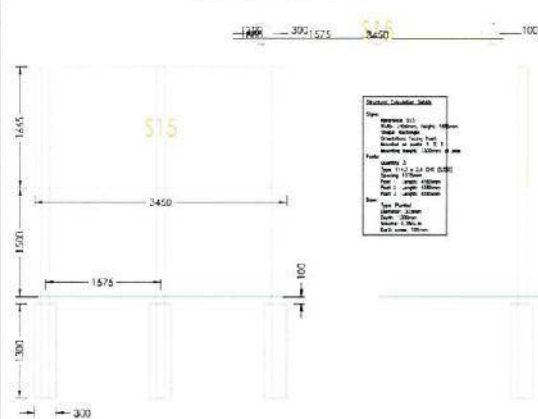
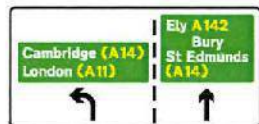
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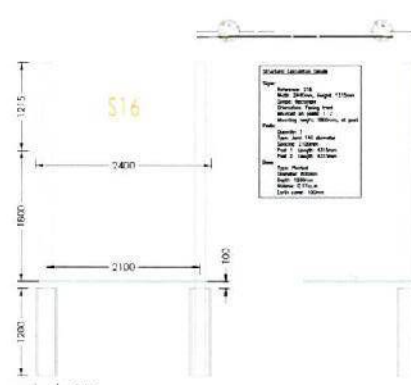
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SCC SIGN



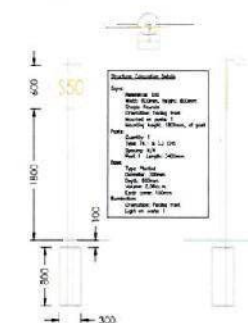
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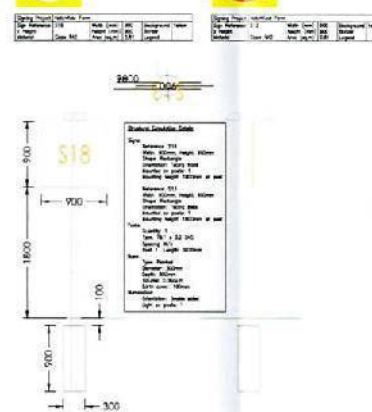
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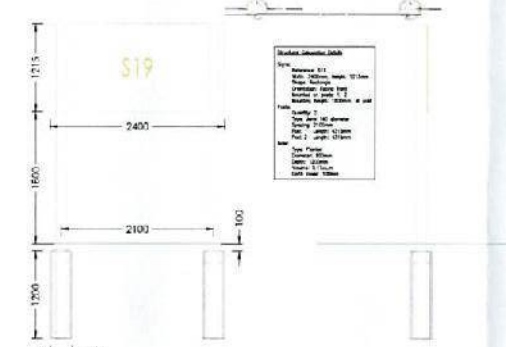
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SCC SIGN



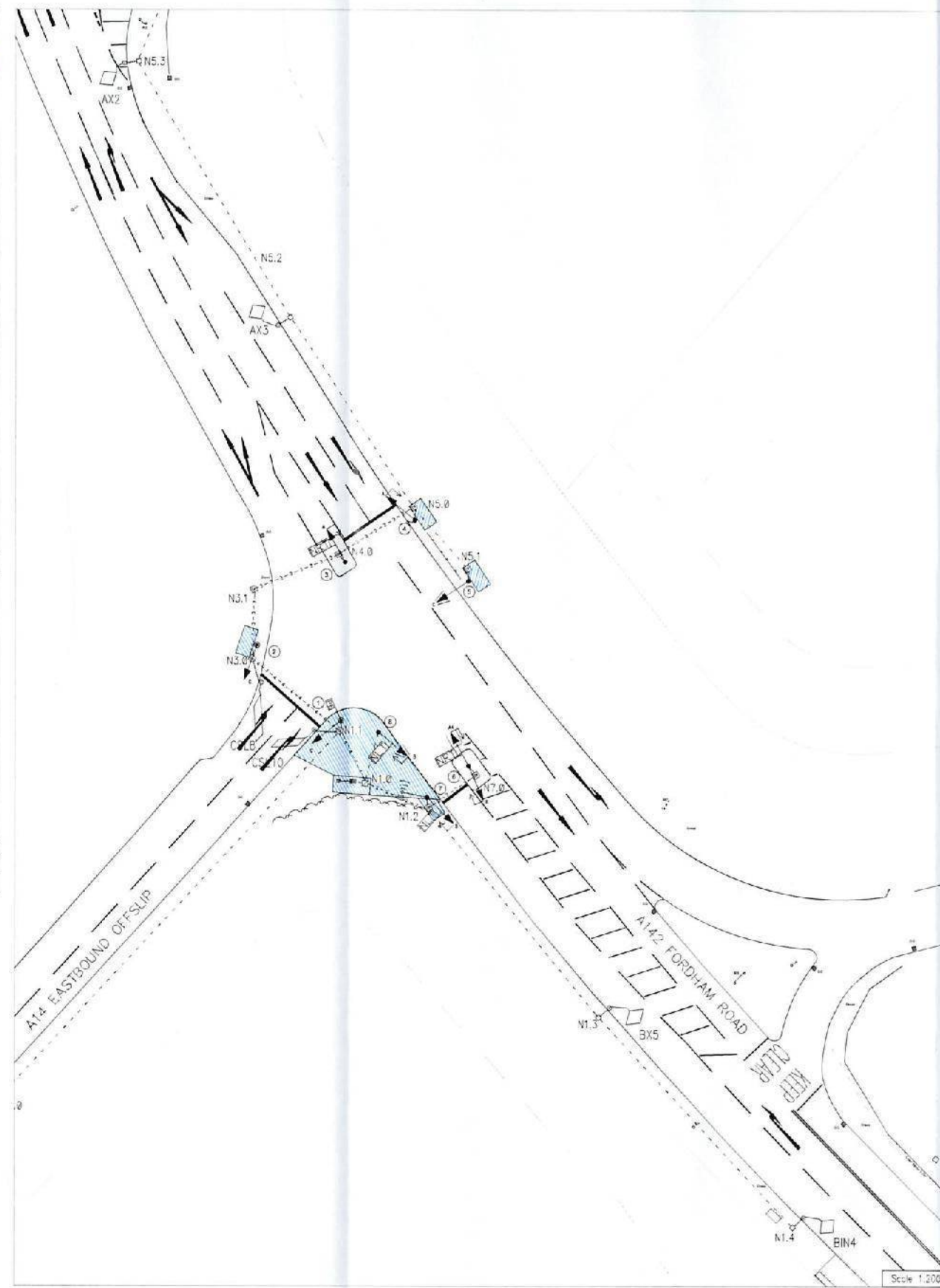
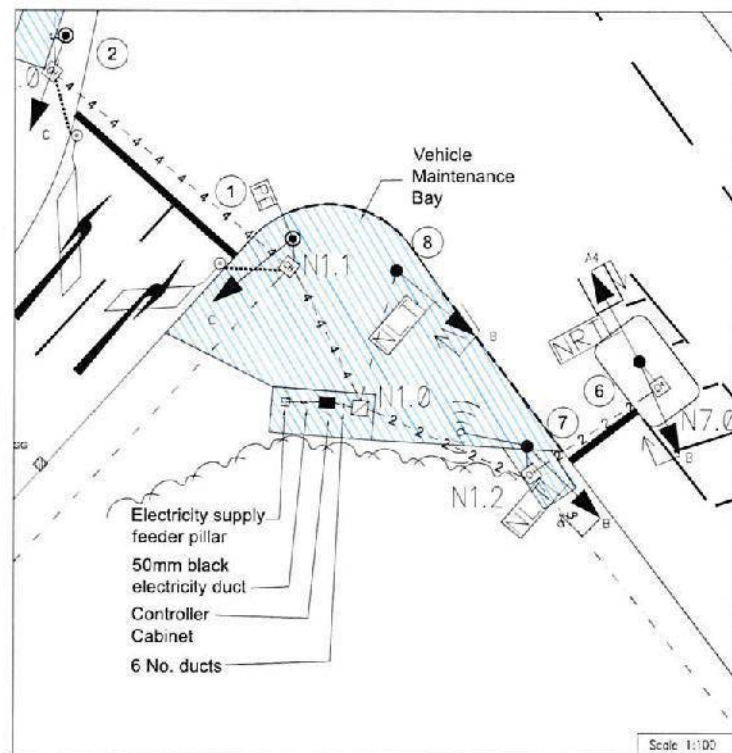
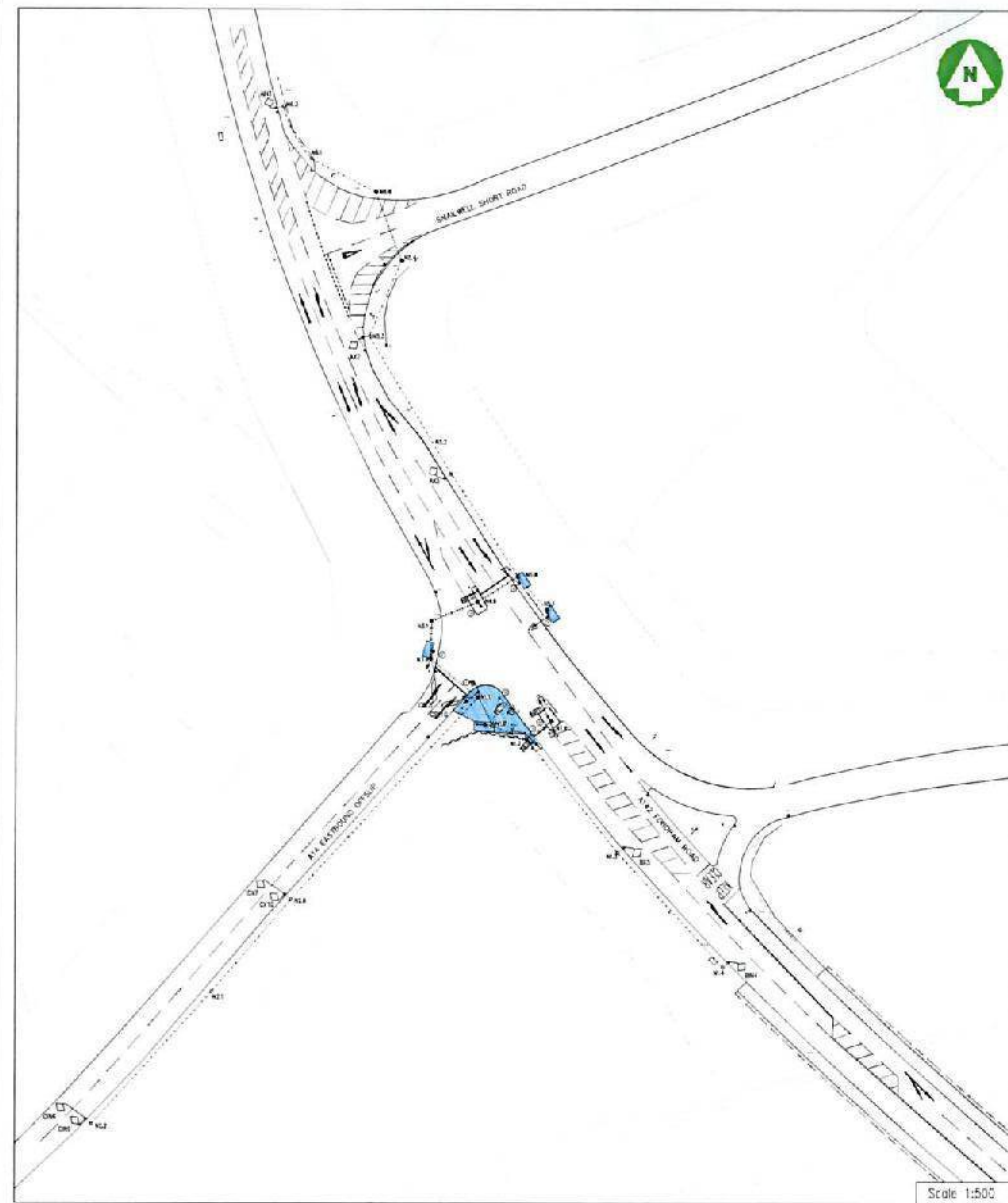
NH SIGN

