

## 6. DEMOLITION AND CONSTRUCTION

### INTRODUCTION

- 6.1 This chapter has been prepared by the project construction advisors Mace and Waterman Environmental, with input from project structural engineers Arup and the project quantity surveyors, Gardiner and Theobald. It describes the anticipated programme of demolition and construction works and the key activities that would be undertaken in relation the four proposed Development Scenarios. It identifies, in general terms, potential effects associated with demolition and construction activities and outlines proposals for their mitigation. Detailed consideration of demolition and construction related environmental effects are assessed within relevant chapters of this Environmental Statement (ES) (refer to Chapters 7-17 inclusive).
- 6.2 It is proposed that a site specific Environmental Management Plan (EMP) would be drawn up for the relevant consented Development Scenario. This is a common approach taken in the City of Westminster for managing environmental effects during demolition and construction. This approach is consistent with methods adopted for other major schemes in urban areas. The site specific EMP would be developed in line with WCC's Code of Construction Practice (CoCP) (Ref. 6.1) and would be discussed and agreed with the relevant planning officers following the approval of the planning application. An outline of the contents of the EMP is also provided in this chapter, the general contents of which would apply to each of the four proposed Development Scenarios.
- 6.3 Planning for demolition and construction is necessarily broad at this stage and may be subject to modification. For example, specific demolition and construction activities could vary in frequency depending upon the particular stage of works. Consequently, where uncertainty exists the assessment has assumed a 'worst-case' situation.
- 6.4 Other proposed developments in the vicinity of the three application sites have been acknowledged, and all necessary measures would be taken to ensure the close liaison and coordination between the parties involved. A more detailed consideration of potential cumulative effects with nearby schemes, during demolition and construction works for each proposed Development Scenario is presented within Chapter 18: Cumulative Effects.
- 6.5 The three applications, and hence four Development Scenarios, have been specifically designed to allow construction of the Victoria Station Upgrade (VSU) proposed by Transport for London (TfL)/London Underground Limited (LUL), in accordance with the latest plans application submitted for VSU. However, it is assumed within the Environmental Statement (ES) that VSU would not occur concurrently with the consented Development Scenario. Potential environmental effects associated with the consented Development Scenario and VSU are considered within Chapter 18: Cumulative Effects.

### Programme of Works

- 6.6 At this stage, it is anticipated that the programme of works for each Development Scenario would comprise an initial period of enabling works which would commence approximately 6 months prior to the onset of demolition and construction works. Demolition and construction works are anticipated to commence in September 2010 for all Development Scenarios and would vary in duration, phasing and completion dates for the four different Development Scenarios. The buildings contained within each Development Scenario and phase, as well as the overall duration of construction within each of these phases, are summarised in Table 6.1. Indicative demolition and construction programmes for each of the Development Scenarios are presented as Figures 6.1 to 6.4 respectively, with phasing plans for each of the Development Scenarios presented as Figures 6.5 to 6.8 respectively.

Table 6.1: Indicative Phasing per Development Scenario

Overall Duration	Phase	Building	Period (Quarter, Year)
<b>Development Scenario 1 (completed Q1, 2017)</b>			
6.5 years	Enabling	All (5, 6a, 6b, 7a, 7b, 7c)	Q1 2010 to Q1 2011
	1	5 and 6b	Q3 2010 to Q4 2014
	2	5 and 7a	Q1 2011 to Q4 2014
	3	6a, 7b and 7c	Q1 2015 to Q1 2017
<b>Development Scenario 2 (completed Q1, 2017)</b>			
6.5 years	Enabling	5, 6b, 7a, 7b and 7c	Q1 2010 to Q1 2011
	1	5 and 6b	Q3 2010 to Q4 2014
	2	5 and 7a	Q1 2011 to Q4 2014
	3	7b and 7c	Q1 2015 to Q1 2017
<b>Development Scenario 3 (completed Q4, 2016)</b>			
6.25 years	Enabling	5, 6a, 6b and 7a	Q1 2010 to Q1 2011
	1	5 and 6b	Q3 2010 to Q4 2014
	2	5 and 7a	Q1 2011 to Q4 2014
	3	6a	Q1 2015 to Q4 2016
<b>Development Scenario 4 (completed Q4, 2014)</b>			
4.25 years	Enabling	5, 6b and 7a	Q1 2010 to Q1 2011
	1	5 and 6b	Q3 2010 to Q4 2014
	2	5 and 7a	Q1 2011 to Q4 2014

### Description of the Works

- 6.7 The anticipated programme for each Development Scenario would involve a degree of overlap between the individual phases as outlined in Table 6.1 and illustrated on Figures 6.1 to 6.4 inclusive. In order to provide a clearer understanding of the interactions between phases and proposed works within each Development Scenario, the programme has been subdivided into ten 'timeslices' for Development Scenarios 1, 2 and 3, and seven 'timeslices' for Development Scenario 4. These timeslices, and associated work elements, are described below for each Development Scenario, and illustrated on Figures 6.9 to 6.12 inclusive.

#### Development Scenario 1 (Applications 1, 2 and 3)

- 6.8 Plans illustrating the proposed programme of works for Development Scenario 1 are presented as Figure 6.9a to j, with a brief description of the main works within each timeslice provided below:

##### *Timeslice 1 – June 2010 to February 2011 (Phases 1 and 2)*

- 6.9 Timeslice 1 would commence within the second quarter of 2010 and would incorporate an overlap between Phases 1 and 2. Timeslice 1 would include the following elements of work:
- Vacant possession of Royal Westminster Hotel, Lake View Court, Carrier House, the Stag Public House, Elliot House, 3-11 Bressenden Place, 77-87 Buckingham Palace Road, 152-172 Victoria Street, 120-124 Victoria Street and 3-19 Allington Street;
  - Erection of hoardings and access gates in Buckingham Palace Road, Bressenden Place, Allington Street, Victoria Street and Warwick Row;

- Utility diversion works along Bressenden Place and Buckingham Palace Road to be commenced in Q1 2010;
- Erection of perimeter scaffolding around buildings to be demolished (scaffolding would be erected as demolition proceeds. Two levels of scaffolding would always be maintained above demolition level) Crash deck to be positioned under Elliot House enabling the operation of Allington Street;
- Completion of Type 3 asbestos survey and asbestos removal carried out within buildings scheduled for demolition (i.e. Royal Westminster Hotel, Lake View Court, Carrier House, The Stag Public House, Elliot House, 3-11 Bressenden Place, 77-87 Buckingham Palace Road, 152-172 Victoria Street and 3-19 Allington Street);
- Implementation of measures to protect existing substations (i.e. sub stations SS 31758 (Bressenden Place - Gorrings North) and SS 31759 (Allington Street – Gorrings South). Appropriate demolition crash decks and waterproof enclosures would be provided. EDF access to the substations to be maintained at all times;
- Propping to Portland House basement in anticipation of Bressenden Place realignment;
- Erection of two tower cranes (along Warwick Row and adjacent to the Stag Public House); and
- Commencement of building demolition, starting with the Royal Westminster Hotel.

***Timeslice 2 – March 2011 to July 2011 (Phases 1 and 2)***

6.10 Timeslice 2 would commence within the first quarter of 2011 and would also incorporate an overlap between Phases 1 and 2. Timeslice 2 would include the following elements of work:

- Vacant Possession of 19 Allington Street and 140-150 Victoria Street;
- Hoardings and access gates would be extended around the entire boundary of the site of Development Scenario 1;
- Casting of a secant wall and capping beam north of Allington Street, together with erection of a temporary earthwork support wall along Allington Street;
- Construction of a ground floor slab in the northwest corner of the site of Development Scenario 1 to position temporary substations;
- Installation of temporary substations within the northwest corner of the site of Development Scenario 1 to replace existing substations from their current locations;
- Partial basement excavation to 5.5m below ground level, (BGL) and bored piling works to the north of Allington Street;
- Installation of temporary vehicle access ramp to the north of Allington Street;
- Two mobile cranes utilised south of Victoria Street to enable demolition works;
- Demolition of 19 Allington Street and 140-150 Victoria Street; and
- Progression of a secant wall within the basement area to the south of Allington Street.

