

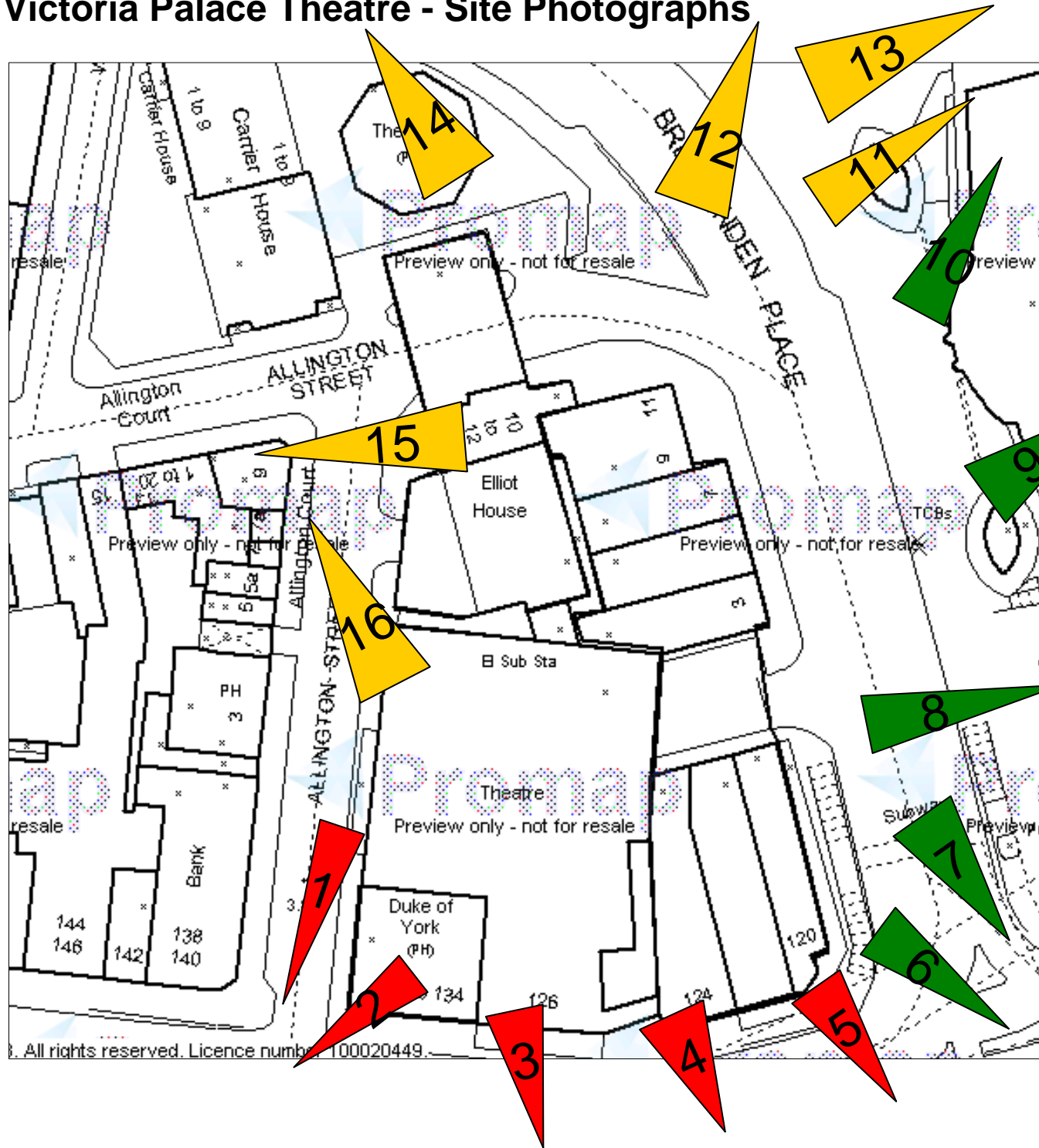


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## Appendix 1

### Photographs of the Environs of the Victoria Palace Theatre

# Victoria Palace Theatre - Site Photographs



**Key:**  
Arrow Colours  
Refer to Pages of  
Photographs:

- Page 1
- Page 2
- Page 3



1. (l-r) Elliot House, Service Entrance of Victoria Palace Theatre & Duke of York PH



2. The Duke of York Public House



3. The Duke of York Public House



4. The Duke of York PH (left) & Victoria Palace Theatre (right)



5. Betting Shop



6. (l-r) Victoria Palace Theatre, Betting Shop, Garfunkles Restaurant & Risky Clothing



8. Rear of Victoria Palace Theatre



7. (l-r) Risky Clothing & Spaghetti House



9. (l-r) Spaghetti House & Trafalgar Travel Shop



10. Trafalgar Travel Shop (foreground) & Elliot House (background)



11. Trafalgar Travel Centre & Elliot House



12. (l-r) Trafalgar Travel Centre,  
Elliot House & The Stag PH



13. (l-r) Elliot House & The Stag PH  
(foreground). No. 1 Warrick Row (behind)



14. Northern Corner of Elliot House



15. Elliot House



16. Victoria Palace Theatre Stage Door

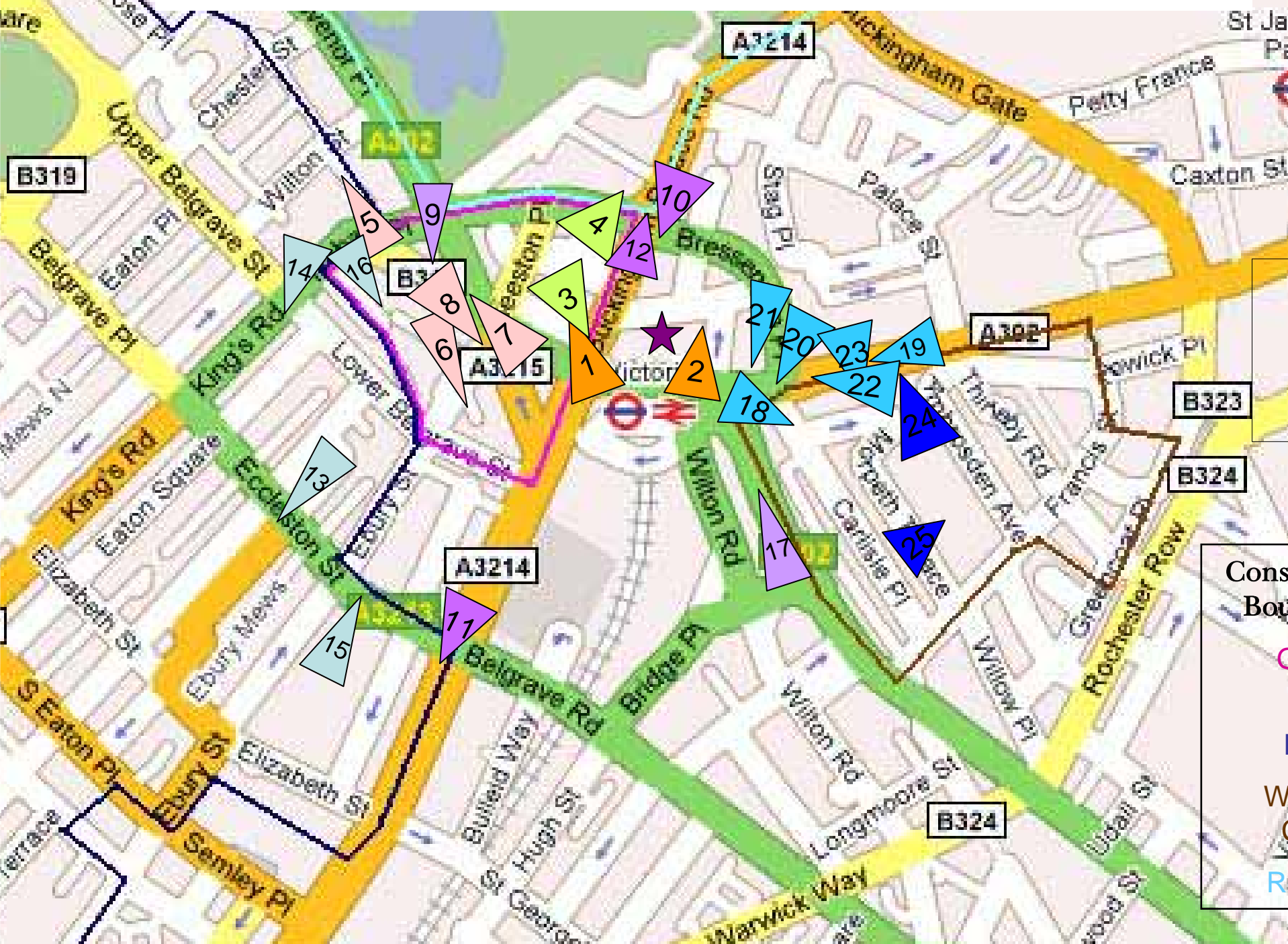


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## Appendix 2

### Photographs of the locality near Victoria Palace Theatre

# Victoria Palace Theatre Local Area – Site Photos



Victoria  
Palace  
Theatre



Conservation Area  
Boundaries Key

- Grosvenor  
Gardens
- Belgravia
- Westminster  
Cathedral
- Royal Parks

Victoria Station

1



2



3



Victoria Square

4





5



6



Grosvenor Gardens

7



8



Area Views (Page 3)

OBJ21/P3A2

Grosvenor Place



Buckingham Palace Road



Buckingham Palace Road





13



14



15



16

# Area Views (Page 5)

## Victoria St, Shops & Offices



Vauxhall Bridge Road



Victoria St, Shops & Offices



# Area Views (Page 6)

## Victoria St, Shops & Offices

21



22



23

24



Westminster Cathedral & Conservation Area



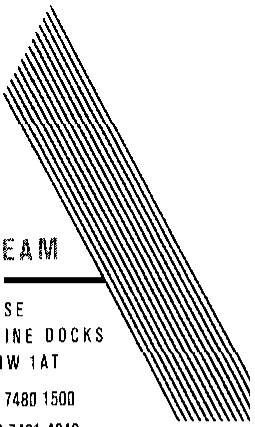
25



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## Appendix 3

Victoria Palace Theatre application, plans and supporting statements in relation to the new fly tower



**ARTS TEAM**

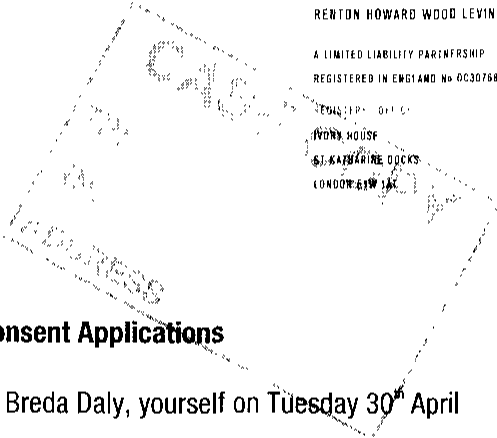
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FAO: David Horkan  
Planning & City Development Department  
Westminster City Council  
PO Box 240  
City Hall  
64 Victoria Street  
London SW1E 6QP

Ref: AMc\_080523\_WCC\_L1\_3.4

23<sup>rd</sup> May, 2008



Dear David,

**VICTORIA PALACE THEATRE – Planning and Listed Building Consent Applications**

Further to our meeting dated with Graham King, Rachel Hamilton, Breda Daly, yourself on Tuesday 30<sup>th</sup> April 2008, we enclosed the following documents:-

**Planning Application**

- 1. 4no. signed copies of Planning Application form, including Certificate B signed by client
- 2. 4no. copies of Site Plan identifying site boundary in red
- 3. 6no. copies of existing and proposed plans, sections and elevations
- 4. 1no. colour copy of Design and Access Report
- 5. cheque made payable to City of Westminster for £2,925, based on a floor area of new development totally 2916m<sup>2</sup>

**Listed Building Consent Application**

- 1. 4no. signed copies of Application for Listed Building Consent, including Certificate B signed by client
- 2. 4no. copies of Site Plan identifying site boundary in red
- 3. 4no. copies of existing and proposed plans, sections and elevations
- 4. 4no. colour copies of Design and Access Report

Also included in our application will be 4no. samples of terracotta rain screen products and copy of minutes taken from our last meeting dated Tuesday 30<sup>th</sup> April 2008.





ARTS TEAM

Please note that the applications for Planning and Listed Building Consent must be read in conjunction with John Earl's Conservation Plan dated August 2007, issued previously to Westminster Planning, English Heritage and Theatres Trust as a supporting document.

We trust that we have met all the statutory requirements for both applications following on going discussions with Westminster Planners, English Heritage and Theatres Trust. If however you require further information or clarification regarding our application, please do not hesitate to contact either Suzie Bridges at Arts Team or the under signed.

Yours faithfully



**Alan McKenzie**

For and on behalf of Arts Team

Encl.

cc: - Sir Stephen Waley Cohen – Victoria Palace Theatre  
Felix Collins – Bruce Shaw Partnership  
Breda Daly - English Heritage  
Mark Price - Theatre's Trust

# DOCUMENT ISSUE

PROJECT: 10980: Victoria Palace Theatre  
 Situated at: Victoria Street, London, SW1  
 For: Victoria Palace Theatre Ltd  
 RE: Planning Application

Our Ref: ISS/10980/9  
 Date: 23/05/2008  
 Page: 1 of 2

The following documents are enclosed in respect of the above for:

Information  Approval  Comment  Other  **Planning**

Title	Reference	Rev
Site Plan	10980-02-P-00	1st
Basement / Understage Plan	10980-02-P-01	/
Ground Floor Plan	10980-02-P-02	/
First Floor Plan	10980-02-P-03	/
Second Floor Plan	10980-02-P-04	/
Third Floor Plan	10980-02-P-05	/
Fourth Floor Plan	10980-02-P-06	/
Fifth Floor Plan	10980-02-P-07	/
Sixth Floor Plan	10980-02-P-08	/
Seventh Floor Plan	10980-02-P-09	/
Roof Plan	10980-02-P-10	/
Long Section	10980-02-P-20	/
Cross Section Stage	10980-02-P-21	/
Long Section Wing	10980-02-P-22	/
South Elevation	10980-02-P-30	/
West Elevation	10980-02-P-31	/
North Elevation Proposed Layout	10980-02-P-32	/
East Elevation Proposed Layout	10980-02-P-33	/
BASEMENT & UNDERSTAGE PLAN	10980-02-X-01	/
Ground Floor Plan, Existing	10980-02-X-02	/
First Floor Plan, Existing	10980-02-X-03	/
Second Floor Plan, Existing	10980-02-X-04	/
Third Floor Plan, Existing	10980-02-X-05	/
Fourth Floor Plan, Existing	10980-02-X-06	/
Existing Cross Section	10980-02-X-20	/
Cross Section, Proscenium Arch	10980-02-X-22	/
South Elevation, Victoria Street, Existing Elevation	10980-02-X-30	/
West Elevation, Allington Street, Existing Elevation	10980-02-X-31	/
North Elevation, elevation Existing	10980-02-X-32	/
East Elevation, Elevation Existing	10980-02-X-33	/

Name	Company	Job function	Format	Delivery	No.
David Horkan	Westminster City Council		PAPER	COURIER	6

Ivory House St Katharine Docks London E1W 1AT  
 tel: +44 (0)20 7480 1500 fax: +44 (0)20 7481 4840 email: artsteam@rhwl.com web: www.artsteam.com

Arts Team, RHWL Architects and RHWL Interiors are all part of Rentor Howard Wood Levin LLP, a Limited Liability Partnership Registered in England no. OC307685, Registered Office Ivory House, St Katharine Docks, London E1W 1AT, England



**ARTS TEAM**

ISO 9001:2000 Approval Certificate No. LRQ400557

Issued by RHWL Architects

Signed



Date

23/05/08

Ivory House St Katharine Docks London E1W 1AT

tel: +44 (0)20 7480 1500 fax: +44 (0)20 7481 4840 email: [artsteam@rhw.com](mailto:artsteam@rhw.com) web: [www.artsteam.com](http://www.artsteam.com)

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**ARTS TEAM**

ISO 9001:2000 Approved Certificate No LRQ400557

Fri 23, May 2008

Our Ref. ISS/10980/9

Page 2 of 2



## Application for Planning Permission. Town and Country Planning Act 1990

### Publication of planning applications on council websites

Please note that with the exception of applicant contact details and Certificates of Ownership, the information provided on this application form and in supporting documents may be published on the council's website.

If you have provided any other information as part of your application which falls within the definition of personal data under the Data Protection Act which you do not wish to be published on the council's website, please contact the council's planning department.

Please complete using block capitals and black ink.

It is important that you read the accompanying guidance notes as incorrect completion will delay the processing of your application.

### 1. Applicant Name and Address

Title:  First name:

Last name:

Company (optional):

Unit:  House number:  House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Country:

Postcode:

### 2. Agent Name and Address

Title:  First name:

Last name:

Company (optional):

Unit:  House number:  House suffix:

House name:

Address 1:

Address 2:

Address 3:

Town:

County:

Country:

Postcode:

### 3. Description of the Proposal

Please describe the proposed development, including any change of use:

EXTENSION AND ALTERATIONS TO FRONT OF HOUSE AREAS  
EXTENSION AND ALTERATIONS TO FLYTOWER AND BACK OF HOUSE AREAS  
NEW SEATING LAYOUT TO AUDITORIUM

Has the building, work or change of use already started?

Yes  No

If Yes, please state the date when building, work or use were started (DD/MM/YYYY):

(date must be pre-application submission)

Has the building, work or change of use been completed?

Yes  No

If Yes, please state the date when the building, work or change of use was completed: (DD/MM/YYYY):

(date must be pre-application submission)

#### 4. Site Address Details

Please provide the full postal address of the application site.

Unit:  House number:  House suffix:

House name: VICTORIA PALACE THEATRE

Address 1: VICTORIA STREET

Address 2:

Address 3:

Town: LONDON

County:

Postcode (optional): SW1E 5EA

Description of location or a grid reference.  
(must be completed if postcode is not known):

Easting:  Northing:

Description:  
REFER TO SITE PLAN

#### 5. Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application?  Yes  No

If Yes, please complete the following information about the advice you were given. (This will help the authority to deal with this application more efficiently).

Please tick if the full contact details are not known, and then complete as much as possible:

Officer name:  
RACHEL HAMILTON / DAVID HOLLAN

Reference:

Date (DD/MM/YYYY):  
(must be pre-application submission)

Details of pre-application advice received?  
SEE MINUTES ATTACHED.

#### 6. Pedestrian and Vehicle Access, Roads and Rights of Way

Is a new or altered vehicle access proposed to or from the public highway?  Yes  No

Is a new or altered pedestrian access proposed to or from the public highway?  Yes  No

Are there any new public roads to be provided within the site?  Yes  No

Are there any new public rights of way to be provided within or adjacent to the site?  Yes  No

Do the proposals require any diversions /extinguishments and/or creation of rights of way?  Yes  No

If you answered Yes to any of the above questions, please show details on your plans/drawings and state the reference of the plan (s)/drawings(s)

#### 7. Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste?  Yes  No

If Yes, please provide details:

Have arrangements been made for the separate storage and collection of recyclable waste?  Yes  No

If Yes, please provide details:

#### 8. Neighbour and Community Consultation

Have you consulted your neighbours or the local community about the proposal?  Yes  No

If Yes, please provide details:  
OUR CLIENT HAS BEEN IN CONTACT WITH LAND SECURITIES AND TRANSPORT FOR LONDON OVER THE PROPOSED REDEVELOPMENT

#### 9. Council Employee / Member

Is the applicant or agent related to any member of staff or elected member of the council?  Yes  No

If Yes, please provide details:

## 10. Materials

If applicable, please state what materials are to be used externally. Include type, colour and name for each material:

	Existing (where applicable)	Proposed	Not applicable	Don't Know	Drawing references if applicable
Walls		PROPRIETARY TERRAZZOTA RAIN SCREEN CLADDING TO NEW FLYTOWER	<input type="checkbox"/>	<input type="checkbox"/>	10980/02/P/1 30, 31, 32, 33
Roof		PANPET ROOF ARRANGEMENT TO INCORPORATE WALL CLADDING SYSTEM	<input type="checkbox"/>	<input type="checkbox"/>	"
Windows		COLOR ANODISED ALUMINIUM WINDOW FRAMES	<input type="checkbox"/>	<input type="checkbox"/>	"
Doors		TO MATCH EXISTING	<input type="checkbox"/>	<input type="checkbox"/>	
Boundary treatments (e.g. fences, walls)			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vehicle access and hard-standing			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Lighting			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Others (please specify)		MATCHING FACIENLE CLADDING TO ADJOINING FRONT FACIENLE	<input type="checkbox"/>	<input type="checkbox"/>	10980/02/A/1 30 + 33

Are you supplying additional information on submitted plan(s)/drawing(s)/design and access statement?

Yes  No

If Yes, please state references for the plan(s)/drawing(s)/design and access statement:

SITE PLAN 10980/P/02/00, EXISTING PLANS, SECTIONS + ELEVATIONS 10980/P/X/01, 02, 03, 04, 05, 06, 20  
30, 31, 32, 33  
PROPOSED PLANS, SECTIONS + ELEVATIONS 10980/P/01, 02, 03, 04, 05, 06, 20  
DESIGN + ACCESS REPORT 22, 30, 31, 32, 33

## 11. Vehicle Parking

Please provide information on the existing and proposed number of on-site parking spaces:

Type of Vehicle	Total Existing	Total proposed (including spaces retained)	Difference in spaces
Cars	0	0	0
Light goods vehicles/ public carrier vehicles	0	0	0
Motorcycles	0	0	0
Disability spaces	0	0	0
Cycle spaces	0	0	0
Other (e.g. Bus)	0	0	0
Other (e.g. Bus)	0	0	0

## 12. Foul Sewage

Please state how foul sewage is to be disposed of:

- Mains sewer  Cess pit  
 Septic tank  Other  
 Package treatment plant

Are you proposing to connect to the existing drainage system?  Yes  No

If Yes, please include the details of the existing system on the application drawings and state references for the plan(s)/drawing(s):

## 14. Biodiversity and Geological Conservation

Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

a) Protected and priority species:

- Yes, on the development site  
 Yes, on land adjacent to or near the proposed development  
 No

b) Designated sites, important habitats or other biodiversity features:

- Yes, on the development site  
 Yes, on land adjacent to or near the proposed development  
 No

c) Features of geological conservation importance:

- Yes, on the development site  
 Yes, on land adjacent to or near the proposed development  
 No

## 16. Trees and Hedges

Are there trees or hedges on the proposed development site?  Yes  No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character?  Yes  No

If Yes to either or both of the above, you will need to provide a full Tree Survey, with accompanying plan before your application can be determined. Your Local Planning Authority should make clear on its website what the survey should contain, in accordance with the current 'BS5837: Trees in relation to construction - Recommendations'.

## 13. Assessment of Flood Risk

Is the site within an area at risk of flooding? (Refer to the Environment Agency's Flood Map showing flood zones 2 and 3 and consult Environment Agency standing advice and your local planning authority requirements for information as necessary.)

Yes  No

If Yes, you will need to submit a Flood Risk Assessment to consider the risk to the proposed site.

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)?  Yes  No

Will the proposal increase the flood risk elsewhere?  Yes  No

How will surface water be disposed of?

- Sustainable drainage system  Existing watercourse  
 Soakaway  Pond/lake  
 Main sewer

## 15. Existing Use

Please describe the current use of the site:

THEATRE / MUSICAL PLAYHOUSE

Is the site currently vacant?  Yes  No

If Yes, please describe the last use of the site:

When did this use end (if known)?  
DD/MM/YYYY   
(date where known may be approximate)

Does the proposal involve any of the following:

Land which is known to be contaminated?  Yes  No

Land where contamination is suspected for all or part of the site?  Yes  No

A proposed use that would be particularly vulnerable to the presence of contamination?  Yes  No

If you have answered Yes to any of the above, you will need to submit an appropriate contamination assessment.

## 17. Trade Effluent

Does the proposal involve the need to dispose of trade effluents or waste?  Yes  No

If Yes, please describe the nature, volume and means of disposal of trade effluents or waste

### 18. Residential Units (Including Conversion)

Does your proposal include the gain, loss or change of use of residential units?  Yes  No  
 If Yes, please complete details of the changes in the tables below:

Proposed Housing							
Market Housing	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>A</b>

Existing Housing							
Market Housing	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>E</b>

Social Rented	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>B</b>

Social Rented	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>F</b>

Intermediate	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>C</b>

Intermediate	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>G</b>

Key worker	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>D</b>

Key worker	Not known	Number of Bedrooms					Total
		1	2	3	4+	Unknown	
Houses	<input type="checkbox"/>						a
Flats and maisonettes	<input type="checkbox"/>						b
Live-work units	<input type="checkbox"/>						c
Cluster flats	<input type="checkbox"/>						d
Sheltered housing	<input type="checkbox"/>						e
Bedsit/studios	<input type="checkbox"/>						f
Unknown type	<input type="checkbox"/>						g
<b>Totals (a+b+c+d+e+f+g) =</b>							<b>H</b>

**Total proposed residential units (A+B+C+D) =**

**Total existing residential units (E+F+G+H) =**

**TOTAL NET GAIN or LOSS of RESIDENTIAL UNITS (Proposed Housing Grand Total - Existing Housing Grand Total):**



### 19. All Types of Development: Non-residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace?  Yes  No

If you have answered Yes to the question above please add details in the following table:

Use class/type of use		Not applicable	Existing gross internal floorspace (square metres)	Gross internal floorspace to be lost by change of use or demolition (square metres)	Total gross internal floorspace proposed (including change of use)(square metres)	Net additional gross internal floorspace following development (square metres)
A1	Shops	<input type="checkbox"/>				
	Net tradable area:	<input type="checkbox"/>				
A2	Financial and professional services	<input type="checkbox"/>				
A3	Restaurants and cafes	<input type="checkbox"/>				
A4	Drinking establishments	<input type="checkbox"/>				
A5	Hot food takeaways	<input type="checkbox"/>				
B1 (a)	Office (other than A2)	<input type="checkbox"/>				
B1 (b)	Research and development	<input type="checkbox"/>				
B1 (c)	Light industrial	<input type="checkbox"/>				
B2	General industrial	<input type="checkbox"/>				
B8	Storage or distribution	<input type="checkbox"/>				
C1	Hotels and halls of residence	<input type="checkbox"/>				
C2	Residential institutions	<input type="checkbox"/>				
D1	Non-residential institutions	<input type="checkbox"/>				
D2	Assembly and leisure	<input checked="" type="checkbox"/>	7595m <sup>2</sup>		9140m <sup>2</sup>	1545m <sup>2</sup>
OTHER	Please specify	<input type="checkbox"/>	177m <sup>2</sup>	SPACE OFFERED BY LAND SECURITIES TO REAR OF FLYTOWER		
		<input type="checkbox"/>	12m <sup>2</sup>	SPACE OFFERED BY LAND SECURITIES TO PROVIDE LIFT CORE		
	Total		199m <sup>2</sup>	AS IDENTIFIED ON SITE PLAN 10880/R/02/00		

In addition, for hotels, residential institutions and hostels, please additionally indicate the loss or gain of rooms

Use class	Type of use	Not applicable	Existing rooms to be lost by change of use or demolition	Total rooms proposed (including changes of use)	Net additional rooms
C1	Hotels	<input type="checkbox"/>			
C2	Residential Institutions	<input type="checkbox"/>			
Other	Hostels	<input type="checkbox"/>			

### 20. Employment

Please complete the following information regarding employees:

	Full-time	Part-time	Total full-time equivalent	Not known
Existing employees				
Proposed employees				

### 21. Hours of Opening

Please state the hours of opening for each non-residential use proposed:

Use	Monday to Friday	Saturday	Sunday and Bank Holidays	Not known

### 22. Site Area

Please state the site area in hectares (ha)

1.615 (1615m<sup>2</sup>)

### 23. Industrial or Commercial Processes and Machinery

Please describe the activities and processes which would be carried out on the site and the end products including plant, ventilation or air conditioning. Please include the type of machinery which may be installed on site:

Is the proposal a waste management development?  Yes  No

If the answer is Yes, please complete the following table:

	Not applicable	The total capacity of the void in cubic metres, including engineering surcharge and making no allowance for cover or restoration material (or tonnes if solid waste or litres if liquid waste)	Maximum annual operational throughput in tonnes (or litres if liquid waste)
Inert landfill	<input type="checkbox"/>		
Non-hazardous landfill	<input type="checkbox"/>		
Hazardous landfill	<input type="checkbox"/>		
Energy from waste incineration	<input type="checkbox"/>		
Other incineration	<input type="checkbox"/>		
Landfill gas generation plant	<input type="checkbox"/>		
Pyrolysis/gasification	<input type="checkbox"/>		
Metal recycling site	<input type="checkbox"/>		
Transfer stations	<input type="checkbox"/>		
Material recovery/recycling facilities (MRFs)	<input type="checkbox"/>		
Household civic amenity sites	<input type="checkbox"/>		
Open windrow composting	<input type="checkbox"/>		
In-vessel composting	<input type="checkbox"/>		
Anaerobic digestion	<input type="checkbox"/>		
Any combined mechanical, biological and/or thermal treatment (MBT)	<input type="checkbox"/>		
Sewage treatment works	<input type="checkbox"/>		
Other treatment	<input type="checkbox"/>		
Recycling facilities construction, demolition and excavation waste	<input type="checkbox"/>		
Storage of waste	<input type="checkbox"/>		
Other waste management	<input type="checkbox"/>		
Other developments	<input type="checkbox"/>		

Please provide the maximum annual operational throughput of the following waste streams:

Municipal	
Construction, demolition and excavation	
Commercial and industrial	
Hazardous	

If this is a landfill application you will need to provide further information before your application can be determined. Your waste planning authority should make clear what information it requires on its website.

### 24. Hazardous Substances

Does the proposal involve the use or storage of any of the following materials in the quantities stated below?  Yes  No  Not applicable

If Yes, please provide the amount of each substance that is involved:

Acrylonitrile (tonnes) <input type="text"/>	Ethylene oxide (tonnes) <input type="text"/>	Phosgene (tonnes) <input type="text"/>
Ammonia (tonnes) <input type="text"/>	Hydrogen cyanide (tonnes) <input type="text"/>	Sulphur dioxide (tonnes) <input type="text"/>
Bromine (tonnes) <input type="text"/>	Liquid oxygen (tonnes) <input type="text"/>	Flour (tonnes) <input type="text"/>
Chlorine (tonnes) <input type="text"/>	Liquid petroleum gas (tonnes) <input type="text"/>	Refined white sugar (tonnes) <input type="text"/>

Other:

Other:

Amount (tonnes):

Amount (tonnes):

**25. Certificates**

One Certificate A, B, C, or D, must be completed, together with the Agricultural Holdings Certificate with this application form

**CERTIFICATE OF OWNERSHIP - CERTIFICATE A**

**Town and Country Planning (General Development Procedure) Order 1995 Certificate under Article 7**

I certify/The applicant certifies that on the day 21 days before the date of this application nobody except myself/ the applicant was the owner (owner is a person with a freehold interest or leasehold interest with at least 7 years left to run) of any part of the land or building to which the application relates.

Signed - Applicant:  Or signed - Agent:  Date (DD/MM/YYYY):

**CERTIFICATE OF OWNERSHIP - CERTIFICATE B**

**Town and Country Planning (General Development Procedure) Order 1995 Certificate under Article 7**

I certify/ The applicant certifies that I have/the applicant has given the requisite notice to everyone else (as listed below) who, on the day 21 days before the date of this application, was the owner (owner is a person with a freehold interest or leasehold interest with at least 7 years left to run) of any part of the land or building to which this application relates.

