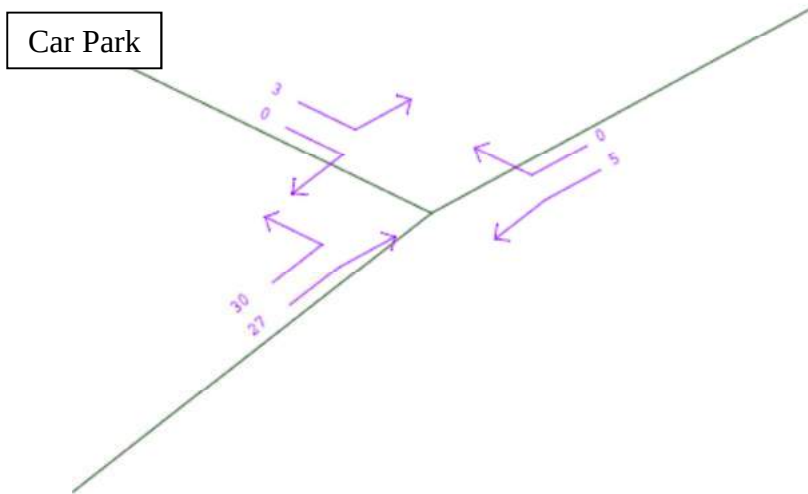


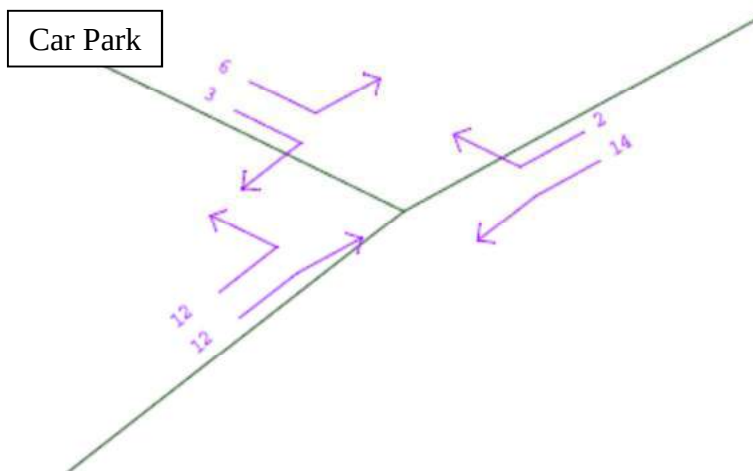
TECHNICAL NOTE

Broad St – Castle Hill

Extant AM

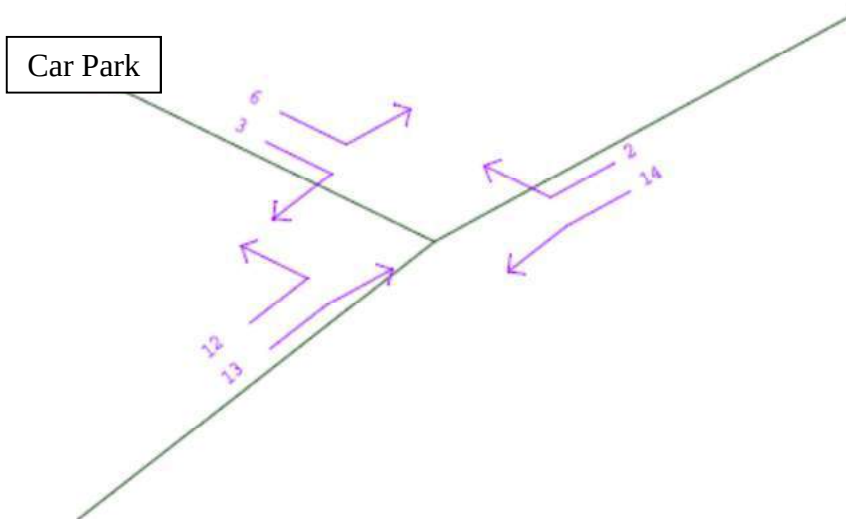
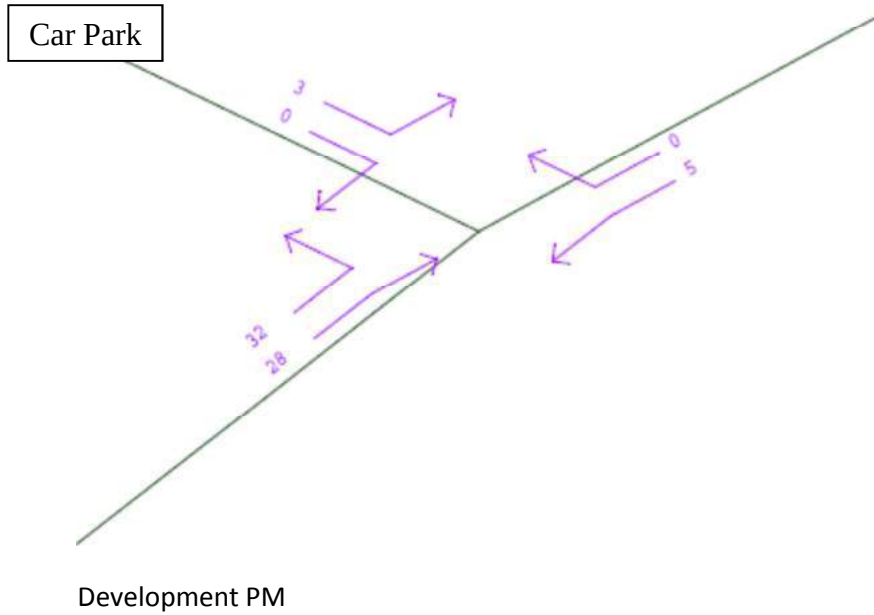


Extant PM



TECHNICAL NOTE

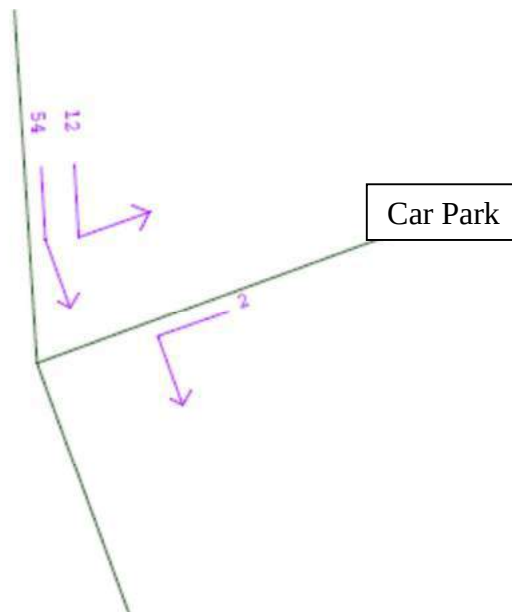
Development AM



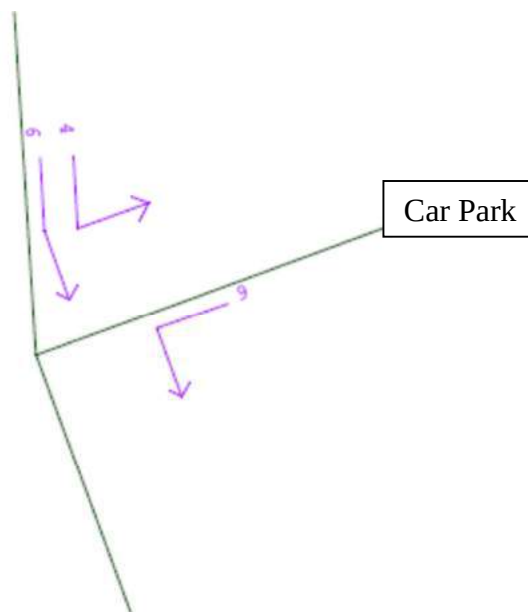
TECHNICAL NOTE

Broad St - IDR

Extant AM

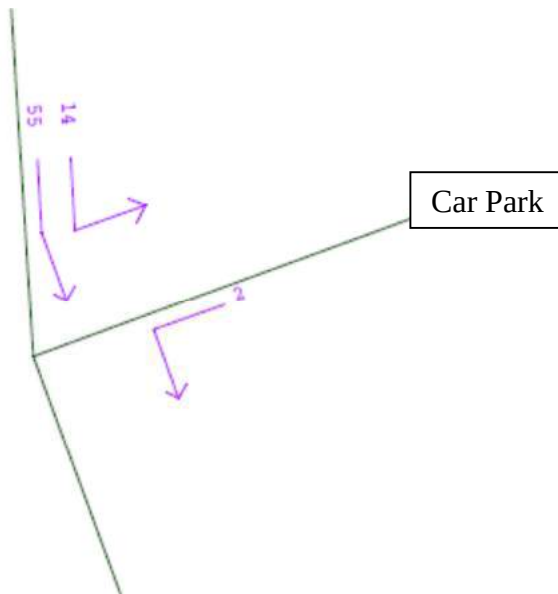


Extant PM

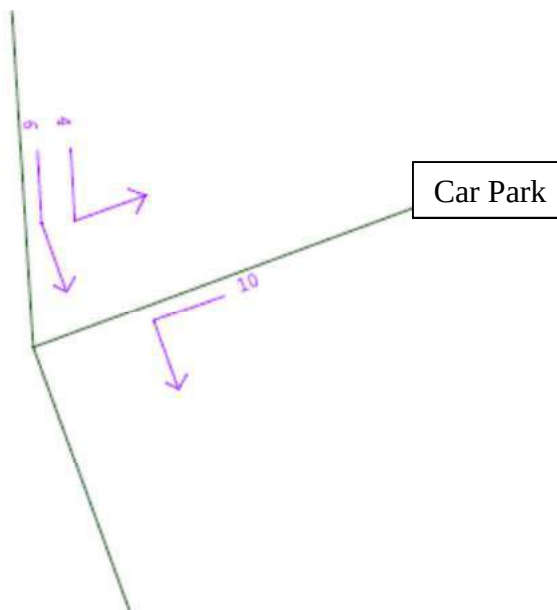


TECHNICAL NOTE

Development AM



Development PM



TECHNICAL NOTE

Summary stats

Extant AM

SATURN SIMULATION SUMMARY RESULTS

NOTE THAT THE FOLLOWING STATISTICS ARE GIVEN AS RATES
E.G., PCU.HRS/HR AS OPPOSED TO THE PCU.HRS OF TRAVEL TIME
DURING THE TIME PERIOD SIMULATED; THESE ARE GIVEN BELOW.

LINK CRUISE TIME INCLUDES FREE FLOW PLUS DELAYS ON LINKS,
DELAYED TIME IS TIME SPENT AT INTERSECTIONS AND THAT QUEUED
TIME REFERS TO THE ADDITIONAL TIME SPENT QUEUING AT
INTERSECTIONS WHICH ARE OVER CAPACITY.

FINALLY NOTE THAT THE FIGURES ONLY INCLUDE TRAVEL IN THE
TIME PERIOD SIMULATED. THE EXTRA TRAVEL TIME AND DISTANCE
IN LATER PERIODS DUE TO VEHICLES QUEUED AT OVER-CAPACITY
INTERSECTIONS IS ALSO GIVEN BELOW.

TRANSIENT QUEUES	=	4548.5 PCU. HRS./HR.
OVER-CAPACITY QUEUES	=	3133.9 PCU. HRS./HR.
(ON LINKS	=	3132.4
ON CENTROIDS	=	1.5)
LINK CRUISE TIME	=	12479.5 PCU. HRS./HR.
(FREE FLOW	=	9023.8
DELAYS	=	3455.7)
TOTAL TRAVEL TIME	=	20162.0 PCU. HRS./HR.
TRAVEL DISTANCE	=	628102.6 PCU. KMS./HR.
OVERALL AVERAGE SPEED	=	31.2 KPH
TOTAL TRIPS LOADED	=	80241.3 PCUS/HR
TOTAL INTRAS NOT LOADED=		1241.2 PCUS/HR

TECHNICAL NOTE

Extant PM

SATURN SIMULATION SUMMARY RESULTS

NOTE THAT THE FOLLOWING STATISTICS ARE GIVEN AS RATES
E.G., PCU.HRS/HR AS OPPOSED TO THE PCU.HRS OF TRAVEL TIME
DURING THE TIME PERIOD SIMULATED; THESE ARE GIVEN BELOW.

LINK CRUISE TIME INCLUDES FREE FLOW PLUS DELAYS ON LINKS,
DELAYED TIME IS TIME SPENT AT INTERSECTIONS AND THAT QUEUED
TIME REFERS TO THE ADDITIONAL TIME SPENT QUEUING AT
INTERSECTIONS WHICH ARE OVER CAPACITY.

FINALLY NOTE THAT THE FIGURES ONLY INCLUDE TRAVEL IN THE
TIME PERIOD SIMULATED. THE EXTRA TRAVEL TIME AND DISTANCE
IN LATER PERIODS DUE TO VEHICLES QUEUED AT OVER-CAPACITY
INTERSECTIONS IS ALSO GIVEN BELOW.

TRANSIENT QUEUES	=	4241.8 PCU. HRS./HR.
OVER-CAPACITY QUEUES	=	3045.9 PCU. HRS./HR.
LINK CRUISE TIME	=	12651.7 PCU. HRS./HR.
(FREE FLOW	=	9129.9
DELAYS	=	3521.8)
TOTAL TRAVEL TIME	=	19939.4 PCU. HRS./HR.
TRAVEL DISTANCE	=	638736.4 PCU. KMS./HR.
OVERALL AVERAGE SPEED	=	32.0 KPH
TOTAL TRIPS LOADED	=	82055.1 PCUS/HR
TOTAL INTRAS NOT LOADED=		945.3 PCUS/HR

TECHNICAL NOTE

Development AM

SATURN SIMULATION SUMMARY RESULTS

NOTE THAT THE FOLLOWING STATISTICS ARE GIVEN AS RATES
E.G., PCU.HRS/HR AS OPPOSED TO THE PCU.HRS OF TRAVEL TIME
DURING THE TIME PERIOD SIMULATED; THESE ARE GIVEN BELOW.

LINK CRUISE TIME INCLUDES FREE FLOW PLUS DELAYS ON LINKS,
DELAYED TIME IS TIME SPENT AT INTERSECTIONS AND THAT QUEUED
TIME REFERS TO THE ADDITIONAL TIME SPENT QUEUING AT
INTERSECTIONS WHICH ARE OVER CAPACITY.

FINALLY NOTE THAT THE FIGURES ONLY INCLUDE TRAVEL IN THE
TIME PERIOD SIMULATED. THE EXTRA TRAVEL TIME AND DISTANCE
IN LATER PERIODS DUE TO VEHICLES QUEUED AT OVER-CAPACITY
INTERSECTIONS IS ALSO GIVEN BELOW.

TRANSIENT QUEUES	=	4562.7 PCU. HRS./HR.
OVER-CAPACITY QUEUES	=	3164.3 PCU. HRS./HR.
(ON LINKS	=	3162.6
ON CENTROIDS	=	1.6)
LINK CRUISE TIME	=	12488.8 PCU. HRS./HR.
(FREE FLOW	=	9029.6
DELAYS	=	3459.2)
TOTAL TRAVEL TIME	=	20215.8 PCU. HRS./HR.
TRAVEL DISTANCE	=	628416.6 PCU. KMS./HR.
OVERALL AVERAGE SPEED	=	31.1 KPH
TOTAL TRIPS LOADED	=	80349.9 PCUS/HR
TOTAL INTRAS NOT LOADED=		1241.7 PCUS/HR

TECHNICAL NOTE

Development PM

SATURN SIMULATION SUMMARY RESULTS

NOTE THAT THE FOLLOWING STATISTICS ARE GIVEN AS RATES
E.G., PCU.HRS/HR AS OPPOSED TO THE PCU.HRS OF TRAVEL TIME
DURING THE TIME PERIOD SIMULATED; THESE ARE GIVEN BELOW.

LINK CRUISE TIME INCLUDES FREE FLOW PLUS DELAYS ON LINKS,
DELAYED TIME IS TIME SPENT AT INTERSECTIONS AND THAT QUEUED
TIME REFERS TO THE ADDITIONAL TIME SPENT QUEUING AT
INTERSECTIONS WHICH ARE OVER CAPACITY.

FINALLY NOTE THAT THE FIGURES ONLY INCLUDE TRAVEL IN THE
TIME PERIOD SIMULATED. THE EXTRA TRAVEL TIME AND DISTANCE
IN LATER PERIODS DUE TO VEHICLES QUEUED AT OVER-CAPACITY
INTERSECTIONS IS ALSO GIVEN BELOW.

TRANSIENT QUEUES	=	4236.4 PCU. HRS./HR.
OVER-CAPACITY QUEUES	=	3037.6 PCU. HRS./HR.
LINK CRUISE TIME	=	12643.8 PCU. HRS./HR.
(FREE FLOW	=	9127.3
DELAYS	=	3516.5)
TOTAL TRAVEL TIME	=	19917.9 PCU. HRS./HR.
TRAVEL DISTANCE	=	638405.3 PCU. KMS./HR.
OVERALL AVERAGE SPEED	=	32.1 KPH
TOTAL TRIPS LOADED	=	82166.1 PCUS/HR
TOTAL INTRAS NOT LOADED=		945.0 PCUS/HR



Appendix 9.2

Transport Statement

Station Hill – Telecom House, Reading

Transport Statement

On behalf of **Sackville Development Reading Limited**

Project Ref: 16996/010 | Rev: v3.0 | Date: July 2015



Document Control Sheet

Project Name: Station Hill – Telecom House, Reading

Project Ref: 16996/010

Report Title: Transport Statement

Doc Ref: TS V3.0

Date: July 2015

	Name	Position	Signature	Date
Prepared by:	Graham Smith	Senior Technician		
Reviewed by:	Chris Brice	Principal Engineer		
Approved by:	Scott Witchalls	Partner		
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
V2.0	07.07.2015	Draft Issue	GS	CB	SW
V3.0	09.09.2015	Issue for Legal Review	GS	CB	SW

Peter Brett Associates LLP disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Peter Brett Associates LLP accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Peter Brett Associates LLP 2014

Contents

1	Introduction	1
1.1	Background	1
1.2	Station Hill 3	1
1.3	Plot E / Telecom House Scheme	1
1.4	Means for Addressing Transport Matters for Planning Application	2
2	Baseline Conditions	3
2.1	Overview	3
2.2	Location	3
2.3	Pedestrian Accessibility	3
2.4	Cycling Accessibility	4
2.5	Bus Accessibility	5
2.6	Rail Accessibility	7
2.7	Highway Access	7
2.8	Car Parking	9
2.9	Personal Injury Accidents	9
3	Development Proposals	10
3.1	Overview	10
3.2	Pedestrian and Cycle Access	10
3.3	Cycle Parking	10
3.4	Vehicular Access	11
3.5	Vehicle Parking	11
3.6	Servicing and Refuse Collection	12
4	Trip Generation Comparison	13
4.1	Methodology	13
4.2	Baseline	13
4.3	Development	16
4.4	Net Difference	20
4.5	Sensitivity Test	22
5	Cumulative Impact	23
5.2	Vehicle Impact	23
5.3	Bus Impact	23
5.4	Framework Travel Plan	23
6	Conclusions	24

Figures

Figure 1-1: Site Location Plan	1
Figure 2-1: Site Location Plan	3
Figure 2-2: Pedestrian Accessibility	4
Figure 2-3: Cycle Accessibility	5
Figure 2-4: Reading Central Bus Network (www.reading-buses.co.uk).....	6
Figure 2-5: Existing Vehicular Access within Reading	8
Figure 2-6: Existing Immediate Access with IDR	9

Tables

Table 1-1: SH3 and SH3 Land Use.....	2
Table 3-1: Masterplan Land Use Changes.....	10
Table 3-2: Illustrative Residential Schedule for Plot E/TH	10
Table 3-3: Cycle Parking Standard	11
Table 3-4: Car Parking Standard.....	11
Table 4-1: Baseline Extant Land Use.....	13
Table 4-2: Extant TH People Trip Rates	14
Table 4-3: Extant TH People Trip Generation	14
Table 4-4: Total Extant Mode Share	15
Table 4-5: Extant Modal Trip Generation – Telecom House.....	15
Table 4-6: Masterplan Land Use	16
Table 4-7: Proposed People Trip Rates	17
Table 4-8: Proposed People Trip Generation (+175 Residential Dwellings).....	17
Table 4-9: Total Proposed Mode Share	17
Table 4-10: Proposed Modal Trip Generation – Plot E/TH Scheme (+175 Residential Dwellings)	18
Table 4-11: Proposed Modal Trip Generation – SH3 with Plot E/TH Scheme.....	19
Table 4-12: SH3 with Plot E/TH Net Difference	20
Table 4-13: Net Difference	21
Table 4-14: Estimated displacement of Office Car Drivers from SH3 Consented Scheme	22

1 Introduction

1.1 Background

- 1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Sackville Developments (Reading) Ltd (SDRL) to undertake a Transport Statement (TS) in support of the outline planning application for an alternative Plot E of the consented Station Hill 3 Development (SH3) that encompasses the adjacent plot known as Telecom House (TH).

1.2 Station Hill 3

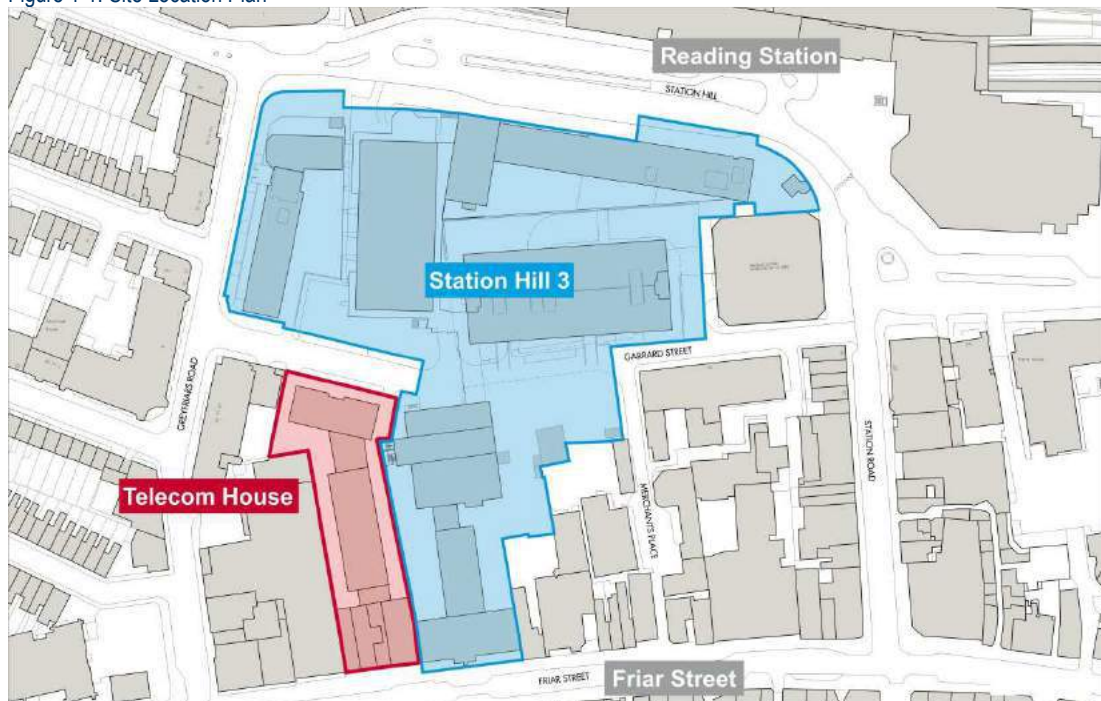
- 1.2.1 In January 2015 Reading Borough Council (RBC) granted outline planning (Application Reference 130436/OUT) for SH3 located to the south of Reading Station. The consented development includes a mix of uses including; office/commercial; retail; residential; leisure; with the retention of the existing Garrard Street car park and 1000 spaces across the site.

1.3 Plot E / Telecom House Scheme

- 1.3.1 Since consent was granted for SH3, SDRL (the Applicant), has acquired a plot of land adjacent to Plot E of the SH3 Scheme, known as Telecom House, and proposes to obtain outline planning consent for a development which encompasses both the Telecom House Site and Plot E (referred to as the Plot E/TH Scheme). SDRL's intention is that the Plot E/TH Scheme would be complementary to the remainder of the SH3 Scheme (i.e. the SH3 Scheme without Plot E).

- 1.3.2 **Figure 1-1** illustrates the TH site in relation to the consented SH3 development.

Figure 1-1: Site Location Plan



- 1.3.3 **Table 1-1** below sets out the SH3 Consented maximum floor areas alongside those of the proposed SH3 with Plot E/TH scheme.

Table1-1: SH3 and SH3 Land Use

Use	SH3 Consent (GFA)	SH3 with Plot E/TH Scheme (GFA)	Net Change (GFA)
A1 – A5 Retail	11,475m ²	11,475m ²	0
B1 Office	103,700m ²	103,700m ²	0
D2 Leisure	1,870m ²	1,870m ²	0
Residential	300 Dwellings	475 Dwellings	+ 175 Dwellings

- 1.3.4 The Plot E/TH scheme proposal is to provide an additional 175 residential dwellings to the overall SH3 scheme.

- 1.3.5 As part of the Plot E/TH scheme it is proposed that the level of parking proposed within Garrard Street will reduce from up to 900 to up to 800, with the number of spaces increasing from up to 100 to up to 200 within Plot E; with up to 1000 spaces maintained as consented.

1.4 Means for Addressing Transport Matters for Planning Application

- 1.4.1 This TS has been prepared comparing the transport impact of the extant uses of TH (should it be refurbished and fully occupied) with the anticipated trip generation of the proposed additional 175 dwellings.
- 1.4.2 Additional comparisons have been made between the consented SH3 scheme with the SH3 with Plot E/TH scheme to assess the transport impact of the proposed adjustment to the distribution of the maximum car parking spaces across the Station Hill site.

Chapter 3: Baseline Conditions

This chapter provides an understanding of the access and movement to and from the site in context with the surrounding area and identifies existing facilities and attractions.

Chapter 4: Development Proposals

This chapter sets out the proposed development concerning schedule, car parking, cycle parking, access and servicing.

Chapter 5: Trip Generation

This chapter provides the anticipated trip generation of the development proposals, for all travel modes.

Chapter 6: Cumulative Impact

This chapter sets out the cumulative impacts of the development on the highway for all travel modes.

Chapter 7: Summary and Conclusion

This chapter sets out the conclusions of the TS, providing recommendation where necessary to RBC.

2 Baseline Conditions

2.1 Overview

- 2.1.1 This section provides an understanding of the current access and movement to and from Plot E/TH in context with the surrounding area.

2.2 Location

- 2.2.1 The Telecom House site is located south of Reading Station, between Garrard Street and Friar Street, directly to the west of SH3 site in the centre of Reading, close to Reading Train Station. As such, the sustainable transport links are considered excellent in encouraging future residents and visitors to travel sustainably to and from the site, as shown in **Figure 2-1**.

Figure 2-1: Site Location Plan



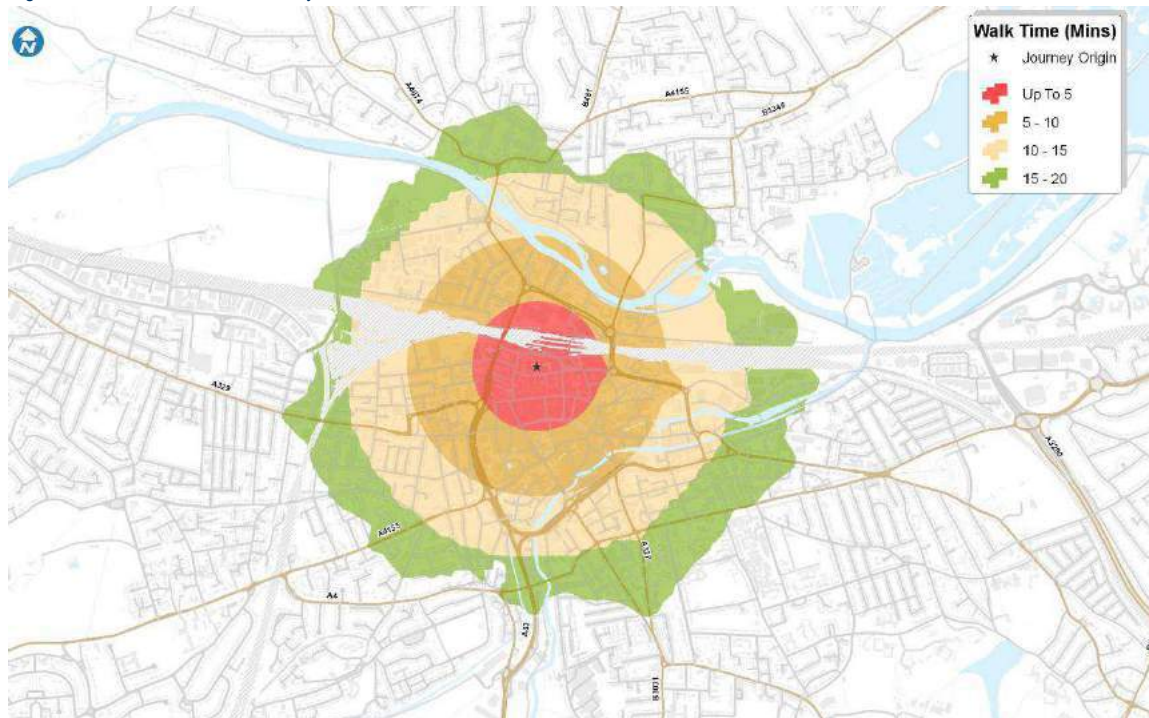
- 2.2.2 The Station Interchange (including bus and taxi stops, passenger drop off and cycle stands) is located between SH3 and the main Reading Station building. This area has recently been redeveloped as part of the Reading Station Area redevelopment proposals. The interchange provides a pedestrian area immediately to the north of SH3, with an improved rail station in terms of rail capacity and station facilities.
- 2.2.3 Telecom House, as shown in **Figure 2-1**, is ideally placed to benefit from national, regional and local transport connections, which directly serve the site.

2.3 Pedestrian Accessibility

- 2.3.1 A Geo-concept assessment (using NavTeq road network) based on a walking speed of 400 metres per 5 minutes has been undertaken and shown in **Figure 2-2** to identify the potential walk times of future employees to access nearby public transport connection and walk time to nearby residential areas. Six 5 minute walk time bands up to 30 minutes have been created and are as follows;

- Up to 5 minutes;
- 5-10 minutes;
- 10-15 minutes;
- 15-20 minutes;
- 20-25 minutes; and
- 25-30 minutes.

Figure 2-2: Pedestrian Accessibility



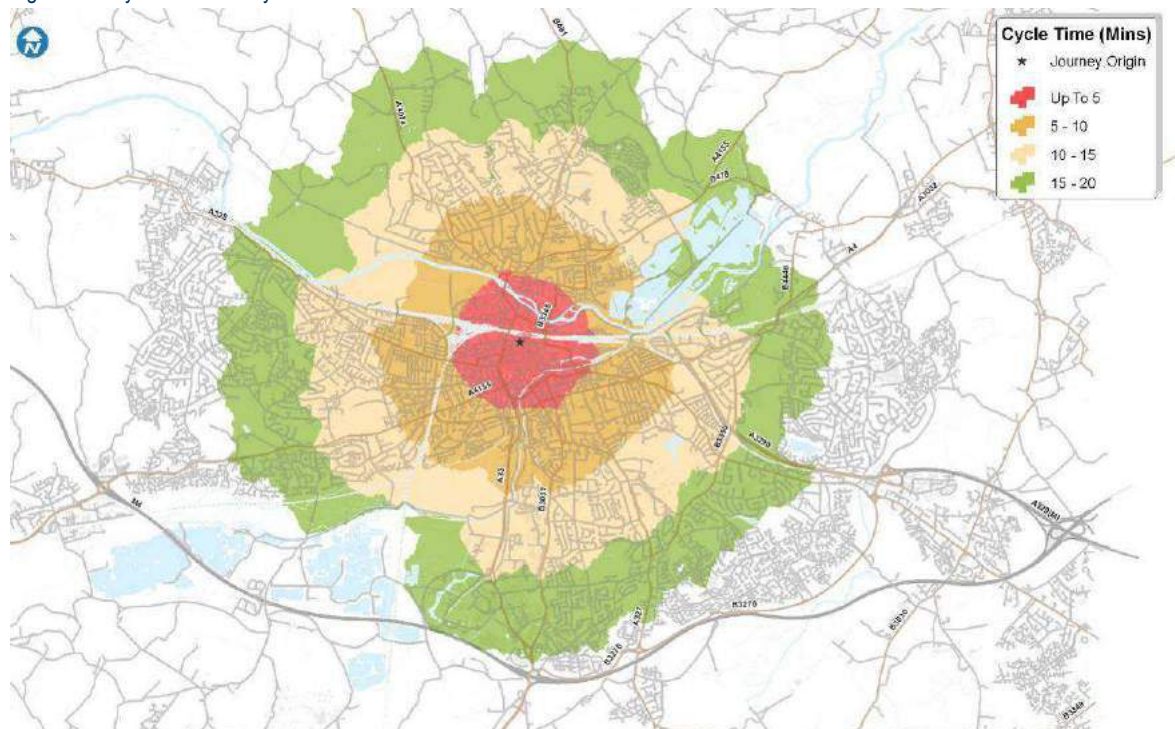
2.3.2 It is evident from **Figure 2-2** that the site is ideally located to encourage walking from a relatively large population catchment. All of the town centre amenities and shops are within a 15-minute walk of the site. The development proposals capitalise on its location within the centre of Reading acknowledging the role walking can play both in delivering accessibility at the local level and in contributing towards sustainable development patterns.

2.4 Cycling Accessibility

2.4.1 A Geo-concept assessment based on a cycle speed of 16kph has been undertaken and shown in **Figure 2-3**. This illustrates the potential cycling times of future employees and visitors. This illustrates the potential cycling catchment up to 30 minutes from the site and encompasses a number of surrounding residential areas. Six 5 minute cycle time bands up to 30 minutes have been created and are as follows;

- Up to 5 minutes;
- 5-10 minutes;
- 10-15 minutes;
- 15-20 minutes;
- 20-25 minutes; and
- 25-30 minutes.

Figure 2-3: Cycle Accessibility



- 2.4.2 **Figure 2-3** demonstrates that the entire urban areas within the RBC boundary are within a 30 minute cycle ride of the TH site, making cycle trips to the site a realistic mode of travel for a large number of people.
- 2.4.3 Central Reading currently has a good level of cycle connectivity to the south of the site through a combination of 'Quiet Roads', cycle paths and cycle lanes within the carriageway. Beyond the immediate centre of Reading, dedicated cycle paths are present on the main routes into Reading, including via Oxford Road and Portman Road to the west; A33 to the south; and routes through Caversham and across Caversham Bridge to the north. Leisure routes are also present along the River Kennet and River Thames.
- 2.4.4 RBC has introduced 'ReadyBike', which is a London inspired, bicycle-renting scheme, available on an annual membership scheme. This allows members to conveniently travel between storage hubs within central Reading, to as far as Green Park and Thames Valley Business Parks. This creates a unique opportunity for alternative bicycle access within Reading, linking a wide range of land uses. The closes 'Ready Bike' station is located to the south of the railway station approximately 350m to the east.

2.5 Bus Accessibility

- 2.5.1 The site benefits from excellent access to a wide choice of bus services due to its close proximity to the town centre bus stops, providing the opportunity for a significant level of trips to be accommodated by bus. Approximately 100 buses per hour serve the area around the development site in the peak hours.
- 2.5.2 This includes access to Reading's bus services, offering frequent, reliable services with improved facilities and comfort. These routes also benefit from bus priority measures, real time information, and better provision for people with reduced mobility.
- 2.5.3 The wider bus network provides access to/from all of the Reading urban area as well as Bracknell, Twyford, Wokingham, Spencers Wood, Aldershot, Theale, Newbury, Pangbourne, Woodcote, Wallingford, Sonning Common, Henley-on-Thames and High Wycombe.

- 2.5.4 Strategic bus routes (including the 'Greenwave' services) operate along the A33 corridor between GreenPark, the Madjeski Park and Ride and Reading International Business Park (RIBP) from the interchange area adjacent to Reading Station and bus stops located throughout the town centre. The main interchange area is located close to the site to the east on Station Road and Forbury Road adjacent to Reading Station.
- 2.5.5 The 'Fasttrack' services provide connections between the site and the Park and Ride site at Loddon Bridge to the east of the town centre as well as to the Madjeski Stadium. Stewarts Coaches operates services between the town centre and Thames Valley Park. Direct and frequent services operate along these routes.
- 2.5.6 The 'Rail-Air' Link, located outside Reading Station, provides a frequent coach service to and from Heathrow Airport.
- 2.5.7 The location of the site in context to the town centre bus stops is highlighted on **Figure 2-4**.

