Development Control
Planning Services
London Borough of Camden
Town Hall
Argyle Street
London
WC1H 8ND

23 May 2007

Reading Room Jade Ring
Design Statement for the Listed Building Application

Introduction / Brief History

The British Museum is planning a season of two significant exhibitions exploring the nature of Imperial Power in the East and West, starting with the First Emperor China's Terracotta Army who established the Chinese Empire and followed by an exhibition on the Roman Emperor Hadrian under whose reign the Roman Empire reached its greatest extent. The exhibition season will last from September 2007 to October 2008.

The British Museum has received listed building consent to erect a temporary stage within the Round Reading room and the opening of the reading room North door in order to provide a temporary exhibition space. London Borough of Camden reference number 2006/3731/L

As part of the exhibition design the British Museum wishes to install an additional temporary structure within the stage structure to support a jade ring above the platform. The jade ring will be removed when the temporary stage is taken down at the end of the exhibition season and the museum will reinstate the reading room. The jade ring will not be fixed to the historic fabric of the reading room.

The jade ring will be fabricated from a combination of steel, timber and fabric. It will support services such as lights, cameras and projectors. The jade ring is designed to help define the exhibition space and provide some acoustic

deadening. The jade ring covers a relatively small area of the stage and will no prevent the view of the ceiling.

Structural Considerations
Structural engineers, Alan Baxter associates, have considered the existing floor construction and set strict parameters that need to be adhered to by the staging designer and the fabric ring designer. Atelierone have designed the temporary stage within these parameters and have worked with ARUP, the jade ring designers to ensure

co-ordination with design and the permissible loads on the existing floor are not exceeded.

Emergency Escape
The emergency escape and fire implications of the jade ring have been reviewed by Lawrence Webster Forrest, the Fire Engineers for the museum. The ring will not affect the fire evacuation plan as originally design for the temporary stage.

Design Statement
It is proposed to install the low level and high level spreader structure under the temporary stage. The new spreaders will not interfere with the temporary stage structure and will not be fixed to the historic fabric of the space. Six columns will be installed to support the ring and the ring will be installed.

The ring will be removed at the end of the exhibition season.

I look forward to hearing from you shortly

Simon Neale
Head of Capital Projects and Estates

Attachments
Temporary Structure Design,
Advice By Atelierone

Temporary Structure Design
Advice by ARUP

Fire Protection
Advice By Lawrence Webster Forrest (LWF)

Appendices/ Drawings

As existing
PMT Drawing 230838-006 Rev B
ABA 699/301/13 April 2006

As proposed
ARUP 75744-61 S001 - Rev T1
ARUP 75744-61 S003 - Rev T2
Metaphor 100-006
Metaphor SK 001
Metaphor SK 002

Your ref CI
Our ref 75744-61/JT
Date 21 May 2007

13 Fitzroy Street
London W1T 4BQ
Tel +44 (0)20 7636 1531
Fax +44 (0)20 7755 5389
Direct Tel +44 (0)20 7755 2789
jens.tandler@arup.com

www.arup.com

Caroline Ingham
Senior Designer
Department of Exhibitions
The British Museum
Great Russell Street

ARUP

Dear Caroline

Jade Ring
Structural Design Statement for the Jade Ring in the First Emperor Exhibition

We confirm that the structural design of the Jade Ring and the structural design of the Stele (an exhibit designed to look like an upright slab for commemorative purposes) has been undertaken by us according to current codes of practices and the building regulations.

These structures, namely the ring and the stele, have interfaces with the raised steelwork deck designed by Atelier One which forms the temporary floor of the exhibition. The stele sits completely on the raised steelwork deck and the ring is laterally restrained by the steelwork deck. The vertical load of the ring is transferred directly down to the original floor of the British Library Reading room. The interfaces, i.e. connection details, forces transferred and the required stiffness have been agreed with Atelier One. Atelier One is the designer carrying responsibly for the overall stability of the structure (see also British Standard 5950-1:2000 2.1.1.2) as the ring and the stele are attachments to the raised deck.

The maximum vertical load of the ring that we are imposing on the original Reading Room floor at any one location is not greater then 300kg. This is a limit requested by Alan Baxter Associates, who have assessed the load carrying capacity of the existing reading room floor.

The design of the ring and the stele is a temporary installation and will be removed at the close of the exhibition.

Yours sincerely

David Lewis
Director

Jens Tandler
Structural Engineer

Ove Arup & Partners Ltd
Registered in England Number 1312453
13 Fitzroy Street London W1T 4BQ

LWF
Lawrence Webster Forrest
Fire Engineering & Fire Risk Management Consultants

Legion House, 75 Lower Road, Kenley, Surrey CR8 5NH Tel +44 (0)20-8668 8663 Fax +44 (0)20- 8668 8583 email fire@lwf.co.uk http://www.lwf.co.uk

Mr. David Meinck

Capital Projects & Estates

The British Museum

Great Russell Street

London WC1B 3DG

Dear David,

Re: First Emperor Exhibition, Jade Ring

We reviewed the submitted information about the Jade ring.

In the event of a fire in a location on the platform below the Jade ring, the ring is considered to be an obstruction within the rising plume of the fire. Smoke would raise buoyantly driven, flow along the soffit of the ring section above the fire location and would then spill over its edges. The disturbance of the buoyantly driven vertical rising of the smoke due to the ring would cause additional turbulences at the edges of the ring and as such entrain a slightly higher amount of ambient air into the plume. Hence, the smoke volume will be increased in comparison to a design omitting the Jade ring.

However, the worst case fire scenario that has been considered to calculate the time available for a safe evacuation is located at ground level of the RRR and not on the higher platform level. Due to the greater rising height and in accordance with BRE 368 the smoke volume that has been assumed as worst case scenario is approximately 20% greater than the smoke volume produced by a fire at platform level (considering an identical fire load in both scenarios).

The fact that the smoke volume of a platform fire below the Jade ring will slightly increase due to additional air entrainment at the Jade ring is therefore deemed to be acceptable as the smoke volume will not exceed the volume considered for the initial worst case scenario calculations.

As such, from a fire safety point of view there are no objections to the provision of the Jade ring as proposed.

Kind Regards,

Markus Cosmann *Dipl.-Ing. VDI*
Senior Fire Engineer

atelier one

4 Goodge Place, London W1T 4SB
Telephone: 020 7323 3350
Fax: 020 7636 3350
E-MAIL: mail@atelierone.com

22 May, 2007 1578/CB/cb/3337

David Meinck
Project Manager
The British Musuem
Great Russell Street
London
WC1B 3DG

Dear David,

PROJECT 1578 – BRITISH MUSEUM ROUND READING ROOM

Further to your recent request we return the following information regarding the loads applied by the Jade Ring onto the existing structure of the Round Reading Room at the British Museum.