C	Signs S10A, S11, S12 and S13 amended to suit work location	16.12.23	EW	SH	SH
E	Sign S14 mounting height increased to 1.8m, posters added	16.12.23	EW	SH	SH
F	Schedule updated to show positive safe work to A14 and	16.12.23	EW	SH	SH

Proposed Development at Hatchfield Farm, Newmarket
Section 27B Highway Works

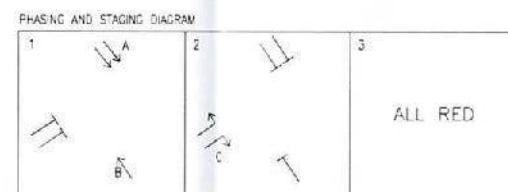
Drawing Description
Sign Schedules - Northern Access and A14 Slip Roads

Project Number	910-C
Scale	1:500@A1
Date	21.07.21
Drawn	TJW
Checked	NJM
Approved	NJM



PHASE TIMINGS

PHASE	TYPE	MINIMUM GREEN
A	TRAFFIC	7
B	TRAFFIC	7
C	TRAFFIC	7



PHASE INTERGREENS

PHASE	INTERGREEN
A	7
B	7
C	7

- NOTES
1. Controller to be ELV
 2. All signal heads to be LED
 3. Stop lines to be 500mm
 4. Poles 1 and 2 to be 4m aluminium preswley safe type, all other poles to be standard steel poles
 5. All poles to be installed with NAL RS10 pole retention sockets
 6. Poles and controller to be black in colour
 7. The accuracy of this drawing cannot be guaranteed for the setting out of cable wires
 8. New secondary feeder pillar to be located with new 50mm duct between new controller and feeder pillar
 9. All signal heads and poles to have a minimum of 0.5m clearance from kerb edge. This is due to the design, safety and Suffolk CC requirements
 10. Secondary signal head of phase A on pole 6 to have tunnel heads installed
 11. Poles 6 and 7 to be installed 1.5m from their associated stop line and at least 1m from the kerb edge. This is to ensure that the clear distance is maintained
 12. Poles 1, 2, 3 and 4 to be installed 2m from their associated stop line and at least 1m from the kerb edge
 13. Poles 3 and 6 to be installed at 1.0m & 1.25m respectively from island kerb edge. This is to be measured from the kerb closest to the stop line
 14. Pole 5 to be installed at 1.5m from kerb edge
 15. Pole 8 to be installed 10m from its associated stop line and at least 1m from the kerb edge
 16. No Right Turn box sign to be installed on poles 3 and 6. Box sign on pole 3 to be mounted to the right of the green aspect and the box sign of the secondary signal head mounted on pole 6 (Phase A), to be 4-in-line
 17. No Left Turn box sign to be installed on poles 7 and 8. Box sign to be mounted to the left of the green aspect
 18. Handstanding (1.5m by 2m minimum) to be installed adjacent to all poles with verges to ensure a ladder can be placed safely near to pole for maintenance
 19. Handstanding (1.5m by 2m minimum) to be installed adjacent to all poles with verges to ensure a ladder can be placed safely near to pole for maintenance
 20. Chambers are to be specified as C20 composite cover and frame, unless unless they are located within verges and are unprotected by W8 safety kerbs or D400 chambers are to be used. All chambers to be installed with a concrete surround as per manufacturer's guidelines
 21. Mesh wireless antenna to be installed on pole 7 to link this junction to the junction at A142 Fordham Road/Coastbound Drift
 22. Mesh wireless antenna to be installed on 2.5m vertical support above pole

- KEY
- PRIMARY 3 ASPECT SIGNAL HEAD
 - PRIMARY 3 ASPECT SIGNAL HEAD WITH STRAIGHT AHEAD ARROW IN PLACE OF FULL GREEN
 - SECONDARY 2 ASPECT SIGNAL HEAD
 - SECONDARY 2 ASPECT SIGNAL HEAD WITH STRAIGHT AHEAD ARROW IN PLACE OF FULL GREEN
 - SECONDARY 2 ASPECT SIGNAL HEAD WITH TUNNEL HEADS STRAIGHT AHEAD ARROW IN PLACE OF FULL GREEN
 - NO RIGHT TURN BOX SIGN
 - NO LEFT TURN BOX SIGN
 - 4-IN-LINE SIGNAL HEAD
 - 4m POLE
 - 4m POLE ALUMINIUM PRESWLEY SAFE
 - ITC CELL
 - MESH WIRELESS ANTENNA
 - DETECTOR LOOPS
 - TRAFFIC SIGNAL CONTROLLER
 - ELECTRICITY SUPPLY MAIN PILLAR
 - 600 x 800 TRAFFIC SIGNAL ACCESS CHAMBER
 - 400 x 450 TRAFFIC SIGNAL ACCESS CHAMBER
 - 450 x 450 TRAFFIC SIGNAL ACCESS CHAMBER
 - N-CARRIAGEWAY LOOP BOX
 - 50mm ELECTRICITY BLACK CABLE DUCT
 - SINGLE 100mm ORANGE CABLE DUCT
 - MULTIPLE 100mm ORANGE CABLE DUCT
 - 50mm ORANGE CABLE DUCT
 - CONTROLLER MAINTENANCE BAY AND POLE HANDSTANDING
 - MAINTENANCE BAY DROP KERB

DETECTOR FUNCTIONS

DETECTOR NUMBER	DETECTOR LABEL	PHASE(S) DEMANDED	PHASE(S) EXTENDED
1	AX1	A	A
2	AX2	A	A
3	AX3	A	A
4	AX4	A	A
5	AX5	B	B
6	CX6	C	C
7	CX7	C	C
8	CSL8	C	C
9	CX9	C	C
10	CX10	C	C
11	CSL11	C	C

DETECTOR LOOP SCHEDULE

DETECTOR LABEL	DISTANCE FROM STOP LINE	SHAPE	C/D-ORIENTATION	D-DIAMETER	LENGTH OF LOOP	DISTANCE TO NEXT/ PREVIOUS CYCLING	NEARSIDE	OFFSIDE
AX1	104	D		1.7	3.6	0.8		
AX2	54	D		1.7	3.6	0.8		
AX3	25	D		1.7	3.6	0.8		
AX4	60	D		1.7	3.6	0.8		
AX5	30	D		1.7	3.6	0.8		
CX6	112	D		1.7	3.6	0.8		
CX7	54	D		1.7	3.6	0.8		
CSL8	3	C		1.1	0.4	0.8		
CX9	112	D		1.7	3.6	0.8		
CX10	54	D		1.7	3.6	0.8		
CSL11	3	C		1.1	0.4	0.8		

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/PERILS ASSOCIATED WITH THE TYPE OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING INFORMATION RELATES TO THE CONTRACTOR TO RETAIN RECORDS AND LOCATE ALL STATUTORY UNDERTAKERS PLANT FROM SITE OCCUPATION

PRINCIPAL CONTRACTOR TO OBTAIN FULL STATE DETAILS PRIOR TO ANY WORK BEING UNDERTAKEN AT THIS SITE

PRELIMINARY WORK

DUE TO LARGE NUMBER OF TREES AND BUSHES IN THE VICINITY OF THE JUNCTION IT IS NOT POSSIBLE TO PROVIDE FORWARD VIEWING OF THE JUNCTION. IT IS ALSO ADVISED THAT THE SITE IS A SITE WITH DELAYED SITE SPECIFIC ANNUAL FOLIAGE CUTTING REQUIREMENTS

DUE TO THE HIGH VOLUME OF TRAFFIC AND POTENTIAL FULL ROUTES ALL VEHICLES/PEDESTALS TO BE KEPT AWAY FROM THE JUNCTION

MAINTENANCE BAY SITUATED ADJACENT TO CONTROLLER LOCATION

DATE

DATE

DATE

DATE

Revision	Description	By	Checked	Authorised	Date
1	Amended drawing to include all statutory undertakers plant from site occupation	MD	MD	MD	10/10/20

GREEN SIGNALS Consulting Limited

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Site: 1
JUNCTION OF A142 FORDHAM ROAD AND A142 COASTBOUND DRIFT

Sheet Number: 21002-101

Sheet Size: A0

Designed: MD

Checked: MD

Authorised: MD

Date: 10/10/20

Half-filled Farm Development



Hatchfield Farm Development,
Newmarket
Traffic Signal Service Duct Specification
Appendix 5/2.