Figure 2-4: Reading Central Bus Network (www.reading-buses.co.uk)



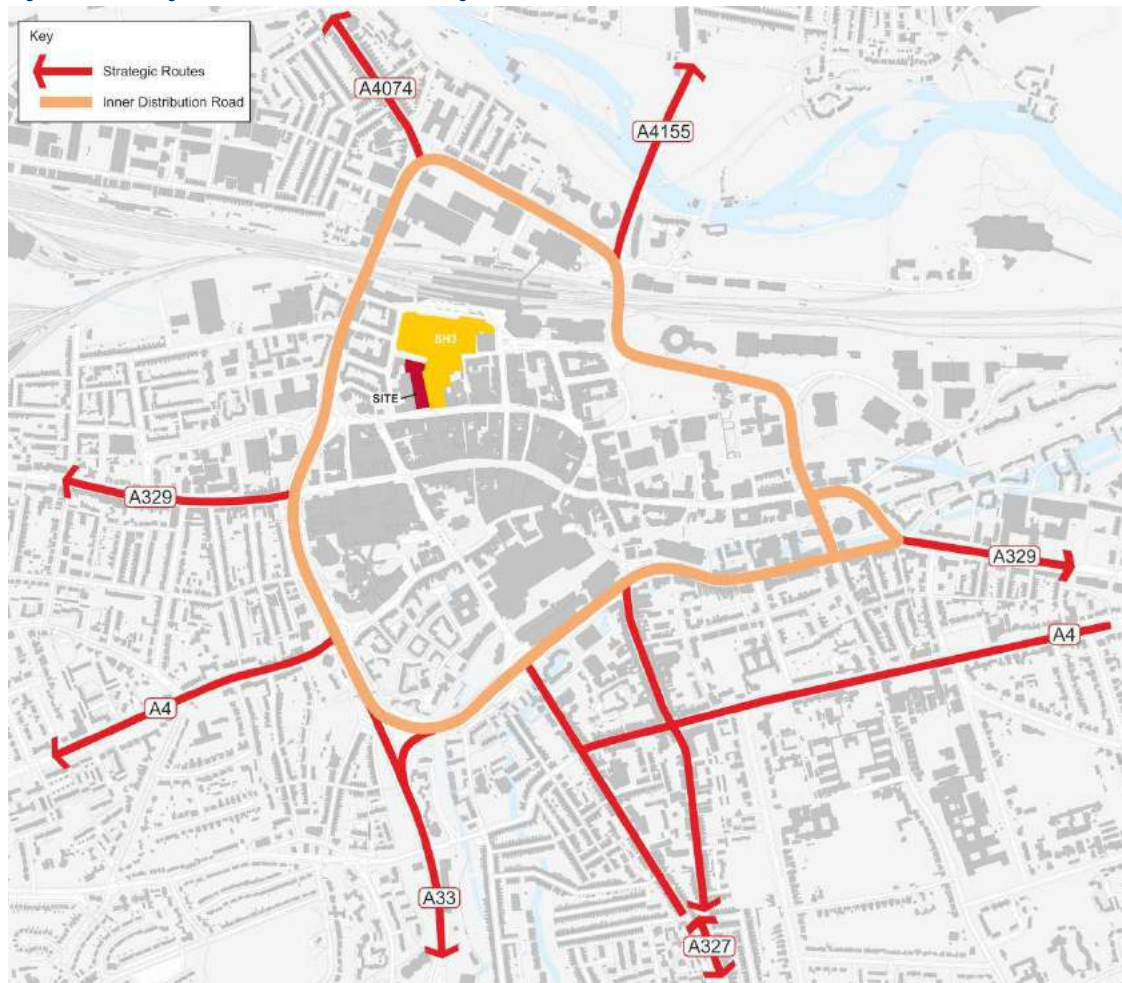
2.6 Rail Accessibility

- 2.6.1 The development site is located close to Reading Station, which is identified as a regional transport hub and the focus of significant regeneration and redevelopment. The Station is the second busiest interchange in the UK outside London, with 60,000 passengers using the station daily.
- 2.6.2 Rail services from Reading Station provide connections to the regional and national rail network where the following train companies offer services to a variety of destinations:
- First Great Western operate trains to destinations which include London Paddington, Slough, Basingstoke, Gatwick Airport, Oxford, Hereford, Worcester, Bristol, South Wales and the South West of England;
 - Cross Country Trains operate trains to destinations including Bournemouth, Southampton, Guildford, Banbury, Coventry, Birmingham, the North of England and Scotland; and
 - South West Trains provides services to Wokingham, Staines, Richmond, Clapham Junction, London Waterloo, Basingstoke, Winchester, Southampton, Portsmouth and Brighton.

2.7 Highway Access

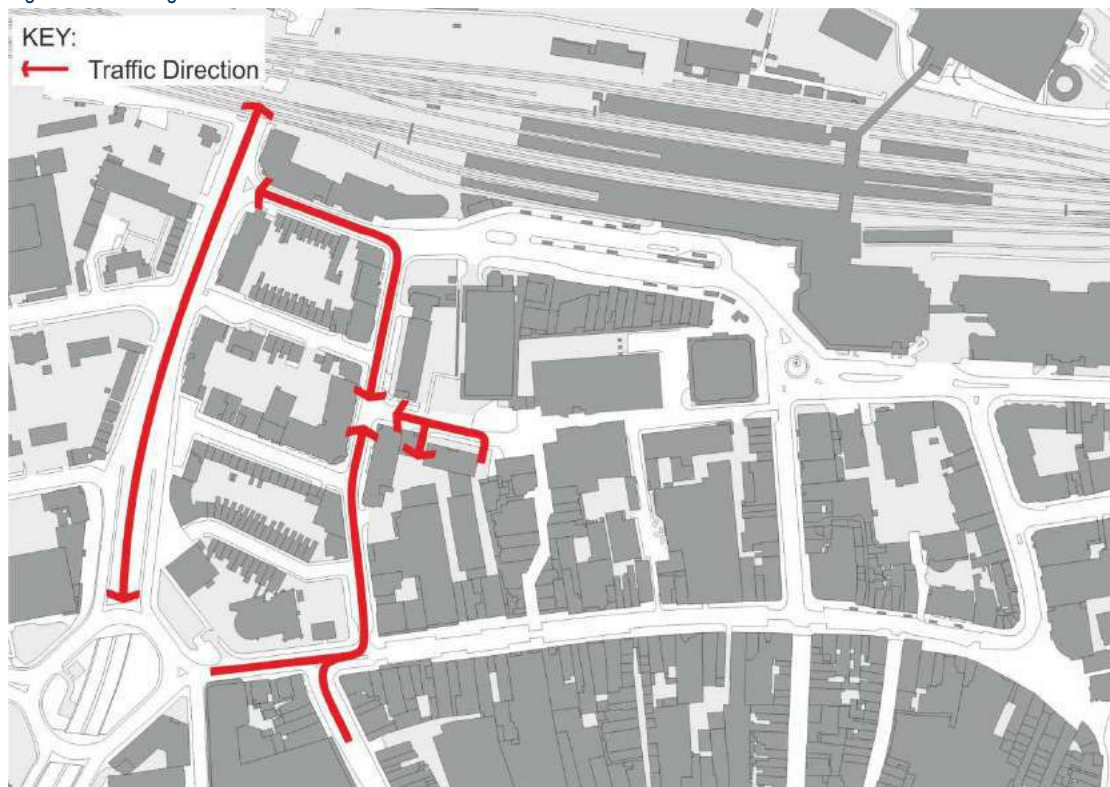
- 2.7.1 The existing highway access routes to TH in a strategic context are shown in **Figure 2-5** below. This shows the strong links to the strategic road network, such as Reading's Inner Distribution Road (IDR) and a number of radial routes to/from Reading Town Centre.
- 2.7.2 The principal vehicle routes to the site are via the IDR. The IDR is for the most part a dual, two lane orbital route which provides the following connections into Reading town centre:
- North: Via Reading and Caversham Bridges;
 - East: Via the A329 Kings Road and the A4 London Road;
 - South: Via the A33, leading to Junction 11 of the M4;
 - West: Via the A4, the junctions with A4155 Castle Hill and the A329 Chatham Street.

Figure 2-5: Existing Vehicular Access within Reading



- 2.7.3 There are two existing points of access to TH from the wider area. The first is from the Tudor Road / IDR (Caversham Road) to the north. The second is via Greyfriars Road, which is a one-way street and provides access for vehicles from the south. Greyfriars Road is available from the grade separated Chatham Street roundabout.
- 2.7.4 All vehicles have to exit the site via the Tudor Road junction with the IDR (Caversham Road). Drivers wishing to travel north must perform a U-turn at the Chatham Street roundabout. The Stanshawe Road junction with the IDR is restricted to bus, taxi and cycle movements only.
- 2.7.5 Garrard Street is located to the north of TH and provides access to the existing site. Through movement between Greyfriars Road and Station Road is not possible for general traffic.
- 2.7.6 Taxis are currently permitted to exit Greyfriars Road onto Station Road as part of the taxi queuing arrangement for the taxi rank outside the Station within the south east interchange.
- 2.7.7 The existing local highway access routes to and from the site are shown in **Figure 2-6**.

Figure 2-6: Existing Immediate Access with IDR



2.8 Car Parking

- 2.8.1 The current TH site currently has 58 car parking spaces which serve the office; these are situated alongside the building on both sides, in front of the building and also underneath the building on the ground floor. Car parking is discussed in greater detail in **Chapter 4**.
- 2.8.2 The consented SH3 scheme includes permission for up to 100 parking spaces within Plot E.

2.9 Personal Injury Accidents

- 2.9.1 A comprehensive review of Personal Injury Accident (PIA) data between 2007 and 2012 was undertaken for the consented SH3 proposals and presented within the accompanying SH3 Transport Assessment, March 2013.
- 2.9.2 The SH3 PIA review concluded not identifying any specific concern with regards to the geometric design/road layout of the local highway network, reoccurring patterns of the frequency or severity of collisions recorded, or any specific concerns relating to the clustering of collisions or locations within the study area.
- 2.9.3 It is therefore proposed that no additional review of PIA data be undertaken as part of the Plot E/TH TS, given;
- Only modest time has lapsed since the PIA review was undertaken for the Station Hill application consented in December 2013; and
 - The recently completed Station upgrade works and town centre public realm improvements may make the recent accident records untypical in this location for consideration.

3 Development Proposals

3.1 Overview

- 3.1.1 The proposal is to redevelop the Telecom House site as part of a new Plot E/TH Scheme, which incorporates SH3's Plot E, creating a larger plot as part of the overall SH3 Scheme.
- 3.1.2 SDRL's intention is that the Plot E/TH Scheme would be complementary to the remainder of the SH3 Scheme (i.e. the SH3 Scheme without Plot E).
- 3.1.3 The proposal for Plot E/TH will provide a maximum of 285 residential dwellings, and will include up to 7,000sqm GEA of retail floor space (Use Classes A1-A5).
- 3.1.4 The proposals will increase the maximum number of residential dwellings over the consented SH3 Scheme by 175 units.
- 3.1.5 The retail floor space will provide frontages which activate the public realm at the ground floor. The resulting total amount of floor space for the enlarged SH3 with Plot E/TH will be unchanged because it was previously assumed that Plot E would have delivered approximately half of the retail floor space for the overall SH3 scheme.
- 3.1.6 **Table 3-1** summarises the proposed net change in Land Uses across the whole masterplan.

Table 3-1: Masterplan Land Use Changes

Use	SH3 Consent (GFA)	SH3 with Plot E/TH Scheme (GFA)	Net Change (GFA)
A1 – A5 Retail	11,475m ²	11,475m ²	0
B1 Office	103,700m ²	103,700m ²	0
D2 Leisure	1,870m ²	1,870m ²	0
Residential	300 Dwellings	475 Dwellings	+ 175 Dwellings

- 3.1.7 **Table 3-2** shows an illustrative residential schedule for Plot E/TH Scheme.

Table 3-2: Illustrative Residential Schedule for Plot E/TH

	1 Bed	2 Bed	3 Bed	Total
Illustrative Proportions	38%	57%	5%	100%
Number of Dwellings	108	163	14	285

3.2 Pedestrian and Cycle Access

- 3.2.1 Pedestrian access will be gained via Friar Street, Garrard Street, and the new pedestrian integration between Friar Street, Station Hill and the railway station. These enhanced connections support RBC's aspirations to improve pedestrian linkages over the railway line, which is highlighted within the RCAAP and LTP3.

3.3 Cycle Parking

- 3.3.1 **Table 3-3** summarises the minimum number of cycle parking spaces required within Plot E/TH; based on RBC's cycle parking standards.

Table 3-3: Cycle Parking Standard

	1 Bed	2 Bed	3 Bed	Total
Number of Dwellings	108	163	14	285
RBC Cycle Parking Standards	0.5	0.5	1	-
Required Parking Provision	54	81	14	149

3.3.2 **Table 3-3** shows that the proposal will require a minimum of 149 spaces to serve the 285 units proposed within Plot E.

3.4 Vehicular Access

3.4.1 The development will relocate the existing access into the TH site to one new location in the vicinity of the existing site access.

3.4.2 The new vehicular access will serve one of the two car park locations across the SH3 with Plot E/TH scheme. The car park will be controlled via the use of a barrier control system.

3.5 Vehicle Parking

3.5.1 It is proposed that the Plot E/TH Scheme will not increase the consented number of car parking spaces proposed across the overall SH3 development. It is still proposed that a maximum of 1,000 spaces will continue to be provided across the new SH3 with Plot E/TH Scheme; with parking provided at the two locations as agreed for the SH3 Scheme.

3.5.2 The consented SH3 Scheme proposed to provide 900 spaces within Garrard Street car park, and 100 parking spaces within Plot E.

3.5.3 The Plot E/TH Scheme proposes to adjust the distribution of maximum car parking spaces across the whole site and provide up to 200 parking spaces within Plot E/TH, and remaining spaces provided within Garrard Street (up to a maximum of 1,000 spaces across the SH3 with Plot E/TH Scheme).

3.5.4 **Table 3-4** summarises the total number of parking spaces required for the proposed number of residential dwellings.

Table 3-4: Car Parking Standard

	1 Bed	2 Bed	3 Bed	Total
Number of Dwellings	108	163	14	285
RBC Car Parking Standards	0.5	0.5	1	-
Required Parking Provision	54	81	14	149

3.5.5 The consented SH3 Scheme included circa 110 residential dwellings (1 / 2 bedroom flats) within Plot E; this had provision for 55 parking spaces. Based on **Table 3-4** the Plot E/TH scheme proposes to provide a maximum of 149 parking spaces; which is an increase in total residential provision of 94 spaces across the SH3 with Plot E/TH Scheme.

- 3.5.6 To compensate for the additional residential parking requirements, the SH3 with Plot E/TH Scheme will reduce the parking for offices to remain within the 1000 space consent. A lower office 'Car Driver' mode share will therefore have to be achieved to account for the reduction in available parking provision across the site; which is an alteration to the previous SH3 assessment.

3.6 Servicing and Refuse Collection

- 3.6.1 The proposed site will provide a shared service dock for the retail units and it is presumed that residential refuse collection will be undertaken on street.

4 Trip Generation Comparison

4.1 Methodology

- 4.1.1 To ascertain the level of impact the proposal will have on the local highway network; this TS has assessed and compared the anticipated trip generation of the following:
- TH Baseline – Estimate trip generation of the overall extant land uses for the TH site.
 - Plot E/TH scheme estimated trips generated from the additional 175 residential dwellings.
- 4.1.2 This will allow a comparison to be made of the anticipated level of transport impact between the extant TH and the proposal for the additional dwellings within the Plot E/TH scheme.
- 4.1.3 The RBC guidance requires 94 additional parking spaces for the proposed uplift in residential dwellings across the SH3 with Plot E/TH Scheme; as a result the office parking provision has been reduced by this amount.
- 4.1.4 The office 'Car Driver' mode share has also been adjusted to reflect the reduction in office parking provision.
- 4.1.5 The estimate of the likely trip generation for the TH Baseline and proposed Plot E/TH Scheme follows the principles and assumptions agreed as part of the consented SH3 Scheme.

4.2 Baseline

Extant Land Uses

- 4.2.1 The Telecom House site is located south of Reading Station, between Garrard Street and Friar Street, directly adjacent to the SH3 Scheme as illustrated previously within **Figure 1-1**. The current site includes an office building fronting Garrard Street and two retail units which front onto Friar Street. The approximate floor areas of these extant land uses are included within **Table 4-1**.

Table 4-1: Baseline Extant Land Use

Use	TH (GFA)
A1 – A5 Retail	793m ²
B1 Office	5,697m ²
D2 Leisure	-

- 4.2.2 The current TH site has 58 car parking spaces which serve the office land use; these are situated alongside the building on both sides, in front of the building and also underneath the building on the ground floor.
- 4.2.3 Trip Generation
- 4.2.4 The estimated number of people travelling to and from the extant TH land uses should they be fully operational has been calculated using the agreed SH3 trip rates are set out in **Table 4-2**.

Table 4-2: Extant TH People Trip Rates

	AM (08:00-09:00)		PM (17:00-18:00)		Two-way Daily
	Arrivals	Departures	Arrivals	Departures	
Office People Trip Rates per 100m2	2.19	0.16	0.13	1.97	16.80
Retail Trip Rates per 100m2	12.43	10.06	21.45	21.15	370.11

4.2.5 For consistency it has assumed that 25% of the retail trips would be primary trips, with 75% of the trips to the existing units being 'linked' or 'pass by' trips associated with other destinations in the town centre as agreed for the consented SH3 Scheme.

4.2.6 The estimated people trips generated by the extant TH uses are set out in **Table 4-3**.

Table 4-3: Extant TH People Trip Generation

	AM (08:00-09:00)			PM (17:00-18:00)			Two-way Daily
	Arrivals	Depart	Two-way	Arrivals	Depart	Two-way	
Office People Trip Generation 5,697 m2	125	9	134	7	112	119	1015
Retail People Trip Generation 793 m2 Primary Trips (25%)	25	20	45	43	42	85	734
Total	150	29	179	50	154	204	1749

4.2.7 During the AM and PM peak hours the office unit generates 134 and 119 two-way trips respectively and 1015 daily two-way people trips. During the AM and PM peak hours the retail units generate 45 and 85 two-way people trips respectively and 734 daily two-way people trips.

4.2.8 Therefore overall during the AM and PM peak hours the existing TH site generates a total of 179 and 204 two-way trips respectively and 1749 daily two-way people trips during the baseline.

Mode Share

4.2.9 The mode share for the TH baseline has been calculated following the agreed methodology used for the SH3 application. The main principles of the mode share calculations as previously agreed are summarised below:

- 2001 Census data has been analysed for the mode of travel from home to work with the destination (work) being the town centre output area (Ref: OOMCMR000022). The 2001 mode of travel from home to work with the destination (work) data has been used since the same level of output area data from the 2011 census data is not publicly available.
- The person trips generated by the office has been adjusted by mode, on the basis that the 58 office parking spaces would be fully utilised and the remaining trips would arrive/depart by the other modes in the same relative proportions as census data;

- The rail mode share has been increased (broadly doubled) to account for the increased attractiveness of rail use as part of the Reading Station Area Major Upgrade scheme. The mode share for other means have been adjusted accordingly.

4.2.10 The Census data has been adjusted to reflect the above, with the mode share of the extant TH site set out in **Table 4-4**.

Table 4-4: Total Extant Mode Share

	TH Retail	TH Office
From Home	0.17%	0.36%
Underground	0.04%	0.10%
Train	37.30%	9.17%
Bus	39.69%	31.26%
Taxi	0.12%	0.08%
Motorcycle	0.56%	0.38%
Car Driver	0.00%	22.49%
Car Passenger	0.00%	4.18%
Bicycle	3.82%	3.93%
Foot	18.14%	27.90%
Other	0.15%	0.15%

4.2.11 Following the calculated mode share above, **Table 4-5** summarises the trips by mode for the extant TH site.

Table 4-5: Extant Modal Trip Generation – Telecom House

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
From Home	0	0	0	0	0	1
Underground	0	0	0	0	0	0
Train	21	8	29	17	26	42
Bus	49	11	60	19	52	71
Taxi	0	0	0	0	0	0
Motorcycle	1	0	1	0	1	1
Car Driver ¹	28	2	30	2	25	27
Car Passenger	5	0	5	0	5	5
Bicycle	6	1	7	2	6	8
Foot	39	6	45	10	39	49
Other	0	0	0	0	0	0

¹ Car driver trip generation capped to 58 office parking spaces

4.2.12 This shows that the extant TH would generate 30 two-way private car trips within the AM peak, and 27 two-way private car trips vehicle trips with the PM peak.

4.3 Development

Proposed Land Uses

- 4.3.1 As previously discussed, the proposed Plot E/TH scheme results in an additional 175 residential dwellings to the overall SH3 scheme. This is shown below in **Table 4-6** which sets out the floor areas of the consented SH3 scheme and the SH3 with Plot E/TH Scheme.

Table 4-6: Masterplan Land Use

Use	SH3 Consent (GFA)	SH3 with Plot E/TH Scheme (GFA)	Net Change (GFA)
A1 – A5 Retail	11,475m ²	11,475m ²	0
B1 Office	103,700m ²	103,700m ²	0
D2 Leisure	1,870m ²	1,870m ²	0
Residential	300 Dwellings	475 Dwellings	+ 175 Dwellings

- 4.3.2 The anticipated trip generation of the proposal has therefore been calculated on the net increase in residential dwellings over the consented SH3 scheme.
- 4.3.3 The new proposal for the Plot E/TH scheme will not increase the number of car parking spaces proposed across the overall consented SH3 development. It is proposed that a maximum of 1,000 spaces will be provided across the consented SH3 scheme and the Plot E/TH Scheme. It is proposed that up to 200 spaces will be provided within Plot E/TH scheme, 149 of which will be residents parking for Plot E/TH. The previous scheme included 55 spaces for residents in this plot.
- 4.3.4 The assessment of the trip generation of the new Plot E/TH scheme follows the methodology previously agreed for the maximum SH3 consent. To ensure a robust 'worst case' scenario, for the purpose of this assessment, the proposal will allow for an additional 94 parking spaces of the overall 1000 space provision to be assigned for residential use (based on RBC required car parking standards) offset by a reduction of 94 spaces for office use in the overall masterplan.
- 4.3.5 As a result 238 of the 1000 spaces will be assigned to the residential dwellings within the new SH3 with Plot E/TH scheme.
- 4.3.6 The need for an additional 94 parking spaces for the increase in residential dwellings will reduce the number of available parking spaces for the office land use within the consented SH3 scheme.
- 4.3.7 Therefore the trip generation for the office land use within the consented SH3 has been adjusted for this assessment.

Trip Generation

- 4.3.8 The anticipated number of people trips generated by the larger Plot E/TH scheme has been calculated using the trip rates agreed for the consented SH3 scheme.
- 4.3.9 The estimated number of additional people travelling to and from proposed Plot E/TH scheme has been calculated using the agreed SH3 trip rates are set out in **Table 4-7**.

Table 4-7: Proposed People Trip Rates

	AM (08:00-09:00)			PM (17:00-18:00)			Two-way Daily
	Arrivals	Depart	Two-way	Arrivals	Depart	Two-way	
People Trip Rates per Dwelling	0.103	0.556	0.659	0.386	0.223	0.609	5.568

- 4.3.10 The estimated number of additional people trips generated by the additional 175 residential dwelling is set out in **Table 4-8**.

Table 4-8: Proposed People Trip Generation (+175 Residential Dwellings)

	AM (08:00-09:00)			PM (17:00-18:00)			Two-way Daily
	Arrivals	Depart	Two-way	Arrivals	Depart	Two-way	
Residential People Trip Generation 175 Dwellings	18	97	115	68	39	107	974

- 4.3.11 During the AM and PM peak hours the proposal will generate 115 and 107 two-way trips to respectively and 974 daily two-way people trips over the consented SH3 scheme.

Mode Share

- 4.3.12 The mode share for the Plot E/TH Scheme has been calculated following the agreed methodology used for the SH3 application and as discussed previously for the baseline. For the proposed residential dwellings included within the proposal the mode share has been informed from the JTW Census data for the Abbey ward.
- 4.3.13 Following the agreed adjustments to the Census data the mode share of the proposed scheme is shown in **Table 4-9**.

Table 4-9: Total Proposed Mode Share

	Residential
From Home	4.13%
Underground	0.45%
Train	20.04%
Bus	11.07%
Taxi	0.42%
Motorcycle	0.35%
Car Driver	28.42%
Car Passenger	2.61%
Bicycle	3.34%
Foot	28.47%
Other	0.69%

- 4.3.14 **Table 4-10** summarises the trips by mode for the additional people trips generated by the Plot E/TH scheme.

Table 4-10: Proposed Modal Trip Generation – Plot E/TH Scheme (+175 Residential Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
From Home	1	4	5	3	2	4
Underground	0	0	1	0	0	0
Train	4	19	23	14	8	21
Bus	2	11	13	7	4	12
Taxi	0	0	0	0	0	0
Motorcycle	0	0	0	0	0	0
Car Driver	5	28	33	19	11	30
Car Passenger	0	3	3	2	1	3
Bicycle	1	3	4	2	1	4
Foot	5	28	33	19	11	30
Other	0	1	1	0	0	1

- 4.3.15 Table 4-10 shows that the additional 175 residential dwellings will generate 33 and 30 two-way 'Car Driver' trips in the AM and PM peak hour respectively.
- 4.3.16 Due to the re-assignment of parking provisions, as a result of the increased required number of residential car parking spaces across the SH3 with Plot E/TH Scheme, the mode share for the office land use within the SH3 scheme has been adjusted to reflect the reduced provision of available parking spaces. All other modes shares have also been adjusted on a pro-rata basis to reflect the adjustment. This is an alteration to the previous SH3 assessment.
- 4.3.17 As a result of this, the parking ratio for the office land use within the consented SH3 changes from 1 space per 250m² to 1 space per 310m². **Table 4-11** summarises the total trips by mode for the whole of SH3 with Plot E/TH scheme.

Table 4-11: Proposed Modal Trip Generation – SH3 with Plot E/TH Scheme

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
From Home	6	12	18	9	9	18
Underground	1	1	3	1	2	3
Train	858	213	1070	326	903	1229
Bus	939	202	1140	330	978	1308
Taxi	3	2	5	2	3	5
Motorcycle	13	3	17	5	14	19
Car Driver	349	96	445	76	315	391
Car Passenger	65	11	76	9	57	66
Bicycle	93	26	118	36	98	134
Foot	463	156	618	195	492	687
Other	4	2	6	2	4	7
Total	2794	723	3517	991	2875	3867

4.3.18 **Table 4-11** shows that the overall SH3 with Plot E/TH Scheme generates 3517 and 3867 people trips during the AM and PM peak hours respectively. Of which 450 and 396 two-way trips by private car will be made in the AM and PM peaks respectively.

4.4 Net Difference

- 4.4.1 Sections 4.2 and 4.3 established the predicted trip generation for the extant use of the TH site and the additional 175 dwellings associated with the Plot E/TH scheme. This section now sets out the net impact on both the TH site comparing the TH extant with the additional 175 units within the Plot E/TH scheme and the consented SH3 masterplan with the SH3 with Plot E/TH masterplan.

Extant TH compared with Plot E/TH scheme (175 residential dwellings)

- 4.4.2 **Table 4-12** sets out the anticipated level of transport impacts between the Extant TH and the additional Plot E/TH scheme (175 residential dwellings).

Table 4-12: SH3 with Plot E/TH Net Difference

Mode	Extant TH		Plot E/TH (Additional 175 dwellings)		Net Difference	
	AM Two-Way	PM Two-Way	AM Two-Way	PM Two-Way	AM Two-Way	PM Two-Way
From Home	1	1	5	4	4	4
Underground	0	0	1	0	0	0
Train	29	42	23	21	-6	-21
Bus	60	71	13	12	-47	-59
Taxi	0	0	0	0	0	0
Motorcycle	1	1	0	0	0	-1
Car Driver	30	27	33	30	3	3
Car Passenger	6	5	3	3	-3	-2
Bicycle	7	8	4	4	-3	-4
Foot	45	49	33	30	-13	-18
Other	0	0	1	1	1	0

- 4.4.3 **Table 4-12** shows that the proposal will result in an additional 3 'Car Driver' trips in the AM and PM peak hours, when compared with the extant uses if TH was fully operational.
- 4.4.4 It is therefore concluded that, whilst there could be a small increase in car driver trips, this is not anticipated to have any material impact on the function of the local highway network.

Consented SH3 compared with SH3 with Plot E/TH scheme

- 4.4.5 **Table 4-13** compares the predicted net change in transport modes between net changes of the consented SH3 Scheme and proposed SH3 with Plot E/TH Scheme.

Table 4-13: Net Difference

Mode	Consented SH3 Net Difference		SH3 with PlotE/TH Net Difference		Difference Between Schemes	
	AM 2-Way	PM 2-Way	AM 2-Way	PM 2-Way	AM 2-Way	PM 2-Way
From Home	12	11	16	15	4	4
Underground	2	2	2	2	0	0
Train	764	698	780	697	17	-1
Bus	804	735	776	692	-28	-42
Taxi	3	3	4	3	0	0
Motorcycle	12	11	12	10	0	0
Car Driver	35	45	-3	12	-38	-33
Car Passenger	-1	2	-11	-7	-10	-9
Bicycle	83	75	81	72	-2	-3
Foot	425	388	417	374	-8	-14
Other	4	4	5	4	1	0

- 4.4.6 **Table 4-13** shows that the SH3 with Plot E/TH Scheme result in a reduction of 38 two-way vehicle trips during the AM peak and 33 vehicles during the PM peak against the consented SH3 application.

- 4.4.7 This is due to the TH baseline generating additional car driver trips if it was to be fully operational due to its existing parking availability, while the SH3 with Plot E/TH scheme does not increase the parking provision of the SH3 development.

4.5 Sensitivity Test

- 4.5.1 A sensitivity test has been undertaken to understand the potential displacement of office car driver trips. This assumes that due to the reduction in available office parking provision of 94 spaces (because of the reallocation of these to residential spaces due to the additional 175 units proposed) compared with the consented SH3 masterplan.
- 4.5.2 This sensitivity test assesses the impact on surrounding multi-storey public car parks within the Town Centre based on the same methodology used within the SH3 TA for the displacement of public car parking.
- 4.5.3 The SH3 with Plot E/TH scheme re-allocated 94 of the 595 parking spaces reserved for the office to meet the parking standard requirements for the proposed residential dwelling composition.
- 4.5.4 Displaced car driver trips have been redistributed based on the distance from Garrard Street car park to alternative car parks within the town centre. This means that car parks located closer will get a greater weighting of trips being distributed to them. The walking distance, rather than the drive distance, was used, as drivers will select a particular car park based on the distance from their next destination (such as their place of work/shops/rail station), which will be made on foot. It is accepted that parking charges will also affect attractiveness but the exercise gives an indication of the spread of impact.
- 4.5.5 **Table 4-14** details the proportion used for the re-distribution of displaced car drivers to alternative car parks and the maximum number of vehicles this displacement equates to. It also details the maximum occupancy of each of the local car parks with the reallocation of SH3 Garrard Street Car Park.

Table 4-14: Estimated displacement of Office Car Drivers from SH3 Consented Scheme

Car Park	Proportion of Trips Assumed to Utilise Each Car Park	Number of Spaces (94 spaces)	Parking Space Availability (post SH3 reallocation of Garrard Street Car Park)	Parking Space Availability (post SH3 with Plot E / TH reallocation of 100 office parking spaces)
Station	27.24%	26	434	408
Chatham Place	17.90%	17	323	306
Broad Street	15.66%	15	241	226
Holybrook	15.28%	14	N/A	N/A
Riverside	12.53%	12	690	678
Queens Road	11.39%	11	220	209
Total	100%	94	2054	1960

- 4.5.6 Based on a reallocation of 94 spaces from the office provision for SH3 with Plot E /TH, this will redistribute the majority of trips to the Station Car Park, with 26 additional vehicles. These levels are based on the average maximum daily occupancy recorded within the data supplied by RBC. It should be noted that car parking occupancy data for Holybrook Car Park could not be previously supplied by RBC, however the above table shows there is sufficient capacity throughout the town centre to cater for the estimated additional users, with additional parking availability likely to also be available at the Cattle Market, Hills Meadow and Kings Meadow car parks which haven't been accounted for within this assessment.

5 Cumulative Impact

- 5.1.1 An extensive Transport Assessment was prepared for the consented SH3. This included a highway impact assessment using Readings Transport Model (RTM). Analysis of the impact the development would have on the existing bus network was also provided.

5.2 Vehicle Impact

- 5.2.1 It has been estimated that the net impact of the proposed Plot E/TH Scheme (175 additional residential dwelling) against the extant TH site, if it was to be fully operational, will result in an additional 3 two-way 'Car Driver' trips in the AM and PM peak hours, shown in **Table 4-12**. This can be considered non material to the operation of the highway network.
- 5.2.2 Assessing the SH3 Scheme with the alterations to parking provisions proposed as part of the Plot E/TH Scheme, shows a reduction of 38 two-way vehicle trips during the AM peak and 33 vehicles during the PM peak when compared with the consented SH3 application, as shown in **Table 4-13**.
- 5.2.3 It can therefore be concluded that the proposals for the SH3 with Plot E/TH does not have a material impact on the local highway network.

5.3 Bus Impact

- 5.3.1 It has been estimated that the net impact of the proposal for the Plot E/TH scheme would result in a decrease in (two-way) bus trips in both the AM and PM peak, as shown in **Table 4-12** and **Table 4-13** for the TH extant with Plot E/TH comparison and consented SH3 comparison with SH3 with Plot E/TH respectively.
- 5.3.2 It can therefore be concluded that the proposals for SH3 with Plot E/TH does not have material impact on the operation of the local bus network.

5.4 Framework Travel Plan

- 5.4.1 The SH3 Framework Travel Plan (FTP) has been amended to include the Plot E/TH Scheme to help promote the sustainable accessibility of the site.

6 Conclusions

- 6.1.1 This Transport Statement considers the development proposals in context of the anticipated impact that would occur as a result of the SH3 with Plot E/TH scheme.
- 6.1.2 The proposed alterations to the Plot E scheme, provides an additional 175 additional residential dwellings to the overall SH3 scheme.
- 6.1.3 It is demonstrated that the development is very well served by pedestrian and cycle infrastructure, as well as public transport services, in the well-established Reading town centre, close to the train station, location.
- 6.1.4 Cycle parking has been proposed to meet with RBCs minimum cycle park standards.
- 6.1.5 Vehicular parking to serve the additional residential dwellings proposed is to be provided to RBC standards.
- 6.1.6 There is sufficient capacity within the local public car parks to accommodate the reduction in office car parking spaces due to the re-distribution of available office spaces to allocated residential spaces.
- 6.1.7 It has been demonstrated that the proposal does not result in a material impact in trip generation that would affect the operation of the local highway network.
- 6.1.8 The proposal is not anticipated to have a negative impact on the operation of the local bus network.