***Timeslice 3 – August 2011 to February 2012 (Phases 1 and 2)***

6.11 Timeslice 3 would commence within the third quarter of 2011 and would again, incorporate an overlap between Phases 1 and 2. Timeslice 3 would include the following elements of work:

- Maintenance of hoardings and access gates to the north of Victoria Street;
- Secant wall south of Allington Street complete (excluding Allington Street);
- Installation of coffer dams and supports around proposed cores to Buildings 5 and 6b to enable traditional excavation. This would be facilitated by two tower cranes located north of Allington Street;
- Progression of basement to the north of Allington Street including installation of level -1 basement slab (6.5m BGL) and the retention of a perimeter berm supporting the secant wall;
- Progressing columns north of Allington Street from Level -1 to ground floor;

- Installation of props to EDF substation and ramp areas where the Level -1 basement slab is omitted. Props to be supported off the central slab;
- Excavation of basement, including bored piling, to the south of Allington Street to a depth of 5.5m BGL;
- Installation of temporary vehicle access ramp within the basement to the south of Allington Street; and
- Piling to the south of Allington Street from a depth of 5.5m BGL.

***Timeslice 4 – March 2012 to July 2012 (Phases 1 and 2)***

6.12 Timeslice 4 would commence within the first quarter of 2012 and incorporate an overlap between Phases 1 and 2. Timeslice 4 would include the following elements of work:

- Maintenance of hoardings and access gates to the north of Victoria Street;
- Ground floor slab to the north of Allington Street complete;
- Level -2 basement slab north of Allington Street nearing completion;
- Progression of superstructure shell construction to Building 6b;
- Progression of cladding to Building 6b;
- Completion of Level -1 slab within basement to south of Allington Street;
- Progression of cores to Building 5 and 7a;
- Progression of ground floor slab south of Allington Street;
- Closure of Allington Street to construction traffic and completion of secant and foundation piling works along Allington Street; and
- Four tower cranes would be operating north of Victoria Street to enable works to Buildings 5 and 6b

***Timeslice 5 – August 2012 to June 2013 (Phases 1 and 2)***

6.13 Timeslice 5 would commence within the third quarter of 2012 and incorporate an overlap between Phases 1 and 2. Timeslice 5 would include the following elements of work:

- Maintenance of hoardings and access gates to the north of Victoria Street;
- Overall completion of ground floor slab;
- Superstructure construction works and envelope to Building 6b complete;
- Progression of fit-out works to Building 6b;
- Temporary waterproofing works to Building 7a complete;
- Progression of fit-out works to Building 7a;
- Superstructure construction works and envelope to Building 5 nearing completion;
- Progression of canopy works in north-south pedestrian route;
- Progression of public realm works;
- Fit-out to the basement levels completed utilising the permanent basement ramp;
- Fit-out works to basement complete;
- EDF works complete;
- Electric power made available to undertake testing and commissioning;
- Utility reinforcement works (sewer augmentation) to Victoria Street completed by others;
- Two tower cranes would be operating north of Victoria Street to enable works to Buildings 5 and 7a; and
- Hoists will be operating internally and externally to Buildings 5, 6b and 7a.

***Timeslice 6 – July 2013 to June 2014 (Phases 1 and 2)***

- 6.14 Timeslice 6 would commence within the third quarter of 2013 and incorporate an overlap between Phases 1 and 2. Timeslice 6 would include the following elements of work:
- Hoardings and access gates maintained only along Building 7a frontage to Victoria Street. All other hoardings removed;
  - Opening of retail units at ground and first floor level within Buildings 5, 6b and 7a;
  - Completion of public realm works to the north of Victoria Street including canopy;
  - Basement fully operational;
  - Progression of demolition works to 120-124 Victoria Street;
  - Progression of fit-out works to Building 5 residential units;
  - Progression of fit-out works to Building 7a commercial units; and
  - Basement goods lifts utilised for material and personnel transportation during fit-out works.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- 6.15 Timeslice 7 would commence within the third quarter of 2014 and incorporate an overlap between Phases 1, 2, and 3). Timeslice 7 would include the following elements of work:
- Erection of hoardings and access gates along Bressenden Place and Allington Street;
  - Phases 1 and 2 complete and operational;
  - Progression of substructure works to Buildings 6a and 7b; and
  - Two tower cranes would be operating along Bressenden Place to enable works to Buildings 6a and 7b.

***Timeslice 8 – May 2015 to February 2016 (Phase 3)***

- 6.16 Timeslice 8 would commence within the second quarter of 2015 and would only involve Phase 3. Timeslice 8 would include the following elements of work:
- Maintenance of hoardings and access gates along Bressenden Place and Allington Street;
  - Completion of superstructure construction and cladding works to Building 6a;
  - Progression of fit-out works to Building 6a;
  - Completion of superstructure construction works to Building 7b;
  - Progression of cladding works to Building 7b;
  - Progression of superstructure construction works to Building 7c;
  - Two tower cranes would be operating along Bressenden Place and Victoria Street to enable works to Buildings 6a, 7b/c; and
  - Hoists positioned along Building 6a to assist material and personnel distribution.

***Timeslice 9 – March 2016 to August 2016 (Phase 3)***

- 6.17 Timeslice 9 would commence within the first quarter of 2016 and would only involve Phase 3. Timeslice 9 would include the following elements of work:
- Maintenance of hoardings and access gates along Bressenden Place and Allington Street;
  - Fit-out works to Buildings 6a and 7b nearing completion;
  - Progression of fit-out works to Building 7c;
  - Progression of public realm works to Buildings 6a and 7b; and
  - Hoists positioned along Building 7c to assist material and personnel distribution.

***Timeslice 10 – September 2016 to February 2017 (Phase 3)***

- 6.18 Timeslice 10 would commence within the third quarter of 2016 and would only involve Phase 3. Timeslice 10 would include the following elements of work:
- Hoardings and access gates removed;
  - Opening of retail units at ground and first floor level within Buildings 7b and 6a;
  - Completion of fit-out works to Building 6a;
  - Completion of fit-out works to Buildings 7b and 7c;
  - Phase 3 complete and operational; and
  - Development Scenario 1 complete.

**Development Scenario 2 (Applications 1 and 2)**

- 6.19 Plans illustrating the proposed programme of works for Development Scenario 2 are presented as Figure 6.10a to j, with a brief description of the main works within each timeslice provided below:

***Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

- 6.20 Proposed works within timeslices 1 to 6 for Development Scenario 2 would be the same as those for Development Scenario 1.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- 6.21 Timeslice 7 would commence within the third quarter of 2014 and incorporate an overlap between Phases 1, 2, and 3). Timeslice 7 would include the following elements of work:
- Erection of hoardings and access gates along Bressenden Place and Allington Street;
  - Phases 1 and 2 complete and operational;
  - Progression of substructure works to Building 7b; and
  - One tower crane would be operating along Bressenden Place to enable works to Building 7b.

***Timeslice 8 – May 2015 to February 2016 (Phase 3)***

- 6.22 Timeslice 8 would commence within the second quarter of 2015 and would only involve Phase 3. Timeslice 8 would include the following elements of work:
- Maintenance of hoardings and access gates along Bressenden Place and Allington Street;
  - Completion of superstructure construction works to Building 7b;
  - Progression of cladding works to Building 7b;
  - Progression of superstructure construction works to Building 7c; and
  - Two tower cranes would be operating along Bressenden Place and Victoria Street to enable works to Building 7b/c.

