Construction Traffic Management Plan

for

Proposed Headhouse

at

St Pancras Substation

57 Pratt Street

Camden NW1 0DP

for

National Grid

August 2009

Contents

APPENDICES

1.0 INTRODUCTION

National Grid is proposing an Electricity Tunnelling Project in North London stretching from Hackney to St John's Wood. The tunnel will house 400,000 Volt (400 kV) electricity supply cables linking National Grid's existing substations at Hackney and St John's Wood, and will also make provision for possible future connections. The project comprises a 12.5 km long cable tunnel where ventilation and access to the tunnel will be provided by a number of headhouse buildings located above shafts linked to the main tunnel.

National Grid is seeking full planning permission for a permanent headhouse building within the existing EDF Energy St Pancras Substation site at the junction of Pratt Street and Royal College Street, within the London Borough of Camden. The connection between the shaft sunk at St Pancras Substation and the main cable tunnel will be by means of a lateral spur tunnel.

The construction of the shaft and spur tunnel are not part of the planning application as they are constructed under National Grids permitted development rights through the Electricity Act 1989.

This Construction Management Plan seeks to outline the management of traffic during the construction period at the St Pancras Substation site and has been prepared following discussions held with the London Borough of Camden.

This is an initial plan and has been prepared in advance of appointment of a contractor. The plan will be updated following the appointment of a contractor and will be agreed with LB Camden when amendments are made.

1.1 Proposed Development

This proposed development consists of the construction of a single headhouse building to accommodate variable speed extraction fans which are used to maintain the temperature of the tunnel at the required level.

Below the headhouse, a shaft and a 3m diameter tunnel will be constructed to connect to the main tunnel beneath Camden Road approximately 280 metres to the north-west. The tunnel will be located at a depth of approximately 35m.

The shaft will be used to construct the 280m lateral spur tunnel to an underground concrete chamber beneath Camden Road at its junction with Lyme Street. The tunnel will be constructed using a simple, open face TBM shield utilising mechanical excavation and hand mining techniques.

The layout for the shaft, spur tunnel connection and permanent headhouse at St Pancras Substation is shown on Drawing No. CS022511_SP_04.

A site compound will be created in the south east corner of the site to separate the proposed construction works from operational land in the substation and the public. To facilitate the construction of the shaft, tunnel and headhouse the following amendments will be required to the existing footpath and access:

1. Temporary closure of the footpath on the north west side of Pratt Street for a distance of approximately 20m from its junction with Royal College Street;

2. Temporary closure of the footpath on Royal College Street from its junction with Pratt Street to its junction the existing pelican crossing at the junction with Georgiana Street.

3. Permanent closure of the existing vehicle access to the substation from Pratt Street.

There are two phases of traffic activity at the St Pancras Substation site that have been addressed in this plan, these are:

1. Shaft and spur tunnel construction (Permitted Development); and

2. Headhouse construction and fit out (subject to Planning Permission)

1.2 Site History

The last planning application registered for this site with LB Camden related to the continued use for training purposes of the building fronting Georgiana Street in 1973.

1.3 Existing Situation

The existing EDF Energy (EDFE) site occupies a rectangular area of land bounded by Georgiana Street to the North, Royal College Street to the East and Pratt Street to the South. The site is occupied by a combination of electricity transmission plant, buildings, service yard and associated circulation space. It is proposed to locate the National Grid headhouse within this compound immediately adjacent to the existing 4-storey former training centre building that directly fronts Pratt Street.

The site is an operational EDF Energy site containing high voltage equipment and it is also currently used as a depot and offices for EDF Energy personnel. Access will need to be maintained for these at all times using the same entry and exit points.

Royal College Street is a 1-way route, a bus corridor and has mandatory cycle facilities which are segregated from vehicular traffic.

2.0 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

2.1 Access Arrangements for Vehicles

Access to the site will be via Royal College Street and egress will be via Georgiana Street.

