

ANNEX1

Dfl 2024-0155 EIR Response Information

Dfl Roads Term Contract for School Safety, 20mph and Vehicle Activated Signs

Requests

Request 1	What are the contractual performance KPI's for this contract?
Answer 1	See appendix A below for details.
Request 2	Suppliers who applied for inclusion on each framework/contract and were successful & not successful at the PQQ & ITT stages.
Answer 2	Swarco UK and Ireland Ltd, Coeval Ltd, Solagen Ltd.
Request 3	Actual spend on this contract/framework (and any sub lots), from the start of the contract to the current date.
Answer 3	None
Request 4	Start date & duration of framework/contract?
Answer 4	Contract commencement date: 15 April 2024. Three years initial contract period with up to two 12-month extension periods.
Request 5	Could you please provide a copy of the service/product specification given to all bidders for when this contract was last advertised?
Answer 5	See Appendix B for Specification
Request 6	Is there an extension clause in the framework(s)/contract(s) and, if so, the duration of the extension?

Answer 6	Up to two 12-month extension periods
Request 7	Has a decision been made yet on whether the framework(s)/contract(s) are being either extended or renewed?
Answer 7	No decision has been made.
Request 8	Who is the senior officer (outside of procurement) responsible for this contract?
Answer 8	Philip Robinson – DfI Traffic Information and Control Centre

Appendix A

Incentive schedule				
Part:	All			
KPI Ref:	S1	S2	S3	S4
Description:	Equipment delivered within contract timescale	Equipment erected / fitted within contract timescale	Successful completion of fault free six-week monitoring period	98.5% serviceability ratio achieved
Measured:	On delivery	On erection	Following installation	At end of warranty period
Reported:	On invoicing		Following installation	At end of warranty period
Actions:	<u>KPI Achieved</u> <ul style="list-style-type: none"> Pay Price for Services Provided 		<u>KPI Not Achieved</u> <ul style="list-style-type: none"> Pay Price for Services Provided less the low service damages Delay payment and warranty start Contractor to provide improvement plan 	

**Department for Infrastructure
Roads**

Schedule 1 - SPECIFICATION

**CfT 4557015 – Supply and Delivery of
School Safety and Vehicle Activated Signs**

**DfI Roads CoPE
Procurement Branch**



CONTENTS

General

- 1.1 Dfl structure & terminology
- 1.2 Contract scope
- 1.3 Contract timescale & start up
- 1.4 Quality assurance/accreditations
- 1.5 Health & Safety
- 1.6 Electrical Safety
- 1.7 General requirements
- 1.8 British & European Standards
- 1.9 European directives
- 1.10 Working hours
- 1.11 Travel time

SRS / VAS signs

- 2.1 Sign specification
- 2.2 Posts
- 2.3 Detection equipment
- 2.4 Solar switch
- 2.5 Innovation
- 2.6 Modifications to equipment
- 2.7 Communications software and hardware
- 2.8 IT security and health checks
- 2.9 Data and information management
- 2.10 Ownership of equipment
- 2.11 Warranty
- 2.12 As-built drawings

Installation

- 3.1 Ordering and delivery of materials
- 3.2 Civil engineering
- 3.3 Damage to roads and adjacent property or buildings
- 3.4 Removal of surplus material
- 3.5 Roads to be kept clean
- 3.6 Temporary traffic management (TTM)
- 3.7 Planning & phasing of the works
- 3.8 Road lighting requirements
- 3.9 Site installation
- 3.10 Protection of third-party equipment
- 3.11 Commissioning of equipment
- 3.12 Tests and inspections
- 3.13 Power supply and installation
- 3.14 Electrical safety
- 3.15 Electrical testing

3.16 Electrical equipment

Contractor

- 4.1 Contract manager
- 4.2 Contractor's personnel – delivery team
- 4.3 Competency and training of staff
- 4.4 Availability of contractor's personnel
- 4.5 Meetings
- 4.6 Contractor's base location
- 4.7 Tools, transport and test equipment
- 4.8 Contractor's records
- 4.9 Contractor's spares holding
- 4.10 Contract performance
- 4.11 Serviceability under warranty
- 4.12 Attendance to faults under warranty
- 4.13 Inspection and maintenance requirements for signs under warranty
- 4.14 Ownership and retention of documentation
- 4.15 Contract handover arrangements

Annex A: Dfl contract areas

Annex B: School safety sign details

Annex C: Drawings of standard details

Annex D: Key performance indicators

Annex E: Low service damages

Annex F: Vesting certificate template

Annex G: Typical supply mini-pillar schematic layout

ABBREVIATIONS

The following terms and abbreviations are used in this Specification: -

Dfi	Department for Infrastructure
DMRB	National Highways Design Manual for Roads and Bridges
DNO	Distribution Network Operator
ELI	Electrical Loop Impedance
ELV	Extra Low Voltage
KPI	Key Performance Indicator
LED	Light Emitting Diode
LV	Low Voltage
PSTN	Public Switched Telephone Network
RMS	Remote Monitoring System
SHW	National Highways Specification for Highway Works
SRS	Safer Route to School Signs (including part time 20mph speed limit signs)
TOPAS	Traffic Open Products and Specifications
TTM	Temporary Traffic Management
TICC	Traffic Information and Control Centre
VAS	Vehicle Activated Sign

General

1.1 Dfl structure & terminology

1.1.1 Dfl Roads is part of the Department for Infrastructure (Dfi). It is the sole road authority in Northern Ireland responsible for just over 25,000km of public roads.

1.1.2 Dfl Roads has 4 Client Divisions, Northern, Southern, Eastern and Western. It also has an internal consultancy and direct labour organisation.

1.1.3 The works under this contract are located throughout Northern Ireland. Equipment will be required to be installed in all four Divisions of Dfl Roads. A map showing these areas is included in Annex A.

The Dfl Roads Traffic Engineers, who will have delegated responsibility under the contract for equipment within their areas*, are located as follows: -

Map Ref**	Dfl Area	Contact and Telephone No.
Area 1	County Hall, 182 Galgorm Road, Ballymena, Co. Antrim, BT41 1QG	Jonathan Stirling (028 2566 2653)
Area 2	County Hall, Castlerock Road, Coleraine, Co. Londonderry, BT51 3HS	Bronagh Gillespie (028 7035 9990)
Area 3	Traffic Information and Control Centre, 1b Airport Road, Belfast, BT3 9DY	Gary McCracken (028 9025 4510)
Area 4	Rathkeltair House, Market Street, Downpatrick, Co Down, BT30 6AJ	Robin Thom (028 3832 0402)
Area 5	Marlborough House, Central Way, Craigavon, Co Armagh, BT64 1AD	David McCullagh (028 3832 0055)
Area 6	County Hall, Drumragh Avenue, Omagh, Co Tyrone, BT79 7AF	Johnny Graham (028 8225 4143)
Area 7	County Hall, Drumragh Avenue, Omagh, Co Tyrone, BT79 7AF	Colm McElholm (028 8225 4164) Tracy Bratton (028 8225 4183)
Area 8	1 Crescent Road, Londonderry, Co. Londonderry, BT47 2NQ	Deaglan MacBride (028 7132 1648)

* This information may be subject to change throughout the period of the contract

**See Annex A

1.1.5	All equipment supplied under this Contract shall be in accordance with National Highways Design Manual for Roads and Bridges and Specification for Highway Works, except where varied by this Specification.
1.1.6	All references in documents to the “Contracting Authority” or “Department” or “Region” or “Overseeing Authority” or “DfI Roads” shall be construed as the Department for Infrastructure, Northern Ireland.
1.1.7	All references in the contract documents to “Supplier” or “Economic Operator” or “Contractor” shall be taken as the Tenderer who has been awarded the contract.
1.1.8	All permanent traffic signs and associated equipment supplied to DfI Roads must carry CE marking in accordance with the Construction Products (Amendment etc.) (EU Exit) Regulations 2020 and Annex ZA of BS EN 12899-1:2007. Suppliers are required to provide evidence of their CE certification.
1.2	Contract scope
1.2.1	The scope of this contract includes: -
a.	This is a call off contract for the supply and installation of equipment and associated services stated in the schedule of rates and as described below.
b.	All transportation costs for personnel, equipment and delivery of materials to multiple sites anywhere in NI shall be deemed included in the prices quoted in the Schedule of Rates. This also includes temporary storage, the collection of equipment from stores and administration costs.
c.	Supply, installation, testing and commissioning of Safer Routes to School Signs, 20mph School Signs, Permanent Vehicle Activated Signs, Portable Vehicle Activated Signs, Power Sources and all fixings. This should include for all lifting equipment necessary taking account of all reasonably foreseeable ground conditions, such as soft verges, falling or rising embankments, high hedges or other local obstructions.
d.	The provision of a design service for support posts and foundations. The post designs provided are to take account of either passive or non-passive posts, as specified by DfI Roads. Foundation designs shall allow for all on site restrictions to width, depth, length or the presence of underground services / obstructions, as advised of by DfI Roads.

e.	<p>The design, supply and installation of all power supply cabling and associated connections / ancillary equipment. While DfI Roads will be responsible for the supply and installation of appropriate mini pillars and incoming DNO (NIE) mains supply, the Contractor will be responsible for the outfitting of the mini pillar downstream of the incoming supply and all cabling / connections to the on-street equipment. DfI Roads will be responsible for the provision of any underground ducting required.</p> <p>Note: 'live' working is not permitted in Northern Ireland regardless of the level of training or G39 certification held. The Contractor shall however be prepared to provide and install all equipment and connections out with that considered 'live' working by the DNO.</p> <p>In general, mains powered or solar powered signs will be acceptable to DfI Roads. In the case of solar or wind powered signs, prior approval must be sought from DfI Roads regarding the size and type of sign and components being offered.</p>
f.	<p>All temporary traffic management (TTM) on single carriageway roads and dual carriageways with speed limit of 40mph and less in accordance with Safety at Street Works and Road Works, A Code of Practice "Red book" https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321056/safety-at-streetworks.pdf</p> <p>All temporary traffic management (TTM) on single carriageway roads and dual carriageways with speed limit of 50mph or above in accordance with Chapter 8 of Traffic Signs Manual.</p>
g.	<p>The Contractor shall provide an adequately sized workforce of sufficient experience and expertise who can achieve the required contract response times for all the equipment to be supplied, irrespective of location within Northern Ireland, and achieve the high level of serviceability required by DfI Roads.</p> <p>The Contractor shall have the facility to call upon additional staff resources during times of increased workload.</p>

h.	<p>DfI Roads is seeking to avoid a proliferation of bespoke fault management / remote monitoring platforms. Consequently, all signs shall be capable of being made fully interoperable with third-party fault management / remote monitoring platforms. The Contractor shall facilitate the enabling such interoperability at the request of DfI Roads at any point during the contract.</p> <p>The Contractor shall supply, maintain and keep up to date a robust, reliable and intuitive to use web-based fault management / remote monitoring platform for all equipment supplied under the contract (see Clause 2.7.6).</p> <p>The Contractor will be required to modify the RMS units in existing signs to ensure that they are interoperable with either the Contractor's or a third-party fault management / remote monitoring platform. An item for this modification is included the Schedule of Rates.</p> <p>The current third-party fault management / remote monitoring platform use by DfI Roads is supplied by Yunex Ltd.</p>
i.	<p>The Contractor will be responsible for the accuracy and the collating of all operational fault logs. Full and relevant information shall be made available to DfI Roads upon request.</p>
j.	<p>The Contractor will be required to provide secure storage facilities for the holding of sufficient equipment to meet contract installation requirements. The storage facilities shall be sufficient to accommodate the temporary storage of up to 100No new signs and their associated posts and ancillary equipment together with such as spares equipment required to service new signs under warranty. The storage facilities must be located so that equipment can be delivered to site within 2 hours of leaving storage.</p>
k.	<p>The Contractor will be required to attend meetings as specified in Clause 4.5. If the Contractor's performance is not satisfactory to DfI Roads, then the Contractor may be requested to attend additional meeting(s) with DfI Roads in Belfast. The Contractor shall attend such meetings at no additional expense to DfI Roads.</p>
l.	<p>The provision of a 12-month parts and labour warranty for each sign.</p>
m.	<p>Liaison with Statutory Undertakers.</p>
n.	<p>The production of as built record drawings for all works undertaken in both electronic and hard copy formats.</p>
o.	<p>The supply of all relevant documentation requested by DfI Roads and keeping of accurate records of all equipment and work carried out under this Contract in a suitable electronic form to be agreed with the Contract Manager. Electrical testing documentation will be required and must be approved by DfI Roads.</p>

p.	The prompt supply to Dfl Roads of all documentation relating to fault finding and rectification, inspections and all other work carried out via digital media.
q.	Attendance at meetings as requested by Dfl Roads.
r.	The storage of equipment belonging to Dfl Roads.
s	The supply and installation of replacement parts under warranty.
t.	Modification and upgrade of Safer Routes to School Signs, 20mph School Signs and Vehicle Activated Signs equipment as agreed by Dfl Roads.
u.	Maintenance and replacement of equipment installed under this contract during the warranty period, detailed in Clauses 2.11 and 4.13 of this Specification.
v.	Chargeable Faults are those resulting from vandalism, traffic collisions and situations considered to be arising beyond normal working service. Details on the handling of chargeable faults are given in Clauses 4.12.5 – 4.12.7 of this Specification.
w.	Attendances at Court if required. Such attendance shall be paid at the Minimum Day Rate specified in the Schedule of Rates.
x.	The holding of Spares to an adequate level to meet warranty repair work.
1.3	Contract timescale & start up
1.3.1	The overall contract timescale can be 5 years, based on an initial 2 years followed by 3 x 1-year extensions based upon satisfactory performance of the Contractor and no change to Dfl Roads strategy for use of this type of signing
1.3.2	<p>The Contractor is required to submit the Contractors Plan for acceptance within 2 weeks. This should include but not be limited to the following:</p> <ul style="list-style-type: none"> a) Formal method statements for all aspects of work to be performed under the Contract b) Formal risk assessments of all specific site operations. The risk assessments and specific resultant actions shall be submitted to Dfl Roads prior to work commencing on site c) A Quality Plan in accordance with the requirements of National Highways Sectors Scheme 8. This should contain details of the Contractor’s training for his delivery team d) Risk Register e) Contact names and line of Communication, including Contractors Key Personnel such as Contract Manager, Area Manager, Lead Engineer etc. f) Proposals on how the KPIs are to be measured

1.4	Quality assurance / accreditations
1.4.1	The Contractor shall have a Quality Assurance Scheme that complies with current BS EN ISO 9001 Standard or its equivalent and this system shall be registered with an approved Certification authority.
1.4.2	<p>Quality Management Schemes - National Highway Sector Schemes (NHSS) are managed and developed in the UK by Technical Advisory Committees having representation from Highway Authorities, relevant Trade Associations, Certification Bodies and training organisations. The following NHSS are mandatory for the Contractor (and/or subcontractors):</p> <ul style="list-style-type: none"> a) Scheme 8: The Overseeing and/or Installation and/or Maintenance of Highway Electrical Equipment and Supporting Works b) Scheme 12A/B: Static Temporary Traffic Management on Motorways and High-speed Dual Carriageways including On-line Widening Schemes c) Scheme 12D: Installing, Maintaining and Removing Temporary Traffic Management on Rural and Urban Roads
1.4.3	All equipment provided under the contract shall comply with the latest TOPAS technical specification where appropriate and if not already registered with TOPAS, the Contractor commits to do so in a reasonable timeframe agreed with DfI.
1.4.4	DfI Roads prohibits the Contractor changing an equipment supplier without prior approval.
1.4.5	All materials shall, if not otherwise specified, comply with the relevant British Standard, or European Standard, which is applicable. Where no British or European Standard, exists, the materials shall be of a quality consistent with the performance required.
1.4.6	The materials may be inspected by a nominated representative of DfI Roads either after delivery or at the Contractor's factory, workshop or store, and if found defective or inferior in quality to, or differing in form or material from the requirements of, the Contract, may be rejected. Any materials so rejected will be deemed unsuitable under the Contract and the Contractor shall, at his own expense, replace them with other materials to the satisfaction of DfI Roads.
1.4.7	DfI Roads reserves the right to call for the submission of samples of materials and in the event of the acceptance of a Tender to retain such samples as a standard by which consignments will be judged. Where a sample is submitted for analysis, if the sample is found to be satisfactory the cost of analysis shall be borne by DfI Roads. If the sample is found to be unsatisfactory such costs shall be borne by the Contractor.

