

Unlocking Prefabrication

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Introduction

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Business Unit Director



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Operations Director



Prefabrication – business as usual?

- Factory quality



Prefabrication – business as usual?

- Quicker build programmes



Prefabrication – business as usual?

- Reduction in on-site hours



Prefabrication – business as usual?

- Better management of interfaces

Prefabrication – business as usual?

- Environmental improvements



Prefabrication – business as usual?

- Minimise on site hazards to health & safety



Prefabrication – business as usual?

- Reduced welfare and logisitcs requirements



True or False..?

- Who is concerned that wholesale prefabrication will add cost to their projects?
- Who feels that prefabrication is largely an M&E approach?
- Who believes that large scale investment is necessary to unlock the full benefit of prefabrication?

Unlocking the 'cost' of prefabrication

- Include prefabricated construction ideas from design concept stage
- Develop a Strategy was developed during preconstruction with input and support from the client & Design team
- **BUY THE STRATEGY!** : choose a supply chain which shares your appetite and has capability

5 Broadgate
 Mace MEP Prefabrication Strategy
 Issue 2

Off Site Assembly

The following components are examples of off site assembly. The following components are examples of off site assembly. The following components are examples of off site assembly.

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Item	Description	Quantity	Unit	Value	Notes
1	Generator enclosure	1	m³	1000	
2	Engine enclosure	1	m³	1000	
3	Transformer enclosure	1	m³	1000	
4	Control room	1	m³	1000	
5	Storage area	1	m³	1000	
6	Access ramp	1	m³	1000	
7	Roof structure	1	m³	1000	
8	Roof cladding	1	m³	1000	
9	Roof insulation	1	m³	1000	
10	Roof drainage	1	m³	1000	
11	Roof ventilation	1	m³	1000	
12	Roof lighting	1	m³	1000	
13	Roof heating	1	m³	1000	
14	Roof cooling	1	m³	1000	
15	Roof waterproofing	1	m³	1000	
16	Roof insulation	1	m³	1000	
17	Roof cladding	1	m³	1000	
18	Roof structure	1	m³	1000	
19	Roof drainage	1	m³	1000	
20	Roof ventilation	1	m³	1000	
21	Roof lighting	1	m³	1000	
22	Roof heating	1	m³	1000	
23	Roof cooling	1	m³	1000	
24	Roof waterproofing	1	m³	1000	
25	Roof insulation	1	m³	1000	
26	Roof cladding	1	m³	1000	
27	Roof structure	1	m³	1000	
28	Roof drainage	1	m³	1000	
29	Roof ventilation	1	m³	1000	
30	Roof lighting	1	m³	1000	
31	Roof heating	1	m³	1000	
32	Roof cooling	1	m³	1000	
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34	Roof insulation	1	m³	1000	
35	Roof cladding	1	m³	1000	
36	Roof structure	1	m³	1000	
37	Roof drainage	1	m³	1000	
38	Roof ventilation	1	m³	1000	
39	Roof lighting	1	m³	1000	
40	Roof heating	1	m³	1000	
41	Roof cooling	1	m³	1000	
42	Roof waterproofing	1	m³	1000	
43	Roof insulation	1	m³	1000	
44	Roof cladding	1	m³	1000	
45	Roof structure	1	m³	1000	
46	Roof drainage	1	m³	1000	
47	Roof ventilation	1	m³	1000	
48	Roof lighting	1	m³	1000	
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51	Roof waterproofing	1	m³	1000	
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96	Roof waterproofing	1	m³	1000	
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98	Roof cladding	1	m³	1000	
99	Roof structure	1	m³	1000	
100	Roof drainage	1	m³	1000	

Assembly Reference

1. Generator enclosure
 2. Engine enclosure
 3. Transformer enclosure
 4. Control room
 5. Storage area
 6. Access ramp
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Section 4 - Prefabricated Plantrooms / Switchrooms

There is opportunity for prefabricated mechanical plantrooms to be installed. These are applicable for the following:

- Air-Conditioning Plantroom - Lower Floor
- Boiler Room - Lower Floor
- Lower Floor U.T. Switchrooms - Lower Floor

Examples of prefabricated plantrooms are indicated in the following photographs.

The generators including the enclosures would be constructed to ensure the best amount of noise abatement.

As the generators will be broken down due to their weight before being transported to site, all components used at the factory will be the exact components installed on site.

We have included a layout of the roof areas which indicate the areas we would look to prefabricate plant areas.