November 2021

Green Signals Consulting Ltd— The Old Brewery, 47 Church Street, Great Baddow, Essex
CM2 7JA

T: 01245 472996 **Email:** info@greensignals.co.uk



Document History

Hatchfield Farm Development,
Newmarket
Traffic Signal Service Duct Specification
Appendix 5/2

Version	Description	Originated	Checked	Authorised	Date
1.0	Initial Version	CNM	DM	SLO	25/11/21
1.0	Amended following SCC comments	CNM	DM	SLO	31/03/23





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1. Introduction 1

2. Service Duct Requirements 1

 General 1

 Installation 2

 Reinstatement 4



1. Introduction

- 1.1. This specification details the work required to install the traffic signal ducts, which form part of the Hatchfield Farm Development, Newmarket scheme.
- 1.2. This document is to be read by all key parties who are involved with the installation of the traffic signal ducts and chambers.

This document covers six sites at following locations: -

- Site 1 – Junction of A142 Fordham Road and A14 Eastbound Off Slip
- Site 2 – Junction of A142 Fordham Road and A14 Westbound Off Slip
- Site 3 – Junction of A142 Fordham Road and Northern Access
- Site 4 – Toucan Crossing A142 Fordham Road south of Oaks Drive Roundabout
- Site 5 – Toucan Crossing Spine Road east of Willie Snaith Road Roundabout
- Site 6 – Toucan Crossing A142 Fordham Road south of Willie Snaith Road Roundabout

2. Service Duct Requirements

General

- 2.1. The position of ducts, traffic signal controller roots, feeder pillars, pole retention sockets, chambers, detector joint boxes and carriageway loop boxes are to be installed as shown on the Traffic Signal Design Drawings listed in Appendix 12/5.
- 2.2. The Principal Contractor shall liaise directly with the Traffic Signal Contractor throughout the duration of the associated traffic signals works.
- 2.3. The Principal Contractor shall be responsible for providing all the necessary traffic management in accordance with the requirements of Chapter 8 of “The Traffic Signs Manual – Road Works and Temporary Situations” (2009) Parts 1 & 2, to carry out all necessary works under this contract.
- 2.4. The Principal Contractor shall be responsible for the installation of the following:
 - Traffic Signal Controller Roots
 - Feeder Pillars
 - Pole Retention Sockets
 - Ducting
 - Chambers and Detector Joint boxes
 - Underkerbs/Carriageway Loop boxes

- 2.5. The Principal Contractor shall liaise with the Traffic Signal Contractor regarding installation specification and timescales.

Installation

- 2.6. Duct and bedding combinations shall be selected from the following drawings which form part of the Highway Construction Details:
- Drawing MCX 0814 Sheet 1 – Longitudinal and Local Ducts
 - Drawing MCX 0814 Sheet 2 – Local Ducts
 - Drawing MCX 0814 Sheet 3 – Transverse Ducts
 - Drawing MCX 0814 Sheet 4 – Spacer and Strapping
 - Drawing MCX 0814 Sheet 5 – Mechanical Duct Plug
- 2.7. The minimum cover below finished level shall be as follows:
- 100mm diameter ducts across carriageway 750 mm
 - 100mm diameter ducts within footway/verges 450 mm
 - 50mm diameter ducts between chambers and underkerbs/carriageway loop boxes 450 mm
- 2.8. Ducts shall conform to BS EN 50086-2-4 and be 100 mm diameter, orange coloured and have 'Traffic Signals' embossed along its length. All ducts are to have smooth internal bore. Ducts from underkerbs/carriageway loop boxes to nearest chamber shall be 50mm diameter and orange in colour.
- 2.9. The numbers and sizes of ducts are specified on the Traffic Signal Design Drawings as listed in Appendix 12/5
- 2.10. Where joints are required between duct sections the edges shall be chamfered and any burrs removed.
- 2.11. In instances where multiple ducts are installed in a single trench, they are to be strapped together at 1m intervals please refer to Drawing MCX0814 Sheet 4.
- 2.12. Chambers and detector joint boxes are to conform to Highway Construction Details Drawing MCX 0815 Sheet 1-4 and should be capable of supporting a vertical load of 12.5 to 40 tons. Refer to each individual Traffic Signal Drawing for site specific proposed chambers.
- 2.13. Chambers are to be 600 x 600 mm and 600 x 450 mm and detector joint boxes 450 x 450 mm as per the Traffic Signal Design Drawings and are to be installed as per the manufacturer's instructions. All chambers and detector joint boxes are to have a smooth and level concrete base and a concrete surround.

- 2.14. Pole retention sockets, Chambers, Detector joint boxes shall be of the following types, or equivalent with the agreement of the Overseeing Organisation's Traffic Signal Engineer.
- Pole Retention Socket: NAL RS115 Pole Retention Socket
 - Chamber: NAL STAKKA box 600x600mm, 600x450mm,
 - Detector Joint Box: NAL STAKKA box 450x450mm
 - Carriageway loop box: NAL Carriageway Loop Box
- 2.15. Before the installation of any signal cable or other equipment, all duct chambers are to be cleared of all debris and ducts shall be sealed by means of pre-formed plastic end caps.
- 2.16. The Principal Contractor shall liaise with the Overseeing Organisation's Traffic Signal Engineer to determine if expanding foam sealant is to be used to seal every duct, to prevent vermin or flooding of the duct network.
- 2.17. As sites 1, 2 and 3 have high speed approaches/ and no safety fencing all chambers and detector joint boxes on both approach must be installed at a minimum of 1m from the carriageway. Measurement is to be taken from the nearest edge of the chamber.
- 2.18. Chambers and Detector Joint boxes located behind safety fencing are to be installed at the current minimum safety working width.
- 2.19. Dimensions and sizes of chambers are referenced on the Traffic Signal Design Drawings as specified in the Appendix 12/5.
- 2.20. Chamber and Detector Joint boxes covers and frames should be Class C250 minimum on sites 1 and 2 and Class B125 minimum on all other sites or as defined in Traffic Signal Design Drawings, with the following exception:
- D400 on A14 and A142 verges when unprotected by VRS safety barrier for sites 1,2 and 3
- 2.21. The chamber covers are to be fitted with 8mm coach screws to enable the cover to be fastened to the chamber. The legend 'Traffic Signals' is to be applied to each chamber cover.
- 2.22. For all chambers and detector joint boxes, resin composite non-slip lids are to be fitted. A concrete surround of not less than 150mm deep shall be provided, and where installed in verges a surround of 150mm on all four sides at ground level is also to be provided.
- 2.23. Where a pull plug electrical disconnection is proposed for passively safe traffic signal poles, the Principal Contractor is to ensure that appropriate fixed cable connection systems are available within the chamber wall. This fixing ensures the cable is pulled tight in the event of a vehicular collision with the pole.

- 2.24. Ducts are to extend into access chambers, joint boxes and pole retention sockets to a distance of 25mm +/- 2mm.
- 2.25. Refer to manufacturers' installation requirements with required to foundation depths and method of installation for pole retentions sockets. Refer to Traffic Signal Design drawings and Appendix 12/5 for site specific requirements.
- 2.26. The Principal Contractor shall ensure that all duct runs are clear of obstructions and contain draw cord before cable installation work begins. If found to be missing at the time of cable installation the Principal Contractor shall install the draw cords.
- 2.27. The Traffic Signal Contractor shall ensure that all draw cords are to remain within the duct network during the course of traffic signal installation and once works are complete. All cables are to be pulled into the duct by the use of draw cord already in the duct network and new draw cord shall be pulled in at the same time.
- 2.28. The maximum number of armoured and non-armoured cables to be installed in any 100mm duct shall be 5 and 10 respectively. If combined an armoured cable is deemed to be equivalent to two non-armoured cables.
- 2.29. Carriageway Loop Boxes are to be positioned as shown on the Traffic Signal Design drawings and installed as per Highway Construction Detail Drawing G25. They are to be used for the entry of inductive detector loops under the kerb into the duct system. The slots in the loop box are to be aligned so that they are parallel to the kerb face. Covers of the carriageway loop boxes are to be securely fastened.
- 2.30. The Principal Contractor shall install underkerbs at the point of where the detector loops connect to the duct network system. They are to be used for the entry of inductive detector loops under the kerb into the duct system. Refer to Traffic Signal Drawings for details of where underkerbs are to be installed.
- 2.31. The Principal Contractor shall install 1 No 50mm black duct between the electrical feeder pillar and the traffic signal controller.

Reinstatement

- 2.32. Trench and carriageway reinstatements are to be in accordance with 'HAUC Specification for the reinstatement of Opening in Highways'.

- 2.33. Coloured marker tape in accordance with SHW Clause 1421 and bearing the legend 'CAUTION TRAFFIC SIGNALS CABLE BELOW' shall be installed as defined in sheets 1 and 2 of MCX 0814.
- 2.34. The Principal Contractor shall carry out the Final (considered permanent) reinstatement of disturbed footway and carriageway surfaces in materials similar to those removed.
- 2.35. The Overseeing Organisation (Highway Authority) will inspect all reinstatement works. Final approval of all reinstatement works shall be given in writing.
- 2.36. All reinstatement works are to be guaranteed for a period of 12 months from system handover. Any failure in the reinstatement works during the warranty period shall be corrected/replaced at the cost of the Contractor.
- 2.37. Any failure in the 12 months warranty period must be fixed within 30 days of a formal notice being served to the Principal Contractor by the Overseeing Organisation.