1.4.8	Any requirement of the Contract that any material or article shall comply with any specified standard, whether a British Standard or other named standard or otherwise, shall be satisfied by compliance with any relevant National or governmental standard of any member state of the European Union or any relevant international standard recognised in such a member state, provided that in either case the standard in question offers guarantees of safety, suitability and fitness for purpose equivalent to those offered by the Standard which is specified in the Contract.
1.4.9	Any requirements of the Contract to use material or an article which is defined by reference to a named supplier or manufacturer or a specified Quality Assurance scheme or Agreement Certificate, or which is registered with or has otherwise received the approval of DfI Roads shall be satisfied using material or an article which has received equivalent approval in another member state of the European Union provided that the article in question is as safe, suitable and fit for the relevant purpose as material or an article complying with the requirement as set out in the Contract.
1.5	Health and safety
1.5.1	The Contractor shall provide for the effective protection of the public and, to prevent accidents whilst carrying out his duties, shall guard and protect his plant, tools and materials and provide all necessary signs, barriers, lighting and the like,
1.5.2	All reasonable means are to be used to prevent inconvenience to frontagers and the travelling public.
1.5.3	The Contractor shall, after carrying out his duties, leave the equipment in a clean, sound and safe condition and shall clear away all rubbish and surplus material and shall make good at his own expense any damage which may have been caused to any property whether belonging to DfI or not, by reason of carrying out his duties.
1.5.4	<p>The Contractor shall ensure that all works carried out by himself, his employees, agents or sub-contractors:</p> <ul style="list-style-type: none"> a) Use safe and adequate working procedures and practises, and staff are supervised and monitored b) Are performed in a good and workmanlike manner c) Comply with all statutes, statutory instruments and other mandatory requirements, British Standards or other relevant codes of practice relating to health and safety and workmanship in force at the time the work is carried out and continue to receive training on amendments to the orders and regulations as appropriate d) Maintain the integrity of all utility services. Should the need arise to disrupt any of the utility services, DfI Roads must be advised in advance and permission sought from the Statutory Authority e) Ensure safe working practices safe in line with HSE publications “Avoiding danger from underground services” (HSG47) and “Avoiding danger from overhead power lines” (GS6) as appropriate

1.5.5	The Contractor shall co-operate and provide any information requested for Health and Safety purposes in accordance with Regulation 19 of the CDM Regulations.
1.6	Electrical Safety
1.6.1	At all times it is the responsibility of the Contractor to ensure the site is made electrically safe in line with: <ul style="list-style-type: none"> • BS 7671:2018+A1:2020 Requirements for Electrical Installations • IET Wiring Regulations, Electricity Safety, Quality and Continuity Regulations (NI) 2012 • The Electricity at Work Regulations (Northern Ireland) 1991
1.6.2	Where instances of high ELI readings at power source are found, the Contractor shall: <ul style="list-style-type: none"> • report immediately to the electricity supply company • contact the relevant DfI Roads office by email • verbally inform DfI Roads personnel of the fault <p>The Contractor shall take all reasonable action to ensure the site is safely guarded from the public.</p>
1.7	General requirements
1.7.1	All legislation referred shall be interpreted, where appropriate, as the corresponding legislation applicable to Northern Ireland.
1.7.2	All equipment supplied or work done under this Contract shall conform, where appropriate, with the latest version of the following (or equivalent) documents: -
a.	The Manual of Contract Documents for Highway Works current edition, except as varied by this Specification
b.	The Design Manual for Roads and Bridges current edition, except as varied by this Specification
c.	Department for Transport (UK), Traffic Advisory Leaflets
d.	The Health and Safety at Work (NI) Order 1978 and the Health and Safety at Work (Amendment) (Northern Ireland) Order 1998
e.	Management of Health and Safety at Work Regulations 1999 and Management of Health and Safety at Work (Amendment) Regulations (NI) 2006
f.	The Construction (Design and Management) Regulations (NI) 2016
g.	The Construction (Health, Safety and Welfare) Regulations 1996

h.	Safety at Street Works and Road Works, A Code of Practice https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321056/safety-at-streetworks.pdf
i.	Traffic Signs Manual Chapter 8: Traffic Safety Measures and Signs for Road Works and Temporary Situations
j.	The Electricity at Work Regulations (Northern Ireland) 1991 http://www.legislation.gov.uk/nisr/1991/13/contents/made
k.	Health and Safety Executive Publications “Avoiding Danger from Underground Services” (HSG 47) and “Avoidance of Danger from Overhead Electric Power Lines” (GS6)
l.	Electricity Safety, Quality and Continuity Regulations (NI) 2012 http://www.legislation.gov.uk/nisr/2012/381/made
m.	Traffic Signs Regulations (Northern Ireland) 1997 primarily, supplemented by Traffic Signs Regulations and General Directions, 2016 (TSRGD)
n.	The Street Works (Amendment) (NI) Order 2007
o.	DfI Director of Engineering Memorandum DEM 184/22 - Provision and Maintenance of ITS Electrical Supplies
p.	DfI Guidance on Electrical Safety in Street Lighting https://www.infrastructure-ni.gov.uk/articles/network-lighting
q.	The Institution of Engineering & Technology Code of Practice for Electrical Safety Management in the Highway Electrical Sector
r.	The Institution of Lighting Professionals Code of Practice for Electrical Safety in Highway Electrical Operations
s.	Health and Safety Executive General Information Sheet No 6 (GEIS6) ‘The selection, management and use of mobile elevating work platforms’
t.	Department for Transport Traffic Signs Manual
u.	Disabled Persons (Northern Ireland) Act 1989
1.8	British & European Standard Specifications
1.8.1	These shall include but not be limited to:
a.	BS EN ISO 9001: 2015 Quality management systems

b.	BS 7671:2018+A1:2020 Requirements for Electrical Installations. IET Wiring Regulations
c.	BS 50293: 2012 Road traffic signal systems. Electromagnetic compatibility
d.	BS 7430:2011+A1:2015 Code of practice for protective earthing of electrical installations
e.	BS EN 12767:2019 Passive safety of support structures for road equipment
f.	BS EN 50556:2018 Road traffic signal systems
g.	BS 8442:2022 Miscellaneous road traffic signs and devices. Requirements and test methods
h.	BS 1363-1:2016+A1:2018 13 A plugs, socket-outlets, adaptors and connection units
i.	BS EN 12368:2015 Traffic control equipment
j.	TOPAS 2505A Performance specification for above ground vehicle detector systems
k.	TOPAS 2512B Performance specification for below ground vehicle detection equipment
l.	DMRB Volume 9 Section 3 TD 131 Control and communications technology
m.	BS EN 10210-1:2006 Hot finished structural hollow sections of non-alloy and fine grain steels
n.	BS EN 12899-1:2007 Fixed Vertical Road Traffic Signs including UK National Annex
o.	BS EN 12966:2014+A1:2018 Road vertical signs – variable message traffic signs
p.	DMRB Volume 8 Section 0 TD 101 Revision 1 Control and communications technology. Design. Traffic signalling systems
q.	IEC 62717:2014+A1:2015+A2:2019 Performance requirements – LED modules for general lighting
r.	BS 5489-1:2020 Design of road lighting
s.	BS EN 60529:1992+A2:2013 (incorporating Feb 2019 corrigendum) Degrees of protection provided by enclosures
1.9	European Directives
1.9.1	In relation to the NI Protocol, all relevant products must meet EU harmonised European standards, and bear either the CE marking or the CE marking & UK(NI) indication to be placed on the Northern Ireland market.

	<p>Goods with the UKCA (UK Conformity Assessed) mark alone are not accepted on the Northern Ireland market.</p> <p>Where third-party conformity assessment has been carried out by a UK approved body, the economic operator must affix the UK(NI) indication in addition to CE marking. Where the conformity assessment has been carried out by an EU-approved body, only the CE marking is required.</p>
1.9.2	<p>All new electrical equipment must be CE marked as appropriate, to show that it complies with all relevant European Directives. The decision as to which Directives are applicable rests with the Contractor.</p> <p>Relevant Directives may include:</p> <ol style="list-style-type: none"> a. Low Voltage directives b. EMC directive c. Telecommunications terminal equipment directive d. Machinery directive e. Safety directive (limited to the safety of system operators or maintainers) f. Waste Electrical and Electronic Equipment (WEEE) g. Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ROHS)
1.10	Working hours
1.10.1	<p>Normal working hours These shall be defined as 06:00 hours to 18:00 hours Monday to Friday, excluding Public Holidays.</p> <p>It may be necessary from time to time to carry out installation works outside normal working hours. A surcharge for this is included in the Price List.</p>

1.10.2	<p>Work outside normal hours</p> <p>Agreed planned work outside normal working hours This is described as non-emergency work, work that could have been reasonably foreseen or work that was planned at a progress meeting. The Contractor should enter his percentage surcharge, as appropriate, in the Price List. The surcharge should only be applied with the prior agreement of Dfl Roads.</p> <p>Emergency work outside normal working hours This is described as work that could not reasonably have been foreseen e.g. a collision or incident that resulted in equipment being knocked down or in a dangerous condition. The Contractor should enter his percentage surcharge, as appropriate, in the Price List.</p> <p>Work outside normal working hours at Contractor's request The Contractor may be permitted to work outside normal working hours, subject to approval of Dfl Roads, but any additional cost incurred must be borne by the Contractor.</p>
--------	--

1.10.3	<p>Permitted working hours</p> <p>Except for emergency work, all other works require the prior approval of Dfl Roads. Work on or adjacent to the carriageway will only be permitted during peak traffic flow and clearway periods in exceptional circumstances and with the prior approval of Dfl Roads. Peak traffic flow periods shall be regarded as 07:00 to 09:30 hours and 16:00 to 18:30 hours, Monday to Friday. The Contractor shall allow in his rates and prices for complying with any limitations and constraints on the use of the site.</p>
1.11	<p>Travel time</p>
1.11.1	<p>Travel time will only be paid in relation to chargeable faults.</p>
1.11.2	<p>Dfl Roads recognises several scenarios that could influence the time to travel to an equipment location. For example, the Contractor's personnel may be despatched from:</p> <ul style="list-style-type: none"> • the Contractor's base location; or • home; or • another fault location
1.11.3	<p>Dfl Roads will pay the actual travel time from the location from which the Contractor's personnel is dispatched to the fault and his return to either the point of origin (if, say, that was his home or to the Contractor's base if that is where the person travels to).</p>
1.11.4	<p>Travel time will only be paid once to attend a chargeable fault. Travel time beyond this may be considered by Dfl Roads when supported with good reason by the Contractor.</p>

1.11.5	Only payment for travel within Northern Ireland will be made and, in submitting invoices, the Contractor will be required to show travel time separate from attendance at fault time and provide a breakdown with times of the journey(s) made.
	SRS / VAS signs
2.1	Sign specification
2.1.1	The Contractor shall provide Safer Routes to School Signs as required by DfI Roads as per Diagrams A and B in Annex B of this specification.
2.1.2	The Contractor shall provide 20mph School Signs as required by DfI Roads, as per Diagrams C and D in Annex B of this specification.
2.1.3	<p>The Contractor shall provide Permanent and Portable Vehicle Activated Signs as required by DfI Roads, as per Diagram F in Annex B of this specification.</p> <p>DfI Roads may from time to time require a Portable Vehicle Activated Sign. This sign should be capable of being easily transported and mounted to an existing column or a lamp post. The sign should not require mains power supply and it is anticipated that such a sign (s) on the network will be temporary in that they will only be at a location for a relatively short period of time before either being relocated or removed back to storage. The sign should be capable of being remotely programmed and the stored data on the sign shall also be capable of being accessed remotely. The Contractor shall detail the power source being supplied for the Portable Vehicle Activated Signs.</p>
2.1.4	All mounting brackets and fixings shall be non-corrosive and in accordance with standards as appropriate.
2.1.5	The casings for Safer Routes to School signs shall be aircraft grey and black for the 20mph flashing amber light casings.
2.1.6	All signs shall be designed to prevent any pooling / collecting of water.
2.1.7	The sizes of signs required by DfI Roads shall in no way relieve the Contractor of his responsibility to supply signs in strict conformity with the current regulations, directions and rules for sign design and current Department for Transport working drawings. In the event of a modification to sign design or size, such modification shall be agreed before fabrication commences.
2.1.8	All signs shall be designed to provide even illumination across the sign so that all images shall be free from flicker.

2.1.9	All signs shall be protected against ingress to a minimum of IP 55 in accordance with BS EN 60529:1992+A2:2013 to prevent water or dust ingress.
2.1.10	All signs shall be designed to incorporate multi-stage dimming to maintain optimum contrast ratio in all lighting conditions.
2.1.11	The Contractor shall submit dimensioned working drawings for the approval of the Contract Manager prior to the commencement of manufacture of the signs together with details of the materials to be used to include manufacturer's name, grade, type, serial number and colour. Details of the sign framing, fixing and mounting shall be shown on the drawings.
2.1.12	Details of any alternative materials proposed by the manufacturer shall be submitted to the Contract Manager for approval.
2.1.13	At all stages of production and delivery, signs shall be protected to avoid damage.
2.1.14	Any damage to sign faces occurring before, in transit or during erection shall be made good by the Contractor at his own expense.
2.1.15	The Permanent and Portable Vehicle Activated Signs will be illuminated when a vehicle has been measured as exceeding a programmable pre-set speed threshold. The pictogram and legend will be displayed for a configurable length of time and then be extinguished.
2.1.16	The Contractor shall use the optimum means of detection for Permanent and Portable Vehicle Activated Signs, for example, inductive loops or above ground detection or as requested by DfI Roads.
2.1.17	The Permanent and Portable Vehicle Activated signs will be illuminated no more than 0.5 seconds after detection. Distance of detection from the sign is to be confirmed by DfI Roads.
2.1.18	For the Permanent and Portable Vehicle Activated signs both the pictogram and the text legend will be extinguished at the same time.
2.1.19	It shall be possible to display the pictogram and the text legend independently, activated by two separate and configurable threshold limits for the Permanent and Portable Vehicle Activated Signs.
2.1.20	It shall be possible for the Permanent and Portable Vehicle Activated Signs to display up to two different pictogram messages independently from the text legend, different messages to be activated by programmable switching device and / or secondary loops.
2.1.21	The method of detection used for the Permanent and Portable Vehicle Activated Signs must be capable of detecting speeding vehicles in multiple lanes of traffic to the approval of DfI Roads. The location of detection equipment shall be agreed with DfI Roads.

2.1.22	<p>Signs may be powered by mains, solar, wind or switched mains as agreed with DfI Roads.</p> <p>DfI Roads will liaise with Northern Ireland Electricity (NIE) for the provision of mains power where required. DfI Roads shall provide and install the mini pillar cabinet and associated ducting ready to receive the incoming mains supply.</p> <p>The Contractor will be responsible for fitting out the mini pillar and cabling between the sign and the mini pillar. Connections at the sign and at the mini pillar will be the responsibility of the Contractor. Cabling to a mini pillar within 5m of the post base is deemed to be included in sign erection costs. Additional cable costs incurred where this distance exceeds 5m are to be paid on a per metre basis.</p> <p>Note: 'live' working is not permitted in Northern Ireland regardless of the level of training or G39 certification held.</p>
2.1.23	<p>The Permanent / Portable Vehicle Activated and 20mph School signs shall have the facility to record vehicle speed and or classification if requested by the Contract Manager.</p>
2.1.24	<p>During the period of operation the 20mph School Signs must have a separate LED cluster mounted on the rear of the mounting post which shall be illuminated at the back of the sign in a position that is visible from 100m distance to indicate when the flashing units are activated. The LED cluster shall be connected in such a way that if the flashing units are not working then the LED cluster will not illuminate. The cluster must have a minimum diameter of 75mm.</p>
2.1.25	<p>The amber LED light sources shall be wired in a format that maintains visible continuity in the event of an individual LED failure.</p>
2.1.26	<p>During the period of operation, each lamp incorporated in a sign shall show an intermittent amber light flashing at a rate of not less than 60, nor more than 90 flashes per minute in such a manner that one horizontal pair of lamps is always lit when the other horizontal pair is not.</p>

2.1.27	<p>Finished sign substrates shall be clearly and durably marked on the back with the following information:</p> <ul style="list-style-type: none"> • CE logo or CE logo & UK(NI) marking • The month and last two digits of the year of manufacture • The identification number of the notified body, where applicable • The reference to the harmonised technical specification applied • The intended use as laid down in the harmonised technical specification applied • The name and registered address of the manufacturer • The unique identification code of the product type • The reference number of the Declaration of Performance • The level or class of performance declared • Coefficient of retro-reflection • Date of manufacture • Overlay type • The legend “Property of DfI Roads” <p>The markings should be in characters legible at a normal reading distance at ground level, such that the total area of the marking does not exceed 30cm² and shall be sufficiently durable to last the expected life of the sign.</p>
2.1.28	The contactor shall supply commissioning sheets and electrical safety sheets for all signs supplied through this contract as per BS7671 and as agreed with DfI Roads.
2.2	Posts
2.2.1	For design purposes steel posts shall conform to BS EN 12899-1:2007 (including UK National Annex) and passively safe posts shall conform to BS EN 12767.
2.3	Detection equipment
2.3.1	Below Ground Detectors shall conform to TOPAS Specification 2512B and shall include all necessary tails and connections.
2.3.2	Above Ground Detectors shall conform to TOPAS Specification 2505B and shall include all necessary mounting brackets and electrical cables.
2.4	Solar switch
2.4.1	Sign dimming shall be controlled by a solar switch which shall be supplied with all appropriate mountings, brackets and materials for fitting and weatherproofing and all necessary electrical connections and cables.

