



**IVAN ATKINS**  
STRUCTURAL DESIGN  
CONSULTING STRUCTURAL ENGINEERS

**STRUCTURAL CALCULATIONS FOR:**

Delay Towers,  
Stability Checks at various locations,  
2004 Season

**FOR:**

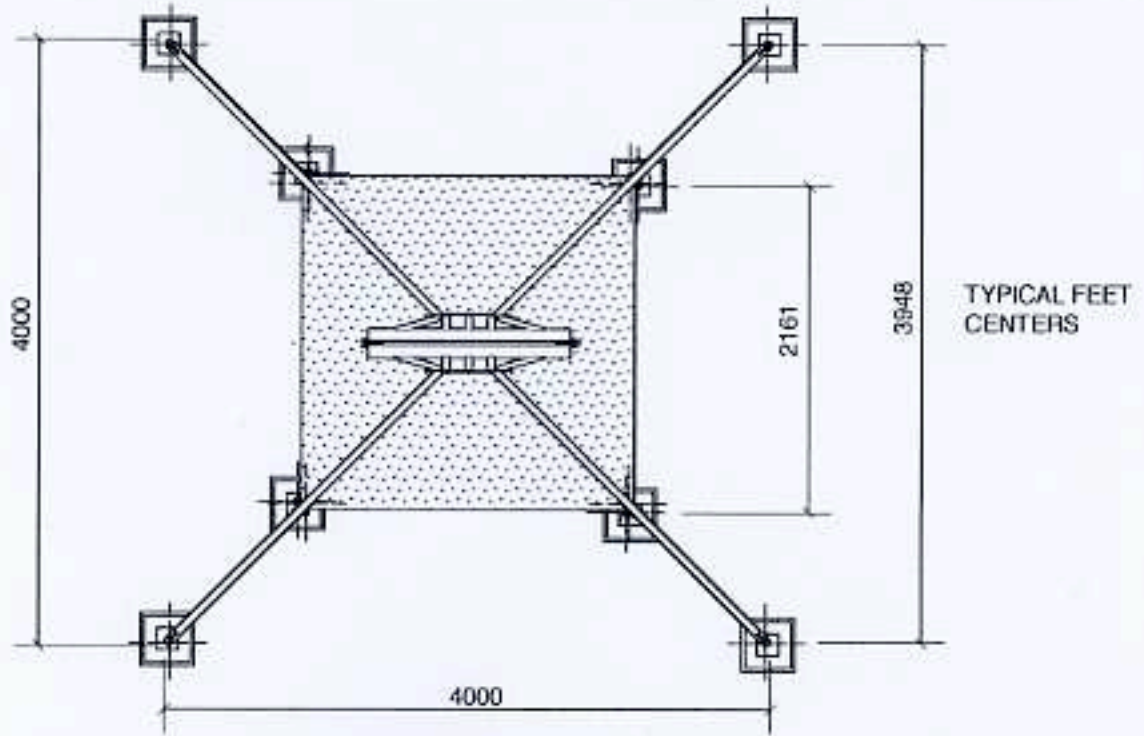
Performing Arts,  
1 Liddall Way,  
Horton,  
West Drayton,  
Middx.,  
UB7 8PG