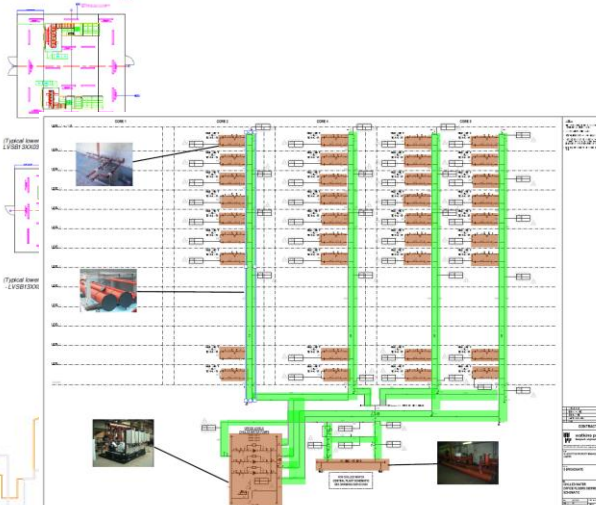
(generator enclosure sections)

(typical prefabricated plantroom in transit)

(typical section through a prefabricated plantroom)

Anticipated generator lifting schedule

1. General container (steel) approx 2000kg
2. Extra alternative for two containers only steel 2000kg
3. General container (concrete) approx 2000kg
4. Engine (steel) approx 1000kg
5. Generator (steel) approx 1000kg
6. Motor (steel) approx 1000kg
7. Engine exhaust silencer (steel) approx 1000kg per pair



Unlocking the 'cost' of prefabrication



Unlocking the 'cost' of prefabrication – some easy wins

- Minimise duplication – testing on and off site ? Use technology: facetime, webcams
- Incorporate everything: ensure of the trades contribute – chose an accessible location
- Chose the right supply chain: they have to share your enthusiasm!

Unlocking the 'cost' of prefabrication

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Item	Supplied By	Installed By	Connect By	Co-ord with	Site Assemble and position	Commission	Comments:	
AHU	6510	6510	6300/6500/ 6700	6500	6510	6510	Delivered in one piece or sections and bolted-up/tested on site	
Electrical supply to Isolator	6700	6700	6700		6700		Co-ordinated with 6500 for size of isolator	
Isolator	6510	6510	6510	6510		6700	Fitted within factory	
Inverter	6700	6510	6510	6700		6510	Fitted within factory (co-ordination required 6700/6500)	
Final connection from inverter to fan motor	6510	6510	6510	6700		6510	Fitted within factory - free issued 6700	
BMS panel and controls / starter panel	6700	6700	6700	6510		6700	Fitted within the factory panel either fitted to AHU OR on standalone support frame	
Fire alarm interface box SP/CP	7050	7050	6700	6700		7050	FAI box fitted and connected adjacent to BMS panel by 6700. 7050 to install and connect fire alarm loop wiring externally to FAI	
400v power to BMS panel	7000	7000	7000	6500			Incoming power by 7000. 6700 issued permit to connect	

Legend

- Package 6300
- Package 6500
- Package 6510
- Package 6700
- Package 7000
- Package 7050

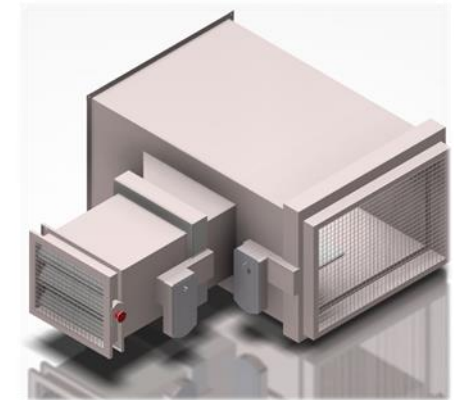
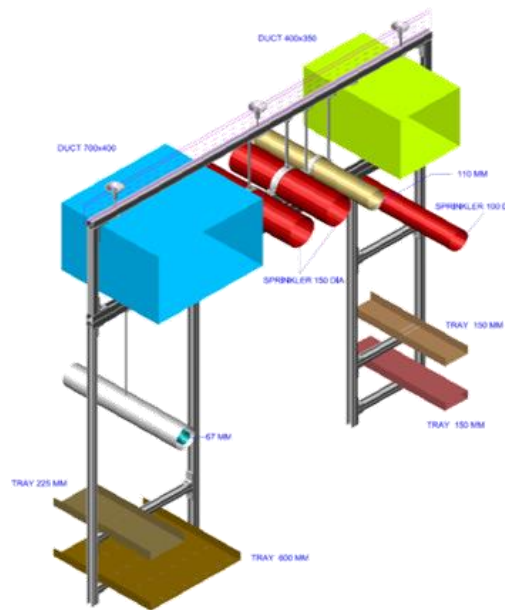
Interface Schedule

Title: AHU's Page 1 of 2

Project: London Bridge Place

Unlocking the 'cost' of prefabrication

- Don't forget the small stuff!