2.5	Innovation
2.5.1	Once the contract has been awarded, the Contractor may at any time submit an Innovation proposal to improve quality, technology or delivery of equipment on order.
2.6	Modifications to equipment
2.6.1	From time to time throughout the Contract period, DfI Roads may request the Contractor to carry out small-scale modifications at existing SRS / VAS / 20mph sites.
2.6.2	Modifications may be undertaken at: - a. Existing sites, making use of as much of the existing equipment and cabling as feasible b. Existing sites in conjunction with replacing some or all the existing equipment and cabling
2.6.3	All modifications shall be carried out to a schedule agreed with DfI Roads. Each schedule will include an agreed completion date and possibly interim milestones upon which the Contractor's performance will be monitored and gauged.
2.6.4	The Contractor may be required from time-to-time to adapt his programme to co-ordinate with other site works and to work alongside another Contractor. All programmes shall be subject to the approval of DfI Roads.
2.6.5	Cabinets and ducts shall be sealed against the ingress of foreign matter.
2.7	Communications software and hardware
2.7.1	On site programming of the signs and sign diagnostics shall be by means of local wifi activated by a magnetic switch or similar approved means. Connection to the sign and the programming of it shall be simple, intuitive to use and not require extensive technical knowledge. The on-board controller shall be capable of being pre-programmed for automatic switching events using software generated timetables. These timetables should be capable of at least six pairs of switching operation per day (six on and six off), covering a period of at least 18 months.
2.7.2	It shall be possible to upload operational information to the sign via local wifi without the need to open the sign enclosure for access or connect any form of hardware. It shall be possible to download status information, fault history and current timetable programming data from the sign via local wifi. The initiation of a lamp test facility shall also be provided via local wifi.

2.7.3	<p>Any device capable of data communications being supplied by the Contractor for the operation of the signs shall be:</p> <ul style="list-style-type: none"> • at least to the minimum specification required to support the system being proposed by the Contractor • minimum 11" screen size for tablets running as a minimum Android 12 or iPadOS 16.1 with 128GB storage • minimum 15" screen size for laptops running Windows 11 with minimum 8GB RAM, 256GB SSD storage and an Intel i5 processor (or equivalent) • capable of external data storage / backup via USB or memory card slot • supplied with a 5-year parts & labour warranty • protected with up-to-date anti-virus and security software for the duration of the contract • subject to the approval of the DfI Roads
2.7.4	<p>Where specified, signs shall be capable of remote communications via the 4G mobile network. SIM cards necessary for such communication will be supplied by DfI Roads for fitment by the Contractor.</p>
2.7.5	<p>Remote communication with 4G enabled signs shall facilitate sign programming and remote fault monitoring of the signs via a web interface hosted by the Contractor (see Clause 2.7.6 below). All web hosting costs are to be borne by the Contractor for the duration of the contract and shall not be restricted in capacity. The web interface should be smart phone compatible.</p>
2.7.6	<p>DfI Roads is seeking to avoid a proliferation of bespoke fault management / remote monitoring platforms. Consequently, all signs shall be capable of being made fully interoperable with third party fault management / remote monitoring platforms. The Contractor shall facilitate the enabling such interoperability at the request of DfI Roads at any point during the contract.</p> <p>The Contractor's own fault management / remote monitoring software shall:</p> <ul style="list-style-type: none"> • robust, reliable and intuitive to use • be capable of remote programming and amendment of timetable data • be capable of remotely monitoring the fault status of equipment • provide a clear graphical user interface that is highly configurable and intuitive to use • have multiple of levels of password protected user access to named individuals with configurable degrees of access and user privileges • be restricted so that DfI Roads data is not visible to other platform users • be capable of displaying, and interacting with, the current operational status of any sign (or group of signs, if required) via a map-based interface. The map and signs displayed shall be configurable on regional basis with access restricted to selected users • be capable of generating timetable programmes using on-screen calendars. Timetable data shall be capable of being cut and paste from one programme to another with a 'save as' facility where programmes need to be duplicated • be capable of monitoring and reporting LED failure below a configurable threshold

	<ul style="list-style-type: none"> • be capable of monitoring and reporting on dimming status and dimming failure • be capable of monitoring and reporting on solar and battery charge levels • be capable of monitoring and reporting on MVD operational status and current thresholds • have a historic log of the times of operation of each sign including an accurate record of all faults and their duration. The log shall have 90 days of searchable data available immediately. All other data gathered during this contract must be archived and supplied to DfI Roads annually in a spreadsheet-based format • be capable of producing user defined reports for printing in document, spreadsheet and PDF formats • provide an atomic clock synchronised master time clock which updates connected devices to ensure consistent timings and correct clock-drift • be the latest available version available to the Contractor. This shall include platform upgrades where applicable. The cost of ongoing updates / upgrades / security patches is deemed to be included in the contract. Updates to be carried out as soon as practical or security demands dictate • be free from the use of proprietary data formats that can only be consumed by the Contractor’s software and that are locked to the use of the Contractor’s solution which would cause impediment to any attempt to re-tender at the end of the contract term • be capable of being restored from a backup site located in a suitably separated location within two hours of primary system failure • be capable of hosting at least 10,000 separate signs of a variety of configurations • provide an inventory database of all equipment • be capable of end-to-end fault management from notification to rectification • be capable of monitoring fault response performance • be capable of generating user-defined reports that are exportable in spreadsheet format. All data will be the property of DfI Roads both during and after the contract.
2.7.7	<p>It shall be possible to manually override the sign operation for unscheduled events using a wireless device with automatic switch off after a set period. The manual override of 4G enabled signs should also include activation via SMS.</p>
2.7.8	<p>No software will be permitted to be installed on any of DfI Roads computers. The Contractor solution for Clause 2.7 should include for all necessary costs, including the provision of hardware associated with hosting the remote monitoring and communication system for the duration of the contract.</p>

2.8	IT security & health checks
2.8.1	<p>All software and communication channels / links shall align with National Cyber Security Centre Guidance.</p> <p>The Contractor shall comply with all the mandatory statements and policies listed below, including any future revisions, amendments or additions to these policies should they be updated throughout the contract term:</p> <ul style="list-style-type: none"> • HMG Security Policy Framework - https://www.gov.uk/government/publications/security-policy-framework • National Cyber Security Centre Cyber Essentials (Plus) - https://www.cyberessentials.ncsc.gov.uk/ • National Cyber Security Centre IT Disposal Guidance - https://www.ncsc.gov.uk/guidance/secure-sanitisation-storage-media • NICS Information Assurance Policy – https://www.cvsni.org/media/1311/nics-information-assurance-policy.pdf • Information Security Management ISO 27001 <p>The Contractor will provide a fully managed IT security service for all the systems (including hardware, software, interfaces, etc) and services (IP communications network) maintained or provided under this contract. This managed service will include, but not limited to, risk and threat analysis, ISO 27001 assessments, network security configuration, intrusion detection and protection, vulnerability testing, patching, hotfixes, upgrades and all licensing costs (both one off and annual costs) whether or not it is explicitly identified e.g. antivirus. IT security costs will be borne by the Contractor throughout the duration of the contract.</p> <p>The Contractor must respond immediately to DfI requests for information relating to cyber security and update systems promptly to respond to any emerging or identified risks.</p>
2.8.2	<p>The Contractor shall provide a robust backup and disaster recovery plan to the satisfaction of DfI Roads for all data held on the remotely hosted system. Data must be backed up to a secure off-site facility. All data must transfer to DfI Roads in an agreed format at the end of the contract. Individual site data must be available to download on demand. The data should be available in a non-proprietary open format such as CSV or ODS and be capable of being selected on an individual site or group basis.</p> <p>All systems must be hosted within the UK and all data must be held and processed within the UK. The origins of all technology used within the contract must be disclosed to and approved by DfI Roads.</p>
2.8.3	<p>An annual IT Health Check (ITHC) will be carried out by a company approved under the National Cyber Security Centre CHECK scheme. The annual ITHC will be commissioned by the Contractor who will bear the cost of the test as well the ensuing report and remediation plan (where required) which must be submitted to DfI Roads for approval. Where an ITHC is required following a significant change in service initiated by the Contractor, the Contractor</p>

	will be required to cover the cost of the ITHC or if the system fails the annual ITHC the Contractor shall cover the cost of the ITHC re-test and any remedial actions necessary.
2.8.4	The Contractor shall facilitate ITHCs as required by DfI Roads and implement any remedial actions within agreed timescales, based upon the severity of vulnerabilities identified. Where risks are identified and suitable remedial actions determined, the Contractor shall be responsible for ensuring action is taken to implement those remedial actions. The Contractor shall be responsible for costs associated with implementing remedial actions for which they are responsible.
2.8.5	Critical security flaws identified by either the Contractor or DfI Roads shall be patched by the Contractor within 48hrs of identification.
2.8.6	The Contractor must proactively monitor and evaluate evolving threats. The Contractor must detail mitigations and resolutions for identified threats and vulnerabilities.
2.9	Data & information management
2.9.1	<p>The Contractor will have full responsibility for ensuring that their technical resources fulfil their obligations under UK Data Protection Legislation. The Contractor shall be able to demonstrate appropriate procedures for the collection, storage, transmission and retrieval of personal data.</p> <ul style="list-style-type: none"> • The Contractor shall not delete or remove any proprietary notices contained within or relating to DfI Roads data. • The Contractor shall not store, copy, disclose, or use DfI Roads data except as necessary for the performance by the Contractor of its obligations under this Contract or as otherwise expressly authorised in writing by DfI Roads. • To the extent that DfI Roads data is held and/or processed by the Contractor, the Contractor shall supply that data to DfI Roads as requested by DfI Roads. • The Contractor shall take responsibility for preserving the integrity of DfI Roads data and preventing the corruption or loss of DfI Roads data. • The Contractor shall perform secure back-ups of all DfI Roads data and shall ensure that up-to-date backups are stored off-site in accordance with the Business Continuity and Disaster Recovery Plan. The Contractor shall ensure that such back-ups are always available to DfI Roads upon request and are delivered to DfI Roads at no less than six monthly intervals. • The Contractor shall ensure that any system on which the Contractor holds any DfI Roads data, including back-up data, is a secure system.

If Dfl Roads data is corrupted, lost or sufficiently degraded because of the Contractor's Default to be unusable, Dfl Roads may:

- a. require the Contractor (at the Contractor's expense) to restore or procure the restoration of Dfl Roads data and the Contractor shall do so as soon as practicable but not later than seven days: and/or
- b. itself restore or procure the restoration of Dfl Roads data and shall be repaid by the Contractor any reasonable expenses incurred in doing so to the extent and in accordance with the requirements.

If at any time the Contractor suspects or has reason to believe that Dfl Roads data has or may become corrupted, lost or sufficiently degraded in any way for any reason, then the Contractor shall notify Dfl Roads immediately and inform Dfl Roads of the remedial action the Contractor proposes to take.

With respect to the parties' rights and obligations under this Contract, the parties agree that Dfl Roads is the Data Controller and that the Contractor is the Data Processor.

The Contractor shall:

- a. Process the Personal Data only in accordance with instructions from Dfl Roads (which may be specific instructions or instructions of a general nature as set out in this Contract or as otherwise notified by Dfl Roads to the Contractor during the Contract Period).
- b. Process the Personal Data only to the extent, and in such manner, as is necessary for the provision of the Services or as is required by Law or any Regulatory Body.
- c. implement appropriate technical and organisational measures to protect the Personal Data against unauthorised or unlawful processing and against accidental loss, destruction, damage, alteration or disclosure. These measures shall be appropriate to the harm which might result from any unauthorised or unlawful Processing, accidental loss, destruction or damage to the Personal Data and having regard to the nature of the Personal Data which is to be protected.
- d. take reasonable steps to ensure the reliability of any Contractor Personnel who have access to the Personal Data.
- e. obtain prior written consent from Dfl Roads to transfer the Personal Data to any sub-contractors or Affiliates for the provision of the Services.
- f. ensure that all Contractor Personnel required to access the Personal Data are informed of the confidential nature of the Personal Data and comply with the obligations set out in this clause.
- g. ensure that none of Contractor Personnel publish, disclose or divulge any of the Personal Data to any third party unless directed in writing to do so by Dfl Roads.
- h. notify Dfl Roads (within five Working Days) if it receives:
 - a request from a Data Subject to have access to that person's Personal Data; or
 - a complaint or request relating to Dfl Roads' obligations under UK Data Protection Legislation.
- i. provide Dfl Roads with full cooperation and assistance in relation to any complaint or request made, including by:
 - providing the Client with full details of the complaint or request.

2.9.2

	<ul style="list-style-type: none"> • complying with a data access request within the relevant timescales set out in UK Data Protection Legislation and in accordance with Dfl Roads’ instructions. <p>j. providing Dfl Roads with any Personal Data it holds in relation to a Data Subject (within the timescales required by Dfl Roads); and</p> <p>k. providing Dfl Roads with any information requested by Dfl Roads.</p> <p>l. permit Dfl Roads or its authorised representative (subject to reasonable and appropriate confidentiality undertakings), to inspect and audit, in accordance with clause 28.0 (Audit) of the Public Sector Conditions of Contract, the Contractor's data Processing activities (and/or those of its agents, subsidiaries and subcontractors) and comply with all reasonable requests or directions by Dfl Roads to enable the Dfl Roads to verify and/or procure that the Contractor is in full compliance with its obligations under this Contract;</p> <p>m. provide a written description of the technical and organisational methods employed by the Contractor for processing Personal Data (within the timescales required by Dfl Roads); and</p> <p>n. not Process Personal Data outside the European Economic Area without the prior written consent of Dfl Roads and, where Dfl Roads consents to a transfer, to comply with:</p> <ul style="list-style-type: none"> • the obligations of a Data Controller under the UK Data Protection Legislation by providing an adequate level of protection to any Personal Data that is transferred; and • any reasonable instructions notified to it by Dfl Roads. <p>The Contractor shall always comply with the UK Data Protection Legislation and shall not perform its obligations under this Contract in such a way as to cause Dfl Roads to breach any of its applicable obligations under UK Data Protection Legislation.</p>
2.9.3	<p>The Contractor shall indemnify Dfl Roads against all actions, costs, expenses, claims, proceedings and demands which may be made or brought against Dfl Roads for breach of statutory duty under the UK Data Protection Legislation which arises from the use, disclosure or transfer of personal data by the Contractor or his employees or agents.</p>
2.9.4	<p>Should an incident, issue or vulnerability be identified the Contractor must initiate containment and recovery procedures and provide advise Dfl Roads on the remediation activities being undertaken or required.</p>

2.9.5	<p>Malicious software</p> <p>Throughout the contract period the Contractor shall use the latest versions of anti-virus definitions available.</p> <p>If malicious software is found, the parties shall co-operate to reduce its effect, particularly if it causes loss of operational efficiency or loss or corruption of Dfl Roads Data. The parties shall assist each other to mitigate any losses and to restore the services to their desired operating efficiency.</p> <p>Any cost arising out of the actions of the parties taken in compliance with these provisions shall be borne by the parties as follows:</p> <ul style="list-style-type: none"> i. by the Contractor where the malicious software originates from the Contractor software, third-party software or Dfl Roads data (whilst Dfl Roads data was under the control of the Contractor); and ii. by Dfl Roads if the malicious software originates from Dfl Roads software or Dfl Roads data (whilst Dfl Roads data was under the control of Dfl Roads).
2.10	<p>Ownership of equipment</p>
2.10.1	<p>All existing installed equipment is the property of Dfl Roads and will remain so unless specified otherwise by Dfl Roads. New equipment installed during the Contract, including equipment installed as maintenance replacements, will also become and remain the property of Dfl Roads.</p>
2.11	<p>Warranty</p>
2.11.1	<p>The Contractor shall supply a warranty to Dfl Roads for all equipment (including electrical mini pillars and their installation), materials and workmanship provided by the Contractor as supplied items under the Contract.</p>
2.11.2	<p>The warranty shall extend for at least twelve months following successful commissioning of the equipment and signing of the Take-over certificate by the Customer; and no charges shall be passed to Dfl Roads regarding repair or replacement of such equipment, which may become faulty under normal use.</p>
2.11.3	<p>During this warranty period the Contractor, or his nominated maintainer, shall repair or replace any faulty equipment as appropriate and in accordance with the attendance requirements outlined in Clause 4.12.2.</p>

2.11.4	If within twelve months after being commissioned there shall appear in the materials, including lamps, any defect which shall arise under proper use from faulty materials, workmanship or design, and Dfl Roads shall give notice thereof in writing to the Contractor, the Contractor shall make good the defects either by repair or, at the option of the Contractor, by the supply of a replacement at the Contractor's expense. The Contractor shall arrange for the removal and replacement of the defective materials or parts within the periods specified in Clause 4.12.2, or as agreed by Dfl Roads.
2.11.5	Should the required Serviceability Ratio of 98.5% (see Clause 20.1) not be achieved over the initial 12-month warranty period, the warranty shall be extended for a further 12-month period. Failure to meet the required Serviceability Ratio of 98.5% within this second 12-month period will require the Contractor to produce a report to the Contract Manager detailing the reasons for this failure and detail what remedial measures are proposed to rectify this situation.
2.11.6	The Contractor shall provide, upon satisfactory completion of the warranty period, a detailed programme of works carried out at each sign location. In addition, the Contractor shall keep accurate records of signs supplied including location of the signs after the warranty period of each sign has expired.
2.11.7	In addition to the 12-month warranty in Clause 2.11.2 above the Contractor shall provide a 10-year warranty on all LED units, arrays, strings and drivers.
2.11.8	The Contractor shall provide copies of all warranty maintenance record reports for all signs.
2.12	As-built drawings
2.12.1	As-built drawings are required for ALL modifications. A copy of the as-built drawing to a scale of 1:200 shall be submitted to Dfl, within 2-weeks of the completion of the work, for approval. The drawings should be in AutoCAD and pdf formats.
2.12.2	Record as-built drawing shall include, at least, the following: <ul style="list-style-type: none"> a) The existing location of all relevant street furniture b) The location of all relevant street furniture and ducts, including road crossings c) Sign and post arrangement d) The location of joints if any e) The location of sub-surface joint boxes f) Carriageway markings g) Specific reference shall be made to any departures from standard