Name of Owner	Address	Date Notice Served
LAND SECURITIES (NIGEL ENRP)	5 STRAND, LONDON WC2N 5AF	23 MAY 2008

Signed - Applicant:  Or signed - Agent:  Date (DD/MM/YYYY):

**CERTIFICATE OF OWNERSHIP - CERTIFICATE C**

**Town and Country Planning (General Development Procedure) Order 1995 Certificate under Article 7**

I certify/ The applicant certifies that:

- § Neither Certificate A or B can be issued for this application
- § All reasonable steps have been taken to find out the names and addresses of the other owners (owner is a person with a freehold interest or leasehold interest with at least 7 years left to run) of the land or building, or of a part of it, but I have/ the applicant has been unable to do so.

The steps taken were:

Name of Owner	Address	Date Notice Served

Notice of the application has been published in the following newspaper (circulating in the area where the land is situated):

On the following date (which must not be earlier than 21 days before the date of the application):

Signed - Applicant:  Or signed - Agent:  Date (DD/MM/YYYY):

**25. Certificates (continued)**

**CERTIFICATE OF OWNERSHIP - CERTIFICATE D**

**Town and Country Planning (General Development Procedure) Order 1995 Certificate under Article 7**

I certify/ The applicant certifies that:

§ Certificate A cannot be issued for this application

§ All reasonable steps have been taken to find out the names and addresses of everyone else who, on the day 21 days before the date of this application, was the owner (owner is a person with a freehold interest or leasehold interest with at least 7 years left to run) of any part of the land to which this application relates, but I have/ the applicant has been unable to do so.

The steps taken were:

[Empty box for steps taken]

Notice of the application has been published in the following newspaper (circulating in the area where the land is situated):

[Empty box for newspaper name]

On the following date (which must not be earlier than 21 days before the date of the application):

[Empty box for date]

Signed - Applicant:

[Empty box for applicant signature]

Or signed - Agent:

[Empty box for agent signature]

Date (DD/MM/YYYY):

[Empty box for date]

**AGRICULTURAL HOLDINGS CERTIFICATE**

**Town and Country Planning (General Development Procedure) Order 1995 Certificate under Article 7**

Agricultural Land Declaration - You Must Complete Either A or B

(A) None of the land to which the application relates is, or is part of, an agricultural holding.

Signed - Applicant:

[Signature: Steve Wallygate]

Or signed - Agent:

[Empty box for agent signature]

Date (DD/MM/YYYY):

02/06/2008

B) I have/ The applicant has given the requisite notice to every person other than myself/ the applicant who, on the day 21 days before the date of this application, was a tenant of an agricultural holding on all or part of the land to which this application relates, as listed below:

Name of Tenant	Address	Date Notice Served

Signed - Applicant:

[Signature: Steve Wallygate]

Or signed - Agent:

[Empty box for agent signature]

Date (DD/MM/YYYY):

02/06/2008

**26. Planning Application Requirements - Checklist**

Please read the following checklist to make sure you have sent all the information in support of your proposal. Failure to submit all information required will result in your application being deemed invalid. It will not be considered valid until all information required by the Local Planning Authority has been submitted.

3 copies of a completed and dated application form:	<input checked="" type="checkbox"/>	The correct fee:	<input type="checkbox"/>
3 copies of the plan which identifies the land to which the application relates drawn to an identified scale and showing the direction of North:	<input checked="" type="checkbox"/>	3 copies of a design and access statement:	<input checked="" type="checkbox"/>
3 copies of other plans and drawings or information necessary to describe the subject of the application:	<input checked="" type="checkbox"/>	3 copies of the completed, dated Article 7 Certificate (Agricultural Holdings):	<input type="checkbox"/>
		3 copies of the completed, dated Ownership Certificate (A, B, C, or D - as applicable):	<input checked="" type="checkbox"/>

**27. Declaration**

We hereby apply for planning permission/consent as described in this form and the accompanying plans/drawings and additional information.

Signed - Applicant:

[Signature: Steve Wallygate]

Or signed - Agent:

[Empty box for agent signature]

Date (DD/MM/YYYY):

02/06/2008

(date cannot be pre-application)

### 28. Applicant Contact Details

Telephone numbers

Country code:	National number:	Extension number:
	<del>020 7480 1500</del>	
Country code:	Mobile number (optional):	
	<del>020 7480 6882</del>	
Country code:	Fax number (optional):	
	<del>020 7480 4840</del>	
Email address (optional):		

### 29. Agent Contact Details

Telephone numbers

Country code:	National number:	Extension number:
	020 7480 1500	511
Country code:	Mobile number (optional):	
	07729823768	
Country code:	Fax number (optional):	
	020 7480 4840	
Email address (optional):		
alanmckenzie@rhwl.com		

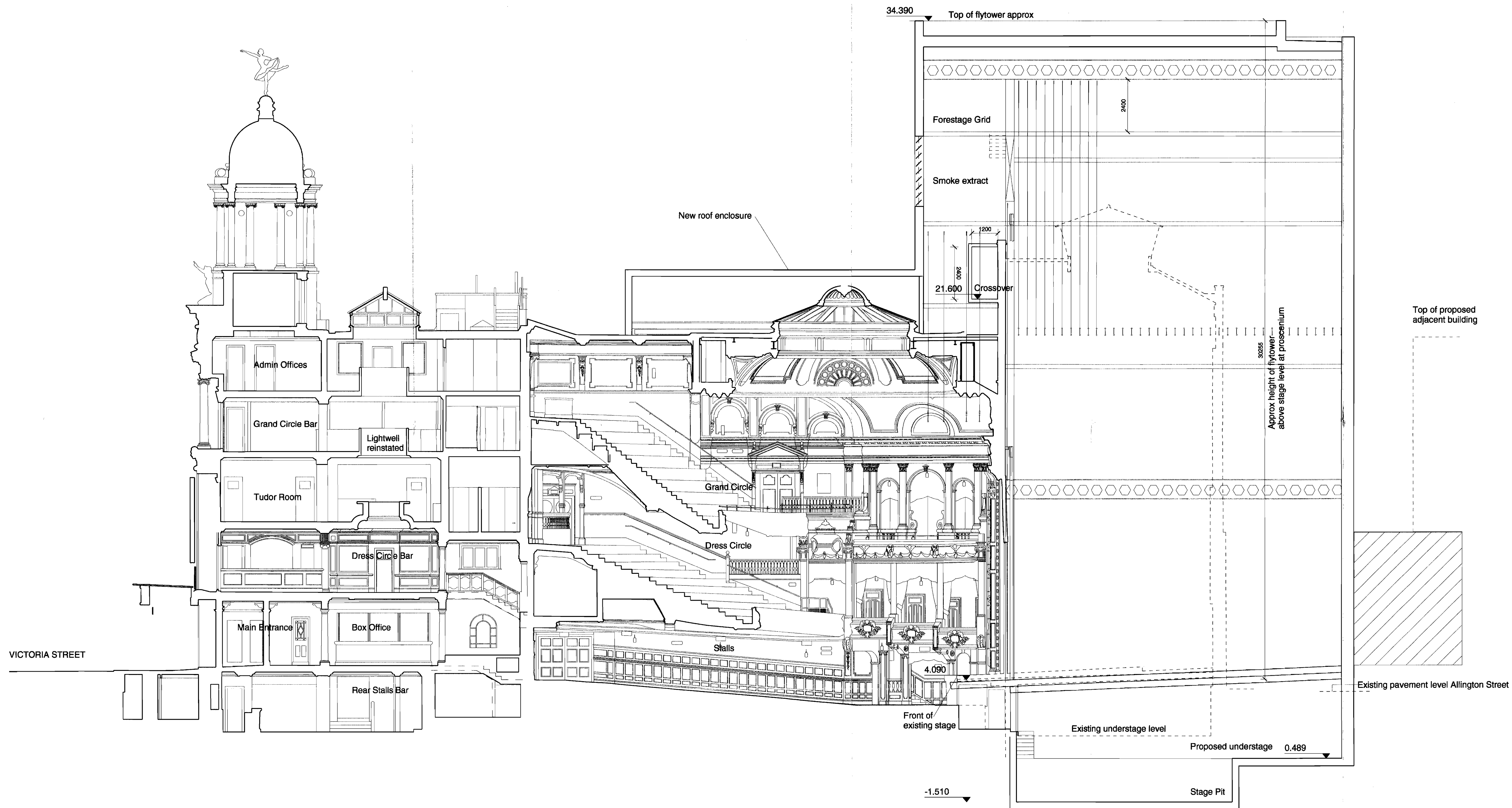
### 30. Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land?  Yes  No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact? (Please select only one)  Agent  Applicant  Other (if different from the agent/applicant's details)

If Other has been selected, please provide:

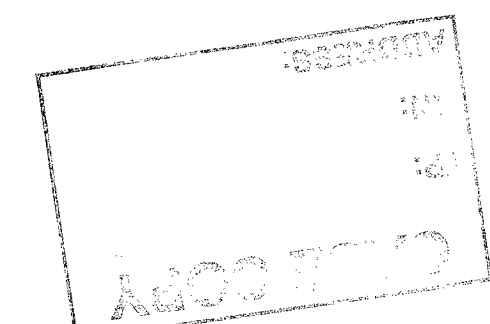
Contact name:	Telephone number:
KIAN MCKENZIE	020 7480 1500
Email address: alanmckenzie@rhwl.com	



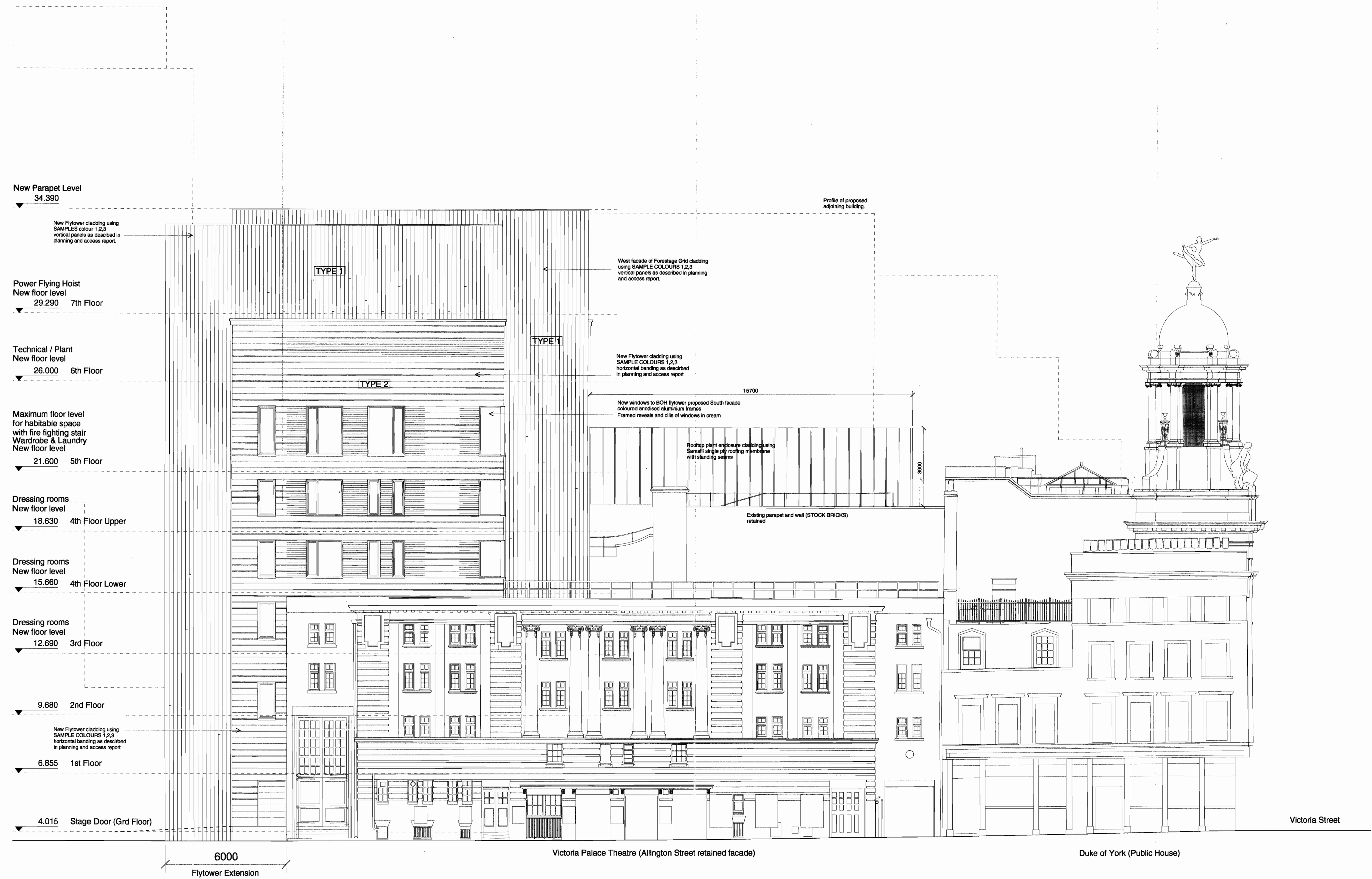
PROPOSED LONG SECTION

/ ISSUED FOR PLANNING		MAY 2008
REV	AMENDMENT	DATE
KEY PLAN		

<b>PLANNING</b>			
PROJECT			
VICTORIA PALACE THEATRE			
CLIENT			
VICTORIA PALACE THEATRE LIMITED			
TITLE			
PROPOSED LONG SECTION			
DRAWN BY	CHECKED BY	SCALE	DATE
Jvi	NQ	1:100 @ A1	NOV 07
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10980 / 02 / P / 20		/	



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ArtsTeam@rtw.com



ISSUED FOR PLANNING	MAY 2008
REV AMENDMENT	DATE
KEY PLAN	

<b>PLANNING</b>	
PROJECT	
VICTORIA PALACE THEATRE	
CLIENT	
VICTORIA PALACE THEATRE LIMITED	
TITLE	
WEST ELEVATION PROPOSED LAYOUT	
DRAWN BY	CHECKED BY
JVI	NG
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JOB NO.	DRAWING NO.
10980/02/P/31	REVISION
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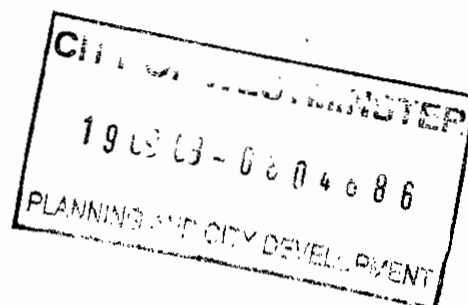
**ARTS TEAM**  
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**Victoria Palace Theatre**

**126 Victoria Street**

**Flood Risk Assessment**



**Project Ref: 21820**

**Doc Ref: J:\Victoria Palace  
Theatre\FRA\Report**

**September 2008**

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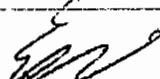
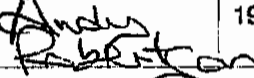
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Flood Risk Assessment**

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126 Victoria Street  
Flood Risk Assessment

## Document Control Sheet

Project Name: 126 Victoria Street  
Project Ref: 21820  
Report Title: Flood Risk Assessment  
Doc Ref: J:\Victoria Palace Theatre\FRA\Report  
Date: September 2008

	Name	Position	Signature	Date
Prepared by:	R. Retief	Graduate Environmental Planner		19/9/08
Reviewed by:	E. Isnenghi	Associate		19/9/09
Approved by:	A. Robertson	Senior Associate		19/9/08
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Issued by

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126 Victoria Street  
Flood Risk Assessment

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# 1 Executive Summary

Peter Brett Associates (PBA) has prepared this Flood Risk Assessment (FRA) in accordance with the guidance set out in the Communities and Local Government Planning Policy Statement 25: 'Development and Flood Risk' (PPS25).

This report summarises the methodology and results of the FRA in relation to the proposed extension of the Victoria Palace Theatre at 128 Victoria Street, Westminster, London. It is proposed to carry out extensions and alterations to part of the theatre. The site area is 0.1615 ha. The site is located approximately 1.3 Km north of the River Thames.

The report has been prepared in consultation with the Environment Agency (EA) and using the data collected as part of a Flood Risk Assessment recently carried out (August 2008) by PBA at a neighbouring site.

According to the EA flood map, the site lies within the defended Flood Zone 3. The site is defended to a very high standard of protection i.e. against flood events with a 0.1% annual probability, 1000 year return period. The ground levels at the site vary between approximately 3.6m and 5.2m.

The EA 0.5% annual probability, 1 in 200 year, tidal flood water level relevant to the site (node 2.32 of the River Thames) is 4.981 m AOD. This becomes 4.955 m AOD (2055 scenario) and 4.968 m AOD (2107 scenario) when the impact of climate change is also considered.

Despite the low risk to the site and minor nature of the proposed extension in order to minimise any residual risk an escape route from the rear of the stage and will be provided through to the ground floor of the adjacent building. The proposed development will also be constructed using general principles of flood resistant design.

The managers of the theatre can further mitigate any residual risk by using the Flood Warning Service subscribing to the Floodline Warning Direct and listening to the available information. This would lead to closure of the development during flooding.

## 2 Introduction

Government policy with respect to development in flood risk areas is contained within the Planning Policy Statement 25 'Development and Flood Risk' (PPS25) which replaced Planning Policy Guidance Note No.25 (PPG25) in December 2006.

This FRA has been undertaken to support the detailed planning application for the proposed extension of the Victoria Palace Theatre at 128 Victoria Street, Westminster, London.

The Local Planning Authority (LPA) will make the final decision with regard to any planning application. PPS25 advises that the LPA should consult with the EA which has the lead role in providing advice on flood issues at a strategic level and in relation to planning applications.

Peter Brett Associates has prepared this study in accordance with paragraph E3 of Annex E of PPS25. Paragraph E3 requires that the Flood Risk Assessment be undertaken by competent people as early as possible in the planning process.

Peter Brett Associates, Consulting Engineers, are specialists in, amongst other areas, hydrology, flood defence and river engineering. PBA is one of the EA's National Framework Consultants for Flood Risk Mapping and has carried out over 800 Flood Risk Assessments.

### **3 Proposed Development Site**

#### **3.1 Site Location and Plan**

The application site is located on 128 Victoria Street, Westminster, immediately north of Victoria Station. The site is approximately 1.3 km to the north of the River Thames. The National Grid Reference for the site is 529047 E, 179198 N and the location is shown in Figure 1 in Appendix A. The site area is 1.615 hectares.

An OSBM datum topographical survey was carried out by APR Services in August 2007. A copy of the survey, drawing '27246', is included in Appendix B. This shows a lowest recorded level of approximately 3.6 m AOD and a maximum height of 5.2 m AOD for the site.

#### **3.2 Development Proposals**

This FRA supports a detailed planning application for the extension of the theatre on 128 Victoria Street, Westminster. It is proposed to carry out extension and alterations to the front of house areas, flytower and back of house areas (including a lowering and extension of the understage level and creation of stage pit below ground floor levels. The alterations will include a new seating layout and auditorium. Please see architectural drawings in Appendix B for further details. The gross internal floorspace proposed is 0.914 ha, with an extension in footprint of 214 m<sup>2</sup> (0.021 ha).

#### **3.3 Existing Flood Defences**

As shown on the EA flood zone map, a copy of which is attached in Appendix D, the site is defended against tidal flooding from the River Thames. The defences are man-made and privately owned although the EA inspect them to ensure they are fit for purpose. The EA letter dated 13<sup>th</sup> February 2007, a copy of which is attached in Appendix E, states that the overall condition grade for defences in the area is 2 (good), on a scale of 1 to 5.

The defences provide protection against 0.1 % annual probability, 1000 year return period tidal flood events; the statutory defence level (the level to which the defences must be maintained) within the study area is 5.41 m AOD, as stated EA letter dated 13<sup>th</sup> February 2007 (see Appendix E).

#### **3.4 Vulnerability**

According to the Flood Risk Vulnerability Classification outlined in PPS25 (Annex D) the proposed scheme is 'Less Vulnerable' due to its commercial use.

## **4 Flood Risk Assessment**

The degree of detail entered into in any FRA is dependent upon the scale and potential impact of the proposed development (PPS25 Annex E, E3). In this case the client has the intention of carrying out an extension to the Victoria Palace Theatre on 126 Victoria Street.

### **4.1 Strategic Flood Risk Assessment**

Westminster City Council (WCC) confirmed that no Strategic Flood Risk Assessment (SFRA) has been carried out for the area (see email dated 4<sup>th</sup> July 2008 in appendix E).

### **4.2 Existing Information on Flood Risk**

The main risk of flooding in the area is from the River Thames, which runs approximately 1.3 Kilometres to the south east of the site.

#### **Tidal Flooding**

The Environment Agency online Flood Zone Map attached in Appendix D indicates that the site is located within the defended tidal Flood Zone 3 of the River Thames.

The EA, in their email dated 16<sup>th</sup> September 2008 (see Appendix E), stated that the 0.5% annual probability, 200 year return period tidal flood water level relevant to the site is 4.981 m AOD (node 2.32 of the River Thames).

This becomes 4.955 m AOD (2055 scenario) and 4.968 m AOD (2107 scenario) when the impact of climate change is also considered. The levels do not significantly change for greater return periods when including climate change because the hydraulic model used to produce these levels take into account the Thames Barrier closure rule.

#### **Surface Water**

The EA in their letter dated 13<sup>th</sup> February 2007 (see Appendix E) provided a spreadsheet of surface water flooding records available for the area.

Similarly Thames Water's flood records indicate incidents of flooding as a result of sewer surcharging in the area (see email dated 16<sup>th</sup> March 2006 in Appendix E).

These records show there have been a number of instances of basement flooding and that there are also issues with the capacity of the surface water drainage system.

#### **Groundwater Flooding**

As mentioned above the EA in their letter dated 13<sup>th</sup> February 2007 (see Appendix E) provided a spreadsheet of groundwater flooding records available for the area. This table indicates there have been a number of reports of basement flooding due to groundwater conditions.

#### **Flood Warning**

The EA flood warning map, as shown in Appendix D, indicates that the site is covered by a Flood Warning System for the Tidal Thames, from Blackfriars Bridge to Battersea Bridge and from Deptford Creek to the River Wandle.

The EA's Flood Warning Service aims to mitigate the impact of flooding for people who live in areas subject to flooding and is available for the areas within the floodplain of the main rivers in England and Wales.



Flood warnings to the population are issued based on water levels measured at the gauging stations, meteorological conditions and forecasts.

Based on the evolution of the event, the Environment Agency can issue four different types of warnings:

- Flood watch (e.g. bad weather conditions, likely increase of flow into the river, wet soil conditions)
- Flood warning (water level at the control gauging station approaching the flooding level)
- Severe flood warning (immediate risk of flooding)
- All clear (no more risk)

The aim of the Environment Agency is to give at least two hours notice before the flood begins. In order to reach as many people as possible, the Environment Agency issues the warning through different media: television, radio, telephone and internet.

The flood warning on the internet is updated every 15 minutes. It is possible to call the Floodline number 0845 988 1188 in order to receive updated information about the area of interest. Furthermore, people who accept to be contacted by the Environment Agency, receive flood warning direct by phone in case of risk of flooding.

The owners/managers of the development will take full advantage of the Flood Warning service by subscribing to the Floodline Warning Direct and listening to the available information. This will enable the theatre to be closed during flooding.

### **4.3 Climate Change**

Climate change is expected to have a major influence on the potential for future flooding. The Government established the UK Climate Impacts Programme (UKCIP) to assist local and regional authorities in assessing their vulnerability to climate change. This project, funded by the Department for the Environment, Food and Rural Affairs (DEFRA) published scenarios of climate change for the UK in 1998 and 2002. The new UKCIP08 is due to be released later this year. However, initial advice has already been published as part of the document 'The climate of the United Kingdom and recent trends' (2007) which includes observations of global and UK climate trends.

Past trends and potential impacts, based on UKCIP02 and 'The climate of the United Kingdom and recent trends' include:

- winters are predicted to be wetter and summers drier, with trends showing seasonal rainfall as being highly variable, decreasing in summer and increasing in winter.
- an increased frequency of heavy, intense precipitation, with all regions of the UK experiencing an increase over the past 45 years in the contribution to winter rainfall from heavy precipitation events.
- a rise in sea level affecting tidal areas, with past records showing sea levels rising around the UK by 1 mm/yr in the 20<sup>th</sup> century.

In relation to the sea levels, the figures from the Intergovernmental Panel on Climate Change (IPCC) for global average sea level change are 0.16 to 0.69m by the 2080s. This would mean that low-lying areas of the UK would be threatened by sea-level rise.

According to the guidance in PPS25 (Annex B), allowances for the regional rates of relative sea level rise together with sensitivity ranges for peak rainfall intensities and peak river flows should be

considered when preparing flood risk assessments. In particular, for the South East of England, an increase in sea level of some 900 mm is expected by the end of the century with an increase in peak river flows of approximately 20 per cent.

In this specific case, the climate change effect is mitigated by the Thames Barrier and associated defences that protect against a tidal flooding event that has a 0.1% annual probability of occurring up to the year 2030. As the site is upstream of the barrier, an increased amount of barrier closure - in response to a critical event - would result in lower extreme flood levels along the section of the River Thames closest to the site.

#### **4.4 The Sequential Test**

PPS25 aims to ensure that flood risk is taken into account at all stages in the planning process steering development towards low risk areas through the use of a sequential approach which avoids inappropriate development in areas at risk of flooding. LPAs are expected to allocate land for development based on a 'Sequential Test' which gives the precedence to the development in Flood Zone 1. Only if no suitable areas are reasonably available within Flood Zone 1, development within Flood Zone 2 or 3 is acceptable.

Westminster City Council has not carried out a sequential test for the borough yet.

#### **4.5 Managing Surface Water and SUDS**

As outlined in PPS25 flood risk can be managed by minimising volumes and rate of surface runoff from development sites through the use of sustainable drainage systems (SUDS).

The EA encourages the use of SUDS to prevent the water environment being adversely affected by increased surface water runoff and the increased risk of pollution and in particular diffuse pollution.

The Building Regulations Requirement H3 stipulates that rainwater from roofs and paved areas is carried away from the surface to discharge to one of the following, listed in order of priority:

- an adequate soakaway or some other adequate infiltration system, or where that is not reasonably practicable,
- a watercourse, or where that is not practicable,
- a sewer.

The site does not lie over a Source Protection Zone (based on the EA online Source Protection Zones (SPZs) map. This map is shown in Appendix D. Source Protection Zones (SPZs) have been defined by the Environment Agency for nearly 2,000 groundwater sources (wells, boreholes and springs) used for public drinking water supply. The SPZs provide an indication of the risk to groundwater supplies, for which SPZs have been defined, that may result from potentially polluting activities and accidental releases of pollutants.

Initial investigations indicate that the geology in the area is alluvium, made up of sandy clay and silt (see copy of the British Geological Survey Map in Appendix D).

A more detailed analysis of the natural ground permeability and groundwater levels is needed to understand whether infiltration is a feasible option to manage the surface water of the site. However, considering the potentially high groundwater levels and the fact that both the existing and proposed extension can be considered 100% impermeable, the use of filtration and infiltration SUDS measures is unlikely to be suitable for this urban site.

## 4.6 Mitigation Measures

This site is defended to a very high standard of protection against tidal flooding by the Thames Barrier and associated flood defences.

Moreover, as the site is located over 1 Km from the River Thames and any potential flood water level at the site in case of a breach/overlapping of the defenses would be realistically significantly lower than the flood water level in the River Thames.

The following mitigation measures are proposed to further minimise the residual risk at the site.

### Access/Egress

Even ignoring the defenses, the topographic survey indicates that Buckingham Palace Road to the west of the site is intermittently above the 1 in 200 year annual probability flood level and would provide a potential way out of the floodplain in case of flooding.

Moreover, an escape route is available from the rear of the stage and will run through to the ground floor of the adjacent building. An internal escape route is also available from the stage pit and understage to the ground and above floors.

### Understage & Stage Pit

The design and construction for the understage and stage pit will employ flood resistant construction techniques such as tanked membrane to reduce the chance and negative impact of flooding.

## 4.7 Residual Risk

It is impossible to completely guard against flooding since an extreme event is always possible, however, the risk can be minimised by employing flood resistant construction techniques to the proposed buildings. Such measures could include:

- Concrete floor with waterproof membrane
- Sealed service ducts
- Locate electrical and other plant above the ground floor
- High level electrical sockets
- Optimise security of supplies

These techniques are in line with recommendations from the ODPM 'Preparing for Floods' guidance document.

The client and architect will consider all the mitigation measures and above techniques when discussing and agreeing the layout of the development with funders and insurers.

A Flood Warning Service is in operation for the area, and its availability means that managers and users of the site are likely to be given timely warning of any potential tidal flood events. It is recommended that the managers of the development take advantage of the Flood Warning Service by subscribing to the Floodline Warning Direct and listening to the available information.

The production of a Flood Warning and Evacuation Plan is recommended. That document, in conjunction with the information provided by the Flood Warning Service would ensure the timely closure of the premises in case of flooding.

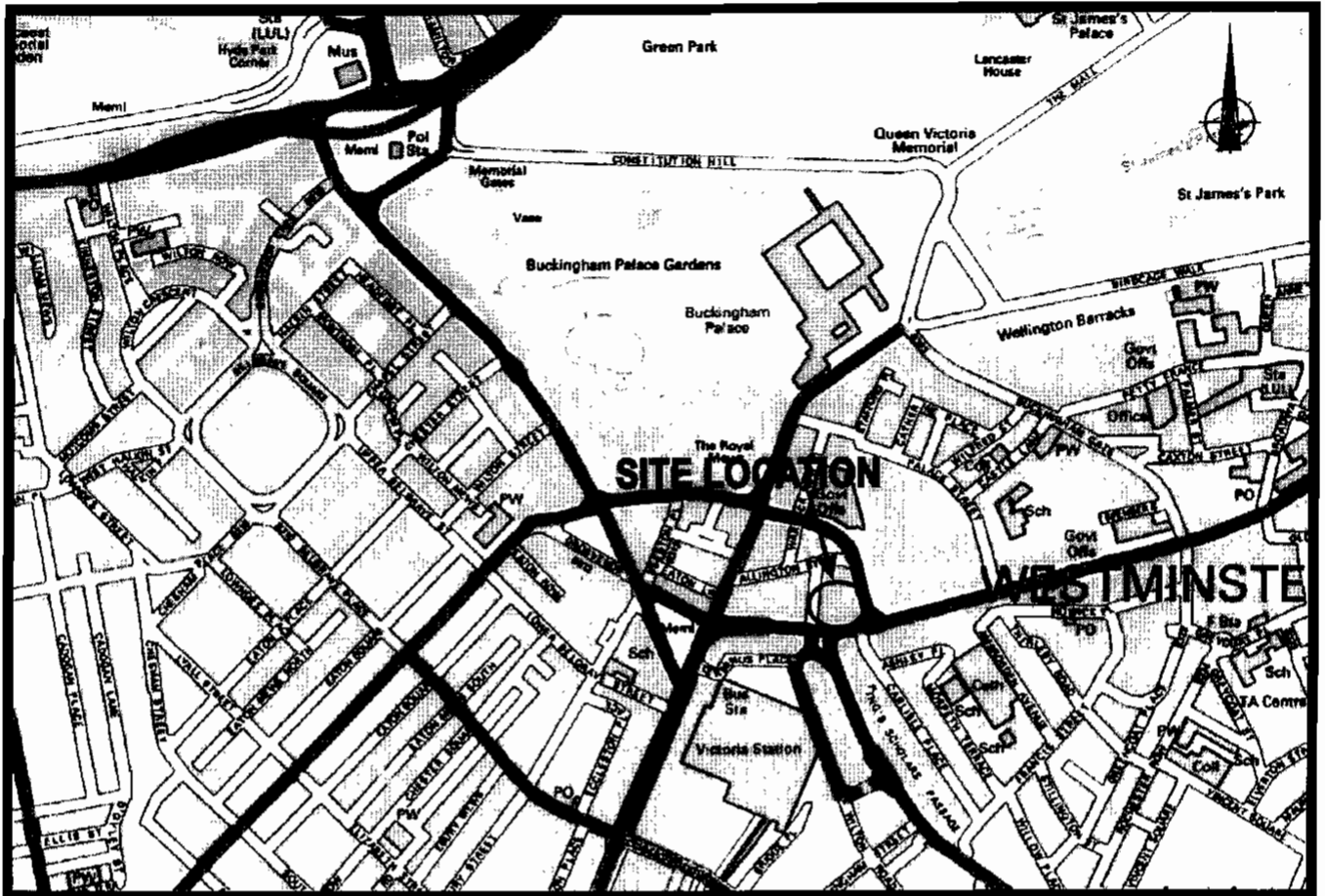
## 5 Conclusions

This FRA has been prepared in line with PPS25 requirements and supports the planning application for the proposed extension to the Victoria Palace Theatre. Overall, the FRA shows that:


- The site is defended by the Thames Barrier and associated defences with a standard of protection of 1000 year return period; as such the area could be flooded only in case of a catastrophic overtopping/breach of the defences;
- The site is approximately 1.3km away from the River Thames and any potential flood water level would be realistically significantly lower than that into the watercourse;
- The vulnerability of the site is low i.e. the proposed development is classified as 'less vulnerable' due to its commercial nature;
- The proposed development is quite small i.e. the extension of an existing theatre
- An internal escape route will be provided from the basement extensions to the ground floor and from the ground floor through to the adjacent building; This would provide safe access/egress in time of flooding
- The risk from flooding particularly from ground water sources, will be minimised by employing flood resistant construction techniques;
- The production of a Flood Warning and Evacuation Plan is recommended. That document, in conjunction with the information provided by the Flood Warning Service would ensure the timely closure of the premises in case of flooding;
- The area is covered by the EA Flood Warning Service. It is recommended that the managers of the development take advantage of the Flood Warning Service subscribing to the Floodline Warning Direct and listening to the available information, leading to closure of the development during flooding.