Hatchfield Farm Development, Newmarket Specification 12/5

November 2021

Green Signals Consulting Ltd

The Old Brewery, 47 Church Street, Great Baddow, Essex CM2 7JA

T: 01245 472996 Email: info@greensignals.co.uk



Issue History

Hatchfield Farm Development, Newmarket Specification 12/5

Version	Description	Originated	Checked	Authorised	Date
1.0	Initial Version	CNM	DM	SLO	25/11/21
2.0	Amended following SCC comments	CNM	DM	SLO	31/03/23



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1. Introduction

1.1. This specification details the work required to supply, install and commission the traffic signal related works which form part of the Hatchfield Farm Development, Newmarket scheme and ensure that all the equipment is fully operational. Unless stated otherwise the work shall be undertaken in accordance TD 101 Traffic Signalling Systems and the Traffic Signs Manual, Chapter 6 Traffic Control. Where differences arise between the content of this Appendix and any referenced specifications/documents, the contents of this appendix shall be followed.

1.2. The work required as part of this contract is:-

- Installation of all of the signal equipment required at the sites detailed below.
- Commissioning of all of the signal equipment required at the sites detailed below.
- Carry out Factory Acceptance Tests (FATs), Site Acceptance Tests (SATs) and site Validation at all the sites detailed below.

This document covers 6 proposed sites and these locations are as follows: -

- Site 1 – Junction of A142 Fordham Road and A14 Eastbound Off Slip
- Site 2 – Junction of A142 Fordham Road and A14 Westbound Off Slip
- Site 3 – Junction of A142 Fordham Road and Northern Access
- Site 4 – Toucan Crossing A142 Fordham Road south of Oaks Drive Roundabout
- Site 5 – Toucan Crossing Spine Road east of Willie Snaith Road Roundabout
- Site 6 – Toucan Crossing A142 Fordham Road south of Willie Snaith Road Roundabout

1.3. This document shall be read by all key parties who are involved with the installation, testing and commissioning of the traffic signal equipment.

1.4. The junctions are located within the jurisdiction of Suffolk County Council and are to be managed and maintained by their term maintenance contractor, which is currently Dynniq. As Sites 1 and 2 are at junctions of the A14 off slips with the A142, National Highways are to be consulted prior to installation.

1.5. The reference to 'Overseeing Organisation' in this specification is the Highway Authority who has responsibility for the junction.

1.6. The reference to 'Traffic Signal Engineer' in this specification is the nominated Traffic Signal Engineer of the Highway Authority or their appointed representative. Contact Details shown below:

Name: Douglas Cook
Email: Douglas.cook@suffolkhighways.org

2. Contractor Responsibilities

Principal Contractor

- 2.1. The appointed Principal Contractor shall be responsible for the overall installation of the scheme, the programming and co-ordination of all installation activities, including the arrangement of traffic management. Should any changes to the design or specification be required or desired during construction, the Principal Contractor shall liaise with the Principal Designer to ensure the proposed changes are suitable.
- 2.2. A copy of the proposed civil works and signal installation programme shall be presented to the Overseeing Organisation and their Traffic Signal Engineer (or representative) at a pre-construction meeting. The installation programme shall include the duration of all areas of works, including Factory Acceptance Test (FAT), Site Acceptance Test (SAT) and validation.
- 2.3. The Principal Contractor shall be responsible for all safe working methods whilst on site. The Principal Contractor shall adhere to all relevant regulations, including Chapter 8 of the current Traffic Signs Manual, The Electricity at Work Regulations 1989, HSG47 "Avoiding Danger from Underground Services" as well as any site-specific rules or instructions.
- 2.4. The Principal Contractor shall co-ordinate with the Traffic Signal Contractor to arrange all necessary traffic management in accordance with the requirements of chapter 8 of "The Traffic Signs Manual - Road Works & Temporary Situations" (2009) Parts 1 & 2, to carry out all necessary works under this contract.

Traffic Signal Contractor

- 2.5. The Traffic Signal Contractor shall be the appointed organisation responsible for the provision, installation and commissioning of the traffic signal installation and all associated works as defined in section 2.
- 2.6. The signal equipment layout for each site is shown on its relevant signal design drawing listed in Appendix A and shall be installed in accordance with the Traffic Signs Manual, Chapter 6 Traffic control, the signal design drawing and this specification.
- 2.7. The Traffic Signal Contractor shall ensure that all staff involved in the installation have been fully made aware of all relevant specifications and have the information and equipment necessary to comply fully with all the requirements. The Traffic Signal Contractor must ensure that all staff involved in the installation attend the site induction.

- 2.8. The Traffic Signal Contractor supervisor shall be present on site, at all times whilst any signal installation works are being carried out.
- 2.9. The Traffic Signal Contractor shall be approved to BS EN 9002 certification against QAS 3433/287 or QSS 015. A copy of the approval certificate is to be submitted with the returned tender document.

Health & Safety

- 2.10. All work on site is to comply with current Health and Safety requirements and standards. Contractors must also comply with the respective Health and Safety Regulations as well as duties placed on them under CDM regulations and NRSWA. This includes Contractors not starting works until they have received all the documentation from the client and designers relating to significant risks associated with the works.

Procurement

- 2.11. All equipment supplied shall fully comply with the Traffic Signs, Regulations and General Directions (TSRGD 2016) and British Standards Institution documents. Furthermore, the equipment shall comply with the relevant TOPAS 25** Series Specification(s) and be registered as such with TOPAS at the time of submission of Tender and throughout the contract period, until the equipment has been accepted by the Client following a successful SAT.
- 2.12. Equipment provided, which is not:
 - a registered product with TOPAS, listed on the TOPAS website and with a valid certificate of registration, or
 - a product specifically detailed by the Designershall not be accepted as suitable or fit for purpose. Evidence of TOPAS registration shall be provided with the tender submission and also at FAT and SAT if requested by any party.
- 2.13. Where specific equipment is detailed, only that equipment is to be supplied. Any use of equivalent equipment will need to be authorised in writing by the client.
- 2.14. Any specific item not detailed in the schedules, which the Tenderer considers necessary must be detailed in the tender submission.

3. Traffic Signal Controller Requirements

General

- 3.1. New Traffic Signal Controllers shall conform to the latest issue of TOPAS 2500A Specification for Traffic Signal Controller.
- 3.2. All Traffic Signal Controllers shall be an ELV controller.
- 3.3. Keys are to be provided with each controller to ensure all parts of the controller can be accessed.
- 3.4. The Traffic Signal Contractor shall provide a maintenance logbook for each controller at the SAT. The logbook should ideally take the form of an A5 book with each page divided into columns, to be pro-formed with date, time on/off site, reason for visit, action taken and signature.
- 3.5. Where a controller, or any hardware fitted within the controller, support or require Internet Protocol (IP) communications, and where IP backhaul communications are available into the controller cabinet, such as DSL broadband, all compatible devices shall be connected to the IP backhaul via Ethernet Ports and cables. There must also be at least one spare Ethernet Port connected to all devices by means of a switch or hub, for connecting a laptop for maintenance. This may require the fitting of an additional Ethernet network switch if the router installed does not have sufficient Ethernet Ports.

Installation

- 3.6. The controller can only be installed once a permanent mains power supply is available.
- 3.7. The Principal contractor shall install all necessary ducting. This includes the duct between the controller and the Electricity feeder pillar as well as the duct for a telemetry connection.
- 3.8. The Traffic Signal Contractor shall provide the Principal Contractor with clear instructions as to how to install each controller cabinet. These include the recommended method of installation and the final level of adjacent footway. The sections of the controller cabinet below ground should be treated accordingly.
- 3.9. The traffic signal controller shall be fitted with a Detector Fault Monitor (DFM) lamp. When illuminated, the lamp shall be visible externally with all cabinet doors closed.
- 3.10. The controller cabinet shall be installed to enable the DFM lamp to be visible from the adjacent carriageway. The orientation of the controller is to be installed as per the design drawings or as instructed by the Overseeing Organisation's Traffic Signal Engineer prior to installation.

- 3.11. Each controller cabinet shall be base sealed to prevent ingress of moisture or gas once all cables have been terminated. The base seal should comprise of backfilled compacted dry sand, followed by an approved sealing compound. This sealing compound shall be mixed as specified by the manufacturer, comprising a layer of 6mm epoxy resin laid on top of the compacted dry sand.
- 3.12. The area around the controller cabinet shall be paved in accordance with the design drawings, in either flexible carriageway material or concrete flags and shall link accordingly to the maintenance bay or footway.
- 3.13. Each controller cabinet shall be black in colour and shall include space for the addition of an OTU/MOVA unit even if such unit can be fitted integrally. Refer to later clauses of this document and Bill Items for unit type/s to be installed. Space shall also be made available for a communication interface.
- 3.14. Each controller cabinet shall be fitted with a suitable stay, to secure the door in windy conditions. The cabinet shall be provided with a door pocket to enable storage of design drawings and the maintenance logbook. A self-adhesive folder/wallet on the back of the cabinet door will not be accepted.
- 3.15. The controller cabinet shall be labelled with the site reference number provided by the Traffic Signal Engineer and should be visible from the adjacent carriageway.
- 3.16. The Traffic Signal Contractor shall arrange for training to be given for any new software or modifications to the controller, which has not been previously used.

Set up and configuration

- 3.17. The timing information for each of junctions and toucan crossings can be found on the ITS1827D Forms provided in Appendix B.

Monitoring Functions

- 3.18. Both Red Lamp and Lamp monitoring facilities shall be provided with the installation of sites 3 to 6. Sites 1 and 2 only require Lamp monitoring facilities to be provided. The Traffic Signal Contractor shall be responsible for the installation and operation of lamp monitoring facilities, which shall be provided either by means of an integral method, which shall be installed in accordance with the requirements of TOPAS 2500A.