The site entrance will be via the existing EDF access at the substation to the north of the junction with Pratt Street. This is detailed on Drawing No. CS022511_SP_04. This entrance will be a shared entrance with operational traffic from EDFE and there will be sufficient space to ensure that both construction traffic and operational traffic can access the site without blocking the cycle path.

The existing cycle path runs parallel to Royal College Street and the vehicle entrance to the site will cross this. Due to the proximity of the footpath and cycle path to the entrance and egress from the site both will have a banksman located at them to control the interface of traffic with the public. There will be a banksman on site at all times during operations to control vehicle movements in the interest of road safety. Highway works will also be required to the central reservation as discussed in paragraph 2.5.

To exit the site vehicles will circulate around existing buildings and exit via the existing access off Georgiana Street as detailed on Drawing No. CS22511_SP_04. Vehicles will turn right into Georgiana Street and then pass straight across Royal College Street to Saint Pancras Way. At Saint Pancras Way vehicles will turn tight towards Crowndale Road and then turn right and right again back into Royal College Street. Vehicles will then travel north passing the site entrance and rejoining the A503 Camden Road towards Severn Sisters, Tottenham Hale and using the A1055 through Pickets Lock, Brimsdown and Enfield Lock to the M25.

Discussions with officers of LB Camden confirmed that the route discussed above is their preferred option.

Secure gates will be provided for the access from Royal College Street. These shall be locked at all times when not in use. For the egress from Georgiana Street the existing gates will be used and again these will remain locked when not in use. 24hr security will also be provided.

2.2 Access Route

It is proposed that HGVs will access the site from the A503 Seven Sisters Road. Traffic will head southwest on the A503 until the A503 Camden Road. Traffic will turn left into St Pancras Way (one way southbound). At the junction with Crowndale Road vehicles turn right and right again into Royal College Street (one way northbound). The site entrance will be via the existing EDF access at the substation, involving a left turn from Royal College Street immediately after the junction with Pratt Street.

Table 1 illustrates the impact of the forecasted HGV traffic on the existing highway network adjacent to the site. Traffic increases are minor and therefore the traffic impact overall is not significant.

Table 1: Additional HGV Increase and Significance Effects

Location	Additional HGVs (2-way per day)	Increases in HGV per day		Significance Effects			
		Total traffic (AADT)	HGV increases (above existing levels)	Traffic Impact overall	Duration/ Frequency	Sensitivity of Receptors	Overall Significance Judgement
A5202 Royal College Street	68	12471	15.7%	Low	Medium	High	Significant – due to access considerations
Saint Pancras Way	68	12001	8.9	Low	Low	Medium	Not Significant

2.3 Vehicle Types and Schedule of Use

Vehicle types influence the geometry and swept path necessary to safely complete manoeuvres. Table 2 below outlines the types of vehicles expected during the construction period at the St Pancras Substation site.

Table 2: Summary of Vehicle Type, Use and Distribution

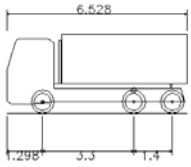
Vehicle Type	Use	Distribution
Rigid Heavy Goods Vehicle	Excavated material Removal	Strategic road network to motorway
Small Articulated Vehicle	Plant, grout, rails, pipes, segments, steelwork, bricks and plant	Strategic road network to motorway
Specialised Articulated HGV	Transport of Open Face Shield	Strategic road network to motorway
Specialised Equipment Low Loader	Occasional Delivery of Plant	Strategic road network to motorway
Vans	Plant service, materials, other suppliers	Distributed to local and strategic network
Cars	Management & supervision, operatives, visitors	Distributed to local and strategic road network

Due to the tight constraints within the site, a large tipper HGV (4 axle) will not be able to manoeuvre within the site. Therefore a small tipper (6.5m long 3 axle) and small articulated vehicle (10.7m long) were tested for access and egress for spoil removal and delivery of tunnel shaft lining segments.

Both types of vehicles will satisfactorily enter the site off Royal College Street and exit onto Georgiana Street using the existing EDF vehicular access and pass straight across Royal College Street to Saint Pancras Way (See CS022511_SP_06a). From here vehicles will and follow the route described in section 2.1 above.