## Appendix A

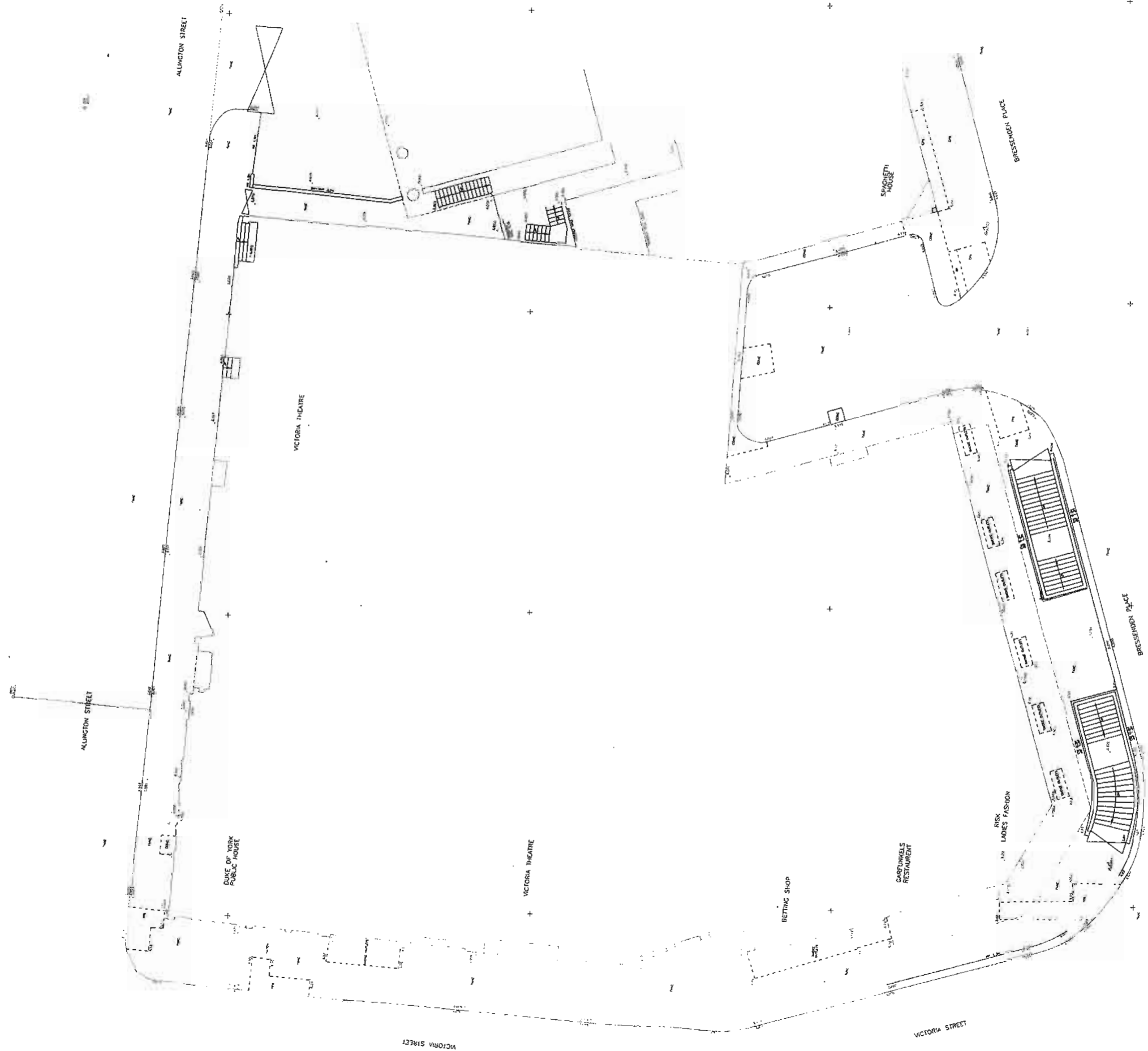
### Figure 1 - Site Location Plan



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 <p>Offices throughout the UK, Ireland, continental Europe, Africa, Asia and Australia www.pba.co.uk</p>	Client:	126 VICTORIA STREET	Date	September 2008
	VICTORIA PALACE THEATRE	FRA LOCATION PLAN	A4 Print	Not to scale
			Drawn	AY
			Checked	RR
			Figure Number	1
<small>HARLING HOUSE, 47-51 GREAT SUFFOLK STREET, LONDON, SE1 0PB TEL 02079819900 FAX 02079221185 email: london@pba.co.uk Internet: www.pba.co.uk</small>				

**Appendix B**  
**Topographical Site Survey**



THE SURVEYOR GENERAL'S OFFICE  
 17, Abchurch Lane, London EC4A 3DF  
 Tel: 020 7421 2000  
 Fax: 020 7421 2001  
 www.land.gov.uk

LEVEL NOTE  
 ALL LEVELS AND COORDS ARE RELATED TO BIRMINGHAM  
 SURVEY CARRED OUT BY THE GEORGE TOMLIN  
 PARTNERSHIP IN SEPTEMBER 2003  
 ORIGINAL DRAWING NUMBER 27246/1

DATE: 27/08/07  
 SCALE: 1:100  
 DWG. NO.: 27246  
 JOB NO.: 272

Revisions

No.	Description	Date

Date: AUGUST 2007  
 Scale: 1:100  
 Dwg. No.: 27246  
 Job No.: 272

Client:  
 VICTORIA PALACE THEATRE

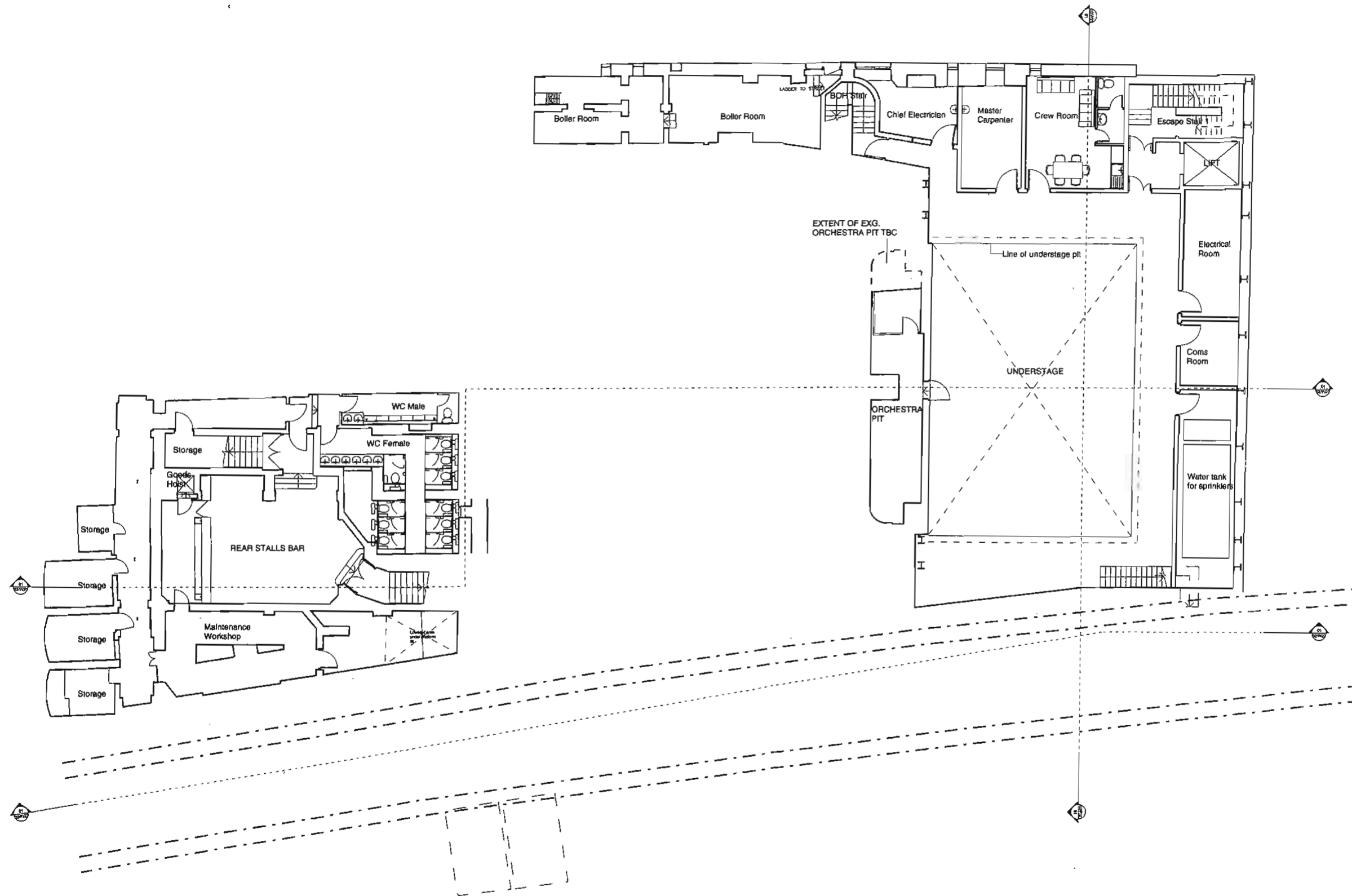
Dwg. Title:  
 LAND SURVEY

Project Title:  
 VICTORIA PALACE THEATRE,  
 VICTORIA STREET, LONDON

ap services  
 11th Floor, 11th Street, London EC4A 3DF  
 Tel: 020 7421 2000  
 Fax: 020 7421 2001  
 www.ap-services.com



**Appendix C**  
**Architectural Drawings**



ISSUED FOR PLANNING / MAY 2008  
REV / AMENDMENT / DATE  
KEY PLAN

**PLANNING**

PROJECT  
VICTORIA PALACE THEATRE

CLIENT  
VICTORIA PALACE THEATRE LIMITED

TITLE  
BASEMENT & UNDERSTAGE PLAN

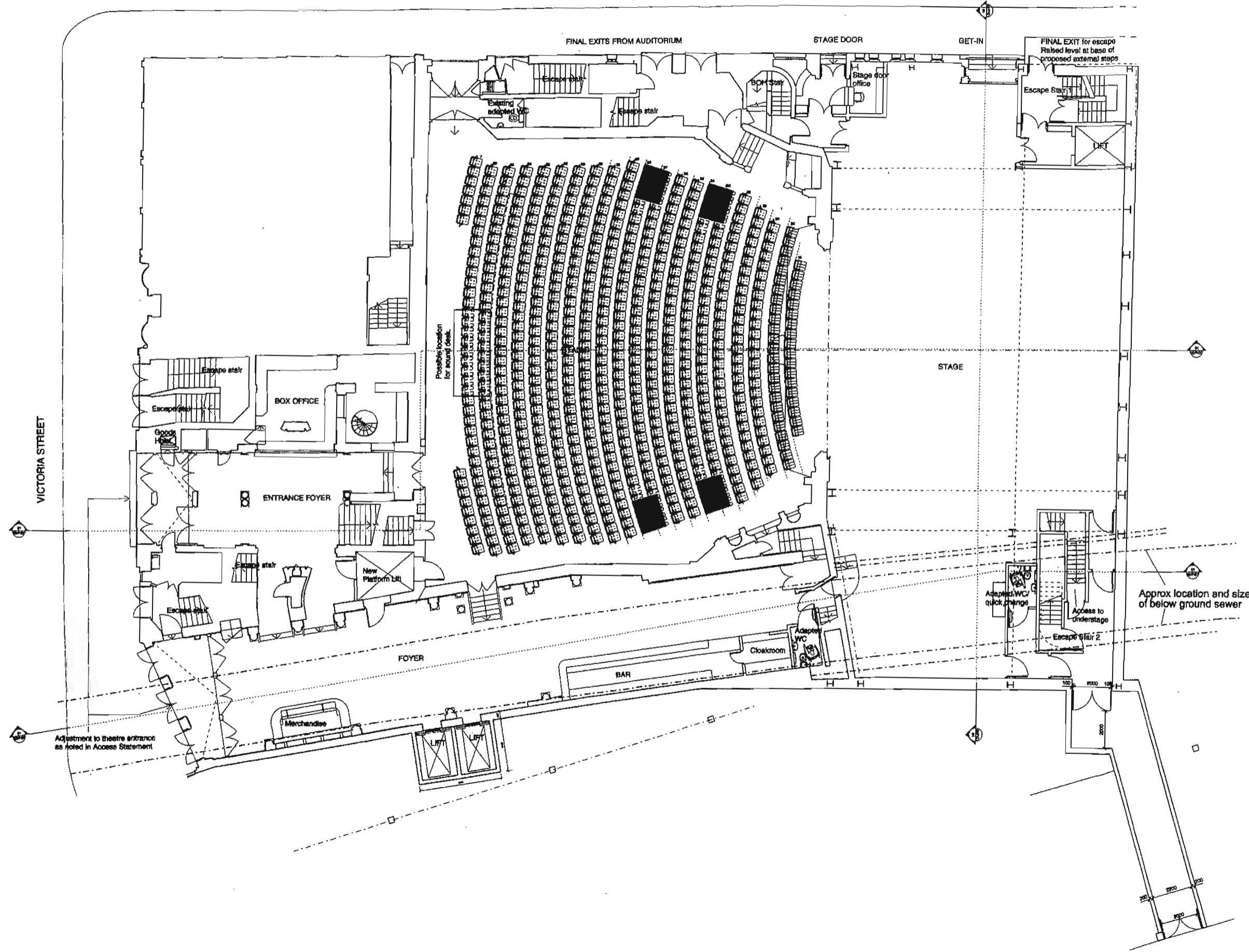
DRAWN BY	CHECKED BY	SCALE	DATE
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JOB NO.	DRAWING NO.	REVISION	
10880 / 02 / P / 01		/	

**ARTS TEAM**  
10000 Market Street, London E1W 3AT  
Telephone 020 7480 1600 Fax 020 7481 6842  
arts.team@arts.team

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ALLINGTON STREET



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REV AMENDMENT DATE  
REV PLAN

**PLANNING**  
PROJECT  
VICTORIA PALACE THEATRE  
CLIENT  
VICTORIA PALACE THEATRE LIMITED  
TITLE  
GROUND FLOOR PLAN

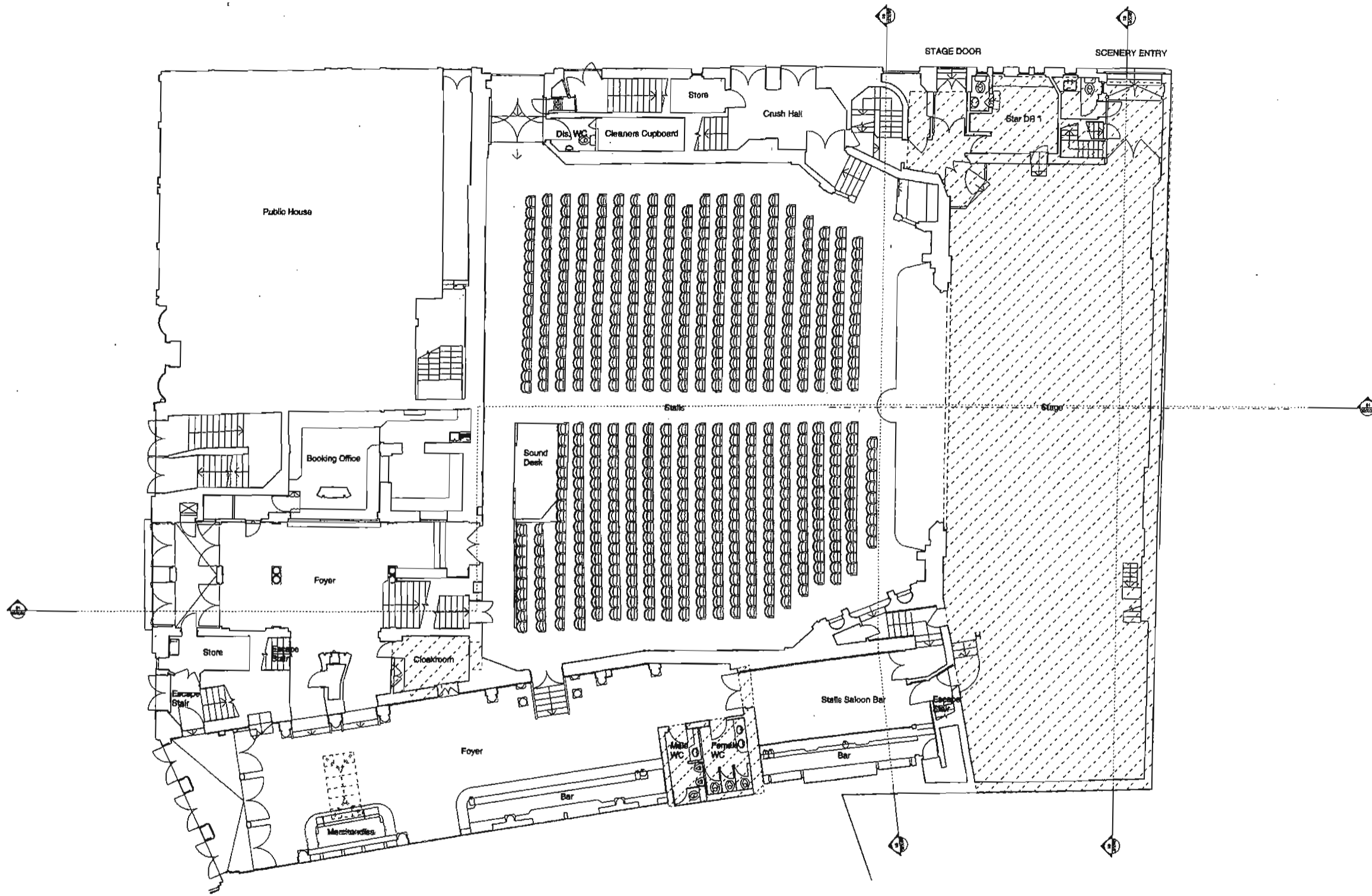
DRAWN BY	CHECKED BY	SCALE	DATE
JM	MD	1:100 @ A1	NOV 07
JOB NO.	DRAWING NO.	REVISION	
10880 / 02 / P / 02			

**ARYS TEAM**  
17-19 ABURY STREET, BARNHURST, LONDON SE18 3NF  
Tel: 020 7461 1000 Fax: 020 7461 4444  
arys@arys.com

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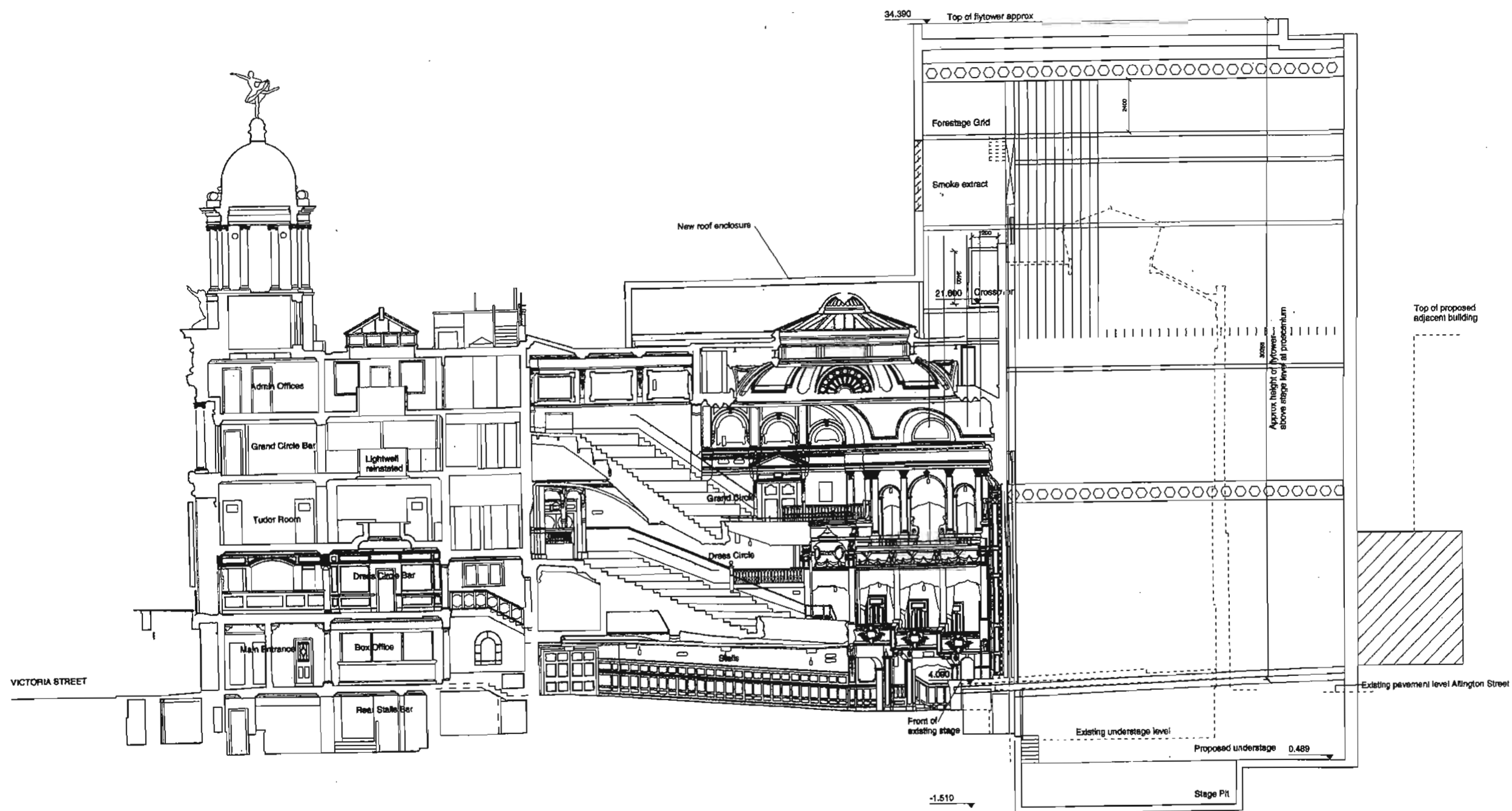


ISSUED FOR PLANNING  
MAY 2004  
KEY PLAN

**PLANNING**  
PROJECT  
VICTORIA PALACE THEATRE  
CLIENT  
VICTORIA PALACE THEATRE LIMITED  
TITLE  
GROUND FLOOR PLAN - EXISTING  
DRAWN BY: JVS  
CHECKED BY: HQ  
SCALE: 1:100 @ A1  
DATE: DEC 07  
JOB NO: 10880 / 02 / X / 02  
REVISION: 1

**ARTS TEAM**  
FRANK KERRILL ARCHITECTS  
108, SOUTH BRIDGE ROAD, SINGAPORE 059113  
Tel: 65 434 3333 Fax: 65 434 3334  
www.kerrillarchitects.com

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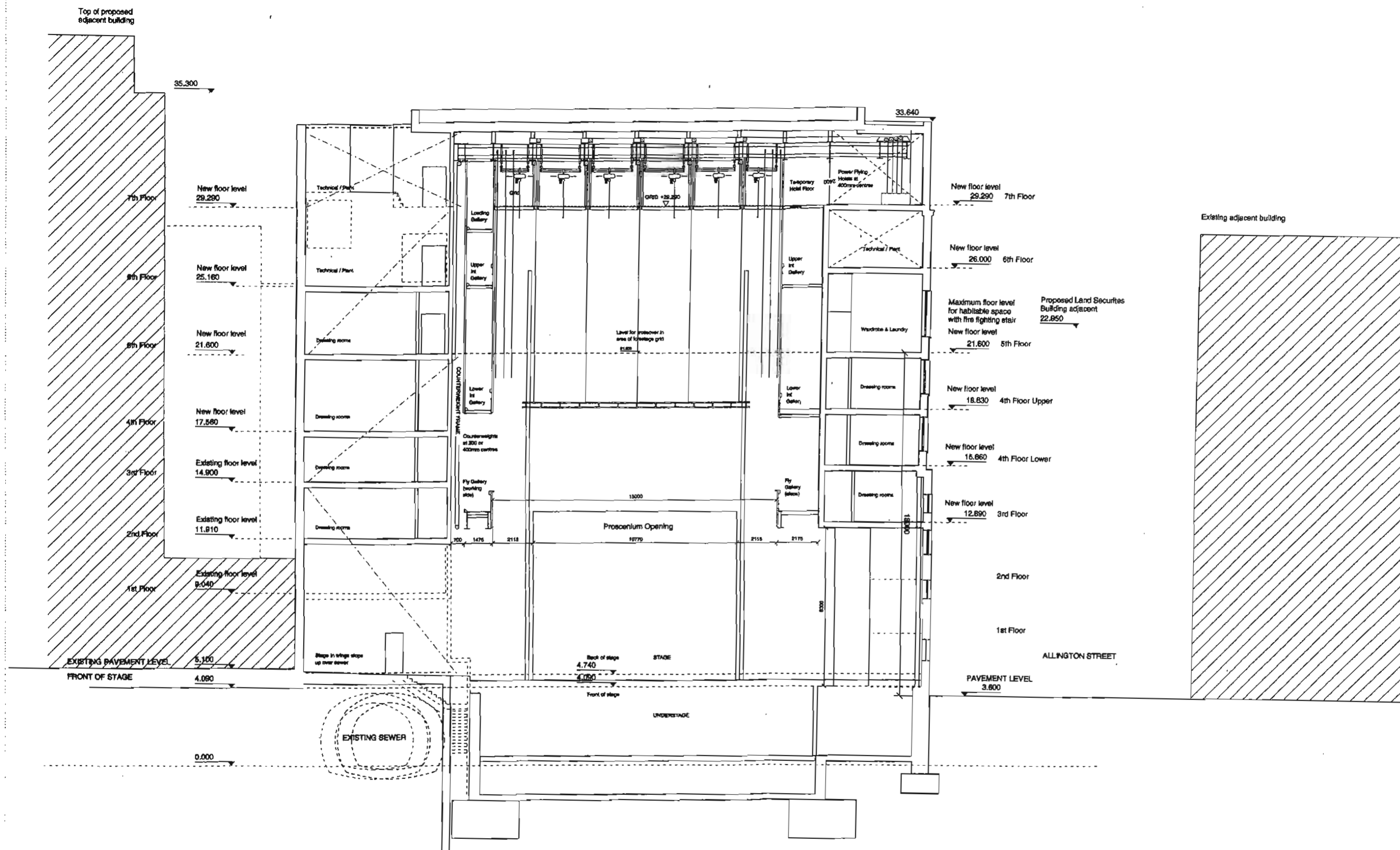


PROPOSED LONG SECTION

ISSUED FOR PLANNING	MAY 2008
REV AMENDMENT	DATE
KEY PLAN	

<b>PLANNING</b>			
PROJECT			
VICTORIA PALACE THEATRE			
CLIENT			
VICTORIA PALACE THEATRE LIMITED			
TITLE			
PROPOSED LONG SECTION			
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JM	MG	1:100 @ A1	NOV 07
JOB NO	DRAWING NO.	REVISION	
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 Every House & Kettlewell Green London E1W 2AT  
 Telephone 020 7480 1800 Fax 020 7481 6840  
 arts@artsteam.com



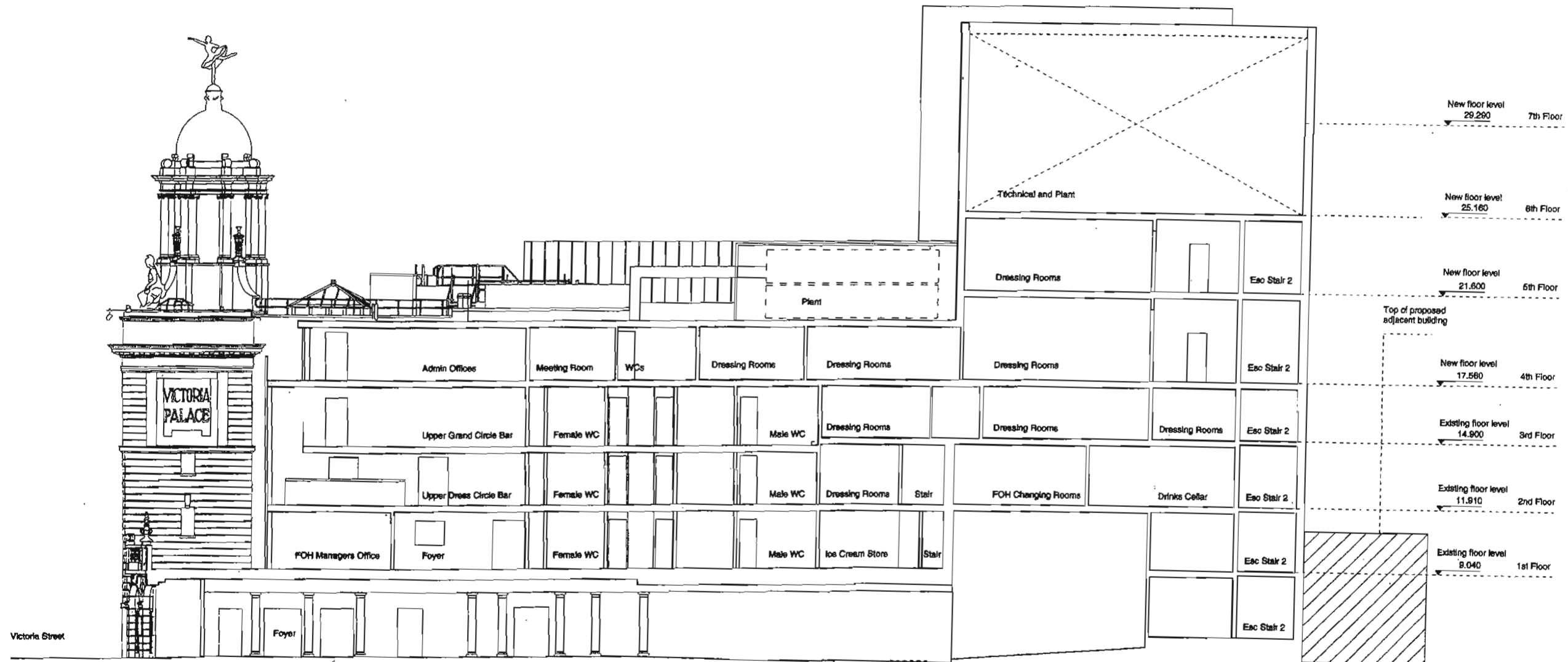
ISSUED FOR PLANNING MAY 2004  
REV AMENDMENT DATE  
KEY PLAN

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PROJECT  
VICTORIA PALACE THEATRE  
CLIENT  
VICTORIA PALACE THEATRE LIMITED  
TITLE  
CROSS SECTION STAGE