	Installation
3.1	Ordering and delivery of materials
3.1.1	<p>Materials may be ordered under this Contract, in accordance with Clause 8 of the Conditions of Contract, by any of the following DfI Roads offices: -</p> <ol style="list-style-type: none"> a. 1 Crescent Road, Londonderry, Co. Londonderry, BT47 2NQ b. County Hall, Castlerock Road, Coleraine, Co. Londonderry, BT51 3HS c. County Hall, 182 Galgorm Road, Ballymena, Co. Antrim, BT41 1QG d. Rathkeltair House, Market Street, Downpatrick, Co Down, BT30 6AJ e. Marlborough House, Central Way, Craigavon, Co Armagh, BT64 1AD f. Traffic Information and Control Centre, 1b Airport Road, Belfast, BT3 9DY g. County Hall, Drumragh Avenue, Omagh, Co Tyrone, BT79 7AF
3.1.2	<p>A joint site survey between the Contractor and DfI Roads will precede all orders unless agreed otherwise by DfI Roads. Following the survey the Contractor will forward a quotation for the work based on contract items and rates. Should DfI Roads require the amendment of the quotation, this shall be agreed with the Contractor before an order is placed. DfI Roads will place an order by emailing the Contractor a copy of the agreed quotation along with a Purchase Order number and specifying the agreed delivery and installation dates.</p> <p>Surveys should be grouped in an area as far as possible to minimise travel time and paid by the hours incurred.</p> <p>Orders of ten units or less shall be delivered within six weeks. The delivery period for orders of more than ten units shall be agreed by the Contract Manager with the Contractor but shall not exceed three months. These timescales will be used in the calculation of Low Service Damages in Annex E. Exceptionally, DfI Roads may agree longer delivery periods where multiple large orders have been received. Low Service Damages will apply where agreed delivery dates are not met.</p> <p>The delivery period shall be complete when the equipment has available for installation from the Contractors' local depot.</p> <p>For orders of ten units or less, installation shall be completed within four weeks of DfI Roads advising that a site is ready for installation. The installation period of orders of more than ten units shall be agreed by the Contract Manager with the Contractor but should not exceed three months. These timescales will be used in the calculation of Low Service Damages in Annex E. Exceptionally, DfI Roads may agree longer installation periods where multiple large orders have been received. Low Service Damages will apply where agreed installation dates are not met.</p> <p>The installation period shall follow the delivery period and commence when DfI Roads advise that a site is ready for the equipment to be installed.</p>

	Orders shall be copied to TICC to facilitate contract management and upkeep of the equipment inventory for maintenance purposes.
3.1.3	On receipt of the order the Contractor shall notify the originator of the order via email of any reason why the information contained within order is incomplete within two working days, otherwise the delivery period (Clause 3.1.2) shall commence on the first full working day following receipt of the order. TICC shall be copied into any such correspondence to facilitate contract management.
3.1.4	<p>On completion of installation there shall be a six-week monitoring period where the equipment shall be available for use in all its facilities both on site and online. All the equipment at a site shall be fault free during this six-week period before a measurement for installation costs can be submitted. Any faults or issues arising within this period shall cause the six-week monitoring period to be reset, commencing from when the fault / issue is resolved to the satisfaction of DfI Roads. Subsequent faults or issues will continue to reset the monitoring period until a six-week fault free period can be achieved.</p> <p>On completion of a fault free six-week period for a site, the Contractor shall submit a measurement to the originator of the order. On receiving the agreement of the originator to the measurement, the Contractor shall invoice AccountNI for payment. Separate measurements / invoices may be submitted for supply and installation at the request of either DfI Roads or the Contractor.</p>
3.1.5	While the individual DfI offices listed in Clause 1.1.4 may each raise, inspect, install and pay for orders separately, however, the TICC Contract Manager retains the overall ownership and management of the Contract.
3.1.6	<p>Materials shall be delivered (with a minimum of 48 hrs notice) to the following locations as specified on the Order or as appropriate for the materials at time of delivery: -</p> <ul style="list-style-type: none"> a. The Traffic Information and Control Centre, 1b Airport Road, Belfast. b. The Contractor's local depot. c. DfI Roads civils contractor depot d. The site or location at which the equipment is to be installed.
3.1.7	All equipment manufactured under the contract shall be supplied in accordance with a programme agreed with DfI Roads.
3.1.8	No equipment shall be delivered until all tests and inspections have been carried out in accordance with the contract, and to the satisfaction of DfI Roads.
3.1.9	All items of equipment shall be adequately packed for protection during transport, handling and storage. Each package shall be clearly labelled with the quantity, identity and serial number of its contents, which shall be notified to DfI Roads in writing.

	Exceptionally, where it is necessary to make advance payments to facilitate the production of equipment ahead of installation on site, the Vesting Certificate template in Annex F should be used to confirm that ownership of the equipment lies with DfI Roads.
3.1.10	Signs shall be available for Factory Acceptance Testing and inspection at the Contractor's local depot six weeks following receipt of the order. The Contractor shall advise DfI via email when the signs are available, thus completing the delivery period.
3.1.11	Installation of signs shall commence as soon as possible following successful completion of Factory Acceptance Testing and should be installed no later than four weeks after Factory Acceptance Testing, unless agreed otherwise by DfI Roads.

3.2	Civil engineering
3.2.1	Civil Engineering works shall be undertaken by DfI Roads. The Contractor must liaise closely with DfI Roads and other contractors to coordinate the works as required.
3.3	Damage to roads and adjacent property or buildings
3.3.1	The Contractor shall satisfy himself as to the condition of the walls; fences and adjacent property before commencing work on a site and shall record (using photographs or video) and report any defects to DfI Roads. The Contractor shall be responsible for making good any damage which may be caused by his workmen or sub-contractors to roads, footways or entrances (public or private) and adjoining property or buildings; including damage to any existing highway infrastructure including drains, chambers, manholes, lighting cables, electrical cables, communications cables, structures, traffic signs, and other highway furniture.
3.3.2	The Contractor shall pay, in full, DfI Roads costs and expenses incurred through any subsequent repair of defects caused by the Contractor's negligence, whether such repair is undertaken by the Contractor or another party.
3.4	Removal of surplus material
3.4.1	The Contractor shall not allow rubbish or surplus material of any description to accumulate at the site but shall clear away all such material daily.
3.4.2	The Contractor shall prevent any material entering a gully chamber and shall remove immediately any material which may enter.
3.5	Roads to be kept clean
3.5.1	The Contractor shall take every precaution to prevent dirt mud or other material being dropped or spread by traffic from or associated with the work on roads in public use or on roads being part of the work which are made available for use by the Contractor. Any dirt or mud adhering to the tyres or chassis of any vehicle shall be thoroughly cleaned off before the

	vehicle is allowed to leave the site. The Contractor shall be equally responsible for the vehicles of his sub-contractors and suppliers.
3.5.2	The Contractor shall take all necessary steps to avoid creating dust nuisance during the supply and commissioning of the signs. If in the opinion of DfI Roads, the Contractor is not dealing adequately with the control of dust, DfI Roads may instruct the Contractor to carry out such additional measures as DfI Roads considers are necessary, at the Contractor's expense.
3.5.3	Machinery and Plant are only allowed to cross public roads when necessary. Slow moving vehicles or wide loads shall be transported at times where traffic flows are a minimum to reduce impact on other road users.
3.6	Temporary Traffic Management (TTM) and planning & phasing of the works
3.6.1	<p>The Contractor shall undertake all temporary traffic management (TTM) on single carriageway roads and dual carriageways with speed limit of 40mph or less in accordance with Safety at Street Works and Road Works, A Code of Practice "Red book" https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321056/safety-at-streetworks.pdf</p> <p>and all temporary traffic management (TTM) on single carriageway roads and dual carriageways with speed limit of 50mph or above in accordance with Chapter 8 of Traffic Signs Manual.</p> <p>The Contractor and his employees must comply with instructions given by DfI Roads, DfI Roads civils contractor or the Police. If instructions to suspend or curtail the whole or part of the works are given by the Police, the Contractor shall immediately inform DfI Roads and cease work.</p> <p>Refer to Clause 1.4.2 for details of relevant mandatory National Highways Sector Schemes which must be held by the Temporary Traffic Management Contractor.</p>
3.6.2	The Contractor shall appoint a suitably qualified senior member of his contract team to act as Traffic Safety and Control Officer (TSCO) and shall notify DfI Roads of his name and the name of his suitably qualified deputy. These appointments along with day, night and mobile telephone contact numbers shall be notified to DfI Roads within one week of the award of the Contract.
3.6.3	The TSCO shall possess a broad experience of the highway construction industry, combined with the ability to interpret the requirements set out in these Contract documents. They should have a detailed working knowledge of temporary traffic management. They should have a working knowledge of all relevant legislation relating to signing of road works.
3.6.4	The TSCO shall be responsible for the installation and removal of the traffic management and safety measures when carrying out any type of lane closures. In the event of an accident

	<p>within the traffic control area, the TSCO shall always be available to liaise with the Police regarding:</p> <ul style="list-style-type: none"> (a) removal of vehicles, debris and oil from the trafficked surface. (b) immediate replacement of damaged signs, cones, cylinders, studs etc and full restoration of the traffic control layout.
3.7	Planning & phasing of the works
3.7.1	TTM proposals shall be submitted to DfI Roads Traffic Management for consideration. The Contractor shall phase the works in a manner acceptable to DfI Roads and the PSNI for the operation of traffic management. The Contractor shall submit applications for road or lane closures to DfI Roads Traffic Management a minimum of three weeks before the date the closure is required.
3.7.2	The Contractor shall, in conjunction with the DfI civils contractor, plan and programme the works to ensure minimum disruption to road users
3.7.3	The Contractor shall carry out the work in such a way as to cause the minimum disturbance to traffic and shall ensure that at all time pedestrians and vehicles can move with safety. In heavily trafficked footways and at entrances to shops and business premises it may be necessary to restrict the extent of work and the hours during which it can be carried out.
3.7.4	The Contractor shall be responsible for and shall make allowance in the programming of the works for clearing parked vehicles by warning frontages prior to the start of the Works, setting out traffic cones and obtaining police assistance where necessary.
3.7.5	No work shall be permitted on a section of road during the operating hours of a clearway System.
3.7.6	<p>The Contractor shall ensure that: -</p> <ul style="list-style-type: none"> (a) all employees and sub-contractors shall always wear approved Personal Protective Equipment in accordance with Chapter 8 of the Traffic Signs Manual and the Street Works Act whilst on the site (b) all employees have had proper training for any operations they carry out and are provided with suitable safety clothing/equipment (c) no work shall commence that affects the public highway until all necessary traffic safety measures are fully operational
3.8	Road lighting requirements
3.8.1	All site vehicles shall be fitted with roof mounted flashing or rotating lamps, hazard-warning lights will not be a permitted alternative.

3.9	Site installation
3.9.1	When an order for sign(s) is placed, the Contractor shall provide a programme and timescale for installation that will be forwarded to the DfI Roads representative(s) for approval.
3.9.2	The Contractor shall provide the Site Acceptance Tests and inspection schedules for the approval of DfI Roads.
3.9.3	The Contractor shall carry out all electrical tests as specified in the British Standard BS EN 7671 and provide DfI Roads with certificates of electrical safety.
3.9.4	All electrical equipment supplied shall conform to the current edition of the British Standard BS EN 7671 Requirements for Electrical Installations.
3.9.5	The Contractor shall provide all labour, tools, clips, transport, plant, materials and lifting equipment needed to carry out his contractual responsibilities. This should include for sites where footings are poor, narrow, embankments fall away or where hedges, fences, obstructions dictate a higher-than-normal mounting height. The use of mobile elevated working platforms and / or loader cranes is deemed to be included where they are required. Clips should be provided for post sizes up to 273mm dia and be rubber lined where passively safe posts are to be used.
3.9.6	The installation and commissioning of the signs shall be subject to the agreement of DfI Roads and may have to consider works being carried out by others.
3.9.7	If, during the works, any damage occurs to the post structures that can be attributed to this contract, then the Contractor shall repair the damage, at his own expense, to the satisfaction of DfI Roads.
3.9.8	The installation procedure shall include full testing of the installed equipment and a full electronic report of the test results shall be submitted to DfI Roads. The tests shall include, at least, the verification of the correct operation and electrical safety.
3.10	Protection of third-party equipment
3.10.1	The Contractor shall have due regard for the protection of third-party equipment installed in the mini-pillar, street furniture or ducting system. During any work requiring the temporary or permanent removal of such equipment the Contractor shall liaise with the relevant Authority / Utility / RMC to ensure their equipment is not damaged and is reinstalled in good working order on completion of the works. This includes but is not limited to: - <ul style="list-style-type: none"> a. Utility electricity supply and termination equipment b. Utility telecommunications supply and termination equipment c. Any other equipment that may be installed at the request of DfI Roads
3.11	Commissioning of equipment

3.11.1	Before the commissioning of new, modified or upgraded equipment installed under this Contract, Dfl Roads shall require two days' notice from the Contractor to undertake an inspection as to the adequacy of the new, modified or upgraded installation (a full inspection report, in a format to be agreed with Dfl Roads. Subject to the adequacy of the installation(s) Dfl Roads will allow switch-on. Dfl Roads must be represented, unless otherwise agreed, at switch-on. The Contractor shall, subject to two days' notice from Dfl Roads, be represented by technically competent personnel at the commissioning. These attendances shall be free of any charges to Dfl Roads.
3.11.2	Subject to successful switch-on Dfl Roads will require a Take-over Certificate (to be signed and agreed jointly by Dfl and the Contractor) to commence the warranty period following the successful completion of the six-week monitoring period (see Clause 3.1.4).
3.11.3	The Contractor must assure Dfl Roads of the adequacy of all new equipment. This assurance is provided by (a) an Electrical Test Certificate which will be completed within 24 hours of switch on and delivered to Dfl Roads within 2 working days after switch-on; and (b) the signing of a Take-over Certificate as per Clause 3.11.2 above.
3.11.4	Any non-compliance identified by Dfl Roads at commissioning must be resolved to the satisfaction of Dfl Roads before switch-on. The onus is on the Contractor to resolve any non-compliance issues.
3.11.5	There will be no cost for planned preventative maintenance to Dfl Roads during the warranty period.
3.12	Tests and inspections
3.12.1	The Contractor shall provide all services and equipment required for Dfl Roads inspection and testing of the signs and all associated equipment.
3.12.2	The Contractor shall provide experienced and competent test personnel and all necessary test equipment.
3.12.3	All test equipment shall be calibrated by an approved Test House. Valid calibration labels shall be firmly attached to the equipment stating where and when it was calibrated.
3.12.4	All equipment and materials supplied under this Contract shall be subject to inspections and / or factory acceptance tests which may be witnessed by Dfl Roads or its representatives at the premises of the Contractor.
3.12.5	For equipment subject to Factory Acceptance Tests, the Contractor shall provide test schedules for the approval of Dfl Roads one (1) week prior to the agreed date of the tests.
3.12.6	Dfl Roads may waive the right to be present at Factory Acceptance Tests. However in any event, the Contractor shall carry out formal Factory Acceptance Tests and forward the completed test results to Dfl Roads. The tests shall examine at least, the following:

- | | |
|--|---|
| | <ul style="list-style-type: none">a. That the individual items of equipment comply with the Technical Specificationsb. That the signs operate correctly when under simulated controlc. That overall, within the permitted tolerances, the signs satisfy all the operational requirements of the relevant Technical Specifications, the Works Specification and those of DfI Roadsd. The recording of all test results will be the responsibility of the Contractor and an electronic report shall be supplied to the Contract Managere. Following installation and commissioning on site, the signs shall undergo Site Inspection Tests, which will be a repeat of the Factory Acceptance Tests and may be witnessed by a DfI Roads representative. An electronic copy of the Site Inspection Tests shall be forwarded to DfI Roads within one week of the sign installation. |
|--|---|

3.13	Power supply and installation
3.13.1	Power supply cable from the mini pillar to the sign shall be 3-core copper PVC armoured cable to BS 5467. For cable lengths up to 80 metres the size shall be 10mm and for cable lengths between 80 metres and 200 metres the size shall be 16mm. For cable lengths above 200 metres the size shall be as agreed with DfI Roads. The Contractor shall ensure that any cable supplied to power the sign shall conform to the regulations as set out in BS 7671.
3.13.2	At no time shall the Contractor be permitted to work on the Distribution Network Operator (NIE for Northern Ireland) cut-out and the connection cable between it and the fuse isolator unit in the mini pillar. Only the NIE and DfI Street Lighting contractors are permitted to work on this equipment. It should be noted that G39 certification in Northern Ireland does not permit live working on DfI Roads apparatus or the removal of the NIE supply cut out fuse.
3.13.3	The main earth equipotential bonding cable shall be copper PVC green/yellow insulated cable to BS 6004, size 16mm, terminated in an ISCO connector, or similar approved, capable of accommodating at least 4 connectors of size 16mm.
3.13.4	The Contractor's responsibility shall extend to the source of supply to the equipment e.g. DfI Roads mini pillar.
3.13.5	Upon completion of any work, which varies the equipment, including cabling, at a site the Contractor shall produce, or modify an existing, record drawing of the work done to a scale agreed with the DfI Roads.
3.13.6	The Contractor shall also be responsible for reporting a loss of supply to the supply authority, Northern Ireland Electricity (NIE) and to DfI Roads.
3.13.7	The Contractor shall provide and ensure that all sign equipment contain a designation label, identifying the location for the source of supply. Destination labels shall be attached to all new cables at each end and in all draw pits.
3.13.8	All work associated with the installation of street equipment and cables shall be carried out in accordance with the Health and Safety at Work Order (NI) 1978, BS 7671, and The Street Works (NI) Order 1995, any subsequent amendments, Safety at Street Works & Road Works and ISO 9001 or equivalent.
3.13.9	Cabling shall be carried out in accordance with the Manual for Highway Works, Volume 1 Specification for Highway Works, Series 1400, cables shall be in accordance with: <ul style="list-style-type: none"> • BE EN 12368 Traffic control equipment • BS 7671 Requirements for Electrical Installations • Traffic Signs Manual Chapter 6 unless varied by this specification.
3.13.10	A warranty on all equipment supplied shall extend for twelve months from the date of commissioning.