The excavated material extraction is assumed to be undertaken by a regular 3 axle tipper. This is a standard vehicle and not subject to restrictions other than those imposed by Traffic Regulation Order (TRO) or areas of highway of limited width or height.

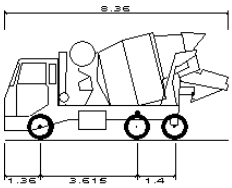
Figure 1: 3 Axle Tipper



Small Tipper	
Overall Length	6.528m
Overall Width	2.495m
Overall Body Height	2.877m
Min Body Ground Clearance	0.327m
Track Width	2.393m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	7.850m

The demolition and excavated material extraction is assumed to be undertaken by a regular 3 axle tipper common to many earthworks contracts. This is a standard vehicle type and subject only to restrictions imposed by TROs or width and height restrictions.

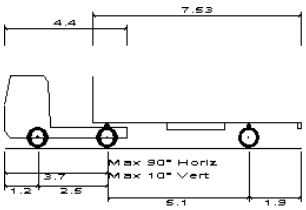
Figure 2: 3 Axle Mixer Lorry



Concrete Mixer	
Overall Length	8.360m
Overall Width	2.390m
Overall Body Height	4.027m
Min Body Ground Clearance	0.358m
Max Track Width	2.413m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	8.210m

The small artic is the second design vehicle anticipated for the Project. This is a generic vehicle type which is expected to be used for grout deliveries, plant movements and segment deliveries.

Figure 3: Small Artic



Small Articulated Vehicle	
Overall Length	10.700m
Overall Width	2.360m
Overall Body Height	3.604m
Min Body Ground Clearance	0.382m
Track Width	2.240m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	5.740m

Abnormal loads may be required on occasions particularly for the delivery of the TBM for construction of the spur tunnel. The access for these will be agreed with LB Camden. It is unlikely that these vehicles will be able to access the proposed working site directly and there may be a requirement for partial road closure on Royal College Street to allow the TBM to be unloaded. This would also require a temporary closure of the cycle path. These deliveries will be co-ordinated by the contractor and will be designed to be undertaken during off peak periods or at the weekend.

To unload the TBM a 400T or 500T crane would be required for this lift. Depending on the slewing arrangements it may be possible to assemble this crane inside the site boundary.

2.4 Traffic Generation and Distribution to Network

HGVs will remove excavated material arisings from the shaft sinking process and deliver construction materials including grout, rail and pipes. There will be van movements associated with plant services, materials and other construction items.

The construction of the headhouse cannot occur in parallel with the construction of the shaft, as the shaft is required to provide an insertion and extraction route for the plant constructing the spur tunnel. Summarised below is the anticipated phasing of the works.

Phase 1 - Months 0 to 3 – Shaft Construction:

The initial activities on site will involve the site set up including the delivery of the required plant and accommodation. There will also be the delivery of a tracked crane. Demolition of the existing boundary wall will also be undertaken and the erection of the site compound.

The construction of the shaft will be undertaken in the confines of the compound however it will require the delivery of precast concrete segments on a small artic with the excavated material removed by 3 axle tipper There will be a crane on site to remove the excavated material from the shafts and deliver the segments for shaft construction. This is anticipated to take approximately 3 months.

Phase 2 - Months 3 to 9 – Tunnel Construction:

Following the completion of the shaft a tunnel will be constructed from the base of the shaft to connect to the main tunnel. As with the shaft construction this will require the removal of excavated material and the delivery of precast concrete tunnel segments.

Phase 3 - Months 9 to 12 – Headhouse Construction:

The proposed headhouse and the installation of the fans and stairwells in the shaft will be undertaken following the completion of the tunnel. This will require the use of a crane to erect the headhouse which will be a steel framed building with brickwork cladding.

Phase 4 - Months 12 to 15 – Headhouse Construction:

This section of the works will comprise the installation of the mechanical and electrical systems in the headhouse.

Table 3 below summarises the expected daily trip generations by type associated with the construction of the spur tunnel and shaft at the St Pancras Substation site.