Appendix 9.3

Site Wide Travel Plan

Station Hill

Site-Wide Framework Travel Plan

On behalf of **Sackville Developments (Reading) Limited**

Project Ref: 16996/010 | Rev: v2.0 | Date: July 2015

Document Control Sheet

Project Name: Station Hill

Project Ref: 16996/010

Report Title: Site-Wide Framework Travel Plan

Doc Ref: FTPv2.0

Date: July 2015

	Name	Position	Signature	Date
Prepared by:	Graham Smith	Senior Technician	10.07.15	GS
Reviewed by:	Chris Brice	Principal Engineer	10.07.15	CB
Approved by:	Scott Witchalls	Partner	10.07.15	SW
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
V1.0	25.03.13	For Planning	EW / AR	SM	SW
V2.0	10.07.15	Telecom House revision	GS	CB	SW

Peter Brett Associates LLP disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Peter Brett Associates LLP accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Peter Brett Associates LLP 2015

Contents

1	Introduction	1
1.1	Context	1
1.2	Travel Plan Approach	1
1.3	Objectives	2
2	Transport Planning Policy and Best Practice	3
2.1	Introduction	3
2.2	Summary	3
3	Existing Accessibility	4
3.2	Site Location	4
3.3	Walking and Cycling	4
3.4	Public Transport	5
3.5	Rail Services.....	8
3.6	Highway Access	9
3.7	Accessibility to Local Amenities and Facilities	11
3.8	Summary	13
4	Future Accessibility	14
4.1	Introduction	14
4.2	Rationale	14
4.3	Reading Station Redevelopment Project	14
4.4	South Western Interchange.....	Error! Bookmark not defined.
5	Access Strategy and Parking.....	15
5.1	Access Strategy.....	15
5.2	Parking	16
6	Travel Plan Management	17
6.1	Site Travel Plan Co-ordinator	17
6.2	Occupier Travel Plan Co-ordinators	18
6.3	Funding and Handover	18
7	Action Plan.....	19
7.1	Introduction	19
7.2	Measures to Promote and Encourage Walking and Cycling.....	19
7.3	Measures to Promote and Encourage Public Transport Use.....	19
7.4	Measures to Promote and Encourage Car Sharing	20
7.5	Parking Measures.....	20
7.6	General Measures to Promote Sustainable Travel	20
7.7	Implementation Plan.....	21
8	Targets and Monitoring	1
8.1	Targets	1
8.2	Monitoring.....	3

Figures

Figure 3-1: Site Location Plan	4
Figure 3-2: Reading Central Bus Stop Locations and Services	8
Figure 3-3: Existing Vehicle Access (Strategic Network)	10
Figure 3-4: Existing Vehicle Access (Local Network).....	11
Figure 3-5: Pedestrian Accessibility	12
Figure 3-6: Cycling Accessibility.....	13
Figure 5-1: Access Strategy	15
Figure 8-1: FTP Monitoring Regime	3

Tables

Table 1-1: Requirements for Travel Occupier Statement or Occupier Travel Plan.....	1
Table 3-1: Local Bus Services.....	5
Table 3-2: Key Rail Destinations	9
Table 3-3: Suggested Walking Distances and Times	11
Table 5-1: Proposed and Assessed Parking Allocation	16
Table 8-1: Interim Targets	1

1 Introduction

1.1 Context

- 1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Sackville Developments (Reading) Ltd to develop a site-wide Framework Travel Plan (FTP) in support of the proposed mixed used development at Station Hill, Reading.
- 1.1.2 The site, both currently and historically, has accommodated a number of different land uses including: various mixed retail uses – within the Friars Walk Arcade and Station Hill Frontage (the majority of which are now closed); a restaurant; food outlets; a bingo hall (now closed); Garrard Street public car park; a public house (now closed); the old bus depot, and Telecom House
- 1.1.3 The proposed redevelopment scheme seeks to obtain planning permission for the following maximum land uses: up to 122,000m² of B1 office use (GEA); up to 13,500m² of A1-A5 retail uses, up to 2,200m² of D2 leisure use; and up to 475 residential dwellings.
- 1.1.4 Given the location of the site in Central Reading, the proposed redevelopment has been designed to support sustainable modes. However, a strategy is necessary to ensure that the proposed redevelopment conforms to national and local policy, which highlights the need to reduce the need to travel, especially by car.

1.2 Travel Plan Approach

- 1.2.1 The Department for Transport (DfT) in its recent report 'Good Practice Guidelines - Delivering Travel Plans through the Planning Process' (2009) defines a travel plan as "a long-term management strategy for an occupier or site that seeks to deliver sustainable transport objectives through positive action and is articulated in a document that is regularly reviewed".
- 1.2.2 The document also identifies that a FTP is an appropriate tool for large mixed-use developments with multiple occupants or mixed classes. A FTP differs slightly from a standard travel plan, in that it is formulated in the period prior to occupation. Whereas the general land uses within the site are known, the specific demographic and geographic profile of residents, employees and visitors travelling to/from the proposed redevelopment site are not known. As such, this FTP sets out a theoretical and practical framework for managing travel demand and includes a range of measures recommended to achieve its objectives.
- 1.2.3 This FTP will form the basis upon which the occupants will prepare in detail their own travel plans as appropriate. These documents would take into account their own specific travel planning requirements, for example arising from differing working practices and operations.
- 1.2.4 The form of these documents will either be a Travel Occupier Statement (TOS) or an Occupier Travel Plan (OTP) based on the DfT requirements outlined in **Table 1-1**.

Table 1-1: Requirements for Travel Occupier Statement or Occupier Travel Plan

Land Use	Travel Occupier Statement	Occupier Travel Plan
A1 Food Retail	>250<800m ²	>800m ²
A1 Non-Food Retail	>800<1500m ²	>1500m ²
A2 Financial and Professional Services	>1000<2500m ²	>2500m ²
A3 Restaurants and cafés	>300<2500m ²	>2500m ²
A4 Drinking establishments	>300<600m ²	>600m ²

A5 Hot-food takeaway	>250<500m ²	>500m ²
B1 Business	>1500<2500m ²	>2500m ²
C3 Dwelling houses	>50 <80 units	>80 units
D2 Assembly and leisure	>500<1500m ²	>1500m ²

1.3 Objectives

1.3.1 The objectives of this FTP are to achieve:

- A framework for the promotion of sustainable travel to/from the proposed redevelopment
- Establish a series of measures to manage single car occupancy to the proposed redevelopment site by residents, employees and visitors
- A feasible on-going coordination process to ensure that the initiatives and their impacts are maintained and monitored
- To contribute local sustainable transport objectives, and in particular to contribute to the overall accessibility of the proposed redevelopment site
- Ensure that residents, employees and visitors to/from the proposed redevelopment site has appropriate accessibility to local services.

2 Transport Planning Policy and Best Practice

2.1 Introduction

- 2.1.1 This section provides an overview of the current national and local government policies that have and will continue to inform the development of this FTP. These policies will influence development and implementation of the FTP.

National Planning Policy

- National Planning Policy Framework (Department for Communities and Local Government, 2012).
- Highways Agency Circular 02/2007: Planning and the Strategic Road Network (Highways Agency, 2002).



Local Planning Policy

- Core Strategy (adopted in 2008)
- Reading Central Area Action Plan (adopted in 2009)
- Local Transport Plan 3 (2011 – 2026) (2011)
- Station Hill South Planning and Urban Design Brief (2006)



Other Travel Planning Best Practice

- Smarter choices – Changing the Way We Travel (DfT, 2004).
- Making Personal Travel Planning Work: Research Report (DfT, 2007).
- The Essential Guide to Travel Planning (DfT, 2007).
- Good Practice Guidelines: Delivering Travel Plans through the Planning Process (Department for Transport and Department for Communities and Local Government, 2009).



2.2 Summary

- 2.2.1 Following a review of national and local policy it can be concluded that the FTP for Station Hill will play an integral part in achieving national and local transport objectives. The measures and strategies outlined within this FTP document will be targeted towards reducing congestion by reducing the need to travel and promoting alternative sustainable modes of travel from the outset.

3 Existing Accessibility

- 3.1.1 In order to understand the existing site location, all of the current site travel opportunities have been reviewed to determine the potential modes of travel available to all users of the proposed redevelopment.

3.2 Site Location

- 3.2.1 The Station Hill site is situated directly south of Reading Station and the south western Interchange and to the north of the town centre's retail core. The site is bordered by Station Hill immediately north, Garrard Street and Friar Street to the south, and Greyfriars Road to the west. The location of the site is provided in **Figure 3-1**.

Figure 3-1: Site Location Plan



3.3 Walking and Cycling

- 3.3.1 Given the town centre location, the site has good pedestrian facilities from all routes feeding the site with generally wide footways on both sides of the carriageway with standard street lighting.
- 3.3.2 The Station Interchange (including bus and taxi stops, passenger drop off and cycle stands) is located between SH3 and the main Reading Station building. This area is has recently been redevelopment as part of the Reading Station Area redevelopment proposals. The interchange provides a pedestrian area immediately to the north of SH3, with an improved rail station in terms of rail capacity and station facilities.
- 3.3.3 The site is located within close proximity of the Reading Town Centre Cycle Route and routes R1 (M4 J11, Madejski Stadium and Green Park and Kennet Island) and the R10 (Whitley to Reading). Reading Town Centre Route also links the site with routes:
- R2 - Lower Earley, Reading University and Redlands to Central Reading;
 - R3 – Bulmershe, Palmer Park and Newtown to Central Reading

- R5 – Tilehurst Station, The West Village and Oxford Road to Reading Town Centre
- R6 – Meadway, Southcote and Coley Park to Central Reading;
- R20 – Winnersh, Earley, Reading University and Redlands to Central Reading;
- R30 – Wokingham Road, Palmer Park and Thames Valley University to Central Reading;
and
- R50 – Tilehurst Village, Meadway, Prospect Park and Oxford Road to Reading Town Centre

3.3.4 NCN route 4 is a short distance from the site providing access to between Reading and Basingstoke, Newbury and Bath. This route also provides access to surrounding the residential areas such as Whitley Wood, Southcote, Caversham and Woodley.

3.4 Public Transport

3.4.1 Public transport is important in providing sustainable means of travel to local leisure, retail, education and employment opportunities. Reading benefits from an excellent bus and rail network, directly opposite and adjacent to the Station Hill site.

Bus Services

3.4.2 Given its central location, the Station Hill site is extremely well served by the local bus service network providing public transport connections between the site and much of the Reading area. Within 'Guidelines for Providing for Journeys on Foot' published in 2000 by the Institution of Highways and Transportation, it is recommended that in Town Centres an acceptable walking distance towards a bus stop would be 400 metres. A summary of the bus stops located within the recommended maximum walking distance of 400 metres is detailed in the **Table 3-1**.

Table 3-1: Local Bus Services

Route / Operator	Details	Approximate Frequency (mins)			
		Monday – Friday Peak	Monday – Friday Off Peak	Saturday	Sunday
Jet Black Reading Buses	Newbury – Thatcham - Reading	25 mins	30 mins	30 mins	60 mins
2 / 2a Reading Buses	Peppard Common – central Reading – Mortimer	30 mins	30 mins	30 mins	30 mins
5 Reading Buses	Reading Station – Northumberland Avenue	8 mins	8 mins	20 mins	20 mins
6 / 6a Reading Buses	Reading Station – Whitley Wood	8 mins	8 mins	10 mins	20 mins
9 Reading Buses	Central Reading - Shinfield Park - Whitley Wood	20 mins	20 mins	20 mins	30 mins
11 Reading Buses	Reading – Coley Park	20 mins	20 mins	30 mins	60 mins
13 Reading Buses	Woodley Airfield – Reading Station	30 mins	30 mins	30 mins	60 mins

14 Reading Buses	Reading Station – Woodley Colemansmoor Road	30 mins	30 mins	30 mins	30 mins
15 / 15a Reading Buses	Tilehurst – Dee Road – Reading Station	15 mins	15 mins	20 mins	30 mins
16 / 16a Reading Buses	Purley – Reading Station	15 mins	15 mins	20 mins	30 mins
17 Reading Buses	Wokingham Road - Reading - Oxford Road - Tilehurst	7 mins	7 mins	7 mins	15 mins
18 Reading Buses	Reading Station – Calcot Sainsbury	N/A	90 mins	105 mins	N/A
19A Reading Buses	Reading Station – Woodley – Lower Earley Asda	60 mins	60 mins	60 mins	N/A
19B Reading Buses	Reading Station – Woodley – Beech Lane	60 mins	60 mins	60 mins	N/A
19C Reading Buses	Reading Station – Woodley – Silverdale Road	60 mins	60 mins	60 mins	N/A
21 / 21a Reading Buses	Reading Station – Lower Earley (Kilnsea Drive)	5 -10 mins	5 -10 mins	10 mins	20 mins
22 Reading Buses	Caversham Heights - Reading	30 mins	30 mins	30 mins	60 mins
23 Reading Buses	Caversham Park - Reading	20 mins	20 mins	20 mins	30 mins
24 Reading Buses	Emmer Green - Reading	20 mins	30 mins	20 mins	30 mins
26 Reading Buses	Reading Station – Calcot Sainsbury's	10 mins	10 mins	12 mins	30 mins
27 Reading Buses Evening only	Friar Street – Amersham Road	N/A	60 mins	60 mins	60 mins
28 Reading Buses	Emma Green – Reading – Tilehurst - Purley	N/A	N/A	N/A	N/A
29 Reading Buses	Friar Street – Lower Caversham	30 mins	60 mins	60 mins	60 mins
33 / 33a Reading Buses	Reading Station – Tilehurst Triangle – Westwood Glen	8 – 10 mins	10 mins	10 mins	30 mins
Greenwave GreenPark	Reading Station – GreenPark	10 – 15 minutes	10 mins	N/A	N/A
Greenwave Kennet Island	Reading Station – Kennet Island	12 – 14 mins	20 mins	30 mins	N/A
Greenwave Madejski P&R	Reading Station – Madejski P&R	8 – 10 mins	10 mins	15 mins	N/A
Greenwave RIBP	Reading Station – Reading Internation Business Park	15 mins	15 mins	N/A	N/A
X39/X40 Thames Travel	Oxford – Wallingford - Reading	45 mins	30 mins	60 mins	60 mins

72 Fleet Buzz	Reading station – Aldershot Bus Station	60 mins	60 mins	60 mins	N/A
82 Fleet Buzz	Reading – Swallowfield – Yateley - Farnborough	100 mins	60 mins	N/A	120 mins
82/82K Reading Buses	Reading Station - Swallowfield	N/A	N/A	N/A	120 mins
90 First in Berkshire & The Thames Valley	Reading – Wokingham - Bracknell	15 mins	15 mins	15 mins	60 mins
126 Thames Travel	Wokingham – Twyford - Reading	N/A	N/A	N/A	N/A
127 Thames Travel	Maidenhead – Twyford – Reading	N/A	N/A	N/A	N/A
128 Thames Travel	Wokingham – Twyford - Reading	N/A	60 mins	120 mins	N/A
129 Thames Travel	Wokingham – Twyford - Reading	35 mins	N/A	N/A	N/A

- 3.4.3 Based on the above, it is evident that the site benefits from excellent access to a wide choice of bus services due to its close proximity to the town centre bus stops, providing the opportunity for a significant level of trips to be accommodated by bus. Approximately 100 buses per hour serve the area around the development site in the peak hours.
- 3.4.4 There are also a number of strategic bus routes (including the 'Greenwave' services) that operate along the A33 corridor between Green Park, the Madejski Park and Ride and Reading International Business Park (RIBP) from the new south west interchange area adjacent to Reading Station. The main interchange area is located close to the site to the east on Station Road and Forbury Road adjacent to Reading Station.
- 3.4.5 There is an additional 'Fasttrack' service which provides a connection between the site and the Park and Ride site at Loddon Bridge to the east of the town centre. Stewarts Coaches operates services between the town centre and Thames Valley Park. Direct and frequent services operate along these routes.
- 3.4.6 The 'Rail-Air' Link, located outside Reading Station, provides a frequent coach service to and from Heathrow Airport.
- 3.4.7 The location of the site in context to the town centre bus stops is highlighted on **Figure 3-2**.

3.5 Rail Services

- J:\16996_St\16996-010_Telecom
House\Transport\Working Documents\Draft
Report\FTIPv2.0 - update.docx

Table 3-2: Key Rail Destinations

Destination	Services per hour		Journey time (mins)
	Peak	Off-Peak	
Maidenhead	5	4	14
Slough	4	4	14
Basingstoke	3	3	22
Oxford	4	4	23
London Paddington	10	8	27
London Waterloo	4	2	85
Swindon	5	4	27
Southampton	2	2	56
Bath	2	2	58
London Gatwick	5	3	85
Cardiff	2	2	95
Birmingham	2	2	97

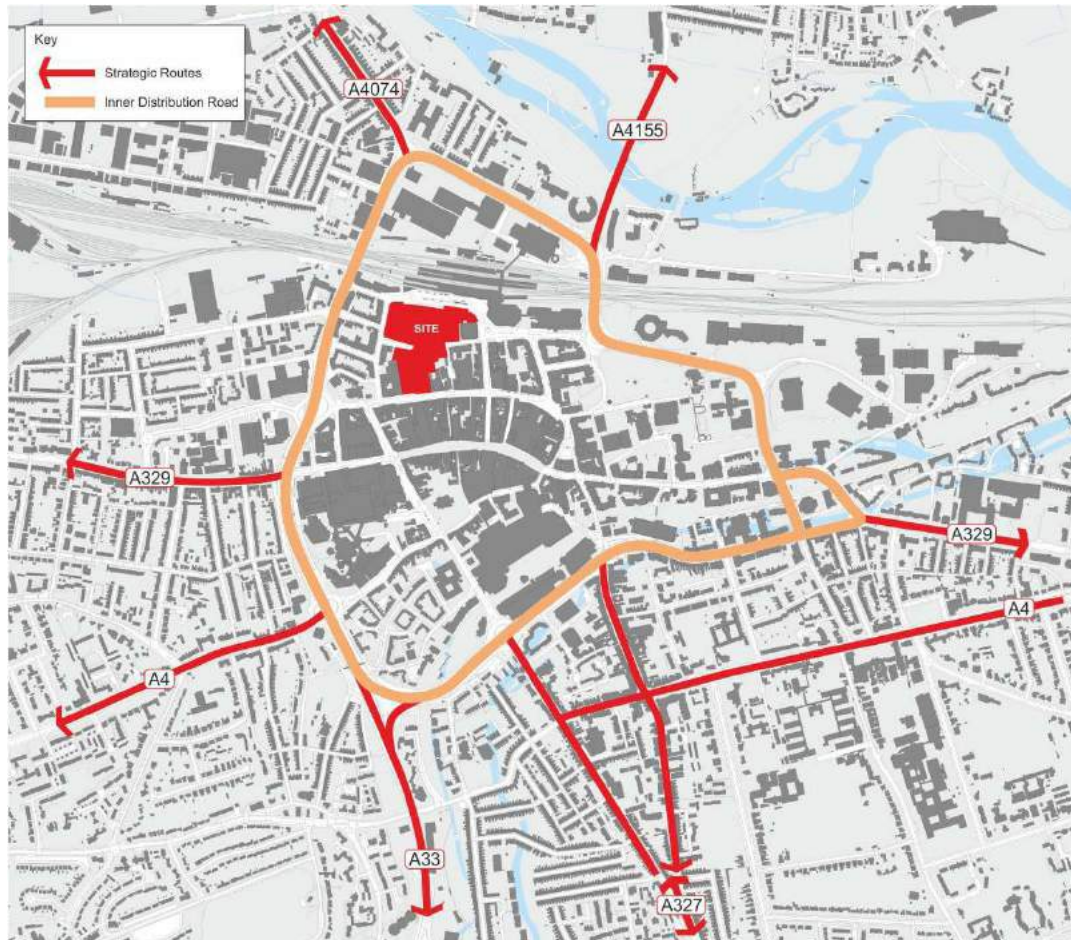
Source: <http://nationalrail.co.uk>

- 3.5.5 From **Table 3-2** it can be seen that the site is extremely well connected to a number of key conurbations via the rail services. The site is particularly well connected to central London, with up to 10 services per hour provided with the journey time to London Paddington being just 27 minutes.

3.6 Highway Access

- 3.6.1 The existing highway access routes (to the Station Hill site) in a strategic context are shown in **Figure 3-3** below. This shows the strong links to the strategic road network, such as the IDR and a number of radial routes to/from Reading Town Centre.
- 3.6.2 The principal vehicle routes to the site are via Reading's Inner Distributor Road (IDR). The IDR is for the most part a dual, two lane orbital route which provides the following connections into Reading town centre:
- North: Via Reading and Caversham Bridges;
 - East: Via the A329 Kings Road and the A4 London Road;
 - South: Via the A33, leading to Junction 11 of the M4; and
 - West: Via the A4, the junctions with A4155 Castle Hill and the A329 Chatham Street.

Figure 3-3: Existing Vehicle Access (Strategic Network)

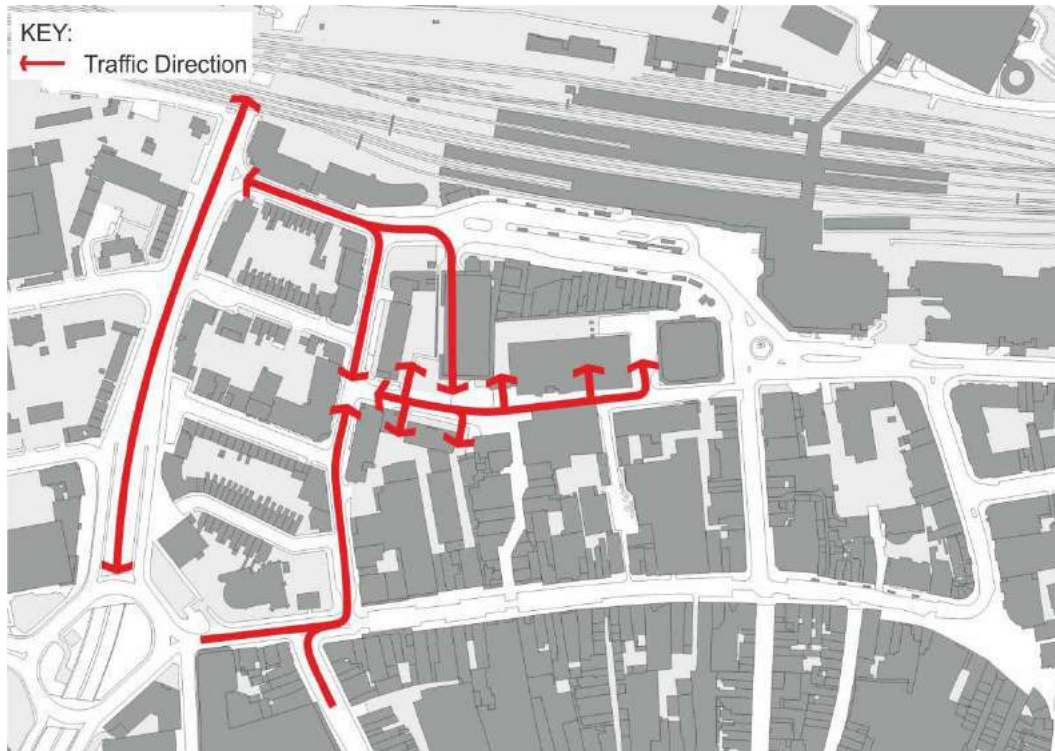


- 3.6.3 There are two existing points of access to the site from the wider area. The first is from the Tudor Road / IDR (Caversham Road) to the north. The second is via Greyfriars Road, which is a one-way street and provides access for vehicles from the south. Greyfriars Road is reached from the grade separated Chatham Street roundabout.
- 3.6.4 All vehicles have to exit the site via the Tudor Road junction with the IDR (Caversham Road). Drivers wishing to travel north must perform a U-turn at the Chatham Street roundabout. The Stanshawe Road junction with the IDR is restricted to bus, taxi and cycle movements only.
- 3.6.5 Garrard Street is located to the south of the main part of the Station Hill site and provides vehicular access to the existing mix of land uses within the Station Hill site. Through movement between Greyfriars Road and Station Road is not possible for general traffic. Taxis are currently permitted to exit Greyfriars Road onto Station Road as part of the taxi queuing arrangement for the taxi rank outside the Station.
- 3.6.6 There are currently five vehicle access points provided into the Station Hill site, four are located on Garrard Street and one from Station Hill. The existing accesses currently serve:
- The Garrard Street multi-storey National Car Parking (NCP) car park in the east of the Site;
 - A separate egress to the Garrard Street car park, forming the access to the servicing and delivery area for Thames Tower adjacent to the east of the Site;
 - An access/egress to the Western Tower car park in the west of the Site; and

- An access/egress to the Xafinity House office buildings situated on the western side of the Site; and

3.6.7 The existing local highway access routes to and from the site are shown in **Figure 3-4**.

Figure 3-4: Existing Vehicle Access (Local Network)



3.7 Accessibility to Local Amenities and Facilities

3.7.1 The distances people are prepared to walk or cycle to destinations are dependent on local circumstances such as; desirable and safe routes, ease and number of road crossings, weather conditions and the purpose of the trip. People are often prepared to walk further as part of a journey to work than say a main shopping trip, although the nature of an industrial employment use and it's dependency on operational vehicles often dictates how employees travel to/from work.

3.7.2 **Table 3-3** shows the suggested acceptable walking distances for pedestrians without mobility impairment, for some common trip purposes.

Table 3-3: Suggested Walking Distances and Times

Definition	Town Centres		Commuting/School		Elsewhere	
	Metres	Minutes	Metres	Minutes	Metres	Minutes
Desirable	200	2.5	500	6.25	400	5
Acceptable	400	5	1000	12.5	800	10
Preferred Maximum	800	10	2000	25	1200	15

Source: Providing for Journeys on Foot (Institute of Highways and Transport, 2000)

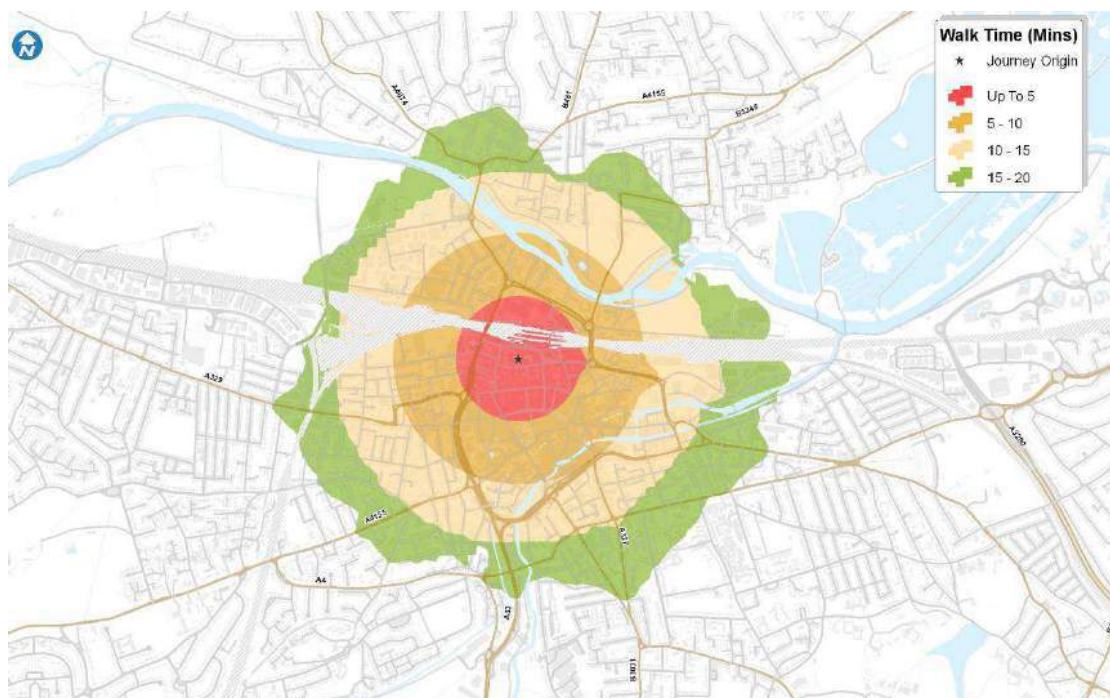
3.7.3 From the above guidance, it is evident that the preferred maximum walking distance to a workplace is 2.0 kilometres.

- 3.7.4 The Local Transport Note (LTN) 1/04 – ‘Policy, Planning and Design for Walking and Cycling’ states: “there are limits to the distances generally considered acceptable for utility walking and cycling. The mean average length for walking journeys is approximately 1 kilometres (0.6 miles) and for cycling, it is 4.0 kilometres (2.4 miles), although journeys of up to three times these distances are not uncommon for regular commuters. The distances people are prepared to walk or cycle depends on their fitness and physical ability, journey purpose, settlement size, and walking/cycling conditions”.

Walking Accessibility

- 3.7.5 The Station Hill site benefits from exceptionally good walking connections due to its central location within Reading Town Centre. All of the town centre amenities and shops are within a 15 minute walk of the site as shown in **Figure 3-5**.

Figure 3-5: Pedestrian Accessibility



3.7.6 Cycle isochrones radiating from the Station Hill site are shown in **Figure 3-6**. This assumes a cycle speed of 16 kilometres per hour.

3.8 Summary

J:\16996_St\16996-010_Telecom
House\Transport\Working Documents\Draft
Report\FT Pv2.0 - update.docx

4 Future Accessibility

4.1 Introduction

- 4.1.1 This section describes the rationale and the approach taken to ensure that the Station Hill development is integrated with the wider transport strategy.

4.2 Rationale

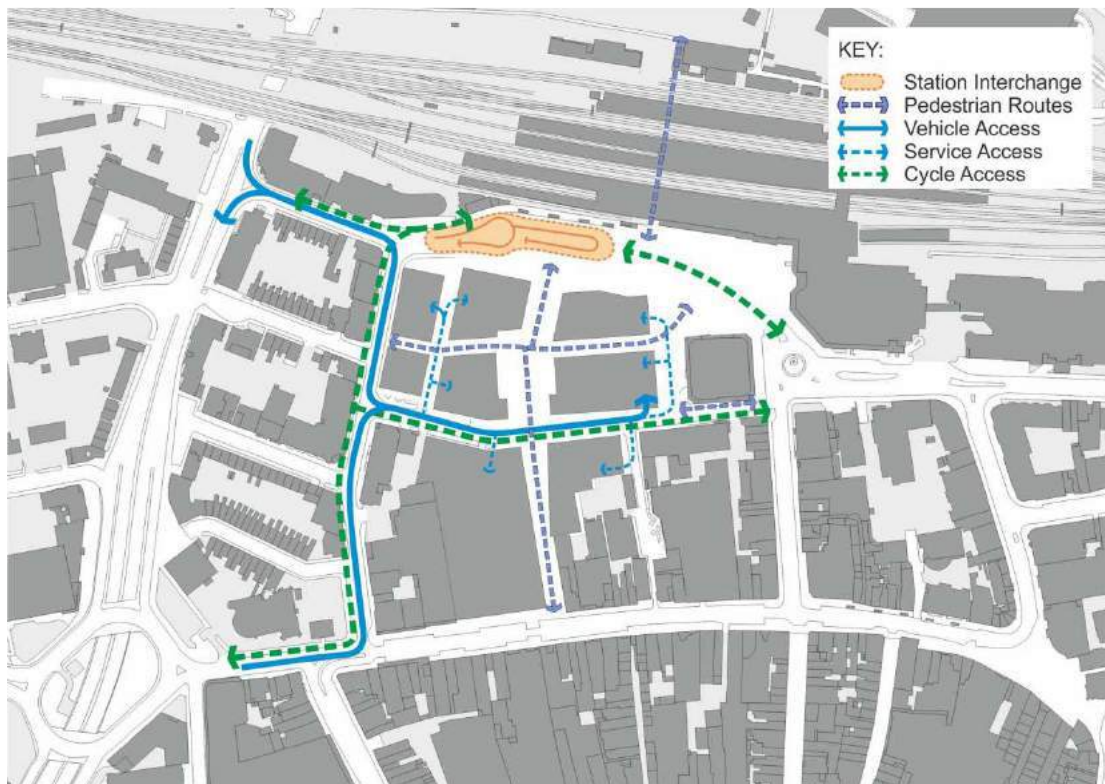
- 4.2.1 The rationale that underpins the transport proposals for Station Hill has been based on the concept of a Transport Development Area – a high density mixed use development located in a highly accessible area. The approach has been to ensure that the development can work in and take advantage of these very high accessibility levels at Reading Station, whilst providing sufficient flexibility to support emerging longer-term transport proposals. In essence this approach has been based around the following:
- Placing Reading Station at the heart of the access and movement strategy and integrating the development with the station
 - Design of the masterplan to fit with the recently completed South Western Interchange and the associated improvements for the streets in the station area.
- 4.2.2 In addition, the Station Hill scheme has been designed to integrate with wider interchange and public realm proposals being promoted by RBC. These proposals will provide a series of high quality streets and squares and will help to strengthen the north-south axis linking the River Thames, station area and central Reading.

5 Access Strategy and Parking

5.1 Access Strategy

- 5.1.1 **Figure 5-1** shows the proposed access strategy to the proposed redevelopment site and the adjacent transport proposals discussed in Section 4.

Figure 5-1: Access Strategy



- 5.1.2 Pedestrian access will be gained via Friar Street, Garrard Street, Greyfriars Road and Station Hill/Station Square. Connections within the development site will improve pedestrian integration between Friar Street, Station Hill and the railway station. These enhanced connections support RBC's aspirations to improve pedestrian linkages over the railway line, which is highlighted within the RCAAP and LTP3.
- 5.1.3 The development proposals are based upon the principle of creating a new primary pedestrian street that runs through the Station Hill site linking Reading Station and Friar Street. Linkages are also made to the lowered station interchange and Greyfriars Road. These enhanced connections have been designed to support the aspirations to improve pedestrian linkages across the railway line; an issue highlighted in RCAAP and LTP3. The creation of a new southern station entrance and public square has also formed an important element in the design and layout of the buildings and streets in the Station Hill scheme.
- 5.1.4 Access for vehicles travelling from the south would be via the IDR roundabout with Chatham Street onto Friar Street. From Friar Street, vehicles would proceed along Greyfriars Road and into Garrard Street.
- 5.1.5 Access to the Station Hill site for vehicles travelling from the north will be via the IDR (Caversham Road) junction with Tudor Road, proceeding on to Greyfriars Road and into Garrard Street.

- 5.1.6 All vehicles leaving the site will travel via the IDR (Caversham Road) junction with Tudor Road. Vehicles travelling north will U turn at the Chatham Street/IDR roundabout.

5.2 Parking

- 5.2.1 Up to 1,000 parking spaces are proposed within the development. The initial allocation of this parking provision based on the maximum floor areas is summarised in **Table 5-1**. This allocation is subject to change to serve the occupation as the scheme is developed .

Table 5-1: Proposed and Assessed Parking Allocation

Land Use	Parking Allocation	Parking Ratio
Use Class B1a (offices)	315	1 space per 310m ²
Use Class C3 (residential)	250	0.5 spaces per 1 / 2 bedroom flat 1.0 space per 3+ bedroom
Public Car Parking Spaces	255	
Provision for Thames Tower	180	20% of total parking in MSCP
Total	1000	

- 5.2.2 The development proposals will look to maximise the potential for cycle travel to and from the Station Hill site. This will be achieved by the provision of up to 700 total cycle parking spaces for residents within the development, commercial users and those associated with the retail and leisure activities.

6 Travel Plan Management

6.1 Site Travel Plan Co-ordinator

- 6.1.1 The developer will appoint a Site Management Company for the site and the role of Site Travel Plan Co-ordinator (STPC) will be undertaken by an employee based on-site. The appointment of a STPC will commence on occupation of the first building and the appointment will remain in place until full occupation or until responsibilities have been transferred to occupier travel plan co-ordinators (OTPC). In the event that the appointed Site Management Company changes, the role will be transferred as a part of any subsequent appointment.
- 6.1.2 The STPC will be responsible for overseeing the implementation of the FTP based on this initial document including the promotion of its contents to prospective occupiers. The FTP is the responsibility of the STPC. The STPC will contact RBC to advise that work has commenced on delivering the FTP. The obligation to deliver a TOS/OTP under the 'umbrella' of this FTP will form part of the sales/lease agreement for the B1 office; A1-A5 retail uses, D2 leisure use and up to 300 residential dwellings.
- 6.1.3 Some of the key responsibilities of the STPC are set out below but these will be reviewed on a regular basis:
- Undertaking the role of Residential Travel Plan Co-ordinator and producing a Residential Travel Plan for implementation, monitoring and maintaining at the residential development on site.
 - Meet with the individual occupiers to ensure an integrated approach to accessibility for as well as other nearby similar developments.
 - Ensuring that each occupier has appointed an Occupier Travel Plan Co-ordinator (OTPC) (discussed in further detail in Section 7) and prepared a TOS/OTP under the 'umbrella' of this FTP;
 - Ensuring that each of the OTPC has introduced each employee to their respective TOS/OTP.
 - Ensuring that each OTPC complies with the travel planning standards and conditions and also meets specific targets;
 - Ensuring that as a minimum biennial travel surveys are produced and provided to each OTPC. All the OTPC's will work with the STPC to collect the data;
 - Organising Personal Travel Planning programmes and the preparation of personalised Travel Welcome Packs and a generic Travel Welcome Pack;
 - Managing any contractual agreements with organisations such as Liftshare, any car club, or any additional third party service providers associated with the site.
 - The STPC will also act as a point of information and guidance in raising awareness of workplace travel issues through e-mails, newsletters, memos, leaflets, special activities, promotions, and reinforcing annual activities such as 'In Town Without My Car', 'National Bike Week' and 'National Walk Week'.
 - Analysing the results of travel surveys and liaising RBC to discuss the results against the targets set.
 - Ensuring that targets are being met and if they are not being met, how they may be addressed through an agreed mitigation package with RBC.