***Timeslice 9 – March 2016 to August 2016 (Phase 3)***

- 6.23 Timeslice 9 would commence within the first quarter of 2016 and would only involve Phase 3. Timeslice 9 would include the following elements of work:
- Maintenance of hoardings and access gates on Bressenden Place and Allington Street;
  - Fit-out works to Building 7b nearing completion;
  - Progression of fit-out works to Building 7c;
  - Progression of public realm works to Building 7b; and
  - Hoists positioned along Building 7c to assist material and personnel distribution.

***Timeslice 10 – September 2016 to February 2017 (Phase 3)***

- 6.24 Timeslice 10 would commence within the third quarter of 2016 and would only involve Phase 3. Timeslice 10 would include the following elements of work:
- Hoardings and access gates removed;
  - Opening of retail units at ground and first floor level within Building 7b/c;
  - Completion of fit-out works to Building 7b/c;
  - Phase 3 complete and operational; and
  - Development Scenario 2 complete.

**Development Scenario 3 (Applications 1 and 3)**

- 6.25 Plans illustrating the proposed programme of works for Development Scenario 3 are presented as Figure 6.11a to j, with a brief description of the main works within each timeslice provided below:

***Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

- 6.26 Proposed works within timeslices 1 to 6 for Development Scenario 3 would be the same as those for Development Scenarios 1 and 2, with the exception of retaining numbers 3 to 7 Bressenden Place and 120 to 124 Victoria Street.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- 6.27 Timeslice 7 would commence within the third quarter of 2014 and incorporate an overlap between Phases 1, 2, and 3). Timeslice 7 would include the following elements of work:
- Erection of hoardings and access gates along Bressenden Place and Allington Street;
  - Phases 1 and 2 complete and operational;
  - Progression of substructure works to Building 6a; and
  - Two tower cranes would be operating along Bressenden Place to enable works to Building 6a.

***Timeslice 8 – May 2015 to February 2016 (Phase 3)***

- 6.28 Timeslice 8 would commence within the second quarter of 2015 and would only involve Phase 3. Timeslice 8 would include the following elements of work:
- Maintenance of hoardings and access gates along Bressenden Place and Allington Street;
  - Completion of superstructure construction and cladding works to Building 6a;
  - Progression of fit-out works to Building 6a;
  - One tower crane would be operating along Bressenden Place to enable works to Building 6a; and
  - Hoists positioned along Building 6a to assist material and personnel distribution.

***Timeslice 9 – March 2016 to August 2016 (Phase 3)***

- 6.29 Timeslice 9 would commence within the first quarter of 2016 and would only involve Phase 3. Timeslice 9 would include the following elements of work:
- Maintenance of hoardings and access gates on Bressenden Place and Allington Street;
  - Fit out works to Building 6a nearing completion;
  - Material distribution to Building 6a fit-out works via the basement; and
  - Progression of public realm works to Building 6a.

***Timeslice 10 – September 2016 to November 2016 (Phase 3)***

- 6.30 Timeslice 10 would commence within the third quarter of 2016 and would only involve Phase 3. Timeslice 10 would include the following elements of work:
- Hoardings and access gates removed;
  - Opening of retail units at ground and first floor level within Building 6a;
  - Completion of fit-out works to Building 6a;
  - Phase 3 complete and operational; and
  - Development Scenario 3 complete.

**Development Scenario 4 (Application 1)**

- 6.31 Plans illustrating the proposed programme of works for Development Scenario 3 are presented as Figure 6.12a to g, with a brief description of the main works within each timeslice provided below:

***Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

- 6.32 Proposed works within timeslices 1 to 6 for Development Scenario 4 would be the same as those for Development Scenario 3.

***Timeslice 7 – July 2014 to December 2014 (Phases 1 and 2)***

- 6.33 Timeslice 7 would commence within the third quarter of 2014 and incorporate an overlap between Phases 1 and 2. Timeslice 7 would include the following elements of work:
- Hoardings and access gates removed;
  - Opening of retail units at ground and first floor level within Buildings 5, 6b and 7a;
  - Completion of fit-out works to Buildings 5 and 7a;
  - Phases 1 and 2 complete and operational; and
  - Development Scenario 4 complete.

**Foundations**

- 6.34 The numbers of existing underground constraints require that each Development Scenario rely upon several types of foundations. As described in Chapter 3: Existing Land Uses and Activities, the main constraints consist of London Underground Limited (LUL) infrastructure and a network of deep combined sewers. In addition, the Chelsea to Hackney Line requires developers to consider a safeguarded zone adjacent to the proposed line of their tunnels. This may require that certain pile shafts would need to be sleeved above the tunnel invert to ensure that no load, in excess of the limits imposed, would be shed to the tunnels. In order to provide sufficient load resistance and to protect each Development Scenario from tunnelling-induced settlement, piles would be founded below the invert of the tunnel.
- 6.35 Wherever possible, piled foundations would be used. However, in particular locations, high-capacity piles which extend through to the London Clay Stratum will be required, notably for Building 6a within Development Scenarios 1 and 3 where such piles will be approximately 2.5m in diameter. Where underground structures are present beneath the proposed basement or a proposed building, a raft foundation would be used.
- 6.36 Pile types suitable for the foundations are as follows:
- **Continuous Flight Auger (CFA) piles:** Smaller diameter piles could be CFA piles (with plunge columns), founded in the London Clay. The toe of each pile would therefore constitute a low permeability barrier, preventing the creation of any potential pollution pathway to the aquifer beneath; and
  - **Rotary bored, straight-shafted piles:** These piles can be constructed to larger diameters and greater depths than CFA piles. Generally, piles would be likely to be limited to 2.5m

diameter and up to approximately 50m long. A support fluid would be used to support unstable soil strata during boring, with care being taken to minimise the risk of potential contamination of the underlying aquifer.

**Structural Design**

- 6.37 The structure of Building 5 (Development Scenarios 1, 2, 3 and 4) and 7c (Development Scenarios 1 and 2) would be a concrete frame comprising walls and columns, with pre-stressed or reinforced concrete flat slabs. For the remaining proposed buildings within all Development Scenarios, steel frames would generally be used, connected to core structures that are either reinforced concrete or braced steel frames. Floors would comprise composite steel beams supporting concrete slabs on metal decking. Further details of building structure and superstructure are provided within Chapter 5: The Proposed Development Scenarios.
- 6.38 All buildings within all Development Scenarios would be based on a concrete substructure. The proposed basement, which would be delivered within all Development Scenarios, would be surrounded by a secant pile wall consisting of 1.2m diameter piles at 1.025m centres, except where below-ground constraints are present, and where reinforced concrete walls would be used. The basement would include floor slabs made of reinforced concrete and supported by a mix of concrete and steel columns.

**Materials and Resource Use**

**Demolition and Excavation**

- 6.39 At this point in the design process, it is not possible to accurately quantify the amount of materials arising from the proposed demolition works for each Development Scenario. However, Table 6.2 below provides an indication of the major types of materials expected to arise from demolition works associated with each Development Scenario, based on the worst case basement option, in terms of extent, as described in Chapter 5: Proposed Development Scenarios.

**Table 6.2: Indicative Materials Volumes Arising from Demolition**

Material	Material Sources	Approximate Quantities			
		Development Scenario 1	Development Scenario 2	Development Scenario 3	Development Scenario 4
Concrete.	Superstructures, floor slabs, retained walls, columns.				
Brick.	External and internal walls.				
Glass and cladding.	Cladding.				
Metal components.	Windows, plant, superstructure, sub-assemblies.	37,055m <sup>3</sup>	37,055m <sup>3</sup>	34,639m <sup>3</sup>	34,639m <sup>3</sup>
Timber and plasterboard	Partitions and ceilings.				
Hardstanding / tarmac.	Streets, pavement, car parks.				
Hazardous materials.	Services, plan, walls, ceilings, linings.				
Earth spoil.	Excavation and piling.	227,875m <sup>3</sup>	226,868m <sup>3</sup>	226,107m <sup>3</sup>	225,100m <sup>3</sup>

- 6.40 As shown above, substantial volumes of earth would be removed under each Development Scenario during excavation and piling. Contaminants found (if any) and the designation and ratio of these would be determined through site-specific chemical test data, including Waste Acceptance Criteria (WAC) tests, and disposed of in accordance with relevant legislation. Further details on proposed identification and treatment/disposal of contaminants are provided in Chapter 13: Ground Conditions and Contamination.
- 6.41 A commitment has been made by the Applicant to target 80% of reuse or recycling of demolition materials by mass for each Development Scenario, which would form part of the contract with the appointed contractor. Further detail on proposed recycling of demolition waste is provided in Chapter 7: Waste Management.