Table 3: Daily Traffic Movements

Month/Period	**0 to 3 Phase 1**	**3 to 9 Phase 2**	**9 to 12 Phase 3**	**12 to 15 Phase 3**
Excavated material Removal	21	21	0	0
Tunnel/Shaft Precast Rings	1	1	0	0
Plant/Grout Deliveries	2	2	0	0
Sundry Materials	10	10	8	9
Sub Total HGV (Inbound journey)	**34**	**34**	**8**	**9**
Cars/Vans	10	10	8	8
Total Vehicles	44	44	16	17

The number of daily HGV movements during the first 9 months is 34 vehicles inbound to the site which is 68 two way HGV movements in total.

The estimated traffic movements generated from the headhouse construction in isolation are detailed in Table 4 below. The overall construction period for the headhouse only is estimated to be 4 months; therefore the daily traffic movements have been pro-rated and are only an average assessment. In addition, the number of HGVs associated with the headhouse construction is based upon the estimated quantities of materials to be transported.

Table 4: Breakdown of Traffic Movements for Headhouse Construction (Total over 4 month period)

Material	Quantities	No. of Vehicle loads	Vehicle Type
Steel frame construction (steel stanchions, castellated roof beams @ 3m ctrs)	80 tonnes	4	Articulated Vehicle
Foundations:			
Concrete Strip (0.6m x 1.5m deep)	60 m^3	-	
Concrete Pads (2.0m^2 x 8 No.)	32 m^3	-	
Sub Total: Foundations	92 m^3	18 (@5m3/load)	Concrete mixer vehicle
Excavated material to tip	92 m^3 x 1.8(bulking factor)=166m^3	12 (@ 14m3/load)	Large Tipper
Brickwork / stonework	54 pallets	4 (@ 16 pallets per vehicle)	Rigid HGV
Floor and roof structure		4	Rigid HGV
Plant		4	Rigid HGV
Total No. of HGV (inbound journey)		**46**	
Sundry Materials		8	Transit Van

The total number of vehicle deliveries for the headhouse construction expected over the 4-month construction period is approximately 46 vehicles plus cars and vans inbound to the site which equates to 92 two way HGV movements in total.

Although peak traffic associated with the headhouse construction could peak at up to 8 HGV vehicles per day (or 16 including cars and vans) it is the shaft construction that will produce the greatest impact with regards to construction traffic.

2.5 Necessary Highway Works

Drawing No. CS022511_SP_06a details the swept path analysis for the above vehicles which shows that they can all access the site however there will be a requirement for highway works to be undertaken at the following locations:

1. Removal of up to 5m of the cyclepath traffic island for the duration of the works on Royal College Street at the proposed entrance to the site (see Drawing No. CS022511_SP_10). The traffic island would be reinstated on completion of all the works;

2. Removal of existing kerbs on the footpath on Georgiana Street to increase width of the exit (see Drawing No. CS022511_SP_10). It would be proposed that this arrangement would remain permanently;

These proposals are subject to further consideration when more detailed topographical survey information is provided.

2.6 Parking and Loading Arrangements

All loading and unloading will be undertaken within the proposed site compound with the exception of the Tunnel Boring Machine (TBM) which will be unloaded onto the site from Royal College Street.

There will be limited parking on the site. A small area will be available on Royal College Street between the cycle path and the site boundary. All vehicles will use locally available public car parking where required.

2.7 Parking Bay Suspension

No parking bay suspensions are envisaged for the works.

2.8 Traffic Management Orders

A number of traffic management orders will be required for the scheme:

1. Temporary footpath closures on Pratt Street and Royal College Street;
2. Footpath amendments on Georgiana Street;
3. Amendments to the central reservation for the cycle path on Royal College Street;
4. Road and cyclepath closure for the unloading of the TBM on Royal College Street;

Temporary Footway Closure:

The site compound required for the construction of the shaft, spur tunnel and headhouse requires the closure of the footpath on Pratt Street and Royal College Street. A temporary crossing will be installed on Pratt Street to provide a safe means to cross. There are two existing pelican crossing facilities on Royal College Street near the junctions with Pratt Street and Georgiana Street that will enable all pedestrians to use the north eastern side of Royal College Street.