The Jade Ring consists of circular steel and timber construction to be erected above the platform. This construction is supported by 6No. columns evenly spaced around the circumference of the ring. The design of the ring, supporting columns and their associated spreader beams has been undertaken by Arup who have supplied reaction loads to Atelier One.

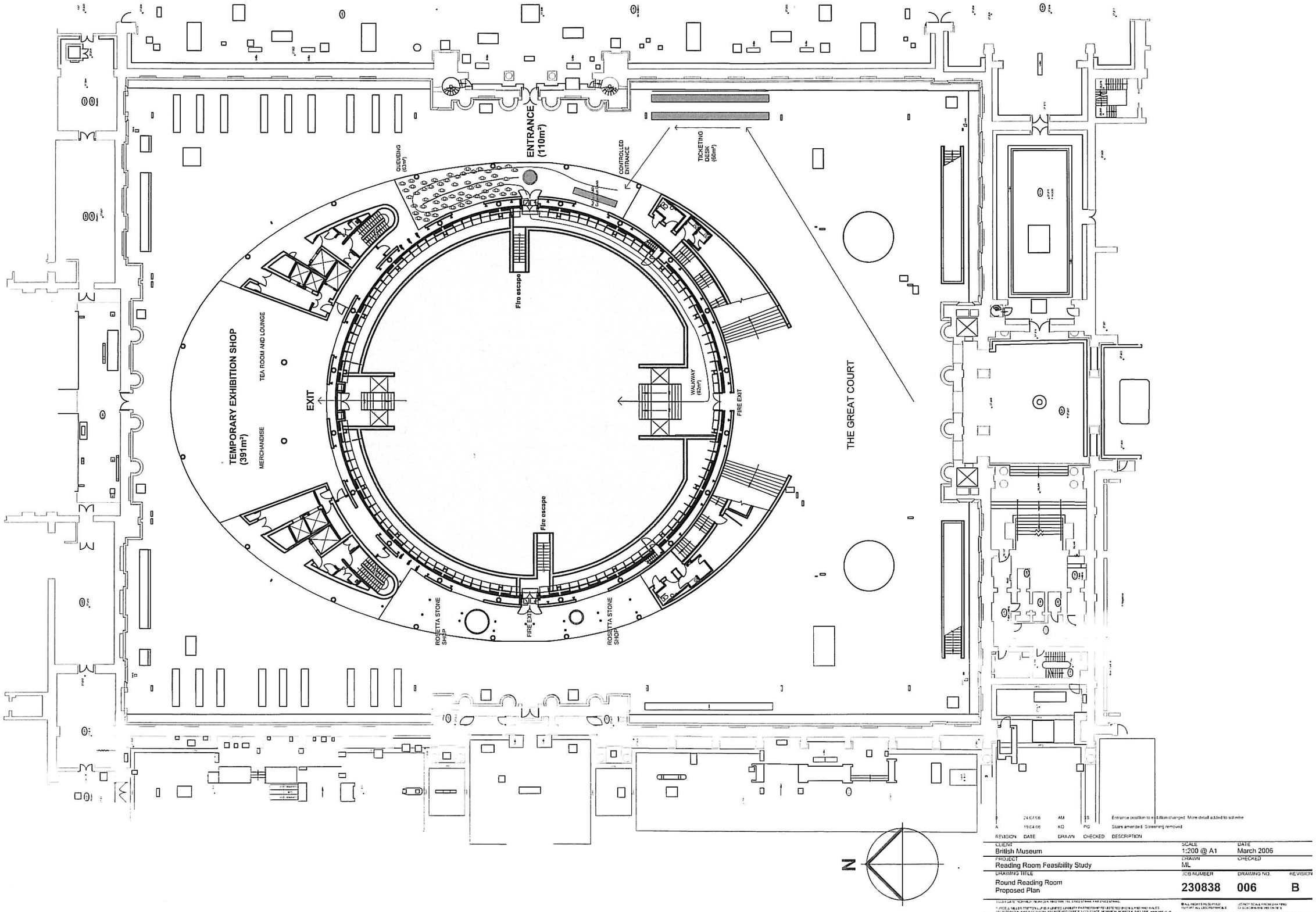
The maximum vertical reaction load is 46kN which is to be supported by a spreader beam. The spreader beams are located so that they are supported at two points by the spider walls of the existing building, therefore imposing a load of 23kN onto the spider walls.

The limiting load that can be carried by the spider walls is 30kN with a minimum spacing of 1m between adjacent point loads. This load allowance has been supplied by Alan Baxter and Associates.

The positions of the Jade Ring spreader beams have been generally located at distances greater than 1m from the spreader beams supporting the platform therefore loads applied to the spider walls comply with the loading restriction. In 2No. instances the Jade Ring spreader beams are located immediately adjacent to platform spreader beams but in this instance the combined load of both pieces of structure does not exceed 30kN.

Yours sincerely,

Dr. C.J. Brown
Associate

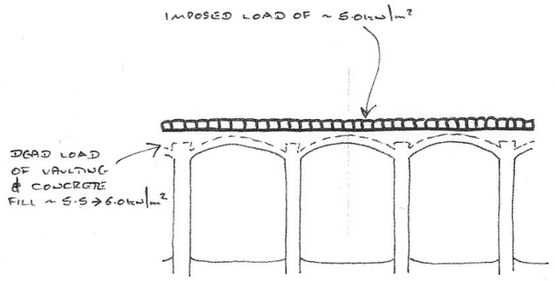


REVISION	DATE	DRAWN	CHECKED	DESCRIPTION
B	24.07.06	AM	JS	Entrance position to exhibition changed. More detail added to scheme
A	19.04.06	KO	PG	Stairs amended. Screening removed

CLIENT: British Museum	SCALE: 1:200 @ A1	DATE: March 2006
PROJECT: Reading Room Feasibility Study	DRAWN: ML	CHECKED:
DRAWING TITLE: Round Reading Room Proposed Plan	JOB NUMBER: 230838	DRAWING NO.: 006
		REVISION: B

PURCELL MILLER TRITTON

Notes:



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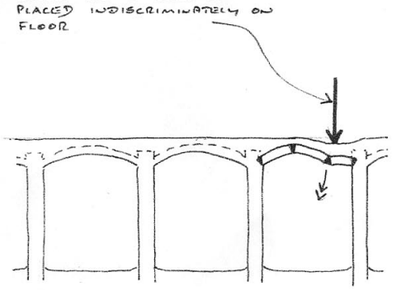
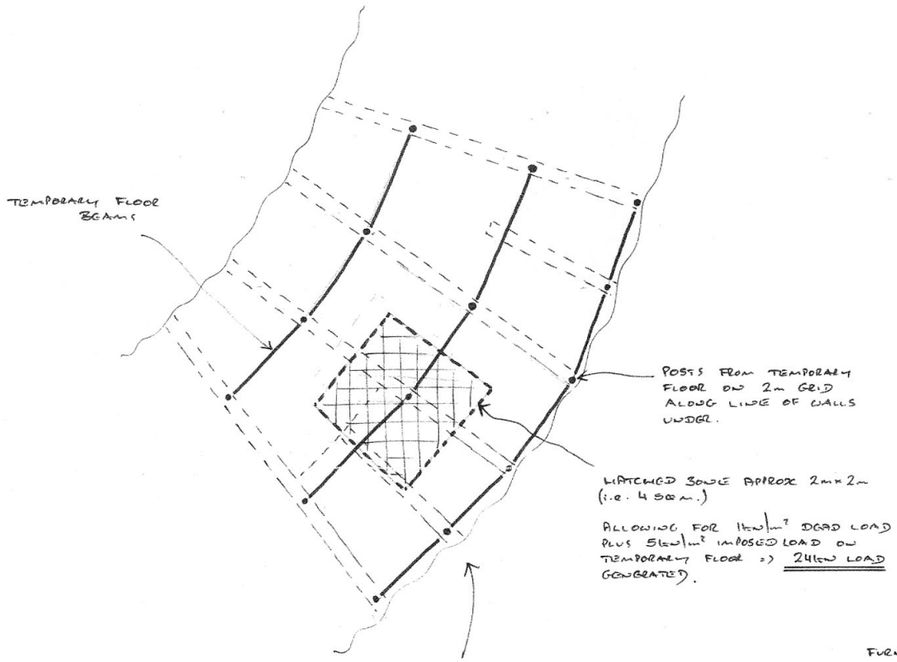
UNIFORM LOAD

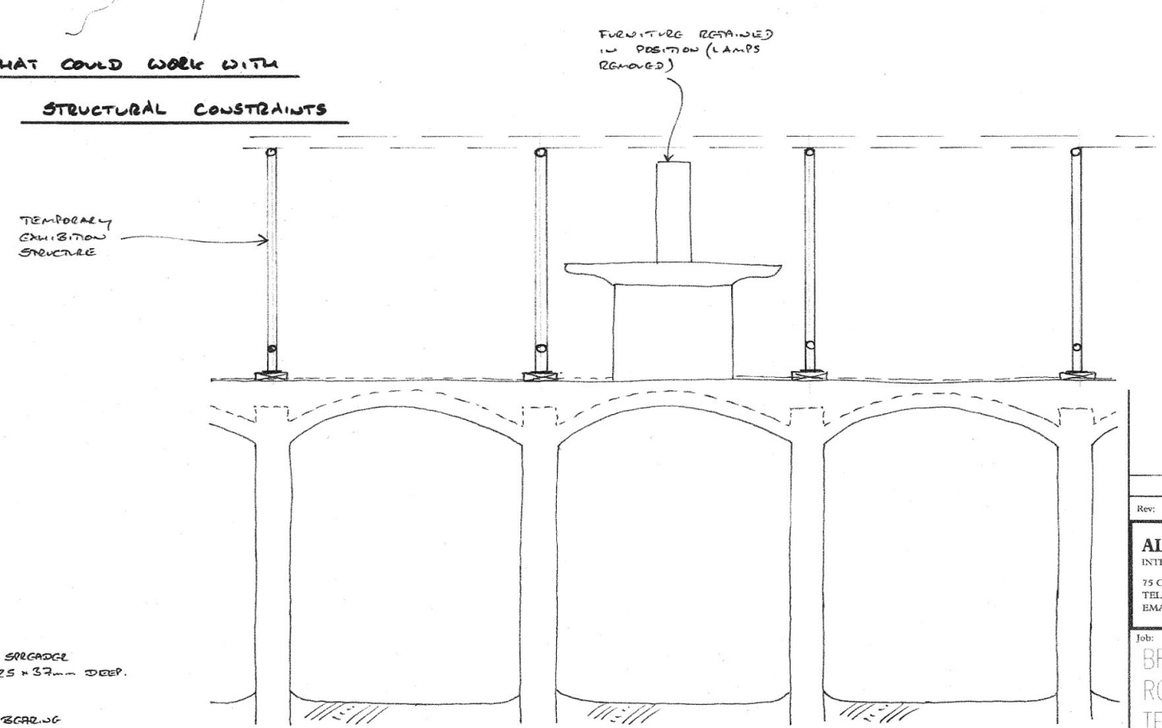


×

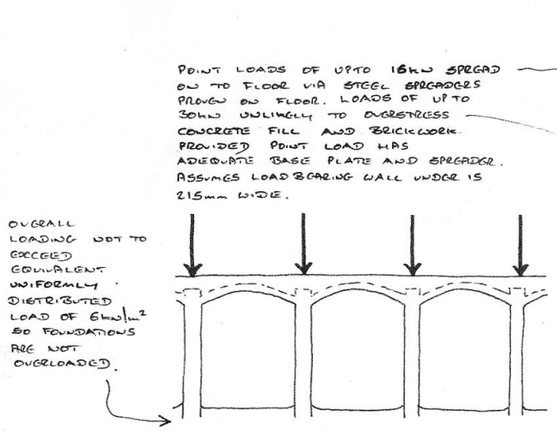
POINT LOAD ANYWHERE

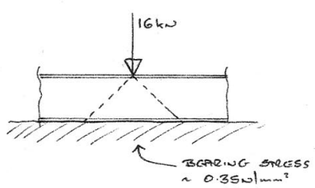


LAYOUT THAT COULD WORK WITH STRUCTURAL CONSTRAINTS



A-A
(1:20)





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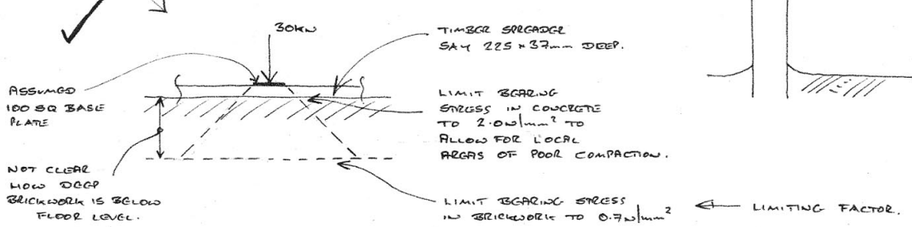