**Construction**

- 6.42 Typical materials required for construction within each Development Scenario, along with an estimate of likely quantities, are indicated in Table 6.3.

**Table 6.3: Indicative Construction Materials**

Material	Materials Required For?	Approximate Quantities			
		Development Scenario 1	Development Scenario 2	Development Scenario 3	Development Scenario 4
Piles.	Foundations.	1,000 piles.	997 piles.	1,000 piles.	997 piles.
Concrete.	Foundations. Substructure. Superstructure.	111,960m <sup>3</sup>	99,590m <sup>3</sup>	107,778m <sup>3</sup>	96,170m <sup>3</sup>
Steelwork.	Foundations. Superstructure.	26,651 Tons	21,642 Tons	26,145 Tons	20,707 Tons
Cladding.	Building envelopes.	53,914m <sup>2</sup>	44,734m <sup>2</sup>	50,979m <sup>2</sup>	41,799m <sup>2</sup>

- 6.43 The above noted quantities are indicative only. However, where possible, consideration would be given during the construction of all Development Scenarios to the use of recycled materials, particularly in respect of the proposed highway and building structure sub-bases. Further details are provided in Chapter 7: Waste Management.

**Plant and Equipment**

- 6.44 Consideration has been given to the types of plant and equipment that are likely to be used during the demolition and construction works. An indication of the typical types of plant and equipment associated with each key element of the demolition and construction works is set out within Table 6.4. This information would apply to all four Development Scenarios.

Table 6.4: Indicative Plant for Demolition and Construction (all Development Scenarios)

Plant and Equipment	Demolition and Site Clearance	Earth-works and Sub-structure	Super-structure	Roofing and Cladding	Services and Finishes	Phase
Tower cranes (to a maximum height 95m).	✓	✓	✓	✓		P1, P2 and P3.
Passenger /goods hoists.			✓	✓	✓	P1, P2 and P3.
Excavators and breakers.	✓	✓				P1, P2 and P3.
Cutters, drills and small tools.	✓	✓	✓	✓	✓	P1, P2 and P3.
Crushers.	✓					P1, P2 and P3.
Floodlights.	✓	✓	✓	✓		P1, P2 and P3.
Fork lift truck.		✓	✓	✓	✓	P1, P2 and P3.
Hydraulic benders and cutters.		✓	✓			P1, P2 and P3.
Lorries and vans.	✓	✓	✓	✓	✓	P1, P2 and P3.
Mobile cranes.	✓	✓	✓	✓	✓	P1, P2 and P3.
Mobile lorry mounted concrete pump.		✓	✓			P1, P2 and P3.
Poker vibrator.		✓	✓			P1, P2 and P3.
Ready mixed concrete lorry.		✓	✓			P1, P2 and P3.
Concrete splitters /concrete saws.	✓	✓	✓			P1, P2 and P3.
Scaffolding and hydraulic access platforms.	✓	✓	✓	✓		P1, P2 and P3.
Tipper lorries	✓	✓	✓	✓		P1, P2 and P3.
Flat bed articulated vehicle.		✓	✓	✓	✓	P1, P2 and P3.
Large rigid lorries.		✓	✓	✓	✓	P1, P2 and P3.
Track mounted piling rigs.		✓				P1, P2 and P3.
Water pumps.	✓	✓	✓			P1, P2 and P3.
Stud welders.		✓	✓			P1, P2 and P3.
Mortar batching plant.			✓	✓	✓	P1, P2 and P3.
Temporary earthwork support.	✓	✓				P1, P2 and P3.

**Hours of Work**

- 6.45 The hours of work are likely to be specified within planning conditions attached to the planning permission sought. However, it is considered likely that the standard hours of work would be prescribed according to WCC's CoCP, as set out below:
- 08:00 to 18:00 hours Monday to Friday;
  - 08:00 to 13:00 hours Saturday; and
  - No working on Sundays or Bank Holidays.
- 6.46 Although night-time (23:00 - 08:00), out-of-hours or weekend working would not normally be permitted, it is conceivable that certain works (for example, highway works) may have to be undertaken during these periods. If necessary, the hours of operation for such works would be subject to prior agreement and reasonable notice with WCC, except in emergency conditions.

**Potential Environmental Effects**

- 6.47 All construction sites have the potential to cause temporary nuisance and other disruptions to existing users, neighbouring occupants, car users, pedestrians and other sensitive receptors within the vicinity. Detailed assessments of potential environmental effects resulting from the demolition and construction works for each Development Scenario are considered within Chapters 7 – 17 inclusive of the ES. However, Table 6.5 provides a brief summary of potential effects, which could arise in the absence of mitigation for all Development Scenarios.

**Table 6.5: Summary of Potential Demolition and Construction Effects for all Development Scenarios.**

Issue	Potential Effects
Transportation and Access.	<p>Disruptions to pedestrian access and routes within, and surrounding, the boundary of all Development Scenarios, including Victoria Street and Buckingham Palace Road.</p> <p>Temporary traffic disruptions due to road closures and diversions.</p> <p>Traffic disruption caused by demolition and construction vehicles and an increase in heavy goods vehicle (HGV) movements.</p> <p>Transfer of mud and materials from vehicles onto the public highway.</p>
Townscape, Conservation and Visual issues.	<p>Temporary visual intrusion of construction to:</p> <ul style="list-style-type: none"> <li>• Nearby residents at Roebuck House, flat above the Shakespeare Public House, flat above Bureau de Change (185 Victoria Street), flat above the Duke of York Public House, Evelyn Mansions, Victoria Square and along Buckingham Palace Road, Eaton Lane, Vauxhall Bridge Road and Carlisle Place;</li> <li>• Occupiers of other properties within the visual ‘zone of influence’ of the Development Scenarios; and;</li> <li>• Pedestrians and road users.</li> </ul> <p>Temporary adverse effects upon views including:</p> <ul style="list-style-type: none"> <li>• The protected strategic viewing corridor of King Henry VIII’s Mound, Richmond to St. Paul’s Cathedral (impinging the north-west boundary of all four Development Scenarios); and</li> <li>• Non-statutory but recognised important views including (views from Westminster Bridge to the Palace of Westminster, views from Albert Embankment to the Palace of Westminster, views from Buckingham Palace; and views from St James’ Park, Hyde Park and Green Park).</li> </ul> <p>Temporary adverse effects upon the setting of:</p> <ul style="list-style-type: none"> <li>• The Grade II listed Victoria Palace Theatre to the immediate southeast of all Development Scenario boundaries;</li> <li>• Conservation Areas surrounding the boundaries of all Development Scenarios (including Westminster Cathedral Conservation Area, Royal Parks Conservation Area, Grosvenor Gardens Conservation Area, Birdcage Walk Conservation Area, Belgravia Conservation Area, Pimlico Conservation Area);</li> <li>• Westminster Abbey World Heritage Site and Westminster Palace World Heritage Site;</li> <li>• The Listed Buildings surrounding the boundaries of all Development Scenarios (including the Grade II listed Little Ben Clock, Grade I listed Royal Mews, the Grade II* listed Apollo Victoria Theatre, the Grade II listed Victoria Station, the Grade II* listed Grosvenor Hotel, the Grade I listed Westminster Cathedral, the Grade II* listed Clergy House and Archbishop’s House, and various other Grade II* and Grade II listed buildings to the west on Buckingham Palace Road, Grosvenor Gardens, Eaton Lane, Beeston Place, Victoria Square and Lower Grosvenor Place).</li> </ul>
Archaeology.	Disturbance and/or loss of archaeological resources.
Air Quality.	<p>Temporary generation of windblown dust from ground surfaces, stockpiles, vehicles, work areas crushing and grinding of materials.</p> <p>Generation of exhaust emissions from construction vehicles and plant.</p>
Noise and Vibration.	<p>Temporary increased road noise and vibration from construction vehicles.</p> <p>Temporary increased noise and vibration levels generated by construction plant and machinery.</p>
Ground Conditions.	<p>Exposure of receptors (including the construction workforce, soil and groundwater) to potential ground contamination.</p> <p>Accidental spills and discharges from the storage of fuels and construction materials to the ground.</p>
Surface Water Drainage.	Accidental spills and discharges from the storage of fuels and construction materials to groundwaters and/or drains.