3.14	Electrical safety
3.14.1	At all times it is the responsibility of the Contractor to ensure the site is made electrically safe in line with BS7671 Requirements for Electrical Installation, Electricity Safety, Quality and Continuity Regulations (NI) 2012, the Electricity at Work Regulations (Northern Ireland) 1991)
3.14.2	Instances of high ELI readings at power source should be reported by the Contractor immediately to the Distribution Network Operator (NIE for Northern Ireland). The Contractor should also contact the relevant DfI Roads office and verbally inform DfI Roads personnel of the fault. The Contractor shall take all reasonable action to ensure the site is safely guarded from the public.
3.14.3	All staff involved in the installation of electrical equipment shall be G39 trained. It should be noted that G39 certification in Northern Ireland does not permit live working on DfI Roads apparatus or the removal of the NIE supply cut out fuse.
3.15	Electrical testing
3.15.1	On completion of, or during, the installation of any equipment and before commissioning, checks and testing shall be carried out by an appropriately skilled and competent person in accordance with BS EN 7671, Requirements for Electrical Installation. This person shall be a time served electrician, with the minimum qualifications of Part 1 City & Guilds Electrical Installation and who has completed the City & Guilds 2380 or 2381 training program and hold a current City & Guilds 2382 certificate. Testing shall include earth loop impedance tests, mains connection polarity check, insulation resistance tests and tests on any residual current devices fitted. Faults found shall be repaired prior to the switch-on of the installation.
3.15.2	A visual inspection carried out as part of clause 3.15.1 shall also include the following: a) Cabinet door seals and locks are acceptable b) Cables are properly labelled, terminated and bonded c) Mains supply fuses and cut-outs correctly installed d) Necessary warning labels attached e) Post caps are correctly installed and that no gaps exist which would allow the ingress of water f) All cable armouring is secured correctly, are made off with the proper glanding and secured to the controller case earth bar g) Terminal block connections are securely made h) The maximum of exposed copper is 2 mm i) A visual structural inspection report is carried out
3.15.3	The Contractor shall provide an electrical completion certificate and test reports in accordance with BS 7671. The test reports to be used shall be the NICEIC electrical installation condition

	<p>report (EICR) and they shall run sequentially. The Contractor is to provide the Engineer with the original of each test report with schematic drawing and shall install a copy of the completed test report and schematic in each feeder pillar that has been inspected. An electronic copy in PDF format shall be emailed to DfI Roads.</p>
3.15.4	<p>Interconnecting cables shall be tested in accordance with the Specification for Highway Works (Manual of Contract Documents for Highway Works, Volume 1) clause 1217.</p>
3.15.5	<p>Detector loops and loop feeder cables shall be tested in accordance with the specification for Highway Works (Manual of Contract Documents for Highway Works, Volume 1) clause 1218.</p>
3.15.6	<p>The Contractor is to ensure that all test instruments are calibrated. The Contractor shall keep a test instrument accuracy record summary and a comprehensive calibration register for the test equipment that is to be used for the duration of the contract to meet the requirements of EN 45011. The Contractor shall have in place an effective system, which enables them to confirm the continuing accuracy and consistency of all test instruments used for certification and reporting purposes as defined by NICEIC guidelines.</p> <p>Should the NICEIC assessment report indicate a non-compliance, in that the Contractor is unable to demonstrate to the satisfaction of the NICEIC Inspecting Engineer that an effective control system is in place which ensures the continuing accuracy and consistency of the test instruments used to carry out the tests required by BS 7671, then any instruments found by the NICEIC Inspecting Engineer to be in non-compliance, and to have been used by the Contractor will render all reports which had been carried out with such instruments invalid. Alternatively should DfI Roads, during an audit or inspection, find any non-compliance regarding the above then in all such cases DfI Roads will require the tests to be redone by the Contractor, at no additional costs, within six weeks of the Contractor being notified in writing by DfI Roads.</p> <p>All test equipment is to be approved by DfI Roads and shall comply with HSE Guidance Note GS38 Electrical Test Equipment. Following award of the Contract the contractor shall supply DfI Roads with a list of all test equipment detailing serial numbers and dates of latest calibration certificates for each instrument to be used during the Works. The information supplied to DfI Roads is to be regularly updated as instruments are calibrated or replaced, should this be necessary during the Contract Period.</p>
3.15.7	<p>Precautions shall be taken during site testing to ensure the safety of road users. Where testing involves obstruction of the carriageway or footway the requirements of the Safety at Street Works and Road Works, A Code of Practice shall be followed. Any potentially misleading signs or indications shall be covered after consultation with DfI Roads.</p>
3.15.8	<p>Precautions shall also be taken during tests, to protect the public, employees and animals from the risk of electrocution or other hazards. Where tests involve an element of risk, a risk analysis shall be carried out to identify test methods to minimise risk or to determine whether the test should be carried out. All risk analyses shall be recorded and subject to regular review.</p>

3.15.9	No personnel shall access or attempt any work on supply mini pillars unless they have passed a Highway Electrical Skills Academy approved training course on Working in the Vicinity of Distribution Network Operator (DNO) / Independent Distribution Network Operator (IDNO) Equipment (including G39). It should be noted that G39 certification in Northern Ireland does not permit live working on DfI Roads apparatus or the removal of the NIE supply cut out fuse.
--------	--

3.16	Electrical Equipment
3.16.1	<p data-bbox="252 293 730 327">Electrical Equipment for Mini Pillars</p> <p data-bbox="252 371 1458 445">The electrical equipment in mini pillars shall be configured as shown in Appendix G and, as a minimum, shall contain the following equipment:</p> <ul style="list-style-type: none"> <li data-bbox="300 490 1238 524">a) Switched fuse isolator unit to BS 61439, IP30 enclosure specification <li data-bbox="300 528 1378 602">b) Double pole (100 amp) isolation switch module to BS EN 60947, IEC 60811-408 240/415-volt AC22B Specification <li data-bbox="300 607 1382 680">c) Three fuse carrier modules to BS HD 60269, with one 45-amp HRC fuse module installed and two cartridge fuse links, one spare <li data-bbox="300 685 1104 719">d) 1m – 16mm PVC/PVC red and black cable (consumer tails) <li data-bbox="300 723 1088 757">e) 1m – 16mm Green/yellow cable (main earth connection) <li data-bbox="300 761 724 795">f) 1 No. 80amp ISCO connector <li data-bbox="300 799 1203 833">g) 1m – 10mm stranded green/yellow cable (earth bonding of pillar) <li data-bbox="300 837 647 871">h) 2 No. 10mm earth lugs <li data-bbox="300 875 635 909">i) 1 No. 16mm earth lug <li data-bbox="300 913 488 947">j) Earth label <li data-bbox="300 952 705 985">k) 1 No. Danger 240-volt label <li data-bbox="300 990 676 1023">l) Designation routing label <li data-bbox="300 1028 1219 1061">m) Appropriate power cable size to supply signal controller from pillar <li data-bbox="300 1066 1430 1099">n) Label indicating “Traffic Signs – Do Not Turn OFF” with emergency contact number <li data-bbox="300 1104 1481 1137">o) Appropriate earthing arrangements for the bonding of cabinets, cables and switchgear

Electrical cut-outs

Each sign circuit shall be protected by a high rupturing capacity type fuse to BS 88-2:2003 of approved manufacture and design, and be of the following ratings unless otherwise stated:

Wattage	Fuse Size
<150W	6A, 4A PECU
≥150W	16A

Double pole isolation cut-outs shall provide for the removal of all phase and neutral connections on the outlet side, by removal of the fuse carrier, to afford isolation of the equipment connected to that cut-out.

A double pole, double cable entry cut-out to cater for looped services up to 25 mm² will be required.

Post base cut-outs shall be double pole, single fuse type and shall comply with BS 7654-2010, IEC 60947-1, as well as complying with the requirements of the Low Voltage Directive LVD/73/223/EEC.

Post base termination units shall be manufactured in a high specification thermoplastic material with moulded drip-proof housings to IP44 or above.

3.16.2

The cut-out unit when correctly installed must be rated to IP44 and IP2X when fuse-bridge is removed. The top cover of the base moulding will be red in colour & must be fitted to protect the incoming cables from inadvertent contact (as per BS 7654).

The base moulding of the cut-out unit and extension box will contain captive brass inserts for the top covers and fuse bridge to be secured via captive lost thread stainless steel screws (NO self-tapping screws permitted).

Removal of the fuse bridge will be via a method such as cam levered handle designed to eliminate stress put on the column backboard during operation.

A sealing wire facility will be provided on the fuse-bridge & base moulding, the fuse bridge will also have a padlock facility and contain brass captive inserts for the fuse legs and solid neutral link to be fitted.

The fuse legs within the fuse bridge will have a secondary fixing to ensure that the leg stays fixed to the fuse bridge when the fuse fixing screw is "slackened" to fit the fuse.

The fuse bridge will be designed to provide the following contact –"Neutral Make, Live Break."

The fuse carrier will incorporate a flash guard, complying with IP2X, to protect the operative when removing the carrier.

	<p>Cut-outs require a maximum rating of 25amps 240V a.c., 50 Hz as required by BS 7654, with a rated insulation voltage of 440V a.c.</p> <p>Terminal blocks are to be manufactured from brass with tin plating, thus ensuring good resistance to corrosion and thermal stability. Terminal block chambers to be sharply serrated to ensure good contact is maintained, even when oxidization is present on copper or aluminium cables. Blocks must be able to accept 25mm² single round conductors. Spring clips are manufactured from stainless steel.</p> <p>Gland plates are to be manufactured from a minimum thickness of 3mm brass. Maximum of 3 x 25mm holes to be punched and fitted with 25mm closed grommets (project dependent). M6 earth bolt to be fitted on both sides of the gland plats.</p> <p>Cut-out must be supplied with all cone grommets for outward circuits.</p> <p>As per BS 5901, the comparative tracking index (C.T.I.) shall not be less than 500. Fuse links shall comply with the requirements of BS EN 60296: BS646 and be of high breaking capacity.</p> <p>Each sign shall be supplied from a separate fuse in the post base cut-out.</p>
3.16.3	<p>Armoured Cable Terminations</p> <p>All SWA cables shall be terminated by means of a CW gland complying with BS 6121-1, BS EN 50262 and a gland plate incorporating a non-ferrous earthing terminal. All CW glands shall be as shown in standard detail SL 61 and shall achieve IP66.</p>

<p>3.16.4</p>	<p>Wiring</p> <p>Blue sheathed 3-core arctic grade flex to BS 7919, of 600/1000-volt grade, having a copper conductor size of not less than 1.5 mm² shall be installed from cut-out to lantern as standard in all lighting columns. All cables shall be correctly colour coded and comply with BS7671.</p> <p>Unsupported lengths of wiring shall be kept to a minimum and not be allowed to come into contact with components by their freedom of movement. Ty-raps will be used to keep wiring away from control equipment.</p> <p>The Contractor shall provide and install a 6mm² PVC insulated earth cable from the cut-out to the column earthing terminal.</p> <p>Surfacing Wiring Cables will be required as follows:</p> <ul style="list-style-type: none"> a. PVC/PVC flat twin with bare CPC. b. PVC/PVC three core Brown/Black/Grey c. PVC/PVC single core cables. d. Green/Yellow PVC insulated protective conductors. <p>All cable to be PVC sheathed and shall be in accordance with BS 6004:2012. In addition to the relevant British Standard all cables shall be BASEC approved.</p>
<p>3.16.5</p>	<p>Labelling</p> <p>Labelling shall be provided to enable ready identification of all protective, switching and isolating devices and all outgoing circuit terminals, with warning notices regarding isolation appropriately positioned.</p> <p>An ivory or Formica label shall be fastened to the cover of each item of switch gear in the supply cubicle by means of brass round-head screws. The label shall be engraved in 5 mm black lettering on a white background to indicate the circuit controlled and the size of replacement fuse.</p>

<p>3.16.6</p>	<p>Records</p> <p>A schematic diagram and copy of each electrical test certificate to BS 7671, with the schematic diagram, sealed in a transparent plastic cover shall be fitted in each supply cubicle. The schematic diagram shall indicate the size of each outgoing cable, the identification numbers of street furniture associated with each cable, and in addition for each circuit, the fuse rating, the circuit length, the maximum permitted earth fault loop impedance value (Zs) including temperature correction values and the phase identification.</p> <p>The original Certificate to BS 7671 shall be submitted with the invoice for the works to DfI Roads in both paper and electronic PDF format. Invoices submitted by the Contractor for payment without the attached schematic diagram and correctly completed BS 7671 Certification will result in delays to payments until this is provided.</p> <p>The Contractor is required to hold copies of all test information supplied to DfI Roads. The Contractor shall validate such information as supplied to DfI Roads.</p>
<p>3.16.7</p>	<p>Residual Current Devices (RCDs)</p> <p>RCDs shall be 2 pole of 40 Amps rating and sensitivities in the range 30 m Amps to 100 m Amps. They shall have been type tested to the current revision of BSEN 61008-1 and shall be suitable for mounting in an individual enclosure to give a degree of protection to IP23. Terminal size and enclosure dimensions shall be such as to accommodate single core PVC/PVC cable of up to 25 mm². Price should include for suitable enclosure, or terminal covers as required.</p>

Feeder pillars with recessed door

Feeder Pillars shall conform to the following: -

Material

3mm sheet steel plate.

Construction

Press formed and welded cubicle, arrange to provide a weatherproof rigid structure, incorporating: Single door, recessed, flush fitting, fully gasketed and designed to BS EN 60 529: 1992, IP55, hung on stainless steel hinges. Feeder pillar mounting brackets to have 2 No 15mm holes at 230mm centres. There shall be an 'Anti-Vandal' security bracket, manufactured and mounted on rear side of door to prevent crowbar access.

Lock

The door shall be fitted with 2 No stainless steel 10mm tri-head locks.

Locking off Facility

A Locking off facility shall be provided on the mini pillar to enable the door to be securely locked by an operative while working on a system serviced from the pillar. The provision shall not protrude more than 25mm beyond the surface of the pillar door and shall have no sharp edges. It would be preferable if this facility were either countersunk into the pillar door leaving no protrusion or where necessary the protrusion is located to the side of the pillar. The protrusion shall have a 15mm diameter hole to facilitate the fitting of a padlock.

3.16.8

Document storage

Provision will be provided on the rear of the pillar door for the storage of A4 size documents for small feeder pillars and for medium to large feeder pillars the provision shall be for A3 size documents.

Earth Stud

Brass M8 earth studs complete with M8 full nuts and washers in brass fitted to both pillar body and door and connected with a 16mm braided earth strap.

Painting and Protection against Corrosion

The protection system will be hot dipped galvanised protection BS EN ISO 1461. The pillar is to be finished overall to BS 4800 14C 39 Hollybush Green.

The pillar shall be protected against corrosion to give a guaranteed life on site, in areas of mild environmental pollution of 15 years.

Protective Treatment for Feeder Pillar Bases

Feeder pillars shall be coated internally and externally with bitumen from the base up to the bottom line of door (alternative treatments will be considered).

Backboard

12.5mm Marine grade plywood, treated with water repellent. To be removable, fixed with 4 No screws, nuts and nylon-shrouded washers.

Label

Each pillar shall be supplied with a white heavy duty plastic label, firmly attached to the door (centrally, 150 mm from top) and bearing the inscription "Dfl Roads" in black embossed lettering, 6 mm high.

Apron

The lower portion of the pillar shall be fitted with a removable 3mm thick apron plate retained by M8 Bolts and washers, screwed into inserts within the main body of the enclosure (alternative fittings will be considered). Painting and protection shall be the same as the main pillar body. The Apron may be removed if installing pillar on a level surface and agreement is given by Dfl Roads.

Board Dimensions

Pillar Backboard - Height 1,000 mm - Width 600 mm.

Depth

Pillar - Minimum 300 mm from backboard to door.

Cables and cable joints

Jointing of Cables

Jointing of cables shall be carried out in dry and clean trenches. The Contractor shall ensure that adequate working room is provided for this use. All jointing works shall be carried out in accordance with the Manufacturer's specification for the equipment and materials supplied. The Contractor shall if required by DfI Roads provide reasonable opportunity for inspection before the joint is filled with compound and before the trench is backfilled. All cable joints and pot ends shall be guaranteed for a period of 2 years from the date of installation.

Earthing of Cable Armouring

Cable armour shall be bonded at all joints without significant increase in resistance as compared with that of an unjointed cable run and form the earth continuity circuit.