- 6.1.4 After full occupation of the development, the STPC will liaise RBC to reach agreement that the day to day responsibility for travel planning for the development will pass to the OTPC's working in conjunction with the appropriate officers at RBC.

6.2 Occupier Travel Plan Co-ordinators

- 6.2.1 Prior to the occupation of each building, any occupier will be required to name an OTPC whose details will be provided to RBC within 3 months of occupation of the site. An OTPC will remain in position for as long as the occupier is on the site. The role of the OTPC will most likely be a part-time role undertaken by an existing employee who will be responsible for assisting the STPC implement the FTP.
- 6.2.2 If an OTPC is not named until after occupation, a representative (such as a senior manager) shall act as the main contact until the OTPC is in place. The representative will be responsible for distributing the Travel Welcome Packs to all employees prior to their first day at work.
- 6.2.3 Some of the key responsibilities of the OTPC's are set out below but these will be reviewed on a regular basis:
- To promote and guide the development of their respective TOS/OTP within the FTP;
 - To advise employees in all matters relating to sustainable travel including providing information on public transport, cycling and walking;
 - Obtain current network, timetable and fare information from the STPC and ensure this is made readily available to employees;
 - To encourage employees living in close proximity to the site to walk or cycle to work;
 - To undertake at least biennial employee travel surveys and compare these to the modal split targets identified;
 - To liaise with the STPC and other OTPC's to share information and ideas
 - The OTPC's will ensure that all of the necessary systems relating to the TOS/OTP including data collection and recording, and the employee travel database are established, maintained and regularly updated.
 - The OTPC's will review the TOS/OTP annually following the employee travel to work surveys and the process of monitoring and review will feed into the review of the FTP.

6.3 Funding and Handover

- 6.3.1 In the short term, the ownership of the FTP lies with the Site Management Company and the developer throughout the construction period and until the point of handover to OTPC's after full occupation. This process will be funded by the developer. Responsibility for the FTP will ultimately rest with the Site Management Company.

7 Action Plan

7.1 Introduction

- 7.1.1 In order to meet the objectives set out in Section 1 of this FTP, the following specific 'hard' and 'soft' measures will be implemented at the proposed redevelopment. The measures to be provided as part of the FTP can be summarised into five categories –walking and cycling, public transport, car sharing, parking and general. The specific measures to promote and encourage these travel modes are summarised below.
- 7.1.2 In general, these measures will be applied across all of the land uses within the proposed redevelopment although it should be noted that certain measures will be more applicable to one land use category than others.
- 7.1.3 It should be noted that these measures have been selected in light of the key attributes of the proposed redevelopment site being situated in area of excellent public transport accessibility and local services.

7.2 Measures to Promote and Encourage Walking and Cycling

'Hard' Measures	An internal network of footways within the development plots to facilitate movement across the proposed redevelopment.
	Connections within the development site to improve pedestrian integration between Friar Street, Station Hill and the railway station.
	New pedestrian grid/public realm
	Provision of showers, changing rooms, drying rooms and lockers.
'Soft' Measures	Consider providing equipment to employees who are able to walk/cycle to and from work including waterproof clothing or umbrellas, basic cycle repair kit etc.
	Offer cycle proficiency training in conjunction with RBC.
	Arrange lunchtime/evening walk/cycle activities.
	Encourage residents and employees to register with liftshare.org, which provides a national travel database of hundreds of thousands of registered users wishing to find a Walk-BUDi or Bike-BUDI to share daily journeys to work on foot and cycle.

7.3 Measures to Promote and Encourage Public Transport Use

'Hard' Measures	An internal network of footways within the development plots to make it easy to get to bus stops, the station interchange and the main station
'Soft' Measures	Consider offering new employees a 1 week's trial bus ticket, if there is a suitable service available for their journey to work. Given the uptake, this could be subsidised and will incentivise employees to try out public transport for themselves.

7.4 Measures to Promote and Encourage Car Sharing

'Hard' Measures	Consider providing reserved 'car sharing' spaces within employee car parks
	Consider introducing a car club vehicle for residents
'Soft' Measures	Setting up a private Station Hill car sharing group on liftshare.org
	Encourage residents and employees to register with liftshare.org, which provides a national travel database of hundreds of thousands of registered users wishing to share daily journeys to work by car.
	Organise specialist coffee mornings and promotional events for those employees interested in car sharing.

7.5 Parking Measures

'Hard' Measures	Provision of suitable car parking: including car, cycle and motorcycle parking.
	Implementation of a controlled car park entry system and Car Park Management Plan
	Agree site car parking priority for residential and commercial occupiers

7.6 General Measures to Promote Sustainable Travel

- Develop Travel Welcome Packs for residents, occupiers and employees. This would include the following information:
 - o Walking and cycling maps and information on journey times to key destinations;
 - o Links to the liftshare.org website;
 - o Links to the RBC travel Reading Live; and
 - o Promotional articles on the benefits of sustainable travel and links to other relevant sustainable travel websites.
- Each occupier will provide a prominent 'Getting Here' link on their own websites promoting access by walking, cycling and public transport. This information will also be distributed to visitors following the arrangement of meetings.
- Prepare and distribute a newsletter on a bi-annual basis to inform residents and employees of upcoming promotional events and local travel issues.
- Briefings for occupiers and employees will be undertaken highlighting the role of the FTP and the relevance of the to them. The role of this is to ensure that all relevant users are fully aware of the content and obligations contained within the FTP document and prepared to support the planning application.
- Internal information boards will be provided in the main reception area of each building. These will be updated by each occupier.

- Participate in national travel awareness days including 'Green Transport Week' and 'Bike Week', 'Liftshare Week', 'Walk to Work Week', 'National Work From Home Day', 'Ride to Work Day' and 'World Environment Day'.

7.7 Implementation Plan

- 7.7.1 A summary of the specific measures to be implemented with respect to the proposed redevelopment are summarised in **Table 7-1**.

Table 7-1: Implementation Strategy

Area	Detail of Measure	Rationale	Land Use				Timescale	Responsibility	Cost
			Residential	Commercial	Retail	Leisure			
Management	Appoint STPC	To provide management resource for process	X	X	X	X	Prior to any occupation	Site Management Company	Approximately £3,000 per annum
	Ensure that leases include commitment to achieving objectives of FTP Plan	To ensure that the occupiers are aware of the FTP objectives		X	X	X	6 months prior to any occupation	Site Management Company	N/A
	Appoint OTPC	To provide management resource for process		X	X	X	Prior to occupation	Occupier	N/A
Walking and Cycling	An internal network of footways within the development plots to facilitate movement across the proposed redevelopment. Connections within the development New pedestrian grid/public realm Provision of showers, changing rooms, drying rooms and lockers.	Infrastrcutre provision	X	X	X	X	Prior to occupation	Developer	To be included within infrastructure costs
	Equipment offered to employees who are able to walk/cycle to/from work	Personal safety and confidence		X	X	X	Upon occupation	OTPC	Dependent upon employer commitments and staff numbers
	Cycle proficiency training with RBC			X	X	X	Within 6 months following occupation	OTPC	Free bicycle proficiency training offered by RBC

Site-Wide Framework Travel Plan
Station Hill



	Arrange lunchtime/evening walk/cycle activities		X	X	X	X	Within 6 months following occupation	STPC/OTPC	To be included in STPC/OTPC costs
	Encourage residents and employees to register with liftshare.org to find a Walk-BUDi or Bike-BUDI		X	X	X	X	Upon occupation	STPC/OTPC	
Public Transport	Consider offering new employees a 1 week's trial bus ticket	Promotion of more sustainable modes		X	X	X	Prior to commencement of employment	OTPC	Costs dependent on staff numbers
Car Sharing	Setting up a private Station Hill car sharing group on liftshare.org	Promotion of more sustainable modes resulting in improved network performance	X	X	X	X	Prior to occupation	STPC	£200 per annum
	Encourage residents and employees to register with liftshare.org to find a car share partner		X	X	X	X	Upon occupation	STPC/OTPC	N/A
	Organise specialist coffee mornings and promotional events for those employees interested in car sharing	Enhances profile of car sharing scheme		X	X	X	Within 6 months following occupation	STPC	To be included in STPC costs
	Consider introducing a car club vehicle for residents		X				Within 6 months following full occupation	Site Management Company	N/A
Parking	Provision of suitable car parking: including car, cycle and motorcycle parking. Implementation of a controlled car park entry system and Car Park Management Plan Agree site car parking priority for residential and commercial occupiers	Infrastructure provision	X	X	X	X	Prior to occupation	Developer/Site Management Company	To be included within infrastructure costs

Site-Wide Framework Travel Plan
Station Hill



	Implementation of a controlled car park entry system and Car Park Management Plan	Demand restraint	X	X	X	X	Upon occupation		
	Agree site car parking priority	Demand restraint		X	X	X	Prior to occupation		
General	Develop Welcome Packs for residents and occupiers	Promotion of more sustainable modes	X	X	X	X	Prior to occupation	STPC	£2000 per annum
	Develop Welcome Packs for new employees			X	X	X	As appropriate	OTPC	Included above
	Walking and cycling maps and information on journey times to key destinations		X	X	X	X	To be included in Welcome Packs for residents and occupiers	STPC/OTPC OTPC	To be included in Welcome Pack costs
	Links to the liftshare.org website		X	X	X	X			
	Links to the RBC travel-info website		X	X	X	X			
	Promotional articles on the benefits of sustainable travel		X	X	X	X			
	Prominent 'Getting Here' link			X	X	X	Prior to occupation		N/A
	Prepare and distribute a newsletter		X	X	X	X	Bi-annually	STPC	£500 per annum
	Briefings for occupiers and employees will be undertaken highlighting the role of the FTP			X	X	X	Upon occupation	STPC	To be included in STPC costs
	Update internal information boards/displays			X	X	X	As appropriate	OTPC	£250 per board
	Participate in national travel awareness days		X	X	X	X	Not later than 4 weeks preceding each EVENT day	STPC	To be included in STPC costs

8 Targets and Monitoring

8.1 Targets

- 8.1.1 At this stage of implementation process it is not possible to identify the possible travel profiles of future residents, employees and visitors to/from the proposed redevelopment site.
- 8.1.2 As discussed previously, the site is highly accessible by public transport and given the restrained car parking provided as part of proposed redevelopment, there is clear evidence the target mode share will meet the aspirations of RBC for a town centre location.
- 8.1.3 An initial baseline travel survey, typically after 50% of each land use is occupied, will be used to determine the baseline mode share. These baseline results will then be used as a basis for establishing the initial modal split targets. **Table 8-1** provides a summary of the likely targets to be met for each land use following full occupation as determined within the supporting Transport Assessment. Note that the 0% by car for leisure and retail reflect that these are linked trips, and may be parked on site for another reason or parked elsewhere in the town centre.

Table 8-1: Interim Targets

Land Use	Mode	Mode Share	Primary Trips				
			AM In	AM Out	PM In	PM Out	Daily
Leisure	Work Mainly at or From Home	0.17%	0	0	0	0	0
	Underground, Metro, Light Rail, Tram	0.04%	0	0	0	0	0
	Train	37.30%	0	0	17	13	0
	Bus, Minibus or Coach	39.69%	0	0	18	14	0
	Taxi	0.12%	0	0	0	0	0
	Motorcycle, Scooter or Moped	0.56%	0	0	0	0	0
	Driving a Car or Van	0.00%	0	0	0	0	0
	Passenger in a Car or Van	0.00%	0	0	0	0	0
	Bicycle	3.82%	0	0	2	1	0
	On Foot	18.14%	0	0	8	6	0
	Other Method of Travel to Work	0.15%	0	0	0	0	0
	Total	100%	0	0	46	34	0
Retail	Work Mainly at or From Home	0.17%	1	1	1	1	18
	Underground, Metro, Light Rail, Tram	0.04%	0	0	0	0	5
	Train	37.30%	133	108	230	226	3960
	Bus, Minibus or Coach	39.69%	142	115	244	241	4214
	Taxi	0.12%	0	0	1	1	13
	Motorcycle, Scooter or Moped	0.56%	2	2	3	3	59

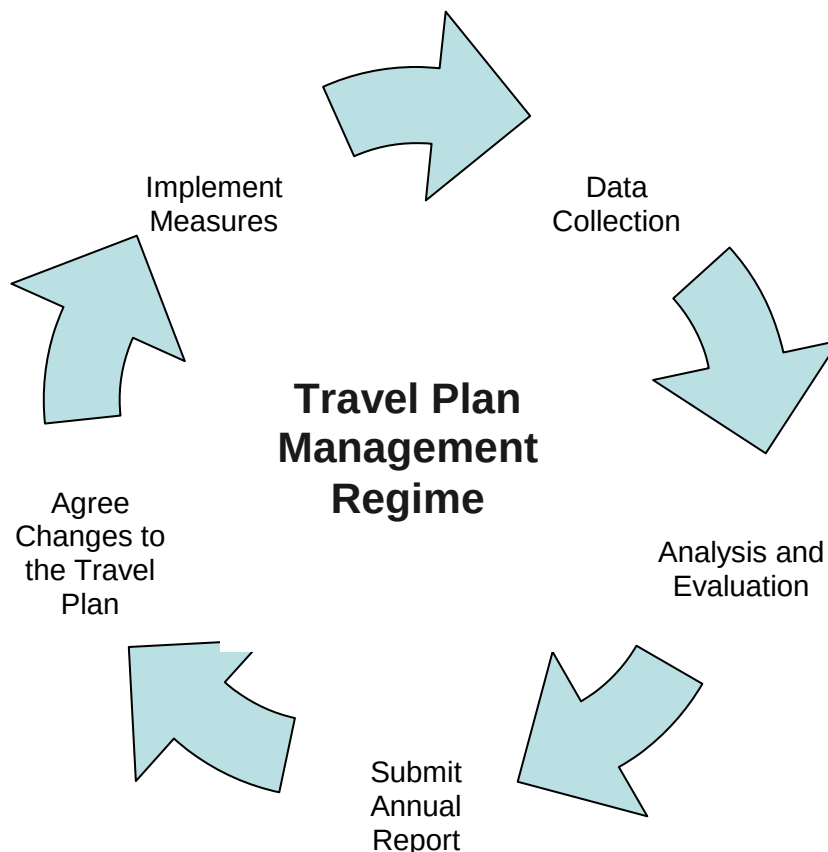
	Driving a Car or Van	0.00%	0	0	0	0	0
	Passenger in a Car or Van	0.00%	0	0	0	0	0
	Bicycle	3.82%	14	11	24	23	406
	On Foot	18.14%	65	52	112	110	1926
	Other Method of Travel to Work	0.15%	1	0	1	1	16
	Total	100%	357	289	615	607	10618
Residential	Work Mainly at or From Home	4.13%	2	11	8	4	109
	Underground, Metro, Light Rail, Tram	0.45%	0	1	1	0	12
	Train	20.04%	10	53	37	21	530
	Bus, Minibus or Coach	11.07%	5	29	20	12	293
	Taxi	0.42%	0	1	1	0	11
	Motorcycle, Scooter or Moped	0.35%	0	1	1	0	9
	Driving a Car or Van	28.42%	14	75	52	30	752
	Passenger in a Car or Van	2.61%	1	7	5	3	69
	Bicycle	3.34%	2	9	6	4	88
	On Foot	28.47%	14	75	52	30	753
	Other Method of Travel to Work	0.69%	0	2	1	1	18
	Total	100%	49	264	183	106	2645
Office	Work Mainly at or From Home	0.17%	4	0	0	3	31
	Underground, Metro, Light Rail, Tram	0.04%	1	0	0	1	8
	Train	31.48%	715	52	42	643	5814
	Bus, Minibus or Coach	34.86%	792	58	47	712	6439
	Taxi	0.11%	2	0	0	2	20
	Motorcycle, Scooter or Moped	0.49%	11	1	1	10	90
	Driving a Car or Van	10.45%	237	17	14	213	1930
	Passenger in a Car or Van	1.94%	44	3	3	40	359
	Bicycle	3.42%	78	6	5	70	632
	On Foot	16.91%	384	28	23	345	3124
	Other Method of Travel to Work	0.13%	3	0	0	3	25
	Total	100%	2271	166	135	2043	18471

8.1.4 It is proposed to keep these targets under review as further relevant baseline data becomes available, to ensure that targets best reflect the circumstances pertaining at the time of implementation, taking account of the complex interaction between baseline travel patterns, mix of new development, trip distribution, and supply of future capability for sustainable travel.

8.2 Monitoring

- 8.2.1 It is stated in the DfT guidance that travel plans are living documents that need to be updated regularly and implementing a travel plan involves “a continuous process for improving, monitoring, reviewing and adjusting the measures in the plan to reflect changing circumstances”. In line with this guidance, a cyclical approach to managing the FTP is proposed for the proposed redevelopment and this is shown in Figure 8-1.

Figure 8-1: FTP Monitoring Regime



- 8.2.2 Monitoring the FTP is important in gauging the success of the measures implemented and therefore the progress made towards meeting the targets set. Progress towards achieving the target mode shifts will be measured at least biennially for a period of 5 years following the initial baseline travel survey (typically after 50% of each land use is occupied).
- 8.2.3 A response rate target of at least 30% should be set to ensure as many people take part in the survey as possible. Incentives will be offered to encourage people to take part and, in order to obtain as large a sample as possible. The travel survey will collect, as a minimum, the following information:
- How residents, employees and visitors travel to and from the proposed redevelopment site;
 - How residents and employees travel during the working day,
 - Where, residents and employees are travelling to/from; and
 - What measures would be most effective in sustaining the mode share levels or increasing sustainable travel, if necessary

- 8.2.4 In addition to the travel surveys, other data such as the take up of bicycle storage and the number of people taking up the car sharing scheme will be monitored
- 8.2.5 The subsequent survey results will be collated, analysed and fed into the FTP/TOS/OTP's. This will allow the setting and possible revision of targets to have a greater degree of relevance to the operational characteristics of the proposed redevelopment and its residents, employees and visitors. This in turn, could highlight any changes to the FTP measures which would have a more positive and instantaneous result in achieving the desired travel mode objectives.



Appendix 9.4

Access Statement



STATION HILL, READING ACCESS STATEMENT

March 2013

Sackville Developments (Reading) Limited (SDRL)

Peter Brett Associates
Transport

**Sackville Developments
(Reading) Ltd**

**Station Hill - Temporary
Flexible Events Space**

Access Statement

Project Ref: 16996/009

Doc Ref: 16996/009/001

March 2013

Peter Brett Associates LLP
Caversham Bridge House
Waterman Place
Reading
Berkshire
RG1 8DN
T: 0118 9500761
F: 0118 9597498
E: reading@peterbrett.com

This page is intentionally blank

Document Control Sheet

Project Name: Station Hill - Temporary Flexible Events Space

Project Ref: 16996/009

Report Title: Access Statement

Doc Ref: 16996/009/001

Date: March 2013

	Name	Position	Signature	Date
Prepared by:	Christopher Brice	Assistant Engineer		25.03.13
Reviewed by:	Scott Witchalls	Partner		25.03.13
Approved by:	Scott Witchalls	Partner		25.03.13
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
Draft	19.12.12	Draft for design team comments	CB	SW	SW
Final	25.03.13	Final	CB	SW	SW

Peter Brett Associates LLP disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Peter Brett Associates LLP accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

This page is intentionally blank

Contents

1	Introduction	6
2	Background	6
3	Baseline Conditions	7
3.1	Site Location	7
3.2	Existing Use	7
3.3	Existing Access.....	8
4	Proposed Development.....	10
4.1	Proposed Scheme	10
4.2	Proposed Access	11
5	Conclusion	14

Figures

Figure 1 – Site Location.....	7
Figure 2 – Reading Cycle Routes	8
Figure 3 – Public Transport Links.....	9
Figure 4 – Proposed Pedestrian Access.....	11
Figure 5 – Vehicular Access.....	12
Figure 6 – 16.5m Articulated Vehicle Access.....	13

Drawings

Figure 1 – Site Location.....	7
Figure 2 – Reading Cycle Routes	8
Figure 3 – Public Transport Links.....	9
Figure 4 – Proposed Pedestrian Access.....	11
Figure 5 – Vehicular Access.....	12
Figure 6 – 16.5m Articulated Vehicle Access.....	13

1 Introduction

Peter Brett Associates LLP has been commissioned by Sackville Developments (Reading) Ltd to assist in the preparation of a planning application to redevelop part of the Station Hill site, Reading. The development proposal seeks permission to create an area for temporary events situated adjacent to the south western station interchange.

2 Background

Sackville Developments (Reading) Ltd are currently in the process of developing a mixed use development scheme incorporating: office/commercial; retail; residential; and leisure uses on the Station Hill site. An outline Planning Application for the main scheme is due to be submitted for consideration by the Local Planning Authority in early 2013.

The phasing of the main Station Hill scheme presents an opportunity to utilise an area of the site for temporary events during development of the main scheme. This space could be constructed either during or prior to the first phase of the Station Hill scheme, remaining in use throughout most of the construction period, before being re-developed as part of the main mixed use scheme during later phases.

It is anticipated that should the proposal receive planning permission, the construction of the space will be undertaken after the lowered station interchange is operational. Therefore the proposal has been developed to work alongside the future interchange scheme.

This report discusses how the events space could be accessed and describes the anticipated level of impact to transportation.

3 Baseline Conditions

3.1 Site Location

The site is located within a highly visible area opposite Reading Station, adjacent to the south western station interchange. Figure 1 below shows the location of the site in relation to Reading Town Centre.

Figure 1 – Site Location



The location of the site provides strong links to Reading Town Centre, Reading Railway Station and bus stops situated throughout the town centre.

3.2 Existing Use

The site currently incorporates retail and office uses within the development site. The retail uses are situated within the ground floor units fronting Station Hill, with office space located above these units within the lower part of the Western Tower office complex.

Currently the site is in a dilapidated condition with only a number of the retail units in operation, however all retail units are to be vacated from the middle of March to the end of April 2013. None of the office space is currently utilised.

Station Hill - Temporary Flexible Events Space Access Statement

3.3 Existing Access

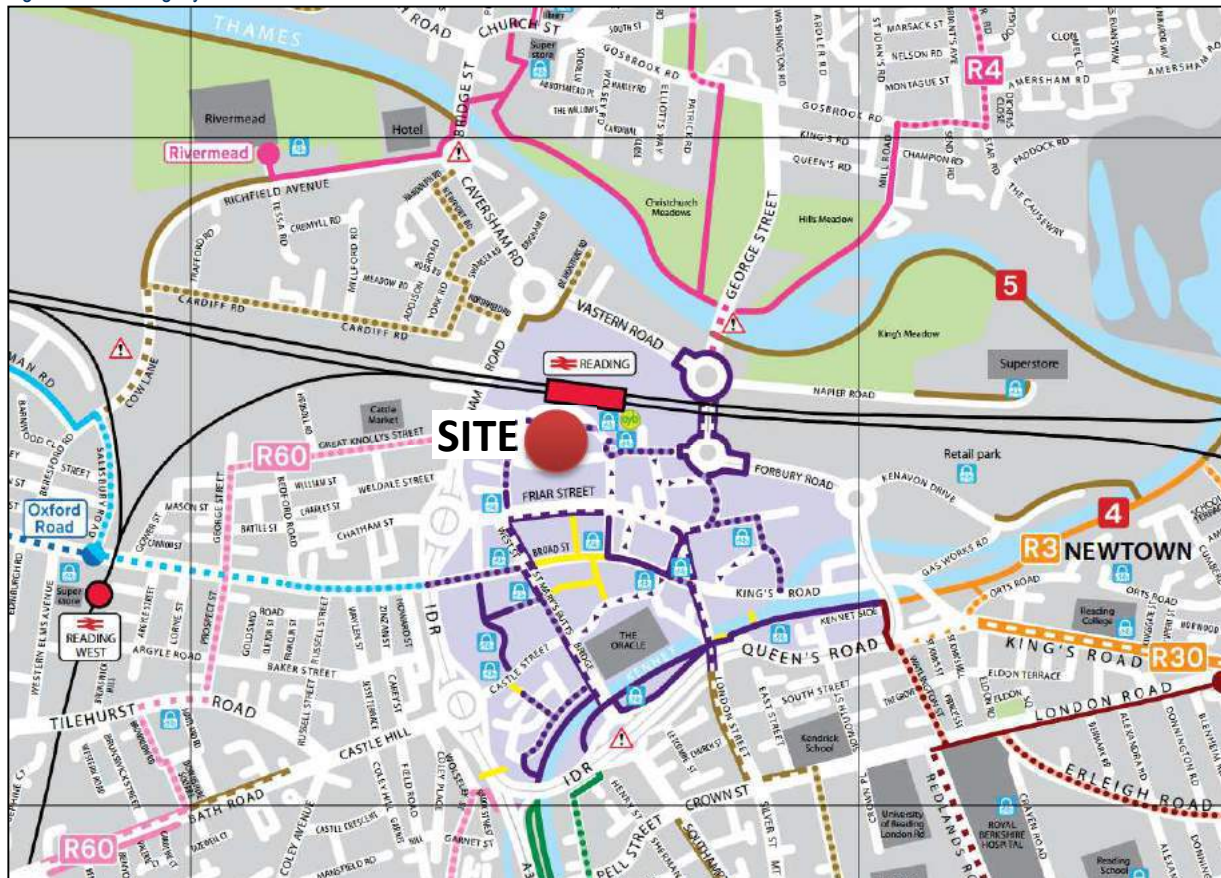
3.3.1 Pedestrian and Cycle Access

The existing site has excellent access to Reading town centre and the surrounding facilities by walking and cycling. Access to the site is facilitated from the footway on the southern side of Station Hill.

This provides easy access to the east via the Station Plaza area and to the west via Tudor Road and Greyfriars Road. The town centre to the south of the site can be accessed from Greyfriars Road or the Station Plaza. People wishing to travel to the north of the site can either use the footway alongside Caversham Road to travel under the railway bridge from Tudor Road, or over the existing station footbridge through the station.

The south western interchange area is designated as a quiet cycle route and provides links to the wider cycle route network. Figure 2 below shows the location of the site in relation to designated cycle routes.

Figure 2 – Reading Cycle Routes



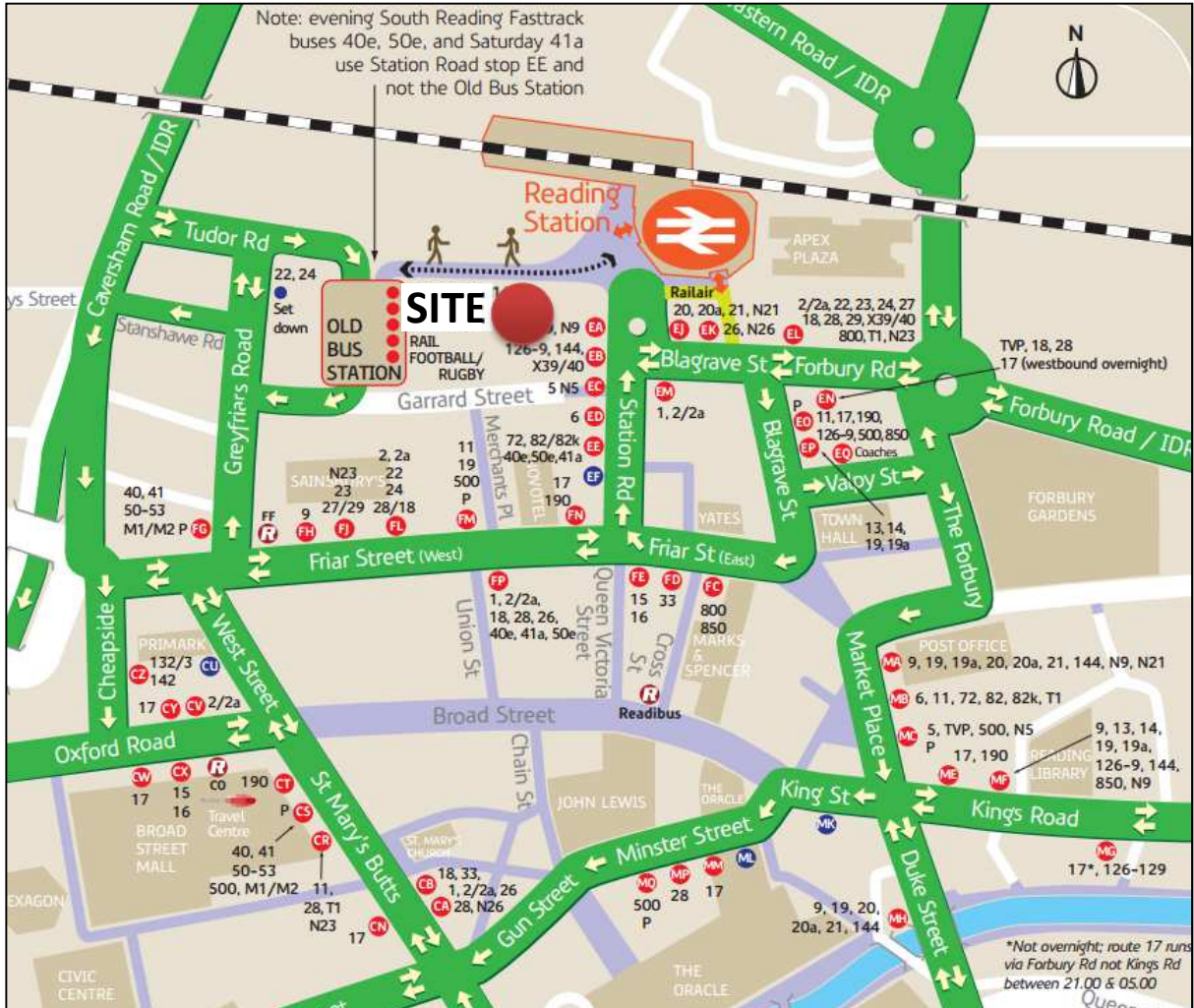
www.reading-travelinfo.co.uk/media/41350/Reading_Cycle_Routes_Network_Map.pdf

Station Hill - Temporary Flexible Events Space Access Statement

3.3.2 Bus and Rail Access

The site is located in close proximity to Reading Railway Station and bus stops situated throughout the town centre. Figure 3 below shows the location of the site in relation to the Railway Station and town centre bus stops.

Figure 3 – Public Transport Links



<http://www.reading-buses.co.uk/files/maps/5%20Nov%2012/town%20centre%20map.pdf>

The above figure shows that the site is located within walking distance of an abundance of bus stops located throughout the town centre, and opposite Reading Railway Station. The site therefore has excellent local and regional public transport links.

3.3.3 Vehicular Access

The site does not have any direct vehicular access or car parking on site. The closest car park is Garrard Street multi-storey car park which is situated to the south of the site. People parking within Garrard Street car park can access the site by walking through the Station Plaza or from Greyfriars Road.

The existing site is currently serviced to the south of the site from Garrard Street.

4 Proposed Development

4.1 Proposed Scheme

The development proposal seeks permission to create an area for temporary events situated adjacent to the lowered station interchange. This flexible space can be used for a variety of uses such as street markets, performances, arts and sport events.

This flexible space is proposed to be constructed either during or prior to the first phase of the main Station Hill development scheme should the main development receive planning permission.

The phasing of the main Station Hill scheme presents an opportunity to utilise an area of the site temporarily as a flexible outdoor space during development of the main scheme. This space could be constructed either during or prior to the first phase of the Station Hill scheme, remaining in use throughout the construction period, before being re-developed as part of the main mixed use scheme during later phases.

It is anticipated that should the proposal receive planning permission, the construction of the proposed area will be undertaken after the lowered station interchange is operational. Therefore the proposal has been developed to work alongside the future interchange scheme.

As previously discussed the site is situated outside Reading Station and is highly visible for people arriving by bus and train and lends itself well to the type of uses proposed, attracting people already travelling into Reading for business, leisure or retail uses.

The possible uses (Arts, Performance, Markets etc...) likely to occupy the proposed space are not anticipated to attract primary trips into Reading, with people drawn to the attraction from pass-by trips while travelling for other purposes, or from existing town centre retail trips.

We therefore do not feel that it is necessary to undertake any trip generation analysis for the proposals, and that there will be no primary impacts for this proposed use. This report therefore focusses only on the proposed access issues.

Station Hill - Temporary Flexible Events Space

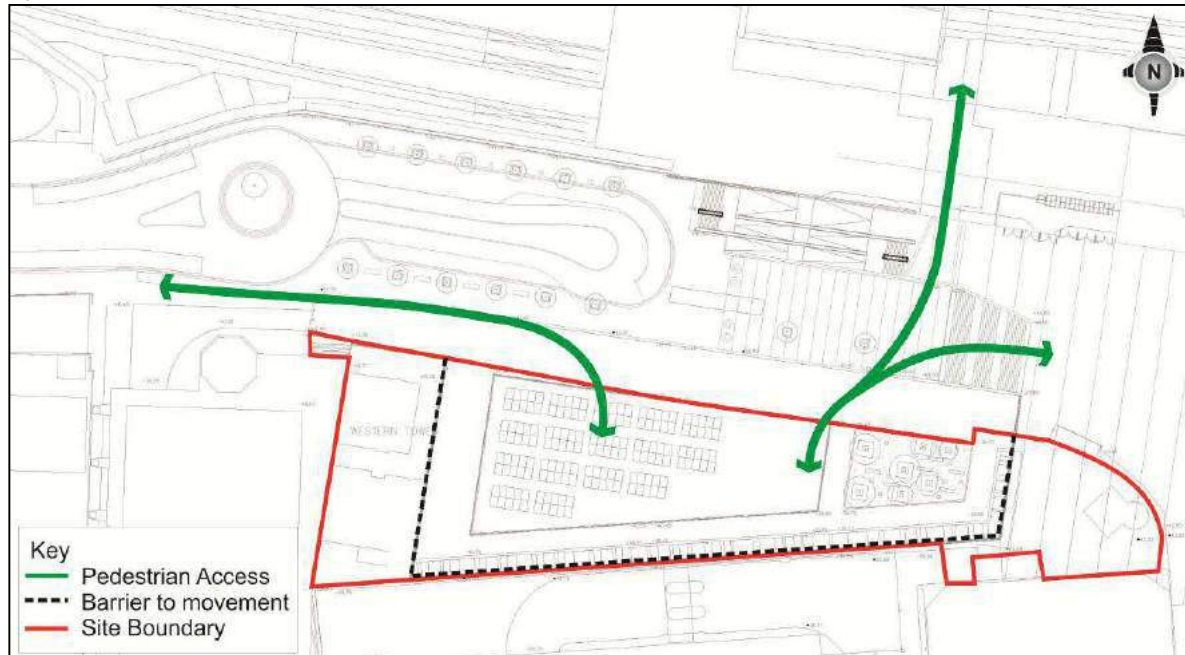
Access Statement

4.2 Proposed Access

4.2.1 Pedestrian and Cycle

The proposed space is to be level with the new footway along the length of its northern boundary with the lowered interchange. This provides easy access to the space for pedestrians and cyclists from the north through the subway (cyclists would dismount), the east via station steps and plaza area, and west via Tudor Road and Greyfriars Road. There is no direct access to the space from its immediate eastern, southern or western boundaries due to large level changes and existing buildings. Figure 4 below shows the pedestrian access routes discussed.

Figure 4 – Proposed Pedestrian Access



Cyclists are anticipated to use the existing cycle parking facilities at the railway station when visiting the site.

4.2.2 Bus and Rail Access

As previously discussed the site has excellent links to public transport being located opposite Reading Station and within walking distance of a number of bus stops within the town centre. The site is also located adjacent to the proposed south western interchange that includes the relocation of a number of bus stops to opposite the site. It is understood that the new interchange facility will also include a taxi rank and public drop off zone.

It is anticipated that the majority of people accessing the site will be people arriving into Reading by bus and train, who were already travelling into Reading for business, leisure or retail uses. The uses proposed are not anticipated to attract primary trips into Reading, with people drawn to the attraction from pass-by trips while travelling for other purposes, or from existing town centre retail trips.