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PROJECT  
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CLIENT  
VICTORIA PALACE THEATRE LIMITED  
TITLE  
LONG SECTION WING

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JM	MC		

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ALLINGTON STREET

ELLIOT  
HOUSE

ELECT  
SUB  
STAX

PROPOSED  
FLYTOWER  
EXTENSION

Theatre

3.8m

Duke of  
York

Public  
House

130 to 134

126

124

12

VICTORIA STREET

SITE PLAN  
SCALE 1:200  
DRAWING 10980\_0

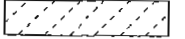


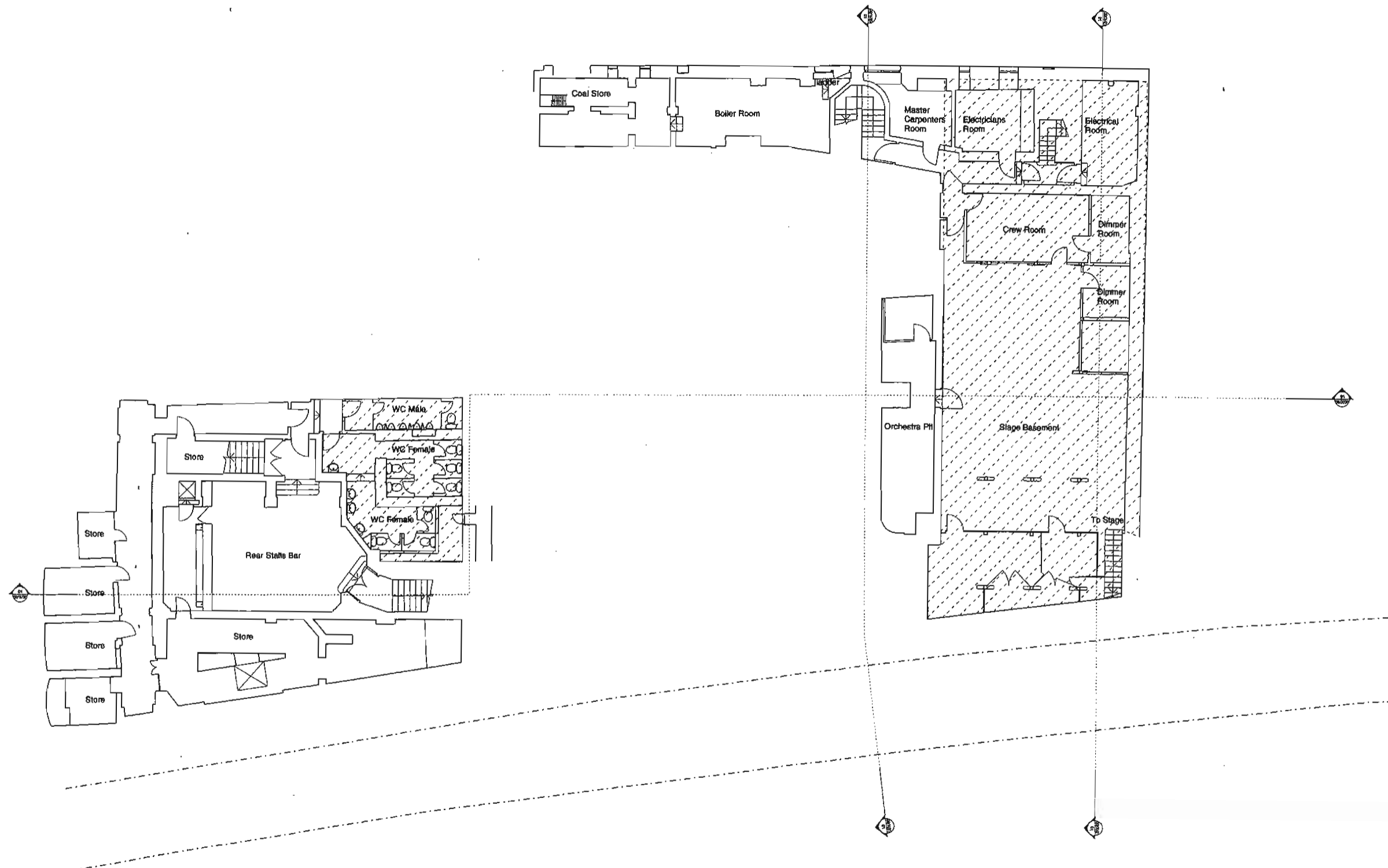
ARTS TEAM  
Ivory House St Katherine Docks  
Telephone 020 7480 1800 Fax 020 7481  
ArtsTeam@nwt.com



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KEY

Demolitions 



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**PLANNING**  
PROJECT  
VICTORIA PALACE THEATRE  
CLIENT  
VICTORIA PALACE THEATRE LIMITED  
TITLE  
BASEMENT & UNDERSTAGE PLAN - EXISTING

DRAWN BY	CHECKED BY	SCALE	DATE
JYS	MD	1:100 @ A1	DEC 07
JOB NO.	DRAWING NO.	REVISION	
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**ARTS TEAM**  
Trinity House 81, 200 Abchurch Lane London EC4N 3DF  
Telephone 020 7440 1800 Fax 020 7461 4440  
arts@artspace.com

Artspace, Artspace Architects, Architects of the Victoria Palace Theatre Ltd.  
11 Great Smith Street London EC4A 3DF  
Registered Office: Trinity House 81, 200 Abchurch Lane London EC4N 3DF  
020 7440 1800 Fax 020 7461 4440



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REV. AMENDMENT DATE  
KEY PLAN

**PLANNING**

PROJECT  
VICTORIA PALACE THEATRE

CLIENT  
VICTORIA PALACE THEATRE  
LIMITED

TITLE  
EXISTING LONG SECTION

DRAWN BY	CHECKED BY	SCALE	DATE
JVI	MO	1:100 @ A1	DEC 07
JOB NO.	DRAWING NO.	REVISION	
10980 / 02 / X / 20			

**ARTS TEAM**  
THIRY HOUSE 51 KINGSWAY OXFORD ROAD LONDON E1W 7AA  
Tel: 020 7461 1800 Fax: 020 7461 4840  
www.arts-team.com

## Appendix D

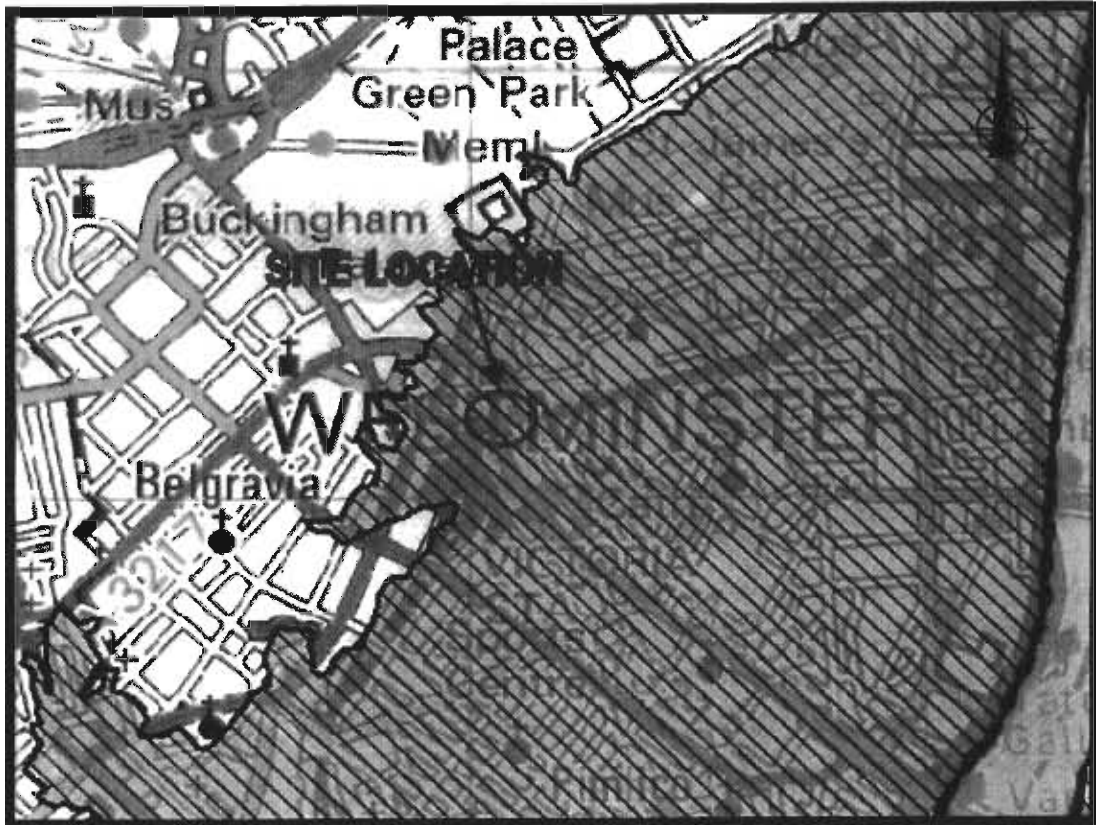
### Environment Agency Maps and Geology Map




Figure 2 - EA Flood Zone Map

Figure 3 - Flood Warning map


Figure 4 - Source Protection Zone Map

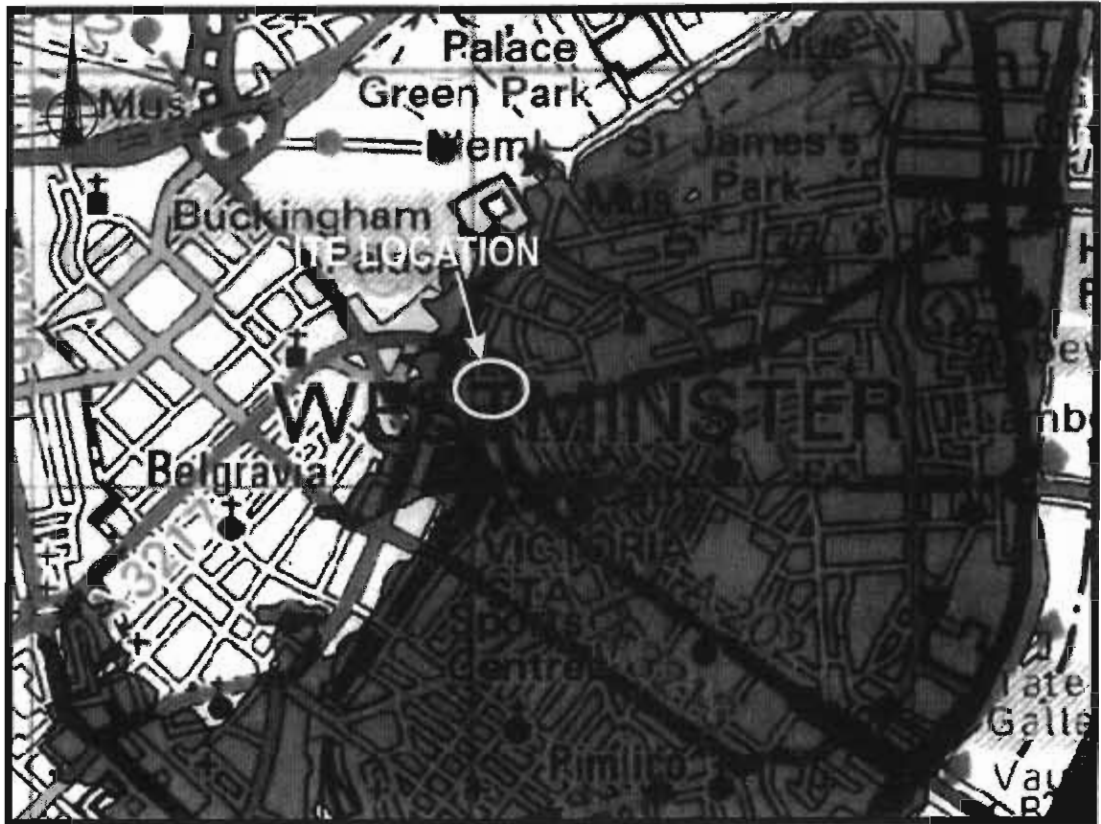
Figure 5 - Geology Map



-  Flood Zone 3
-  Flood Zone 2
-  Areas benefiting from flood defences

This map was sourced from the Environment Agency Web Site

 <small>Offices throughout the UK, Ireland, continental Europe, Africa, Asia and Australia</small> <a href="http://www.pba.co.uk">www.pba.co.uk</a>	Client:	126 VICTORIA STREET	Date	September 2008
	VICTORIA PALACE THEATRE	FRA	A4 Print	Not to scale
		EA FLOOD ZONE MAP	Drawn	AY
			Checked	RR
			Figure Number	2
<small>HARLING HOUSE, 47-51 GREAT SUFFOLK STREET, LONDON, SE1 0PB TEL 02079818900 FAX 02079221185 email: london@pba.co.uk Internet: www.pba.co.uk</small>				




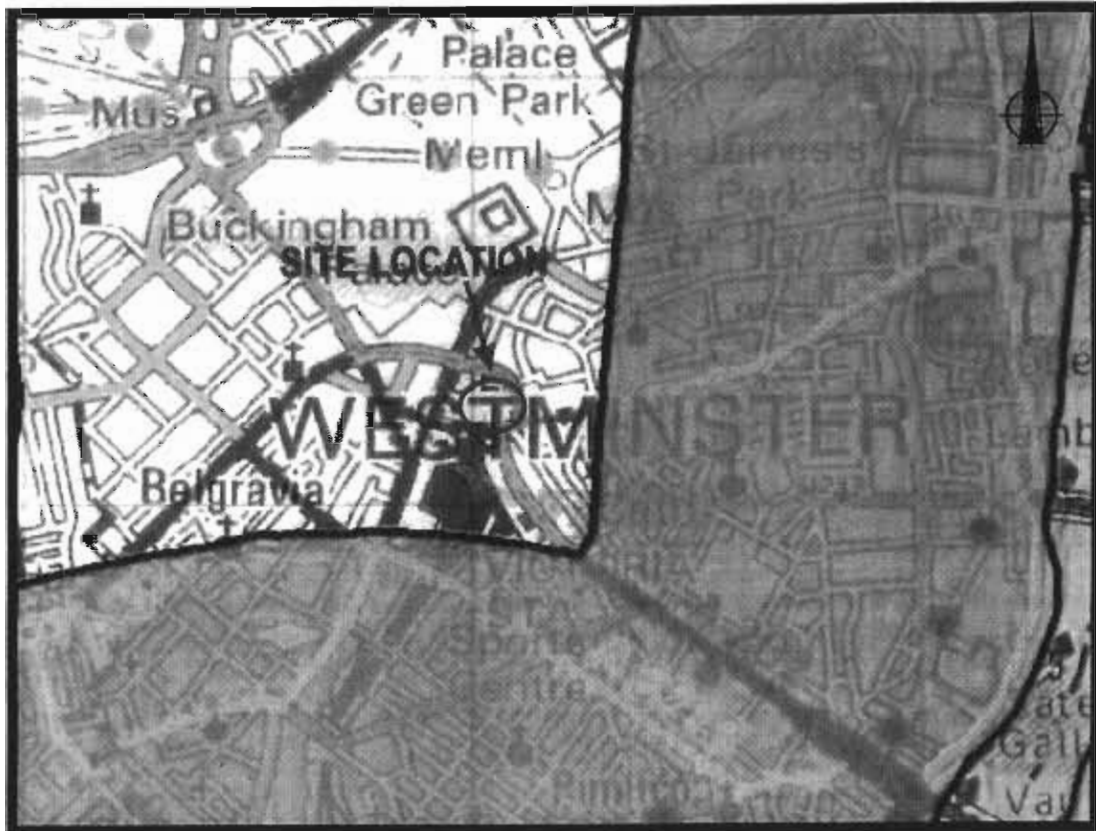
**KEY**







Areas covered by flood warnings

This map was sourced from the Environment Agency Web Site


 <small>Offices throughout the UK, Ireland, continental Europe, Africa, Asia and Australia</small> <a href="http://www.pba.co.uk">www.pba.co.uk</a>	Client:	126 VICTORIA STREET	Date	September 2008
	VICTORIA PALACE THEATRE	FRA	A4 Print	Not to scale
		EA FLOOD WARNING MAP	Drawn	AY
			Checked	RR
			Figure Number	3
<small>HARLING HOUSE, 47-51 GREAT SUFFOLK STREET, LONDON, SE1 0PB TEL 02078819900 FAX 02078221165 email: london@pba.co.uk internet: www.pba.co.uk</small>				

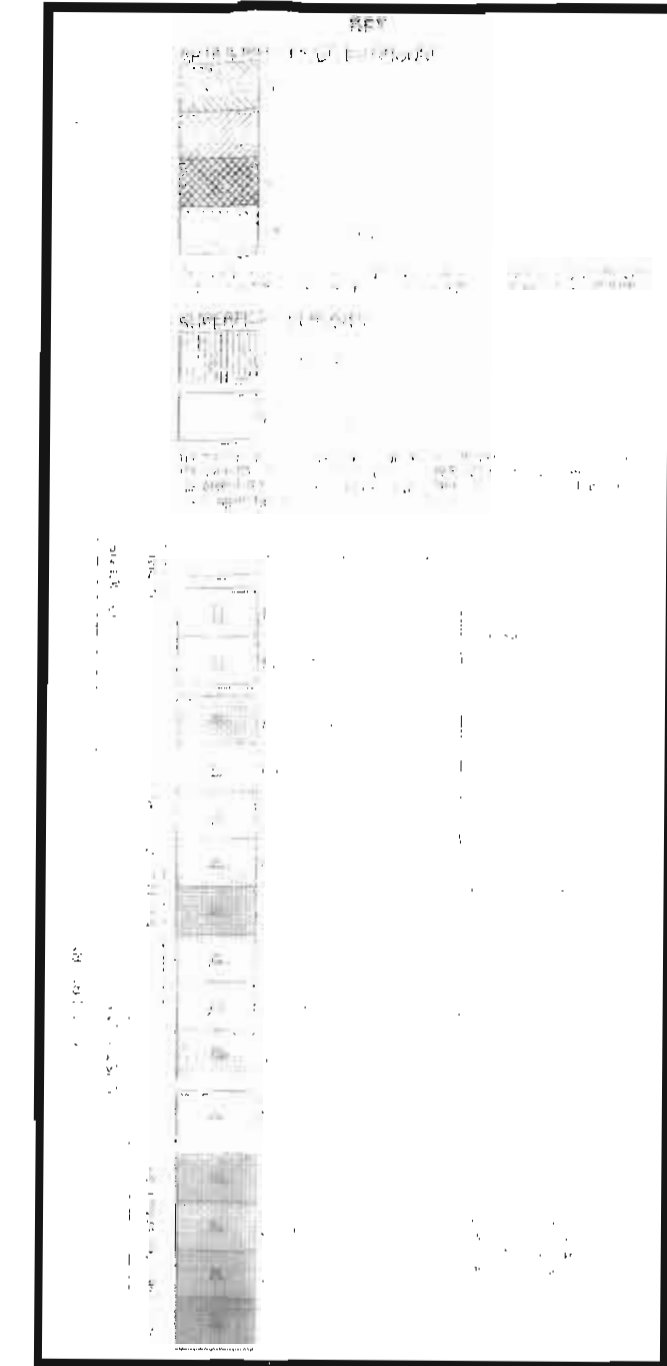


**KEY**

-  Inner zone
-  Outer zone
-  Total Catchment
-  Thames Corridor

This map was sourced from the Environment Agency Web Site

 <small>Offices throughout the UK, Ireland, continental Europe, Africa, Asia and Australia</small> <a href="http://www.pba.co.uk">www.pba.co.uk</a>	Client:	126 VICTORIA STREET	Date	September 2008
	VICTORIA PALACE THEATRE	FRA	A4 Print	Not to scale
		EA GROUND WATER SOURCE PROTECTION ZONE MAP	Drawn	AY
			Checked	RR
			Figure Number	4
<small>HARLING HOUSE, 47-51 GREAT SUFFOLK STREET, LONDON, SE1 0PB TEL 02079818900 FAX 02079221185 email: london@pba.co.uk Internet: www.pba.co.uk</small>				



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Client  
**VICTORIA PALACE  
 THEATRE**

126 VICTORIA STREET  
 FLOOD RISK ASSESSMENT  
 EXTRACT OF GEOLOGICAL MAP

Date	SEPT/2008
(A3 print size) Scale	Not to scale
Drawn by	AY
Checked by	RR
Revision	01

**FIGURE 5**

## Appendix E

### Correspondence

16 <sup>th</sup> Sept. 2008	Environment Agency	Updated flood water levels
13 <sup>th</sup> Feb. 2007	Environment Agency	Flood information
4 <sup>th</sup> July 2008	Westminster City Council	SFRA information
16 <sup>th</sup> March 2006	Thames Water	Flooding information



**From:** Byrne, Matt [matt.byrne@environment-agency.gov.uk] on behalf of Customer Contact, Thames Northeast [thnortheast@environment-agency.gov.uk]  
**Sent:** 16 September 2008 13:20  
**To:** Ronelle Retief  
**Subject:** NE18072MB - 126 Victoria Street, London SW1E 5EA

**Attachments:** Levels; Standard notice (commercial).pdf

Dear Ms Retief

Thank you for your enquiry.

Please find attached a spreadsheet showing flood levels for 126 Victoria street. Please also find attached a copy of our standard notice (commercial), which tells you how you are permitted to use our data.

If I can be of any further help, please contact me.

Yours sincerely

Matt Byrne

External Relations Officer

Environment Agency - Thames North East Area

Direct dial: 01707 632505

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**World Environment Day 2008 - Time for a new routine.** Take part in our campaign by telling us what one thing you will do to stand up to climate change. Visit our website to tell us and find out more: [www.environment-agency.gov.uk/wed](http://www.environment-agency.gov.uk/wed)

---

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**Modelled Tidal Levels (mAODN)  
Node 2.32**

Year	Return Period						
	10	20	50	100	200	500	1000
2005	4.856	4.897	4.938	4.962	4.981	5.002	5.015
2010	4.915	4.926	4.939	4.947	4.955	4.965	4.973
2017	4.943	4.946	4.951	4.961	4.968	4.978	4.995

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Environment  
Agency

Richard Fisher  
Peter Brett Associates  
Caversham Bridge House  
Waterman Place  
Reading  
Berkshire  
RG1 8DN

Our ref: NE12173AN  
Your ref: 18277/105CBH/ASR/RMF  
Date: 13<sup>th</sup> February 2007

Dear Mr Fisher,

**Enquiry Regarding Flood Risk Assessment At Victoria Transport Interchange,  
Westminster.**

Thank you for your letter regarding the above site.

We have no record of historical flooding from the tidal Thames at this site. I attach records of groundwater and surface water flooding that we have within 2km of the site.

The modelled tidal levels that apply to this site are as follows

Present day;

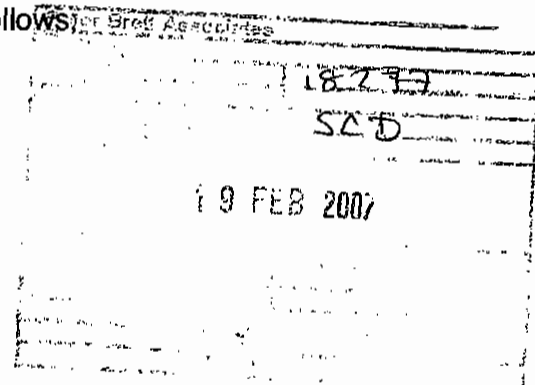
10% annual chance = 5.04  
5% annual chance = 5.09  
2% annual chance = 5.14  
1% annual chance = 5.17  
0.5% annual chance = 5.20  
0.1% annual chance = 5.23

2052 (allowing for climate change)

10% annual chance = 5.11  
5% annual chance = 5.13  
2% annual chance = 5.15  
1% annual chance = 5.17  
0.5% annual chance = 5.20  
0.1% annual chance = 5.23

All levels are in metres above Ordnance datum Newlyn. The levels for the more extreme events do not increase when allowing for climate change as the more frequent use of the Thames Barrier or any replacement structure should prevent them from doing so. The levels allowing for climate change have not yet been adjusted to reflect the new guidance from PPS25. They were calculated as part of a joint probability study considering both fluvial and tidal inputs to the Thames between Southend and Teddington. This site is not within a fluvial flood plain, so there are no

Apollo Court, 2 Bishops Square Business Park, St Albans Road West, Hatfield, Herts, AL10 9EX.  
Customer services line: 08708 506 506  
Email: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)



fluvial levels relevant to it. If you want to compare your site survey levels to our modelled levels then it is best to use a GPS based survey, as the Ordnance Survey no longer supports the system of bench marks.

The defences in this part of the Thames are raised, man-made and privately owned. The Environment Agency regularly inspects them to ensure that they remain fit for purpose. The defences currently rate as being in 'good' condition (condition grade 2 on a scale of one to five). The Statutory Defence Level, to which the defences must be maintained by their owners, in this area is 5.41m AODN. This gives a standard of protection of 1:1000 years up to the year 2030 (when the defences are considered in conjunction with the use of the Thames Barrier). Beyond 2030 the standard of protection will steadily decline. The Thames Estuary 2100 project is looking at the options for the management of flood risk in London beyond that date.

As the site is within Flood Zone 3 you could sign up to our flood warning service, which will provide information on flood warnings, issued for the tidal Thames by automated phone message and fax. Flood Warnings are also available via Floodline on 0945 988188 or on the Environment Agency's website [http://www.environment-agency.gov.uk/subjects/flood/flood warning/](http://www.environment-agency.gov.uk/subjects/flood/flood%20warning/).

Please find attached an extract from the Flood Map for this location. Flood Zone 3 shows the 0.5% annual chance tidal outline, Flood Zone 2 shows the 0.1% tidal outline, in the absence of any defences. Both of these outlines were modelled using a two dimensional hydraulic model, with the joint probability levels for the present day as an input, in the absence of all flood defences. The outputs of the model velocities around the development site are below 0.5m/sec. If breach analysis was carried out for the site the velocities could vary significantly from those we found when modelling to create the Flood Zones, due to the entirely different modelling scenario. The Flood Zone modelling work has not taken account of the local effects of buildings on velocities, so in areas where buildings cause bottlenecks in the flow, velocities could be higher than our results suggest.

If I can be of any further help, please contact me.

Yours sincerely,



**Andrew Naish**  
**External Relations Officer**  
**Environment Agency**  
Direct dial 01707 632 410  
Direct fax 01707 632 610  
Direct e-mail [thnortheast@environment-agency.gov.uk](mailto:thnortheast@environment-agency.gov.uk)

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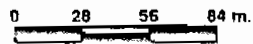
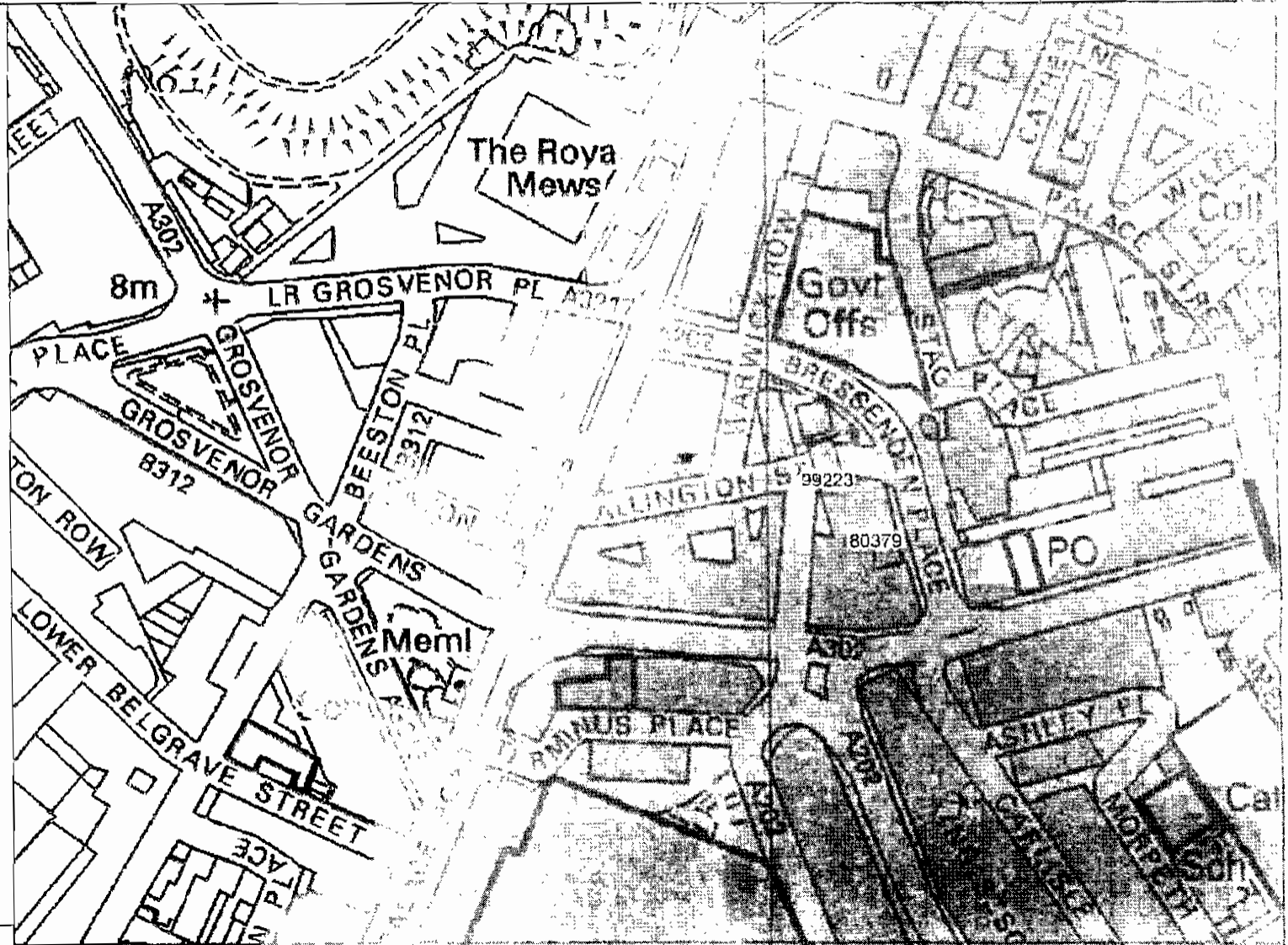
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DATE	NGR	PROBLEM	COMMENTS
13/02/2001	TQ 29977 81149	Water in basement	
04/04/2001	TQ 29365 80736	Flooded basement due to gravels groundwater.	
24/04/2002	TQ 28148 81192	pub in cellar with water beneath floor boards causing movement	
02/07/2004	TQ 30813 81526	Water seeping into basement, which happened before, due to blocked drains.	TWUL now say it's not their water, caller will go away and see what the land lord says
03/12/2002	TQ 29554 81451	Have had flooded underground room before but drains had reduced problem, has now occurred in another part.	Possibly due to building work in the area changing groundwater flow etc, look into sealing and pumping the area.
07/01/2003	TQ 30137 78988	Flooded sump in below ground car park - only recently flooded. Pump failed levels rose to couple of feet deep.	Gravels gw poss risen, water come in and flooded, when levels drop below ingress point flooding will slow/stop.
12/03/2004	TQ 28491 80418	water in basement, intermittent and not every year. Sometimes floods in summer	Told to contact TWUL for sampling
16/04/2004	TQ 29430 81280	diffuse seepage of water into basement - no sample can be taken	TWUL are checking their supply mains
23/03/2004	TQ 28274 78756	water in basement from road? - seeping through wall and puddling on floor	also in neighbours basement - TWUL to take a sample
24/12/2003	TQ 30370 80900	thousands of gallons needing to be pumped out of basement	Sand and gravel. Volumes suggest burst main ? Water table is 40mbgl
06/07/2005	TQ 27278 81044	wet basement over many yrs , experts come to tank it today and want to know groundwater level	on lynch hill gravels over London Clay , advised groundwater was probably around 2 - 4 m below ground surface ( at depth of basement )
09/11/2005	TQ 29300 78224	Wet basement after heavy rainfall	TWUL to be called out. Sent info pack

# Flood Map for Victoria Transport Interchange

## Legend

Flood Map - Flood Zone 2  
 Flood Map - Flood Zone 3



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**Peter Brett Associates**

Caversham Bridge House  
Waterman Place  
Reading  
Berks  
RG1 8DN

**Thames Water Property Insight**

Your ref	No Ref:
Our ref	MD/DQT
Name	Mandy Davey
Phone	0118 9251566
Fax	0118 9236669
E-Mail	<a href="mailto:searches@thameswater.co.uk">searches@thameswater.co.uk</a>

16<sup>th</sup> March 2007

**Victoria Transport Interchange, London (528960, 179245)**

Dear Sirs

I refer to your letter of 22<sup>nd</sup> February requesting information with respect to events of sewer flooding in the above area.