POINT LOAD ON WALL LINES UNDER

Rev:	Date:	Amendment:	Chkd:
	05/06/06	ISSUED FOR INFORMATION	

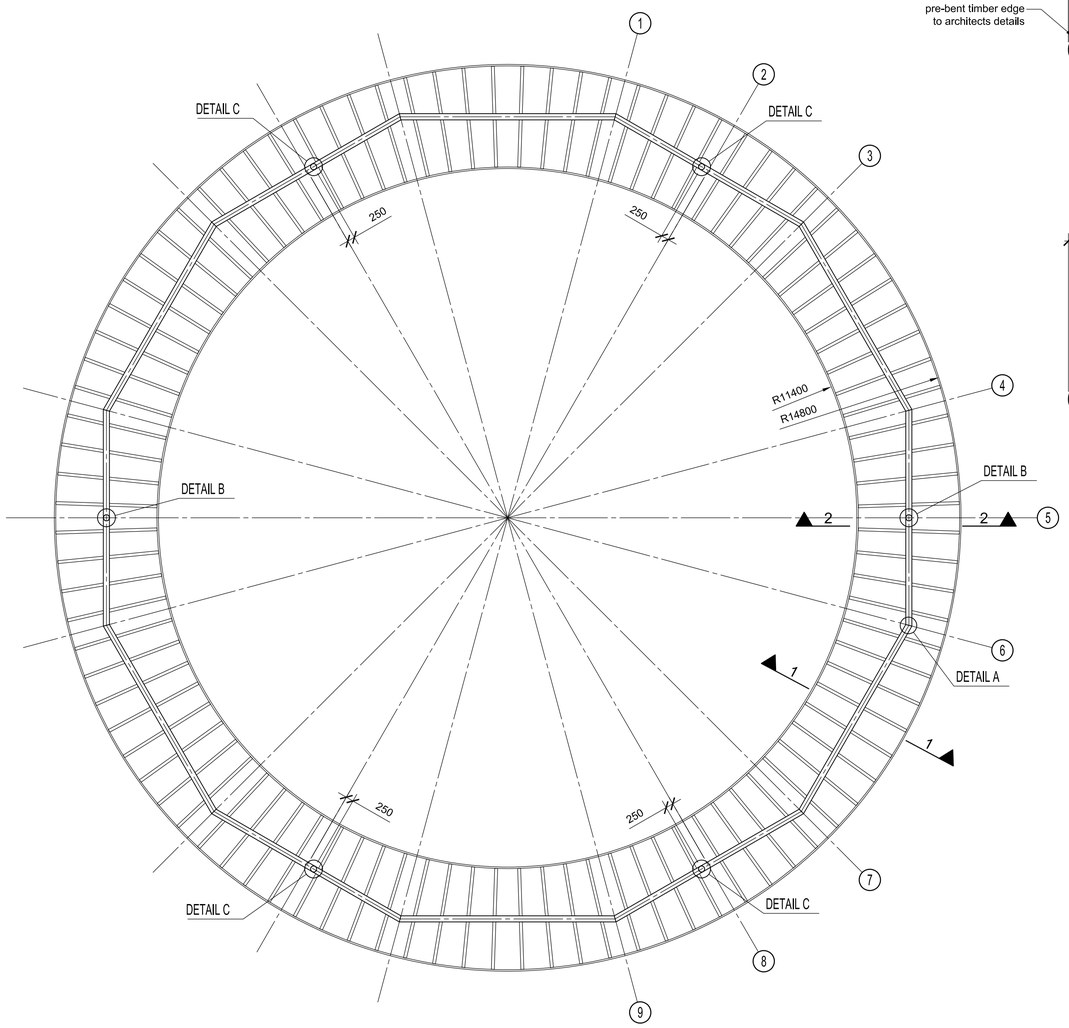
ALAN BAXTER & ASSOCIATES
INTEGRATED DESIGN FOR THE BUILT ENVIRONMENT
75 COWCROSS STREET, LONDON EC1M 6EL
TELEPHONE 020 7250 1555 FAX 020 7250 3022
EMAIL: aba@alanbaxter.co.uk

Job:
BRITISH MUSEUM
ROUND READING ROOM
TEMPORARY EXHIBITION.

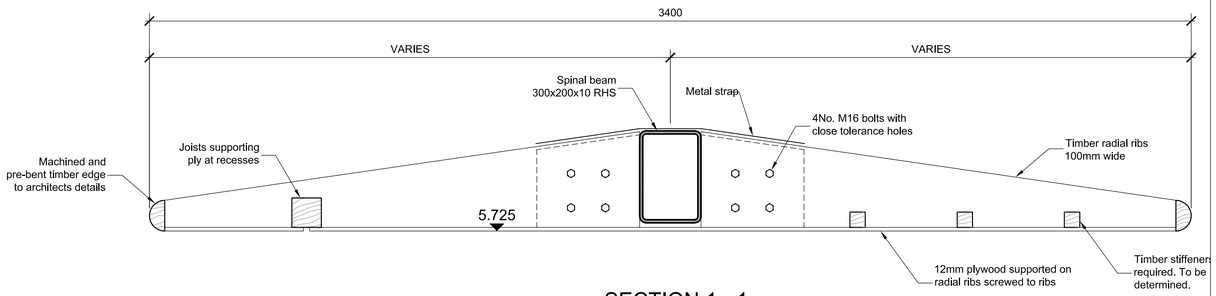
Drg. Title:
ACCEPTABLE FLOOR LOADING ON EXISTING FLOOR

Scale: (original A1)	Date:	Drawn:
AS SHOWN	APR '06	Checked:

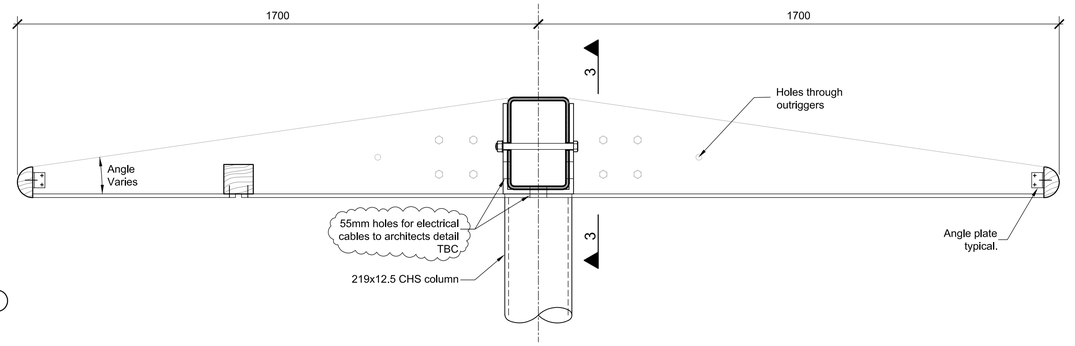
Drg.No. 699/301/13 Rev.