Cable Jointing Kits

Resin filled joints shall comply in all respects with BS EN 50393:2015 HD623 and accompanying ISO 9001 quality assurance licence. Joints shall be cold poured polyurethane resin. All joints must have a means of securing the steel armour wires and have an earth continuity conductor. If pressure springs are to be used the earth continuity conductor shall be earth braid.

Heat Shrink Cable Joints

Cable joints shall be supplied in kit form and the packaging shall be designed to protect against mechanical damage and the ingress of dirt and moisture. Kits shall be individually packaged and components subject to a shelf-life limitation and shall have the final date for use prominently and permanently shown on all packaging.

Cable joint kits of the following types shall be provided: -

- a. Straight through joints for all cable types in the range 4-35 mm².
- b. Pot end for all cable types in the range 4-35 mm².
- c. Outer insulation cable repair tape (Electrical Adhesive Sealing Compound)

Joint kits shall comply in all respects with BS EN 50393:2015 HD623 and accompanying ISO 9001 quality assurance licences. Mechanical and electrical protection for all heat shrink joint kits for all types of cable shall incorporate a metallic screen surrounding the insulated conductors for the full length of the joint.

Cable sheath repair kits must contain all necessary fittings to facilitate the satisfactory repair of PVC outer cable sheath damage and should incorporate the use of a wrap around, adhesive coated and moisture sealing outer cover.

Pot end kits must be marked to indicate the presence of live conductors.

Records of all type testing and routine testing shall be maintained by the Contractor and shall be made available to DfI Roads on request.

3.16.9

All heat shrink kits and components shall comply with EA Technical Specification 09-11 and the following: -

REQUIREMENTS FOR COATED TUBING

Type	Supplied Diameter (mm)	Recovered Diameter (mm)	Length (mm)	Nominal Wall Thickness (Fully Recovered)
Thin Wall	16	4	1200	1
Thin Wall	39	13	150	1.5
Medium Wall	25	8	400	2
Medium Wall	35	12	400	2
Heavy Wall	51	16	1000	4

Cables

Cables shall be supplied in accordance with Clause 3.13.9 and all underground cables shall be marked at 5 m intervals to indicate length remaining on the drum.

Certificates of tests giving details of type tests, sample tests and routine tests and measurements shall be provided to DfI Roads.

Both cable ends must be sealed immediately after completion of works testing, using a heat shrinkable cap.

DfI Roads will not accept responsibility or authorise payment for cable drums, nor will it accept responsibility for their return. Any Contractor who wishes to deliver to site cable on cable drums and wishes to have them returned must mark such cable drums in a manner, which clearly identifies ownership. It will be the Contractor's responsibility to arrange collection of cable drums from site.

All cables shall be terminated in accordance with the requirements of BS 7671.

Marking Tape

Marking tape shall be coloured yellow and stamped along its length with the legend "Caution - Live Cable Below", in black lettering. The tape shall be of the 'light duty' type, 150 mm wide and 500 m in length per roll.

3.16.10	<p>Electrical installation</p> <p>All power cables shall be terminated in accordance with BS 7671 Regulations for Electrical Installation</p> <p>All equipment shall be identified or marked in accordance with BS 7671 Regulations for Electrical Installation</p> <p>All equipment installed in the mini pillar shall be secured to the backboard using square recess or Torx drive, round or countersunk head screws, size 8. Screws shall be manufactured from hardened steel, bright zinc plated, self-tapping thread, Screwlux or similar approved.</p>
	<p>Contractor</p>
4.1	<p>Contract manager</p>
4.1.1	<p>The Contractor shall appoint a Contract Manager for this Contract who shall be involved in the day-to-day operations and have responsibility for, at least, the following:</p> <ul style="list-style-type: none"> a) The operation of the Contract b) Co-ordination and liaison between DfI Roads, the Contractor, and his sub-contractors c) Administration of the Contract d) Technical and electrical aspects of the Contract
4.1.2	<p>Within one week of the Contract being awarded, the Contractor shall inform DfI Roads of all information relevant to the role of the Contract Manager, including the place and telephone number where he may be contacted. The Contractor shall also appoint a member of his staff as a deputy for the Contract Manager to ensure continuity of the Contract Managers functions in his absence.</p>
4.1.3	<p>The Contract Manager or his deputy as appropriate shall be always available, including outside normal hours, to oversee problems as they arise.</p>
4.1.4	<p>The Contract Manager shall be experienced in the supply and installation of School Signs with at least three years relevant experience.</p>
4.1.5	<p>The deputy for the Contract Manager shall also be experienced in the supply and installation of School Signs with at least two years relevant experience.</p>

4.2	Contractor's personnel – delivery team
4.2.1	<p>The Contractor shall have within his delivery team:</p> <ul style="list-style-type: none"> a) an adequate number of personnel, to the satisfaction of DfI Roads, both technical and administrative to service all aspects of the Contract b) personnel located such that the contractual response times and commitments can be adequately met
4.2.2	<p>Within the local workforce the Contractor shall have at least two engineers fully competent in the preparation, configuring, testing, programming and installation of all the equipment being supported.</p>
4.2.3	<p>The Contractor, may, at times be asked to undertake some associated scheme preparation work and will have access to suitable trained and qualified personnel to undertake such work in a timely manner.</p>
4.2.4	<p>The Contractor shall provide all necessary facilities, materials and other equipment, and personnel of appropriate qualifications and experience to undertake the support services. All personnel deployed on work relating to the Contract shall have appropriate qualifications, be competent, properly managed and supervised, and in these and all respects be acceptable to DfI Roads.</p>
4.2.5	<p>The Contractor shall take all reasonable steps to avoid changes to any staff designated as Key Personnel. The Contractor shall give at least one month's notice to DfI Roads of any proposals to change Key Personnel.</p>
4.2.6	<p>The Contractor shall have the facility to call upon additional staff resources during times of increased workload.</p>
4.3	Competency and training of staff
4.3.1	<p>The training requirements of the Highways Agency Sector Scheme 8 will apply to this Contract. Amongst other things there is a requirement for the Contractor to maintain a register of its employees indicating the competency levels of its employees, and to issue a competency card to its employees. The Contractor shall only use staff on the Contract who are fully trained and experienced on the types of equipment to be supplied, configured, installed and maintained.</p>
4.3.2	<p>All staff appointed to work on the Contract shall be to the approval of DfI Roads. The Contractor shall submit for the inspection and approval of DfI Roads copies of relevant qualifications and Curriculum Vitae of staff proposed to be engaged on the works. These qualifications and experience shall be appropriate to the nature of the duties and the types of equipment upon which the member of staff will be engaged.</p>

4.3.3	For the purposes of this Contract, a Contractor's engineer shall be a member of his delivery team capable of performing all commissioning, fault finding, inspection and repair works on SRS / VMS signs. Additionally the engineer will be capable of preparing, modifying and programming of VMS signs.
4.3.4	For the purposes of this Contract, a Contractor's installer shall be a member of his delivery team capable of performing all installation, fault finding and repair works including installation of new equipment and modification of existing equipment including SRS / VMS signs.
4.3.5	The Contractor shall establish a supervisory system for superintendence and shall monitor quality and quantity of work done and achievement of programme. Where the Contractor is not an NICEIC approved Contractor any electrical work required shall be carried out by an NICEIC approved Contractor. The Contractors qualifying supervisor shall have successfully completed and hold the qualification for City and Guilds 2391.
4.3.6	The Contractor shall, whenever work is in progress, have the correct category of competent person in charge on site and the Works shall be executed by enough suitably trained staff employed by the Contractor who are experienced in this type of work. The Contractors qualifying supervisor shall have successfully completed and hold the qualification for City and Guilds 2394 and 2395 or the equivalent 2391. The Contractor shall use only competent, time served electricians, with the minimum qualifications of Part 1 City & Guilds Electrical Installation, who have completed the City & Guilds 2380 or 2381 training program and hold a current City & Guilds 2382 certificate.
4.3.7	The Contractor, to the satisfaction of DfI Roads, shall train his delivery team and arrange refresher courses for the types of equipment and range of duties upon which they will be engaged. This shall include the facilities, installation and maintenance of new models and types of equipment which, from time to time, come within the responsibilities of the Contractor. This extends to all equipment being maintained by the Contractor. The frequency of such courses shall be to the satisfaction of DfI Roads which reserves the right to send representatives to attend these courses.
4.3.8	While necessary, the successful completion of a Highway Electrical Skills Academy approved training course on Working in the Vicinity of Distribution Network Operator (DNO) / Independent Distribution Network Operator (IDNO) Equipment (including G39) does not authorise the holder to carry out any work on mains electricity fuses within the supply mini pillar.
4.3.9	The Contractor shall train his staff, and arrange refresher courses, on new regulations which may from time to time become relevant to the work and on Chapter 8 of the Traffic Signs Manual and the Street Works Act. The frequency of such courses, including refresher courses, shall be to the satisfaction of DfI Roads which reserves the right to send representatives to attend these courses.

4.3.10	The Contractor shall provide training and instruction of the Client's personnel in the use and maintenance of equipment supplied under this Contract. Where necessary this may include staff from the Client's maintenance contractor.
4.4	Availability of contractor's personnel
4.4.1	The Contractor shall supply the immediate response of appropriate personnel to urgent incidents upon a direct request DfI Roads.
4.4.2	The Contractor shall supply appropriate personnel for attendance as expert witness at Court as requested by DfI Roads. These attendances shall be free of any costs to DfI Roads.
4.5	Meetings
4.5.1	The Contractor shall attend all meetings arranged by DfI Roads for the discussion of matters concerned with the performance of Contract as follows: - <ul style="list-style-type: none"> a) Contract Meetings at nominal 3-monthly intervals, or as requested, to review the performance of the Contract. These will normally be online although initial meetings and further subsequent meetings in Belfast will be facilitated at the request of DfI Roads. These meetings will be primarily to discuss the overall contract performance and will be supported by a Quarterly Performance Report prepared by the Contractor b) Technical Meetings at nominal monthly intervals with DfI Roads areas to discuss progress in delivering local work commitments and to address any local issues. It is anticipated that these meetings will be at a local level c) Ad hoc meetings as may be requested from time to time by DfI Roads
4.5.2	The Contractor shall be represented by the Contract Manager and other suitably qualified and informed staff at such meetings and the cost of so doing shall be deemed to be included in the Contract. The Contractor will prepare minutes of all meetings and copies of the minutes will be circulated to all interested parties within one week of the meeting having taken place.
4.6	Contractor's base location
4.6.1	The Contractor is required to have a local permanent base location of sufficient size and suitably equipped to facilitate the servicing of the contract, and from where the Contractor can achieve the warranty period response times required under the contract.
4.6.2	The Contractor's base location shall be certified to BS EN ISO 9000, or equivalent and be fully equipped to undertake the installation and maintenance service being provided to include at least: <ul style="list-style-type: none"> a) Configuration and programming of all types of equipment being supplied and installed by the Contractor b) Local acceptance testing of all types of equipment being supplied and installed by the Contractor c) Routine maintenance or repair work to be carried out under warranty

4.6.3	The Contractor shall make available a local facility for testing and demonstrating all SRS / VMS signs.
4.6.4	The contractor shall provide, to the satisfaction of DfI Roads, adequate computing and communication equipment for use by his personnel involved in the administration and management of the contract.
4.6.5	The Contractor shall have a drawing package and printer to enable site record drawings to be produced in the latest version of AutoCAD or a compatible format.
4.6.6	The Contractor will be required to provide secure storage facilities for the holding of sufficient equipment to meet contract installation requirements. The storage facilities shall be sufficient to accommodate the temporary storage of up to 100No new signs and their associated posts and ancillary equipment together with such as spares equipment required to service new signs under warranty. The storage facilities must be located so that equipment can be delivered to site within 2 hours of leaving storage. This facility shall be at no cost to DfI Roads.
4.7	Tools, transport and test equipment
4.7.1	The Contractor shall equip his delivery team with all tools, transport, test equipment, communication equipment and documentation necessary for the efficient execution of all the work of the Contract. Contractor's delivery team shall have the correct signs and cones available and make use of them whilst working on site.
4.7.2	The Contractor's vehicles shall be of an appropriate high visibility colour and high visibility rear markings as indicated in Chapter 8 of the Traffic Signs Manual.
4.7.3	The Contractor's livery markings on his vehicles shall be subject to the approval of DfI Roads.
4.7.4	Whenever site operations above ground level are required, the Contractor shall provide mobile elevated working platforms, loading cranes and access equipment as required. This shall include areas where there are rising or falling embankments, local obstructions or poor ground conditions. Special attention shall be paid to the presence of overhead electricity lines when working at height. All operatives shall be fully conversant with the operation of the hydraulic platform from ground level in accordance with HSE General Information Sheet No 6 (GEIS6) "The selection, management and use of mobile elevating work platforms"
4.7.5	All test equipment shall be calibrated by an approved authority and re-calibrated at the correct intervals.

4.8	Contractor's records
4.8.1	<p>The Contractor shall maintain the following records:</p> <ul style="list-style-type: none"> a) A weekly timesheet for each employee engaged on the Contract showing the hours worked per day on all aspects of the Contract and showing the fault, job or order number in respect of each item of work performed under the Contract b) A record of materials used, whether supplied by the Contractor or free issued by DfI Roads, on each job or other work performed under the Contract c) A breakdown of total contract spend per DfI Roads area as follows: <ul style="list-style-type: none"> i. Costs to repair Chargeable Faults ii. Electrical costs iii. TTM costs iv. Modification costs v. Spend will be recorded such that reports can be run on a monthly, year to date, and contract to date basis d) An up-to-date record of Schedule of Rates item usage in each DfI Roads area e) A record of vandalism in each DfI Roads area
4.8.2	The Contractor shall maintain all records in support of the Contractor's accounts for a period of not less than three years after the completion of the Contract.
4.8.3	The Contractor shall supply all documents and permissions to enable an authorised DfI Roads Officer to examine any or all Contractor's records relevant to the Contract, or any aspect of the Contract.
4.9	Contractor's spares holding
4.9.1	The Contractor shall maintain a replacement parts stock, within Northern Ireland, for all the equipment under warranty to the satisfaction of DfI Roads.
4.9.2	The number and type of spare equipment held will be at the Contractor's risk and will remain the property of the Contractor following expiry of the contract; however, the Contractor should be aware of the potential impact that non availability of spare equipment can have on Serviceability Ratios.
4.10	Contract performance
4.10.1	<p>The Contractor shall properly manage and monitor the performance of the services required under this Contract and immediately inform DfI Roads if any aspect of the Contract is not being, or is unable to be, performed.</p> <p>Details on Key Performance Indicators and Low Service Damages are outlined in Annex D - Key Performance Indicators and Annex E - Low Service Damages</p>

4.11	Serviceability under warranty
4.11.1	The Contractor shall maintain the signs (and flashing amber lights) so that each one shall have a Serviceability Ratio of not less than 98.5%
4.11.2	<p>For this Contract, Serviceability Ratios shall be calculated using the following formula: - $100 \text{ multiplied by Serviceable Time divided by Total Time.}$</p> <p>Serviceable Time shall be the time duration for which the sign (or flashing amber light) and any associated equipment is available for normal use, with no reported faults, and includes the time between occurrence of a fault and its being reported to the Contractor.</p> <p>Lost Time shall be the time duration from when a fault is reported to the Contractor until the same fault is repaired to the satisfaction of the Dfl Roads. It shall be recorded as starting from the issue of an email from the Dfl Roads informing the Contractor of the fault. It shall be recorded as ending upon receipt of an email from the Contractor advising Dfl Roads that the fault has been repaired. The latter will only apply where the fault has been repaired to the satisfaction of Dfl Roads.</p> <p>Lack of connectivity with the sign (or flashing amber light) either remotely or on-site shall be considered as Lost Time from when it reported to the Contractor until the required connection can be re-established to the satisfaction of Dfl Roads.</p> <p>Total Time is the sum of Serviceable Time and Lost Time.</p>
4.11.3	Serviceability Ratios shall be calculated by the Contractor for any thirteen-week period at the request of Dfl Roads and supplied to Dfl Roads within one week of being requested.
4.11.4	Time lost due to circumstances outside the responsibility of the Contractor (e.g. mains electrical failure) shall not be treated as Lost Time. Lack of connectivity with the sign (or flashing amber light) either remotely or on-site shall be considered as Lost Time regardless of whether connectivity has been re-established when attended by the Contractor.
4.11.5	The Contractor shall be responsible for ensuring that the standards of maintenance and serviceability are applied to equipment maintained and operations performed by sub-contractors.