The flooding records held by Thames Water indicate incidents of flooding as a result of surcharging of sewers in the vicinity of the above area.

Although Thames Water may have records of sewer flooding within the vicinity of the area, the details of the effect of this flooding on individual properties should be obtained from the current owners.

Please be aware that although Thames Water has records of sewer flooding in this area, some property owners do not report this flooding to Thames Water. It is therefore advisable to contact the current owners to ascertain the complete flooding picture. This should include flooding from watercourses and highway drains, neither of which are the responsibility of Thames Water.

When preparing your assessment, you should take into account of the fact that sewer surcharging is directly affected by duration and intensity of rainfall. The previous levels experienced by both of these factors, could be exceeded during future rainfall events with consequential increased surcharging of sewers.

Yours faithfully

Mandy Davey  
Data Quality

Thames Water Plc  
Property Insight  
P O Box 3189  
Slough SL1 4WW

DX 151280 Slough 13

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Registered in England and Wales  
No. 2366623, Registered office  
Clearwater Court, Vestem Road,  
Reading RG1 8DN

**Richard Fisher**

---

**From:** Alderman, Sally [salderman@westminster.gov.uk]  
**Sent:** 04 July 2008 14:49  
**To:** Richard Fisher  
**Subject:** RE: Flood Risk Assessment - Victoria Transport Interchange

Richard

Thanks for your email. We have just received the final report from our consultants Halcrow. I am hoping that we we be consulting on our SFRA later in the summer.

Sally

Sally Alderman  
Principal Planning Officer  
**Planning and City Development**

Westminster City Council  
11th Floor  
City Hall  
64 Victoria Street  
London SW1E 6QP  
Fax 0207 641 3050  
Tel 0207 641 6063  
Email:salderman@westminster.gov.uk

---

**From:** Richard Fisher [mailto:RFisher@pba.co.uk]  
**Sent:** 30 June 2008 10:00  
**To:** Alderman, Sally  
**Subject:** RE: Flood Risk Assessment - Victoria Transport Interchange

Hi Sally,

I received the email below from you back in February regarding the WCC SFRA - I just wanted to check if this document had been released yet?

Regards,

Richard Fisher

Senior Engineer

For and on behalf of Peter Brett Associates LLP

Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN

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Website: [www.pba.co.uk](http://www.pba.co.uk)

31/07/2008

**Richard Fisher**

---

**From:** Alderman, Sally [salderman@westminster.gov.uk]  
**Sent:** 06 March 2008 17:54  
**To:** Richard Fisher  
**Cc:** James, Dianne  
**Subject:** RE: Flood Risk Assessment - Victoria Transport Interchange

Dear Mr Fisher  
I have answered your questions below. Hope they are of assistance.  
Sally

Sally Alderman  
Principal Planning Officer  
**Planning and City Development**

Westminster City Council  
11th Floor  
City Hall  
64 Victoria Street  
London SW1E 6QP  
Fax 0207 641 3050  
Tel 0207 641 6063  
Email:salderman@Westminster.gov.uk

---

**From:** Richard Fisher [mailto:RFisher@pba.co.uk]  
**Sent:** 29 February 2008 11:10  
**To:** Alderman, Sally  
**Cc:** James, Dianne  
**Subject:** Flood Risk Assessment - Victoria Transport Interchange

Sally,

We are carrying out a Flood Risk Assessment for the above site, to the immediate north of Victoria Station (see attached plan), and are trying to establish the flood risk information held by Westminster City Council. Your colleague advised that I should contact you on these issues.

It would be much appreciated if you could advise on the following:

1) Can you tell me the current status of the Strategic Flood Risk Assessment being prepared for WCC? (I understand consultants have been appointed and the document is currently being prepared?)

No change to the information provided by email last Friday

2) Can you confirm the current WCC planning policies regarding flood risk and surface water drainage? (from previous enquiries the relevant policies were ENV 9 and paragraphs 9.122 and 9.125, from the 'Westminster Replacement Unitary Development Plan', adopted January 2007?)

Agreed

3) Can you confirm whether the PPS25 Sequential Test has been applied to the site, or whether the site is allocated?

From your attached Map it would appear that this site is part of the Victoria Opportunity Area. See Para's 1.12 and 1.13 of the Draft Regional Flood Risk Appraisal which appears to indicate that opportunity sites are not required to go through the sequential test. You will of course be required to submit an FRA with your application.

31/07/2008

4) Finally, I need to ascertain whether WCC, as the land drainage and highways authority, has any record of flooding at the site, from any sources? I had contacted WCC previously and they indicated that they had no such information, but it would be useful if this could be reconfirmed (I appreciate this is probably not your area - if you are able to forward the enquiry to the relevant person it would be much appreciated). We have already contacted the Environment Agency and Thames Water in this regard.

Provisional information provided from our consultants indicate that the VTI site sites in a critical flow path in a critical flood location.

Thanks in advance for your assistance.

Regards,

Richard Fisher

Senior Engineer

For and on behalf of Peter Brett Associates

Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN

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31/07/2008

**Richard Fisher**

**From:** Roberts, John [jroberts1@westminster.gov.uk]  
**Sent:** 25 April 2007 17:01  
**To:** Richard Fisher  
**Subject:** Follow up to flooding enquiry - Victoria Transport Interchange

Dear Mr Fisher,  
Refer to your enquiry regarding the above.

I am afraid we do not have available to us any flood risk assessment for the area in question. If you haven't already, I suggest you make contact with the Environment Agency. I am sorry I cannot be of further assistance.

Regards

**John Roberts**  
Highways Management  
Transportation Department

Westminster City Council  
10th Floor, City Hall  
34 Victoria Street  
London SW1E 6QP  
Tel: 020 7641 3080  
Fax: 020 7641 2046  
Email: jroberts1@westminster.gov.uk

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VICTORIA PALACE THEATRE

VICTORIA PALACE THEATRE

STAGE D REPORT

FOR

BUILDING SERVICES ENGINEERING

ADONIS



**FURNESS GREEN PARTNERSHIP**  
Building Services and Environmental Engineering Consultants

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Tel 020 7588 4645 - Fax 020 7588 5713  
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CITY OF WESTMINSTER

10/03 - 0804886

GAND CITY DEVELOPMENT

DOCUMENT HISTORY

Revision	Description	Date
0	Preliminary Copy – Issued to team	25 February 2008

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5.0	LIFT INSTALLATION
Appendix A	Auditorium Ventilation Report
Appendix B	Mech & Elec Services Drawings



## 1.0 INTRODUCTION

- a) The purpose of the following report is to briefly describe the design strategy of the building services engineering for the Victoria Palace Theatre redevelopment project.
- b) The report commences by describing the design standards for the various areas and systems within the accommodation.
- c) The report continues by describing the services that will provide and control the building environment.
- d) The report will be subject to design development and client approval.

## 2.0 REGULATIONS AND STANDARDS

All materials and work carried out will be in accordance with the standards specified and will conform to:

- BS7671: 1992 – Requirements for electrical installations – IEE Wiring Regulations Sixteenth Edition (hereinafter referred to as the IEE Regulations).
- Amendments to the above, as and when issued.
- Electricity Supply Regulations, 1988.
- Factories Act including Electricity (Factories Act) Special Regulations, 1961.
- Requirements of the Health and Safety Executive under the Health and Safety at Work Act.
- Requirements of the Regional Electricity Company.
- Relevant British Standard Specification and/or Codes of Practice for materials and equipment and method of installation.
- Chartered Institution of Building Services Engineers Codes and Technical Memoranda.
- The Electricity at Work Regulations, 1989.
- The Control of Pollution Act.
- COSHH (Control of Substances Hazardous to Health) Regulations.
- Requirements of the Local Authorities: -
  - Environmental Health Department
  - Building Control Officer
- Requirements of Insurance Companies concerned.
- Requirements of the Fire Authority.
- Such other regulations and statutory devices as may from time to time apply.
- The Construction Design and Management (CDM) Regulations, 1994.
- Furness Green Partnership Mechanical Specification.
- Furness Green Partnership Electrical Specification.

3.0 DESIGN CRITERIA

3.1 EXTERNAL CONDITIONS

The mechanical systems shall be designed where relevant to cater for external conditions as follows:

Summer maximum	28°C db 19°C wb
Winter minimum	-4.0°C saturated

3.2 INTERNAL DESIGN CONDITIONS

Winter Conditions	Dry Resultant Temperature
Box Office/Entrance Foyer	20°C ± 2°C
Foyers	21°C ± 2°C
Offices	22°C ± 2°C
Toilets	19°C ± 2°C
Dressing Rooms	23°C ± 2°C
WC/Shower	23°C ± 2°C
Corridors	18°C ± 2°C
Stores	16°C ± 2°C
Get-In	20°C ± 2°C
Plant Rooms	16°C ± 2°C

Summer Conditions	Dry Resultant Temperature
Box Office/Entrance Foyer	Uncontrolled
Foyers	Uncontrolled
Offices	Uncontrolled
Toilets	Uncontrolled
Dressing Rooms	Uncontrolled
WC/Shower	Uncontrolled
Corridors	Uncontrolled
Stores	Uncontrolled
Get-In	Uncontrolled
Plant Rooms	Uncontrolled

3.3 OCCUPANCY

Auditorium	1525
Bars	Various

3.4 HOT & COLD WATER SERVICES

Hot water will be generated and stored centrally in the plant room.

Water will be stored at 60°C (to counteract Legionella formation) and distributed to the toilet cores via a hot water service flow and return piped installation. The water will be mixed down locally to ensure water temperatures do not exceed 42°C at the outlet in all areas with the exception of the process requirements, where water at the upper temperature will be available.

3.5 LOW TEMPERATURE HOT WATER

LTHW shall be generated from the new condensing boilers planned for the basement boiler room.

3.6 VENTILATION

Bar Areas / Foyers	10 litres per second per person
Offices	10 litres per second per person
Changing Rooms	10 litres per second per person

Openable windows shall be utilised to ventilate rooms in lieu of mechanical ventilation where possible.

It is assumed all areas are no smoking as per current legislation.

Mechanically ventilated toilets are provided with the following ventilation rates:

- 10 air changes per hour or 6 litres per second per WC extract, whichever the greater.

Mechanically ventilated showers are provided with the following ventilation rates:

- 10 air changes per hour or 15 litres per second per shower extract, whichever the greater.

3.7 NOISE CONTROL

Box Office/Entrance Foyer	NR 40
Foyers	NR 40
Offices	NR 35
Toilets	NR 45
Dressing Rooms	NR 35
WC/Shower	NR 40
Corridors	NR 40
Get-In	NR 35

Noise levels generated by the building services to the external environment will be designed to satisfy the requirements of the Local Authority Environmental Health Department.

### 3.8 LIGHTING INSTALLATION

The lighting system and luminaries will be designed and installed to provide the following average levels of luminance.

Theatre Auditorium	As existing
Bars	100-150 lux
Foyer Areas	100-150 lux
Dressing Rooms (general)	200 –300 lux

The complete lighting installation will comply with the requirements of the Code for Interior Lighting published by the Chartered Institution of Building Services Engineers and relevant CIBSE Technical Memoranda.

### 3.9 EMERGENCY LIGHTING

Emergency lighting will be provided by using the existing central battery system together with the statutory requirement for "running man" directional and exit signage.

The emergency lighting design will be compliant with British Standard 5266: Part 1: 1988.

### 3.10 FIRE ALARM SYSTEM

The existing type L2 fire alarm and detection system conforming to the requirements of British Standard 5839 will be extended through the new accommodation areas.

In addition to the above system a staff alarm system incorporating audiovisual devices and emergency rated public address system will be extended through the new areas of the building for use during public performances, complying with British Standard 5588 Part 6.

### 3.11 LIGHTNING PROTECTION

A lightning protection system conforming to the requirements of BS 6651 will be provided.

## 4.0 OUTLINE SPECIFICATION

### 4.1 MECHANICAL SERVICES

#### 4.1.1 Cooling

The existing cooling requirement for the auditorium is supplied via roof mounted air handling units incorporating refrigerant based cooling coils.

A new roof mounted air cooled chiller will be provided in the plant area of the fly tower which will supply chilled water to the new supply air handling units and internal fan coil units.

Local cooling to the foyers / bars and offices will be provided via a four pipe fan coil unit system.

It is noted that the air conditioning condensers that are currently sited on the roof of the east wing will need to be removed to enable the construction of the new extension. The indoor units that are in areas served by these condensers will be replaced with a multiple split system allowing several room located cooling units to be connected to single outdoor roof mounted condensers.

#### 4.1.2 Heating

The existing heating system serving Victoria Palace Theatre comprises of 2no. gas fired steam boilers in the front of house basement, which serves front and back of house areas, the auditorium and the stage area.

It is proposed to replace the steam boilers with new high efficiency condensing gas fired boilers and install new variable speed pumps. Existing radiators and pipework will be retained where possible. The new boilers will also serve heating coils in the new air handling units, four pipe fan coil units and radiators proposed for the new areas.

New air curtain heaters will be installed within the new remodelled east wing foyer entrance.

The multiple split units mentioned in section 4.1.1 can also be utilised as heat pump units allowing the refrigerant cycle to be reversed providing heating to spaces where it is required.

#### 4.1.3 Ventilation

##### Auditorium

Proposals are in place to the client for the future upgrade of the auditorium ventilation system. The two options in place are for a new displacement ventilation system to the auditorium or to re-plan the current ventilation philosophy so that the supply and exhaust points are reversed and the plant capacity is increased.

The report on the limitations of the existing ventilation and proposals to improve the ventilation are contained in the Furness Green reports included in the appendix.

As this client decision has been deferred the current ventilation system to the auditorium will be retained for the planning issue.

Any new proposals for this system will have to be submitted in a new or revised planning application.

#### Stage

A ventilation or cooling system is not currently proposed to this area though it may be considered if required by the client at a later date.

#### New East Wing Development

All dressing rooms, wc's, offices and bars in the new east wing development that are being fitted out shall be mechanically ventilated from central plant where possible as there are no openable windows.

A new air handling unit will be provided above the new east wing extension to provide the fresh air requirements for the following areas

- **Foyer/ Bars / Offices Air Handling Plant (supply & extract units)** – Air handling plant with thermal wheel heat recovery to provide fresh filtered air to the foyers, bars, offices and changing rooms, via low velocity ductwork distribution system and diffusers.
- **WC (extract only) Air Handling Plant** – Air handling plant to extract air from the central WC core in the east extension, via low velocity ductwork distribution system and grilles. Make up air to the toilets will come from the foyer / bars supply system.

#### West Wing Re-development

New air handling units will be provided in the plant room above the west wing to provide ventilation to the toilets and changing areas

#### 4.1.4 Domestic Hot & Cold Water

The existing hot and cold water pipework serving the areas that are not being refurbished shall be retained. The pipework shall be drained, flushed and chemically cleaned. Where necessary the existing pipework will be re-configured to supply hot and cold water to the new/relocated outlets

A complete new hot and cold water supply system shall be provided for the new build areas. A new incoming mains cold water supply shall be installed to serve the new areas. Site measurements of the mains water pressure shall determine if cold-water booster sets are required.

Hot water for the back of house areas and new extension shall be generated centrally via hot water storage calorifier located in the basement plant room heated using the new boilers.

The hot water supplies to new draw offs shall be blended at each outlet using a thermostatic mixing valve, which shall be DO8/TM3, approved.

#### 4.1.5 Controls

An automatic control system will provide time clock control, over-ride facilities, frost protection, safety interlocks and user interfaces to control the following:

- The new ventilation air handling units
- The new gas fired condensing boilers
- The new roof mounted chiller
- The new hot water storage calorifiers

#### 4.1.6 Gas Service

The existing gas main entering the theatre if required shall be upgraded and a new meter supplied.

#### 4.1.7 Above Ground Drainage

The existing above ground drainage system will be designed to suit the remodelled building layout in accordance with BS EN 12056/1.

#### 4.1.8 Rainwater

The existing rainwater system will be designed to suit the remodelled building layout. A new rainwater system will be designed for the reconstructed fly tower roof.

#### 4.1.9 Fire Protection Services.

A new incoming fire main shall be installed into the building to serve the new sprinkler system

Initial advice from the fire consultant suggests that only the stage area / flytower will need to be served by the new sprinkler system. A new sprinkler tank & booster pumps shall be installed within the basement at the rear of the reconstructed fly tower

An LPC approved contractor shall provide the sprinkler system design and installation.

#### 4.2 ELECTRICAL SERVICES

##### 4.2.1 Electrical Supply

The electricity supply to the existing theatre building is derived from EDF's local area network.

There are three existing low voltage service connection, one serving the front of house and two serving the back of house. The approximate nominal capacities of the service connections are as follows:

FOH 1	215kVA
BOH 1	215kVA
BOH 2	143kVA

The extension and re-planning of the building will necessitate the relocation of the two back of house service connections. In order to serve the extended building an application will be made for two new upgraded back of house services each with a capacity of 280kVA.

The service connections will be at 415 volts, three phase and neutral, 50HZ.

#### 4.2.2 Metering

New consumption metering will be provided to suit the new service connections.

#### 4.2.3 Main Low Voltage Switchgear

The existing front of house switchgear comprises panel board assemblies incorporating Merlin Gerin MCCB protective devices.

The existing front of house panel boards will be retained and reused.

The existing back of house switchgear comprises loose, wall mounted switch fuse equipment. The majority of the equipment was manufactured by MEM.

The existing back of house switchgear will be replaced with a new main and two sub main panel boards to suit the new up-rated electricity supply and sub main distribution. The panel boards will incorporate MCCB's as the outgoing protective devices.

The second BOH electrical service will be utilised to feed the performance dimmers and flying equipment. A new panel board will be located at levels 6 / 7 for individual feeds to the dimmers and flying winches.

#### 4.2.4 Power Factor Correction

Fixed power factor correction equipment will be installed connected to motive power plant to reduce the power factor to 0.95pf lagging.

All new fluorescent luminaries will be fitted with individual power factor correction capacitors.

#### 4.2.5 Low Voltage Distribution

Some of the existing distribution to the front of house will be retained.

New distribution will be provided to the new front of house areas and the existing foyer extension area where the accommodation is re-planned. Generally new distribution will be provided to the back of house areas where the fly tower and stage house is extended.

All new and existing sub main cables will be protected by MCCB's. New sub main circuits will be served by XLPE/SWA/LSF cables. Separate supplies will be provided for

- Lighting and small power distribution boards
- Chiller
- Mechanical services motor control centres
- Lifts

#### 4.2.6 Standby Generator

A diesel driven, automatic standby generator will be provided to support the following life safety equipment

- Fire fighting lift
- Smoke extract fans
- Sprinkler pumps

#### 4.2.7 Lighting

##### Auditorium

Under the present scheme the house lighting to the main auditorium will remain.

##### Stalls Foyer

*Lighting scheme to be developed*

##### Box Office

*Lighting scheme to be developed*

##### Stalls Toilet Areas

*Lighting scheme to be developed*

##### Stalls Bar

*Lighting scheme to be developed*

##### Circle Foyer

*Lighting scheme to be developed*

##### Dressing Rooms

In the new dressing room accommodation lighting will be installed with general lighting to the space and mirror lighting to the artist dressing tables.

##### Wardrobe and Laundry

General lighting will be provided in the room space with provision for task lighting to the wardrobe repair and stitching area.

#### External Lighting

The existing lighting to the canopy will be retained.

A scheme of some additional accent flood lighting will be developed for the front facade of the building to highlight features of the facade.

#### 4.2.8 Emergency Lighting

An emergency lighting installation in accordance with the Fire Officer and Local Authority requirements will be provided throughout the building.

The central battery charger unit serving the Theatre will be inspected, and serviced. New batteries will be provided.

A new central battery / inverter system may be installed to serve the new areas in the building.

#### 4.2.9 Small Power

Wall mounted socket outlets will be provided in the new areas for cleaning and maintenance.

Socket outlets will be provided in the bars for till points, POS equipment, beer coolers, bottle fridges etc.

#### 4.2.10 Fire Alarm

The existing fire detection and alarm system will be retained and extended to serve the new areas in the building.

The fire alarm system will interface with the public address system (PA) and will form an integral part of the fire detection and alarm system.

Manual break glass units to be installed adjacent to critical exits to staircases, escape routes and at the final exits from the building.

Audiovisual devices will be strategically sited in all areas where staff are expected to be present.

#### 4.2.11 Lightning Protection

A lightning protection system will be provided to protect the new and extended areas of the building. The system will be in accordance with British Standard BS 6651: 1990. The system will comprise of a suitable air termination network, down conductors, earth terminations and test joints.

Aluminum tapes will be used as down conductors.

Earth terminations will comprise earth rods and inspection pits sited internal to the building.

#### 4.2.12 Mechanical Services Wiring

Power and control wiring will be provided to all items of new plant and equipment.

#### 4.2.13 Earthing and Bonding

Protection against electric shock within the building will be by means of earthed equipotential bonding and automatic disconnection of the supply.

The system will provide all necessary earthing and bonding connections to exposed and extraneous conductive parts as defined by the IEE Wiring Regulations.

#### 4.2.14 Stage Lighting and Equipment

New sub main distribution will be provided for the performance dimmers which are to be relocated to level 6 / 7.

New sub main distribution will be provided for the new power flying winches to be located at level 7.

#### 4.2.15 Security

The existing CCTV system will be extended to cover the new extended building.

#### 4.2.16 Voice and Data

Cat 5e cable installation will be provided in the new building areas linked back to the existing building systems for voice and data, EPOS systems etc. Telephone instruments, tills and other equipment will be provided direct by the Client.

#### 4.2.17 Show Relay

A new show relay system will be installed with new wiring and speakers installed in the new dressing rooms and other appropriate areas.

## 5.0 LIFT INSTALLATION

Two goods/passenger lifts will be provided in the front of house. Both lifts will be suitable for wheelchair users.

The front of house lifts will be a 16 person, 1250kg lift with 1100 wide doors. The lifts will be a machine roomless type with a contract speed of 1.0m/s.

A fire fighting lift will be provided in the back of house. The lift will be 8 person, 630kg with 800 wide doors. The lift will be a machine roomless type with a contract speed of 1.6m/s.

A platform lift will be provided in the foyer area at front of house to provide access to wheelchair users to the stalls.

**APPENDIX A**

**AUDITORIUM - BARS AIR CONDITIONING REPORT  
& DISPLACEMENT VENTILATION VIABILITY REPORT**

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**VICTORIA PALACE THEATRE**  
**AUDITORIUM AND BARS**  
**AIR CONDITIONING REPORT**  
**FOR**  
**VICTORIA PALACE THEATRE LTD**



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## 1.0 EXECUTIVE SUMMARY

The air-cooling and ventilation plant serving the Victoria Palace Theatre auditorium is insufficient to meet the demands of a summer design day full house condition. During the summer design day the temperatures within the auditorium can rise to the figures below.

External Temperature : 28°C

Matinee Performance Room Temperature : 31°C

Evening Performance Room Temperature : 28°C

A new larger capacity air handling unit and chiller would be required for the auditorium to satisfy design conditions.

The fresh air supply into the auditorium is below the recommended level.

The extract from the auditorium is also below the recommended level.

The auditorium supply air cooling units have been well maintained and are in a reasonable condition. We would expect them to achieve a further 10 years of economic life.

This said the cooling units are charged with R22 refrigerant which will only be available in recycled form from 2010 and will not be available at all after 2015.

The air distribution system in the auditorium has an air flow system from front to back. This is not in accordance with the recommendations in the Technical Regulations. The highest risk of fire is considered to be the stage area and the recommendation for normal ventilation systems and smoke ventilation systems is that they should be arranged to take the smoke away from the audience.

The existing distribution system is not ideal. The supply air delivered from decorative grilles in the ceiling dome result in some "dumping" of air in the stalls. The extract grilles at the rear of each level are not very effective and only a small proportion of the supply air will move across to the area at the back.

The existing controls are quite basic with a manual on / off control and a temperature sensor at the rear of the auditorium at stalls level.

There is no heat recovery incorporated in the existing system.

### Auditorium System Recommendations

With the proposed refurbishment works to the theatre we would propose the following upgrades to the existing system serving the auditorium.

#### New Plant

- New air-cooled water chiller or condenser of a capacity to match the demands of the auditorium at full house matinee on the design summer day.
- New air handling unit sufficient to provide the minimum fresh air quantity of 10l/s/person.

- Improved access to the air conditioning units.
- Heat recovery via CO<sub>2</sub> (occupancy level) controlled air re-circulation device to reduce running costs.
- Full automatic control system to efficiently and effectively control the auditorium temperature.

#### Works on the Existing System

- Modify existing ductwork distribution system to reverse the supply and extract air flows to provide an audience to stage air flow pattern (refer to Section 7.3).
- Provide additional distribution ductwork and re-heat coils to enable temperature control at each seating level.

#### Bar Areas Recommendations

All of the bars which have cooling use R22 as the refrigerant gas. With the planned refurbishment works and the need to replace the DX split units in the next 3-5 years, we would recommend consideration of replacement with a variable refrigerant flow system to replace the individual split units. Some improvement to the fresh air supply to particular bars is also recommended.

- Environmentally friendly refrigerant to satisfy all upcoming legislation changes.

## 2.0 INTRODUCTION

The purpose of this document is to report on the survey, investigations and conclusions relating to the installed air conditioning systems at the Victoria Palace Theatre.

The document comprises of an overview of the heating, cooling and ventilation systems serving the theatre auditorium and front of house bars, the key elements that have a bearing on the success or failure of the installed systems, and recommendations to improve the current systems.

The report also demonstrates via thermal calculations how the existing cooling systems perform under full house matinee when the ambient temperature is at the normal summer design temperature of 28°C.

The survey of the theatre was conducted by Furness Green on the 5<sup>th</sup> September 2007. The survey was limited to a visual inspection of the accessible parts of the installation. No tests were carried out. No drawings or operational manuals for the existing installation were available.

### 3.0 DESIGN DATA

The following criteria has been used in the assessment of the existing system performance and future proposals.

### 3.1 THE INTERNAL DESIGN TEMPERATURE

The recommended internal design temperatures to be achieved by means of heating, cooling or ventilation are as follows.

Space	Design Temperature	TEMPERATURE RANGE
Seated Auditoria	22°C	+/- 2°C
Theatre Bars	22°C	+/- 2°C

### 3.2 DUCTWORK AIR VELOCITIES

To maintain the recommended noise rating of 25NR to 30NR required for Auditoria, the air velocities within the ductwork distribution system must not exceed the following values.

Main Ducts	4.0 m/s
Branch Ducts	3.5 m/s
Run out Ducts	2.0 m/s

### 3.3 OCCUPANCY LEVELS

The occupancy levels for the auditorium are based on the number of seats as follows:

Area	Occupancy (maximum)
Auditorium Stalls	712
Auditorium Dress Circle	400
Auditorium Upper Circle	393
Auditorium Boxes	20
<b>Total Auditorium</b>	<b>1525</b>

The occupancy levels for the bars are based on the measured floor area and occupancy densities as follows:

Area	Comments	Occupancy Density
Crush Bar Areas	Up to 2 metres from the serving bar	0.4m <sup>2</sup> /person
Bar Standing Areas	Accessible bar areas excluding crush and circulation space	0.6m <sup>2</sup> /person

Circulation Areas	At bar entrances, around stairs and foyer areas	1.0m <sup>2</sup> /person
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The above table totals the maximum occupancy levels in the bars as follows:

Area	Occupancy (maximum)
Stalls Back Bar	40
Stalls Bar	140
Stalls Saloon Bar	30
Lounge Bar	70
Long Bar	50
Upper Circle Bar	80

### 3.4 FRESH AIR REQUIREMENTS

Assuming all areas to be non-smoking; to provide oxygen for breathing, reduce the build up of carbon dioxide and to control body odour, a minimum of 10 litres/second of fresh air per person is recommended.

The minimum fresh air requirements for the Auditoria are as follows:

Area	Occupancy (Maximum)	Minimum Fresh Air (l/s)
Auditorium Stalls	712	7120
Auditorium Dress Circle	400	4000
Auditorium Upper Circle	393	3930
Auditorium Boxes	20	200
<b>TOTAL AUDITORIUM</b>	<b>1525</b>	<b>15250</b>

The minimum fresh air requirements for the Theatre bars are as follows:

Area	Occupancy (Maximum)	Minimum Fresh Air (l/s)
Stalls Back Bar	40	400
Stalls Bar	140	1400
Stalls Saloon Bar	30	300
Lounge Bar	70	700
Long Bar	50	500
Upper Circle Bar	80	800

### 3.5 INTERNAL HEAT GAINS

Internal heat gains into the areas under consideration are from the occupants, performance lighting and sound mixing desks. The following table details the design data used to calculate these gains.

Heat Emitter	Auditorium	Theatre Bars
Occupants	73W(s) per person 32W(l) per person	90 W(s) per person 50 W(l) per person
Performance Lighting	20 kW(s) Total (Averaged simultaneous load)	Not Applicable
Sound Mixing Desks	4 kW(s) Total	Not Applicable

### 3.6 SUMMER EXTERNAL CONDITIONS

The thermal performance of the plant, systems and buildings has been calculated using maximum summer design conditions as follows.

Peak Summer Design Condition

Outside Dry Bulb Temperature	28°C
Outside Wet Bulb Temperature	19°C
Matinee Performance Times	1430 hrs to 1730 hrs
Evening Performance Times	1930 hrs to 2230 hrs

## 4.0 BUILDING COOLING LOAD

### 4.1 AUDITORIUM

Thermal load calculations based on the design data in section 3.0 compute a heat load on the air-cooling coil to achieve a design temperature of 22°C within the auditorium as follows:

Summer Design Day: Matinee performance 275 kW

### 4.2 STALLS BACK BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Stalls Bar as follows:

Summer Design Day: Matinee performance 5.0 kW

### 4.3 STALLS BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Stalls Bar as follows:

Summer Design Day: Matinee performance 17.2 kW

### 4.4 STALLS SALOON BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Stalls Saloon as follows:

Summer Design Day: Matinee performance 3.9 kW

### 4.5 LOUNGE BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Lounge Bar as follows:

Summer Design Day: Matinee performance 8.9 kW

### 4.6 LONG BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Long Bar as follows:

Summer Design Day: Matinee performance 6.1 kW

### 4.7 UPPER CIRCLE BAR

Thermal load calculations based on the design data in section 3.0 compute a heat gain to the Upper Circle Bar as follows:

Summer Design Day: Matinee performance 10.5 kW

## 5.0 THE EXISTING AIR CONDITIONING SYSTEMS

### 5.1 AUDITORIUM

Powered supply ventilation provides fresh air from roof level, where it is filtered, heated or cooled via the roof air handling plant. The air is supplied to the auditorium via a ductwork distribution system on the roof to plenum chambers in the ceiling void above the auditorium dome.