## Mitigation

### Approaches to Environmental Management

- 6.48 Potential effects associated with demolition and construction works are largely dependent on the implementation of effective management controls, for example, the employment of dust suppression methods and use of properly maintained plant.
- 6.49 As previously noted, WCC has published a CoCP which contains a guide to good practice for contractors carrying out demolition and construction works within WCC's administrative boundary. Large scale redevelopments, such as those proposed by all four Development Scenarios, are expected to comply with the CoCP as part of the conditions of any consent. Within the CoCP, WCC encourages the development of site-specific EMPs for demolition and construction, the purpose of which is to demonstrate how the requirements of WCC's CoCP would be met. The EMP would be an operational manual for carrying out environmental controls and monitoring during works, covering (as a minimum) the issues set out in WCC's CoCP. The EMP would also include reference to essential standards for dealing with waste and materials, air quality and noise. Further details are provided in the section below and within relevant technical chapters of this ES.
- 6.50 WCC also adopts a Considerate Builders Scheme (Ref. 6.2) to promote high environmental management standards on all building sites. Contractors must follow a 'Code of Good Practice' which outlines seven criteria which must be adhered to. In summary, the seven criteria are as follows:
- Be considerate;
  - Be quiet;
  - Be clean;
  - Be tidy;
  - Be safe;
  - Be responsible; and
  - Be accountable.
- 6.51 The appointed contractor would be a member of this scheme and would be required to adhere to an EMP.

### Site Specific Environmental Management Plan

- 6.52 The contents of the site-specific EMP would be set out in accordance with WCC's CoCP and agreed with WCC and other relevant bodies prior to the commencement of the works. This would detail the management, monitoring, auditing and training procedures in place to ensure compliance with the CoCP and relevant legislation. It would also set out the specific roles and responsibilities of the contractors' personnel. Thus, the site specific EMP would:
- Identify potential environmental issues;
  - Specify measurable limits and targets to be adhered to; and
  - Detail mitigation measures to be undertaken and the management tools and procedures required for environmental management.
- 6.53 A Project Environmental Manager (PEM) would be appointed who would have primary responsibility for dealing with WCC, the Greater London Authority (GLA) and other agencies on environmental matters. It is anticipated that regular meetings would take place to review progress and to agree any necessary actions. Notwithstanding this, it is recognised that positive action and reaction in the field are essential components for effective environmental management.

- 6.54 The EMP would address requirements in relation to environmental controls and is likely to include, the following:
- Available details of the phasing of the works;
  - Details of construction activities highlighting any operations likely to result in adverse environmental effects, with an indication of the specific detailed mitigation measures to be employed in accordance with the principles outlined in this Chapter;
  - Reference to, and provision of a framework for compliance with relevant legislation and guidance (including WCC's CoCP);
  - Details of emergency procedures which would be implemented on the site;
  - Prohibited or restricted operations;
  - Control limits or target criteria for environmental issues, where practicable;
  - Any requirements for monitoring and record-keeping;
  - Mechanisms for third parties to register complaints and the procedures for responding to complaints;
  - Provisions for reporting, public liaison and prior notification, especially where dispensations would be required;
  - Details of proposed routes for HGVs associated with the demolition and construction works;
  - Details of plant to be used;
  - Details of all construction works involving interference with a public highway, including temporary carriageway/footpath closures, realignments and diversions; and
  - Housekeeping procedures and environmental management controls.

#### **Management of Construction Works and Liaison Personnel**

- 6.55 The PEM would deal with queries from the public and other complaints and enquiries. This nominated individual would be named at the entrance to the construction site, with a contact number, and would be identified to WCC and community groups, prior to the commencement of demolition and construction activities, and whenever a change of responsibility occurs.
- 6.56 Any complaints would be logged and reported to the relevant individual within WCC (and vice versa) as soon as practicable. The EMP would also specify the roles and responsibilities of the PEM and WCC in respect of any breaches or complaints from the public.
- 6.57 In accordance with WCC policy, an Environmental Inspectorate, acting on behalf of WCC, would be appointed to the project. The Environmental Inspectorate would be responsible for liaising with the Applicant's contractor and advise on environmental responsibilities, agreeing routine arrangements for all activities and ensuring compliance with the WCC's CoCP.
- 6.58 The PEM would constitute the main point of contact with the Environmental Inspectorate.

#### **Management of Contractors and Sub-Contractors**

- 6.59 Individual contracts (for example waste removal) would incorporate appropriate requirements in respect of environmental management and control. These would be based upon statutory requirements and the principles of 'good working practice' outlined in the EMP. Potential contractors and sub-contractors would be required to demonstrate how they would achieve the provisions of the EMP, how targets would be met and how potential adverse effects would be prevented, reduced and offset.

### Scope of Environmental Management Controls

- 6.60 The EMP would include detailed information on the controls to be implemented for the following:
- Public Safety, Emergencies and Accidents;
  - Traffic and Access Management;
  - Control of Noise, Vibration and Dust;
  - Materials Storage and Handling;
  - General Waste Management and Minimisation;
  - Hazardous Materials and Contaminated Land;
  - Site Drainage;
  - Protection of Ecological Resources;
  - Protection of Archaeological Remains ; and
  - Built Heritage.
- 6.61 A summary of the control measures that would be included in the EMP is provided in the following sections.

#### **Public Safety, Emergencies and Accidents**

- 6.62 A clear and secure demarcation between operational activities and other areas would be maintained to ensure public safety. Particular attention would be paid to locations supporting high volumes of pedestrian movement (for example, Victoria Street, Buckingham Palace Road and Bressenden Place, relevant to all Development Scenarios), demolition and construction routes, access gates and security arrangements. A 'clean site' policy would be maintained. Hoardings would be used to prevent public access to areas of works and to provide information regarding the project and its progress.
- 6.63 The building contractor would be required to maintain high safety standards throughout the works, and to be fully compliant with current health and safety legislation. An Emergency Incident Plan would be in place to deal with potential spillages and/or pollution incidents. Any pollution incidents would be reported immediately to WCC and the regulatory bodies such as the Environment Agency (EA).

#### **Traffic and Access Management**

- 6.64 Predicted traffic flow alterations and implications (if any) for construction vehicles, buses and the general public together with pedestrian routes and construction access locations for the duration of the demolition and construction works are summarised below and indicated on Figures 6.13 to 6.16 inclusive. The sequences described below have been co-ordinated with the programme of all four Development Scenario timeslices previously described in this chapter. Final details regarding traffic flow alteration and management would be agreed with WCC and Transport for London (TfL) prior to the onset of any works.