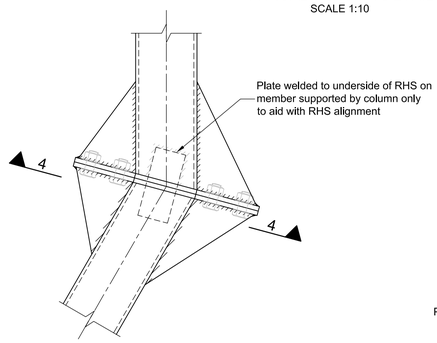
PLAN OF RING



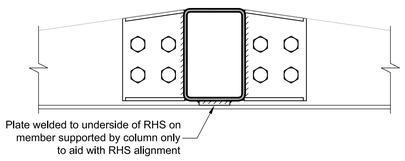
SECTION 1 - 1
TYPICAL TIMBER RIB DETAIL
SCALE 1:10



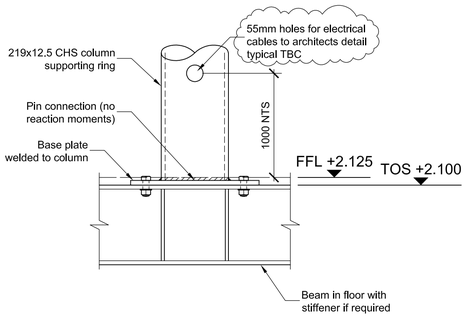
SECTION 2 - 2
TYPICAL COLUMN DETAIL
SCALE 1:10



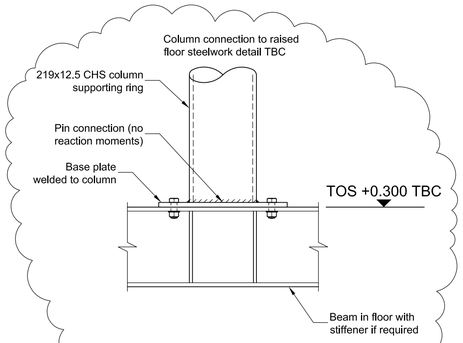
DETAIL A
RHS CONNECTION DETAIL
SCALE 1:10



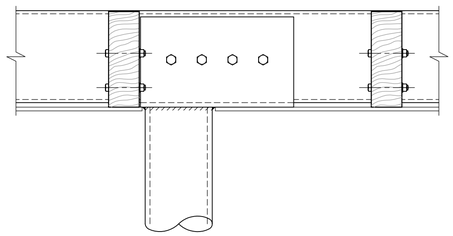
SECTION 4 - 4
SCALE 1:10



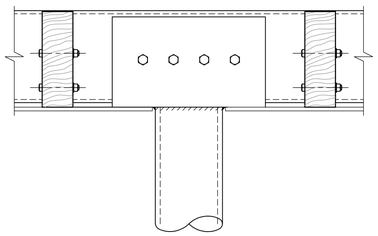
DETAIL B
COLUMN TO FLOOR CONNECTION
SCALE 1:10



DETAIL C
COLUMN TO FLOOR CONNECTION
SCALE 1:10



SECTION 3a - 3a
TYPICAL COLUMN DETAIL
SCALE 1:10



SECTION 3b - 3b
CENTRALLY-LOCATED
COLUMN DETAIL
SCALE 1:10

Notes
1. Steelwork S275
2. Timber as in specification

Issue	Date	By	Chkd	Appd
T2	30/03/07	GT	JT	DL
REVISED AS CLOUDED				
T1	26/03/07	GT	JT	DL
TENDER ISSUE				

ARUP
Arup Security Consulting
13 Fitzroy Street
London W1T 4BQ
Tel +44 (0)20 7636 1531 Fax +44 (0)20 7580 3924
www.arup.com/securityconsulting