4.12	Attendance to faults under warranty
4.12.1	The Contractor shall attend on site as soon as possible and within the hours stated below, taking account of the time of day and any special circumstances. All reasonable steps shall be taken to complete repairs. The Contractor shall take appropriate emergency action to make the equipment electrically safe or contact NIE for assistance if appropriate. If the equipment is in an unsafe physical condition that the Contractor is unable to rectify, he shall contact urgently the appropriate DfI Roads office or emergency depot to have assistance in ensuring the damaged equipment is made safe or moved to a safe position. The Contractor shall take all reasonable steps to ensure the safety of the site pending the completion or repairs.
4.12.2	<p>The response times for attendance to faults in equipment or installations which occur under warranty shall be as follows: -</p> <p>a) During the period 08.00 hours to 18.00 hours, Monday to Friday, the Contractor shall attend the site within 4 hours of the fault being reported unless otherwise agreed by DfI Roads</p> <p>b) During the period 18.00 hours to 08.00 hours, Monday to Friday, the contractor shall attend within 4 hours of the following 08.00 hours unless otherwise agreed by DfI Roads</p> <p>c) Faults reported on Saturday, Sunday or Public Holiday shall be attend within 4 hours of 08.00 hours on the following working day</p> <p>d) The Contractor shall comply with any emergency instructions given by DfI Roads or the Police for immediate attendance</p>
4.12.3	The Contractor shall affect a full repair to all faults in equipment or installations which occur under warranty as soon as possible after the fault has been reported and certainly within two working days. Where a full repair is not possible within the first working day, a report shall be made to the appropriate DfI Roads office detailing the reasons why the repair is not completed and the proposals for completing the repair in the next working day, or as agreed with DfI Roads.
4.12.4	During the warranty period the Contractor shall be responsible for the repair of all faults which occur in normal working service at no cost to DfI Roads regardless of when the fault occurs. There will be no cost to DfI Roads for instances where no fault is found.
4.12.5	Chargeable faults are those resulting from vandalism, traffic collisions and situations considered to be arising beyond normal working service. A report of work undertaken, together with costs for the fault rectification shall be submitted promptly to DfI Roads.

4.12.6	<p>An appropriate measurement sheet shall be submitted to DfI Roads for costs associated with repairing Chargeable faults for all works carried out and shall include the following:</p> <ul style="list-style-type: none"> a) The relevant order number or contract reference number b) The location at which the work was carried out including the site reference number c) Full details of the materials and/or services provided d) Prices of the materials and/or services e) Details of travel time incurred f) Photographs showing damage incurred for cost recovery purposes, where appropriate
4.12.7	<p>DfI Roads and the Contractor may agree that measurement sheets for Chargeable fault repairs can be submitted in batches to reduce the administration process.</p>
4.12.8	<p>If the Contractor employs sub-contractors to carry out any of the works, it will be the responsibility of the Contractor to ensure that representatives from any sub-contractors have provided the necessary information in good time to the Contractor for inclusion in reports etc.</p>
4.13	<p>Inspection and maintenance requirements for signs under warranty</p>
4.13.1	<p>The Contractor shall always maintain services with the minimum of disturbance and down time. Response times are defined under Clause 4.12.2.</p>
4.13.2	<p>The Contractor is responsible for the repair of faults notified to him. Where rectification of a fault is outside the boundaries as defined by the Specification, the Contractor shall ensure adequate information is passed to the appropriate authority, and shall, if required, provide assistance within the contract boundaries to ensure faults are remedied as quickly as possible.</p>
4.13.3	<p>The Contractor shall provide experienced personnel to undertake all required works.</p>
4.13.4	<p>The Contractor will be responsible for providing all the necessary test equipment to his staff employed on the Contract for fault diagnoses and repairs to be carried out on the equipment to be maintained.</p>
4.13.5	<p>Any test equipment used for the maintenance and repair shall be calibrated by an accredited test organisation and clearly identified on all test equipment and at the Manufacturer's recommended periods but shall not exceed 1 year. The calibration authority and the date of the calibration shall be clearly marked on all the test equipment. Calibration certificates shall be available for inspection at any time by DfI Roads.</p>
4.13.6	<p>There have been issues with DfI Roads achieving connectivity to signs. If specifically directed, the Contractor shall, on report of connectivity issues, attend the site <u>at the same time</u> as a DfI Roads representative, wait if necessary for the DfI Roads representative and connect using the DfI Roads representative's laptop or approved communication device.</p>

4.13.7	<p>The Contractor shall provide ongoing maintenance as and when required for the signs and associated equipment within the warranty period. Typical maintenance works may include check and repairs to following sign equipment:</p> <ul style="list-style-type: none"> a. Sign housings b. Solar / wind / battery powered equipment c. Sign calibration and verification d. LEDs e. Modular sign components including sign patches f. Electrical safety – for example lightning protection / fuse operation g. Electrical/power supply. Including back to the source of supply i.e. mini pillar or fuse cut out if sign is powered from a Street Lighting connection. Liaison will be required with Street Lighting or NIE for any power supply connection issue h. Sign programming i. VAS detection equipment j. Signposts k. Communications equipment such as antenna/aerials, processors, Bluetooth, 4G, Wi-Fi, comms ports etc. <p>(The above list is not exhaustive)</p>
4.14	Ownership and retention of documentation
4.14.1	Documentation (including electronic media) generated during the Contract, recording work done at the sites maintained under this contract, or any documents relative to the operational aspects of the Contract, shall become the property of Dfl Roads.
4.14.2	Any drawings, specifications, software, design, or other data (including working documents, maps or photographs, configurator files and other electronically generated media) completed or provided in connection with this contract shall become or, as the case maybe, remain the property of Dfl Roads and be delivered up to Dfl on completion or termination of the contract, subject to the retention of proper professional records. Where Dfl Roads has agreed to accept electronic media storage, drawings and other documents shall be supplied by the Contractor in this agreed form.
4.14.3	The Contractor shall retain, produce when required (and explain if necessary) such accounts, documents (including working documents) as Dfl Roads may request in connection with the contract, at any time during the contract and for a period of seven years from the date of expiry or termination or such longer period as may be agreed between Dfl Roads and the Contractor in writing, and afford such facilities as Dfl Roads may reasonably require for his representative to visit the Contractor’s premises and examine the record under this clause.
4.15	Contract handover arrangements
4.15.1	The outgoing Contractor shall complete any outstanding remedial works prior to termination. Any outstanding works at termination not completed shall be undertaken by the incoming Contractor at contract rates and charged to the outgoing Contractor.

4.15.2	The outgoing Contractor shall ensure that all outstanding reports of work done have been submitted in full to the appropriate DfI Roads area.
4.15.3	The outgoing Contractor shall handover all documentation as described in Clause 4.14
4.15.4	The outgoing Contractor shall comply with the TUPE requirements in the Public Sector Standard Conditions of Contract, Clause 8.

Annex A: Dfl Contract Areas



Northern Division

- Area 1** Antrim & Newtownabbey
Mid & East Antrim
- Area 2** Causeway Coast & Glens (East)
Causeway Coast & Glens (West)

Southern Division

- Area 4** Ards & North Down
Newry, Mourne & Down (East)
- Area 5** Newry, Mourne & Down (West)
Armagh City, Banbridge & Craigavon (East)
Armagh City, Banbridge & Craigavon (West)

Eastern Division

- Area 3** Belfast North
Belfast South
Lisburn & Castlereagh

Western Division

- Area 6** Mid Ulster (North & South)
- Area 7** Fermanagh & Omagh (East & West)
- Area 8** Derry & Strabane

Annex B: School Safety Sign details

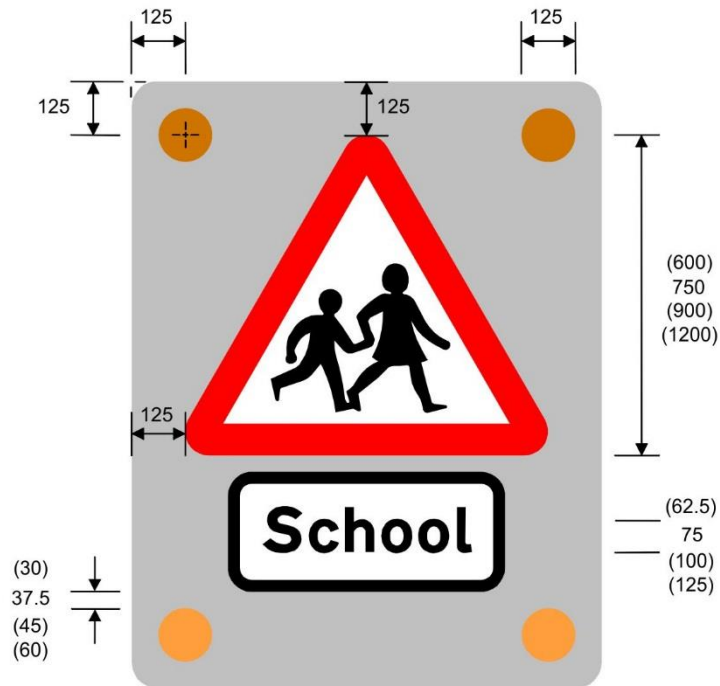


Diagram A

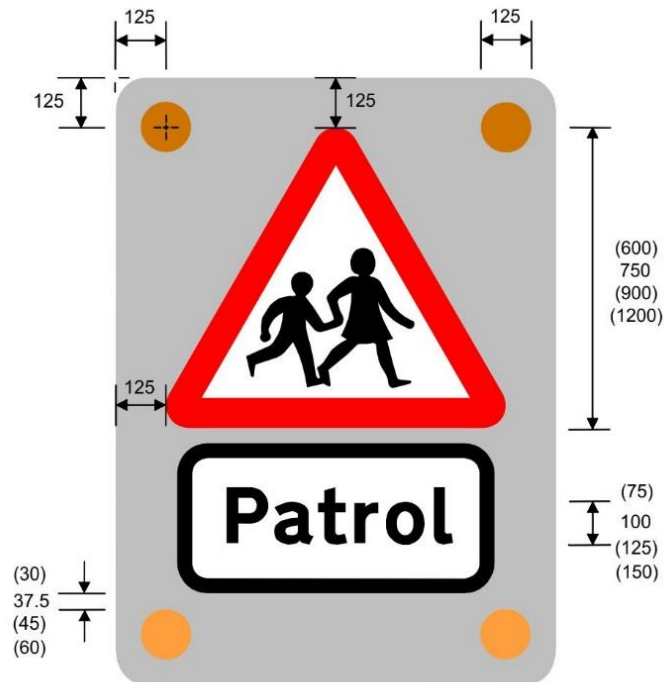


Diagram B

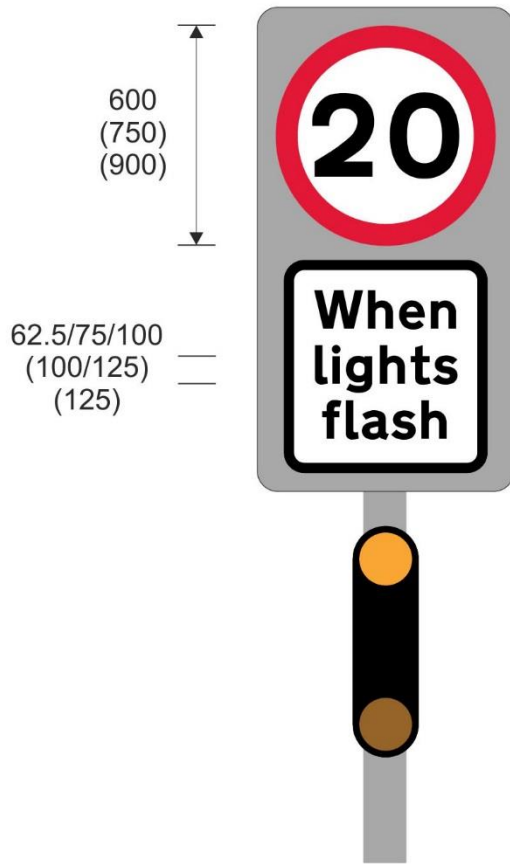


Diagram C

Note:

Sign face will be provided by DfI Roads and is shown only to show the indicative arrangement between it and the flashing amber lights which are to be provided under this contract

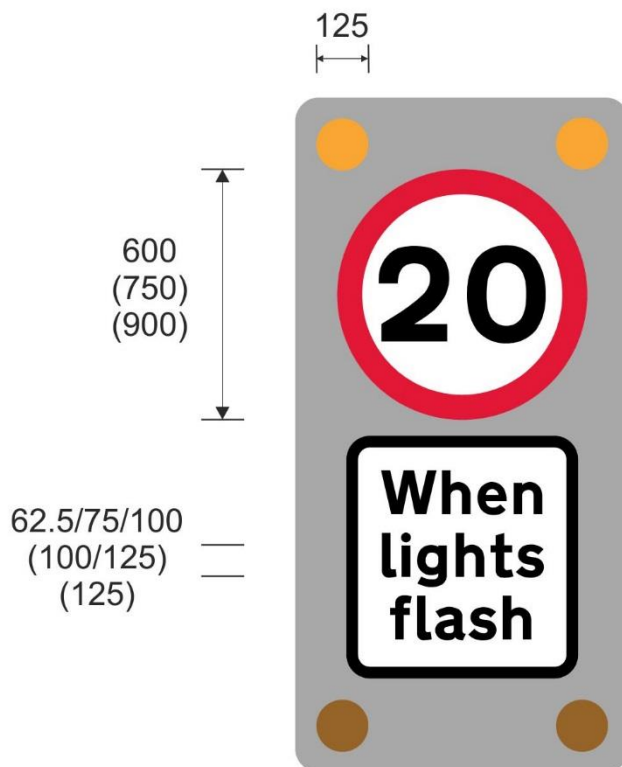
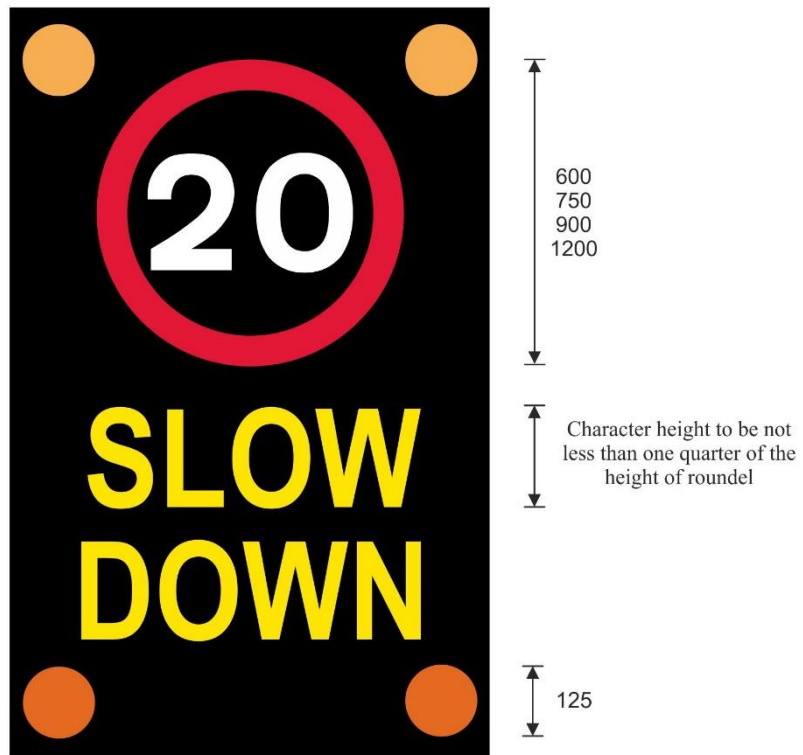


Diagram D

Diagram E (not used)



VMS incorporating flashing amber lamps indicating speed limit and the message "SLOW DOWN"

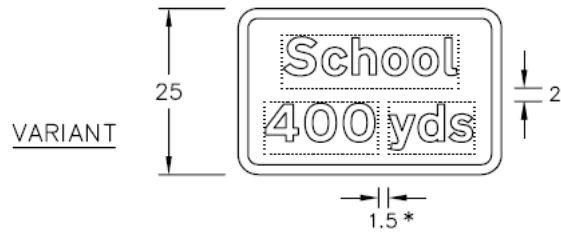
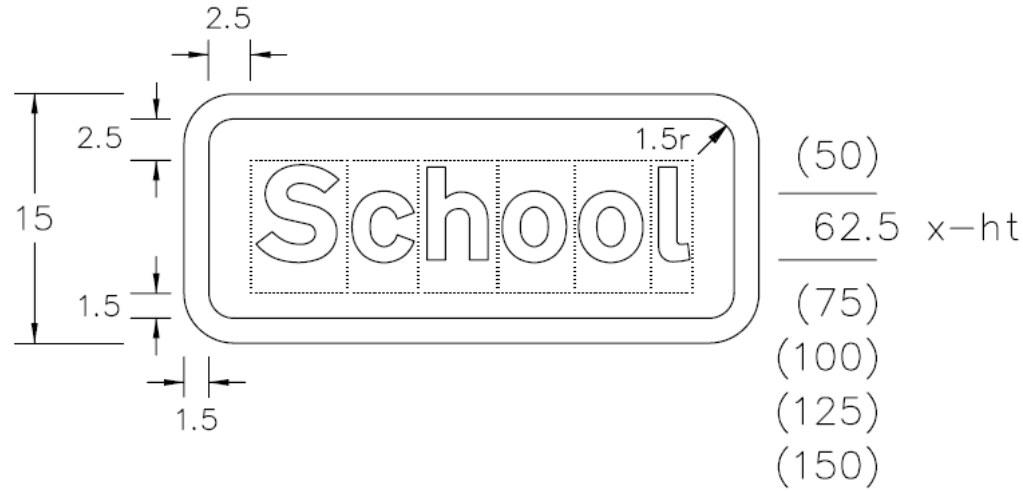
Diagram F

Drawing No.
P 546

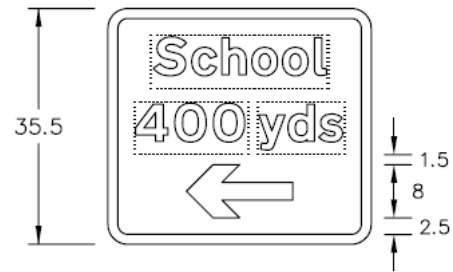
Before using this drawing, confirm that it has not been superseded.