#### ***Development Scenario 1 (Applications 1, 2 and 3) (refer to Figures 6.13a to i)***

##### ***Timeslice 1 – June 2010 to February 2011 (Phases 1 and 2)***

- During utility diversions, the Buckingham Palace Road footpath would be restricted in width. However, pedestrian access would be maintained at all times;
- Bressenden Place would be reduced to two lanes during the utility diversion works;
- Warwick Row would be closed to traffic and not reopened as it forms part of the north basement;
- Allington Street would be converted to 1-way traffic for an estimated period of 6 months after which it would only be accessible to construction traffic;

- Access to Bressenden Place from Wilton Road/Terminus Place would always be maintained via the southern part of Allington Street;
- The subway to Bressenden Place at the northeast boundary of the four Development Scenarios would be closed and would be subsidised by a temporary signalised pedestrian crossing; and
- Gates to the construction site of Development Scenario 1 would be positioned along Bressenden Place, Warwick Row and Allington Street.

***Timeslice 2 – March 2011 to July 2011 (Phases 1 and 2)***

- Pedestrians along Bressenden Place would be redirected across the temporary pedestrian crossing to the north side of Bressenden Place;
- The western part of Allington Street would only be available for two-way construction traffic and would not be re-opened as it forms part of the proposed basement; and
- Access to Bressenden Place from Wilton Road/Terminus Place would always be maintained via the southern part of Allington Street.

***Timeslice 3 – August 2011 to February 2012 (Phases 1 and 2)***

- Pedestrians along Bressenden Place maintained on the north side of Bressenden Place;
- The western part of Allington Street would be maintained for one-way construction traffic only;
- Access to Bressenden Place from Wilton Road/Terminus Place would always be maintained via the southern part of Allington Street;  
Gates to the construction site of Development Scenario 1 would be utilised along Buckingham Palace Road, Allington Street and Victoria Street.

***Timeslice 4 – March 2012 to July 2012 (Phases 1 and 2)***

- Pedestrians along Bressenden Place would be maintained on the north side of Bressenden Place;
- The site of Development Scenario 1, north of Victoria Street would be accessed via Buckingham Palace Road and across the new ground floor level slab. Exits would be provided into Bressenden Place;
- Access to Bressenden Place from Wilton Road/Terminus Place would always be maintained via the southern part of Allington Street; and
- Gates into the construction site of Development Scenario 1 utilised along Buckingham Palace Road and Allington Street only.

***Timeslice 5 – August 2012 to June 2013 (Phases 1 and 2)***

- Pedestrians along Bressenden Place maintained on the north side of Bressenden Place;
- Victoria Street partially reduced to two lanes during utility diversion works (by others);
- Access to Bressenden Place from Wilton Road/Terminus Place will always be maintained via the southern part of Allington Street; and
- Gates to the construction site of Development Scenario 1 would be utilised along Bressenden Place, Victoria Street and Allington Street.

***Timeslice 6 – July 2013 to June 2014 (Phases 1 and 2)***

- All pedestrian routes would be enabled throughout Phase 1 and Phase 2;
- Pedestrians along Bressenden Place would be maintained on the north side of Bressenden Place; and
- Gates to the construction site of Development Scenario 1 would be utilised along Victoria Street only.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- All pedestrian routes would be enabled throughout Phase 1 and Phase 2 excluding the Bressenden Place southern pavement, beyond the car park entrance.
- Traffic exiting Allington Street would utilise alternative approach to Bressenden Place, where required;
- Pedestrians along Bressenden Place would be maintained on the north side of Bressenden Place; and
- Gates to the construction site of Development Scenario 1 would be utilised along Bressenden Place only.

***Timeslice 8 – May 2015 to February 2016 (Phase 3)***

- All vehicular and pedestrian routes and access logistic would be as per Timeslice 7.

***Timeslice 9 – March 2016 to August 2016 (Phase 3)***

- All vehicular and pedestrian routes and access logistic would be as per Timeslice 7.

***Timeslice 10 – September 2016 to February 2017 (Phase 3)***

- All pedestrian routes would be enabled throughout the completed Development Scenario 1 and surrounding areas. and;  
All traffic routes would be enabled.

**Development Scenario 2 (Applications 1 and 2) (refer to Figures 6.14a to i)*****Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

All vehicular and pedestrian routes and access logistics within timeslices 1 to 6 for Development Scenario 2 would be identical to those described for Development Scenario 1.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- All pedestrian routes would be enabled throughout Phase 1 and Phase 2.
- Traffic exiting Allington Street would utilise alternative approach to Bressenden Place, where required;
- Pedestrians along Bressenden Place would be able to utilise both pavements, except in front of Building 7b/c, where only eastern pavement would be open; and
- Gates to the construction site of Development Scenario 2 would be utilised along Bressenden Place only.

***Timeslices 8 to 10 – June 2010 to June 2014 (Phases 1 and 2)***

- All vehicular and pedestrian routes and access logistics within timeslices 8 to 10 for Development Scenario 2 would be the same as those for Development Scenario 1.

**Development Scenario 3 (Applications 1 and 3) (refer to Figures 6.15a to i)*****Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

All pedestrian routes and access within timeslices 1 to 6 for Development Scenario 3 would be the same as those for Development Scenario 1, as described above.

***Timeslice 7 – July 2014 to April 2015 (Phase 3)***

- All pedestrian routes would be enabled throughout Phase 1 and Phase 2, excluding the Bressenden Place southern pavement to the east of the new car park entrance.

- Traffic exiting Allington Street would utilise alternative approach to Bressenden Place, where required;
- Pedestrian movement along Bressenden Place would be maintained on the north side of Bressenden Place; and
- Gates to the construction site of Development Scenario 3 would be utilised along Bressenden Place only.

***Timeslices 8 to 10 – June 2010 to June 2014 (Phases 1 and 2)***

All pedestrian routes and access within timeslices 8 to 10 for Development Scenario 3 would be the same as those for Development Scenario 1.

***Development Scenario 4 (Application 1) (refer to Figures 6.16a to f)***

***Timeslices 1 to 6 – June 2010 to June 2014 (Phases 1 and 2)***

All pedestrian routes and access within timeslices 1 to 6 for Development Scenario 4 would be the same as those for Development Scenario 1.

***Timeslice 7 – July 2014 to April 2015 (Phases 1 and 2)***

- All pedestrian routes would be enabled throughout the site of Development Scenario 4 and surrounding areas. and;
- All traffic routes would be enabled.

**Works to Roads and Footpaths**

- 6.65 The construction works for each of the four Development Scenarios would involve the temporary disruption of certain carriageways and footways, as described above and indicated on Figures 6.13 to 6.16. The key disruptions are envisaged to be associated with the utility works to Buckingham Palace Road, Bressenden Place and Victoria Street and the realignment of Bressenden Place. Such works are applicable to all four Development Scenarios.
- 6.66 Methods of construction and timings of the works to roads and footpaths would be agreed with WCC and TfL prior to commencement. However, specific mitigation measures would be put in place to:
- Minimise disruption to users of Victoria Mainline Station and other public transport facilities;
  - Minimise disruption to the general traffic and inconvenience to road users;
  - Ensure safety of the public; and
  - Guarantee reasonable pedestrian access including those with disabilities, wheelchairs and pushchairs, via temporary footways and pedestrian crossings.

**Access Routes and Site Access**

- 6.67 All traffic entering and leaving the construction site for all four Development Scenarios, would be closely controlled. Vehicles making deliveries or removing spoil or demolition material would travel via designated routes which would be agreed with WCC and other relevant bodies such as TfL.
- 6.68 Detailed information regarding these issues and measures to minimise the risk of traffic congestion would be presented in detail through a construction traffic management plan that would be compiled by the contractor and agreed with WCC prior to commencement of any works. Measures are likely to include:
- Deliveries would be phased and controlled on a 'just in time' basis with all vehicles being clearly marked to show their destination and entry gate number; and

- In the event of unusual activities or events that can be anticipated, WCC and other relevant adjacent property owners or occupiers would be notified, in advance of the activity, wherever possible.