Client
The British Museum

Job Title
Jade Ring

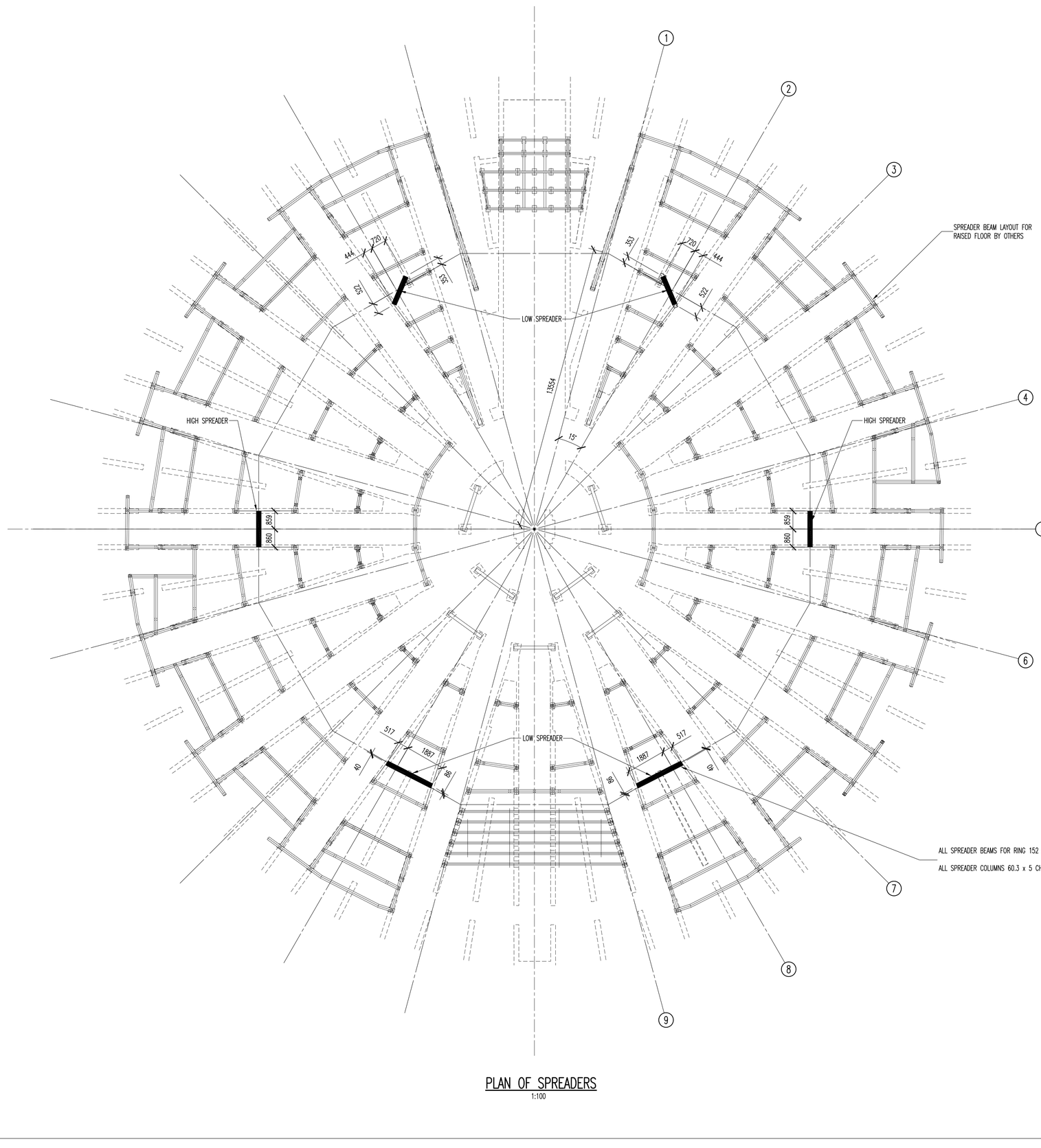
Drawing Title
Plan and Details Ring

Scale at A1 1:100 1:10

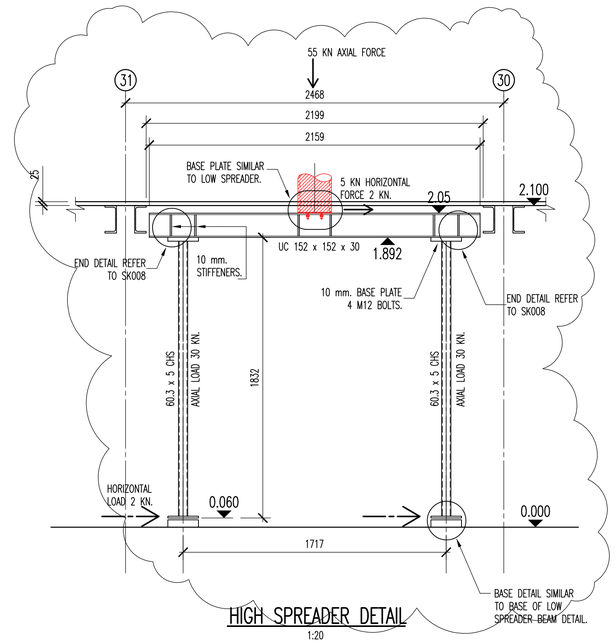
Plot ID 63180FF8-3457-4616-A16A-B9DE50F33C11

Drawing Status
Tender

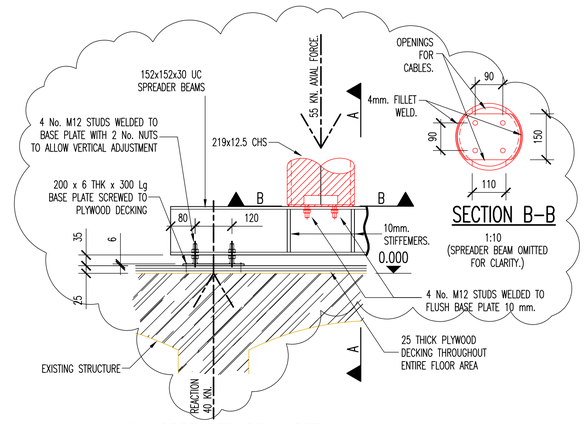
Job No	Drawing No	Issue
75744-61	**S001**	**T1**



PLAN OF SPREADERS
1:100

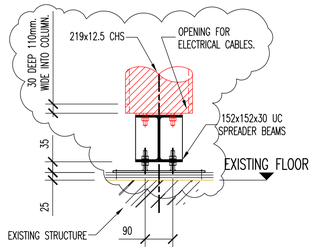


HIGH SPREADER DETAIL
1:20



LOW SPREADER BEAM DETAIL
1:10

SECTION B-B
1:10
(SPREADER BEAM OMITTED FOR CLARITY.)



A – A
1:10

Notes

1. Steelwork S275
2. For further timber detail see timber specifications
3. Load restrictions:
   - 300kg point load on existing reading room including door way.
   - 4KN/m² uniformly distributed load on raised deck.
   - Point loads on deck during erection to be agreed with Atelier one.
4. The contractor should be aware of the restrictions on element sizes due to the location (door dimensions).

General Notes

1. This drawing must not be used for construction or installation purposes unless expressly stated.
2. Do not scale off this drawing. Always work to noted dimensions.
3. All dimensions must be verified on site before completing shop drawings and setting out the work.
4. This drawing to be read in conjunction with the technical specification and associated schedules prepared by Arup.
5. This drawing to be read in conjunction with architectural and service engineer's drawings and Atelier one drawings.
6. All forces shown ULS design forces.

Hatched steelwork by steelfabricator of exhibition.

Issue	Date	By	Chkd	Appd
T2	04/05/07	JLN	JT	DL
REVISED AS INDICATED				
T1	25/04/07	LH	JT	DL
TENDER ISSUE				

ARUP

Arup Security Consulting
13 Fitzroy Street
London W1T 4BQ
Tel +44 (0)20 7636 1531 Fax +44 (0)20 7580 3924
www.arup.com/securityconsulting