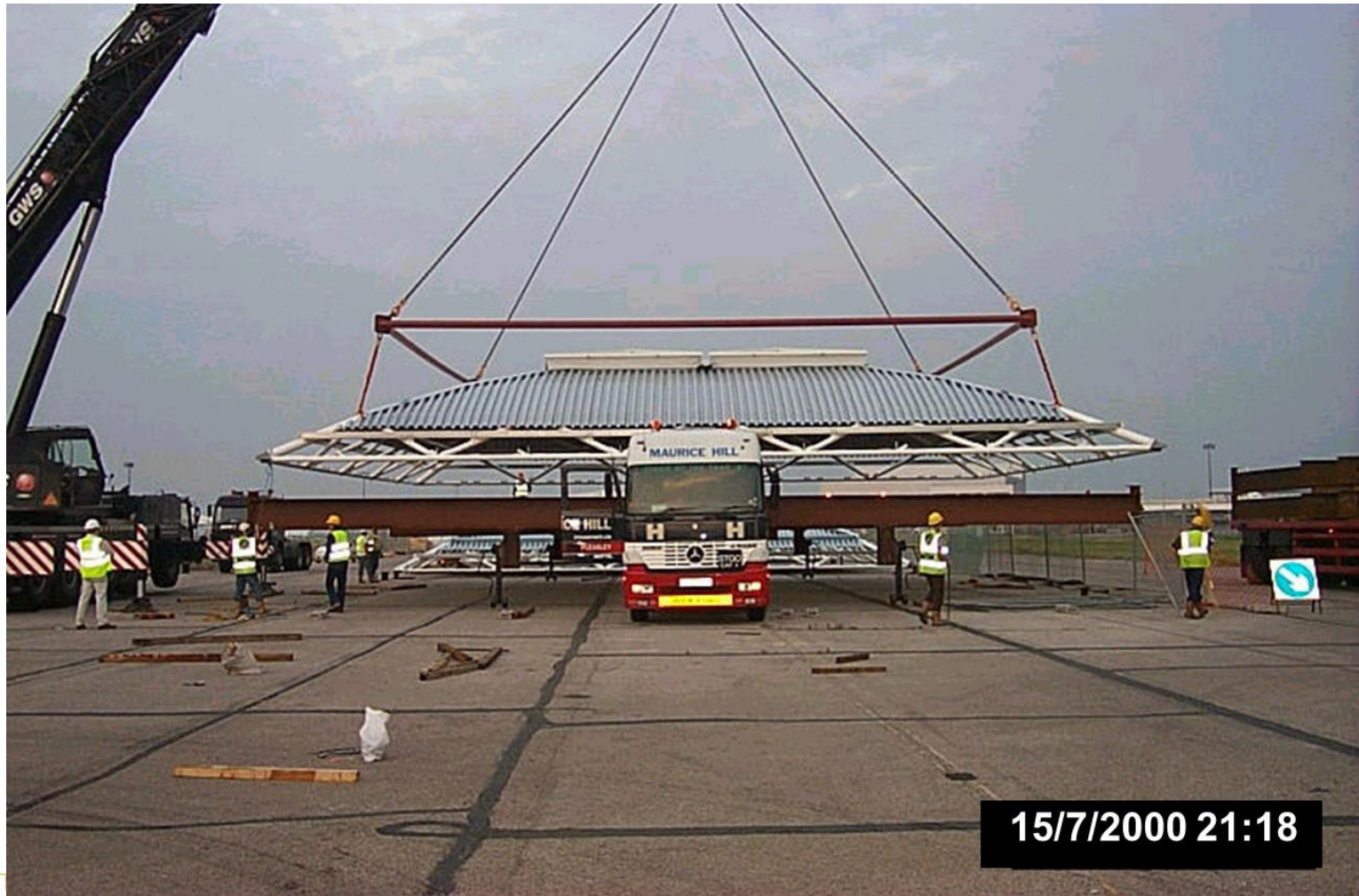


Prefabrication of non-MEP elements

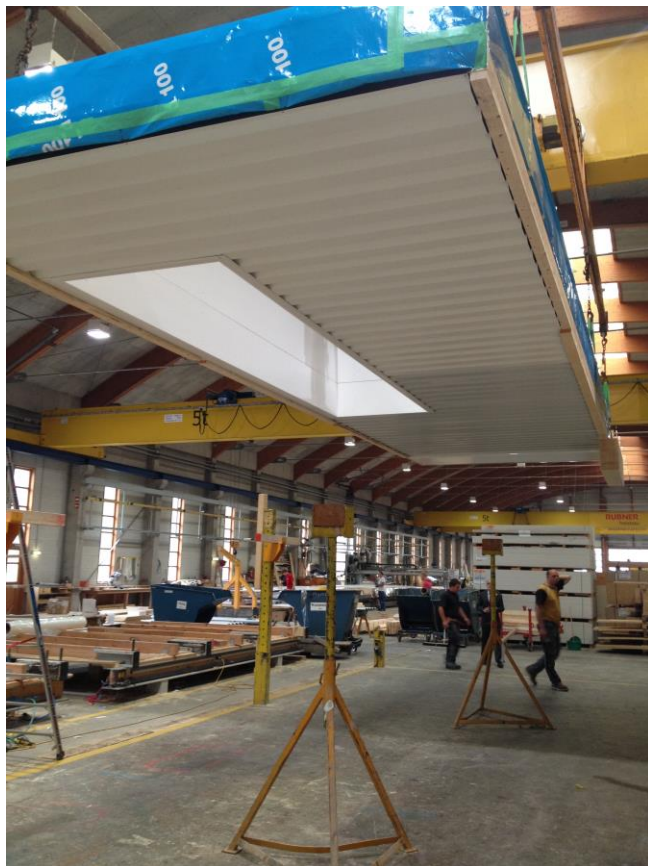
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Integration of major elements



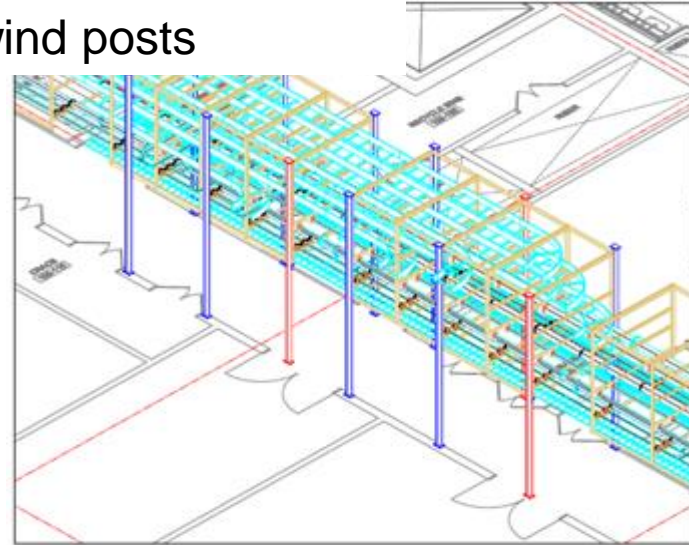
Integration of major elements



- 10.5m x 3m timber roof cassettes
- Fixings installed for h/I service modules
- PV arrays applied in on site assembly yard
- 7km total

Integration of major elements

Walk through modules with integrated wind posts



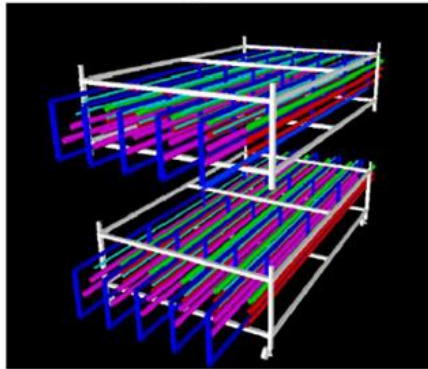
Service modules with PV array