### Construction Traffic Flows

6.69 It is anticipated that peak traffic flows for all four Development Scenarios would occur during Quarter 3 2011 to Quarter 2 2012. This would include the main excavation works overlapping with basement construction, piling, foundation activities and superstructure activities associated with Phases 1 and 2. Construction deliveries would be dominated by muck away and ready mixed concrete wagons, as well as large HGV's delivering steelwork and reinforcement.

6.70 Construction deliveries within the programme for all four Development Scenarios would peak at 22 to 24 vehicles per hour in Quarter 3 2011 (i.e. a delivery every 2 to 3 minutes). There would be a number of access points situated throughout the Site and it is intended that during the majority of the works, a one way system would be implemented. Wheel wash facilities would be provided at all exit points.

A further peak period of construction vehicle flows for all four Development Scenarios is anticipated during the period Quarter 4 2012 to Quarter 2 2013 due to the overlap of superstructure/envelope works associated with Phases 1 and 2, and fit out works to Phases 1 and 2. The peak traffic flow would occur during Quarter 1 2013 with 8 to 9 vehicles per hour (every 6-7 minutes).

6.71 In order to reduce the effect of construction traffic, bulk transit trips (such as muck away and steelwork delivery) would be undertaken during off-peak periods only. Lane closures on the local highway network would also be minimised during peak periods. Traffic cones would be relocated to maximise highway widths during peak periods.

6.72 Construction delivery vehicles would approach the site of the consented Development Scenario from the southeast via Vauxhall Bridge Road, Eccleston Bridge, Buckingham Palace Road and Grosvenor Place and into Bressenden Place and Victoria Street. Vehicles would subsequently exit the area via Vauxhall Bridge Road to the southeast. Proposed construction vehicle routes to and from the sites of all four possible Development Scenarios are shown on Figure 6.17.

### *Access to Individual Phases of the Development Scenarios*

6.73 During the Phase 1 and 2 works, for all four Development Scenarios, the existing Allington Street would be retained and utilised as a route for new basement construction works for as long as possible. Access would be provided off Buckingham Palace Road and exit onto Bressenden Place.

6.74 During the remainder of Phase 1 and 2 works for all Development Scenarios, the newly created ground floor slab and permanent basement ramp would be used to replace Allington Street. Construction access would be facilitated from Buckingham Palace Road and Bressenden Place and exits would be provided to both Bressenden Place and Victoria Street. Construction access and egress to Phase 3 (again, common to all four Development Scenarios) would be from Victoria Street, Allington Street and Bressenden Place.

### Car Parking

6.75 The construction labour force for all four Development Scenarios is anticipated to be significant (with an average 1100 to 1400 persons working on Site). However, due to limited car parking spaces and the proximity of a range of excellent public transport services, a policy of no car parking would be adopted throughout the development programme of the consented Development Scenario/.

6.76 In addition, at the main entrance to construction areas, which would vary according to phasing, a minibus set-down point would be established. However, only a small proportion of the workforce

for the consented Development Scenario is anticipated to use this service (less than 5%), with the remainder anticipated to utilise public transport.

#### **Offices and Welfare Facilities**

- 6.77 Project offices would be located in close proximity to the site of the consented Development Scenario. A main workforce welfare facility would be established at the main entrance location and supplemented by satellite facilities situated at appropriate locations throughout the duration of demolition and construction works.

#### **Control of Noise, Vibration and Dust**

- 6.78 It is recognised that demolition and construction generated noise, vibration and dust could give rise to temporary and local disturbance. These effects would be an inevitable consequence of the demolition works, HGV traffic, ground excavations, piling works and other heavy construction activities associated with any of the four Development Scenarios. Site-specific best practice measures would therefore be implemented by contractors to minimise the disturbance to local residents and other potentially sensitive receptors in the surrounding area. Chapter 10: Air Quality and Chapter 11: Noise and Vibration include a detailed review of the proposed mitigation measures during demolition and construction. However, a summary is provided below:

- Careful selection of demolition/construction methods and plant to be used in order to minimise noise impacts at source as far as reasonably practicable;
- Switching off of plant and vehicle engines when not in use;
- Regular maintenance and servicing of vehicles, equipment and plant;
- Appropriate handling and storage of materials;
- Operational hours (to be agreed with WCC);
- The use of temporary acoustic barriers where appropriate;
- Breaking out of concrete structures would be undertaken, where possible, using low noise impact methods including bursting and splitting rather than percussive breaking;
- Damping down surfaces during dry weather;
- Implementation of measures to reduce dust emissions during transport (for example, sheeting the sides of vehicles carrying fine material);
- Use of dust screens and covers and the appropriate location of dusty materials storage;
- Use of water sprayers and boarding; and
- Restriction of drop heights onto lorries.

- 6.79 Noise and vibration levels would be monitored during the demolition and construction phases. If noise and vibration levels breach the agreed threshold Site Action Values at sensitive receptors, alternative methods of demolition would be explored and employed in discussion with WCC's Environmental Health Department. Details pertaining to Site Action Values are provided in Chapter 11: Noise and Vibration.

- 6.80 Dust monitoring would also be undertaken during the demolition and construction phases, with special provisions applied for any materials containing asbestos. A safety method statement would outline the control measures necessary to minimise the risks to an acceptable level, and all statutory notices would be placed with the Health and Safety Executive (HSE).

#### **Materials Storage and Handling**

- 6.81 Environmental issues would be considered in the procurement of raw materials and all such materials would be appropriately stored in order to minimise damage by vehicles, vandals, weather or theft.
- 6.82 Contractors and their subcontractors would be expected to maintain a tidy site and where practical, to operate a 'just-in-time' policy for the delivery and supply of materials for the works.

Excavated materials would primarily be removed from site as there would be limited opportunity to store this material on spoil heaps. The excavated material would be loaded into HGV's for transportation to nearby construction or disposal sites.

- 6.83 Tanks and drums of liquid chemicals and fuels would be stored in bunded compounds and, where feasible, packaging would be returned.
- 6.84 Where possible, pre-fabricated elements would be lifted directly into position from delivery vehicles. This would assist in reducing on site storage and labour requirements and construction noise levels reducing potential nuisances to the surrounding receptors. An off site storage/consolidation centre would be established, in conjunction with all relevant parties, to relieve on site storage requirements but ensure the availability of materials and components to meet the demands of the construction programme.

#### **General Waste Management and Minimisation**

- 6.85 Potential waste would be generated during all stages of the demolition and construction works, with major sources of potential waste for all four Development Scenarios within the demolition and construction process anticipated to include:
- Demolition, site clearance and spoil from excavations comprising concrete, brick rubble, steel, aluminium, plastics, wood, glass and glass cladding;
  - Hazardous material, such as asbestos;
  - Packaging comprising plastics, pallets, expanded foams;
  - Materials delivered for use in new construction; and
  - Dirty water, for example surface water runoff containing silt.
- 6.86 The Applicant's contractor would endeavour to reduce waste generation during demolition and construction. An SWMP would be developed by the contractor detailing how waste would be disposed and managed during the demolition and construction phase. This would be based on guidance within the Department of Trade and Industry (DTI) report 'Site Waste Management Plan - Guidance for Construction Contractors and Clients: Voluntary Code of Practice' (Ref. 6.3). Further details are provided in Chapter 7: Waste Management.
- 6.87 The Applicant has committed to recycling 80% of demolition and construction related waste arising from whichever consented Development Scenario, with all relevant contractors having to comply with this commitment. They would be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to recycle and reuse at least 80% of the demolition and construction materials. Wherever feasible, and storage permitting, such arisings would be reused within construction. The following measures would be implemented to meet this target:
- Concrete and brick from walls and foundations would be crushed and reused for temporary on-site roads and piling platforms;
  - All metal components would be segregated for recycling off-site;
  - Demolition strip-out materials would be segregated for resale /reuse off-site.
  - Other materials would be segregated and recycled off-site
- 6.88 The destination of all waste or other materials removed during demolition and construction would be notified to the relevant authority by the Contractor/Construction Manager for approval. Loads would only be deposited at authorised waste treatment and disposal sites. Deposition of waste would be in accordance with the requirements of the EA, Environmental Protection Act 1990 (EPA) (Ref. 6.4), the Controlled Waste Regulations 1992 as amended (Ref. 6.5), the Hazardous Waste Regulations 2005 (Ref. 6.6), the List of Waste Regulations 2005 (Ref. 6.7) and the Duty of Care Regulations 1991 (Ref. 6.8).