- 3.19. The DFM lamp is to be lit for any failure of detector input (vehicle/pedestrian) for which fault monitoring has been specified. No fault indication shall be generated when inhibited by an operator command. A permanently active condition shall be inserted for each detector when in fail state, unless otherwise specified. This permanent demand shall be removed when the fault is rectified.

Microprocessor Optimised Vehicle Actuation (MOVA)

- 3.20. All MOVA facilities provided by hardware other than the controller shall comply with the requirements of the latest issue of MCH 1542 'Guidelines for the implementation of MOVA using 'Add On' Equipment. MOVA may alternatively be provided by 'integral' means. If provided within the controller, the Traffic Signal Contractor shall demonstrate that MOVA is fully functional.
- 3.21. The Traffic Signals Contractor shall install the MOVA unit (or enable the facility) in the controller. The latest version of MOVA is to be compatible with the signal equipment and the associated remote monitoring system.
- 3.22. The Traffic Signal Contractor shall setup all necessary licenses and configuration as may be necessary to enable MOVA (other than providing a dataset). This shall include the mapping of detectors, control and reply bits, if necessary.
- 3.23. Where Urban Traffic Control (UTC) is also specified, MOVA operation shall be in accordance with the UTM2 UG405 protocol, to allow control and reply of MOVA from UTC. This shall include the provision of control and reply bits MO (MOVA override), MR (MOVA ready), ML (MOVA on-line) and MF (MOVA Fault) within the same hardware as MOVA. These shall not be wired to the controller unless MOVA is provided integrally, or MOVA and UTC are specified to operate on separate hardware.
- 3.24. As this specification details two MOVA Linked controllers (sites 1 and 2), the Traffic Signal Contractor is to supply and install communications equipment within each traffic signal controller, along with the associated cabling to enable a Traffic Signal Engineer to interrogate both controllers (and other hardware or facilities) from either location. This shall include all communications facilities provided within either controller (including additional hardware and facilities such as MOVA) and includes RS232 Serial Handset Port(s) and Ethernet ports. The transmission media may be anything appropriate and secure for the data being transmitted, however the facilities shall be reproduced in the same manner (both physical connection and communications protocols) that they are originally presented in.
- 3.25. Linking communications are to be achieved via a local Mesh network, with Mesh wireless antenna being installed at both site 1 and 2.

- 3.26. The MOVA equipment supplied shall be provided with a means of communication via both a front panel terminal port (via notebook PC) and by the in-station equipment (via communication connection). The communication with equipment should be achieved using the latest TRL MOVA Comms programmes, or through a standard web browser on a laptop PC.
- 3.27. The Traffic Signal Contractor shall supply, install and commission all of the necessary interface facilities, hardware and software to provide MOVA control as detailed in this specification and design drawings.

Urban Traffic Control (UTC)

- 3.28. The Traffic Signal Contractor is to supply, install and commission all of the necessary interface facilities, hardware and software to provide UTC control as detailed in this specification and design drawings.
- 3.29. UTC Control is to comply with the UTM2 Protocol, including UG405 for UTC and SCOOT.
- 3.30. The Bit pattern for the control and reply words is detailed in the ITS1827D forms in Appendix B.
- 3.31. Refer also to Special Conditioning requirements (ITS1827D forms in Appendix B) for details on the use of the Higher Priority LEDs on the manual panel.
- 3.32. The Traffic Signal Contractor shall provide and configure all necessary in-station modems to ensure all systems are operational prior to the commissioning of the works.

Wireless linking

- 3.33. The Traffic Signal Contractor is to supply, install, test and commission all of the necessary interface facilities, cabling, hardware and software to provide wireless linking as specified below and detailed in this specification, design drawings and ITS1827D Controller forms.
- Site 1: Junction of A142 Fordham Road and A14 Eastbound Off Slip
 - Site 2 – Junction of A142 Fordham Road and A14 Westbound Off Slip
- 3.34. The preferred wireless linking equipment is IDT Mesh I/O

4. Electrical Requirements

General

- 4.1. The Principal Contractor shall be responsible for procuring the power supply, including the placing of the order and liaising with the DNO prior to the start of the works, supplying and installing the supply pillar. As part of the liaison the Principal Contractor is to determine the type of power supply (unmetered/metered) required and respond to queries raised by the DNO with regards to ELEXON codes. Liaison is also required with the Traffic Signals Contractor to determine controller power requirements. As part of this process the Principal Contractor should also contact the Overseeing Organisation's Traffic Signal Engineer to determine whether existing power supply arrangements are already in place and if they can be used for the new installation. The Principal Contractor is to further liaise with the Traffic Signals Contractor to confirm timescales of the power connection to the traffic signal controllers.
- 4.2. All electrical work shall be undertaken in accordance with the latest edition of BS 7671 (IEE wiring regulations), including all amendments.
- 4.3. A 6mm² core armoured cable shall be used to link the power supply secondary isolator fuse to the signal controller cabinet. The pillar casing, door and controller link cable earth conductor shall be bonded together and to a main earth terminal with a 10mm² earth cable.
- 4.4. All cables (excluding loop detector cables) shall be coloured orange and marked with 'Traffic Signals'.
- 4.5. The Traffic Signal Contractor shall calculate the cable requirements for the traffic signal equipment and shall provide the Traffic Signal Engineer with a Cable Schematic drawing, detailing proposed cable runs, types and lengths. This is to be provided not less than one month prior to the installation date.
- 4.6. All Cables are to comply with the requirements of BS 7671 and all other relevant specifications and standards. Cables shall be of adequate size and rating to meet the electrical current carrying requirements, the voltage drop requirements and provide the necessary electrical protection to the system.
- 4.7. The ends of all spare cores for each cable shall be capped using self-amalgamating tape. All spare cores are to be earthed at the controller.
- 4.8. The Traffic Signal Contractor shall ensure that all cables lengths have sufficient slack to enable future pole relocation of up to 2m should it be required in the future.

Traffic Signal Cable Installation

- 4.9. ELV shall have yellow 'pull tight' labels securely fixed to each end. Additional cable labels are required at the end of each cable. Each cable label shall have a unique cable reference in indelible ink.
- 4.10. All ELV cable runs between the controller and signal pole or adjacent controller shall include for a minimum of 25% spare cores throughout its length.
- 4.11. Each and every pole shall have its own cable, with the exception of adjacent linked 2m poles. If that is not possible then cables installed are to be arranged such that should one signal pole be knocked down, it does not extinguish all of the signals on any one phase.
- 4.12. The signal cabling within the controller cabinets shall be terminated at the termination points recommended by the manufacturer.
- 4.13. If required, the link cable between controller to controller or to miscellaneous cabinet is to be either a 16 core ELV cable or CAT5 Ethernet cable or other suitable cable to fulfil specification requirements.
- 4.14. Cable Schedules shall be completed for each controller and termination cabinet showing the cable identities and their termination locations. A separate schedule is required for Low Voltage and Extra Low voltage at sites where both types of cables are used. Cable Core Schedule shall be completed for each cable detailing the function of each core within the cable. The completed schedules shall be passed to the Overseeing Organisation's Traffic Signal Engineer for signature prior to site acceptance.

Mains Power Supply

- 4.15. The electricity supply to the traffic signal controller *and termination cabinet* is to comply with the requirements of all relevant TOPAS 25** Series specifications for the equipment being installed, including the classes specified from BS EN7987:2001. A 60-80A lockable double pole isolator with a single pole fuse is to be fitted in the mini pillar together with a secondary isolation fuse (double pole MCE 040DN or similar) incorporating a 20-32A. The connection between the mini pillar and the controller is via a 6mm² double insulated cable installed in 50mm black ducting.
- 4.16. The Traffic Signal Contractor shall be responsible for ensuring fuse discrimination. During the SAT the Traffic Signal Contractor will be required to demonstrate fuse discrimination as well as compliance with BS 7671 and the requirements of the electrical regulations to the Overseeing Organisation's Traffic Signal Engineer.

- 4.17. The Traffic Signal Contractor shall be responsible with the Principal Contractor with regards to the procurement and connection timescales of the electricity supply to the controller cabinet of this 230 volt supply.
- 4.18. The Electricity supply pillar shall be of Stainless Steel construction (Haldo or equivalent). This pillar will need to be supplied sufficiently wide enough for a meter to be installed if the electricity supply has to be metered. Within the pillar a wooden panel shall be fixed to enable the electricity supply to mount and connect the cut out (180mm (H) x 100mm (W) x 95mm (D)). Where a meter is required within a supply pillar a larger or additional wooden panel will be required. A suitable lockable double pole fused isolation switch shall be fitted within the mini pillar. All earth bonding within the pillar shall be terminated at a main earth terminal.
- 4.19. Refer to Appendix 5/2 'Traffic Signals Service Duct Specification' for details of the ducting to be installed by the Principal Contractor between the Electricity Supply pillar and the controller.
- 4.20. The Traffic Signal Contractor shall supply and install the cable connecting the supply to the controller cabinet. The final connection and installation of the electricity supply company's cartridge fuse is to be only undertaken by the electricity company's authorised staff.
- 4.21. A 6mm² core armoured cable shall be used to link the power supply secondary isolator fuse to the signal controller cabinet. The pillar casing, door and controller link cable earth conductor shall be bonded together and to a main earth terminal with a 10mm² earth cable.
- 4.22. Should the feeder pillar have multiple isolators, a clear label shall be installed to identify the supply to each controller and termination cabinet.
- 4.23. A supply should be provided within each cabinet for powering the cabinet heaters if fitted. The fuse rating shall be in accordance with manufacturers' requirements.
- 4.24. For regulatory signs a separate fuse or circuit breaker shall be provided.

OTU Power Supply

- 4.25. A 5A fused supply shall be provided within the controller for powering the OTU unit, irrespective of whether it is specified that a separate unit is to be fitted.

Maintenance Power Supply

- 4.26. Within the Traffic Signal controller a switched dual 13A socket for maintenance purposes shall also be provided in addition to other power requirements. This socket must be protected by an RCD.