© CROWN COPYRIGHT

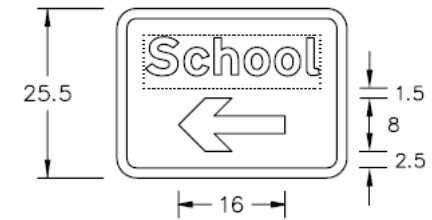
- NOTES: -
1. The legend is from the Transport Heavy alphabet at the x-heights shown.
 2. The tile outlines do not form part of the signs.
 3. COLOURS :-
Background ----- WHITE
Legend, Arrow & Border --- BLACK
 4. DIMENSIONS : x-heights are in millimetres, other dimensions are in stroke widths.
(4sw = x-height)



* This dimension is increased to 2.5sw when "yds" is varied to "yards" or "mile".



VARIANT



VARIANT

P546

**Department for
Transport**

Title: Warning Signs
SUPPLEMENTARY PLATES
FOR USE WITH P 545

Issue: Date:
A: 22.6.94
B: 13.11.02
C:

Drawn by:
L.W.
Approved by:
R.M.

Dimensions:
SEE
NOTE 4

Drawing No.
P 546

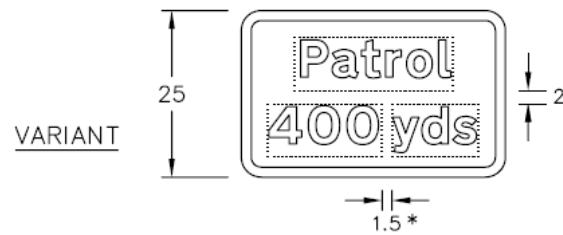
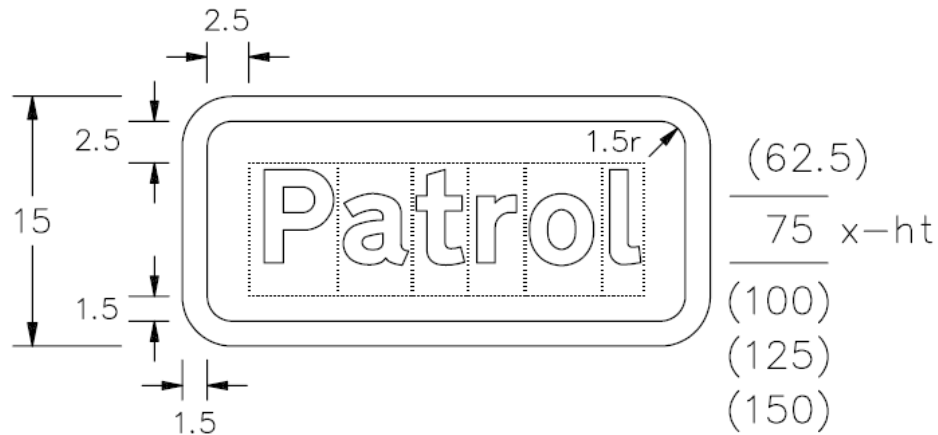
Diagram G

Drawing No.
P 547.1

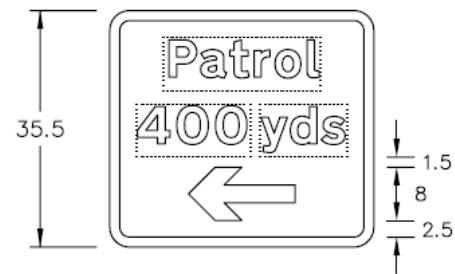
Before using this drawing, confirm that it has not been superseded.

© CROWN COPYRIGHT

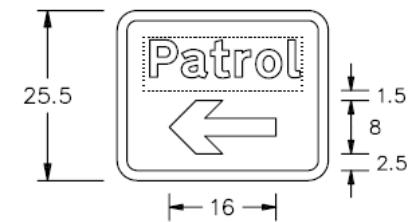
- NOTES: - 1. The legend is from the Transport Heavy alphabet at the x-heights shown.
2. The tile outlines do not form part of the signs.
3. COLOURS :-
Background ----- WHITE
Legend, Arrow & Border ---- BLACK
4. DIMENSIONS : x-heights are in millimetres, other dimensions are in stroke widths.
(4sw = x-height)



* This dimension is increased to 2.5sw when "yds" is varied to "yards" or "mile".



VARIANT



VARIANT

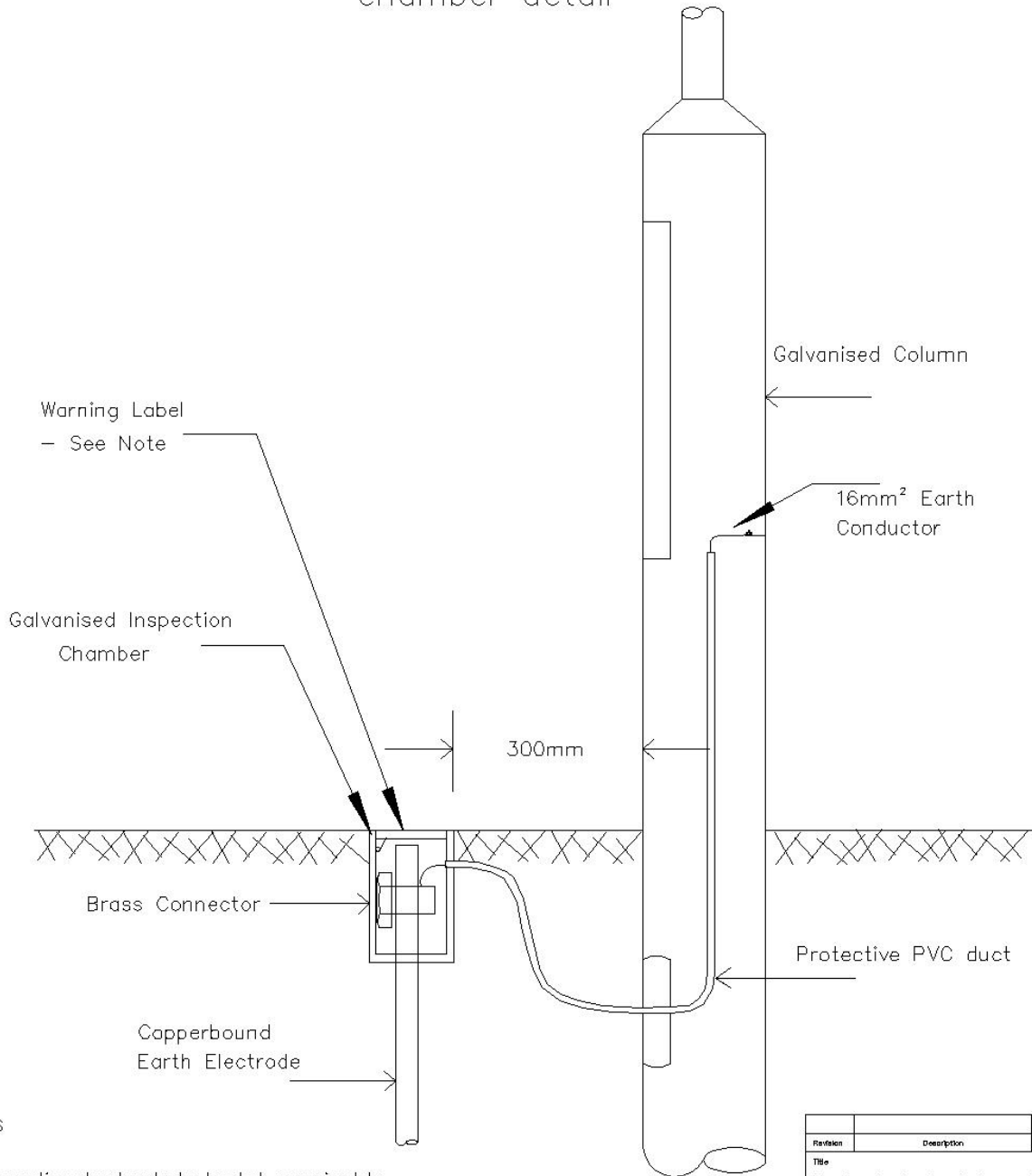
P547x1

	Title:	Warning Signs	Issue:	Date:	Drawn by:	Dimensions:	Drawing No.
		SUPPLEMENTARY PLATES FOR USE WITH P 545	A:	22.6.94	L.W.	SEE NOTE 4	P 547.1
			B:	13.11.02	Approved by:		
			C:		R.M.		

Diagram H

Annex C: Drawings of standard details

Earth electrode & inspection chamber detail



NOTES

1. Inspection chamber to be located approximately 300mm from the column, or as directed by the Engineer, and positioned on the door side of the column.
2. Sufficient length of flexible 32mm I.D. duct shall be laid between the inspection chamber and the column entry slot to go inside the column and rise to the bottom edge of the column door.
3. Earthing conductor shall be 16mm² PVC.
4. A warning label shall be firmly attached to the earth rod clamp connector as follows: – DANGER ELECTRICAL EARTH CONNECTION DO NOT REMOVE.

Revision	Description	Date
Title		
Earth electrode & inspection chamber detail		
DRAWN		Date
CHECKED		Date
APPROVED		Date
TIC Dwg. No.	SRSVAS/011	Revision
Scale	n/a	
TRAFFIC INFORMATION AND CONTROL CENTRE		
Road Safety Unit 1b Airport Rd Belfast BT3 9DY		
Tel: 0300 200 7893		

Annex D

Key Performance Indicators

Incentive schedule				
Part:	All			
KPI Ref:	S1	S2	S3	S4
Description:	Equipment delivered within contract timescale	Equipment erected / fitted within contract timescale	Successful completion of fault free six-week monitoring period	98.5% serviceability ratio achieved
Measured:	On delivery	On erection	Following installation	At end of warranty period
Reported:	On invoicing		Following installation	At end of warranty period
Actions:	<u>KPI Achieved</u> <ul style="list-style-type: none"> Pay Price for Services Provided 		<u>KPI Not Achieved</u> <ul style="list-style-type: none"> Pay Price for Services Provided less the low service damages Delay payment and warranty start Contractor to provide improvement plan 	

Annex E

Low service damages				
Part:	All			
KPI Ref:	S1	S2	S3	S4
Description:	Equipment delivered within contract timescale	Equipment erected / fitted within contract timescale	Successful completion of fault free six-week monitoring period	98.5% serviceability ratio achieved
Low service damages:	5% deduction	5% deduction	Delay payment and warranty start	Additional 12-month warranty
Low service damages applied to:	Equipment costs	Installation costs	Installation costs and warranty	Warranty
Notes:	Serviceability ratio below 98.5% in additional 12-month warranty period will require the production of a report to DfI Roads detailing the reasons for this failure and detail what remedial measures are proposed			

Annex F – Vesting Certificate

THIS AGREEMENT is made on _____

BETWEEN

Dfl Roads Clarence Court 10 - 18 Adelaide Street Belfast BT2 8GB	<i>List company name and address</i>
Hereinafter referred to as the 'Customer'	Hereinafter referred to as the 'Sub-Contractor'

WHEREAS:

- a) The Customer has appointed the Sub-Contractor under Sub-Contract order(s): *list purchase order numbers*
- b) This Agreement is supplemental to the Contract.
- c) The Sub-Contractor wishes to be paid in respect of certain materials, goods, services or manufactured articles specified in the Schedule attached hereto (hereinafter referred to as the Materials) before delivery to the Site.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the agreement of the Customer to have included in the next Payment Certificate for interim payment the sum of £_____ in respect of the goods, the Sub-Contractor warrants and undertakes as appears hereinafter.
2. The Sub-Contractor warrants that:
 - 2.1. The Materials are intended for incorporation in the Works (as defined in the Contract), and
 - 2.2. Nothing remains to be done to the Materials to complete them up to the point of their delivery to site
 - 2.3. The Materials have been stored at the premises described in the Schedule of Off-Site Materials attached and have been marked as follows: *'These Materials are the property of Dfl Roads'*
 - 2.4. The Sub-Contractor warrants that the property in the Materials (including but not limited to supplies received from a third party for incorporation in the Materials) is vested in the Sub-Contractor and are free from encumbrances and charges and the Sub-Contractor is able to pass title in the Materials. It is declared that property in the Materials shall unconditionally vest in the Customer upon receipt of the interim payment.
 - 2.5. The Materials are in every respect in accordance with the requirements of the Contract.
 - 2.6. The Materials shall at all times after the date of this Agreement until the Materials are delivered to the Site be insured for their full reinstatement value under a policy of insurance protecting the interests of the Customer and the Sub-Contractor against any loss or damage howsoever arising and the Sub-Contractor has provided to the Customer evidence of the existence of said insurance policy.

2.7. The Materials can be inspected at any time by the Customer or by its duly authorised representatives.

- 3. The Sub-Contractor shall not, except for use pursuant to the Contract, remove or cause or permit the materials to be moved or removed from the premises named in the Schedule of Off-Site Materials attached hereto.
- 4. Nothing contained in this Agreement or the Contract or any payment that may be made to the Sub-Contractor in respect of the Materials shall be taken as any approval by the Customer that the Materials are in accordance with the Contract.
- 5. The Sub-Contractor shall indemnify and save harmless the Customer from all costs claims demands losses and expenses of whatsoever nature including but not so as derogate from the generality of the foregoing any consequential losses arising from any breach or non-observance of any of the terms contained in this Agreement.

THIS AGREEMENT has been signed for and on behalf of the Parties the day and year written above.

Signed:

Name:

Position:

for and on behalf of
Dfi Roads

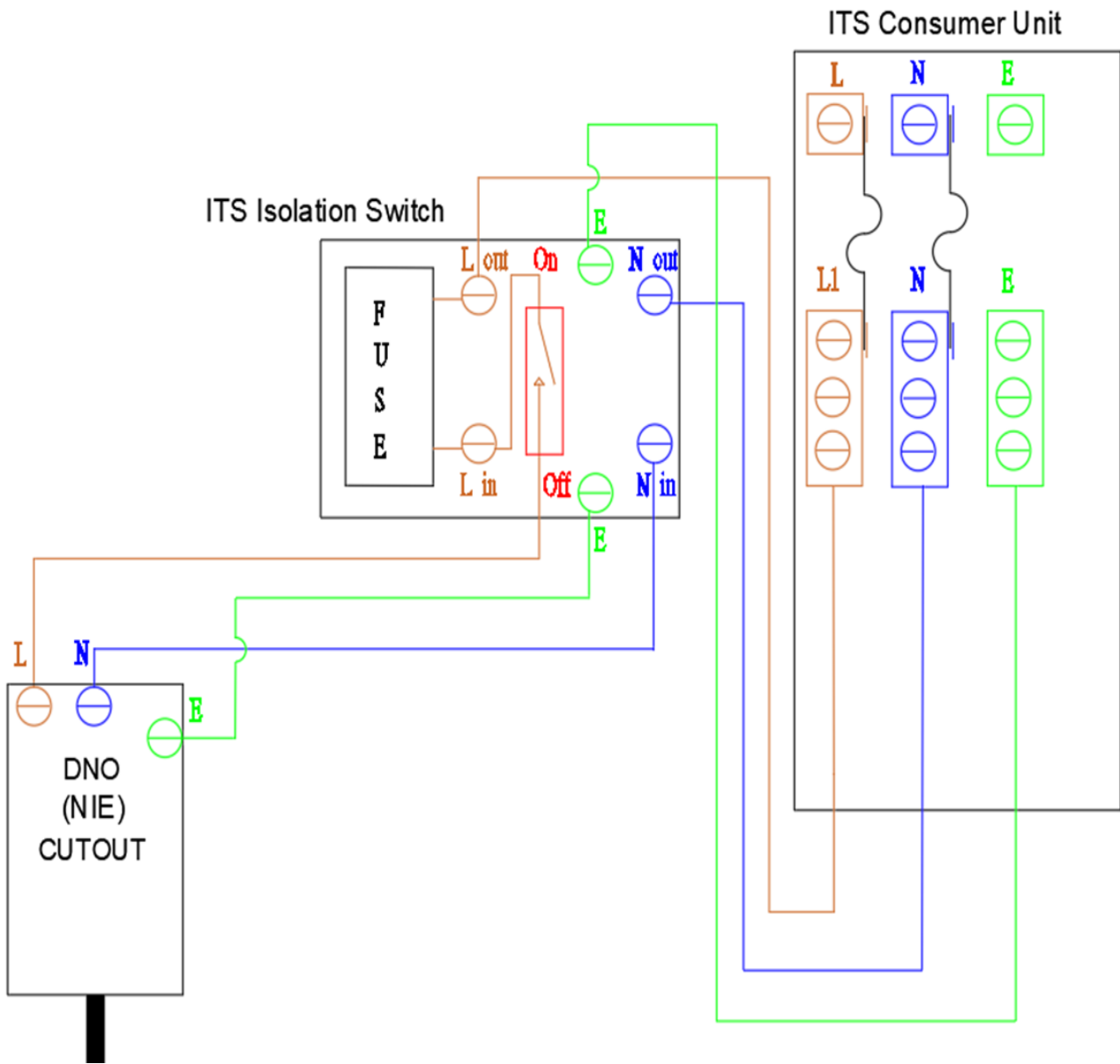
Signed:

Name:

Position:

for and on behalf of

Annex G – typical supply mini-pillar schematic layout



Example of typical mini-pillar installation