Temporary footpath diversions are expected to be in place for up to two years. Therefore, a temporary crossing facility is proposed on Pratt Street to provide safe means to cross. There are two existing pelican crossing facilities on Royal College Street close to the site. Pedestrians will need to use the eastern side of Royal College Street during the works and then cross at the pelican crossing at the junction of Georgiana Street.

Temporary Road Closure:

As stated above a temporary road and cycle path closure will be required on Royal College Street for the unloading of the TBM.

2.9 Proposed Overhang of Public Highway

As stated above the construction phase will require a crane but this is not anticipated to overhang the public highway save for the footpath on Pratt Street and Royal College Street which will be included in the site compound. The only anticipated overhang will come from the unloading of the TBM from Royal College Street but this is anticipated to be during off peak periods.

2.10 Proposed Hoarding

The compound will require the erection of hoarding which will be constructed from plywood and will be approximately 3m high with anti-intruder barrier along the top edge. The design for this will be agreed with LB Camden. This hoarding will be between the cycle path and footpath on Royal College Street and the footpath and the existing parking bays on Pratt Street.

2.11 Pedestrian and Cyclist Safety

Construction traffic poses a potential risk to pedestrians and cyclist's safety, particularly when entering and exiting the site. The safety of pedestrians and cyclists will be ensured by the use of banksmen during all periods of operation at the site. Professional banksmen will supervise all arrivals and departures of construction traffic. Traffic movements will be co-ordinated such that the arrival of vehicles is staggered to ensure that there is no overhang of vehicles onto the cyclepath on Royal College Street.

2.12 Proposed Working Hours

Access to site will be between the hours of 0700 and 1900hrs Monday to Friday and 0700 to 1300hrs on Saturday. No works are expected to take place on Sunday

2.13 Proposed Start and End Dates for Construction Phases

The whole construction process is scheduled to be undertaken within a maximum two year programme. Each phase will start and end as follows:

1. Site setup and shaft construction from week 1 to week 12
2. Tunnel Construction from week 12 to week 36
3. Headhouse construction and M&E installation from week 36 to week 65

2.14 Details of Measures to Reduce Congestion

The contractor when appointed will develop a system for vehicles accessing site such that their arrival and exit will be controlled and there will not be a series of vehicles arriving at the same time. This will avoid queuing of lorries on the approach roads

3.0 OTHER ISSUES

3.1 Road Sweeping

As a minimum road sweeping will be provided and shall be used on all public roads used by site traffic within 500m of the site entrances. Roads outside of this will be monitored and inspected and road sweeping will be undertaken where required.

3.2 Vehicle Cleaning

Powered jet washes will be provided for wheel washing of all vehicles leaving the site to reduce the impact on the surrounding road network.

3.3 Public Consultation

A public exhibition was held on 10th December 2008 at The Prince Albert in Royal College Street.

National Grid will write to all of the people living in the immediate vicinity of the site prior to the start of the construction programme detailing the scope of the project and the contact details for the Public Relations team, Contractor and the Site Manager who they can contact in the event that they have any concerns or difficulties.

During the construction phase information will be provided on a regular basis to all people living in the immediate vicinity of the site.

APPENDICES

Appendix A - Proposed Site Plan: Drawing No. CS022511_SP_04

PROPOSED TUNNEL ALIGNMENT

SITE EGRESS

FOOTPATH INCORPORATED WITHIN TEMPORARY SITE BOUNDARY

ADDITIONAL COMPOUND AREAS DURING CONSTRUCTION

TEMPORARY SITE BOUNDARY

CONSTRUCTION ACCESS

5 METRES OF EXISTING TRAFFIC ISLAND TO BE TEMPORARILY REMOVED

EDFe ACCESS

PROPOSED LOCATION OF SHAFT

FOOTPATH TO BE REINSTATED UPON COMPLETION OF WORKS

CONSTRUCTION ACCESS

PROPOSED HEADHOUSE STRUCTURE

FOOTPATH INCORPORATED WITHIN TEMPORARY SITE BOUNDARY

PERMANENT SITE BOUNDARY

N

10m 0 10m 20m 30m 40m

1:500

Key

- Headhouse
- Shaft Site
- EDFe Vehicle access around site
- Construction Vehicle Access
- Proposed Tunnel Alignment
- Temporary Site Boundary
- EDFe Site Boundary
- Permanent Site Boundary