Air is extracted from the auditorium at each tier via a ductwork distribution system at the back of the auditorium to roof mounted extract fans.

Air is delivered into the auditorium via the following ventilation terminals:

- Ornate grilles mounted within the dome over the auditorium
- Ornate grilles mounted in the ceiling bulkhead over upper circle level

Air is extracted from the auditorium via the following ventilation terminals:

- Stalls – Sidewall grilles mounted in the back wall of the auditorium and within a high level bulkhead.
- Dress Circle – Ceiling mounted egg crate grilles.
- Upper Circle – Sidewall grilles mounted in ductwork at the back of the auditorium.

The existing scheme air distribution is demonstrated using a diagram in the appendix of this document.

No heat recovery is incorporated into the existing system.

The ventilation and air conditioning for the auditorium is controlled on/off manually. The heating and cooling coil outputs are controlled via a temperature sensor at the back of the auditorium at stalls level.

### 5.2 STALLS BACK BAR

Cooling for the stalls back bar is provided by a single local wall mounted refrigerant DX unit (Fig. 5.2). Mechanical extract ventilation is provided via a single egg crate grille located on the bar right wall.

Installed Cooling Plant

Type:	Wall Mounted Unit (Mitsubishi)
Make & Model:	PKH-2AGH
Cooling Duty:	5.2KW
Heating Duty:	4.7KW
Refrigerant:	R22

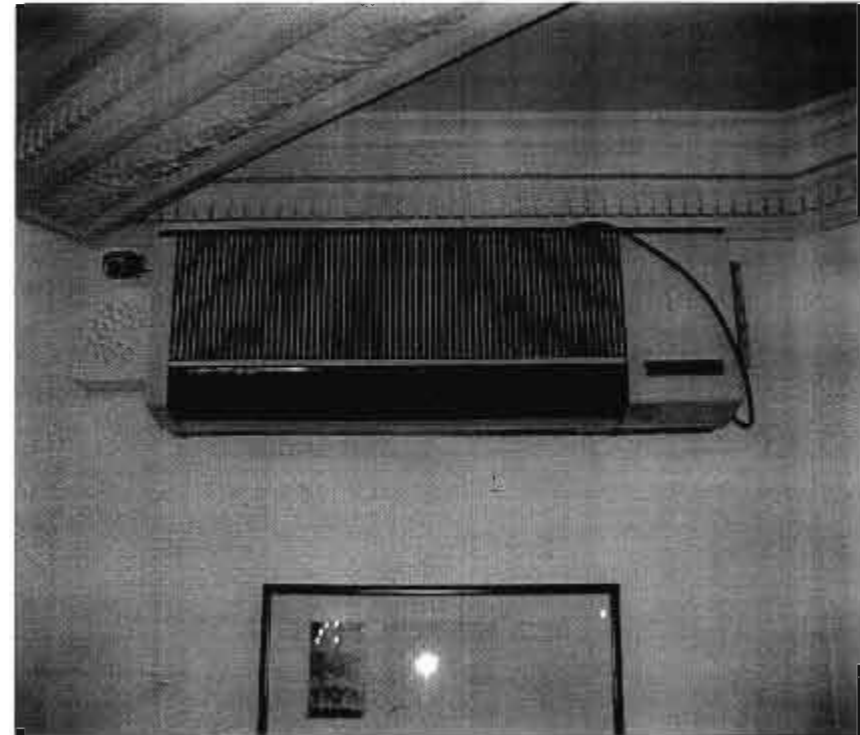


FIG. 5.2

### 5.3 STALLS BAR

Cooling, heating and fresh air ventilation for the stalls bar is provided by a roof mounted air conditioning plant (Fig. 5.3), ducted supply and extract ventilation with room air distribution provided by sidewall mounted double deflection grilles above the bar.

Installed Air Condition Plant

Type:	Mitsubishi
Make & Model:	PRH-8YA-L
Cooling Duty:	3.8KW
Heating Duty:	3.0KW
Refrigerant:	R22

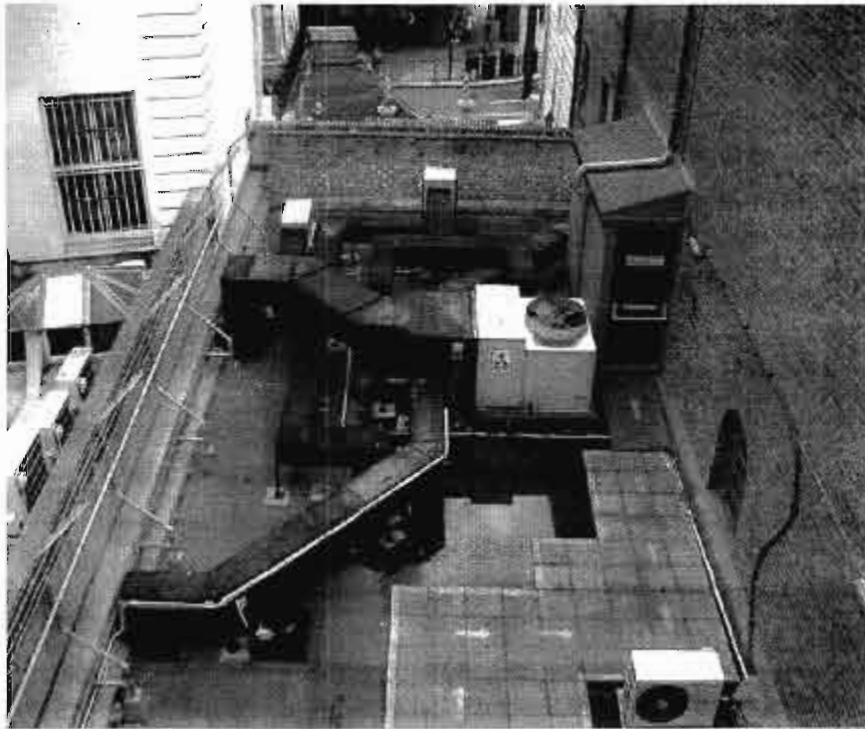


FIG. 5.3

#### 5.4 STALLS SALOON BAR

Cooling for the stalls bar is provided by a single local wall mounted refrigerant DX unit. No mechanical ventilation is provided for the stalls saloon bar (Fig. 5.4).

Installed Cooling Plant

Type: Wall Mounted  
Make & Model: Mitsubishi PKH-2GKLH  
Cooling Duty: 5.2KW  
Heating Duty: 4.7KW

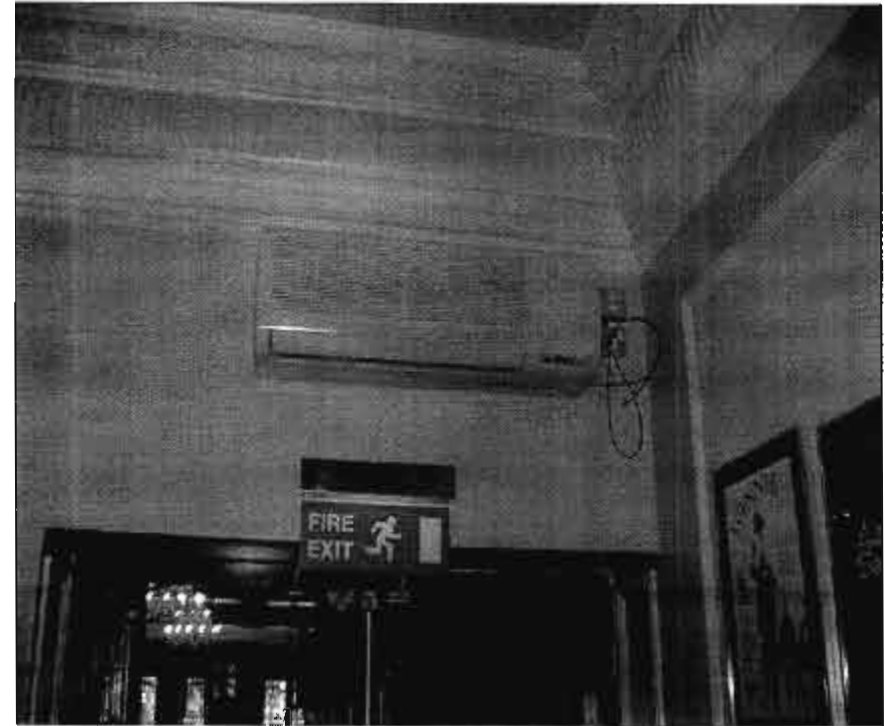


FIG. 5.4

#### 5.5 LOUNGE BAR

Cooling for the lounge bar is provided by a single double deflection supply grille mounted above the bar area.

- Estimated cooling capacity provided by ventilation: 1.3 kW
- Operable doors to the balcony provide additional fresh air ventilation and cooling capacity.
- Heating is provided by electric radiators.

#### 5.6 LONG BAR

Cooling for the long bar is provided by a single floor mounted refrigerant DX unit (Fig. 5.6).

No fresh air supply is provided for the bar. Extract air is provided by a ceiling mounted grille over the bar.

- Installed Cooling Plant: Capacity Unknown

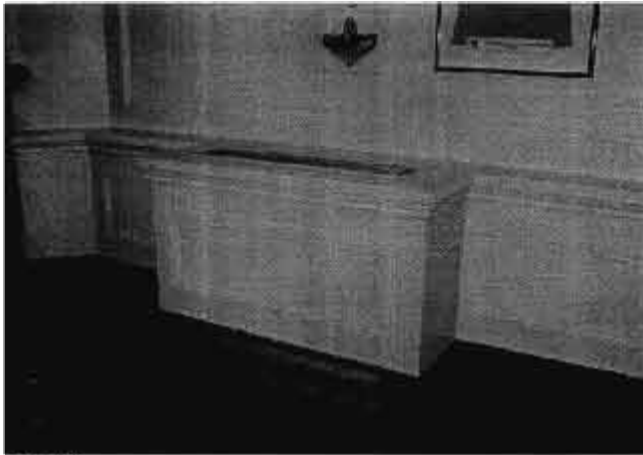


FIG. 5.6

#### 5.7 UPPER CIRCLE BAR

No mechanical cooling is provided for the upper circle bar. Fresh air supply and space cooling is provided by openings to the balcony.

Extract is provided by two panel mounted extract fans (Fig. 5.7).

Heating is provided by electric radiators.

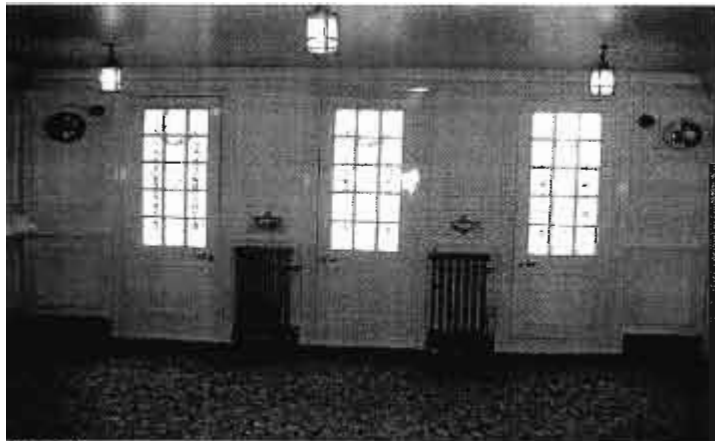


FIG. 5.7

#### 5.8 EXISTING AUDITORIUM PLANT DETAILS

##### (a) Roof Mounted Air Conditioning Unit

Two air cooled heat pump / supply air units are located on the roof above the auditorium (Fig. 5.8a).

These units provide all the heating, cooling and fresh air supply for the auditorium.

Details of the units are as follows: -

Manufacturer:	interclisa Carrier,S.A.
Model Reference:	RT320DH721D90632
Refrigerant:	R22
Cooling Duty:	71.2KW
Heating Duty:	5.9KW
Supply Air Duty:	3.47m <sup>3</sup> /s



FIG 5.8a

The air conditioning units age is unknown but has been well maintained and would expect another 5 to 10 years economic life remaining.

The refrigerant unit is charged with R22. R22 is a single hydro chlorofluorocarbon or HCFC compound. From 2010 only recycled or saved stocks of R22 can be used, as it will no longer be manufactured. The key dates for R22 are as follows.

After 1 January 2010 no more virgin refrigerant R22 can be used in existing systems.

After 2015 no more recycled refrigerant R22 can be used in existing systems.

There is a "drop in" replacement refrigerant for R22, refrigerant R417A however this will reduce system capacity and would be uneconomical for this unit.



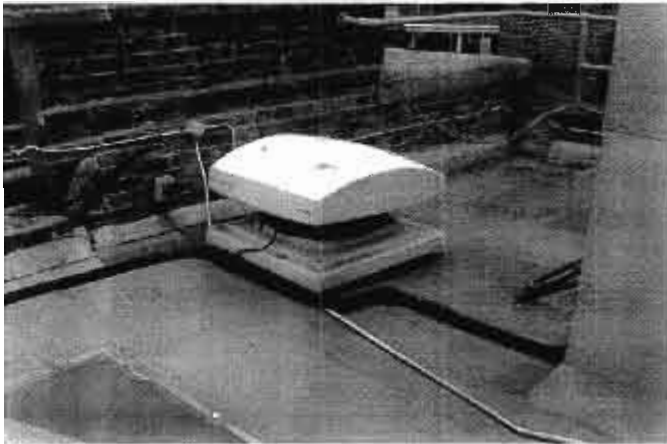
**(b) Extract Air Fans**

Air is extracted from the auditorium via distribution ductwork at the back of the auditorium to roof mounted extract fans (Fig. 5.8b). No heat recovery is provided.

The extract fans age is unknown but has been well maintained and would expect a further 5 to 10 years economic life from the fans.

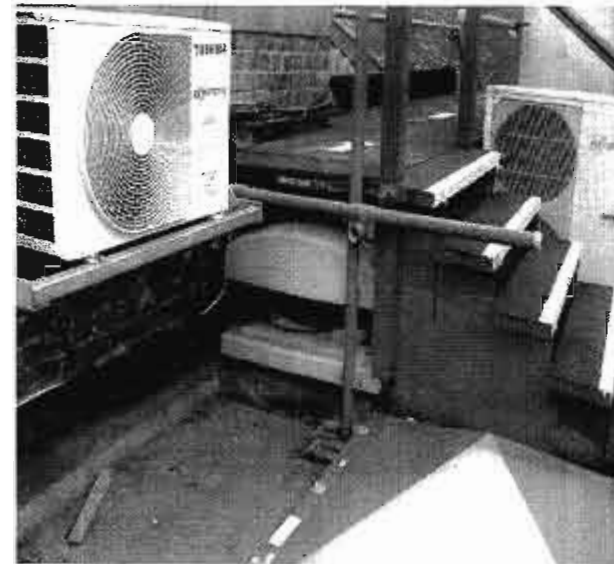
Details of the existing fans are as follows:

Manufacturer:	oof Units Group
Model Reference:	CH450/4
FL amps:	3.2
SC amps:	7
Supply:	240V/1/50
RPM:	1280



**FIG 5.8b**

One of the extract fans has been enclosed in some steps which will result in a reduced performance (Fig 5.8bi).



**FIG 5.8bi**

## 6.0 EXISTING SYSTEM ANALYSIS

### 6.1 INSTALLED PLANT CAPABILITY

The supply air-handling unit delivers an estimated 6.94m<sup>3</sup>/s of fresh air. This equates to approximately 4.6 litres per second per person, which is below the recommended fresh air requirements but is sufficient to prevent the build up of carbon dioxide and will provide reasonable air distribution within the space.

The air conditioning unit has the cooling capacity of 142kW. This is not enough to dissipate the sensible heat gain from the occupants at normal summer design day conditions and therefore temperatures within the auditorium could rise to a maximum 31°C

In winter the heating capacity of the system is 152kW. This is sufficient for offsetting the ventilation, fabric and infiltration heat losses within the auditorium.

The air conditioning unit is a combined heating, cooling and ventilation unit. The cooling and heating capacities are therefore sufficient for the quality of air delivered into the auditorium.

The quantity of ventilation to the auditorium however is insufficient to maintain comfort conditions within the auditorium.

### 6.2 INSTALLED SYSTEM CAPABILITY

#### (a) Auditorium Supply Air Distribution

The occupants in the auditorium are provided with heating, cooling and fresh air from two locations. The main air supplied to the auditorium is delivered from four ornate grilles located within the dome at high level within the auditorium (Fig. 6.2a).



FIG 6.2a

The air is delivered to the grilles via an acoustic plenum box behind the grille (Fig. 6.2ai). This provides a low velocity of air across the grille. The grille is purely a decorative feature and does not provide any diffusion, direction or mixing of the supply air. The resulting air flow during cooling mode therefore dumps from the high level grilles to just a few seats in the stalls. This will create great discomfort to the occupants affected by this air flow.

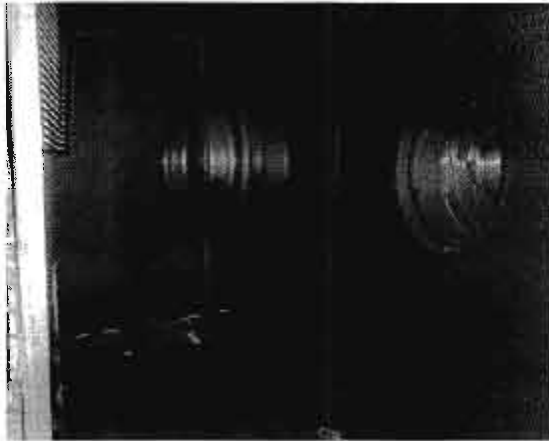


FIG 6.2ai

Supply air is also delivered to the upper circle of the auditorium via decorative grilles installed in the ceiling bulkhead (Fig. 6.2aii). The grille is purely decorative providing no diffusion, direction or mixing of the air. The supply air exits the grille at a high velocity over the heads of the audience and is captured by the extract grilles along the back wall. This installation is therefore ineffective at providing comfort conditions to the upper circle audience.

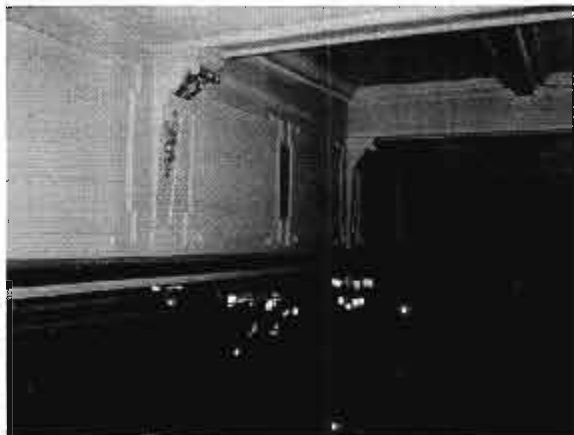


FIG 6.2aii

The ventilation system has been designed to provide air flow distribution from the front of the auditorium to the back. This is not the ideal air pattern within an auditorium. Building Control and Licences Authorities prefer air flow from audience to stage to prevent smoke entering the

auditorium from any stage fire. For similar reasons theatre producers prefer audience to stage air flow to prevent dry ice etc. from being drawn into the auditorium.

#### (b) Auditorium Extract Distribution

The stalls level is provided with extract grilles mounted at high level in the back wall (Fig. 6.2b)

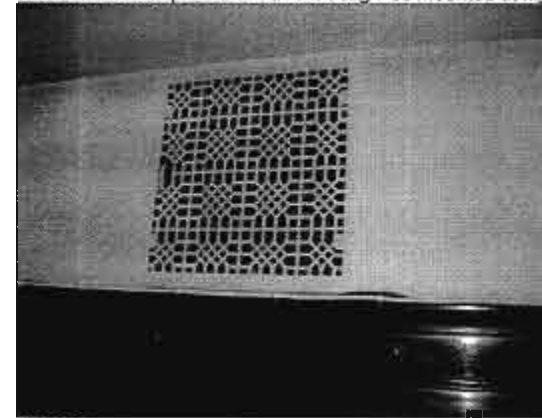


FIG 6.2b

The capture capability of extract grilles is only effective within approximately one metre of the grille and therefore the purpose of these grilles is to encourage an audience front to audience back air flow pattern. Only a small proportion of the supply air will move across the stalls area to the back and this will not be sufficient for comfort conditions for the majority of the audience.

The dress circle level is provided with extract grilles mounted in the ceiling at the back of the auditorium (Fig. 6.2bi).



FIG 6.2bi

These grilles will be ineffective in providing conditioned air to the dress circle occupants, for reasons similar to above.

The upper circle level is provided with extract grilles mounted in vertical ducts along the back wall of the auditorium (Fig 6.2bii).

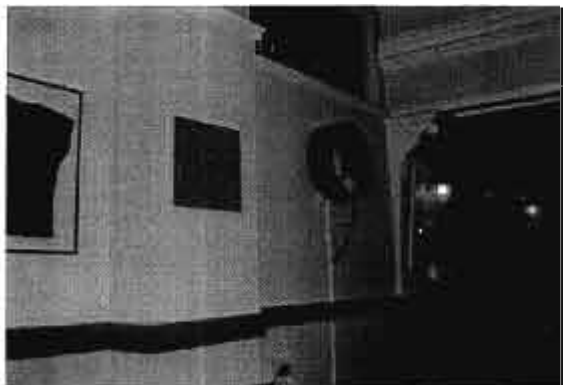


FIG 6.2bii

The grilles are installed in a position that is causing a short circuit between the upper circle supply grilles as discussed previously.

#### (c) Ductwork Distribution

Supply air ductwork within the ceiling void contains long lengths of flexible ductwork (Fig 6.2c). Due to the poor support the ductwork is now sagging and twisted causing restriction to the air flow between the air conditioning unit and supply air plenums. The thermal insulation has come loose in some areas which may cause a condensation risk in the roof void.



FIG 6.2c

There is evidence of air flow generated noise breaking out from the extract ducts at the back of the auditorium at upper circle level suggesting that the installed ductwork is undersized for the extract air flow rate.

### 6.3 INTERNAL TEMPERATURE ANALYSIS

The following table summarises the internal temperatures, which can be expected from the existing installation within the auditorium during a full house matinee and evening condition when the ambient temperature is at the normal summer design of 28°C.

AREA	Normal Summer Design Day (external peaks at 28°C)	
	Matinee	Evening
Auditorium (average of all levels)	31°C	28°C
Stalls Back Bar	22°C	22°C
Stalls Bar	22°C	22°C
Stalls Saloon	25°C	25°C
Lounge Bar (balcony door closed)	26°C	26°C
Long Bar	22°C	22°C
Upper Circle Bar (balcony doors closed)	29°C	24°C
Upper Circle Bar (balcony doors open)	33°C	30°C

### 7.0 RECOMMENDATIONS

#### 7.1 AUDITORIUM HEATING, COOLING AND VENTILATION

The roof top air conditioning units have insufficient cooling and ventilation capacity to provide comfort conditions for the summer design day conditions.

Because of limited capacity of the existing refrigerant plant and supply air volumes, temperatures within the auditorium can exceed 30°C. The low fresh air quantities delivered by the system means its ability to remove body odour is limited.

Extract from the auditorium is via roof mounted extract fans without any form of heat recovery.

The existing controls are very basic with supply air temperature being controlled by a single room thermostat and no ability in the system to provide independent temperature control of the different ceiling tiers.

We conclude that the existing air conditioning plant is insufficient for the auditorium and with the refrigerant plant operating on R22, the cost of maintenance will sharply rise in the next few years and therefore recommend a new air conditioning unit for the auditorium.

The proposed new plant shall incorporate the following:

- New air-cooled water chiller or condenser of a capacity to match the demands of the auditorium at full house matinee on the design summer day
- New air handling unit sufficient to provide the minimum fresh air quantity of 10l/s/person
- Improved access to the air conditioning units
- Heat recovery via CO<sub>2</sub> (occupancy level) controlled air re-circulation device to reduce running costs
- Full automatic control system to efficiently and effectively control the auditorium temperature
- Environmentally friendly refrigerant to satisfy all upcoming legislation changes

Recommended works on the existing system: -

- Modify existing ductwork distribution system to reverse the supply and extract air flows to provide an audience to stage air flow pattern (refer to Section 7.3)
- Provide additional distribution ductwork and re-heat coils to enable temperature control at each seating level.

#### 7.2 AUDITORIUM AUTOMATIC CONTROLS

We recommend that a fully automatic control system should be installed to control the output of the re-circulation dampers, heating and cooling coils of the air-handling unit throughout the year to maintain the design room temperatures. Auditorium temperature shall be controlled via signals from temperature sensors at each tier of the auditorium.

On/off control of the air handling units and extract fans will be automatic based on time clock and optimum start cooling/heating signals.

The use of night purging shall be incorporated into the control strategy to take advantage of the lower night time temperatures to cool the fabric.

The installation of zone re-heaters and CO<sub>2</sub> controlled heat recovery devices as recommended in section 7.1 will be incorporated into the control philosophy.

### 7.3 AUDITORIUM AIR DISTRIBUTION

As discussed in this report there are fundamental problems with the air distribution within the auditorium. The system has been designed to provide air flow distribution from front to back within the auditorium. In reality this is not happening due to the uncontrolled distribution of the supply air, the conflict between the extract locations and heat plumes patterns set up by the occupancies and supply and extract short circuit problems at upper circle level.

We therefore propose to reverse the air flow distribution within the auditorium. Supply air shall be provided at the back of each level of the auditorium utilising the same distribution routes as the existing extract system where possible. It will be necessary to increase the duct sizes at the back of the auditorium to accommodate the additional quantities of air and ensure low noise operation.

Extract air will be drawn from the existing supply air grilles within the high level dome of the auditorium.

Ductwork distribution shall be modified to enable three supply air zones, one for each tier, to ensure each level can be controlled to comfort conditions and recirculation ducts shall be installed on the roof to enable heat recovery.

Further surveys are required to assess the extent of the new supply ductwork installation and how this can be incorporated into the existing structure without excessive builders work by incorporating into future works within the auditorium.

### 7.4 STALLS BACK BAR

The wall mounted heat pump unit in the stalls back bar is of sufficient capacity to provide comfort conditions in the bar at the expected occupancy levels.

No fresh air is supplied to the bar but the inclusion of the extract grilles above the bar will create a negative pressure relative to the auditorium inducing fresh air to the occupants.

Although the heating, cooling and ventilation to the stalls back bar is satisfactory the heat pump uses R22, which as previously reported, is being withdrawn from the market.

We therefore recommend the eventual replacement of the heat pump unit. (Refer to Section 7.10)

### 7.5 STALLS BAR

The stalls bar cooling / heating is provided via an AHU system located on the first floor roof and is of sufficient capacity to provide comfort conditions in the bar at the expected occupancy levels.

Fresh air is supplied to the bar via supply grilles above the bar with extract grilles located on the opposite wall.

Although the heating, cooling and ventilation to the stalls bar is satisfactory the system uses R22, which as previously reported, is being withdrawn from the market.

We therefore recommend the eventual replacement of the heat pump unit. (Refer to Section 7.10)

### 7.6 STALLS SALOON BAR

The wall mounted heat pump unit in the stalls saloon bar is of sufficient capacity to provide comfort conditions in the bar at the expected occupancy levels.

No fresh air / extract is provided to this bar, however, the Stalls bar is at a positive pressure and therefore introducing fresh air to the occupants.

Although the heating, cooling to the stalls saloon bar is satisfactory the heat pump uses R22, which as previously reported, is being withdrawn from the market.

We therefore recommend the eventual replacement of the heat pump unit. (Refer to Section 7.10)

### 7.7 LOUNGE BAR

The cooling/supply to the Lounge bar is provided via a single supply grille located behind the bar is of sufficient capacity to provide comfort conditions in the bar at the expected occupancy levels.

No extract is provided to this bar, however, there are openable windows which will provide sufficient ventilation to the space.

The cooling and supply to the lounge bar system uses R22, which as previously reported, is being withdrawn from the market. Heating is provided via electric radiators.

We therefore recommend the eventual replacement of the heat pump unit. (Refer to Section 7.10)

### 7.8 LONG BAR

The floor standing heat pump unit in the long bar is of sufficient capacity to provide comfort conditions in the bar at the expected occupancy levels.

No fresh air is provided to this bar, however, there is extract located at either end of the room to draw in fresh air from other areas.

Although the heating, cooling to the long bar is satisfactory the heat pump uses R22, which as previously reported, is being withdrawn from the market.

We therefore recommend the eventual replacement of the heat pump unit. (Refer to Section 7.10)

### 7.9 UPPER CIRCLE BAR

There is no cooling provided to the upper circle bar, the heating is provided via an electric radiator.

There is no supply ventilation provided to the space, with extract ventilation coming from 2no. panel mounted extract fans.

There are however openable windows which if used would provide sufficient ventilation to the bar.

We therefore recommend the installation of an air conditioning unit to provide comfortable conditions within the bar.

#### 7.10 OVERALL FRONT OF HOUSE AIR CONDITIONING STRATEGY

The previous sections recommend the upgrading of some of the bars, but in all cases recommends consideration for future replacement of the R22 refrigerant systems.

To improve energy efficiency and free up roof space a central variable refrigerant flow system could be installed to replace all the individual split system units. This could also include the offices and miscellaneous areas currently air conditioned.

Improvements to the fresh air supply is also recommended for some of the bars and a central ventilation plant may prove to be the most economical although further investigations will be required to discover the extent of builders work to accommodate this option.

#### 8.0 HEALTH AND SAFETY ISSUES

No health and safety issues were apparent during the site survey.



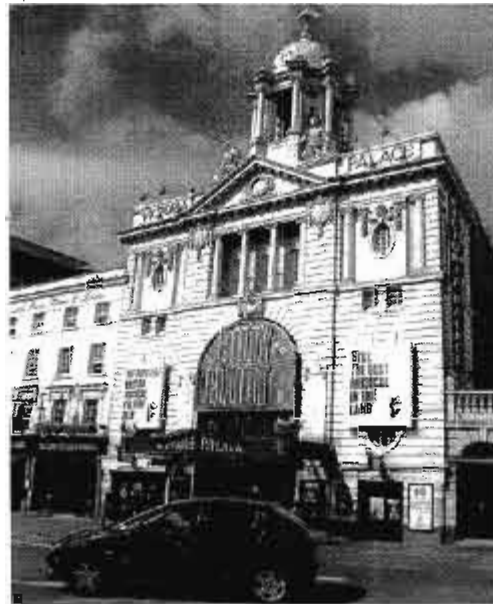


VICTORIA PALACE THEATRE

DISPLACEMENT VENTILATION VIABILITY REPORT

FOR

VICTORIA PALACE THEATRE LTD



**CONTENTS**

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2.0	DISPLACEMENT SYSTEM PHILOSOPHY
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5.0	STALLS SURVEY
6.0	CONCLUSIONS

## 1.0 INTRODUCTION

The purpose of this document is to report on the survey, investigations and conclusions relating to the viability of a displacement ventilation system at the redeveloped theatre.

The survey of the building is to ascertain the space currently available under the stalls, dress circle and upper circle and whether this lends itself to a displacement type system.

The survey of the existing theatre was conducted by Furness Green on the 20<sup>th</sup> November 2007. The survey was limited to a visual inspection. No tests were carried out. No drawings or operational manuals for the existing installation were available.

## 2.0 DISPLACEMENT SYSTEM PHILOSOPHY

Displacement systems introduce air at low velocities with the outlets or diffusers located at or near the floor. The system utilises natural buoyancy generated by heat sources such as people in a theatre to move heat from the occupied zone to return air grilles at high level.

Traditionally in theatres this system utilises low level diffusers under seating which in turn requires there to be a continuous air sealed void or plenum under the seats to allow the air to distribute correctly.

It should be noted that the theatre is currently served in the reverse way to this with the supply at high level and the extract at the rear of the tiers.