**Hazardous Materials and Contaminated Land**

- 6.89 Due to the historical industrial land uses within the boundaries of all four Development Scenario sites, there is likely to be a low to medium risk of localised ground contamination (refer to Chapter 13: Ground Conditions and Contamination). Contaminated materials identified during the demolition and construction works for the consented Development Scenario would therefore be handled and disposed of safely and properly, according to current relevant legislation.
- 6.90 Appropriate mitigation relating to contaminated material would therefore include:
- Site investigation prior to commencement of the works to establish the extent and nature of potential ground contamination within the boundary of the consented Development Scenario and in the immediate vicinity. The investigation would also provide a Waste Acceptance Classification (WAC) for excavated materials, which would facilitate their proper disposal in accordance with current waste legislation. Remediation would be carried out, where required;
  - In the case of contamination identified during excavation works, an environmental specialist would assess the nature of the contamination. An appropriate remedial strategy would then be drawn up accordingly; and
  - Appropriate management of waste generated by demolition and construction works. For example, excavated spoil would be loaded into lorries and transported by registered carrier under cover of a consignment note and deposited at a licensed disposal facility agreed with the EA.
- 6.91 Prior to demolition and construction, the Contractor would be required to prepare a safety method statement exemplifying how the safety of construction workers and the public would be addressed in terms of potentially harmful substances. Protective measures would include:
- Provision of adequate facilities and procedures for personal washing and changing;
  - Provision and use of personal protective equipment (PPE);
  - Implementation of dust suppression methods; and
  - Implementation of measures to avoid surface water ponding and the collection and disposal of surface water run-off.
- 6.92 Other practical methods of limiting risks from hazardous materials and contaminated land would include:
- The storage of all potentially hazardous materials on hard surfaced areas, with bunding to the satisfaction of the EA;
  - The storage of ground tank oil in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref. 6.9); and
  - The treatment of any excess dewatering effluent prior to discharging excess water to the foul sewerage system and only on the achievement of (and in accordance with) an approved discharge consent from Thames Water.
- 6.93 Building materials containing asbestos would be fully assessed in advance of any demolition works. A full access Type 3 Asbestos Survey would be conducted by a suitable UKAS accredited specialist to confirm the presence of all Asbestos Containing Materials (ACMs) within the structures, plant and services on site. Any identified asbestos would be removed by a licensed contractor in accordance with relevant legislation and regulations, including the Hazardous Waste Regulations.

**Site Drainage**

- 6.94 The Applicant's contractor would ensure that potentially contaminated water is disposed of in accordance with the Water Resources Act (1991) (Ref. 6.10) and other relevant legislation, and to the satisfaction of the EA and Thames Water.

- 6.95 Best practice pollution prevention measures would be put in place to isolate environmentally damaging substances and the prevention of their release into surface water or underground drainage systems. These would include:
- Careful siting and bunding of fuel storage facilities and any areas used for the storage of potentially hazardous materials;
  - Works involving concrete would be carefully controlled and ready-mix concrete wagons would be washed out in a safe area;
  - Management of site drainage to prevent sediment laden/contaminated run-off entering the wider environment;
  - Surface drainage would pass through settlement tanks and oil interception facilities where required and discharge arrangements would be agreed with Thames Water and WCC;
  - Construction vehicle parking areas may need to be paved; and
  - Provision for the safe disposal of wastewaters.
- 6.96 An emergency plan would be implemented outlining procedures to follow in the instance of any accidents involving spillages. This would involve the provision of on-site equipment for containing spillages, such as emergency booms and chemicals to soak up spillages. Should an incident occur, the EA and Thames Water would be contacted immediately.

#### **Protection of Archaeological Remains**

- 6.97 The site of all four Development Scenarios is not within an Area of Special Archaeological Priority. However, a desk-based archaeological assessment has been undertaken by MoLAS and is summarised within Chapter 12: Archaeology. This reveals that all four sites of the Development Scenarios present a moderate potential for the survival of palaeo-environmental remains and a high potential for Post-Medieval remains. However, any remains are expected to be of local importance.
- 6.98 In accordance with the above, a precautionary approach, with selective geo-archaeological sampling, localised excavation and watching briefs, would be implemented in relation to the consented Development Scenario. Following demolition, archaeological evaluation would be undertaken to ensure that archaeological finds are appropriately dealt with in order to avoid their destruction. This strategy would be agreed with WCC and English Heritage, and would be secured by an appropriately worded planning condition. A more detailed description of the mitigation strategy is presented in Chapter 12: Archaeology.

#### **Built Heritage**

- 6.99 With respect to the listed structures located within the immediate vicinity of the boundary for all Development Scenarios (i.e. the Grade II listed Victoria Palace Theatre) appropriate protective measures would be implemented to avoid accidental damage. With respect to the Victoria Palace Theatre, the following measures would be implemented:
- The erection of appropriate hoarding to protect the listed features and provide a buffer zone from active site construction works; and
  - Vibration monitoring to ensure that listed features are not damaged by the works.
- 6.100 Furthermore, where necessary, appropriate measures would be undertaken to ensure the integrity of the surrounding listed buildings are not affected by the works (for example, the Grade II listed Little Ben Clock, the Grade II listed Victoria Station, the Grade II\* listed Grosvenor Hotel, and the Grade II listed buildings along Buckingham Palace Road). However this is considered highly unlikely given the proposed techniques of demolition and construction for all Development Scenarios.

**Protection of Ecological Resources**

- 6.101 Due to the dominance of buildings and hardstanding, the sites of all four Development Scenarios are considered to be of low ecological potential. For this reason, it has been explained in Chapter 2: EIA Methodology that ecology has been considered as a non-significant issue within the EIA process. However, to ensure the adoption of a precautionary approach, where practicable, demolition and clearance works for the consented Development Scenario would be carried out outside of the bird breeding season to ensure that any unidentified breeding birds are not adversely affected. Where this is not possible, an Ecological Watching Brief would be maintained over the duration of the works.

**Summary and Conclusions**

- 6.102 The programme for the proposed Development Scenarios would span from approximately 4.25 years (Development Scenario 4, due for completion by end 2014), to 6.25 years (Development Scenario 3, due for completion by end 2016) and 6.5 years (Development Scenario 1 and 2, due for completion in early 2017). The shorter duration of works proposed for Development Scenarios 3 and 4 reflects the reduced extent of new built form proposed, as detailed within Chapter 5: The Proposed Development Scenarios.
- 6.103 The programme of demolition and construction works for Development Scenarios 1, 2 and 3 has been divided into 3 Phases, whilst only 2 Phases are envisaged for Development Scenario 4. The works are further sub-divided into a number of 'timeslices', which encompass key elements of work.
- 6.104 The demolition and construction effects of the proposed Development Scenarios would be managed through the development of a project and site-specific EMP. The EMP would be agreed with WCC and other relevant bodies prior to the commencement of works. This would comply with WCC's Code of Practice for Deconstruction and Construction Sites and the mitigation measures set out in this chapter. The appointed contractor for the works would be obliged to adhere to the EMP and to join the WCC's Considerate Builders Scheme.
- 6.105 These procedures would ensure the delivery of a high level of environmental control throughout the demolition and construction phase, thereby minimising the potential for adverse effects. Further detail regarding specific mitigation during demolition and construction works for each Development Scenario is presented with Chapters 7 to 17 of this ES.