Photo Electric Control Unit Power Supply

- 4.27. A separate fuse or circuit breaker shall be provided for the power supply to the photo electric control unit.

5. Outstation Monitoring and Control

Outstation Transmission Unit (OTU)

- 5.1. The OTU supplied and installed is to conform to the latest issue of MCH0010 'Installation Guide for Urban Traffic Control'.
- 5.2. All equipment shall be fully compatible with the existing Siemens/Peek UTC equipment and shall have the latest issue of firmware installed.
- 5.3. The Traffic Signal Contractor shall install a UG405 compatible OTU and router within the controller cabinet and is responsible for the configuration of the OTU, including mapping detectors, reply and confirm bits to hardware IO. This includes the creation of .CSV or IOUT files as may be relevant. The Traffic Signal Contractor shall keep a record of how and where all inputs and outputs are wired and mapped and shall pass this to the Traffic Signal Engineer at SAT.
- 5.4. The full functionality of the OTU be demonstrated during the SAT including the checking of the following, via an Installation operator: SCOOT detector inputs, Force/Reply bits, lamp faults, detector faults, controller faults and any other items deemed appropriate.

Installation

- 5.5. The OTU unit shall be mounted within the traffic signal controller cabinet. The Traffic Signal Contractor is to provide all necessary mounting equipment and racking. Likewise the Traffic Signal Contractor is to supply and install all necessary cabling/interface leads between the traffic signal controller and the OTU.
- 5.6. Cable forms for OTU installations are to be of a standard length and not to be cut down to fit the dimensions of the traffic signal controller during installation. All excess and spare cables are to be coiled and suitably tied back.

4G Communications

- 5.7. The Overseeing Organisation shall be responsible for the provision of a data only 4G SIM card that is compatible with the SCC Remote Monitoring Installation and OTU. The Overseeing Organisation is responsible for requesting the data SIM card and the Traffic Signal Contractor is responsible for the installation of the SIM card and setting it up within the OTU.
- 5.8. The Traffic Signal Contractor shall be responsible for the supply and installation of the GSM enabled OMCU. All equipment provided by the Traffic Signal Contractor shall be compatible with the Remote Monitoring System currently operated by Overseeing Organisation.



- 5.9. The Principal contractor shall be responsible for arranging and overseeing that the connection and set up of the site has been carried out on the appropriate RMS Instation modem prior to site commissioning.

6. Signal Equipment Requirements

General

- 6.1. All traffic signal street furniture is to comply with the requirements of all relevant TOPAS 25** Series specifications for the equipment being installed.

Installation

- 6.2. All items of street furniture are to be treated with an appropriate colour coating which is to be intact at the time of delivery. Should any item sustain minor damage or have unprotected metal surfaces exposed during the course of installation an appropriate repair shall be undertaken to reduce the risk of corrosion. Such repairs are to be highlighted to the Overseeing Organisation's Traffic Signal Engineer.
- 6.3. The location of the signal equipment shall be marked on site prior to works commencing during a site meeting between the Overseeing Organisation's Traffic Signal Engineer and a representative from the Traffic Signal Contractor.
- 6.4. The Traffic Signal Contractor will be responsible for the transportation of all signal equipment to/from site during the course of the site installation as well as the on-site handling of the signal equipment during the course of installation works. The safekeeping of all equipment until site acceptance by the Overseeing Organisation's Traffic Signal Engineer will also be the responsibility of the Traffic Signal Contractor.
- 6.5. All pillars (mini/haldo type), including any pole access doors, shall be sealed to prevent water ingress.
- 6.6. The Traffic Signal Contractor shall be responsible for the supply and affixing of self-adhesive pole numbers.
- 6.7. The supplied numbers shall be to the following specification:-
- Character Height: 50 to 75mm
 - Colour: Black character on white background
- 6.8. The pole numbers shall be affixed just below the bottom signal head bracket and be located on the pole so it can be seen from the controller.

Traffic Signal Poles

- 6.9. Two types of poles are to be supply and installed. All sites to have standard 4m steel signal pole with the exception of the primary signal poles on both of the A14 off slips at sites 1 and 2, two for each site, these four poles are to be aluminium and passively safe poles.
- 6.10. Where steel poles are to be supplied galvanised and have a black coloured plastic coating. The colour of the pole caps is to match the signal poles.
- 6.11. Steel poles are to be galvanised. The Overseeing Organisation' Traffic Signal Engineer reserves the right to check than un-galvanised poles have not been used.
- 6.12. Passive poles where specified shall be Aluminium type and have a black coloured outer sheath or finish.
- 6.13. All signal poles shall be supplied without pre-drilled holes for pedestrian demand units. Holes shall be drilled on site as required in accordance the design and the Traffic Signal Engineer instructions. The colour of the pole caps is to match the signal poles.
- 6.14. Stub poles which carry pedestrian demand unit only shall be supplied with welded caps and be earth bonded via a brass stud, tapped into the push button unit.
- 6.15. All poles shall fit within an RS115 pole socket, however aluminium poles may widen locally above ground level.
- 6.16. All signal poles shall be mounted in NAL pole retention sockets (or similar if agreed by Overseeing Organisation). The Pole retention socket and its foundation is to be designed and installed as per the manufacturer's guidelines. The top of the socket is to be level with the finished level of the footway. The Traffic Signal Contractor is to supply the appropriate length signal pole and cable entry system.
- 6.17. As part of the pole installation process the Principal Contractor is to obtain a stump pole. This stump pole is to be used to obtain correct vertical alignment of the socket. During the course of installation the Principal Contractor is to liaise with the Overseeing Organisation for guidance should problems be encountered with installation of the retention sockets/poles.
- 6.18. Passive poles and associated equipment shall comply with BE EN 12767:2007. Electrical disconnect systems are not proposed as equipment is ELV.

Traffic Signal Heads

- 6.19. All signal heads and aspects shall be designed in accordance with BS EN 12368.
- 6.20. All signal heads shall be ELV LED. The size, appearance and optical performance of all signal heads is to comply with the requirements of the Traffic Signs, Regulations and General Directions (TSRGD) 2016, BS 7987 (HD 638) and all relevant TOPAS 25** Series specifications for the equipment being installed.
- 6.21. All vehicle signals shall be fitted with primary, secondary or tunnel hoods as shown on the signal design drawings. The Traffic Signal Contractor shall be responsible for ensuring all signal equipment (including backings boards, visors and tunnel hoods) is installed achieving a minimum of 0.6m (sites 1 and 2) and 0.46m (sites 3, 4, 5 and 6) lateral clearance between the kerb edge and the equipment, in accordance with Suffolk County Council requirements.
- 6.22. All vehicle signal heads shall be installed on poles, with the bottom of the signal head/bracket assembly mounted between 2.1 and 2.55 metres above ground pole. Each nearside signal head and its associated offside signal head should be mounted on the same horizontal plane.
- 6.23. Signal head mounting brackets are to be protected with an appropriate plastic coating or catalytic paint. Brackets should be sufficiently long enough to provide at least 125 degree rotational adjustment movement on each traffic signal head where several are mounted on one pole.
- 6.24. If a signal head is shown on the design drawings as being bracket mounted, a bracket is to be installed to allow for the signal head to be offset from the pole as specified.
- 6.25. Traffic signal heads shall be supplied and installed with backing boards (unless otherwise specified) that have been factory treated with BS EN 12899-1: 2001 Class 1 retro-reflective white borders.
- 6.26. Signal heads shall be installed so that any flexible tubing (Copex type), above ground detectors plugs and sockets and associated cabling is not loose or susceptible to damage by vandals or adverse weather.
- 6.27. Flexible tubing is to be installed to protect the external wiring between each signal head and pole. This tubing shall be fixed securely to the back of the signal head using a nylon or plastic gland. The length of this tubing should be sufficiently long enough to ensure that it remains within the pole to accommodate the signal head being flexed in all weathers.
- 6.28. No transformer or power supplies (for tactile devices, pedestrian detectors or audible/tactile equipment) shall be fitted in any traffic signal head.

- 6.29. All erected signal heads that have not been commissioned are to be covered at the end of each day of installation. The Traffic Signal Contractor is to provide durable waterproof orange coloured covers for this purpose. During the installation period the Traffic Signal Contractor will be responsible for the maintenance of the covers and their fitting.
- 6.30. Signal lamp dimming to 27.5V ELV shall be provided. A Photo Electric Control Unit (PECU) (PE cell) shall be mounted on top of the signal head with the least effect from artificial light sources. Ideally this should be on the signal head closest to the controller and in a location that makes it easy to be serviced. Failure of the solar switch shall cause the signals to assume the 'bright' condition. Refer to the signal design drawings for an indicative location of which pole the PECU is to be installed. The location is subject to change once the street lighting proposals are known.

Pedestrian Demand Units

- 6.31. All pedestrian push button units are to be ELV with a maximum voltage rating of 48V, fitted with appropriate wait indicator lamps, unless otherwise specified. The demand panel is to be manufactured from Makrolon or a similar material.
- 6.32. Combined nearside demand and display units are to be installed.
- 6.33. Nearside pedestrian demand units are to comply with TOPAS 2511A 'Performance Specification for Nearside Signal and Demand Units'. All Cycle/Equestrian/Pedestrian aspects shall be LED design and fitted with 3M masks or other equivalent means of limiting phantom effects.
- 6.34. The demand unit shall be fitted with any of the following as specified on the drawing and/or Bill Items: an audible device, a tactile device and a LED indicator for the demand being accepted.
- 6.35. The demand unit shall be mounted between 1.0 and 1.1 metres above the pavement to the centre of the push button.
- 6.36. The combined nearside pedestrian demand and display units are to be installed on the signal pole as agreed with the Traffic Signal Engineer on site.
- 6.37. Audible devices shall comply with TOPAS 2509 'Performance Specification for Audible Equipment for use at Pedestrian Crossings'. Refer to Signal Design Drawings for specific information.