It is also important to note that it is not good practice to mix a displacement system with a traditional high level based supply air system. (This also applies to different tiers)

### 3.0 UPPER CIRCLE SURVEY

The void under the upper circle is accessed from the position marked on drawing MSK01. The tier is supported by the large beams shown on the drawing and in figure 1. There is a gap underneath the beam and a fairly large triangular gap of around 650 x 300 at each end which will allow access underneath the majority of the seats in the upper circle. The space within the void is also quite sufficient to fit a supply air duct to provide air for a potential displacement system (see figure 2).

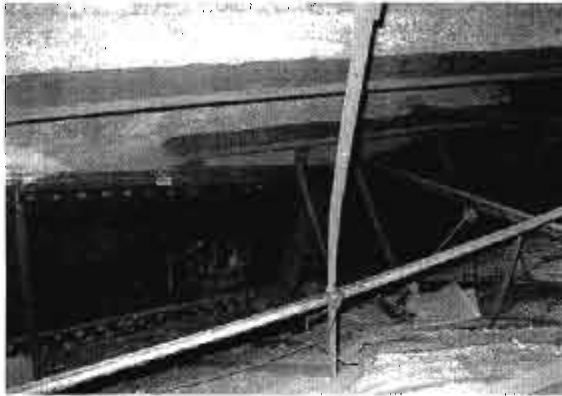


Figure 1 – Large beams below upper circle



Figure 2 – Existing extract duct indicates space available under upper circle

### 4.0 DRESS CIRCLE SURVEY

The void under the dress circle is accessed from two positions marked on drawing MSK02 and MSK03. The first access point is through a panel within the first floor bar area and the second on the stair landing between the first and second floors. The tier is supported by the large beams shown on the drawing. The accessible area covers approximately 6 rows out of a total of 11. The front and rear rows are un-accessible. The space within the available void is quite sufficient to fit a supply air duct to provide air to a potential displacement system plenum (see figure 3). Due to the limited access to all of the rows supplementary supply displacement diffusers may have to be installed at other low level locations within the dress circle to make up the correct air flow allowance.



Figure 3 – Space available under dress circle

## 5.0 STALLS SURVEY

A limited access small service tunnel within the basement level provides a void below the rear walkway of the stalls. (See drawing MRSK04) No apparent access is available underneath the existing stalls to implement a displacement system at this level.

## 6.0 CONCLUSIONS

From the survey undertaken a displacement system is certainly possible within the upper and dress circles of the theatre. Unfortunately there is no void under the stalls which would rule out such a system within the existing theatre. If a void or plenum could be excavated underneath the stalls as part of the redevelopment then it would be possible to install a displacement system within the theatre with exhaust air removed at high level from the cupola.

If excavation and therefore a displacement system is not possible we would propose to serve the theatre from diffusers located at high level within the tiers.

The stalls area in front of the stage would need to be served from high level high throw jet or swirl diffusers as they are not covered by the tiers.

## APPENDIX 1 – DRAWINGS

MRSK01	Upper Circle, Third Floor
MRSK02	Dress Circle, Second Floor
MRSK03	Dress Circle, First Floor
MRSK04	Stalls, Ground Floor

**APPENDIX B**

**MECHANICAL SERVICES DRAWINGS**

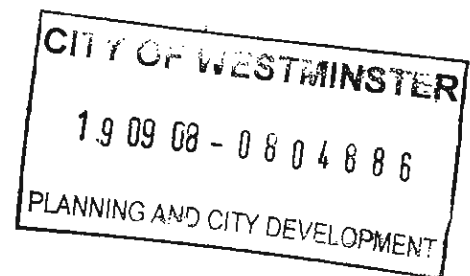
Preliminary sketch drawings showing ventilation philosophy, main plant & duct sizes and locations.

**APPENDIX B**  
**ELECTRICAL SERVICES DRAWINGS**

# VICTORIA PALACE THEATRE

## Environmental Performance Statement

September 2008



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Environmental Performance Statement for  
Victoria Palace Theatre Extension and Redevelopment  
September 2008

Introduction

The proposed redevelopment of Victoria Palace Theatre (VPT) will involve the retention of the existing theatre from the rear face of the proscenium wall forwards.

The plan attached shows the proposed extension to the rebuilt stagehouse to the north, and the small area of new lifts to the east. These two pieces of land will become available as a result of LUL and Land Securities developments adjoining the theatre. Demolitions to release this land will be undertaken by LU and Land Securities under separate development applications prior to VPT commencing work.

The increased footprint of the theatre is limited to these two small areas and thus it was agreed between David Horkan of City of Westminster (CoW) Planning Department and Alan McKenzie of Arts Team that Victoria Palace Theatre would need to submit the following:

- 1) A drainage proposal indicating a slight increase in surface water and how Victoria Palace Theatre will address this.
- 2) Reference to the Land Securities Flood Risk Assessment as submitted to CoW on 24<sup>th</sup> July 08 (with minor amendments)
- 3) Environmental Performance Statement – comprising FGP Stage D Report submitted to CoW on 8<sup>th</sup> July 2008 which is now augmented by the following sections.

## Environmental Performance Statement - Checklist of Environmental Effects and Sustainability (Numbering from Westminster UDP)

- I. Energy Efficiency; Vacant and underused land and buildings: ENV 1 and ENV 3
  - a) For energy efficiency and predicted carbon emissions refer to FGP Environmental Performance Statement and Stage D Report.
  - b) Achieving sustainable buildings: policy ENV 1

The reason for the proposed extension is to ensure that this historic theatre – Victoria Palace Theatre – can continue to effectively and efficiently perform as a theatre in contemporary London. VPT plays a significant role in London's cultural heritage, and its future would be assured with this extension. By maximising the retention of existing fabric and reusing or modifying the existing, the most sustainable solution has been developed. It is envisaged that this development will secure its use as a theatre well into the future.

### Heating

The heating is currently provided to the theatre by steam boilers. The proposal is to replace the current inefficient steam heating system with a low pressurised hot water system. Heat will be generated by new energy efficient condensing boilers, which will surpass the requirements as laid out in the third tier planning documentation, e.g. the NDHCVC 2006 Guide. The design will target a seasonal efficiency of greater than 84%, and will aim to minimise the associated NO<sub>x</sub> emissions.

### Domestic hot water

Domestic hot water will be independently generated by direct gas fired heaters. This enables the heating system to always operate in a condensing mode.

### Air Conditioning and Ventilation

A new roof mounted NDHCVC approved air cooled chiller will be provided in the plant area of the fly tower which will supply chilled water to the new supply air handling units and internal fan coil units. The chillers will be configured to operate on a free cooling cycle during mid season operation and during evening/late performance times.

The new air handling units serving the extension of the theatre will incorporate high efficiency, low resistance heat recovery devices to reclaim waste energy that would normally be exhausted from the building. In this way, cooling as well as heating energy can be reclaimed.

### Building Regulations Part L Calculation

A National Calculation Method compliant building energy model will be undertaken at detailed design stage to demonstrate compliance with Part L (Conservation of Fuel & Power) of the Building Regulations. The design approach at this time will 'build in' energy efficient enhancements that are in our control, e.g. variable speed drives on fans and pumps, higher temperature cooling and lower temperature heating and variable volume systems. Given the restrictions on the existing building fabric, enhancements to the fenestrations are difficult to achieve. The design will seek ways of improving the fabric insulation of the roof, walls and floors where possible whilst preserving the historic nature of the building.

### Fixed Internal Lighting

Where new office or other areas that involve predominantly desk based tasks areas are created or existing areas re-planned within the building new lighting will be provided with an average efficacy of not less than 45 luminaire - lumens/circuit watt over the area of these spaces within the building.

In all other areas where the building is extended or modified new lighting will be provided with an average efficacy of not less than 50 luminaire - lumens/circuit watt. Except in listed areas of the building where luminaires of the period will be installed.

Lighting controls will be provided to avoid unnecessary lighting during times when the spaces are unoccupied. Where dimming controls are provided they will reduce the energy supply.

c) Materials: policy ENV 1

The selection of materials for works to this listed building has been described and justified in the Design and Access Statement. The predominant external cladding material is a terracotta rainscreen cladding. The construction elements will be standardised and pre-fabricated off-site increasing the efficiency of on-site installation. The chosen manufacturer for this cladding is Terreal and their Environmental Statement highlighting their policy on energy use, waste and recycling follows this statement.

2. Air Pollution: Policy ENV 5

A Transport Assessment will not be prepared as part of this submission as agreed with CoW as there will be no change to the existing arrangement. Get-in to the theatre will be in the same location onto Allington Street and there will be no increase to audiences capacity.

a) Plant machinery etc

Two existing natural gas fired steam boilers will be replaced with new natural gas fired condensing boilers. We will aim to minimise NOx emissions with the new installation.

A new air cooled chiller is proposed for the theatre to serve new air handling units and fan coil units. The type of chiller has been selected for energy efficiency reasons. It will operate on a free cooling cycle during mid season and during late performances which will have a greater efficiency than the existing equipment.

No aspects of the development will cause odours to be released.

Refer also to FPG Stage D Report

- b) Risks to air quality: An asbestos survey has been completed and will be referred to in developing details at the next stage. Dust during demolition and construction will be controlled via strict contract measures and "Considerate Builders Scheme" – which will be defined in the construction contract.

### 3. Noise Pollution: Policies ENV 6 and ENV 7

New external plant will be selected to comply with CoW's noise level requirements. The design team includes a specialist acoustic consultant who will verify the equipment complies.

Refer to Appendix 7.2 in the Design and Access Statement: Stage D Acoustics by Arup Acoustics.

### 4. Contaminated Land

The history of the site since the mid 18<sup>th</sup> Century indicates that the existing and proposed extended site have not had any industrial use on them. At the end of the 18<sup>th</sup> century the site was still rural and through the 19<sup>th</sup> century was built on with housing and two public houses one of which was developed into the Royal Standard Music Hall in 1886. This was then redeveloped and extended in 1911 to become the Victoria Palace Theatre.

To the East of the VPT site runs what was once the River Tyburn a small tributary of the River Thames which effectively became an open sewer during the 19<sup>th</sup> century. This was culverted in the 1890s to become what is now known as the Kings Scholars Pond Sewer. The stage left wing and the foyer extension of 1999 are

built over this construction. There may have been some localised leakage from the sewer but none was found at the time of the foyer extension in 1999 and none has been reported by the VPT since then.

The proposal is for the existing theatre to be extended and the use will remain as a theatre with the same audience capacity, therefore it is anticipated that there will be no change to the current situation with respect to land contamination from building use.

See Section 12 below re archaeology which outlines the proposed redevelopment of the surrounding area of the VPT by London Underground and Land Securities prior to commencement of the VPT works. An investigation of the land prior to the start of the VPT works will seek to establish the presence of contamination of the land and as a result of the other redevelopment works.

## 5. Water Quality:

- a) No alterations to the existing building will affect any existing watercourses and there are no areas of open water in the vicinity of the site.

No changes to the building will be made which could cause pollution to surface water run off. All surface water will be collected from the building and discharged into the existing surface water drainage system.

The only marginal increase in surface area of the building is where the fly tower is to be extended. Surface water run off will be collected via the existing surface water collection system and discharged to the existing local authority drain.

Is our proposal in the flood zone? The site is located in central London approximately 1.2 kilometres North and West of the River Thames and is defended from flooding by the Thames tidal flood defences. The Environmental Agency Flood Zone Map shows that the site lies within flood zone 3a, i.e. land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or 1 in 200 or greater annual probability of tidal flooding (>0.5%). The EA have confirmed that they have no record of historical flooding from the (tidal) River Thames. The flood

zones noted above do not take account of flood defences. This site is defended up to the 1 in 1000 (0.1% annual probability flood level and gives this standard protection up to the year 2030.

Impact of the Development on Site Permeability – any increase in the impermeable surfacing over an area would represent an increased risk of flooding by increasing the runoff potential and rate at which surface water rainfall enters watercourses.

The existing site can be considered 100% impermeable. The proposed development comprising an extension to the building, primarily the existing fly tower to be extended to the rear of the site will be built on land which either has a small building on it or is a hard standing surface. There will, therefore, be no additional surface water discharge into the existing local authority drainage system than at present.

Refer to Flood Risk Assessment for VPT to be issued under separate cover.

- b) Water saving sanitaryware will be incorporated into the design where new toilets are provided and / or toilet areas are re-planned. For example dual flush cisterns, low flow taps and urinal economiser valves will be installed.

It is not intended to install sub metering of the domestic water as the building is not going to be sub-let.

Opportunities for making use of rainwater or recycling water have been considered. However it was found that with the limited expansion of the building, primarily the fly tower, there is little opportunity to accommodate the tanks and associated plant. The existing building is to be extended, primarily the fly tower which will only marginally increase the rain water collection. Given the building will be extended onto the site area at the rear of the building which is presently hard standing, overall the surface water collection will not be increased and therefore no additional measures are proposed to reduce the speed and volume of surface water run off. Extracting water from boreholes has not been investigated due to the building being existing and the disruption this would cause plus several existing and future London Underground tunnels and main sewers which run beneath the building.

6. Light Pollution:

There will be no change to the current external lighting of the VPT.

7. Waste and Recycling: Policies ENV 11 and ENV 12

- a) There will be no change to the existing arrangements for waste and recycling in the proposed scheme. (Note: there will be no increase in the number of people using the building).

With respect to the storage, recycling and transfer of waste as a result of the construction works, consideration will be given to this in the preparation of the construction phase documentation.

- b) Residential developments: Not applicable
- c) Developments that will generate large volumes of waste: Not applicable
- d) Developments with grassed or landscaped etc areas: Not applicable
- e) Developments with no smoking policies: Arrangements to be as existing
- f) Large developments: Not applicable
- g) Medical etc developments: Not applicable
- h) Achieving sustainable buildings: Prefabrication of standardised terracotta cladding system is being proposed for the external cladding of the extension. Other contractor designed elements and construction processes will be required to respond to the list of criteria described here from 1 to 8 as part of the contract.

8. Amenity, environmental quality, daylight and sunlight: Policy ENV 13

- a) Achieving sustainable buildings: Refer to Appendix 7.3 in the Design and Access Statement: Access Statement prepared by Innova Property Consultants Ltd which addresses Part M of the Building Regulations and BS 8300.
- b) Residential buildings: Not applicable



9. Open land: Policy ENV 14:

Not applicable as there is no open land on or in close proximity to the site.

10. Trees, Shrubs and landscape: Policies ENV 15 and ENV 16

- a) Not applicable
- b) There is no proposed landscaping that includes planting.
- c) The inclusion of green roofs was considered inappropriate on this historic building. The existing roofs have pitched areas and flat roofs have mechanical plant enclosures. The new flytower roof was considered too high for maintenance access and will probably be overshadowed by proposed tall buildings around it.

11. Habitat and wildlife: Policy ENV 17

- a) The site is within a dense urban environment with no green open space and the proposed building is an extension to an existing building in which there is no known habitat for wildlife.

12. Archaeology: Policy DES 11

- a) There are two areas of land which will become extensions of the VPT. The area of land currently to the East of VPT is occupied by 124 Victoria Street a late 19<sup>th</sup> / early 20<sup>th</sup> century building which will be demolished by London Underground (LU) to make way for the LU works referred to below. The VPT will be extended into a small area to the East of the foyer party walls to form new lift shafts for the VPT foyer. The area under the proposed new lift shafts will be within what was the basement of the building therefore there will be no archaeological remains to be disturbed in this area.

After demolition of the existing stage and flytower a new deeper stage and higher flytower will be built extending further North by 6m and a deeper understage and under stage pit will be excavated. The proposed understage area including the 6m extension will be at approx 1m below the existing understage area. Across the central 15m of the proposed stage and extending back to the line of the existing rear stage wall a new understage pit will be excavated at a level approximately 3m below the existing understage level. Beneath the level of these will be the strip foundation to the perimeter of the new stagehouse the bottom of which will be approx 4.85m below existing understage.

The land surrounding and underneath the site are the subject of two major proposed redevelopments. One is the Victoria Station Upgrade (VSU) described below and the other is the Victoria Transport Interchange (VTI) a major mixed development of the Victoria area by Land Securities. The VTI includes the sites immediately adjoining the VPT to the North and East.

London Underground (LU) has applied to the Secretary of State for a Transport and Works Act Order (TWAO) for the upgrade and extension of Victoria Underground Station (referred to as VSU). The project involves a substantial refurbishment and extension including new escalators and a new North ticket hall as well as new passenger and technical links and passageways and other spaces all underground. The proposed new North ticket hall is directly to the east of VPT and the proposed new escalators will rise beneath the rear wall of the existing stage. This work will have been carried out before the commencement of the VPT redevelopment.

As part of the mitigation proposals for noise and vibration as a result of the VSU works and to maintain stability of the VPT, LU are proposing to underpin the external walls of the VPT prior to commencement of their works. The proposed underpinning method is jet grouting which will mean that much of the area under the VPT will have been effectively 'frozen' with any archaeological remains within it. LU has submitted an Environmental Impact Statement as part of the TWAO for the VSU which describes their approach to archaeology and cultural heritage of the

site. The archaeological assessment carried out on behalf of LU has determined that the VSU site which includes the VPT is not within an Area of Special Archaeological Priority nor does it contain any Scheduled Monuments.

After the stabilising works to VPT certain areas under the VPT will be excavated for tunnels including the new escalator tunnel from the Victoria line platforms. The ground in this area above the London clay is made up of water bearing sands and gravel and has to be stabilised in order to tunnel. LU is proposing to do this by jet grouting the area outside the proposed tunnel which will affect the ground to a thickness of approximately 2m all round it. This will disturb and then again effectively freeze any archaeological remains that might be within it. Quite a substantial area under and in the vicinity of the VPT will be treated in this way.

In their Environmental Statement they describe the likely importance of the archaeology and geoarchaeology of the site and the mitigation strategies they propose which includes a suitable programme of archaeological investigation to achieve 'preservation by record' in areas where archaeological remains cannot be preserved.

All of this work is outside of the control and scope of VPT.

The redevelopment of VPT will commence after the completion of the VSU works. When the VPT stagehouse is demolished much of the underpinning installed by LU will be excavated out to allow for the extension. At this point an evaluation of the archaeology of any remaining undisturbed areas to be excavated will be made and a strategy for recording the archaeological investigation will be developed in response to this.

In the year 2000 VPT underwent a limited redevelopment within its own site building over the Kings Scholars Pond Sewer. The extension structure was built into the foundations of 124 Victoria Street. No discoveries were made during excavations for this development with respect to previous use of the site.

## ENVIRONMENTAL STATEMENT FROM TERREAL re Terracotta Rainscreen Cladding

At Terreal, we are well aware of environmental concerns, and we opted for a pro-active approach on this issue. Our commitment to an environmentally-friendly production encompasses the following elements.

### The Choice of Raw Materials

Our tiles, exclusively made of terracotta, present very interesting and “age-resistant” properties. Terracotta is a natural and rot-proof material, with well known acoustic and thermal qualities. Regulations on refuse products classify Terracotta as an inert material:

- On April 18th, 2002 French Government Decree regarding the classification of refuse materials in France;
- 1999/31/EC European Directive, defining “inert products” as “products that do not incur any major physical, chemical or biological modification” throughout their life.

### The Manufacturing Process

1. Natural gas is the only fossil energy employed in our factories because of its lower level of Greenhouse effect gas emissions (exclusively CO<sub>2</sub> and H<sub>2</sub>O).
2. Major investments to reduce kiln smoke and gas emissions have been made during the last several years (in accordance with February 2nd, 1998 French Government Decree).
3. All waste is treated or recycled; liquids are reused in the production line and other waste is sorted for either recycling or re-evaluation (non-recyclable refuse is transferred to a proper disposal centre).
4. Our policy is to rehabilitate open quarry sites as often as possible.
5. From 2005, at least 25% of our electrical supply comes from renewable energies (i.e.: hydraulic, photovoltaic, windmills...), that is above the 2010 target of 21% for renewable sources of electricity in France (and 15% in 2004).

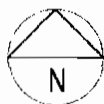
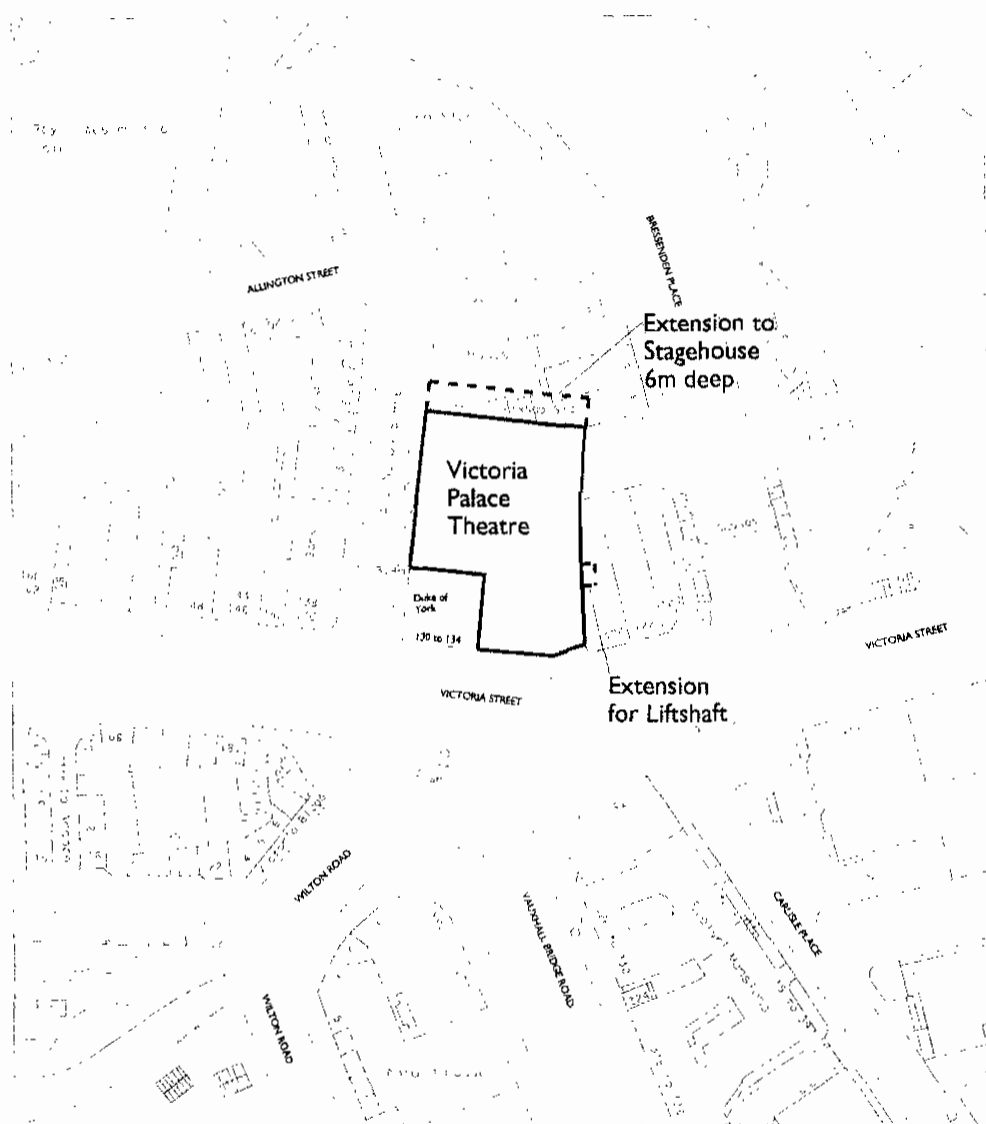
## The Protection of Landscapes

Because the respect of the environment also means a harmonious integration of your home in the local architectural style, Terreal assists you in your choice by finding the best tile aspects in use in your region among the range of 56 models available in more than 300 colours.

## The Thorough Knowledge of our Activities' Environmental Impact

Today, our Terracotta tiles have been studied to determine their environmental impact during their entire life cycle. This study, carried out by the French Federation of Tile and Brick Manufacturers, answers to the 14 environmental objectives - including environmentally friendly constructions and economic choices - described in the HQE® approach (see below).

*HQE®, the French label for an ecologically-friendly architecture, is a global approach to accompany development projects, renovations or new constructions, of any size, with a view to sustainable growth. It aims at taking into account the impact of these constructions on the Environment. Our life cycle survey follows the protocol of XP-P01-010 international norm.*



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<b>CHECKED BY</b>	<b>DATE</b> Sept 08	<b>DRAWING NO.</b> 10980 / SK21	<b>TITLE</b> Location Plan Showing Proposed Extensions



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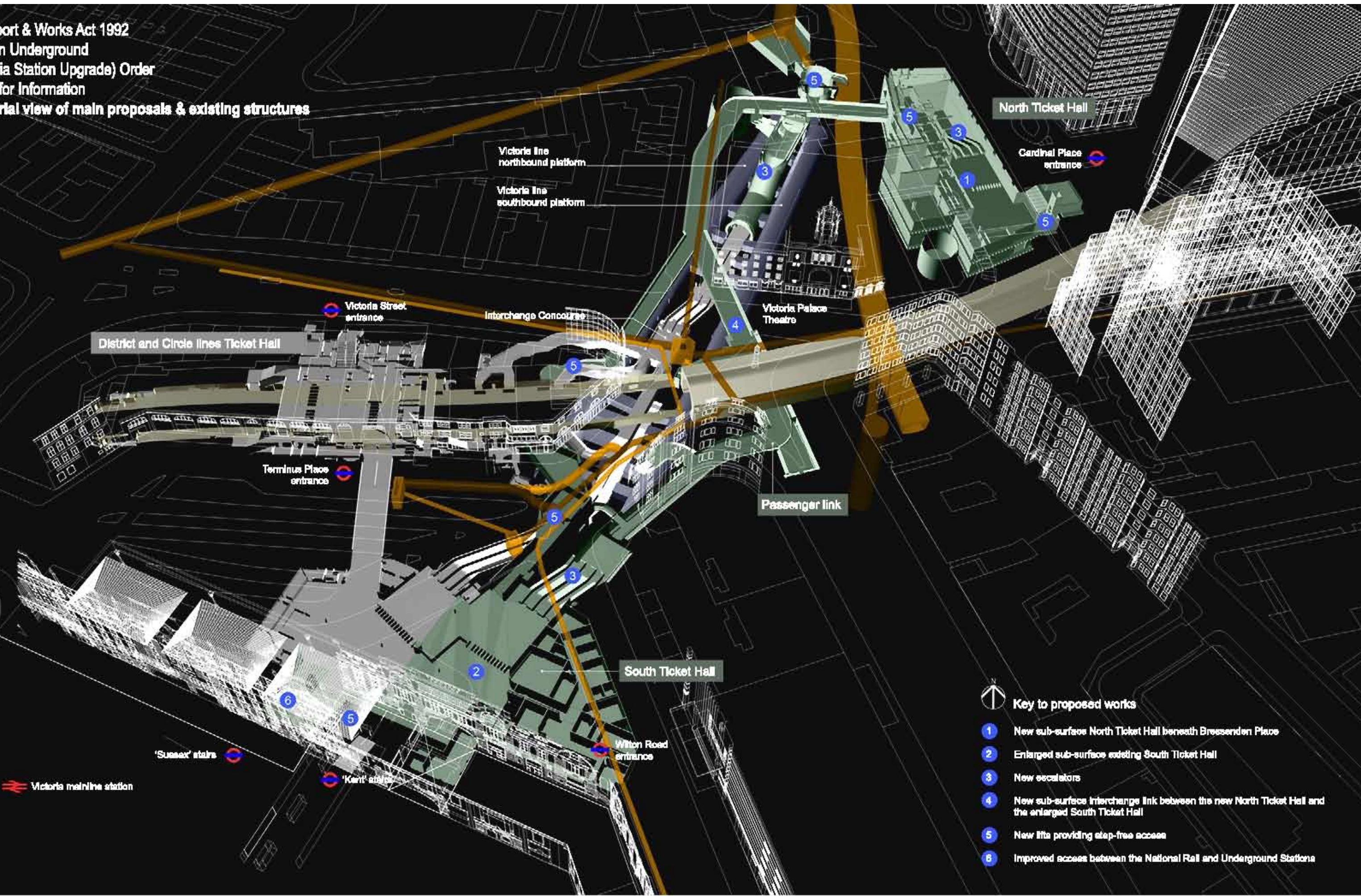


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## Appendix 4

3D aerial view of the revised VSU proposals prepared by LUL

Transport & Works Act 1992  
 London Underground  
 (Victoria Station Upgrade) Order  
 Plans for Information  
 3D Aerial view of main proposals & existing structures



- Key to proposed works**
- 1 New sub-surface North Ticket Hall beneath Bressenden Place
  - 2 Enlarged sub-surface existing South Ticket Hall
  - 3 New escalators
  - 4 New sub-surface Interchange link between the new North Ticket Hall and the enlarged South Ticket Hall
  - 5 New lifts providing step-free access
  - 6 Improved access between the National Rail and Underground Stations