Support and maintenance
access routes



Integration of major elements

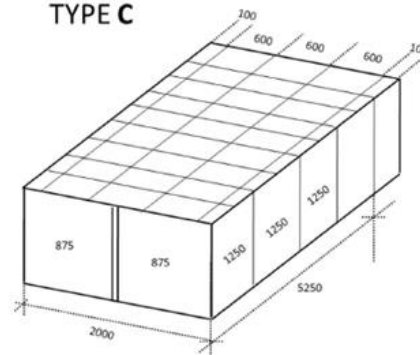
Low Level Combined Service Modules

3D Graphic View of Lifting Assembly with sacrificial steel supports and wheels



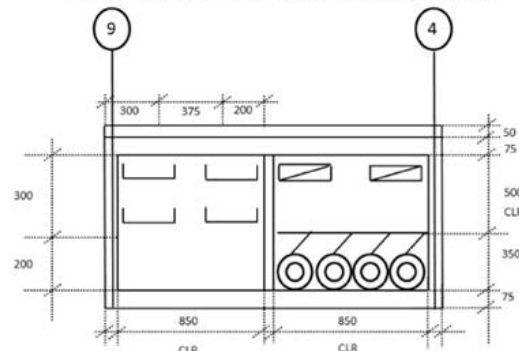
Typical Sketch Section indicating MEP Distribution

TYPE C



Floor void service modules designed to carry raised floor pans

Isometric Sketch indicating CSM Steel Frame



Prefabrication without major capex



Prefabrication without major capex



Prefabrication without major capex

- Why not pre-assemble on site??