Client
The British Museum

Job Title
Jade Ring

Drawing Title
Spreader Beams Details

Scale at A1 1:100 1:20 1:10

Plot ID CB0143C3-4ECD-410E-9D26-EFF1D3BDEBEA

Drawing Status
Tender

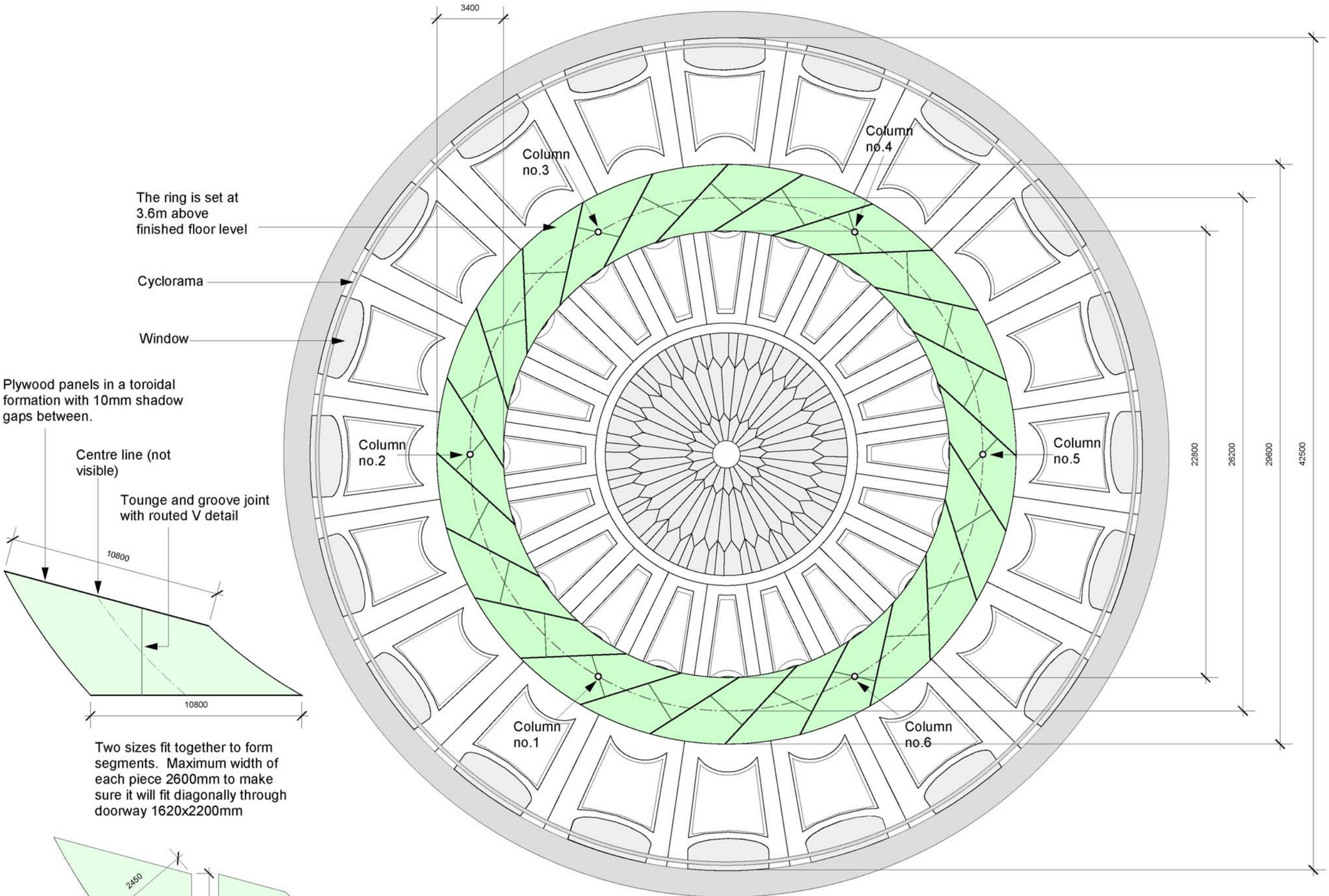
Job No	Drawing No	Issue
75744-61	**S003**	**T2**

J:\General\BEL\67000\75744 BL8 Possible Jobs\75744-61 Jade Ring\Internal\Dwgs\S003.DWG 4 May 2007 16:23:52 Jens.tandler

Notes:

Contractor to ensure sizes fit through door opening proir to manufacture

See Ove Arup and Partners' drawing S001 for construction method and support details

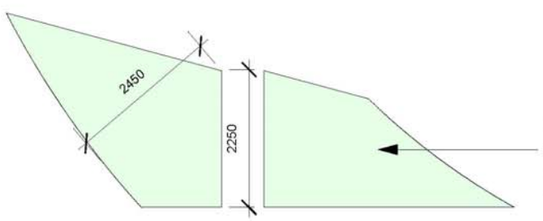


Plywood panels in a toroidal formation with 10mm shadow gaps between.

Centre line (not visible)

Tounge and groove joint with routed V detail

Two sizes fit together to form segments. Maximum width of each piece 2600mm to make sure it will fit diagonally through doorway 1620x2200mm



Segments made up of ply sheets fixed to ply frame.
Finish to be a painted silk vinyl, colour ref TBC

Segments 1:100

FOR TENDER

issue	date	description	drawn	checked

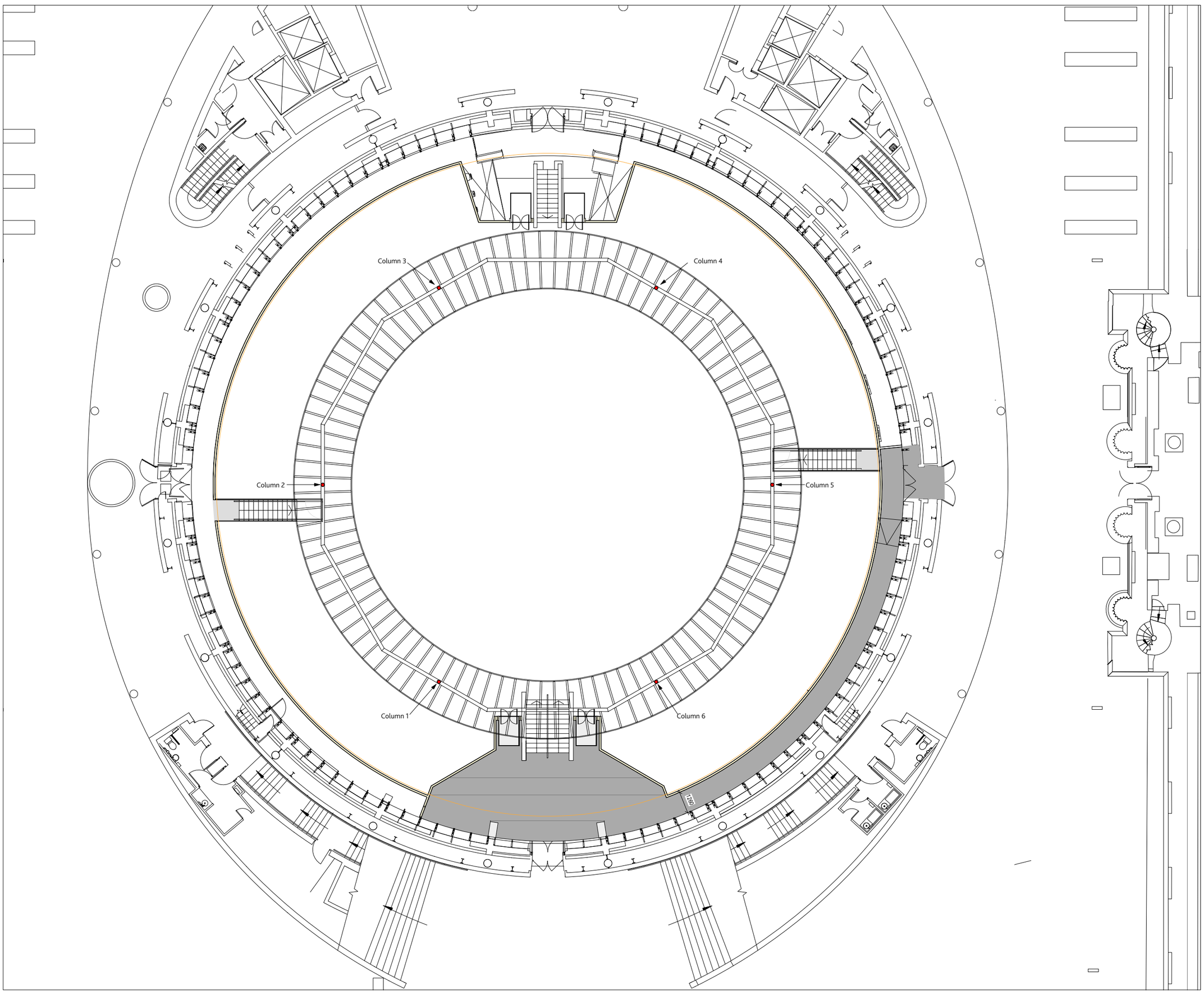
47 St John's Wood
High Street
St John's Wood
London NW8 7NJ