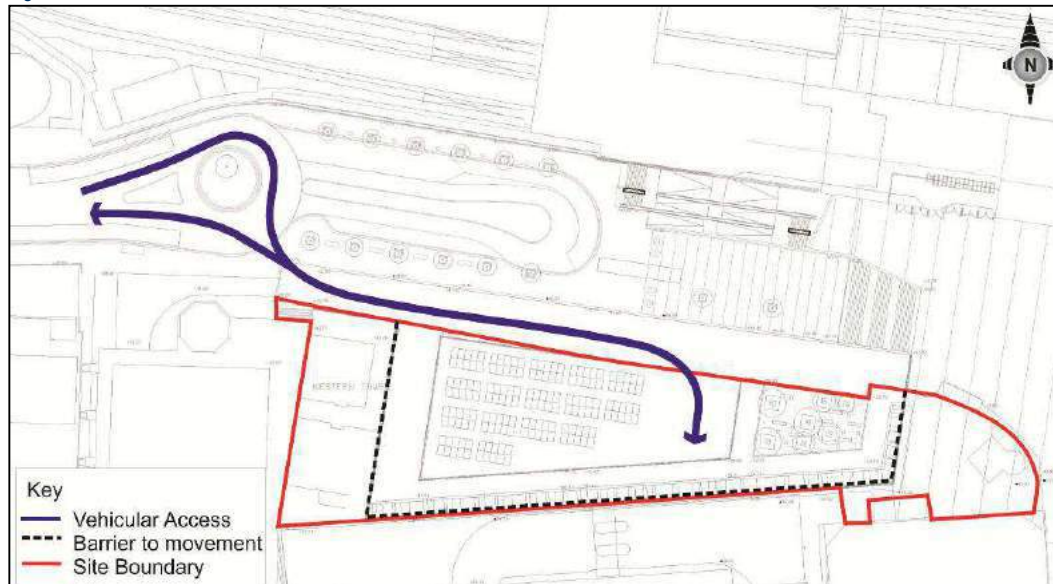
Station Hill - Temporary Flexible Events Space

Access Statement

4.2.3 Vehicular Access

There will be no general traffic access or public parking at the proposed area. The only vehicles able to access the space will be associated with the setting up or removal of uses being undertaken within the space. It is proposed that trade vehicles will access the site by travelling around the future bus turning point before travelling along the footway and into the space. This movement is shown in Figure 5 below.

Figure 5 – Vehicular Access

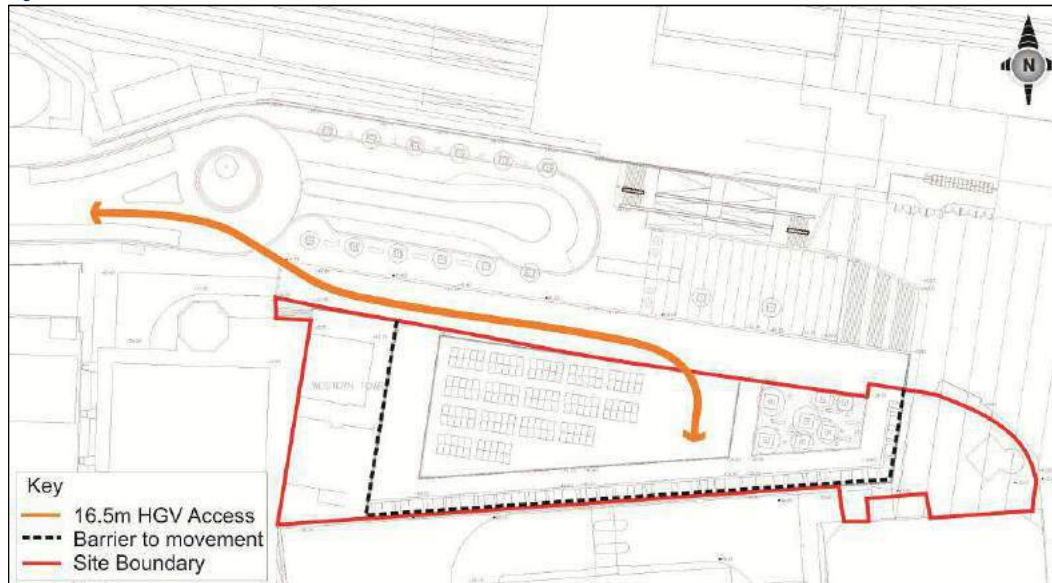


Vehicles up to and including a 10m rigid vehicle are able to undertake this movement as indicated within Drawing 16996/009/SK005. Generally vehicular access to the temporary space would be expected to be from Transit style panel vans with larger vehicles such as a 10m rigid vehicle or 16.5m articulated vehicle only needing to access the space for setting up bespoke events.

Larger 16.5m articulated vehicles would not be able to enter the site by travelling around the bus turning point unless a significant movement of street furniture were made in the proposed layout. To avoid this need, it is proposed that this larger vehicle access the footway by travelling on the wrong side of the bus turning point over a short distance directed by a marshal for the very infrequent number of times this may be needed. This movement has been illustrated on Figure 6 below.

Station Hill - Temporary Flexible Events Space Access Statement

Figure 6 – 16.5m Articulated Vehicle Access



This movement will require supervision to enable the vehicle to safely enter the site through temporarily stopping buses and taxis from exiting the interchange area. Vehicle swept path analysis for a 16.5m articulated vehicle is illustrated on Drawing 16996/009/SK004.

The area of footway required for vehicles to access the temporary space will be strengthened to enable the increased loading required to accommodate occasional movements by heavy vehicles.

Vehicular access will be infrequent (only occurring when events are set up within the space) and could be managed with retractable bollards to prevent unauthorised access.

To prevent conflict between vehicles and pedestrians using the footway, access will be managed and restricted to times outside of peak periods. Vehicles will not be able to access the site while the temporary space is being used by large numbers of members of the public. It is likely that the majority of vehicle movements to the site would be early morning or during the evening.

Parking within the temporary space will be prohibited with vehicles required to park off site after setting up the event. Emergency access and servicing will be undertaken from the previously discussed vehicular route.

5 Conclusion

The proposal seeks planning permission to create an area that could be used for a variety of uses while the main Station Hill development is being brought forward.

The site is located within the town centre and has excellent access to public transport. It is highly visible for people arriving by bus and train which lends itself well to the type of uses proposed, attracting people already travelling into Reading.

The uses likely to occupy the proposed space are not anticipated to attract primary trips into Reading, with people drawn to the attraction from pass-by trips while travelling for other purposes, or from existing town centre retail trips.

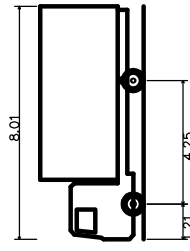
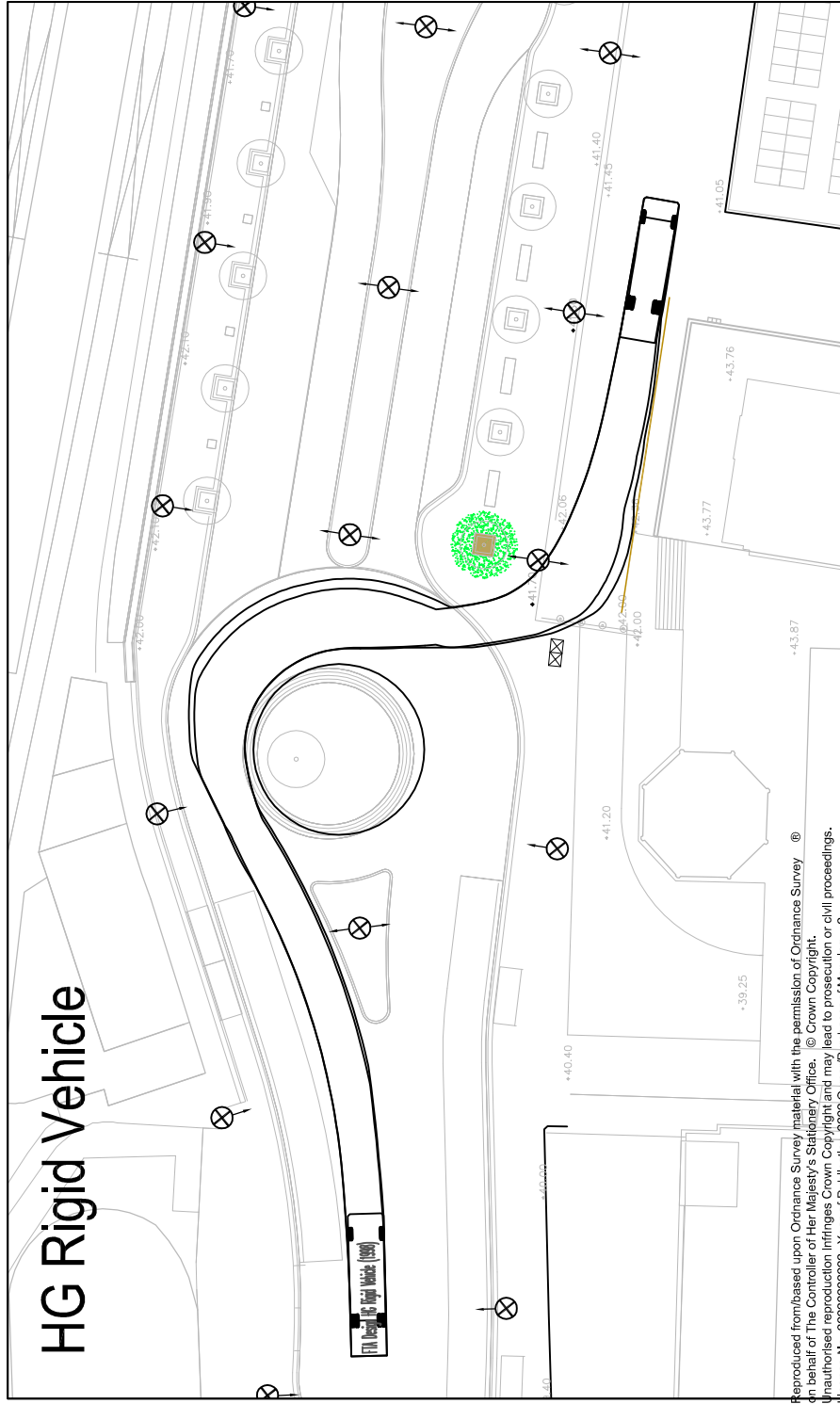
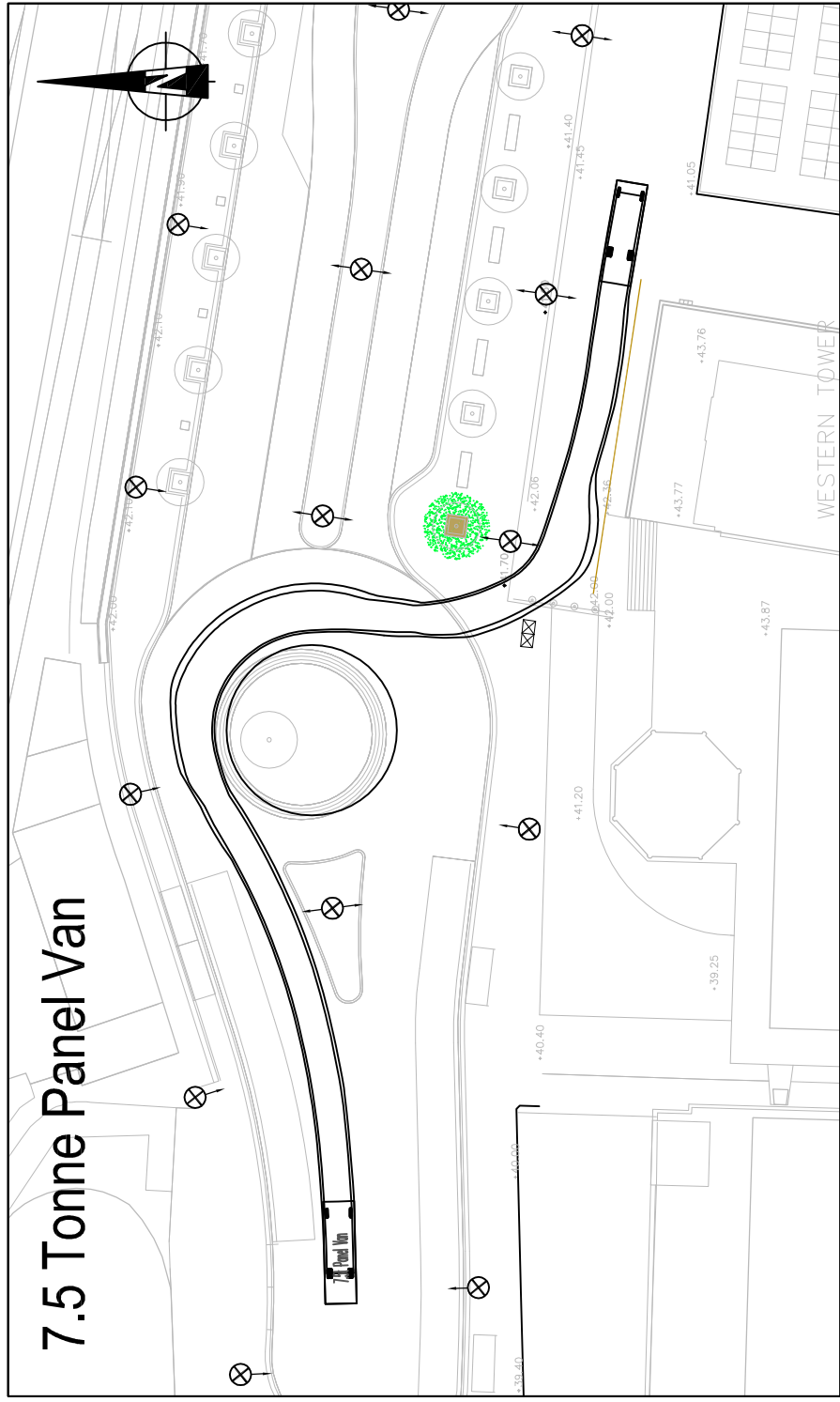
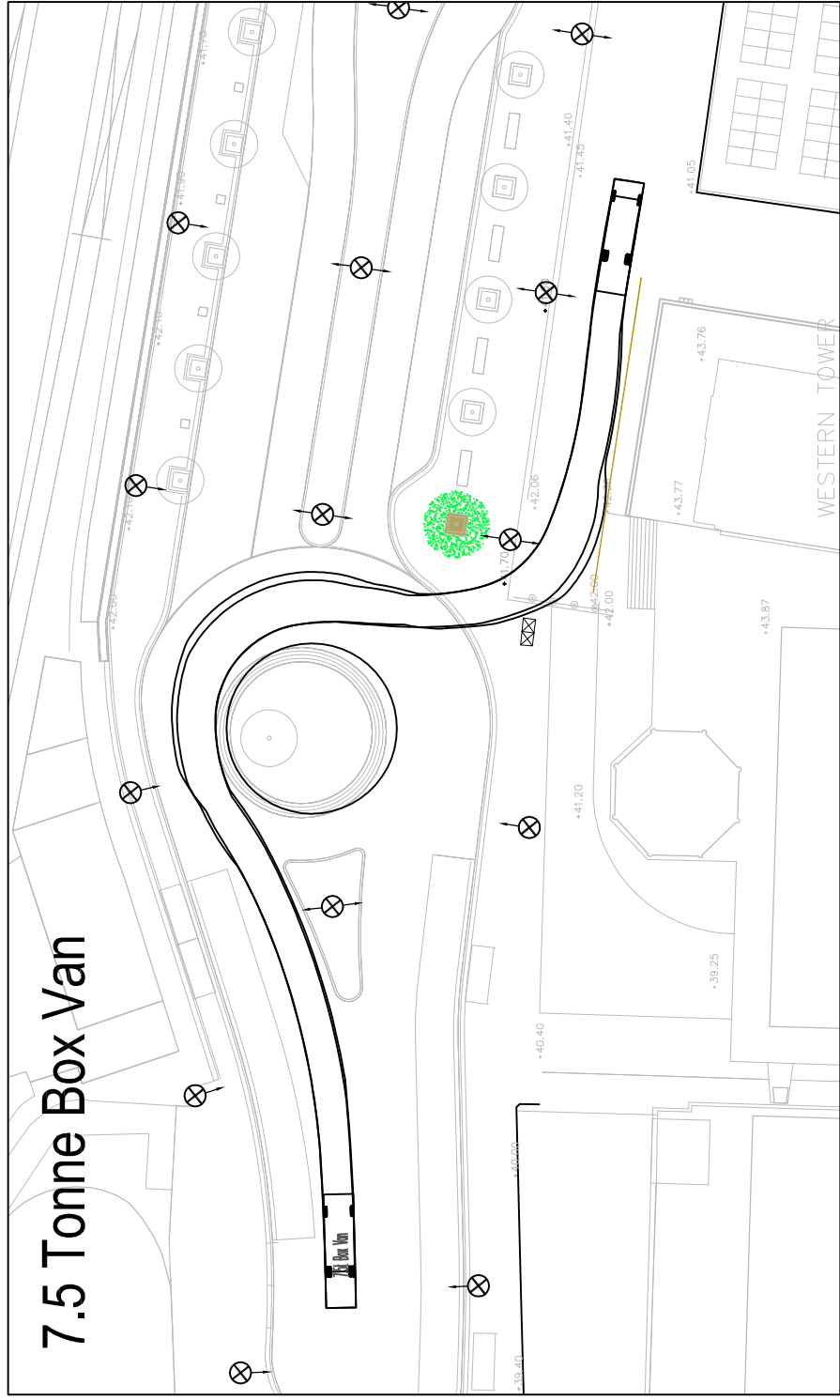
Access to the site for the general public/visitors is to be solely facilitated by foot, with no general vehicular access.

Vehicles are able to safely access and egress the site to set up or remove uses being undertaken within the space.

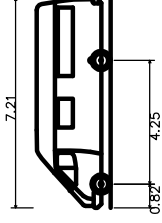
A managed access plan is proposed to allow very large delivery vehicles to access the site.

It is therefore believed that the proposed scheme can operate without any material impact to the safety and operation of the public highway.

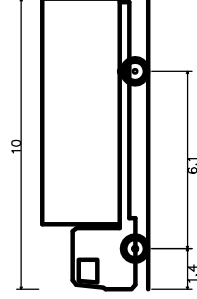
Drawings



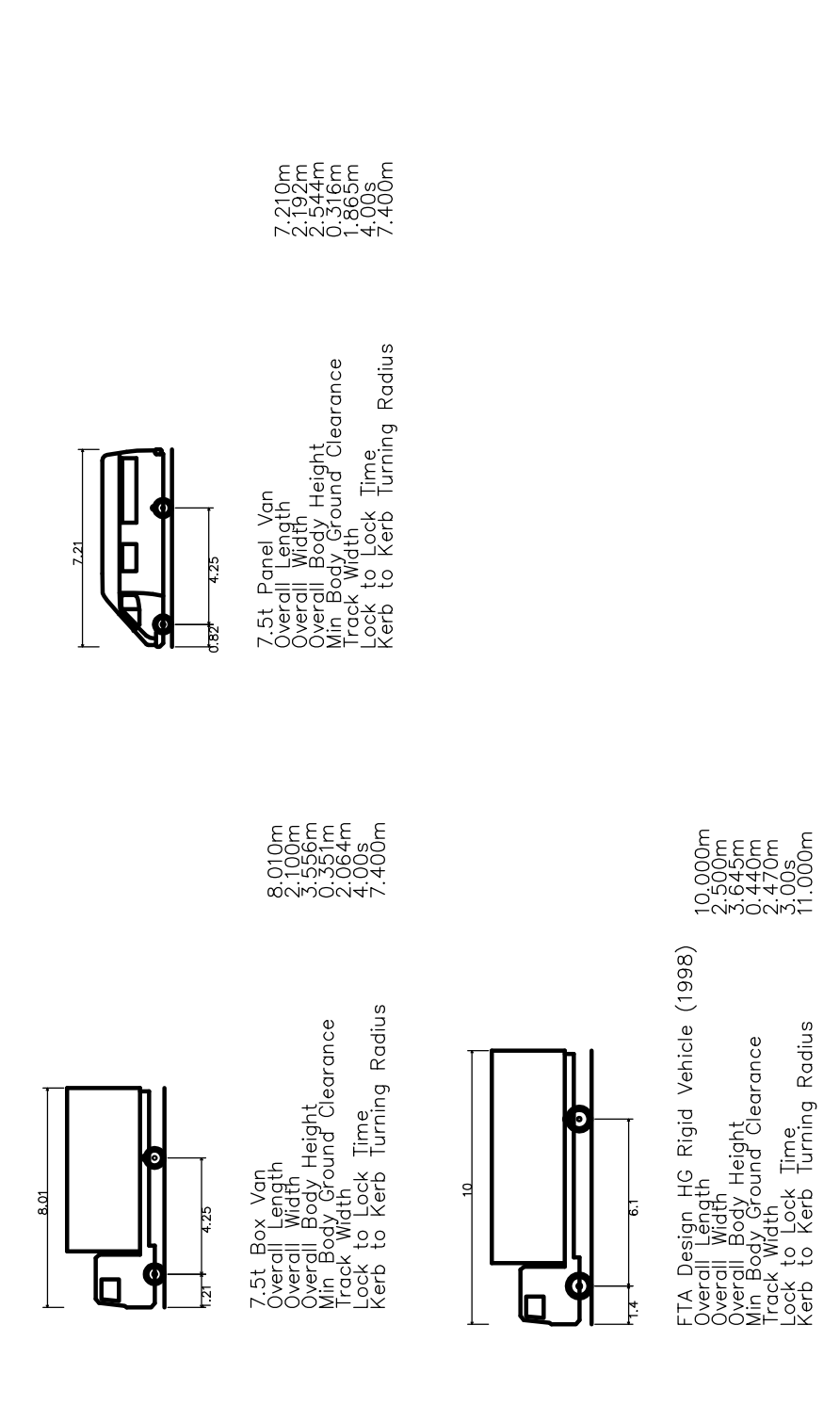
7.5t Box Van	8.010m
Overall Length	100m
Overall Width	3.556m
Overall Body Height	3.351m
Min Body Ground Clearance	2.064m
Track Width	4.000m
Lock to Lock	7.400m
Kerb to Kerb	Turning Radius



7.5t Panel Van	7 210mm
Overall Length	2 192mm
Overall Width	2 544mm
Overall Body Height	2 544mm
Min Body Ground Clearance	0 316mm
Track Width	1 865mm
Lock to Lock Time	4 00s
Kerb to Kerb Turning Radius	7 400mm



FTA Design	HG Rigid Vehicle	(1998)
Overall Length	10,000mm	
Overall Width	2,500mm	
Overall Body Height	3,945mm	
Min. Body Ground Clearance	2,440mm	
Track Width	2,470mm	
Lock to Lock Time	3.00s	
Kerb to Kerb Turning Radius	11,000mm	



 Offices throughout the UK and Europe www.peterbrett.com © Peter Brett Associates LLP RESOLVING Tel: 0118 950 0761	Client	STATION HILL, READING TEMPORARY EVENTS SPACE ACCESS ANALYSIS SWEPT PATH ANALYSIS	SCALING NOTE: Do not scale from this drawing. If in doubt, ask the Utilities Note: The position of any existing public or private sewers, utility services, plants or apparatus may affect the operations. The Contractor is therefore obliged to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect the operations.	<table><tr><td>Mark</td><td>Revision</td><td>Drawn</td><td>Date</td><td>Chk</td></tr><tr><td colspan="5">Drawing Status</td></tr></table>	Mark	Revision	Drawn	Date	Chk	Drawing Status					FOR DISCUSSION	<table><tr><td>Date of 1st Issue</td><td>04.12.12</td><td>Drawing Number</td><td>Revision</td></tr><tr><td>A3 Scale</td><td>1:500</td><td rowspan="2">16996/009/SK005</td><td rowspan="2">-</td></tr><tr><td>Drawn by</td><td>JH</td></tr><tr><td colspan="2">Checked by</td><td></td><td></td></tr></table>	Date of 1st Issue	04.12.12	Drawing Number	Revision	A3 Scale	1:500	16996/009/SK005	-	Drawn by	JH	Checked by			
	Mark	Revision	Drawn	Date	Chk																									
	Drawing Status																													
	Date of 1st Issue	04.12.12	Drawing Number	Revision																										
	A3 Scale	1:500	16996/009/SK005	-																										
Drawn by	JH																													
Checked by																														

Appendix 10.1

Air Quality Modelling Study

Appendix 10.1: Air Quality Modelling Study

- 10.1 This Appendix presents the technical information and data upon which the air quality assessment is based.

Model

- 10.2 In urban areas, pollutant concentrations are primarily determined by the balance between pollutant emissions that increase concentrations, and the ability of the atmosphere to reduce and remove pollutants by dispersion, advection, reaction and deposition. An atmospheric dispersion model is used as a practical way to simulate these complex processes; such a model requires a range of input data, which can include emissions rates, meteorological data and local topographical information.
- 10.3 The impact on local air quality of emissions from changes to traffic movements and heating plant as a result of the operation of the completed Development was assessed using an advanced atmospheric dispersion model, ADMS-Roads.
- 10.4 The ADMS-Roads model is a comprehensive tool for investigating air pollution in relation to road networks and small industrial uses. On review of the Site, and its surroundings, the ADMS-Roads model is considered appropriate for the assessment of the effects of the proposals on air quality, both in the short and long terms. The science of ADMS-Roads is significantly more advanced than that of most other air dispersion models. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions. It can predict long-term and short-term concentrations, as well as calculations of percentile concentrations. The use of the ADMS-Roads model was agreed with the air quality Environment Health Officer (EHO) at Reading Borough Council (RBC).
- 10.5 The ADMS-Roads model is a version of the Atmospheric Dispersion Modelling System (ADMS), which is a model representing dispersion of pollutants from road traffic and small industrial sources. This is a formally validated model, developed in the United Kingdom (UK) by CERC (Cambridge Environmental Research Consultants). This includes comparisons with data from the UK's Automatic Urban Rural Network (AURN) and specific verification exercises using standard field, laboratory and numerical data sets. CERC is also involved in European programmes on model harmonisation, and their models were compared favourably against other EU and U.S. EPA systems. Further information in relation to this is available from the CERC web site at www.cerc.co.uk.

Model Scenarios

- 10.6 In order to assess the impact of the proposed Development on local air quality, future 'without Development' and 'with Development' scenarios were assessed. Although the year of completion is now anticipated to be later, 2018 was chosen as the year to be modelled to remain consistent with the ES of the consented SH3 Scheme. As set out in the Transport Chapter of this ES, the forecast traffic data remains valid up to 2026 and the air quality model assumes that there would be improvements in air quality year on year. Use of 2018 as the year of opening is therefore considered to represent a worst case assessment. The year 2011 was modelled to establish the existing baseline situation. This baseline was used in the 2013 ES for the consented SH3 Scheme because at that time it was the latest year for which available monitoring data surrounding the Site was available. Consequently the most recent baseline air quality monitoring data (2012 to 2014) was reviewed and the current data were found to be similar to those of 2011. The use of 2011 as a baseline year is therefore considered acceptable and was

agreed with the Environmental Health Officer. Base year traffic data for 2011 and meteorological data for 2011 were also used to be consistent with the verification year.

- 10.7 To take into account the recent DEFRA analyses¹ that historical monitoring data is not declining in line with emission forecasts, as outlined in the Assessment Methodology section of Chapter 10: Air Quality, a sensitivity analysis was undertaken on the basis of no future reductions in pollutant concentrations (i.e. considering the potential effects of the Development against the current baseline, 2011, conditions by applying the 2018 traffic data to 2011 background concentrations and emission rates). The results for this sensitivity analysis are presented later in this document.

Traffic Data

- 10.8 Traffic flow data comprising annual average daily traffic (AADT) flows, traffic composition (% HDVs) and speeds (kph) were used in the model as provided by Peter Bret Associates for the surrounding road network.
- 10.9 Table A1.1 presents the traffic data used within the air quality assessment.

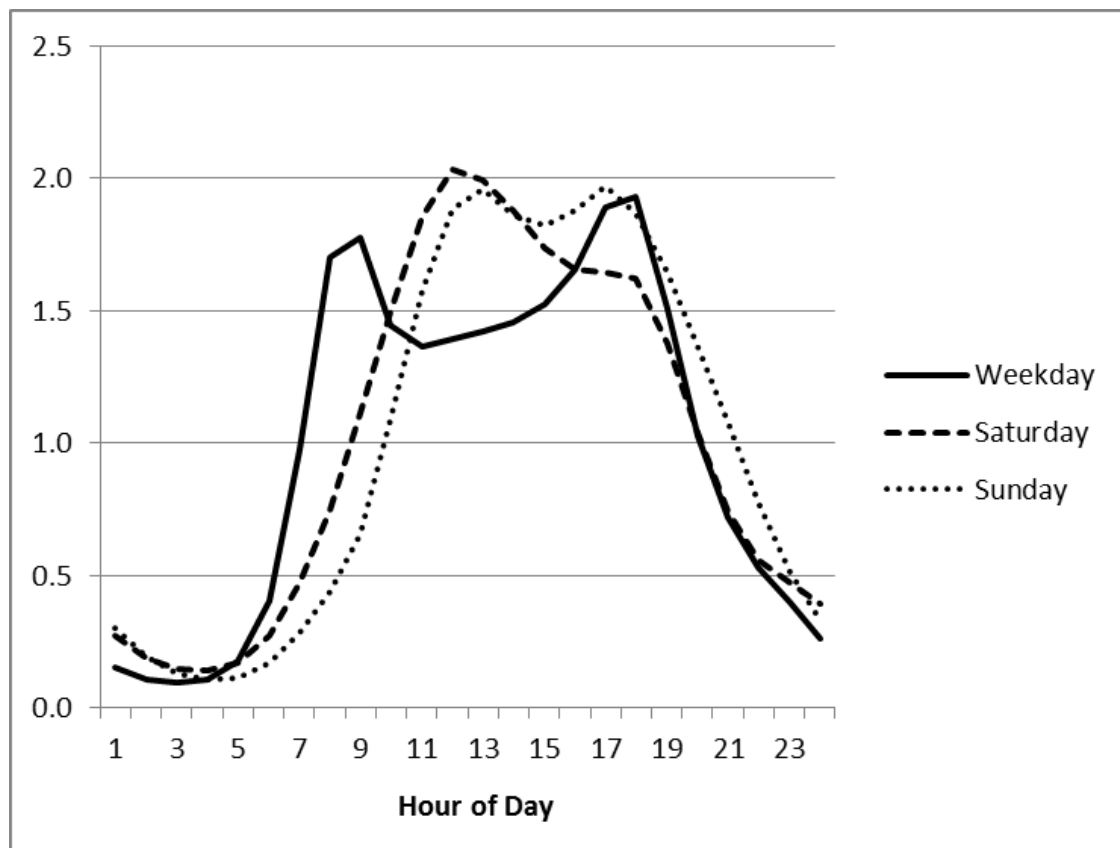
Vehicle Speeds

- 10.10 The traffic speeds presented in Table A1.1 are the speed limits. To take into account the presence of slow moving traffic near junctions and at roundabouts, the speed on each road was reduced using the following criteria recommended within LAQM.TG(09)²:
- For a busy junction, an average of 20kph (approximately 12 mph) was applied; and
 - For other junctions (non-motorway) and roundabouts, where some slowing of traffic occurs, the speed was reduced by 10kph compared to the speed limit.

Diurnal Profile

- 10.11 The ADMS-Roads model uses an hourly traffic flow based on the daily (AADT) flows. Traffic flows follow a diurnal variation throughout the day and week. Therefore, a diurnal profile was used in the model to replicate how the average hourly traffic flow would vary throughout the day and the week. This was based on traffic distribution data available on the DfT website³. Figure A1.1 presents the diurnal variation in traffic flows that was used within the model.

Figure A1.1: Diurnal Traffic Variation



Canyons

- 10.12 Narrow streets with tall buildings on either side have the potential to create a confined space, which can interfere with the dispersion of traffic pollutants and may result in pollutant emissions accumulating in that area. In an air quality model these narrow streets are described as street canyons.
- 10.13 ADMS-Roads includes a street canyon model to take account of the additional turbulent flow patterns occurring inside a street with relatively tall buildings on both sides, known as a 'street canyon'. LAQM.TG(09) identifies a street canyon *"as narrow streets where the height of buildings on both sides of the road is greater than the road width."*
- 10.14 Following a review of the road network to be included within the model, the roads within the network to be modelled are relatively wide and existing buildings are not considered to be tall. The proposed buildings within the Development Site, while being tall, do not cause any new canyons to be created with the existing buildings on the opposite side of Station Hill, Greyfriars Road, Garrard Street or Friar Street. Therefore, no canyons were included within the model for the existing or with Development scenarios.

Heating Plant

- 10.15 Five gas-fired boilers and one gas fired CHP plant are proposed within the Development. The emissions data used within the ADMS-Roads model for the energy plant were provided by the project M&E Consultants, Hoare Lea, and are presented in Table A1.2 below.

Table A1.2: Emission Parameters for the gas-fired CHP and Boiler Flues

Location	Grid Reference	Facility	Diameter (mm)	Release Velocity (m/s)	Height (m above ground)	Release Temperature (deg °C)	NO _x (g/s)
Building Plot A	471299, 173759	Boiler	160	15	52.7	65	0.031
Building Plot B	471338, 173777	Boiler	160	15	82.5	65	0.046
Building Plot C	471428, 173765	Boiler	160	15	88.6	65	0.062
Building Plot D	471322, 173728	Boiler	140	15	66.7	65	0.034
Building Plot F	471397, 173679	Boiler	160	15	44.2	65	0.062
Building Plot F	471397, 173679	CHP	150	15	44.2	65	0.010 ₂

Note: For gas-fired plants emission factors are not provided for PM₁₀ because gas-fired plants do not emit any significant level of particulates.

Emission Factors

- 10.16 The latest ADMS-Roads version (version 3.1.4 22nd November 2012) was used. However, DEFRA and the Devolved Administrations published an updated Emission Factor Toolkit (EFT) (EFTv5.2) in January 2013. The updated EFT uses the factors from COPERT 4 v8.1 published in May 2011 by the European Environment Agency. This updated EFT has yet to be included within the ADMS-Roads model, but should be used for air quality assessments. Therefore, the emissions factors from EFTv5.2 have been inputted into the ADMS-Roads model manually.
- 10.17 The EFT uses traffic flow, HDV%, speed and road type information as input data and calculates outputs as total emissions as g/km and g/km/s for the selected pollutant(s).

Pollutant Background Concentrations

- 10.18 The ADMS-Roads model requires background pollutant concentration data (i.e. concentrations not including local pollutant sources such as roads or stacks), that correspond to the year of assessment, to which the model adds contributions from the road sources.
- 10.19 RBC undertake background air pollutant monitoring at one automatic monitor within their administrative boundary. Table A1.3 shows the monitoring results for the automatic analyser located at New Town approximately 2km from the Site.

Table A1.3: Monitored Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$) at the RBC's Urban Background Automatic Monitor

Site I.D.	AQS Objective	Pollutant	2011	2012	2013	2014
New Town, AURN	Annual Mean: $40\mu\text{g}/\text{m}^3$	NO_2	27	25	27	27
	Hourly Mean: $200\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times per year	NO_2	2	0	0	0
	Annual Mean: $40\mu\text{g}/\text{m}^3$	PM_{10}	19	18	16	14
	24 Hour Mean: $50\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times per year	PM_{10}	8	Data Unavailable		
	Annual Mean: $25\mu\text{g}/\text{m}^3$	$\text{PM}_{2.5}$	14	12	10	10

Source: <http://uk-air.defra.gov.uk>
AQS – Air Quality Strategy;

- 10.20 In addition to the background monitoring undertaken by RBC, background concentrations of NO_x , NO_2 , PM_{10} and $\text{PM}_{2.5}$ are available from the DEFRA Air Quality Archive for $1\times 1\text{km}$ grid squares for assessment years between 2010 and 2030 (updated in August 2012).
- 10.21 Table A1.4 presents the DEFRA background concentrations for the year 2011 for the grid square the Site is located within (473500, 173500).

Table A1.4: DEFRA Urban Background Maps in 2011 for the Grid Square at the Location of the Site

Pollutant	Concentration ($\mu\text{g}/\text{m}^3$)*
NO_x	44.02
NO_2	25.97
PM_{10}	17.82
$\text{PM}_{2.5}$	12.74

- 10.22 Tables A1.3 and A1.4 show that in 2011 monitored urban background NO_2 concentrations at the New Town automatic monitor ($25.67\mu\text{g}/\text{m}^3$) is very similar to the DEFRA maps ($25.97\mu\text{g}/\text{m}^3$). The 2011 monitored concentrations of PM_{10} ($19.18\mu\text{g}/\text{m}^3$) and $\text{PM}_{2.5}$ ($13.81\mu\text{g}/\text{m}^3$) are slightly higher than the DEFRA maps (PM_{10} : $17.82\mu\text{g}/\text{m}^3$ and $\text{PM}_{2.5}$: $12.74\mu\text{g}/\text{m}^3$).
- 10.23 It was agreed in consultation with the EHO at RBC to use the monitoring data from the AURN New Town automatic monitor. The 2011 data at this monitor was factored to the assessment year (2018) using the same ratio as the DEFRA background maps.
- 10.24 Background concentrations data used within the assessment are presented in Table A1.5.