REV		DR	CH	PA	DATE

ST. PANCRAS SUBSTATION

ANNEX GEN.01

CAPITA SYMONDS

DRAWN BY	CHECKED BY	PASSED BY	DATE	SCALES @ A3 SIZE	ISSUE STATUS	DRAWING NUMBER	REV.
HL	GW	JD	MAY 09	1:500	FINAL	CS022511_SP_04	

Appendix B - Access Proposals: Drawing No. CS022511_SP_10.

N

EXISTING KERBS TO BE BROKEN OUT AND ACCESS WIDENED

R3

R2

PROPOSED KERBLINE TO MATCH EXISTING. ANTICIPATED PCC HB2 KERB WITH NOMINAL 125mm UPSTAND

IN

NEW SURFACING TO HIGWAY SPECIFICATION

EXISTING PEDSTRIAN CROSSING

EXISTING DIVIDING KERBS TO BE CUT BACK TO PROVIDE FOR SWEPT PATH ON ENTRY TO SITE.

PROPOSED TEMPORARY PEDSTRIAN CROSSING. POSITION TO BE AGREED WITH HIGHWAY AUTHORITY

EXISTING PEDSTRIAN CROSSING

LYME STREET

GEORGIANA STREET

ROYAL COLLEGE STREET

PRATT STREET

St Pancras Commercial Centre

Cycle Track

24.0m

23.5m

EL Sub Sta

St Michael's C of E Primary School

Lady's RC Primary School

Prince Albert (PH)

Golden Lion (PH)

Saints

10mm 0 10mm

-10mm

10m 0 10m 20m 30m 40m

1:500

Key

- Proposed Tunnel Alignment
- Permanent Site Boundary
- Temporary Site Boundary
- Headhouse
- Shaft Site
- EDFe Site Boundary