- 6.38. Tactile devices shall comply with TOPAS 2508 'Performance Specification for Tactile Equipment for use at a Pedestrian Crossing' and have its own separate power supply.
- 6.39. The Traffic Signals Contractor is to ensure that all the pedestrian push button and display units are suitably covered until commissioning, indicating the equipment is not in use.

7. Detection Requirements

Above Ground Detection (AGD)

- 7.1. Above Ground Vehicle Detection is to comply with the latest issue of TOPAS 2505 'Performance Specification for Above Ground Vehicle Detector Systems for use at Permanent Traffic Signal Installations'.
- 7.2. Above ground pedestrian detection is to comply with the latest issue of TOPAS 2506 "Performance Specification for Above Ground On-Crossing Pedestrian Detection Systems" and TOPAS 2507 "Performance Specification for Kerbside Detection Systems for use with Nearside Signals and Demand Units.
- 7.3. The supporting bracket for above ground detectors shall normally be mounted on top of a signal aspect bracket. The supporting bracket shall allow for the vertical and horizontal adjustment of the above ground detectors. When set in final position the detector should be able to be locked in that position.
- 7.4. The mounting method of the detector should ensure that other signal equipment, such as a backing board, does not obscure the field of detection. The above ground detector is to be secured by means of an anti-theft fixing.
- 7.5. Cables for the above ground detectors are to be neatly secured to the top signal bracket using tie-wraps.
- 7.6. Plug and socket cable connections are to be supplied for termination purposes. They are to be fitted to the stop of the signal head assembly, enabling easy removal of the detector units
- 7.7. Refer to the signal design drawings for exact above ground detector requirements.

Inductive Vehicle Loop Detection

- 7.8. Inductive loop detection is to comply with TOPAS 2512 'Performance Specification for Below Ground Vehicle Detection Equipment'.
- 7.9. Vehicle detector loops are to be installed only after the road markings and any High Friction Surfacing has been laid, unless specific authorisation has been granted by the Traffic Signal Engineer.
- 7.10. The inductive loop cable is to comply with TR2029 'NMCS inductive Loop Detector Cable'

- 7.11. The feeder cable for the inductive loops is to comply with TR2031 'NMCS feeder cable for inductive loop detectors'. The colour of the outer sheath of the feeder cable is to be orange and not grey as specified in TR2031 clause 5.10.1
- 7.12. The Traffic Signal Contractor is to carry out tests and record the insulation and series resistance of the components of each loop detector installation. The results of the tests are to be completed prior to the SAT and handed over signed to the Traffic Signal Engineer.
- 7.13. Feeder cables shall not generally exceed 200 metres. This length can be increased to 300m in exceptional circumstances with the specific authorisation from the Traffic Signal Engineer.
- 7.14. Only Single pair feeder cable shall be used one for each detector. Should the Traffic Signal Contractor wish to use Twin pair feeder cable, a cable schedule, detailing all the cable runs and detector channels/packs is to be submitted to the Traffic Signals Engineer for specific authorisation. This process is required to eliminate cross talk between detector channels/packs.
- 7.15. No individual feeder cable is to be connected to more than one physical detector. Each loop is to be individually connected to separate channels of multi-channel detector units or as shown on the signal design drawings or as detailed on the ITS1827D forms.
- 7.16. Each feeder cable is to have a green 'pull tight' label securely fixed to each end. The identity of the loop is to be labelled, in indelible ink, in accordance with the signal design drawings.
- 7.17. All detector channels including spares are to be labelled with their respective loop identification.
- 7.18. The Traffic Signal Contractor is to adjust the detector sensitivity and frequency settings on the detector channels to achieve optimum performance for the detection system in operation and ensure cross-talk between adjacent channels is eliminated.

Slot Cutting

- 7.19. Slot cutting through kerbs is not permitted. Under kerb ducting is to be installed to connect the loop detector with the chamber in the adjacent footway/verge. Refer to the traffic signal design drawings and Appendix 5/2 for details of the ducting, carriageway box and chambers.
- 7.20. The minimum dimensions for slot cutting in porous or bitumen road surfaces shall be 8.0mm wide by 95mm in depth. This dimension is to be used for the actual loop perimeter and the cut back to the kerb/verge for single and double loop tails. The minimum dimension shall be increased to 110mm where three pairs of loop tails share a single cut back to the kerb/verge. The depths specified may be reduced by 30mm for concrete road surfaces.
- 7.21. Where armoured feeder cable is to be installed, the depth of slot cuts shall be increased to provide a minimum of 75mm and 45mm cover in asphalt and concrete surfaces respectively.
- 7.22. The depth of slot cutting on bridge decks is to be agreed with the Traffic Signal Engineer.
- 7.23. The loop cable turns will be in accordance with MCH1540.
- 7.24. All slots are to be free of debris and dry before loop cable is installed. The slots are to be kept clean and dry before the back fill is complete.
- 7.25. All loop tails are to be taken back to the joint with the feeder cable separately.
- 7.26. Slot cutting is to be carried out only during the hours identified by the Overseeing Organisation NRSWA coordinator Traffic Signal Engineer. Traffic Signal Contractor to liaise with the Overseeing Organisation NRSWA coordinator and Traffic Signal Engineer to determine the nominated hours.

Water Supply during Slot Cutting

- 7.27. A water supply is to be used for cooling saw blades during slot cutting. This water supply shall be provided either directly from a mains water feed or via a water bowser.
- 7.28. The Traffic Signal Contractor/Slot Cutting Sub-Contractor shall be responsible for gaining permission from the water supply company for the extraction of water required for slot cutting purposes.
- 7.29. A double non-return valve assembly on standpipe is to be used by the Slot Cutting operatives when connected to the water hydrant. This is required to minimise the possibility of damage to the mains or contamination of the water supply.

- 7.30. To supply high pressure water from the bowser to the slot cutting machine a water pump may be connected.
- 7.31. Slot cutting operations shall not be conducted when the ambient temperature is below 2°C. If in doubt the Engineer's representative should be consulted.

Inductive Loop Back Fill

- 7.32. The back fill for the loop cable is to be a one part process using hot pour bitumen.
- 7.33. When more than one pair of loop tails share the cut back slot a layer of epoxy resin is to be poured on each pair of loop tails. This is required to avoid entrapment of air amongst the loop cables.
- 7.34. The manufacturer's recommendations are to be followed regarding handling, mixing and use of resins. A 5mm cover of resin pour is to be used in all cases to cover the upper cable in the slot. The resin must be allowed to set before the application of hot pour bitumen or cold setting asphalt as appropriate.
- 7.35. The oxidised grade bitumen R85/40 shall be heated to a pouring temperature of 185°C, and poured from an enclosed container which shall be preheated before use.

Inductive Loop Jointing kits

- 7.36. Only re-useable joint are to be used. No chemical joints are permitted.
- 7.37. Approximately 0.5m of surplus loop cable and 0.5m of surplus feeder cable shall be left at the joint position in the roadside chamber.
- 7.38. All joint connections are to by means of a suitable terminal block arrangement within an enclosure to IP68 rating. A suitable bracket arrangement within each loop chamber is to be provided. This is to ensure that the enclosure is kept above the base of the chamber and any water likely to be at the base of the chamber.
- 7.39. The process of jointing is to be carried out in a dry environment. If the weather conditions are wet suitable protection is to be provided to ensure that the no moisture enters the joint during the jointing operation.

8. Service Duct Requirements

- 8.1. The ducting and access chambers are shown on the signal design drawings and are to be installed in accordance with Appendix 5/2 'Traffic Signals Service Duct Specification'.

9. Testing

Testing and Putting Into Service

- 9.1. The Principal Contractor shall make arrangement and cover all necessary costs to ensure the safe and independent testing of traffic signal equipment as it is being put into service by the Traffic Signal Contractor.
- 9.2. Testing and validation works may be provided by the Traffic Signal Engineer, on written agreement with that Local Authority. Otherwise, the Principal Contractor shall provide a competent person(s), independent of the Traffic Signal Contractor, to undertake the following works. Where the following paragraphs refer to the Traffic Signal Engineer, this would apply to either the Traffic Signal Engineer of the Local Authority, or whoever else undertakes the works.

Factory Acceptance Test (FAT)

- 9.3. A FAT is not usually required for Pelican/Puffin and Toucan controllers, however for MOVA crossings, a FAT will be required.
- 9.4. The Traffic Signal Contractor shall provide, if requested by the Traffic Signal Engineer one printed copy of the user handbook or guide. The documentation is to include a full list of operator commands and their functions as well as details of the functions of all switches accessible to the Traffic Signal Engineer. This documentation is to be handed to the Traffic Signal Engineer at the FAT.
- 9.5. The Traffic Signal Contractor shall make all necessary arrangements for the Traffic Signal Engineer to attend the FAT at the local depot of the Traffic Signal Contractor. At least two weeks' notice is to be provided of the proposed FAT date. A copy of the configured specification in .PDF and Emulation Format is to be provided to the Traffic Signal Engineer at this time.
- 9.6. The Traffic Signal Contractor shall ensure that the control equipment on test during the FAT is the equipment to be installed on site as part of this contract. The Traffic Signal Contractor is to demonstrate compliance with the TOPAS 2500/ ITS1827D work specification and configuration forms and signal design drawings. As part of the test suitable lamp mimics, adequate means of simulating detector inputs and an interface to simulate UTC shall be provided.

- 9.7. The FAT is to be undertaken by the Traffic Signal Engineer with the Traffic Signal Contractor's engineer present. Upon completion of a successful FAT a certificate is to be issued and signed by all parties as evidence of test compliance.
- 9.8. Following a successful FAT the Traffic Signal Engineer reserves the right to uniquely mark parts of the control equipment.
- 9.9. Repeat tests are to be arranged within one week of the initial test failure. The Traffic Signal Contractor will meet all costs incurred by the Traffic Signal Engineer in attending the retest.