Meteorological Data

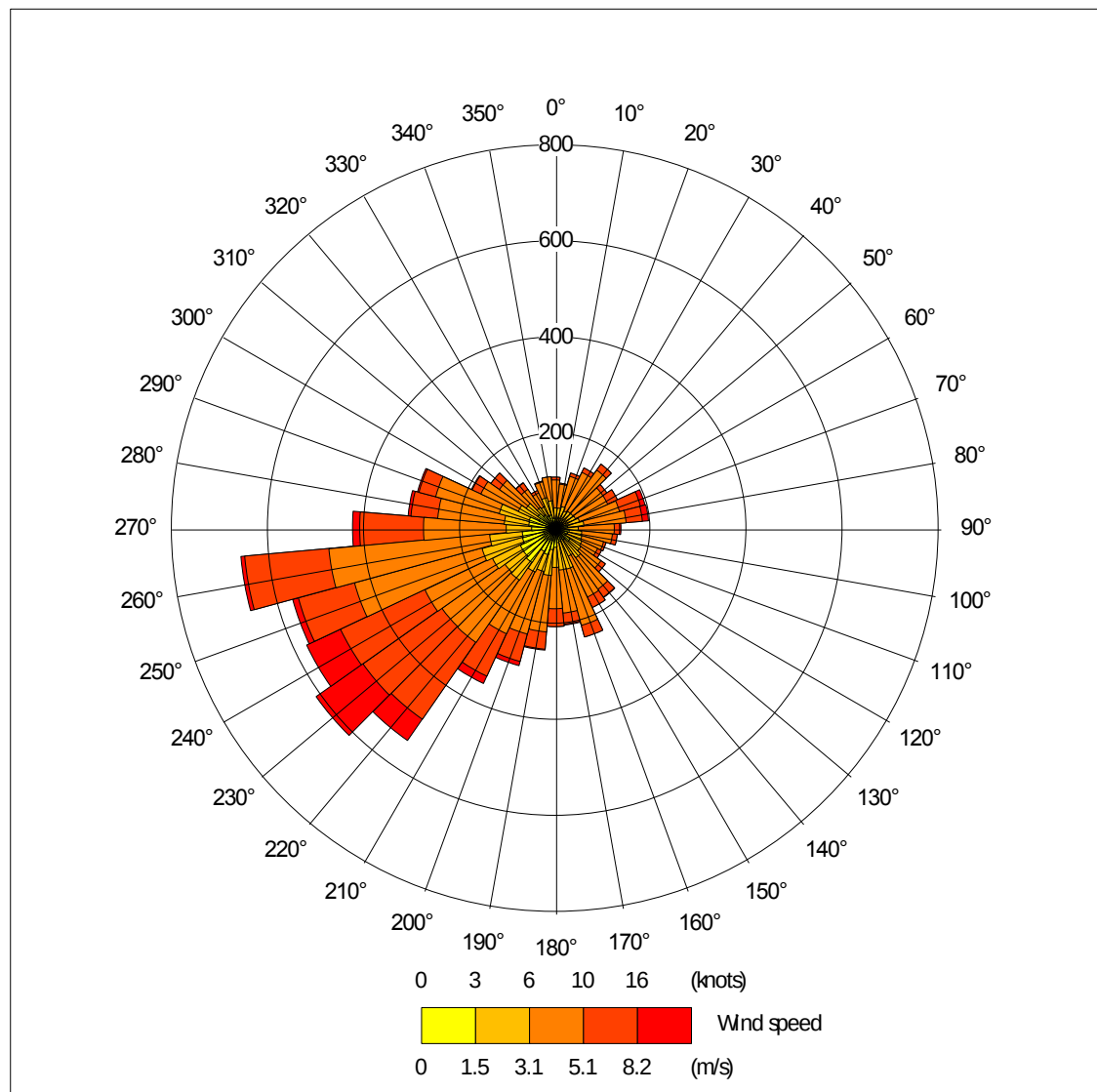
Table A1.5: Background Concentrations ($\mu\text{g}/\text{m}^3$) Used within the Assessment

Pollutant	2011	2018
NO_x	37.01	30.44*
NO_2	25.67	22.09**
PM_{10}	19.18	17.67^
$\text{PM}_{2.5}$	13.81	12.29^^

Note: * factor of 0.822 obtained from DEFRA background maps; ** factor of 0.861 obtained from DEFRA; ^ factor of 0.921 obtained from DEFRA background maps; ^^ factor of 0.890 obtained from DEFRA background maps

- 10.25 Meteorological data provides hourly sequential data including wind direction, wind speed, temperature, precipitation and the extent of cloud cover for each hour of a given year. As a minimum ADMS-Roads requires wind speed, wind direction, and cloud cover.
- 10.26 Meteorological data, to input into the model, were obtained from the closest meteorological station, Farnborough Airport Meteorological Station, for the year 2011, although the Farnborough cloud cover data record for 2011 was incomplete. Therefore, missing cloud cover data were obtained from the Odiham Meteorological Station and merged with the Farnborough data (on the advice of the Meteorological data supplier). The 2011 data were used, to be consistent with the base/verification traffic year. It was also applied to the 2018 scenarios for the air quality impact assessment.. Figure A1.2 presents the wind-rose for the meteorological data.

Figure A1.2: 2011 Wind Rose for the Farnborough Airport Meteorological Site



Model Data Processing

- 10.27 The modelling results were processed to calculate the averaging periods required for comparison with air quality objectives.

- 10.28 NO_x emissions from combustion sources (including vehicle exhausts) comprise principally nitric oxide (NO) and nitrogen dioxide (NO₂). The emitted nitric oxide reacts with oxidants in the air (mainly ozone) to form more NO₂. Since only nitrogen dioxide is associated with impacts on human health, the air quality standards for the protection of human health are based on NO₂ and not total NO_x or NO.
- 10.29 The ADMS-Roads model was run without the Chemistry Reaction option to allow verification (see below). Therefore, a suitable NO_x:NO₂ conversion needed to be applied to the modelled NO_x concentrations. There are a variety of different approaches to dealing with NO_x:NO₂ relationships, a number of which are widely recognised as being acceptable. However, the current approach was developed for roadside sites, and is detailed within the Technical Guidance LAQM.TG(09), which supersedes the previous 2003 guidance document.
- 10.30 The latest guidance provides a spreadsheet calculator⁴ to allow the calculation of NO₂ from NO_x concentrations, accounting for the difference between primary emissions of NO_x and background NO_x, the concentration of O₃, and the different proportions of primary NO₂ emissions, in different years. This approach is only applicable to annual mean concentrations.
- 10.31 Research⁵ undertaken in support of LAQM.TG(09) has indicated that the hourly mean limit value and objective for NO₂ is unlikely to be exceeded at a roadside location where the annual-mean NO₂ concentration is less than 60µg/m³. The hourly objective is, therefore, not considered further within this assessment where the annual-mean NO₂ concentration is predicted to be less than 60µg/m³.
- 10.32 In order to calculate the number of daily exceedances of 50µg/m³ PM₁₀ the relationship between the number of 24-hour exceedances of 50µg/m³ and the annual mean PM₁₀ concentration from LAQM.TG (09)¹ was applied as follows:

$$\text{Number of Exceedances} = -18.5 + 0.00145 \times (\text{annual mean}^3) + \frac{206}{\text{annual mean}}.$$

Other Model Parameters

- 10.33 There are a number of other parameters that are used within the ADMS-Roads model which are described here for completeness and transparency:
- The model requires a surface roughness value to be inputted. A value of 1.5 was used, which is representative of large urban areas such as Reading;
 - The model requires the Monin-Obukov length (a measure of the stability of the atmosphere) to be inputted. A value of 30m (representative of A value of 30m (representative of large cities and towns, such as Reading) was used for the modelling; and
 - The model requires the Road Type to be inputted. 'Urban [not London]' was selected and used for the modelling.

Model Verification

- 10.34 Model verification is the process of comparing monitored and modelled pollutant concentrations for the same year.
- 10.35 Discrepancies between modelled and measured concentrations can arise for a number of reasons, for example:
- Traffic data uncertainties;
 - Background concentration estimates;

- Meteorological data uncertainties;
- Sources not explicitly included within the model (e.g. car parks and bus stops);
- Overall model limitations (e.g. treatment of roughness and meteorological data, treatment of speeds); and
- Uncertainty in monitoring data, particularly diffusion tubes.

10.36 Verification is the process by which uncertainties such as those described above are investigated and minimised. Disparities between modelling and monitoring results are likely to arise as result of a combination of all of these aspects.

Nitrogen Dioxide

10.37 The ADMS-Roads model was run to predict annual mean NO_x concentrations at 26 diffusion tube locations within Reading Town Centre and the Caversham Road automatic monitor. These locations were chosen as the most representative of roadside locations within the Town Centre within the road study network with good data capture.

10.38 As highlighted above, the NO₂ concentrations are a function of NO_x concentrations. Therefore, the roadside NO_x concentration predicted by the model was converted to NO₂ using the NO_x to NO₂ calculator provided by DEFRA on the air quality archive. The background data for 2011, as presented in Table A1.5 were used.

10.39 The modelled and equivalent measured roadside NO₂ concentration at the diffusion tube location was compared as shown in Table A1.6 below.

Table A1.6: Model Verification Result for Annual Mean NO₂ at the Reading Town Centre Monitoring Locations

Site ID	Monitored Annual Mean NO ₂ (µg/m ³)	Modelled Total Annual Mean NO ₂ (µg/m ³)	% Difference (modelled – monitored)
20-30 New Bright Street	30	38.31	27.70
Kings Oak Flat - Queens Road	33	35.46	7.45
10-20 Hieatt Close	34	31.58	-7.12
44 Crown Street	35	36.03	2.94
Red Cow PH, Southampton Street	37	39.09	5.65
6 Tilehurst Road	29	32.94	13.59
Blenheim Terrace, Castle Street	40	38.01	-4.98
128 Castle Hill	48	45.55	-5.10
162 Castle Hill	33	33.45	1.36
31a Vastern Road	37	36.12	-2.38
108 Caversham Road	39	39.94	2.41
197 Caversham Road	40	33.91	-15.23
Picture House	31	36.67	18.29
2 Kings Road, Caversham	33	36.47	10.52
68 George Street	33	33.48	1.45
40 George Street	48	33.76	-29.67
Station Hill 1	53	30.08	-43.25

Site ID	Monitored Annual Mean NO ₂ (µg/m ³)	Modelled Total Annual Mean NO ₂ (µg/m ³)	% Difference (modelled – monitored)
Garrad Street	33	29.35	-11.06
10 Trinity Place	31	34.38	10.90
27 Sackville Street	39	32.63	-16.33
Vachel Road	34	33.75	-0.74
33 Caversham Road	47	35.81	-23.81
59a Caversham Road	44	37.20	-15.45
281 Oxford Road	45	33.50	-25.56
165 Oxford Road	48	32.15	-33.02
Cow Land Bridges	33	30.57	-7.36
Caversham Road Automatic Monitor	46.9	41.58	-11.34

10.40 Table A1.6 indicates that the model both under and over predicts annual mean NO₂ concentrations at the monitoring locations within the town centre.

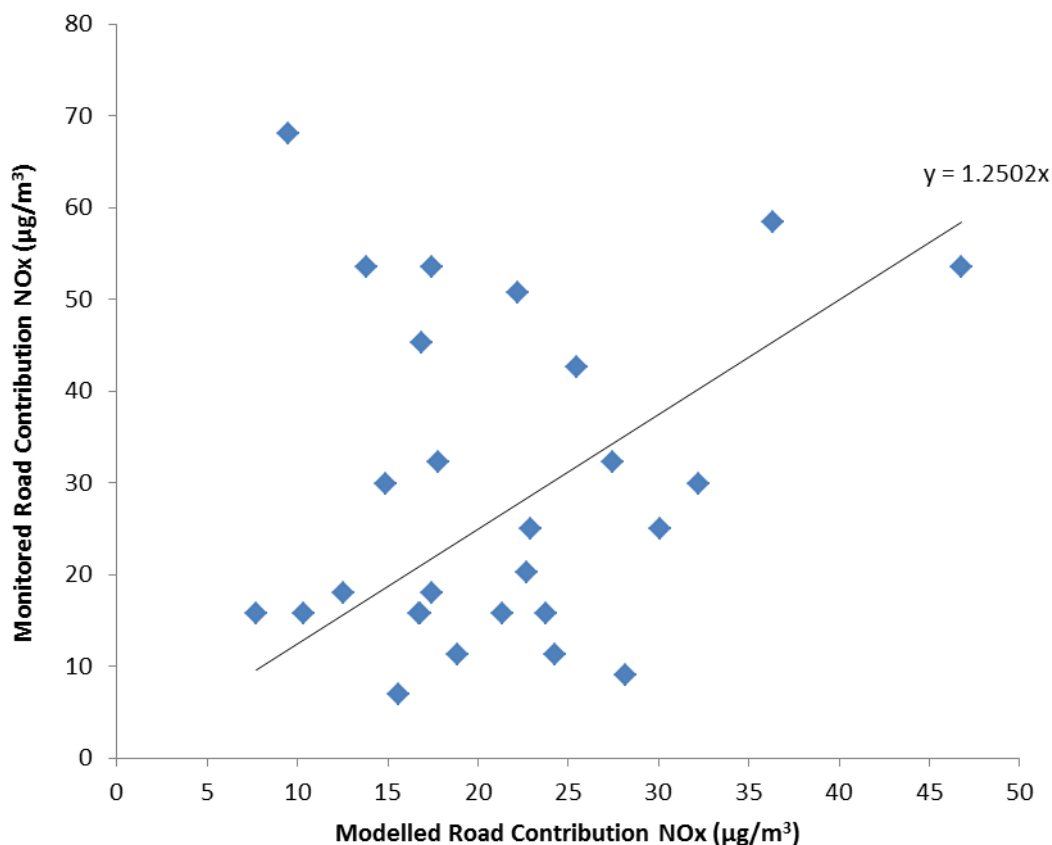
10.41 Technical Guidance LAQM.TG(09) suggests that where there is disparity between modelled and monitored results appropriate adjustment should be undertaken. LAQM.TG(09) presents a number of methods for approaching model verification and adjustment. Example 2, of Annex 3 in the LAQM.TG (09) guidance document, indicates a method based on adjusting NO₂ road contribution and calculating a single adjustment factor. This method refers to modelling based on road traffic sources and can be applied to either a single diffusion tube location, or where numerous diffusion tube monitoring locations are sited within the modelled area. This requires the roadside NO_x contribution to be calculated. In addition, monitored NO_x concentrations are required. The NO_x concentrations were calculated from the annual mean NO₂ concentration at the diffusion tube sites using the NO_x to NO₂ spreadsheet as described above. The monitored NO_x concentration from the Caversham Road automatic monitor was used for this location. The verification process applied here, shown in Table A1.7, was based on that example.

Table A1.7: Model Verification Result for Adjustment NO_x Emissions (µg/m³)

Site ID	Monitored NO ₂	Monitored NO _x	Monitored Road NO _x	Modelled Road NO _x	Ratio Monitored to Modelled Road NO _x
20-30 New Bright Street	30	46.09	9.09	28.18	0.32
Kings Oak Flat - Queens Road	33	52.74	15.74	21.38	0.74
10-20 Hieatt Close	34	55.01	18.01	12.55	1.44
44 Crown Street	35	57.32	20.32	22.73	0.89
Red Cow PH, Southampton Street	37	62.03	25.03	30.10	0.83
6 Tilehurst Road	29	43.93	6.93	15.60	0.44
Blenheim Terrace, Castle Street	40	69.34	32.34	27.46	1.18
128 Castle Hill	48	90.50	53.50	46.75	1.14
162 Castle Hill	33	52.74	15.74	16.76	0.94

Site ID	Monitored NO ₂	Monitored NO _x	Monitored Road NO _x	Modelled Road NO _x	Ratio Monitored to Modelled Road NO _x
31a Vastern Road	37	62.03	25.03	22.94	1.09
108 Caversham Road	39	66.87	29.87	32.19	0.93
197 Caversham Road	40	69.34	32.34	17.80	1.82
Picture House	31	48.28	11.28	24.25	0.47
2 Kings Road, Caversham	33	52.74	15.74	23.78	0.66
68 George Street	33	52.74	15.74	16.82	0.94
40 George Street	48	90.50	53.50	17.45	3.07
Station Hill 1	53	105.05	68.05	9.51	7.15
Garrad Street	33	52.74	15.74	7.70	2.05
10 Trinity Place	31	48.28	11.28	18.88	0.60
27 Sackville Street	39	66.87	29.87	14.91	2.00
Vachel Road	34	55.01	18.01	17.45	1.03
33 Caversham Road	47	87.72	50.72	22.21	2.28
59a Caversham Road	44	79.61	42.61	25.50	1.67
281 Oxford Road	45	82.28	45.28	16.87	2.68
165 Oxford Road	48	90.50	53.50	13.83	3.87
Cow Land Bridges	33	52.74	15.74	10.34	1.52
Caversham Road Automatic Monitor	46.9	95.42	58.42	36.33	1.61
Adjustment Factor					1.25

Figure A1.3: Unadjusted Modelled versus Monitored Annual Mean Roadside NO_x at the Monitoring Sites (µg/m³)



- 10.42 Figure A1.3 shows the mathematical relationship between modelled and monitored roadside NO_x (i.e. total NO_x minus background NO_x) at the 27 locations in a scatter graph (data taken from Table A1.7), with a trendline passing through zero and its derived equation.
- 10.43 Consequently in Table A1.8 the adjustment factor (1.2502) obtained in Figure A1.3 is applied to the modelled NO_x Roadside concentrations to obtain improved agreement between monitored and modelled annual mean NO_x. This was converted to annual mean NO₂ using the NO_x:NO₂ spreadsheet calculator.

Table A1.8: Adjusted Annual Average NO₂ Concentrations Compared to Monitored Annual Mean NO₂ Concentrations (µg/m³)

Site ID	Adjusted Modelled Road NO _x	Adjusted Modelled Total NO _x	Modelled Total NO ₂	Monitored Total NO ₂	% Difference
20-30 New Bright Street	35.23	72.23	41.15	30	37.17
Kings Oak Flat - Queens Road	26.73	63.73	37.71	33	14.27
10-20 Hieatt Close	15.69	52.69	32.98	34	-3.00
44 Crown Street	28.42	65.42	38.41	35	9.74
Red Cow PH, Southampton Street	37.63	74.63	42.09	37	13.76
6 Tilehurst Road	19.51	56.51	34.65	29	19.48

Site ID	Adjusted Modelled Road NO _x	Adjusted Modelled Total NO _x	Modelled Total NO ₂	Monitored Total NO ₂	% Difference
Blenheim Terrace, Castle Street	34.33	71.33	40.79	40	1.98
128 Castle Hill	58.45	95.45	49.74	48	3.63
162 Castle Hill	20.95	57.95	35.27	33	6.88
31a Vastern Road	28.68	65.68	38.51	37	4.08
108 Caversham Road	40.25	77.25	43.1	39	10.51
197 Caversham Road	22.25	59.25	35.83	40	-10.43
Picture House	30.31	67.31	39.18	31	26.39
2 Kings Road, Caversham	29.73	66.73	38.94	33	18.00
68 George Street	21.03	58.03	35.3	33	6.97
40 George Street	21.82	58.82	35.64	48	-25.75
Station Hill 1	11.89	48.89	31.28	53	-40.98
Garrad Street	9.62	46.62	30.24	33	-8.36
10 Trinity Place	23.60	60.60	36.4	31	17.42
27 Sackville Street	18.65	55.65	34.28	39	-12.10
Vachel Road	21.81	58.81	35.64	34	4.82
33 Caversham Road	27.77	64.77	38.14	47	-18.85
59a Caversham Road	31.88	68.88	39.81	44	-9.52
281 Oxford Road	21.09	58.09	35.33	45	-21.49
165 Oxford Road	17.29	54.29	33.68	48	-29.83
Cow Land Bridges	12.92	49.92	31.74	33	-3.82
Caversham Road Automatic Monitor	45.42	82.42	45.05	46.9	-3.94

- 10.44 The data in Table A1.8 indicates an improved agreement between monitored and modelled annual mean NO₂ results compared to the unadjusted/unverified model.
- 10.45 The NO_x adjustment process was subsequently applied to all of roadside NO_x modelling for 2011 and 2018 'without' and 'with' the development in place, at the specific receptors locations assessed, before the predicted concentrations were converted to NO₂.

Particulate Matter (PM₁₀ and PM_{2.5})

- 10.46 PM₁₀ monitoring is also undertaken at the automatic monitoring site at Caversham Road, and therefore, a similar process to that above has been applied to PM₁₀. The steps involved in the adjustment process are presented in Table A1.9.

Table A1.9: Model Verification Result for Annual Mean PM₁₀ in 2011 at Caversham Road Automatic Monitor

Site ID	Monitored PM ₁₀	Background PM ₁₀	Monitored Road PM ₁₀	Modelled Road PM ₁₀	Adjustment Factor
Caversham Road Automatic Monitor	32.0	19.18	12.82	2.64	4.86

- 10.47 The adjustment factor (4.86) obtained in Table A1.9 is applied to the modelled PM₁₀ Roadside concentrations, prior to the addition of the background concentrations and before the number of daily PM₁₀ exceedences was calculated, to obtain improved agreement between monitored and modelled annual mean PM₁₀.

Table A1.10: Adjusted Annual Average PM₁₀ Concentration Compared to Measured Annual Mean PM₁₀ Concentration (µg/m³)

Site ID	Modelled Road PM ₁₀	Adjusted Modelled Road PM ₁₀	Modelled Total PM ₁₀	Monitored Total PM ₁₀	% Difference
Caversham Road Automatic Monitor	2.64	12.82	32.0	32.0	-

- 10.48 The data in Table A1.10 indicates an improved agreement between monitored and modelled annual mean PM₁₀ results compared to the unadjusted/unverified model. This process of verification improves confidence in the modelling results and further reduces uncertainty, with the agreement between monitored and modelled annual mean PM₁₀ results improved compared to the unadjusted/unverified model, shown in Table A1.9.
- 10.49 The adjustment process was then applied to all of the roadside PM₁₀ modelling results for 2011 and 2018 without and with the development in place, at the specific receptors locations assessed and before daily mean PM₁₀ concentrations were calculated.
- 10.50 No roadside PM_{2.5} monitoring data is undertaken to compare to the model output. Therefore, the adjustment factor (of 4.86) calculated in Table A1.9 for the adjustment of PM₁₀ has been applied to all the roadside PM_{2.5} modelling results, before the addition of the appropriate background concentrations.

Verification Summary

- 10.51 Any atmospheric dispersion model study will always have a degree of inaccuracy due to a variety of factors. These include uncertainties in traffic emissions data, in the differences between available meteorological data and the specific microclimate at each receptor location, simplifications made in the model algorithms that describe the atmospheric dispersion and chemical processes. There will also be uncertainty in the comparison of predicted concentrations with monitored data, given the potential for errors and uncertainty in sampling methodology (technique, location, handling, and analysis) as well as processing of any monitoring data.
- 10.52 Whilst systematic under or over prediction can be taken in to account through the model verification/adjustment process, random errors will inevitably occur and a level of uncertainty will still exist in corrected/adjusted data.
- 10.53 Model uncertainties arise because of limited scientific knowledge, limited ability to assess the uncertainty of model inputs, for example, emissions from vehicles, poor understanding of the interaction between model and/or emissions inventory parameters, sampling and measurement error associated with monitoring sites and whether the model itself completely describes all the necessary atmospheric processes.

- 10.54 Overall, it is concluded that with the adjustment factors applied to the ADMS-Roads model is performing well and is considered to be suitable for use within the impact assessment.

Sensitivity Analysis

- 10.55 Whilst this air quality assessment was based on current guidance, i.e., with reduced emission rates and background concentration for the completion year of 2018, to take into account the trend that NO_x and NO₂ concentrations are not declining as expected¹, the results presented in Table A1.11 are on the basis of no future reductions in emission rates and background concentration (i.e. considering the potential impact of the Development against the current baseline 2011, conditions).

Table A1.11: Results of the ADMS-Roads Modelling at Sensitive Receptors, Assuming No Improvement in NO_x and NO₂

ID	Receptor Name	2011 Existing	2018 without Development	2018 with Development	2018 Change
1	125 Friar Street	30.41	30.56	30.60	0.04
2	54 Russell Street	38.04	39.33	39.31	-0.02
3	107 Castle Hill	40.14	39.98	40.01	0.03
4	Alms House Castle Street	36.81	36.68	36.76	0.08
5	41 Bath Road	31.52	31.68	31.67	-0.01
6	96 Berkeley Avenue	30.12	30.25	30.25	-
7	88 Queens Road	39.18	39.47	39.49	0.02
8	Grantley Heights	35.55	35.73	35.75	0.02
9	90 Kings Road	36.64	36.76	36.79	0.03
10	Forbury Hill School	35.73	36.67	36.72	0.05
11	119 Caversham Road	38.51	37.79	37.83	0.04
12	20-30 New Bright Street	41.75	41.56	41.59	0.03
13	10-20 Hieatt Close	33.81	34.38	34.38	-
14	44 Crown Street	39.63	38.98	39.02	0.04
15	6 Tilehurst Road	35.44	36.37	36.37	-
16	Blenheim Terrace, Castle Street	41.96	41.76	41.80	0.04
17	162 Castle Hill	35.57	35.66	35.68	0.02
18	31a Vastern Road	39.09	40.99	41.09	0.10
19	68 George Street	36.64	39.27	39.28	0.01
20	10 Trinity Place	37.20	36.51	36.52	0.01
21	33 Caversham Road	38.25	37.57	37.62	0.05

ID	Receptor Name	2011 Existing	2018 without Development	2018 with Development	2018 Change
22	Merchant House, Merchants Place	29.52	29.72	29.71	-0.01
23	Gateway, 31 Greyfriars Road	31.80	32.00	31.93	-0.07
24	Malthouse Public House, 53 Greyfriars Road	32.19	32.32	32.27	-0.05
25	Projection West	29.69	29.91	29.89	-0.02
26	25a-25b Friar Street	34.67	35.38	35.37	0.01
27	32-34 Friar Street	34.12	34.83	34.82	-0.01
28	36-137 Friar Street	31.60	32.04	32.04	-
29	144 Friar Street	31.28	31.65	31.65	-
30	Bridewell House/ Samuel House	36.61	37.19	37.02	-0.17
31	20 Stanshawe Road	33.78	33.75	33.74	-0.01
32	Terrace House, Vachel Road	35.82	35.83	35.83	-
33	Kennet House, 80-82 Kings Road	32.49	32.63	32.64	-0.01
34	15-21 Tudor Road	47.03	46.96	46.84	-0.12
35	Projection East	29.70	29.91	29.90	-0.01
23	Proposed: Residential Building E 1 st Floor (Garrard Street Façade)	-	-	30.82	-
24	Proposed: Residential Building E 1 st Floor (Friar Street Façade)	-	-	31.80	-
25	Proposed: Residential Building F 1 st Floor (Garrard Street Façade)	-	-	30.46	-
26	Proposed: Residential Building F 1 st Floor (Friar Street Façade)	-	-	29.94	-
27	Proposed: Residential Building F 14 th Floor (Merchants Place Façade)	-	-	29.69	-

10.56 Table A1.12 summarises the magnitude of change (as outlined in Table 10.5 of the Air Quality Chapter) and the significance of effects (as outlined in Table 10.6 of the chapter) for annual mean NO₂ concentrations 'with' the Development, assuming no improvements to NO_x and NO₂.

Table A1.12: Magnitude of Change and Significant of Effects for Annual Mean NO₂ Concentrations with the Development in 2018, Assuming No Improvement in NO_x and NO₂

No.	Receptor Location	Magnitude of Change (see Table 10.5 of Report)	Significance (dependent on magnitude of change and magnitude of concentration see Table 10.6 of Report)
1	1 st Floor Flat, 125 Friar Street	Imperceptible	Negligible
2	54 Russell Street	Imperceptible	Negligible
3	107 Castle Hill	Imperceptible	Negligible
4	Alms House Castle Street	Imperceptible	Negligible
5	41 Bath Road	Imperceptible	Negligible

No.	Receptor Location	Magnitude of Change (see Table 10.5 of Report)	Significance (dependent on magnitude of change and magnitude of concentration see Table 10.6 of Report)
6	96 Berkeley Avenue	Imperceptible	Negligible
7	88 Queens Road	Imperceptible	Negligible
8	Grantley Heights	Imperceptible	Negligible
9	90 Kings Road	Imperceptible	Negligible
10	Forbury Hill School	Imperceptible	Negligible
11	119 Caversham Road	Imperceptible	Negligible
12	20-30 New Bright Street	Imperceptible	Negligible
13	10-20 Hieatt Close	Imperceptible	Negligible
14	44 Crown Street	Imperceptible	Negligible
15	6 Tilehurst Road	Imperceptible	Negligible
16	Blenheim Terrace, Castle Street	Imperceptible	Negligible
17	162 Castle Hill	Imperceptible	Negligible
18	31a Vastern Road	Imperceptible	Negligible
19	68 George Street	Imperceptible	Negligible
20	10 Trinity Place	Imperceptible	Negligible
21	33 Caversham Road	Imperceptible	Negligible
22	Merchant House, Merchants Place	Imperceptible	Negligible
23	Gateway, 31 Greyfriars Road	Imperceptible	Negligible
24	Malthouse Public House, 53 Greyfriars Road	Imperceptible	Negligible
25	Projection West	Imperceptible	Negligible
26	25a-25b Friar Street	Imperceptible	Negligible
27	32-34 Friar Street	Imperceptible	Negligible
28	36-137 Friar Street	Imperceptible	Negligible
29	144 Friar Street	Imperceptible	Negligible
30	Bridewell House/ Samuel House	Imperceptible	Negligible
31	20 Stanshawe Road	Imperceptible	Negligible
32	Terrace House, Vachel Road	Imperceptible	Negligible
33	Kennet House, 80-82 Kings Road	Imperceptible	Negligible
34	15-21 Tudor Road	Imperceptible	Negligible
35	Projection East	Imperceptible	Negligible

Predictions at Height within the Development

- 10.57 Chapter 10: Air Quality presents data for the areas of the proposed Development that are likely to be exposed to the worst-case air quality conditions i.e. the lowest levels of the Development that would be nearest to the road traffic and the level closest to the heating plant. Tables A1.13 to A1.17 presents predicted concentrations at height

Table A1.13: Predicted Annual Mean NO₂ Concentrations (µg/m³) in 2018 at Receptors Introduced as part of the Development for Differing Floor Heights

Floor	Telecom House / Building E		Building F		
	Garrard Street Façade	Friar Street Façade	Garrard Street Façade	Friar Street Façade	Merchants Place Façade
First Floor	25.24	25.26	25.01	24.48	24.48
Second Floor	24.55	24.63	24.40	24.37	24.29
Third Floor	24.28	24.32	24.15	24.21	24.11
Fourth Floor	24.08	24.11	23.98	24.05	23.96
Fifth Floor	23.90	23.93	23.83	23.88	23.81
Sixth Floor	23.74	23.77	23.68	23.73	23.67
Seventh Floor	23.58	23.62	23.54	23.58	23.54
Eighth Floor	23.44	23.48	23.42	23.45	23.41
Ninth Floor	23.31	23.36	23.30	23.33	23.30
Tenth Floor	23.21	23.26	23.19	23.23	23.19
Eleventh Floor	23.12	23.18	23.09	23.15	23.11
Twelfth Floor	23.09	23.11	23.00	23.13	23.05
Thirteenth Floor	23.17	23.07	22.94	23.18	23.22
Fourteenth Floor	23.47	23.05	23.40	23.37	25.75

Table A1.14: Predicted Annual Mean PM₁₀ Concentrations (µg/m³) in 2018 at Receptors Introduced as part of the Development for Differing Floor Heights

Floor	Building E		Building F		
	Garrard Street Façade	Friar Street Façade	Garrard Street Façade	Friar Street Façade	Merchants Place Façade
First Floor	20.36	20.11	20.14	19.64	19.66
Second Floor	19.77	19.72	19.61	19.56	19.50
Third Floor	19.54	19.52	19.41	19.45	19.36
Fourth Floor	19.38	19.37	19.27	19.32	19.24
Fifth Floor	19.23	19.23	19.15	19.19	19.12
Sixth Floor	19.09	19.10	19.03	19.07	19.01
Seventh Floor	18.96	18.98	18.92	18.95	18.90
Eighth Floor	18.84	18.86	18.81	18.83	18.80
Ninth Floor	18.72	18.74	18.71	18.73	18.70
Tenth Floor	18.62	18.64	18.61	18.63	18.61
Eleventh Floor	18.52	18.54	18.52	18.54	18.52
Twelfth Floor	18.44	18.46	18.44	18.45	18.45
Thirteenth Floor	18.36	18.38	18.37	18.38	18.37
Fourteenth Floor	18.29	18.31	18.30	18.31	18.31

Table A1.15: Predicted Daily Mean PM₁₀ Concentrations (number of days >50µg/m³) in 2018 at Receptors Introduced as part of the Development for Differing Floor Heights

Floor	Building E		Building F		
	Garrard Street Façade	Friar Street Façade	Garrard Street Façade	Friar Street Façade	Merchants Place Façade
First Floor	4	4	4	3	3
Second Floor	3	3	3	3	3
Third Floor	3	3	3	3	3
Fourth Floor	3	3	3	3	3
Fifth Floor	3	3	2	2	2
Sixth Floor	2	2	2	2	2
Seventh Floor	2	2	2	2	2
Eighth Floor	2	2	2	2	2
Ninth Floor	2	2	2	2	2
Tenth Floor	2	2	2	2	2
Eleventh Floor	2	2	2	2	2
Twelfth Floor	2	2	2	2	2
Thirteenth Floor	2	2	2	2	2
Fourteenth Floor	2	2	2	2	2

Table A1.16: Predicted Annual Mean PM_{2.5} Concentrations (µg/m³) in 2018 at Receptors Introduced as part of the Development for Differing Floor Heights

Floor	Building E		Building F		
	Garrard Street Façade	Friar Street Façade	Garrard Street Façade	Friar Street Façade	Merchants Place Façade
First Floor	13.86	13.70	13.72	13.43	13.44
Second Floor	13.51	13.48	13.42	13.39	13.35
Third Floor	13.37	13.36	13.30	13.32	13.27
Fourth Floor	13.28	13.28	13.22	13.25	13.20
Fifth Floor	13.19	13.20	13.15	13.17	13.13
Sixth Floor	13.11	13.12	13.08	13.10	13.07
Seventh Floor	13.04	13.05	13.01	13.03	13.00
Eighth Floor	12.97	12.98	12.95	12.96	12.94
Ninth Floor	12.90	12.91	12.89	12.90	12.89
Tenth Floor	12.84	12.85	12.83	12.84	12.83
Eleventh Floor	12.78	12.80	12.78	12.79	12.78
Twelfth Floor	12.73	12.75	12.74	12.74	12.74
Thirteenth Floor	12.69	12.70	12.69	12.70	12.70
Fourteenth Floor	12.65	12.66	12.66	12.66	12.66

Table A1.17: Predicted Annual Mean NO₂ Concentrations (µg/m³) in 2018 at Receptors Introduced as part of the Development for Differing Floor Heights, Assuming no Improvement in NO_x and NO₂

Floor	Building E		Building F		
	Garrard Street Façade	Friar Street Façade	Garrard Street Façade	Friar Street Façade	Merchants Place Façade
First Floor	30.82	31.80	30.46	29.94	29.76
Second Floor	29.83	30.30	29.59	29.71	29.46
Third Floor	29.41	29.62	29.21	29.40	29.17
Fourth Floor	29.08	29.20	28.92	29.07	28.90
Fifth Floor	28.78	28.85	28.66	28.77	28.63
Sixth Floor	28.49	28.55	28.40	28.48	28.38
Seventh Floor	28.21	28.27	28.16	28.22	28.14
Eighth Floor	27.96	28.02	27.93	27.98	27.92
Ninth Floor	27.74	27.80	27.72	27.77	27.72
Tenth Floor	27.54	27.61	27.53	27.58	27.54
Eleventh Floor	27.38	27.45	27.36	27.42	27.38
Twelfth Floor	27.28	27.32	27.20	27.33	27.25
Thirteenth Floor	27.29	27.21	27.08	27.32	27.35
Fourteenth Floor	27.51	27.13	27.46	27.44	29.69

Consultation

- 10.58 The EHO at RBC was consulted to discuss the assessment methodology and their responses are presented below.