REV		DR	CH	PA	DATE

DRAWN BY	CHECKED BY	PASSED BY	DATE
JMB	GW	JD	JUN 2009

SCALES @ A3 SIZE	ISSUE STATUS
1:500	FINAL

ST. PANCRAS SUBSTATION

ANNEX TRA.03

CAPITA SYMONDS

DRAWING NUMBER	REV.
CS022511_SP_10	

Appendix C - Vehicle Swept Paths: CS022511-SP-06a

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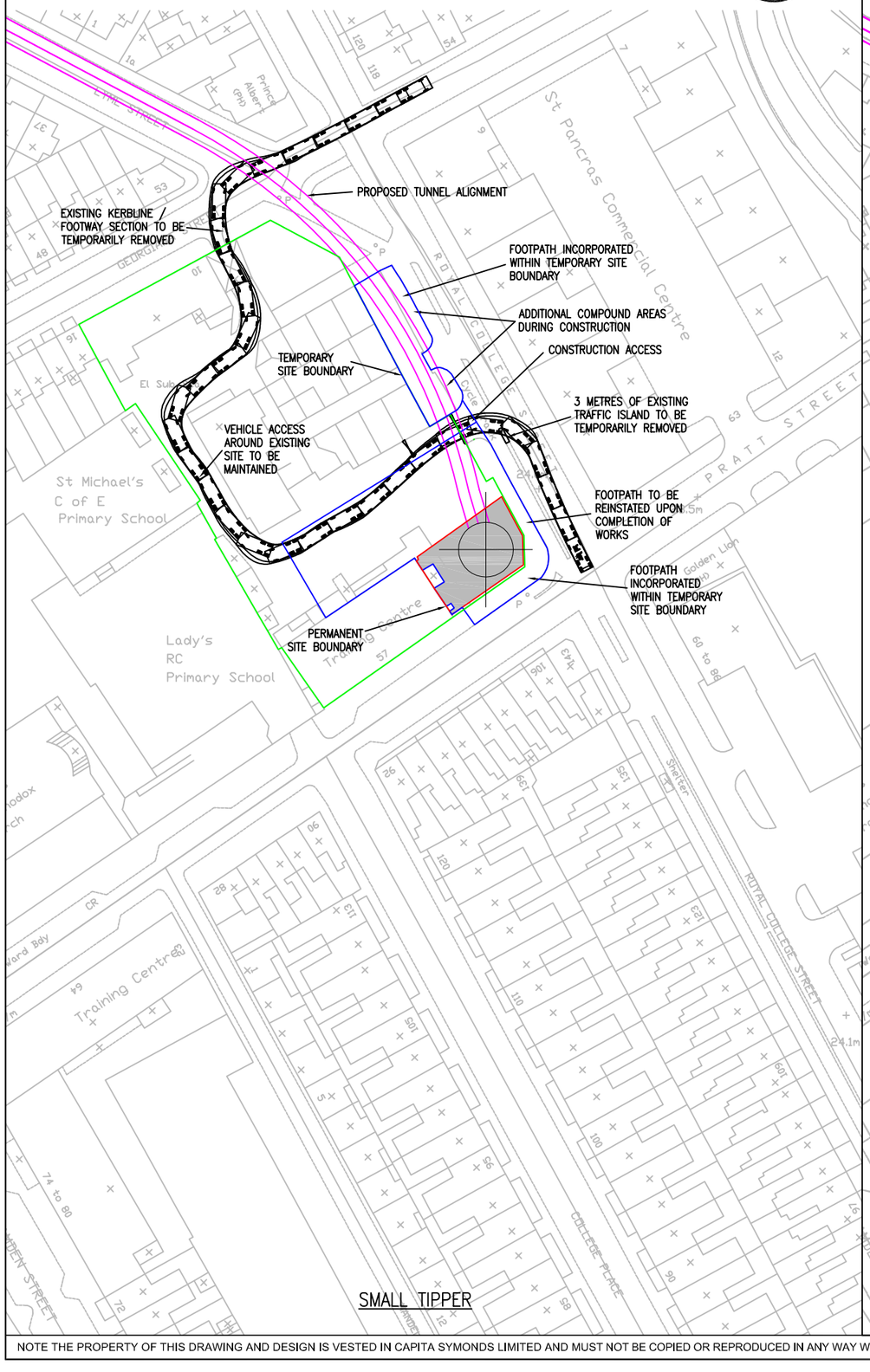
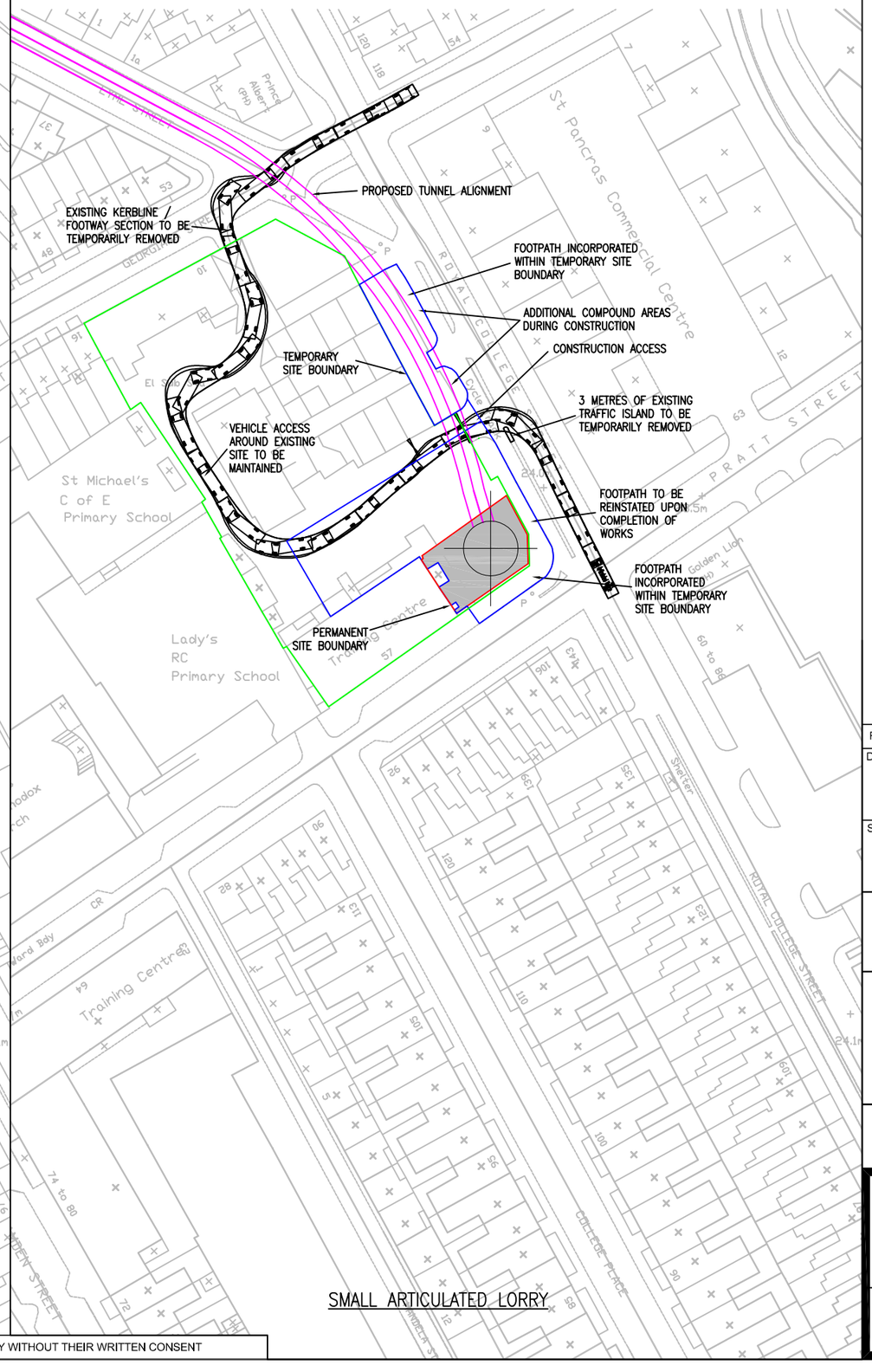
1:1000