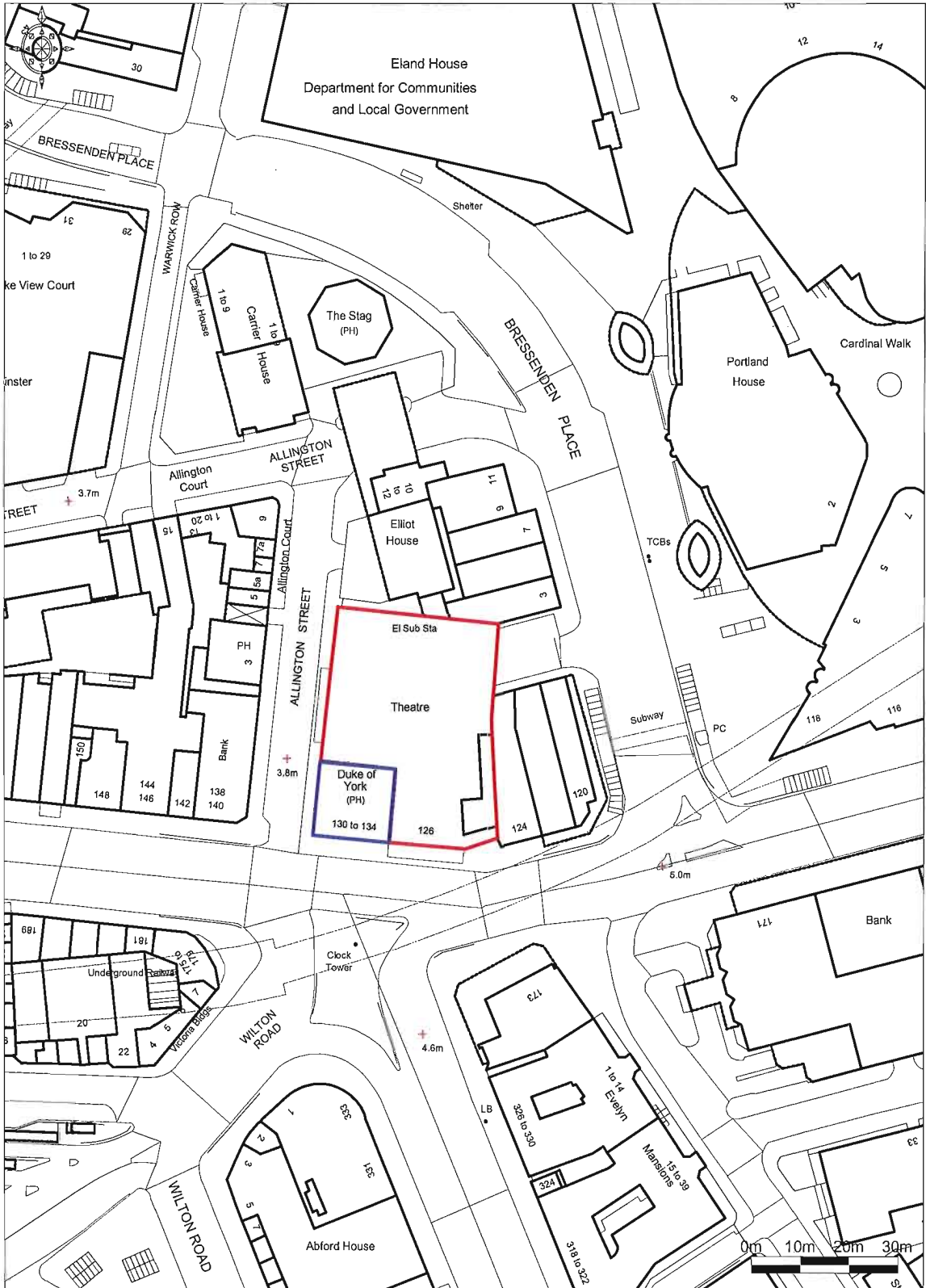


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## Appendix 5

### Site Plan - Victoria Palace Theatre

# Appendix 5 Site Map Victoria Palace Theatre



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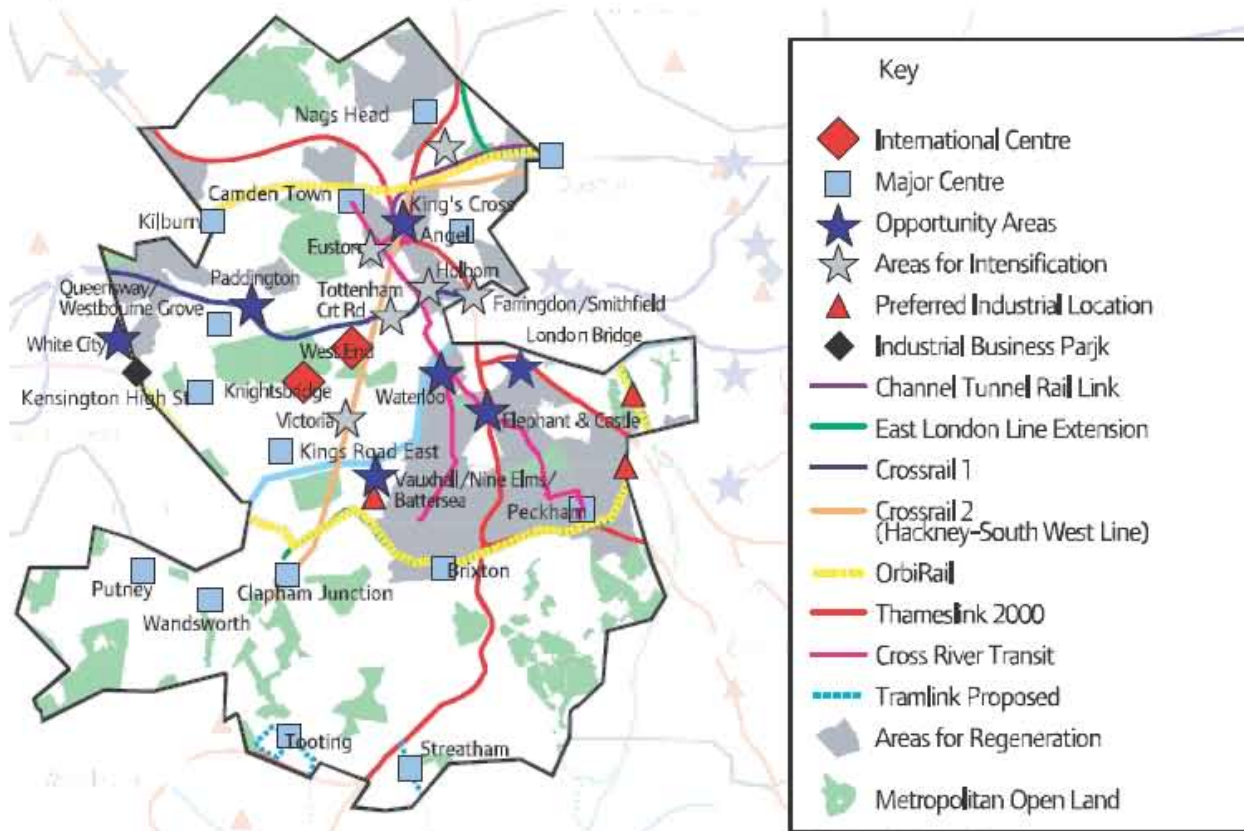
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## Appendix 6

Consolidated London Plan Map 5B.1

North London sub-region: Source GLA

map 5B.1 Central London sub-region



source GLA 2002

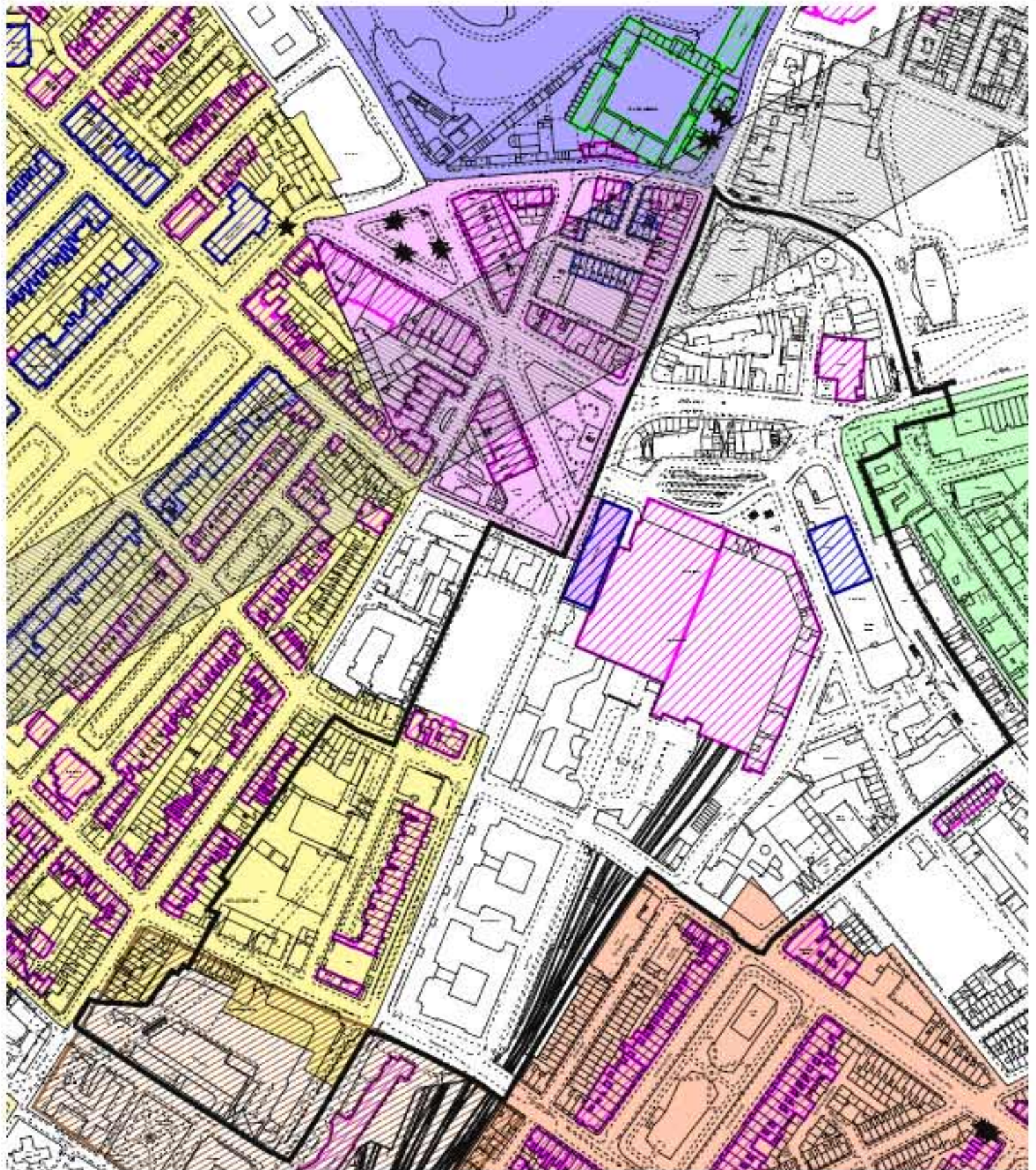


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## Appendix 7

Victoria Area Planning Brief, SW1, adopted April 2006  
Westminster City Council. Map 6 (Landmark Buildings)

# Victoria Station - Listed Buildings, Conservation Areas & Strategic Views Map 6



Brief Boundary

Area of Archaeological Importance

Strategic View Corridor:

King Henry VIII's Mound,  
Richmond to St Paul's  
Cathedral

Conservation Areas:

- Belgravia
- Grosvenor Gardens
- Pimlico
- Royal Parks
- Westminster Cathedral

Listed Buildings:

- Grade I
- Grade II\*
- Grade II

Listed Street Furniture

Source: UDP as agreed  
by Full Council, 13th December 2004



0 100 Metres

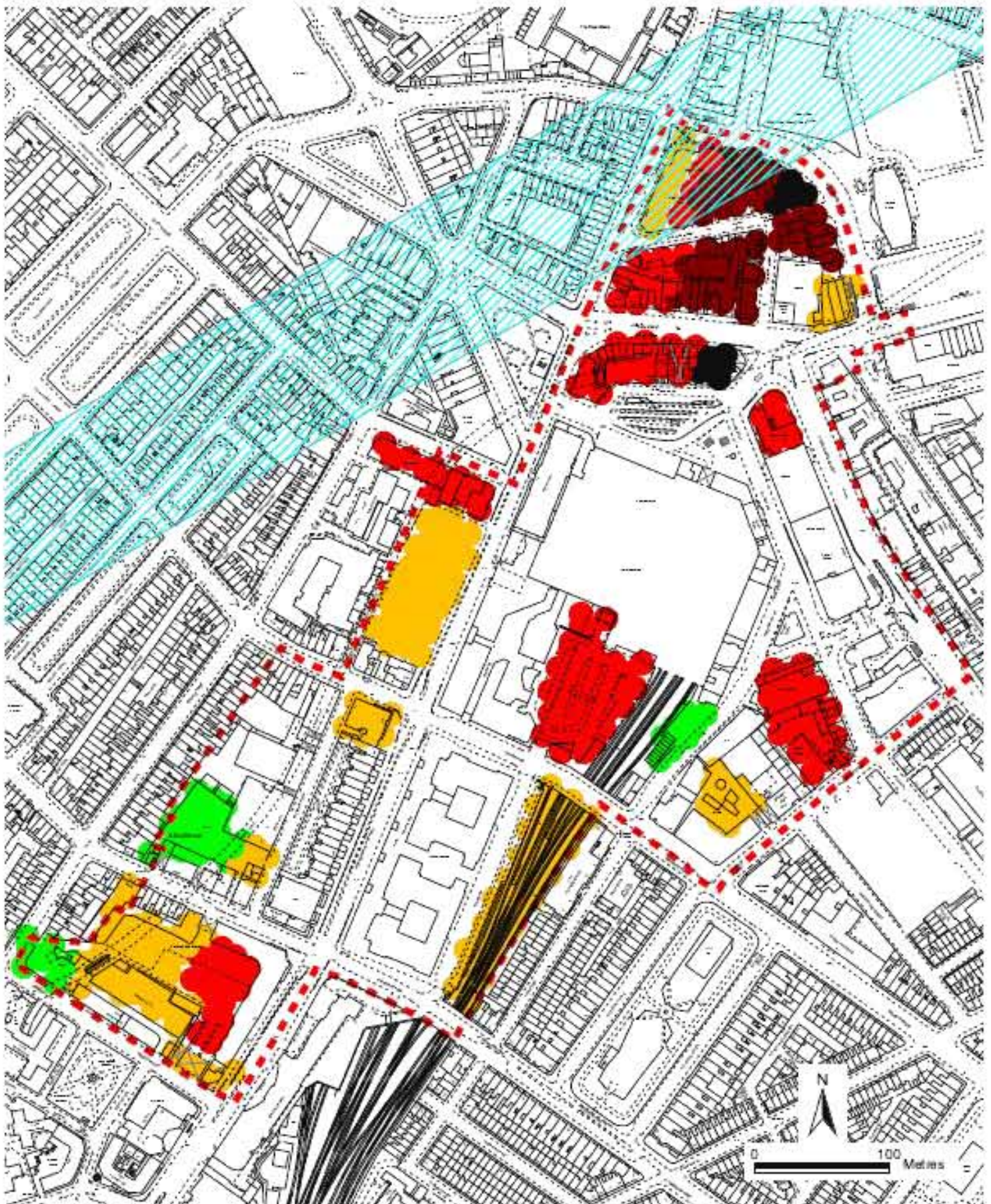




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## Appendix 8

Victoria Area Planning Brief, SW1, adopted April 2006

Westminster City Council. Fig 3, General Guidelines on Height



-  Brief Boundary
-  Strategic View Corridor

- Storey Height Range:
-  2-4
  -  5-7
  -  8-10
  -  10-12
  -  12+

\*Where tall elements may be appropriate as part of a composite mass scheme providing transport impacts, only 1 building of 12+ storeys would be acceptable, in either of the locations identified, not both.

Typical storey heights vary between 3 and 4m.





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## Appendix 9

Victoria Area Planning Brief, SW1, adopted April 2006

Westminster City Council. Fig 10, “Generic” Plan

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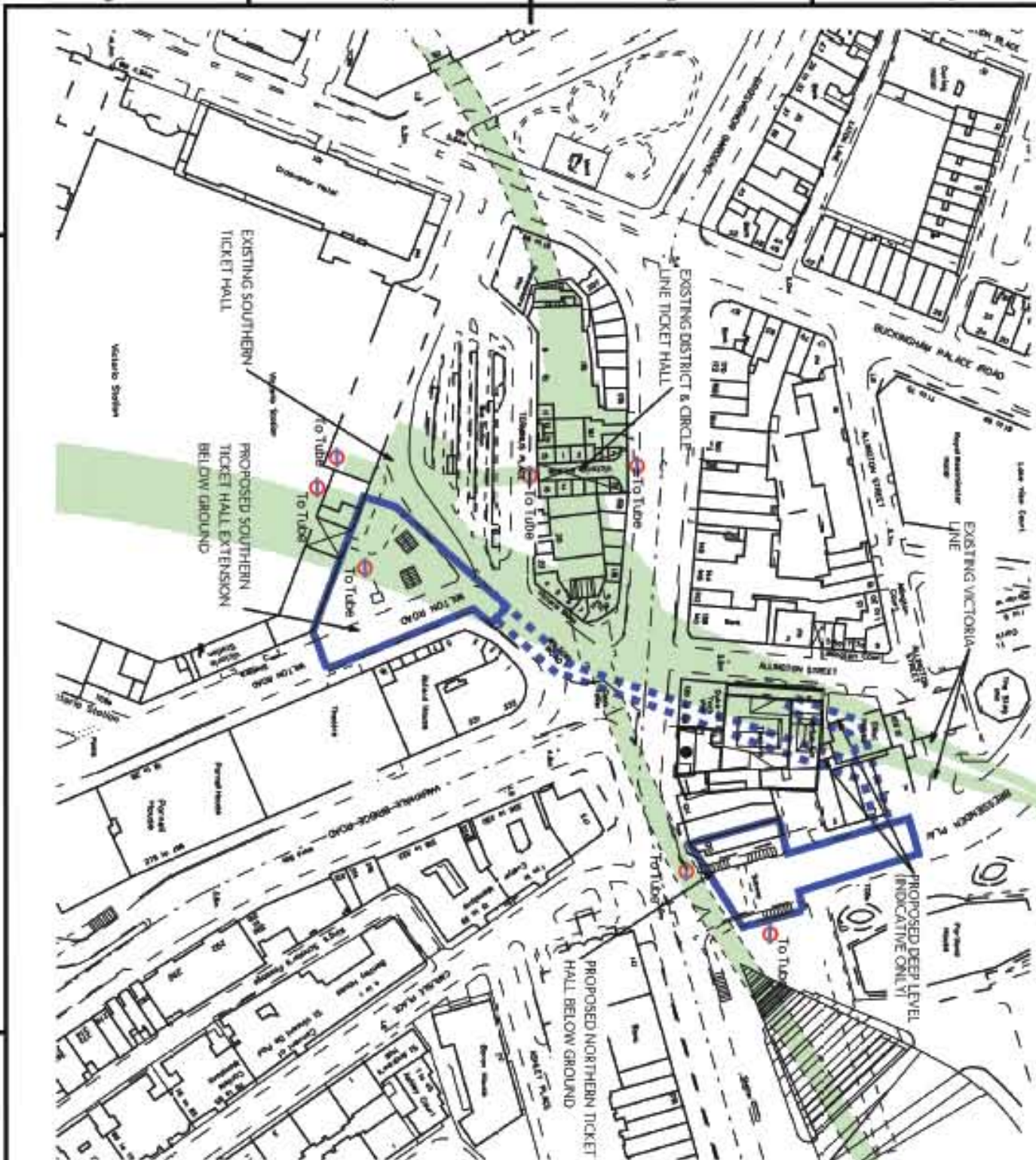


Figure 10

<p><b>KEY</b></p> <p>Existing</p> <p>Proposed</p>	
<p><b>SITE</b></p> <p>VICTORIA STATION</p>	
<p><b>TITLE</b></p> <p>UPGRADE PROJECT FOOTPRINT</p>	
<p><b>London Underground Limited</b></p>	
<p>Document Code</p> <p>Rev. No.</p>	<p>Drawn No.</p> <p>4</p>



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Appendix 10

Joint letter – Land Securities and Victoria Palace Theatre to  
Westminster City Council, 13<sup>th</sup> October 2008

**Land Securities**  
5 Strand  
London  
WC2N 5AF

**Victoria Palace Theatre**  
Victoria Street  
London  
SW1E 5EA

Mr G King  
Head of City Planning  
WCC  
City Hall  
64 Victoria Street  
LONDON SW1E 6QP

Dear Graham

**Proposed London Underground (Victoria Station Upgrade) Order and Land Securities' Option 1A route for and method of construction of the tunnel to form the Paid Area Link (PAL)**

Both Land Securities (LS) and Victoria Palace Theatre (VPT) consider it appropriate to make this joint representation to you concerning the above proposed Transport and Works Act order (VSU Order).

We are both objectors to the VSU Order on a number of different points, and would like to place on record with you our joint view that the LS Option 1A route for and construction method of the PAL (as shown on Plan 1 annexed to this letter and as further referred to in the LS' evidence submitted in respect of the impending VSU Order inquiry) is a preferable alternative to the form of the PAL promoted in the VSU Order as currently proposed by London Underground Limited (LUL). For ease of reference, we also enclose a plan showing the route for the PAL along Allington Street as proposed by LUL in its VSU Order application.

In summary, LS Option 1A is an alternative route for the PAL beneath the VPT and utilises a closed face tunnelling machine (that provides positive support to an excavated tunnel face) to construct the PAL, which in turn deliver an upgrade of the Victoria Underground Station in a form which is acceptable to both VPT and LS. This tunnelling method is a commonly used technique for the formation of tunnels through permeable and unstable ground (as exists at Victoria at the level planned by LUL for this tunnel).

It has been used recently in London for the DLR tunnel under the Thames to Woolwich, the two tunnels under the Olympic Park at Stratford (that allow the power-lines to be diverted underground) and also the London tunnels for the Channel Tunnel Rail Link. It is proposed for substantial lengths of the Crossrail tunnels under London where they run through less stable strata.

The following are some of the principal benefits of Option 1A when considered against the route of the PAL and the construction method proposed by LUL in the VSU Order application (the list is in no particular order and is also by no means exhaustive):

1. This method is much safer and carries significantly less risk than the method proposed by LUL, which is a development of the New Austrian Tunnelling Method (NATM), known as Sprayed Concrete Lining (SCL) – the technique associated with the collapsed tunnel at Heathrow. You will no doubt have seen from LS' evidence that they hold grave concerns about use of this method in the VSU Order area given the type of ground conditions prevalent there. In particular, the LUL proposals carry with them a risk of tunnel collapse with consequent health and safety implications, as well as a risk to the stability of the adjoining Grade 1 Listed VPT (to which large numbers of the public

regularly have access). If a collapse were to occur, this would have serious programme and cost to the public purse implications;

LUL has seriously underestimated the risks to the structure of the Theatre, and indeed has conducted its ES and SES on a completely wrong basis. It believed the masonry of the theatre to be load bearing when in fact the loads are borne by steel stanchions, with the consequence that settlement will have a far more serious impact on the structure of the Theatre than appears in either the ES or SES;

2. There would be much less need for jet grouting, a process which causes significant noise and vibration as well as surface disruption, and which will have a very material effect on VPT's ability to run their business during the construction of VSU. In addition, the jet grouting will result in permanent physical connection of the VPT to the Victoria Line running tunnels, which will cause vibration to the VPT, the magnitude of which could result in permanent closure of the VPT.

LUL has significantly underrated the importance of VPT as a Grade 2 Listed Building, as an important element in London's Theatreland, and a significant social and cultural element in Victoria

3. It would avoid many of the expensive service diversions required. Not only would this benefit the VSU scheme itself in terms of time and cost, it would also reduce the impact to the Victoria area in terms of road closures (whole or partial) and street works;
4. It is potentially a quicker method of tunnelling that will have time and cost savings for VSU – the time savings also having advantages for local residents and businesses;
5. Option 1A avoids the need to close and work in Allington Street. Such closure and working has safety implications for the VPT whose emergency escape route is onto Allington Street;
6. It will allow LS simultaneously to build VTI2, Permission 1 (buildings 5, 6b and 7a), with the VSU project, as the Option 1A route does not impact on LS' ability to build its scheme. In turn, this speeds up delivery of regeneration in Victoria and will reduce the period of disruption to residents, the VPT and local businesses by a minimum of 4 years; and
7. It will lead to less settlement underneath VPT and the central Victoria area. This means that there is a reduced risk of land subsidence and distress/collapse of buildings.

The route of the PAL pursuant to the VSU Order is of grave concern to both LS and VPT. This concern is aggravated by the proposed use by LUL of SCL, which is obviously unsuitable given the specific ground conditions of this area.

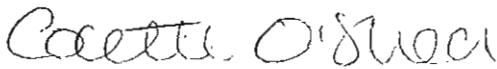
It should also be noted that LS are proposing, as part of their Section 106 obligations, to make available to VPT a 6 metre deep strip of land to the rear of the VPT. This land will allow a much needed extension to the VPT thereby increasing the type and range of productions. A Planning Application for this extension and other works was submitted to WCC during the summer of 2008. In order to construct this extension and not impair the acoustics of the VPT, it is believed that the proposed LUL escalators should be positioned further to the North.

Both VPT and LS accept and commend to Westminster City Council LS Option 1A and the re-located escalators as a way to deliver the transport benefits of VSU without the significant level of cost and risk associated with the VSU scheme (as currently promoted), in terms of (in brief summary) the:

- (a) risk of irreparable damage being caused to the structure of the Grade 2 listed VPT, and its business that would ensue from the proposed tunnelling method and jet grouting, both during and after construction;
- (b) delay to regeneration through LS' VTI 2 scheme;
- (c) increase of costs of VSU due to the level of compensation due to LS for delaying VTI 2;
- (d) prolonged disruption in the local area;
- (e) risk of tunnel collapse resulting in injury to persons; and
- (f) unnecessary service diversions.

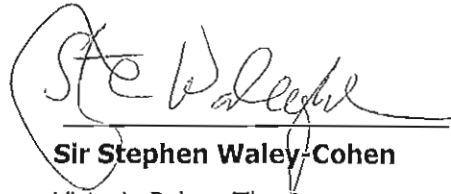
We should be pleased to provide the Council further information on Option 1A, should you require it.

Yours sincerely,



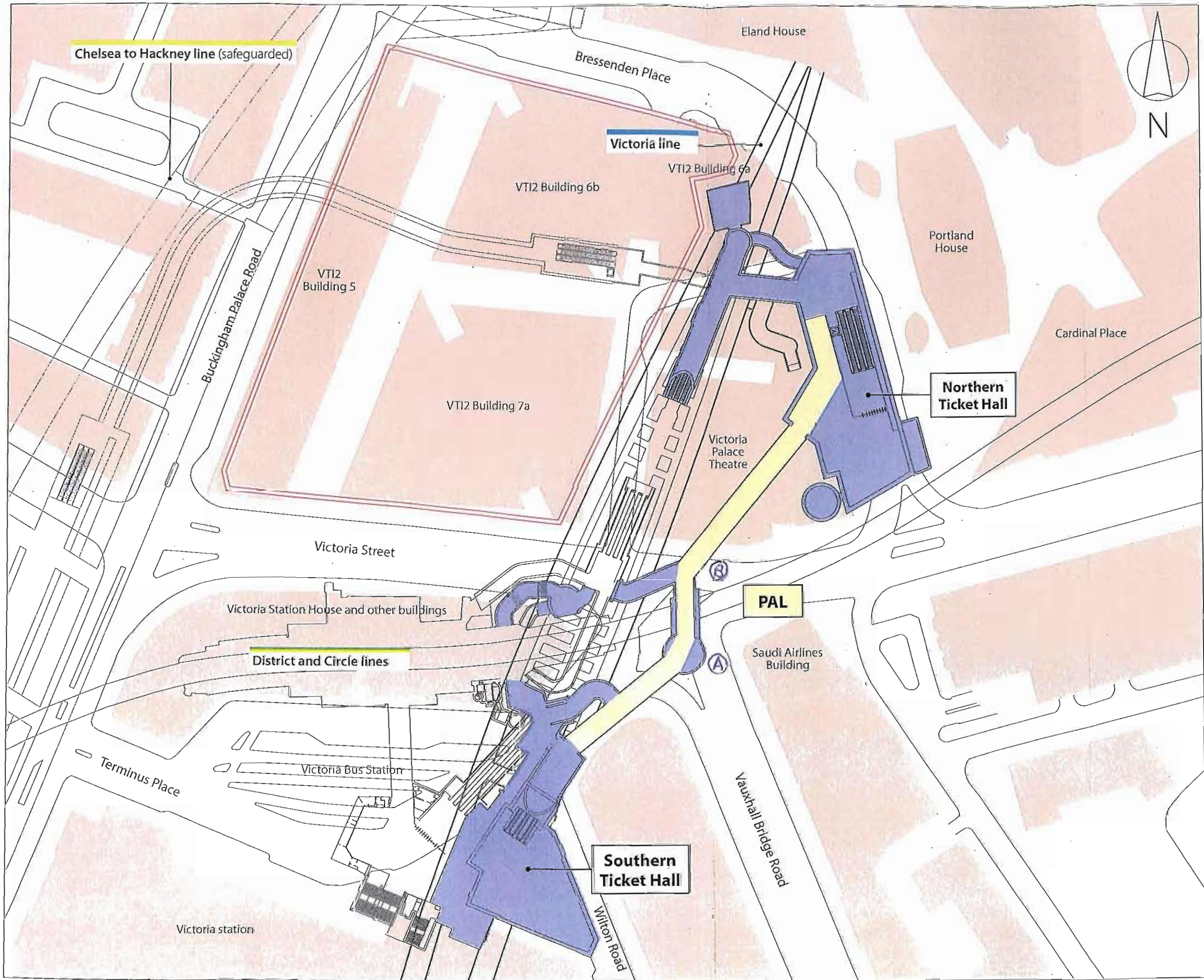
**Colette O'Shea**

Development Director, Head of Development  
London Portfolio



**Sir Stephen Waley-Cohen**

Victoria Palace Theatre



**Key**

- Extent of VSU works
- Paid Area Link (PAL)
- VT12 Basement Outline

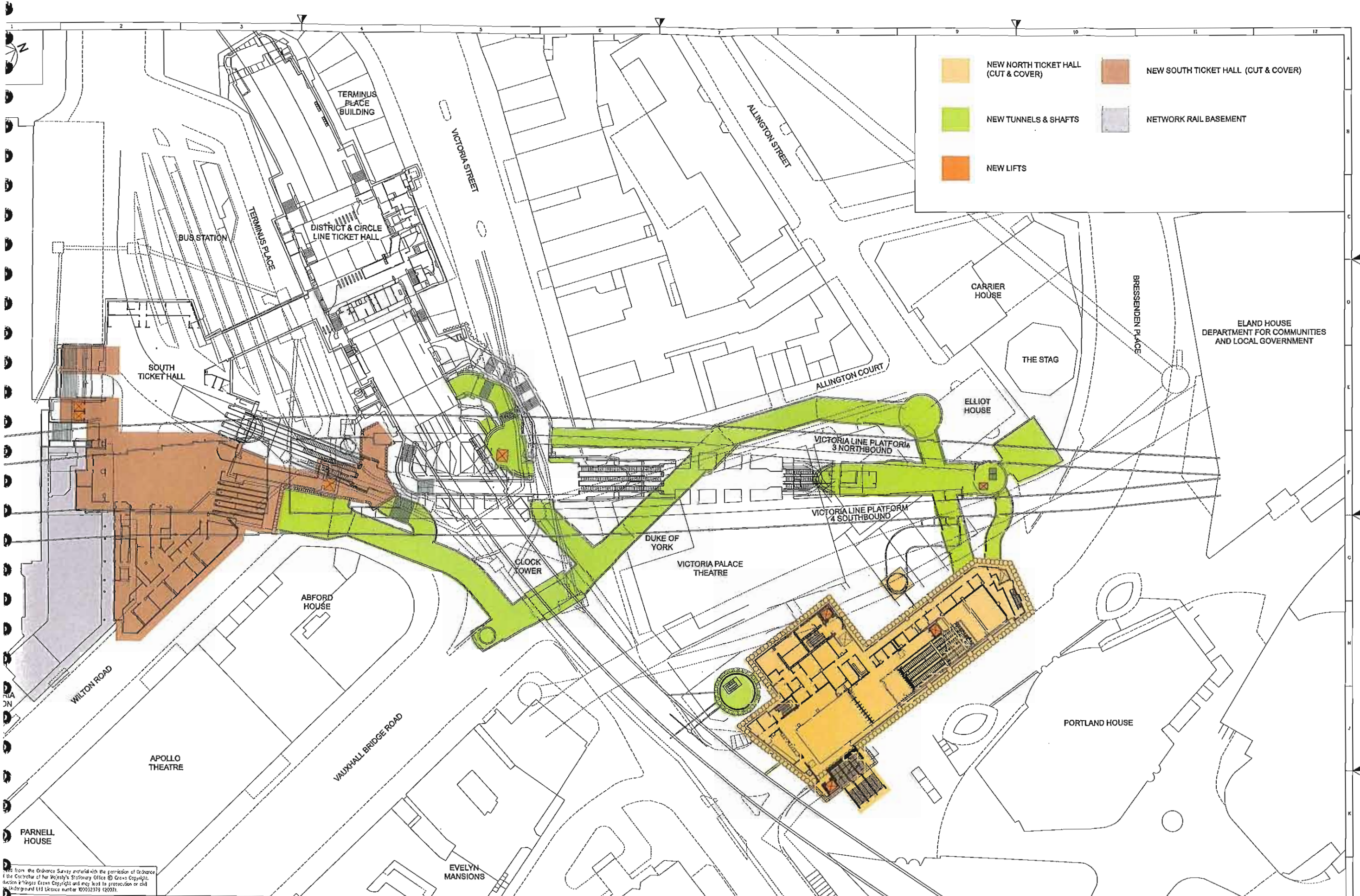
0 5 10 20 metres 50

Scale 1:1000 at A3

**OBJ3/P3**  
 Evidence of Tim Chapman  
 Land Securities

**EXHIBIT 12**  
 Land Securities  
 Option 1A layout

ISSUED 10/10/08



	NEW NORTH TICKET HALL (CUT & COVER)		NEW SOUTH TICKET HALL (CUT & COVER)
	NEW TUNNELS & SHAFTS		NETWORK RAIL BASEMENT
	NEW LIFTS		

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E11 REV	TWA ISSUE	23/07/2008	PK	JAM	JS	ML
	DESCRIPTION	DATE	CHK	BY	CHKD	APVD

STATUS
CAD MODEL TOLERANCES
MODEL VERSIONS

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London Underground  Victoria Station Upgrade			
TITLE			
SCOPE OF WORKS			
MASTER MODEL COMMIT DATE	SCALE @ A1 N.T.S. (1:400)	DRG No. MMD-V047-1159-GEN-DRG-50001	REV E11