From: Jarvis, Ross [<mailto:Ross.Jarvis@reading.gov.uk>]

Sent: 12 March 2015 14:18

To: Brownlie, Chris

Subject: RE: Telecom House, Friar Street, Reading - Planning reference 141124

Hi Chris,

It sounds to me like the transport model needs to be updated. How accurate is a model likely to be if it does not the significant changes that have happened in the area over the last few years? That said, as it is the best that is available I am happy to accept the use of the 2011 baseline data.

Regards

Ross

Ross Jarvis

Senior Technical Officer

Environmental Protection & Nuisance | Department of Environment & Neighbourhood Services

Reading Borough Council

Civic Offices

Bridge Street

Reading

RG1 2LU

0118 937 2314 (72314)

[Website](#) | [Facebook](#) | [Twitter](#) | [YouTube](#)



From: Brownlie, Chris [<mailto:chris.brownlie@watermangroup.com>]

Sent: 12 March 2015 11:09

To: Jarvis, Ross

Subject: Telecom House, Friar Street, Reading - Planning reference 141124

Dear Ross,

We have been commissioned to undertake the air quality assessment as part of the EIA for the proposed Telecom House Application. As part of the assessment work a request for a scoping opinion was requested in a letter to the Council on 2 June 2014. The response to this letter on the 8th October 2014 stated that for Air Quality:

"If 2011 baseline data is to be used, we would expect this to be fully justified to show that the differences between the 2011 and 2013 baseline air quality data is insignificant and why 2013 baseline data could not be obtained."

Following consultation with the transport consultants (Peter Brett Associates) they have confirmed that the traffic data uses the Reading Transport Model (which is maintained and operated by PBA on behalf of RBC). The model is the RBC development model used to assess proposed developments within RBC.

This model is validated to the baseline year 2011 and therefore this is the baseline data PBA are able to supply. PBA have also agreed with the highways department that they do not require to update their assessment work as they have assessed a worst case scenario. The transport consultant has confirmed that they could growth the 2011 baseline data to another baseline year however this would not take into account the changes in flows around Garrad Street, Friar Street and Station Road based on the changes to bus routing as these happened after the model was validated using the 2011 data. The transport consultant confirmed that the forecast model used to supply the future development year does include these changes.

Based on the above we propose to use the 2011 baseline year in our air quality assessment and to enable our model to be verified against the Councils monitoring data. We would be grateful if you could confirm that the use of 2011 as the baseline/model verification year is acceptable.

Should you have any questions then please do not hesitate to contact me. I would be grateful if you could confirm the above approach is acceptable at your earliest convenience.

Kind regards,

Chris

Chris Brownlie

Principal Consultant

Waterman Energy, Environment & Design

Pickfords Wharf

Clink Street

London

SE1 9DG

t 020 7928 7888

www.watermangroup.com

Please note my email address has changed to chris.brownlie@watermangroup.com

Please amend your records accordingly

P Please consider the environment before printing this e-mail. Thank you

Hi Chris,

Overall the proposed approach is acceptable. In addition to the information you have provided I would ask that you use the data from the AURN located at cemetery junction as representing background rather than background mapping.

You identify emissions of PM10 as a result of the redevelopment and vehicular movements during redevelopment. I would be particularly interested to see what the modelled impact of this will be, as we have been having some high PM10 readings recently at our Caversham Road AQMS, which I believe is likely to be in part due to the long term redevelopment work that is already taking place in the vicinity.

Kind regards

Ross

Ross Jarvis
Senior Technical Officer
Environmental Protection | Reading Borough Council
Level 15 | Civic Centre | Reading | RG1 7AE
Direct Tel: 0118 937 2314 **Internal:** x72314

From: Brownlie, Chris [<mailto:chris.brownlie@watermangroup.com>]
Sent: 11 March 2013 09:30
To: Jarvis, Ross
Subject: Station Hill, Reading - Air Quality

Dear Ross,

Waterman have been commissioned to undertake an air quality assessment to support the outline planning application for the proposed redevelopment of approximately 2.5 hectares (ha) of brownfield land between Reading Mainline Station and Reading town centre.

The site is bound by Station Hill and Reading Mainline Station to the north, Station Road to the east, Friar Street to the south, and Greyfriars Road to the west and is bisected by Garrad Street and centred on National Grid Reference 471361, 173756.

It is currently envisaged that the Development would include in the order of 150 to 300 residential units, 90,000-110,000m² Gross External Area (GEA) of office space, 6,000-8,000m² GEA of retail uses, 900-1,200m² GEA of leisure development, and associated parking and new pedestrian routes through the Site.

We have identified the following potential impacts on air quality as a result of the proposed redevelopment:

- Emissions of PM₁₀ and dust as a result of the redevelopment;
- Emissions from construction vehicles along routes used to access the site; and
- Emissions from additional traffic generated by the proposed redevelopment on existing and proposed sensitive receptors.

We propose to assess the impact of the proposed development on local air quality using guidance published in LAQM.TG(09) and the ADMS Roads model to predict the effect from additional traffic movements generated by the proposed development on the future local air quality. The new NO₂ from NO_x Calculator available from the Air Quality Archive website (version 3.2 released 6 September 2012) will then be applied to derive the road-related NO₂ emissions from NO_x ADMS outputs. We will undertake the main assessment of the potential effect of the development for the future completion year. However, given the current uncertainty in relation to the projected decline in NO_x and NO₂ concentrations, we will also undertake a sensitivity analysis on the basis of no future reductions in NO_x and NO₂. (i.e. considering the potential effect of the development against current baseline conditions).

It is not clear at this stage what the energy strategy is at this stage but should the development include CHP or similar then our assessment will include this.

We propose to verify the predicted concentrations from ADMS Roads against a number of diffusion tubes located within Reading Town Centre and would be grateful if you could confirm that this is acceptable.

We are not aware of any other sources of pollution in the area, other than road traffic that may affect air quality at the site (and should therefore be considered in the assessment).

*If you have any queries in relation to our proposed methodology please do let me know.
However, it would be helpful if you could confirm that our proposed approach is acceptable.*

*Kind regards,
Chris*

Chris Brownlie
Consultant
Waterman Energy, Environment & Design

*Pickfords Wharf
Clink Street
London
SE1 9DG
t 020 7928 7888
www.watermangroup.com*

References

- 1 <http://laqm.defra.gov.uk/faqs/faqs.html>
- 2 DEFRA, 2009, Local Air Quality Management Technical Guidance LAQM.TG (09)
- 3 www.dft.gov.uk : Road Traffic Statistics: TRA0307
- 4 AEA, NO_x to NO₂ Calculator, <http://laqm1.defra.gov.uk/review/tools/monitoring/calculator.php> Version 3.2, September 2012
- 5 AEAT, 'Analysis of the relationship between annual-mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective', 2008.

Appendix 11.1

Glossary of Acoustic Terminology

APPENDIX 11.1 GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibels (dB)	Noise can be defined as unwanted sound. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic. The dynamic range of the auditory system is generally taken to be 0dB to 140dB. Generally, the addition of noise from two sources producing the same sound pressure level, will lead to an increase in sound pressure level of 3dB. A 3dB noise change is generally considered to be just noticeable, a 5dB change is generally considered to be clearly discernible and a 10dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness. Examples of typical sound intensity levels within the decibel range of 0 to 120dB are listed below: • Four engine jet aircraft at 100m 120dB • Riveting of steel plate at 10m 105dB • Pneumatic drill at 10m 90dB • Circular wood saw at 10m 80dB • Heavy road traffic at 10m 75dB • Telephone bell at 10m 65dB • Male speech, average at 10m 50dB • Whisper at 10m 25dB • Threshold of hearing, 1000Hz 0dB
Frequency	Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18,000Hz. The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.
A-Weighting	The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit which has a frequency response similar to the human auditory system. All the measurement results referred to in this report are A-weighted.
Sound Power Level (L_W) and Sound Pressure Level (L_P)	These two units are used to express sound level. Sound power level is the inherent property of a source, whilst sound pressure level is dependent on surroundings/distance/directivity etc. The sound level that is measured on a meter is the sound pressure level, L_P.
$L_{Aeq,T}$	The A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.
L_{A10}	The noise level exceeded for 10% of the measurement period. It has been used in the UK for the assessment of road traffic noise.
L_{A90}	The noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise which is present even during the quieter parts of the measurement period.

L_{Amax}	Maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax F}$, or Fast, is averaged over 0.125 of a second and $L_{Amax S}$, or Slow, is averaged over 1 second. Maximum noise levels were all monitored using the Fast response.
$L_{10,1-hour}$	The L_{10} level measured over a 1 hour period.
$L_{10,18-hour}$	The arithmetic average of the $L_{10,1-hour}$ levels for the 18 hour period between 06:00 hours and 24:00 hours on a normal working day. It is a common traffic noise descriptor.
Ambient noise	The totally encompassing sound in a given situation.
Free Field	Free field noise levels are measured or predicted such that there is no contribution made up of reflections from nearby building façades.
Façade Noise Level	A noise level measured or predicted at the façade of a building, typically at a distance of 1m, containing a contribution made up of reflections from the façade itself (+3dB).
Sound Reduction Index (R)	The sound reduction index is a single-number rating of the sound reduction through a wall or other building element. Since the sound reduction may be different at different frequencies, test measurements are subjected to a standard procedure which yields a single number that is about equal to the average sound reduction in the middle of the human hearing range.
Weighted Sound Reduction Index (R_w)	The R_w incorporates a correction for the ears' response. It is derived from comparing the window sound insulation to frequency curve with a family of reference curves.
R_{TRA}	Traffic noise reduction – by adopting an idealised but typical spectrum of road traffic noise dominated by low frequencies, an index R_{TRA} (reduction of road traffic noise) is derived. By comparing this with the sound reduction of the window in dB(A) it represents the likely in service performance for road traffic noise attenuation.
Vibration Dose Value (VDV, $ms^{-1.75}$)	VDV, specified in BS 6472, is used as a basis for assessing human exposure to vibration over a given period of time.



Appendix 11.2

Baseline Noise Monitoring Data

Appendix 11.2 Baseline Noise Monitoring Data

Identification of Noise Sensitive Receptors

The nearest noise sensitive receptors to the Application Site boundary were identified following a site visit and study of an OS map of the Application Site and surrounds. The identified noise sensitive receptors are presented in Table 11.1.1 and illustrated by Figure 11.1.

Table 11.1.1 Noise Sensitive Receptors

NSR Reference (Figure 11.1)	Description of NSR	Distance from Site Boundary (approximate in metres)
A	Three Guineas Public House, Grade II listed building, Station Hill.	30m North
B	Bridewell House/Samuel House, Junction Greyfriars Road and Friar Street.	60m West
C	The Gateway Public House, Greyfriars Road, with residential use at first floor level	15m West
D	Terrace housing on Stanshawe Road. Oblique view of site and intervening buildings between site and NSRs.	35m West
E	Terrace housing on Vachel Road. Oblique view of site and intervening buildings between site and NSRs.	65m South-East
F	Novotel and Ibis Hotels, Friar Street. Intervening buildings between hotels and site.	70m West
G	Malthouse Public House, Greyfriars/Tudor Road junction, residential 1 st and 2 nd floor levels.	15 m West
H	39 Friar Street, Grade II listed building	10m East
I	Projection East and West at Merchants Place	35m East
J	5-21 Tudor Road	60m West
K	Telecom House/Residential Plot E and Plot F	Within Site Boundary
L	Garrard House, 30 Garrard Street	15m South

Baseline Noise Survey

A baseline noise survey was undertaken at the Site over a typical weekday period from Tuesday 13th December until Thursday 15th December 2011. The noise monitoring locations are illustrated on Figure 11.1 and described in Table 11.2.2. It should be borne in mind that at the time of undertaking the baseline noise survey the exact location of the residential elements of the development was unknown, therefore monitoring was undertaken at locations representative of the site boundaries.

The noise parameters logged throughout the survey period in 5 to 10 minute contiguous sampling periods were L_{Aeq} , L_{Amax} , L_{A90} and L_{A10} . The L_{Aeq} level is the equivalent continuous sound pressure level over the measurement period; L_{Amax} is an indicator of the highest sound level during the measurement period; L_{A90} is used as a descriptor of background noise levels and L_{A10} is the noise level which is achieved for 10% of the monitoring period and is often used as a descriptor of road traffic noise.

The sound level meters were calibrated both before and after each monitoring period; no drift from the reference level of 94dB was recorded.

Monitoring was undertaken by trained and competent staff who are members of the Institute of Acoustics (IOA).

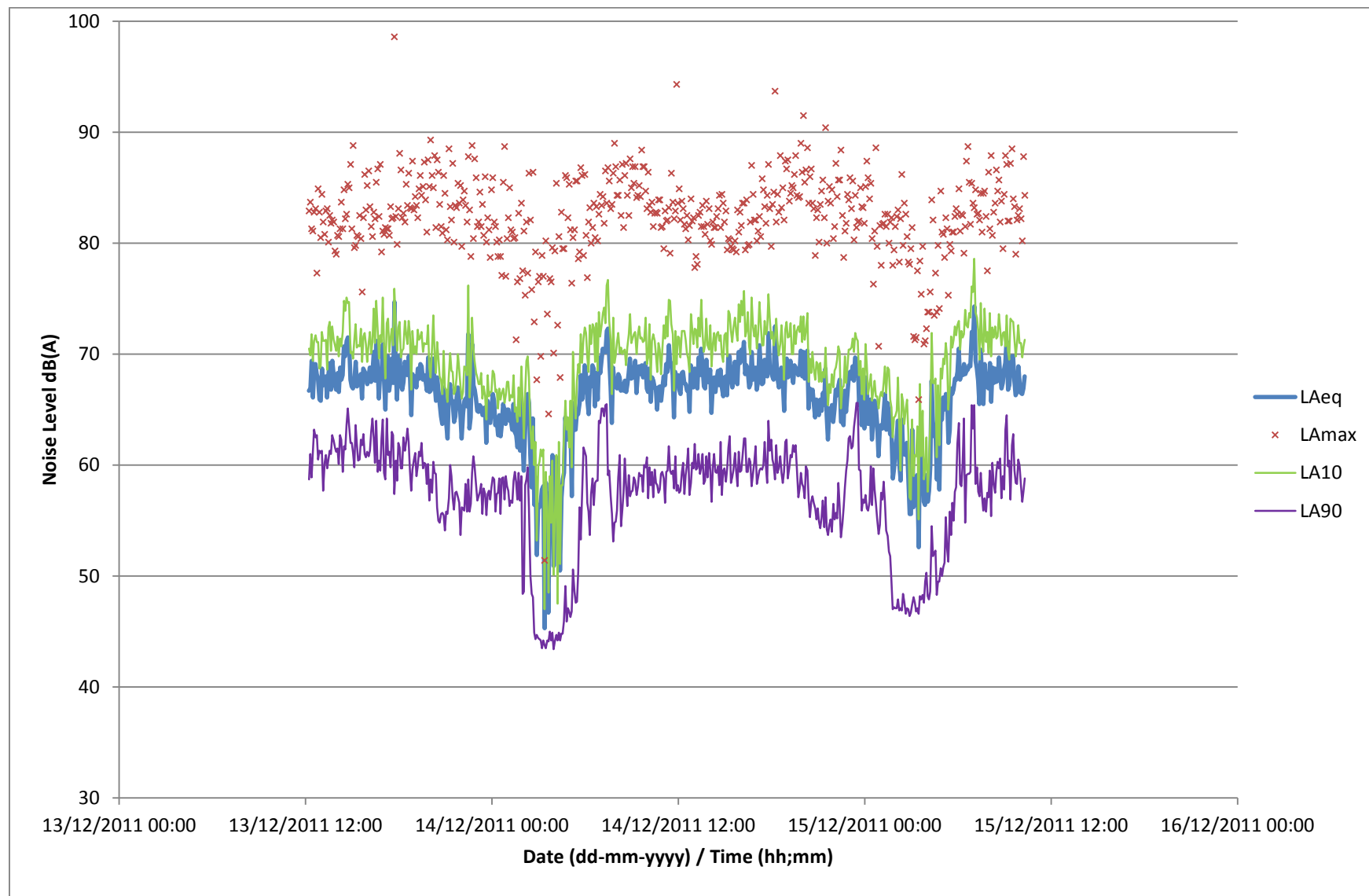
Time history plots of the measured noise levels are presented below all of which exhibit a distinct diurnal variation in noise level due to reduction traffic and other noise contributing activities during the night-time period. Tabulated values are available on request.

All locations were exposed to mixed noise sources predominantly consisting of road traffic noise but with some contribution from Reading Railway Station at LT2 (Station Hill) and prevailing building services and fixed plant noise.

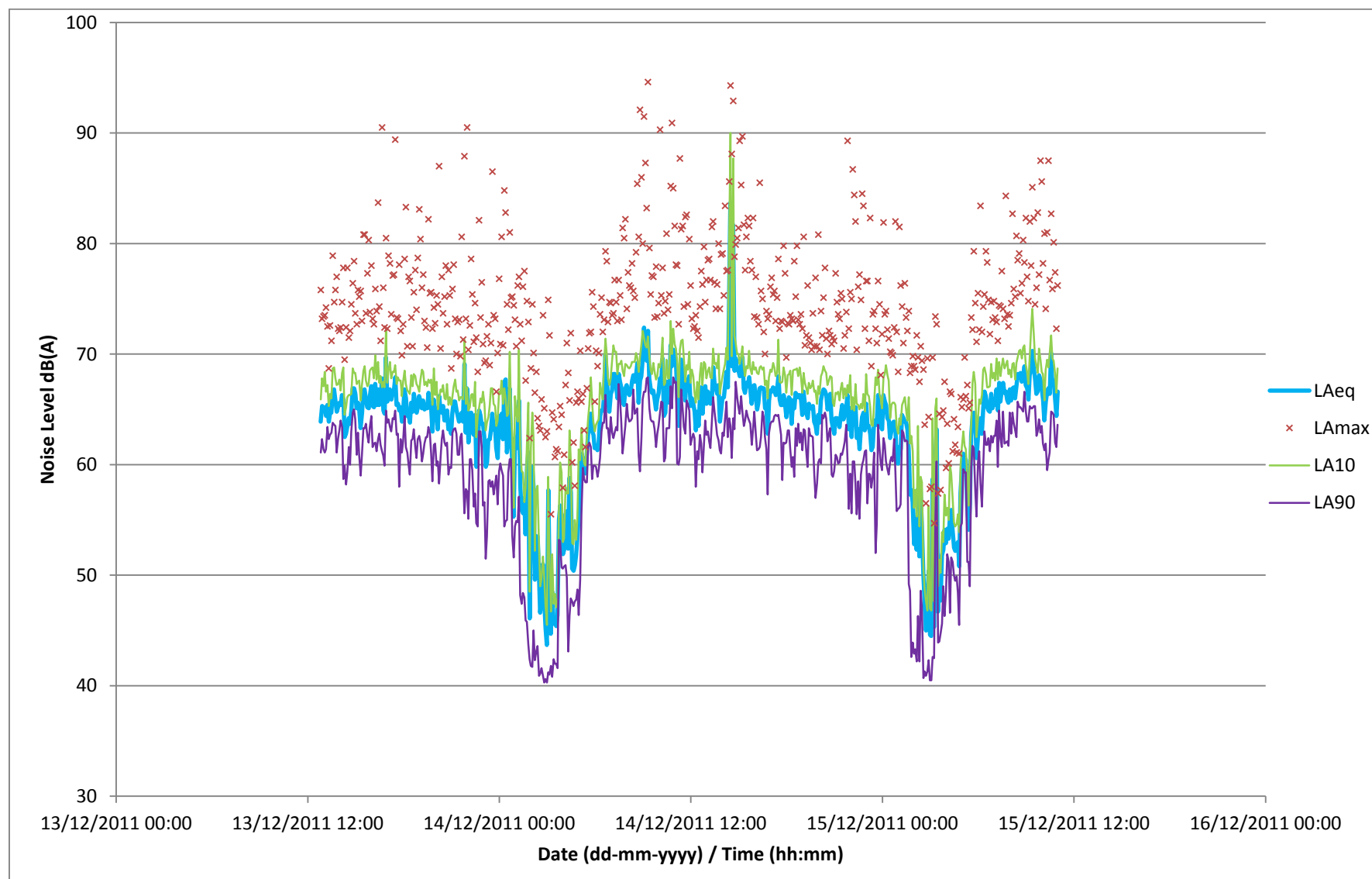
Table 11.2.2 Description of Noise Monitoring Locations

Monitoring Location (Figure 11.1)	Description	Observations and Predominant Noise Sources
LT1	Long term unattended facade monitoring location at 2 nd floor level facing onto Friar Street (Southern Site Boundary)	Noise climate dominated by road traffic movements along Friar Street and adjoining road network.
LT2	Long term unattended façade monitoring location at 2 nd floor level facing onto Station Hill and Reading Railway Station. (Northern Site Boundary)	Noise climate dominated by road traffic from the adjoining road network and Reading Railway Station. During the noise survey Station Hill Road was closed due to construction works. Intermittent construction noise was discernible during the daytime period. The noise measured at this location is therefore indicative at best without the contribution of road traffic noise along Station Hill.
LT3	Long term unattended façade monitoring location at 3 rd floor level facing onto Greyfriars Road. (Western Site Boundary)	Noise climate dominated by road traffic along both Greyfriars Road and adjoining road network.
LT4	Long term unattended free-field monitoring location at roof top location, 6 th floor level, facing onto Garrard Street.	Noise climate dominated by road traffic along both Garrard Street and adjoining road network.

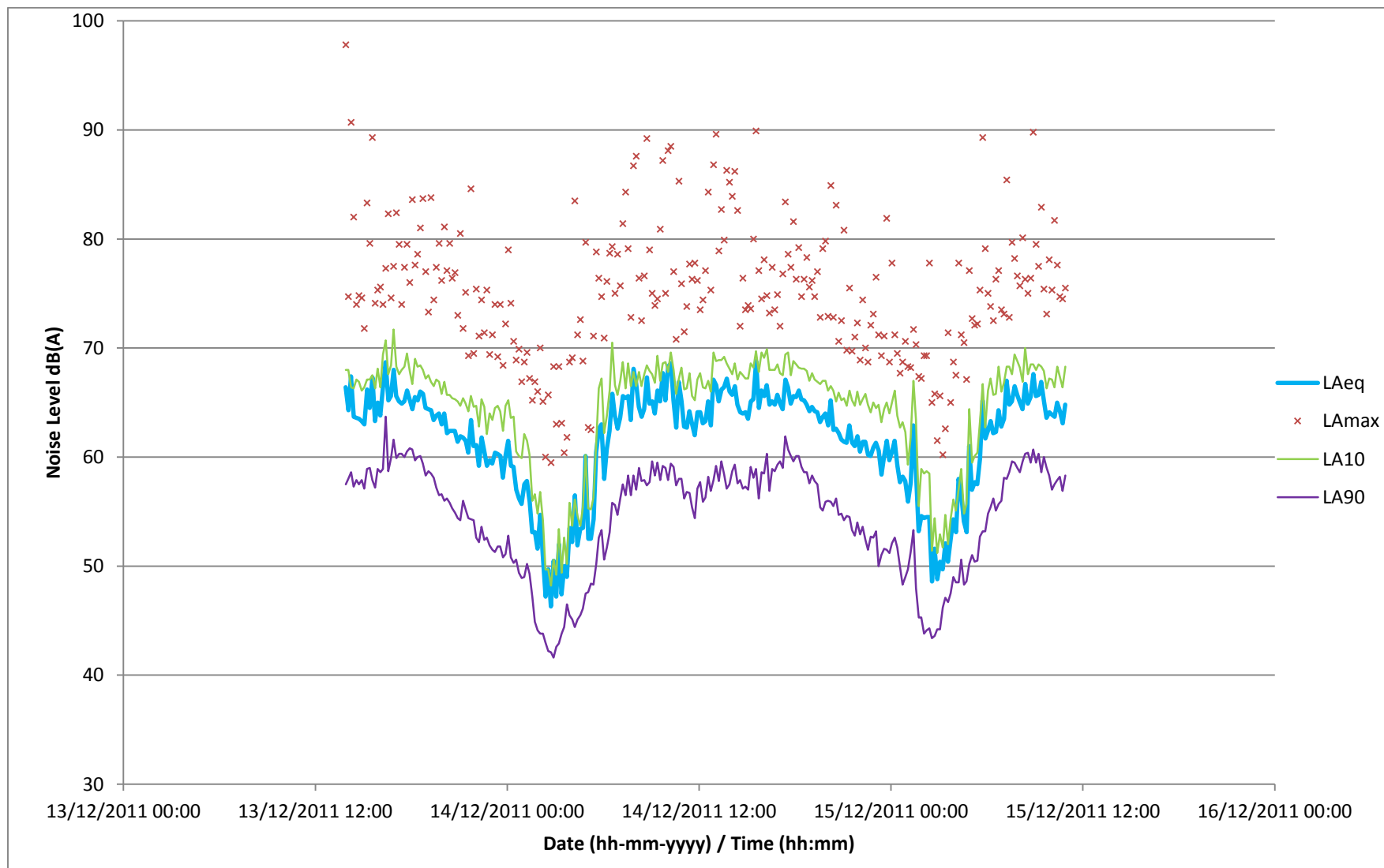
LT1: Friar Street (Southern Boundary)



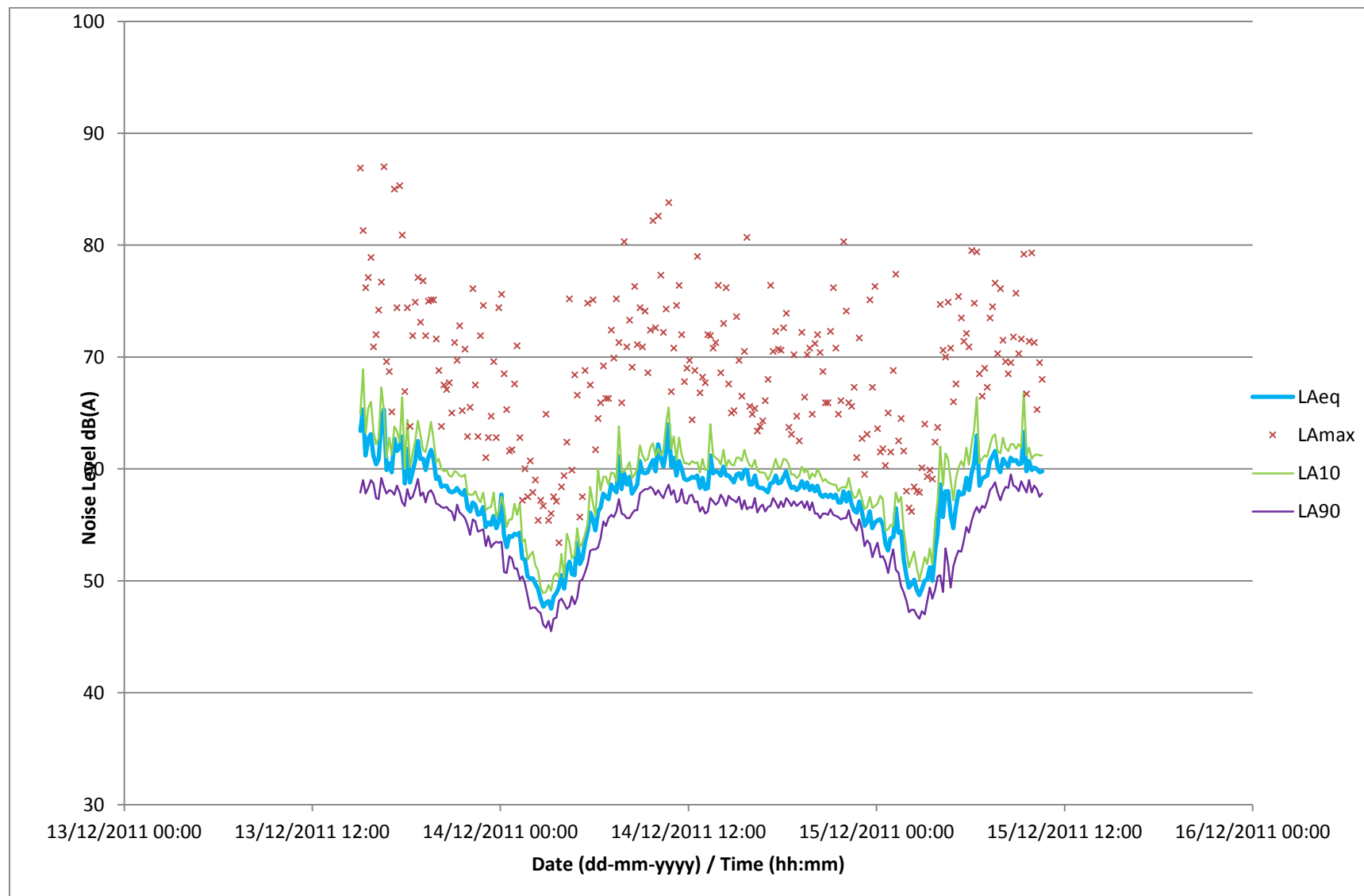
LT2: Station Hill (Northern Boundary)



LT3: Greyfriars Road (Western Boundary)



LT4: Garrard Street (Western Boundary)





Appendix 11.3

Construction Noise Assessment

Appendix 11.3 Construction Assessment

Construction Noise Assessment

The significance criteria for the construction noise assessment are based on 'The ABC Method' from BS 5228-1:2009+A1:2014. An extract describing this method is provided below.

Example Method 1 – The ABC Method

Table E.1 shows an example of the threshold of **potential** significant effect at dwellings when the **total site** noise level rounded to the nearest decibel, exceeds the listed value. The table can be used as follows: for the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5 dB. This is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a significance effect is deemed to occur.

Table E.1 Example threshold of significant effect at dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00-07.00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07.00-19.00) and Saturdays (07.00-13.00)	65	70	75

NOTE1 A **potential significant** effect is **indicated** if the site L_{AeqT} noise level, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the **Category C** threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a **potential** significant effect is **indicated** if the total L_{Aeq} noise level for the period increases by more than 3 dB due to **site noise**.

NOTE 3 Applied to residential receptors only.

^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

^{B)} Category B: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

^{C)} Category C: threshold values to use when the ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

^{D)} 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays.

(Source: BS 5228-1:2009+A1:2014, Page119)

Table 11.3.1 presents the derived daytime threshold values for the selected representative NSRs. Calculations have not been undertaken for the evening or night-time as given that the build out is over a 5 year period, it is assumed that evening and night-time construction work would only be undertaken under exceptional circumstances and not without prior approval. Exceptional circumstances may include concreting operations where the pumping of concrete to foundations has to be a continuous process which may require operations outside the daytime period.

Table 11.3.1: Construction Daytime Threshold Categories (BS85228 ABC Method)

NSR Ref.	NSR	Prevailing Noise Level dB L _{Aeq}	BS5228: Threshold Value
A	Three Guineas Public House, Station Hill, Grade II Listed Building	64 [1]	70
B	Bridewell House/Samuel House, Junction Greyfriars Road and Friar Street	68	75
C	The Gateway Public House, Greyfriars Road	68	75
D	Stanshawe Road	61 [2]	65
E	Vachel Road	62 [2]	65
F	Malthouse Public House, Greyfriars Road	68	75
G	Novotel & Ibis, Friar Street	69	75
H	39 Friar Street (Grade II Listed Building)	69	75
I	Porjection East and West at Merchants Place	64 [3]	70
J	5-21 Tudor Road	64 [1]	70
K	Telecom House/Plot E and Plot F	65 [4]	70
L	Garrard House	65 [4]	70

Note: [1] – Derived from LT2. [2] – Derived from LT3. [3] Derived from LT1. [4] Derived from LT4.

Generic calculations were undertaken using the data and procedures set out in BS 5228:2009+A1:2014 for the noisiest construction phases, to derive indicative noise levels at selected NSRs. The highest noise levels tend to be associated with plant associated with, piling, earthmoving and construction of the substructure and superstructure. During the fit-out, construction noise would be significantly lower. The calculations assume that plant would be operating at the closest point to the NSR, such as the construction Site boundary (hoarding location), and do not take into account any existing or proposed screening. The noisiest construction phases and associated noise levels are as follows:

- Demolition 92 dB(A) at 10m;
- Earthworks 84 dB(A) at 10m;
- Piling 88 dB(A) at 10m (Rotary Bored Piling Method);
- Concreting 80 dB(A) at 10m;
- Pavement 81 dB(A) at 10m.

The closest potentially sensitive receptors to the proposed Development are identified in Table 11.3.2. The baseline noise levels for each receptor were derived from the most representative monitoring position from the noise surveys. Suitable threshold levels, above which significant adverse effects may arise, are specified in accordance with the guidance provided in BS 5228:2009+A1:2014.

A maximum worst case noise level over a one hour period was calculated, assuming that plant would be operating at the closest point to the nearest NSRs in the absence of mitigation. In practice, noise levels would tend to be lower owing to greater separation distance as the works progress. They would also tend to reduce over a 12-hour working day owing to periods of plant inactivity.

Where construction phases occur concurrently, then calculations are based on the nearest building plot to the NSR.

Table 11.3.2: Generic Construction Calculations

NSR	Construction Phase	Threshold Level (dB(A))	Site Noise Level (dB(A)) No Mitigation	Significance No Mitigation	Site Noise Level (dB(A)) With Mitigation	Significance Mitigation
NSR A	Demolition	70	82	Major Adverse	72	Minor Adverse
	Earth Works	70	74	Minor Adverse	64	Negligible
	Piling	70	78	Moderate Adverse	68	Negligible
	Concreting	70	71	Minor Adverse	61	Negligible
	Pavement	70	72	Minor Adverse	62	Negligible
NSR B	Demolition	75	76	Minor Adverse	66	Negligible
	Earth Works	75	68	Negligible	58	Negligible
	Piling	75	72	Negligible	62	Negligible
	Concreting	75	65	Negligible	66	Negligible
	Pavement	75	66	Negligible	56	Negligible
NSR C	Demolition	75	88	Major Adverse	78	Minor Adverse
	Earth Works	75	63	Negligible	<55	Negligible
	Piling	75	84	Moderate Adverse	74	Negligible
	Concreting	75	77	Minor Adverse	67	Negligible
	Pavement	75	78	Minor Adverse	68	Negligible
NSR D	Demolition	65	76	Major Adverse	66	Minor Adverse
	Earth Works	65	68	Minor Adverse	58	Negligible
	Piling	65	72	Moderate Adverse	62	Negligible
	Concreting	65	64	Negligible	<55	Negligible
	Pavement	65	65	Minor Adverse	55	Negligible
NSR E	Demolition	65	70	Moderate Adverse	60	Negligible
	Earth Works	65	63	Negligible	<55	Negligible
	Piling	65	66	Minor Adverse	56	Negligible

NSR	Construction Phase	Threshold Level (dB(A))	Site Noise Level (dB(A)) No Mitigation	Significance No Mitigation	Site Noise Level (dB(A)) With Mitigation	Significance Mitigation
NSR F	Concreting	65	59	Negligible	<55	Negligible
	Pavement	65	60	Negligible	<55	Negligible
	Demolition	75	70	Negligible	60	Negligible
	Earth Works	75	62	Negligible	<55	Negligible
	Piling	75	66	Negligible	56	Negligible
	Concreting	75	58	Negligible	<55	Negligible
	Pavement	75	59	Negligible	<55	Negligible
NSR G	Demolition	75	88	Major Adverse	78	Minor Adverse
	Earth Works	75	81	Moderate Adverse	71	Negligible
	Piling	75	84	Moderate Adverse	74	Negligible
	Concreting	75	77	Minor Adverse	67	Negligible
	Pavement	75	78	Minor Adverse	68	Negligible
NSR H	Demolition	75	92	Major Adverse	82	Moderate Adverse
	Earth Works	75	84	Moderate Adverse	74	Negligible
	Piling	75	88	Major Adverse	78	Minor Adverse
	Concreting	75	80	Moderate Adverse	70	Negligible
	Pavement	75	81	Moderate Adverse	71	Negligible
NSR I	Demolition	70	81	Major Adverse	71	Minor Adverse
	Earth Works	70	73	Minor Adverse	63	Negligible
	Piling	70	77	Moderate Adverse	67	Negligible
	Concreting	70	69	Negligible	59	Negligible
	Pavement	70	70	Minor Adverse	60	Negligible
NSR J	Demolition	70	76	Moderate Adverse	66	Negligible
	Earth Works	70	68	Negligible	58	Negligible

NSR	Construction Phase	Threshold Level (dB(A))	Site Noise Level (dB(A)) No Mitigation	Significance No Mitigation	Site Noise Level (dB(A)) With Mitigation	Significance Mitigation
	Piling	70	72	Negligible	62	Negligible
	Concreting	70	65	Negligible	55	Negligible
	Pavement	70	66	Negligible	56	Negligible
NSR K	Demolition	Not Applicable – No Demolition Works When Telecom House/Plot E Occupied				
	Earth Works	70	84	Major Adverse	74	Minor Adverse
	Piling	70	88	Major Adverse	78	Moderate Adverse
	Concreting	70	80	Major Adverse	70	Minor Adverse
	Pavement	70	81	Major Adverse	71	Minor Adverse
NSR L	Demolition	Not Applicable – No Demolition Works When Garrard House Residential				
	Earth Works	70	81	Major Adverse	71	Minor Adverse
	Piling	70	84	Major Adverse	74	Minor Adverse
	Concreting	70	77	Moderate Adverse	67	Negligible
	Pavement	70	78	Moderate Adverse	68	Negligible
NSR M	Demolition	Not Applicable – No Demolition Works When Telecom House/Plot F Occupied				
	Earth Works	70	66	Negligible	56	Negligible
	Piling	70	69.5	Negligible	60	Negligible
	Concreting	70	62	Negligible	<55	Negligible
	Pavement	70	63	Negligible	<55	Negligible

During the deconstructive demolition works, when operations are being conducted in the nearest development plot to the NSRs, predominantly temporary major adverse effects are predicted. At Vachel Road and the Novotel and Ibis Hotels on Friar Street temporary moderate adverse and negligible effects are predicted respectively due to attenuation afforded by distance and the intervening buildings. Negligible effects are also predicted at Bridewell House/Samual House due to distance attenuation. With mitigation the effects are reduced ranging from negligible to temporary moderate adverse.