Signal Installation Electrical Test

- 9.10. The Traffic Signal Contractor is to carry out Earth Leakage Impedance tests using appropriate test equipment, at each pole, controller cabinet and termination cabinet. These tests are to comply with BS 7671 'Requirements for electrical installation'.
- 9.11. A 'Signal Installation Electrical Test Certificate' is to be completed by the Traffic Signal Contractor and handed to the Traffic Signal Engineer at commissioning. The Traffic Signal Contractor is to notify the Traffic Signal Engineer in writing of any precautions that are required to safeguard the control equipment during the test process. A list of these precautions is to be left in the controller following commissioning.

Site Acceptance Test (SAT)

- 9.12. Commissioning of any traffic signal installation shall only be undertaken when all works at the installation, including surfacing, pedestrian guard railing and road marking activities are complete.
- 9.13. If requested by the Traffic Signal Engineer the Traffic Signal Contractor is to provide one set of Traffic Signal Controller keys prior to or at the SAT.
- 9.14. The Traffic Signal Contractor is to provide a SAT engineer to demonstrate to the Traffic Signal Engineer that the signal installation has been installed in accordance with all specification requirements. This includes such tests as safety checks i.e. Red Lamp Monitoring.
- 9.15. The Traffic Signal Contractor is to have carried out all pre-switch tests before confirming and inviting the Traffic Signal Engineer to attend the SAT.
- 9.16. The SAT will also include the commissioning of the fitted OTU unit.

- 9.17. The SAT acceptance certificate/sheets are to be signed by both the Traffic Signal Contractor representative and the Traffic Signal Engineer. Detailed on this document will be a list of any outstanding items, which are to be addressed by the Principal Contractor within four weeks of switch on.
- 9.18. At commissioning the Traffic Signal Contractor is to complete and hand to the Traffic Signal Engineer the following documents: Inductive Loop Test Certificate, Cable Schematic, Signal Installation Electrical Test Certificate for all sites.
- 9.19. The Traffic Signal Contractor shall provide suitably competent and experienced personnel to set up the MOVA control facilities and to test and validate MOVA control operation in the presence of the Traffic Signal Engineer. The validation process shall include for a minimum *of two peak periods, a morning and evening peak for each junction*. For crossings the validation process will need to include all potential traffic flow and pedestrian demand scenarios.
- 9.20. Validation shall include the optimisation of all relevant modes to ensure the traffic signals comply with the operational requirements of the Local Authority, including capacity, delay and safety considerations.
- 9.21. Following the successful commissioning, the Traffic Signal Contractor shall supply the Traffic Signals Engineer electronic details of the controller specific configuration data and shall retain sufficient records to provide replacements at reasonable cost, in the event of the configurations becoming damaged or requiring modification.

10. Equipment Handover and Warranty

Handover

- 10.1. All outstanding items are to be rectified within four weeks of switch on. After four weeks has expired the Traffic Signal Engineer reserves the right to employ the services of another signal company to complete outstanding work not resolved. Failure to complete outstanding items to the Traffic Signal Engineer's satisfaction will result in the 12-month warranty period being awarded to another signal company. Costs incurred when resolving outstanding work after the allocated timeframe, including the 12-month warranty period, shall be invoiced to the original Traffic Signal Contractor.
- 10.2. The traffic signals will only be accepted into maintenance of the Overseeing Organisation once all items have been completed to the satisfaction of the Traffic Signal Engineer. Until such time the Principal Contractor will be responsible for the signal equipment including the maintenance.

Warranty

- 10.3. The tender price shall include for the provision of 12 months warranty of all equipment supplied under this contract. The 12-month warranty period will not commence until all works (including outstanding items list) have been completed and signed by Traffic Signal Engineer. The warranty is to include for all necessary materials, labour, transport required to carry out these works and traffic management.
- 10.4. During the time period of site acceptance and handover the Traffic Signal Contractor shall comply with the Overseeing Organisation's current maintenance response times, which shall be as follows:-
- Urgent faults attendance within 2 contract hours
 - Non-urgent faults attendance within 8 contract hours
 - Full repair for both categories within 4 contract hours.
 - Contract hours 08.00 - 18.00, Monday to Sunday including Bank Holidays.
- 10.5. An Urgent Fault is defined as:-
- All signals Unlit Signals failing to change
 - Defective signals that are likely to cause excessive queues or danger and have caused abnormal traffic conditions requiring urgent attention
 - Equipment damaged and in a dangerous condition
 - Red Lamp failures
- 10.6. All faults will be reported by telephone or email by the Traffic Signal Engineer.

- 10.7. The Traffic Signal Contractor is to provide contact details for both during and outside office hours, together with the postal address of the proposed maintenance facility from which the service is to be provided. Should the response times not be adhered to, the Traffic Signal Engineer reserves the right to obtain quotes from other signal companies. The associated costs incurred shall be invoiced to the original Traffic Signal Contractor.
- 10.8. The warranty includes all of the on-site equipment provided by the Traffic Signal Contractor. Excluded from the warranty is the telecommunication connection facilities and the incoming power supply into the pillar up to excluding the cartridge fuse.
- 10.9. Prior to leaving site, the Traffic Signal Contractor is to inform the Traffic Signal Engineer by telephone (during office hours) of the following details:
- Time of arrival on site / time of leaving site
 - Fault on arrival on site
 - Works carried out
- 10.10. Upon return to the depot the Traffic Signal Contractor is to confirm by email, to both the Principal Contractor and Traffic Signal Engineer the details listed above.
- 10.11. Should six months have expired between commissioning and the formal site handover the Traffic Signal Contractor is to carry out Periodical Inspections (PI), in accordance with TD 24/97 "All-Purpose Trunk Roads Inspection and Maintenance of Traffic Signals and Associated Equipment". A PI will be required every six months until formal site handover.
- 10.12. Should 12 months have expired between commissioning and the formal site handover the Traffic Signal Contractor is to carry out the annual cleaning requirements.
- 10.13. The Traffic Signal Contractor is to invite the Overseeing Organisation's signal maintenance company to attend site at the SAT, to confirm that the installation is of a satisfactory standard. The Traffic Signal Contractor is to fund the site visit of the signal maintenance company of up to two persons. Any work required to ensure site is of a satisfactory standard shall be completed prior to hand over of the site.
- 10.14. Should there be conflicting views between the Traffic Signal Contractor and the signal maintenance company, the Traffic Signal Engineer's decision is final. The Traffic Signal Engineer reserves the right to employ the services of another signal company to complete outstanding work not completed at the time of takeover, after four weeks of the SAT. Any costs incurred to resolve such faults shall be invoiced to the original Traffic Signal Contractor.

- 10.15. A cost estimate is to be provided by the Traffic Signal Contractor for the supply of poles in barrels and associated works only if deemed necessary, to facilitate the installation of the new traffic signal installation. The Principal Contractor is to be responsible for the installation of any such system.

Timing Amendments - Revised Configurations

- 10.16. The Traffic Signal Contractor shall include in the cost estimate for the provision and installation of up three revised configurations within the twelve months warranty period for each controller provided under this contract. This shall incorporate any timing or configuration amendments deemed necessary by the Traffic Signal Engineer.
- 10.17. For every revised configuration the Traffic Signal Contractor shall provide an electronic copy of the configuration at least two weeks before FAT/SAT is scheduled to the Traffic Signal Engineer. Following successful commissioning of each revision, the Traffic Signal Contractor is to re-send the configuration electronically to the Traffic Signal Engineer.

Appendix A: Traffic Signal Design Drawings

21062-101 - Site 1 - Junction of A142 Fordham Road and A14 Eastbound Off Slip

21062-201 - Site 2 - Junction of A142 Fordham Road and A14 Westbound Off Slip

21062-301 - Site 3 - Junction of A142 Fordham Road and Northern Access

21062-401 - Site 4 - Toucan Crossing A142 Fordham Road south of Oaks Drive Roundabout

21062-501 - Site 5 - Toucan Crossing Spine Road east of Willie Snaith Road Roundabout

21062-601 - Site 6 - Toucan Crossing A142 Fordham Road south of Willie Snaith Road Roundabout

Appendix B: Controller Configuration Data

21062-101 - Site 1 - ITS1827D Forms

21062-201 - Site 2 - ITS1827D Forms

21062-301 - Site 3 - ITS1827D Forms

21062-401 - Site 4 - ITS1827D Forms

21062-501 - Site 5 - ITS1827D Forms

21062-601 - Site 6 - ITS1827D Forms

Appendix C: Bill Items

Item	Equipment	Location
1	Controller Cabinet	At Site 1 – Junction of A142 Fordham Road and A14 Eastbound Off Slip (DWG 21062-101)
2	Controller Cabinet	At Site 2 – Junction of A142 Fordham Road and A14 Westbound Off Slip (DWG 21062-201)
3	Controller Cabinet	At Site 3 – Junction of A142 Fordham Road and Northern Access (DWG 21062-301)
4	Controller Cabinet	At Site 4 – Toucan Crossing A142 Fordham Road south of Oaks Drive Roundabout (DWG 21062-401)
5	Controller Cabinet	At Site 5 – Toucan Crossing Spine Road east of Willie Snaith Road Roundabout (DWG 21062-501)
6	Controller Cabinet	At Site 6 – Toucan Crossing A142 Fordham Road south of Willie Snaith Road Roundabout (DWG 21062-601)
7	Electrical Feeder Pillar (as per Item 1)	New feeder pillar to be provided
8	Electrical Feeder Pillar (as per Item 2)	New feeder pillar to be provided
9	Electrical Feeder Pillar (as per Item 3)	New feeder pillar to be provided
10	Electrical Feeder Pillar (as per Item 4)	New feeder pillar to be provided
11	Electrical Feeder Pillar (as per Item 5)	New feeder pillar to be provided
12	Electrical Feeder Pillar (as per Item 6)	New feeder pillar to be provided

Table E.1 – Cabinets and Enclosures

Item No.	Description
40	Witness Factory Acceptance Test (FAT) x6
41	Witness Site Acceptance Test (SAT) x6
42	Undertake Validation x6

Table E.5 – Works to be undertaken by Traffic Signal Engineer