t 020 7449 2949
f 020 7449 2924
e info@mphor.co.uk
w www.mphor.co.uk

metaphor

client	The British Museum
project title	First Emperor
project address	The British Museum Great Russell Street London WC1B 3DG
job number	BRI1-003

scale	paper size	drawing title	no.
1:200	A3	Reflected ceiling plan	100/006



issue	date	description	drawn	checked

47 St John's Wood
High Street
St John's Wood
London NW8 7NJ

t 020 7449 2949
f 020 7449 2924
e info@mphor.co.uk
w www.mphor.co.uk

metaphor

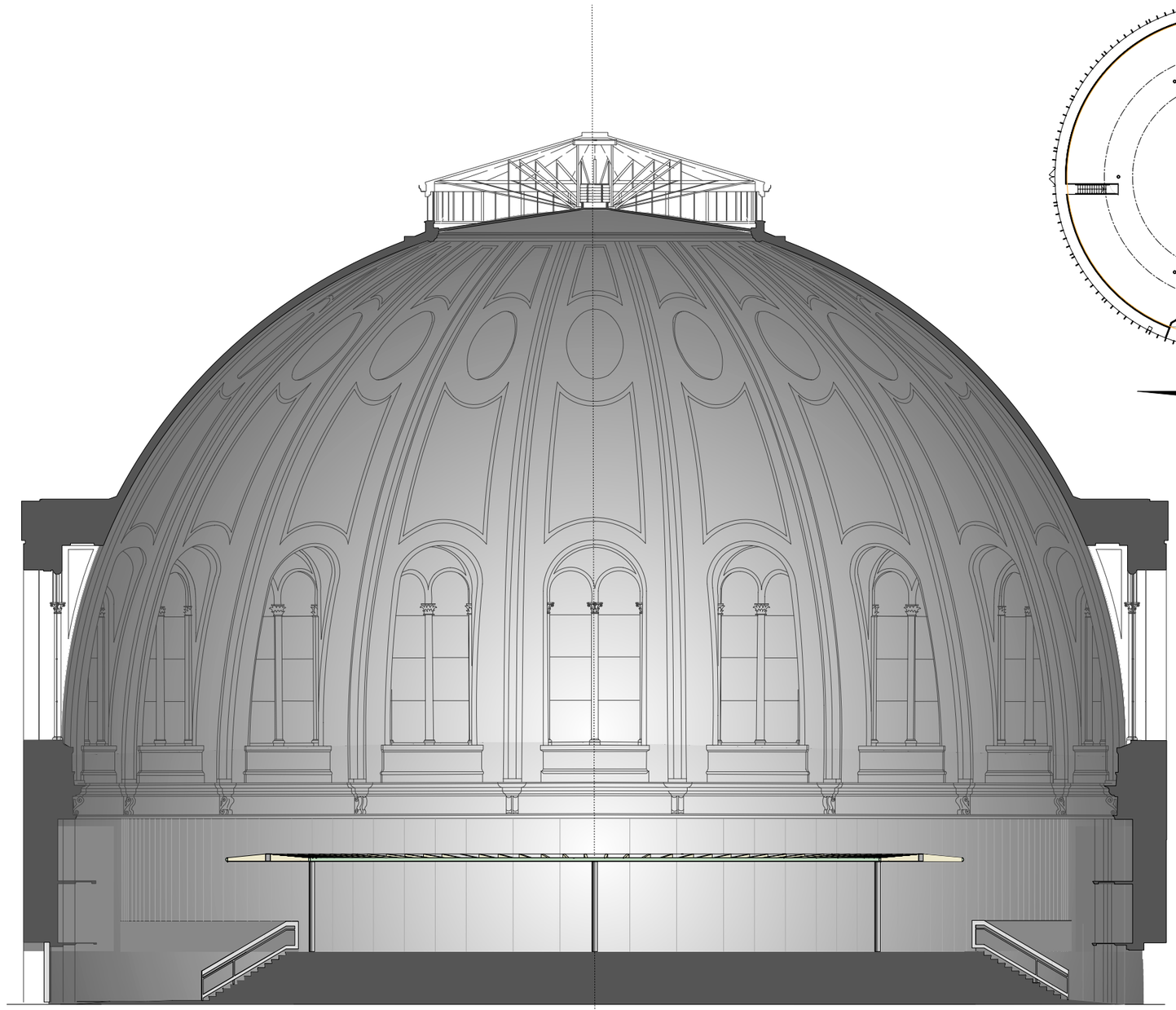
client The British Museum

project title First Emperor

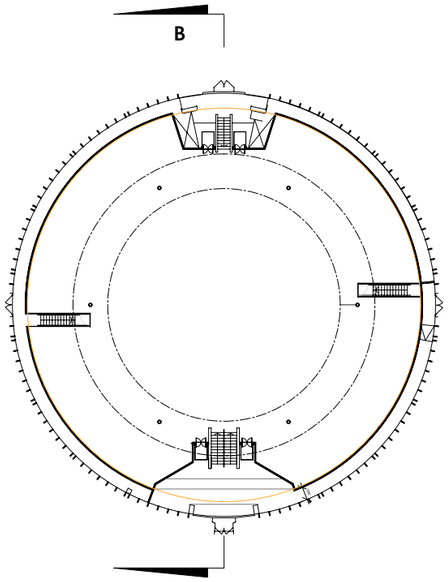
project address The British Museum
Great Russell Street
London WC1B 3DG

job number BRI1-003

scale	paper size	Drawing title	type	number	revision
1:100	A1	Ring Plan	-	SK_001	



Section B-B



Key Plan

47 St John's Wood
High Street
St John's Wood
London NW8 7NJ

t 020 7449 2949
f 020 7449 2924
e info@mphor.co.uk
w www.mphor.co.uk

metaphor

client	The British Museum
project title	First Emperor
project address	The British Museum Great Russell Street London WC1B 3DG
job number	BRI1-003

scale	paper size	drawing title	no.	revision
1:100	A1	Section B-B	SK002	