For all other phases of construction the results are as follows:

At Three Guineas Public House on Station Hill, when construction works are being conducted at the northern boundary of development plots C and G temporary effects are predominantly of minor adverse significance with moderate adverse predicted during piling operations. With mitigation negligible effects are predicted.

At Bridewell House/Samuel House, on the junction of Greyfriars Road and Friar Street, negligible effects are predicted for all the construction phases due to distance.

At the Gateway Public House, on Greyfriars Road, predicted significance of effects range from negligible to temporary moderate adverse when works are being conducted at the western boundary of development plot A. With mitigation negligible effects are predicted.

At the nearest residential housing on Stanshawe Road, predicted significance of effects range from negligible to temporary moderate adverse when works are being conducted at the western boundary of development plot A. With mitigation negligible effects are predicted.

At the nearest residential housing on Vachel Road, predicted significance of effects range from negligible to temporary minor adverse. With mitigation negligible effects are predicted.

At Novotel and Ibis and hotels on Friar Street, predicted significance of effects are negligible due to attenuation afforded by distance and screening from the intervening buildings.

At the Malthouse Public House at the junction with Greyfriars Road and Tudor Road, predicted significance of effects range from temporary minor adverse to temporary moderate adverse. With mitigation negligible effects are predicted.

At 39 Friar Street, which is a grade II listed building, as it is directly adjacent to the Application Site boundary at Plot E, predicted significance of effects range from moderate adverse to major adverse. With mitigation they reduce to negligible and minor adverse for all phases except during demolition where moderate adverse effects are predicted.

At East and West Projection at Merchants Place predicted significance of effects range from negligible to moderate adverse. With mitigation all effects are predicted to reduce to negligible.

Based on the indicative construction phasing, there may be the potential for construction activities to impact on residents of the Telecom House/ Plot E Scheme, if occupied when construction of Plot F is progressed. When works are being conducted at the shortest distance then there is the potential for temporary major adverse effect to occur. With mitigation these reduce to temporary minor adverse with moderate adverse during piling.

There is also the potential for construction activities to impact on the residents of Plot E and F when Plot C is being constructed. However, due to the distance attenuation and screening afforded by buildings within Plots D and G, all impact are predicted to be negligible.

Appendix 11.4

Assessment of Residential Amenity

Appendix 11.4 Assessment of Residential Amenity

Introduction

To determine the suitability of the Application Site for residential use, a baseline noise assessment has been undertaken to establish the prevailing noise levels at the Application Site boundaries, thereby representing worst-case scenario.

Residential Amenity Assessment Criteria

National Planning Policy Framework (2012)

The National Planning Policy Framework¹ (NPPF) set out the Government's planning policies for England and how these are expected to be applied. The NPPF is a material consideration in planning decisions.

With regard to noise the NPPF states:

- *"The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution;"*
- In support of this, paragraph 123 states that planning decisions should aim to;
- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".*

Pollution, including noise, is defined as anything that might lead to an adverse impact on human health, the natural environment or general amenity.

Annex 3 of the NPPF states that the document replaces Planning Policy Guidance 24 'Planning and Noise' (PPG24)ⁱ but falls short of providing any specific technical guidance.

Web based guidance on the NPPF has been issued with regard to noiseⁱⁱ although it does not explicitly state acceptable construction noise levels or indeed acceptable operational noise levels in the context of maintaining existing residential or commercial amenity. The National Planning Practice Guidance does outline the qualitative effects of noise exposure and what action should be taken and states that:

"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment."

The preliminary assessment of residential amenity has been undertaken with reference to the guideline noise levels presented in BS 8233:2014 and the WHO 'Guidelines for Community Noise' as summarised below.

¹ Communities and Local Government. (2012) 'The Planning Policy Planning Framework'. HMSO.

BS 8233 Guidance on Sound Insulation and Noise Reduction for Buildings (2014)

BS 8233:2014 'Sound Insulation and Noise Reduction for Building'² provide guidance with regards to the control of noise in and around buildings. The guidance suggests appropriate noise criteria for different uses, which are primarily intended to guide the design of new buildings, or refurbished buildings undergoing a change in use. It can be used to assess the required sound insulation to be afforded by the building envelope to provide suitable residential amenity for existing and future noise sensitive receptors.

Table 11.4.1 presents the noise criteria of BS8233:2014 for residential spaces.

Table 11.4.1: Guideline Internal Noise Levels for Residential Dwellings

Activity	Location	Daytime $L_{Aeq, 16 \text{ hour}}$ (07:00 to 23:00)	Night-Time $L_{Aeq, 8 \text{ hour}}$ (23:00 to 07:00)
Resting	Living room	35dB	Not applicable
Dining	Dining room / area	40dB	Not applicable
Sleeping (daytime resting)	Bedroom	35dB	30dB

When considering external amenity spaces such as gardens balconies and terraces, the guidance provided in BS 8233 states:

"For traditional external areas that are used for amenity space, such as gardens or patios it is desirable that the external noise level does not exceed 50 dB $L_{Aeq, T}$, with an upper guideline value of 55 dB $L_{Aeq, T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

World Health Organisation Guidelines for Community Noise (2000)

The World Health Organisation (WHO) published guidance on the desirable levels of environmental noise in 2000. In this document entitled, Guidelines for Community Noise³, the authors consider that sleep disturbance criteria should be taken as an internal noise level of 30dB $L_{Aeq, 8hr}$ or an external level of 45dB $L_{Aeq, 8hr}$, measured at 1m from the façade. It is also suggested that internal L_{Amax} levels of 45dB and external L_{Amax} levels of 60dB, should not be exceeded 10-15 times during the night-time period.

For external daytime levels it recommends ≤ 55 dB L_{Aeq} to protect the majority of people from being seriously annoyed.

It should be noted that in many areas within England the WHO guideline levels are already exceeded and therefore the levels suggested in Guidelines for Community Noise may be considered more aspirational than immediately attainable.

Baseline Noise Survey

A baseline noise survey was undertaken over a typical weekday period from Tuesday 13th December until Thursday 15th December 2011. Long-term unattended noise measurements were conducted at 4 locations over the day and night-time period. The noise monitoring locations are illustrated in Figure 11.1 and Table 11.4.2.

² British Standards Institute, 2014, 'BS 8233:2014 Guidance on Sound insulation and noise reduction for buildings - Code of Practice', BSI.

³ World Health Organisation. Guidelines for Community Noise. 2000

Table 11.4.2: Noise Monitoring Locations

Monitoring Location (Figure 11.1)	Description	Observations and Predominant Noise Sources
LT1	Long term unattended facade monitoring location at 2 nd floor level facing onto Friar Street (Southern Site Boundary)	Noise climate dominated by road traffic movements along Friar Street and adjoining road network.
LT2	Long term unattended facade monitoring location at 2 nd floor level facing onto Station Hill and Reading Railway Station. (Northern Site Boundary)	Noise climate dominated by road traffic from the adjoining road network and Reading Railway Station. During the noise survey Station Hill Road was closed due to construction works. Intermittent construction noise was discernible during the daytime period. The noise measured at this location is therefore indicative at best without the contribution of road traffic noise along Station Hill.
LT3	Long term unattended facade monitoring location at 3 rd floor level facing onto Greyfriars Road. (Western Site Boundary)	Noise climate dominated by road traffic along both Greyfriars Road and adjoining road network.
LT4	Long term unattended free-field monitoring location at roof top location, 6 th floor level, facing onto Garrard Street.	Noise climate dominated by road traffic along both Garrard Street and adjoining road network.

Table 11.4.3 presents a summary of the baseline noise levels.

Table 11.4.3: Summary of Baseline Noise Levels

Location (Ref Figure 11.1)	Period	Noise Level dB(A) (free-field) to nearest whole dB				
		L _{Aeq}	L _{Amax} ^[1]	L _{A10}	L _{A90}	L _{A90 min}
LT1 Friar Street	Daytime	67	89	70	58	56
	Night-time	64	88	65	52	42
LT2 Station Hill	Daytime	66	85	67	61	58
	Night-time	61	79	60	52	39
LT3 Greyfriars Road	Daytime	66	89	68	59	54
	Night-time	60	82	61	61	49
LT4 Garrard Street	Daytime	66	84	67	63	61
	Night-time	61	81	62	57	52

Note: [1] – 90th Percentile to take account of outliers (atypical events).

In summary the prevailing daytime noise levels at the site boundaries (LT1, LT2, LT3 and LT4) are typical of an urban setting surrounded by the local road network. In this respect the prevailing noise levels at the site boundaries exceed the WHO criteria of 55dB L_{Aeq,16h} for protecting the majority of people from being seriously annoyed. During the night-time period the prevailing ambient noise levels are above the WHO noise criteria of 45dB L_{Aeq}, which would result in an internal noise level above 30dB L_{Aeq} with windows open. Further to this, the L_{Amax} noise level of 60dB L_{Amax} is exceeded more than 10-15 times during the night-time period at site boundary location.

The prevailing ambient noise levels indicate that standard thermal double glazing in combination with trickle ventilation should provide an appropriate level of residential amenity to future residents. External spaces and public realm also currently satisfy the WHO guideline value.

Design Advice

As indicated in Parameter Plan 7 'Upper Floor Uses' (Drawings 698_E_PP_07_007 and 698_PP_07_007) residential use is indicated within Telecom House/Plot E and Plot F which will provide up to 475 residential units of mixed tenure. It should be noted that this is a net increase of 175 residential units from the consented SH3 scheme.

As previously discussed, the dominant noise sources in the area of the Development were noted to be road traffic noise with rail traffic noise contributing to the noise climate at the northern part of the Application Site. Given that Telecom House/Plot E and Plot F are both located within the southern area of the Application Site and that the proposed building heights are lower than those proposed for the northern area, as indicated in Parameter Plan 3 'Building Plot Parameter Including heights' (Drawings 698_E_PP_07_003 and 698_PP_07_003), the dominant noise prevalent on residential Telecom House/Plot E and Plot F will be road traffic noise.

The predicted noise levels at the building facades of Telecom House/Plot E and Plot F are presented as Table 11.4.5 together with indicative internal ambient noise levels with windows open. The attenuation afforded by an open window ranges from 10 to 15dB(A), but for the purpose of this assessment a conservative approach has been adopted and an attenuation of 10dB(A) has been assumed.

Table 11.4.5 presents the predicted internal noise levels based on an attenuation of 10-15dB(A) of attenuation afforded by an open window.

Table 11.4.5: Predicted Internal Noise Levels (Windows Open)

Plot / Facade	Period	BS8233/WHO Criteria	External Noise Level (dB(A))	Internal Ambient Noise Level Windows Open
Telecom House/Plot E / North	Daytime	35dB LAeq,16h	66	56
	Night-time	30dB LAeq,8h	61	51
	Night-time	45dB LAmax	84	74
Telecom House/Plot E / East	Daytime	35dB LAeq,16h	66	56
	Night-time	30dB LAeq,8h	61	51
	Night-time	45dB LAmax	84	74
Telecom House/Plot E / South	Daytime	35dB LAeq,16h	67	57
	Night-time	30dB LAeq,8h	64	54
	Night-time	45dB LAmax	88	78
Telecom House/Plot E / West	Daytime	35dB LAeq,16h	66	56
	Night-time	30dB LAeq,8h	61	51
	Night-time	45dB LAmax	84	74
Plot F / North	Daytime	35dB LAeq,16h	66	56
	Night-time	30dB LAeq,8h	61	51
	Night-time	45dB LAmax	84	74
Plot F / East	Daytime	35dB LAeq,16h	66	56
	Night-time	30dB LAeq,8h	61	51
	Night-time	45dB LAmax	84	74
Plot F / South ^[1]	Daytime	35dB LAeq,16h	61	51
	Night-time	30dB LAeq,8h	58	48
	Night-time	45dB LAmax	82	72

Plot / Facade	Period	BS8233/WHO Criteria	External Noise Level (dB(A))	Internal Ambient Noise Level Windows Open
Plot F / West	Daytime	35dB L _{Aeq,16h}	66	56
	Night-time	30dB L _{Aeq,8h}	61	51
	Night-time	45dB L _{Amax}	84	74

Note: Derived from LT1, Friar Street Noise Survey.

The indicative ambient noise levels presented as Table 11.4.5 are 'worst-case' based on the measured long-term noise levels and assumes that the façades have an unobstructed view of the surrounding road network, which will be the case of facades facing directly onto the roads and the upper floors which are higher than the surrounding intervening buildings. At the lower floors of both Telecom House/Plot E and Plot F, which face away from the roads, the actual noise level are likely to be lower than those indicated by approximately 10-15dB(A) due to screening effects from the intervening buildings. In view of the above, mitigation will be required in the form of glazing combined with a suitable ventilation strategy to allow the criteria of BS8233:2014 and WHO to be satisfied.

Table 11.4.6 presents the required sound insulation and indicative glazing specification to achieve BS8233:1999 internal ambient noise level criteria.

Table 11.4.6: Indicative Sound Insulation & Glazing Specification

Plot / Facade	Period	BS8233 WHO Criteria	External Noise Level (dB(A))	Sound Insulation Rw ,Ctr	Indicative Glazing Specification
Telecom House/Plot E / North	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	61	31	
	Night-time	45dB L _{Amax}	84	39	
Telecom House/Plot E / East	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	61	31	
	Night-time	45dB L _{Amax}	84	39	
Telecom House/Plot E / South	Daytime	35dB L _{Aeq,16h}	67	37	16.8#/12/16.8#
	Night-time	30dB L _{Aeq,8h}	64	34	
	Night-time	45dB L _{Amax}	88	43	
Telecom House/Plot E / West	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	61	31	
	Night-time	45dB L _{Amax}	84	39	
Telecom House/Plot F / North	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	61	31	
	Night-time	45dB L _{Amax}	84	39	
Plot F / East	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	61	31	
	Night-time	45dB L _{Amax}	84	39	
Plot F / South ^[1]	Daytime	35dB L _{Aeq,16h}	61	31	8.8#/12/12.8#
	Night-time	30dB L _{Aeq,8h}	58	28	
	Night-time	45dB L _{Amax}	82	37	
Plot F / West	Daytime	35dB L _{Aeq,16h}	66	36	8.8#/12/12.8#

Plot / Facade	Period	BS8233 WHO Criteria	External Noise Level (dB(A))	Sound Insulation Rw ,Ctr	Indicative Glazing Specification
	Night-time	30dB $L_{Aeq,8h}$	61	31	
	Night-time	45dB L_{Amax}	84	39	

Note: Derived from LT1, Friar Street Noise Survey.

The results indicate that high specification glazing will be required in order to achieve WHO and BS8233:2014 guideline IANLS. This is likely to be required in conjunction with an appropriate ventilation strategy such as through wall passive ventilation strategy and possibly mechanical ventilation thereby removing the requirement for residents to open their windows.

Document IP4/99:1999: Ventilators: Ventilation and Acoustic Effectiveness⁴ details a study into the sound reduction performance of fourteen different window mounted trickle ventilators and seven different through-wall passive ventilators. The measured sound reduction performance after taking into account flanking sound paths (i.e. sound paths that do not travel directly through vents) and the effective area of the ventilator were 14 to 46 dB(A) for 'passive through-wall ventilators'.

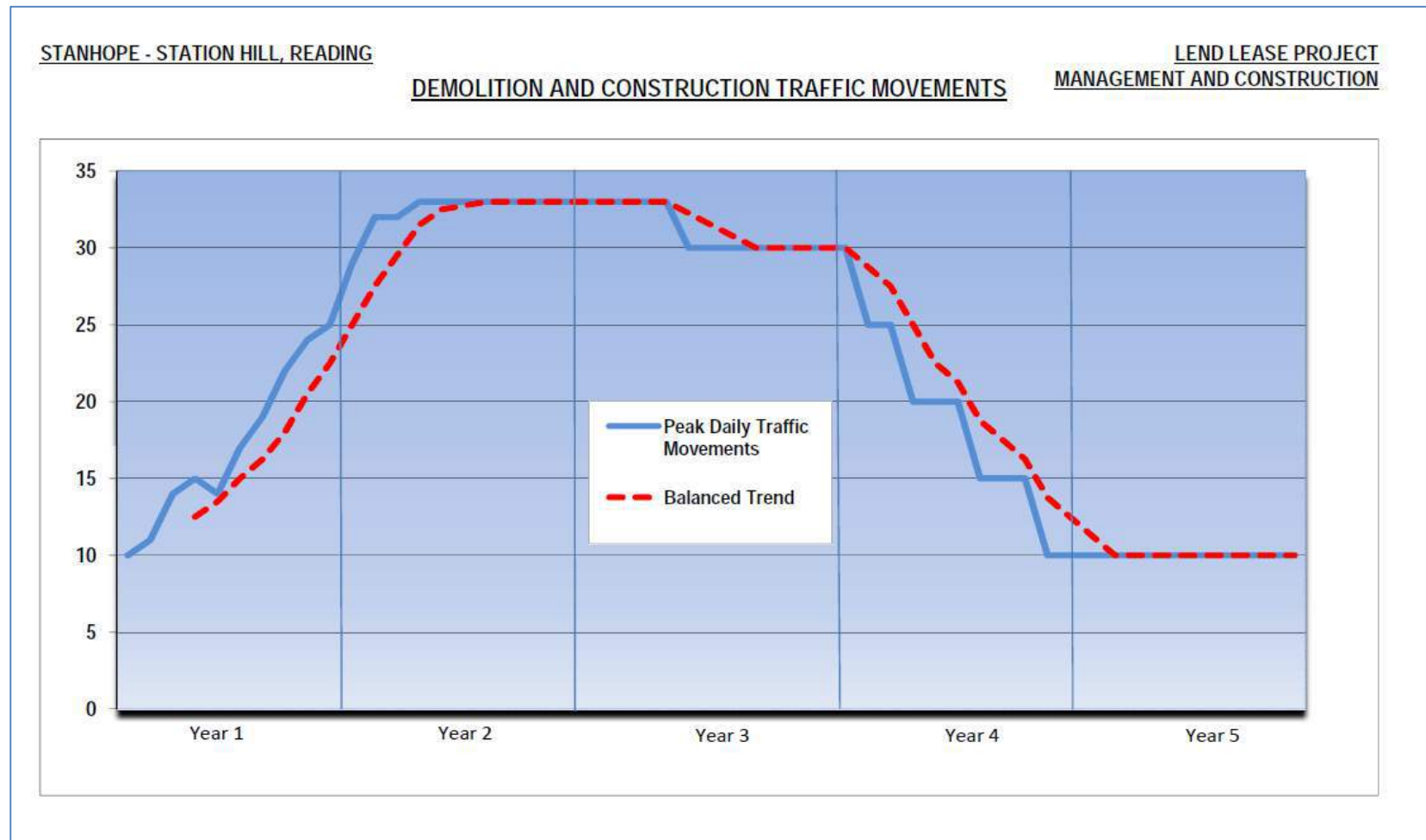
It can be seen from these figures that passive through-wall ventilators are available that meet the requirements of the Building Regulations Approved Document F for background ventilation and also provide sound reduction performance that meets or exceeds that required from the glazing elements.

The above indicative mitigation is for façade areas of residential Telecom House/Plot E and Plot F that are directly exposed to road traffic noise from the surrounding road network. Façade areas that are below the level of the intervening buildings are likely to be exposed to noise levels 10 to 15 dB(A) lower due to screening effects. Based on a noise level reduction of 10dB(A) external noise levels would range from 51 to 57dB $L_{Aeq,16h}$ during the daytime period and 48 to 51dB $L_{Aeq,8h}$ during the night-time period estimated L_{Amax} values from road traffic of 72 to 78dB L_{Amax} . At these façade locations internal noise levels with windows open are still likely to exceed the BS8233:2014 noise criteria. A mitigation strategy of standard thermal glazing in combination with trickle or through wall passive ventilation thereby removing the requirement for residents to open their windows should provide appropriate residential amenity at these locations.

⁴ BRE (1999); IP4/99'Ventilators: Ventilation and Acoustic Effectiveness'. BRE.

Appendix 11.5 Road Traffic Noise Assessment

Demolition & Construction Traffic Movements



Appendix 11.5

Road Traffic Noise Assessment

2011 2-way traffic data –								
A node	B node	24hr AADT	18 hr Weekday traffic (6am - 12pm)	6 hr Weekday traffic (12pm -6am)	AM Average Speed kph	PM Average Speed kph	Prop HGV	Road
1064	1604	1517	1518	64	47.9	47.9	51.9%	Friar Street
1065	1066	4112	4115	172	26.3	26.2	4.2%	Greyfriars Road
1065	1607	5712	5716	239	28.5	27.1	0.0%	Garrard Street
1066	1067	4245	4248	178	26.0	26.0	7.4%	Greyfriars Road

Operational Road Traffic Noise Calculations

Road Links		Without Development (Extant)			With Development			% Flow Change	BNL 18hr		
		Future Year 2018			Future Year 2018				Extant	Development	Change
		% HGV	Speed kph	Flow	% HGV	Speed kph	Flow				
1005-1749	Link off Vastern Road Roundabout	0	29	3349	0	28	4215	25.9	58.4	59.4	1.0
1065-1607	Garrard Street	0	27	7046	0	27	6307	-10.5	61.6	61.2	-0.4
1071-1606	Friar Street (Cheapside-West St)	3	27	3394	3	27	3030	-10.7	60.3	60.0	-0.3
1598-1599	Slip off Caversham Rd to Tudor Road	3	28	1221	4	28	1027	-15.9	55.8	55.3	-0.5
1599-1597	Slip on Caversham Rd from Tudor Road	2	40	593	2	40	593	0.0	52.7	52.7	0.0
1602-1601	Station Hill (in front of station)	0	30	4	0	30	2	-50.0	29.3	26.3	-3.0
1604-1065	Greyfriars Rd (Friar St-Garrard St)	5	25	3133	5	25	2768	-11.7	60.8	60.5	-0.3
1606-1074	Friar Street (West St-Greyfriars Road)	3	24	3380	3	25	3015	-10.8	60.1	59.8	-0.3
1633-1702	Unamed Road near Penta Hotel/Hexagon	0	30	1778	0	30	2037	14.6	55.9	56.5	0.6

i Department of Education (DoE). (1994). *Planning Policy Guidance 'Planning and Noise*

ii Department for Communities and Local Government. (2014) *Noise*.

<http://planningguidance.planningportal.gov.uk/blog/guidance/noise/>



Appendix 11.6

Noise Assessment for Temporary Flexible Event Space

Noise Assessment

Station Hill, Reading - Temporary Flexible Events Space

March 2013

Waterman Energy, Environment & Design Limited

Pickfords Wharf, Clink Street, London, SE1 9DG, United Kingdom

www.watermangroup.com

Noise Assessment

Station Hill, Reading - Temporary Flexible Events Space

Client Name: Sackville Developments (Reading) Ltd
Document Reference: EED12350-109_R_2_2_1_TC
Project Number: EED12350

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008 and BS EN ISO 14001: 2004)

Issue	Date	Prepared by	Checked by	Approved by
First	December 2012	Mark Maclagan Associate Director	Emily Low Technical Director	Emily Low Technical Director
Second	March 2013	Mark Maclagan Associate Director	Nicole Quail Principal Consultant	Emily Low Technical Director

Comments

Comments

Our Markets



Property & Buildings



Transport & Infrastructure



Energy & Utilities



Environment

Disclaimer

This report has been prepared by Waterman Energy, Environment & Design Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

1.	Introduction
2.	Proposed Acoustic Limits and Design Targets
3.	Baseline Noise Survey
4.	Plant Noise
5.	Activity Noise
6.	Summary

1. Introduction

- 1.1. Waterman Energy, Environment & Design Limited has been appointed by Sackville Developments (Reading) Limited to provide acoustic advice in relation to the proposed temporary events space of part of the wider Station Hill development site in Reading.
- 1.2. The proposed temporary events space is located to the south of Reading Mainline Railway Station. The site (hereafter 'the Site') is bound by:
 - Station Hill and Reading Mainline Station to the north;
 - NCP Car Park and Garrard Street to the south;
 - Former central bus station and former vacant bingo hall above to the west; and
 - The vacant eleven storey Thames Tower office building to the east.
- 1.3. The nearest residential facility to the Site is located at Merchants Place some 85m south of the Site boundary.
- 1.4. The proposals for the Site (hereafter referred to as the 'Development') comprise a temporary flexible event space prior to the redevelopment of the wider Station Hill site. The proposals comprise demolition of the former Station Hill retail parade (including 26 to 58 Station Hill) to create a landscaped area and multipurpose events platform for temporary uses (Use Classes A1 to A5, D1, D2 and *Sui Generis*). In addition, works of hard and soft landscaping and other incidental works are proposed.
- 1.5. The exact use of the Site is expected to vary throughout the life of the proposed temporary use. However, potential uses could include fairground, market stalls, entertainment space and small scale sporting activities. Given the variable use of the space this document does not provide a detailed assessment but rather provides a set of design goals and management strategies for proposed future uses.
- 1.6. The key acoustic issues for consideration in relation to the temporary events are as follows:
 - Noise from any temporary plant items;
 - Noise from activities during events; and
 - Noise from patrons.

2. Proposed Acoustic Limits and Design Targets

Fixed Mechanical Plant Noise

- 2.1. Noise associated with proposed temporary plant items should fall below the minimum monitored background noise level in line with the local authorities' standard planning requirements.

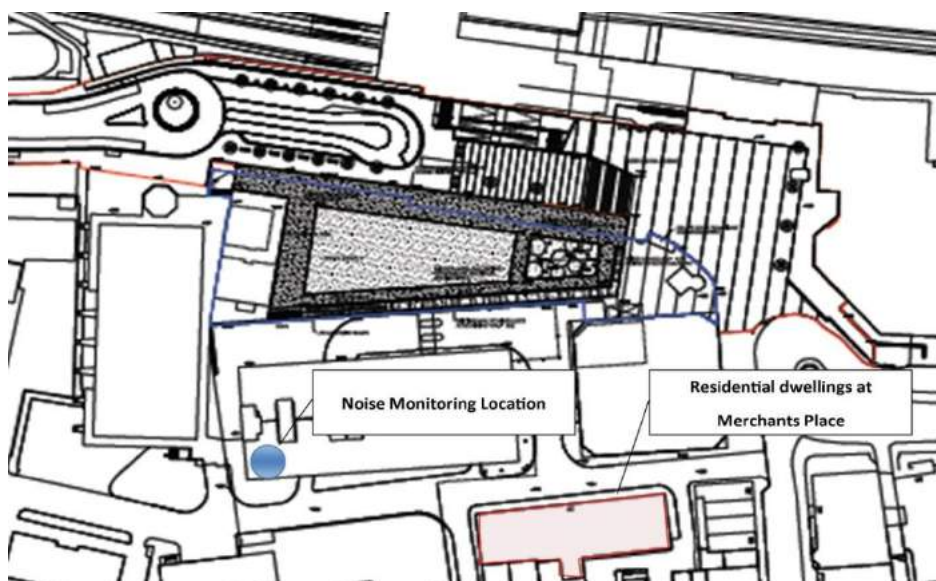
Activity Noise and Noise from Patrons

- 2.2. Given the variable nature of the future use of the Site, it is not proposed to set specific limits in relation to activity noise due to their variable nature and duration. However, a Noise Management Plan should be devised for any events likely to take place. Noise limits would be set on an activity by activity basis and agreed through the Licensing and Planning Process. However, it should be noted that should activities take place post 23:00 a statutory internal noise limit of 35dB(A) would apply for inhabited dwellings.

3. Baseline Noise Survey

- 3.1. A noise survey was previously undertaken in 2011 as part of the Environmental Impact Assessment (EIA) and Environmental Statement (ES) for the permanent redevelopment of the wider Station Hill site. The information and data from this existing noise survey has been used for the purpose of this assessment.
- 3.2. The nearest existing sensitive receptors to the Site boundary and the representative monitoring location are presented as Figure 1. Noise levels were monitored over a typical weekday period from Tuesday 13th December until Thursday 15th December 2011.

Figure 1 Noise Monitoring and Receptor Locations



- 3.3. The monitoring equipment used during the survey period is described in Table 1. The sound level meter was calibrated both before and after each monitoring period; no significant drift from the reference level of 94 dB was recorded.

Table 1: Noise Monitoring Equipment

Sound Level Meter	
Meter Mode	Rion NA-28
Serial Number	570397
Calibrator	
Calibrator Model	NC-74
Serial Number	35173533
Calibration Level at 1000 Hz	94 dB

- 3.4. All measurements were undertaken under free-field conditions and a wind shield was fitted to the monitoring equipment at all times. Measurements were taken in 5-minute samples.
- 3.5. The survey result in terms of L_{A90} recorded 55dB(A) and 46dB(A) for the daytime and night-time periods respectively (refer to Table 2).

4. Plant Noise

- 4.1. As discussed above, plant noise limits are set relative to the existing background noise levels in the area of the Site. The baseline noise survey result in terms of L_{A90} and the maximum allowable plant noise limits are presented as Table 2 below.

Table 2: Plant Noise Limiting Criteria

Receptor	Monitored Baseline Noise Levels (L_{A90})		Maximum Permissible Plant Noise Limit Level at Sensitive Receptor	
	Daytime (0700 to 2300)	Night-time (2300 to 0700)	Daytime (0700 to 2300)	Night-time (2300 to 0700)
Merchants House	55	46	55	46

- 4.2. Provided that the above design targets are met for all fixed mechanical plant associated with the operation of the Site, adverse comment by local residents is unlikely to arise.

5. Activity Noise

Operational Hours

- 5.1. It is understood that the maximum operational hours of the temporary events at the Site would be from 08:00 to 00:00 hours. However, it should be noted that these are the maximum hours, and the actual operating hours would depend on the individual operator of each event.

Key Activity Noise Sources

- 5.2. The key noise sources likely to be present within the Site during the operation of the Development are:
- Noise from speakers, amplified music etc.; and
 - Noise from people attending the events.

Noise Limits

- 5.3. In practice, it is difficult to set specific noise limits for activity noise, as the effect on the surrounding residences etc. would be dependent on the activities which would vary between events.
- 5.4. On this basis, no specific noise limits have been applied at the closest residences during the daytime (07.00 to 23.00), although consideration has been given to the measures which would be employed to minimise the noise effect on the nearby residences. A noise limit of 35 dB(A) would be applied within residences during the night time (23.00 to 07.00). Given the maximum operating hours of the temporary events at the Site, the only period during which the night-time noise limit would be relevant is between 23.00 and 00.00.

Indicative Assessment of Daytime and Night-time Noise Levels

- 5.5. As previously discussed the precise activities within the event space are not yet known. However, assuming as a worst case that noise levels at the boundary of the event site would be 85dB $L_{Aeq,1 \text{ hour}}$ and allowing for attenuation as a result of distance and partial screening by intervening structure, noise levels at the nearest façade of Merchants House to the Site would be in the region of 45 to 50dB $L_{Aeq,1 \text{ hour}}$.
- 5.6. Guidance provided in BS 8233:1999 'Sound Insulation and Noise Reduction for Buildings' states that noise reduction through a partially open window would be around 10 to 15dB(A). As such, based upon the predicted noise levels presented above, internal noise levels of between 30 and 35dB(A) are predicted. Noise levels of this magnitude would be in compliance with the adopted night-time limiting criteria set out above.
- 5.7. When considering the daytime period, it should be noted that predicted noise levels fall below the monitored background noise level (L_{A90}). As such, adverse comment or complaints by local residents are unlikely to arise during this period.

Patron Noise

- 5.8. Whilst there would inevitably be some noise arising from having an increased number of people on site at any one time, this would be minimised as far as possible by using stewards and staff, who would be on hand to speak to, and if necessary remove any person causing excessive noise.

Proposed Noise Control Measures

- 5.9. The following noise control measures are proposed so as to ensure the potential for disturbance to nearby residents is minimised:
- Noise limits to be set for live music events in agreement with the Local Authorities licensing department;
 - External PA systems would utilise small directional speakers where possible so as to minimise potential for noise transmission to sensitive receptors; and
 - Use of stewards to control crowd noise.

6. Summary

- 6.1. Waterman Energy, Environment & Design Limited was appointed to provide acoustic advice with regards to the proposed temporary flexible events space on land at Station Hill, Reading.
- 6.2. An indicative assessment of the potential effects has been undertaken and, where required, mitigation and noise control measures including setting noise limit criteria have been proposed.
- 6.3. With the proposed noise control and management measures in place it is considered that the noise generated from the proposed temporary events at the Site would be unlikely to result in adverse comment or complaint by local residents and that the Site would be suitable for the proposed temporary events use.



Appendix 12.1

Preliminary Environmental Risk Assessment (July 2015)



Preliminary Environmental Risk Assessment

Station Hill, Reading

July 2015

Waterman Infrastructure & Environment Limited

Pickfords Wharf, Clink Street, London SE1 9DG,
www.watermangroup.com

Preliminary Environmental Risk Assessment

Station Hill, Reading

Client Name: Sackville Developments (Reading) Ltd

Document Reference: WIB12350-111-R-4.1.7-NS

Project Number: WIB12350-111

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008 and BS EN ISO 14001: 2004)

Issue	Date	Prepared by	Checked by	Approved by
First	July 2015	Nicola Swallow Graduate Consultant	Joanna Bagley Associate Director	Richard Meredith Associate Director

Our Markets



Property & Buildings



Transport & Infrastructure



Energy & Utilities



Environment

Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

EXECUTIVE SUMMARY

1. Introduction	1
1.1 Objectives	1
1.2 Regulatory Context	1
1.3 Constraints	2
2. Methodology	4
3. Site Setting	5
3.1 Description and Reconnaissance	5
3.1.1 Site Surroundings	7
3.2 History	9
3.3 Geology	12
3.3.1 Ground Stability	13
3.4 Ground Gas	13
3.5 Surface Waters	13
3.5.1 Surface Water Quality	14
3.5.2 Flood Risk	14
3.6 Groundwater	14
3.7 Previous Environmental Assessments	15
3.8 Consultations	16
3.8.1 Environmental Health	16
3.8.2 Trading Standards	17
3.8.3 Building Control Department	17
3.8.4 Archaeology	17
3.8.5 Berkshire Record Office	17
3.8.6 Thames Water	17
4. Conceptual Model	19
5. Conclusions	22
6. Recommendations	23

Figures

Figure 1: Current Site Layout	5
Figure 2: Historical Site Use	9
Figure 3: Geology	12
Figure 4: Flood Risk	14

Tables

Table 1: Summary of potentially contaminative activities on Site	6
Table 2: Summary of surrounding land uses	9
Table 3: History for the subject Site	11
Table 4: Site geology	13
Table 5: Summary of hydrogeological properties of the main geological strata	15
Table 6: List of previous environmental reports reviewed	15
Table 7: List of parties consulted during this study	16
Table 8: Conceptual model for the Site – pre and post development	19



Appendices

- Appendix A Site Plans
- Appendix B Site Photographs
- Appendix C Consultation Information
- Appendix D Risk Rating Matrix
- Appendix E Environmental Receptors