N



SMALL TIPPER

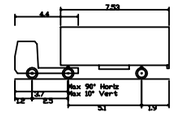


SMALL ARTICULATED LORRY

Key

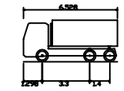
- EDFe Site Boundary
- Proposed Tunnel Alignment
- Permanent Site Boundary
- Temporary Site Boundary
- Headhouse
- Shaft Site

Vehicle Type:



Small Articulated Vehicle

Overall Length	10.700m
Overall Width	2.360m
Overall Body Height	3.604m
Min Body Ground Clearance	0.360m
Track Width	2.240m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	5.740m



Small Tipper

Overall Length	6.528m
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Overall Body Height	2.927m
Min Body Ground Clearance	0.362m
Track Width	2.393m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	7.850m

N.B
CONTRACTOR TO PROVIDE DETAILED TRAFFIC MANAGEMENT LAYOUT FOR APPROVAL BY LOCAL AUTHORITY

REV		DR	CH	PA	DATE

DRAWN BY	CHECKED BY	PASSED BY	DATE
HL	GW	JD	MAY 09

SCALES @ A3 SIZE	ISSUE STATUS
1:1000	FINAL

ST. PANCRAS SUBSTATION

ANNEX TRA.02a

CAPITA SYMONDS

DRAWING NUMBER	REV.
CS022511_SP_06a	

10mm 0 -10mm