18<sup>th</sup> June, 2004

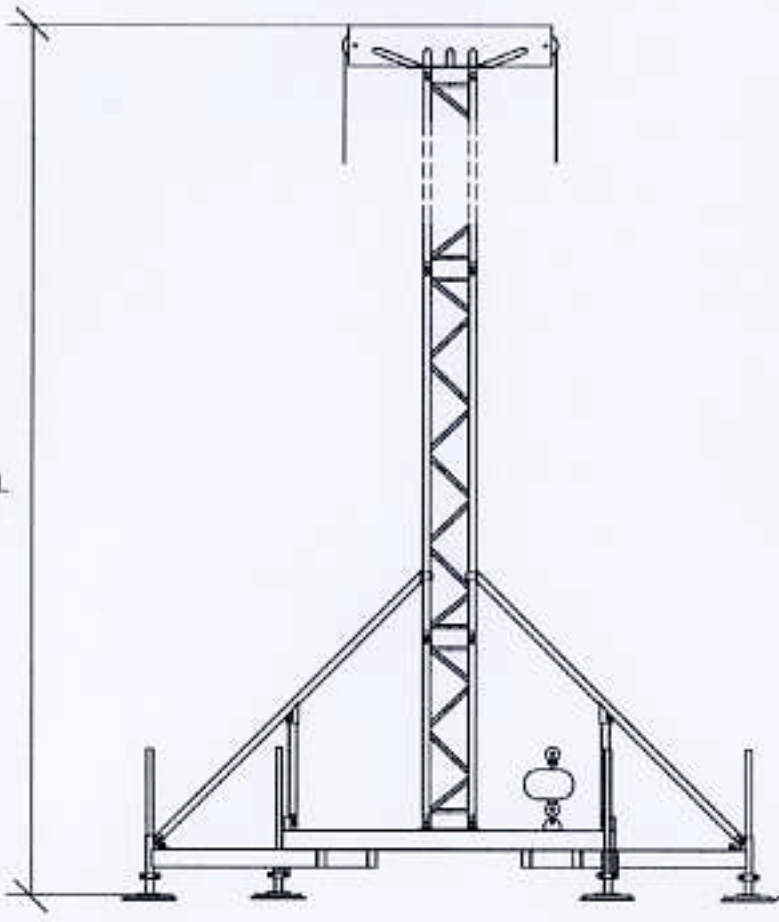


THE INSTITUTION  
OF STRUCTURAL ENGINEERS

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TYPICAL FEET CENTERS



10.5m  
OVERALL  
HEIGHT

OVERALL WEIGHT  
OF TOWER STRUCTURE  
1874 KG

300MM X 300 MM X18MM  
PLY PROTECTION  
BOARDS WITH CARPET UNDER  
8 PER TOWER



1 Liddall Way,  
Horton Road  
West Drayton,  
Middlesex, UB7 8PG  
Tel: 01895 432 995  
Fax: 01895 432 976

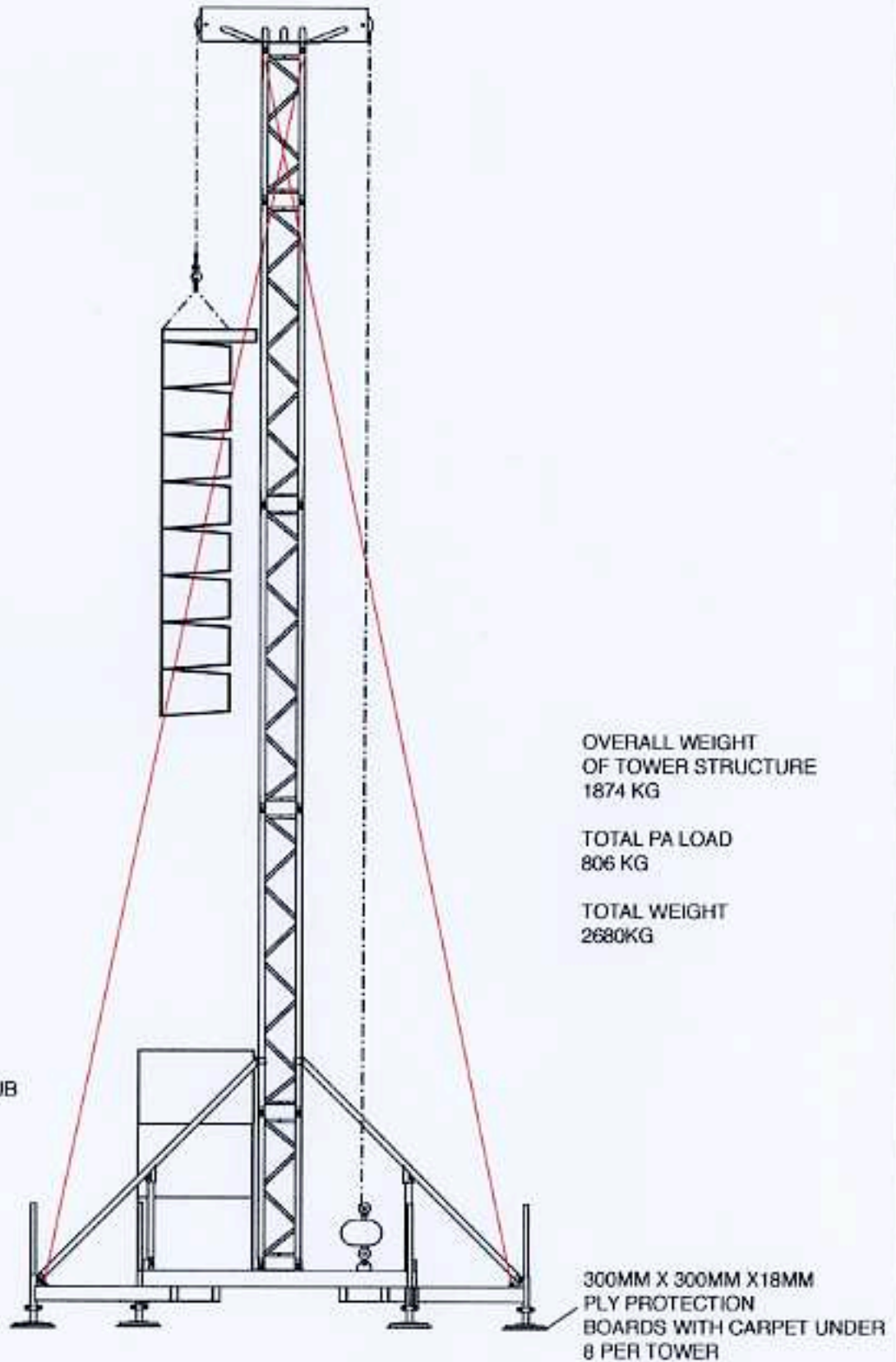
DESCRIPTION  
**DANCING IN THE STREET  
TRAFALGAR SQUARE  
PA TOWER DETAILS**

DATE 17/07/06	SCALE 1:50	DRAWN NGR
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DRG NO  
**2220/PA1**

8 off MARTIN W8LC  
WITH RIGGING  
500KG

3 OFF d&b B2 SUB  
306 KG



OVERALL WEIGHT  
OF TOWER STRUCTURE  
1874 KG

TOTAL PA LOAD  
806 KG

TOTAL WEIGHT  
2680KG

300MM X 300MM X18MM  
PLY PROTECTION  
BOARDS WITH CARPET UNDER  
8 PER TOWER



1 Liddall Way,  
Horton Road  
West Drayton,  
Middlesex, UB7 8PG  
Tel: 01895 432 995  
Fax: 01895 432 976

DESCRIPTION

DANCING IN THE STREET  
TRAFALGAR SQUARE  
PA DETAILS

DATE

17/07/06

SCALE

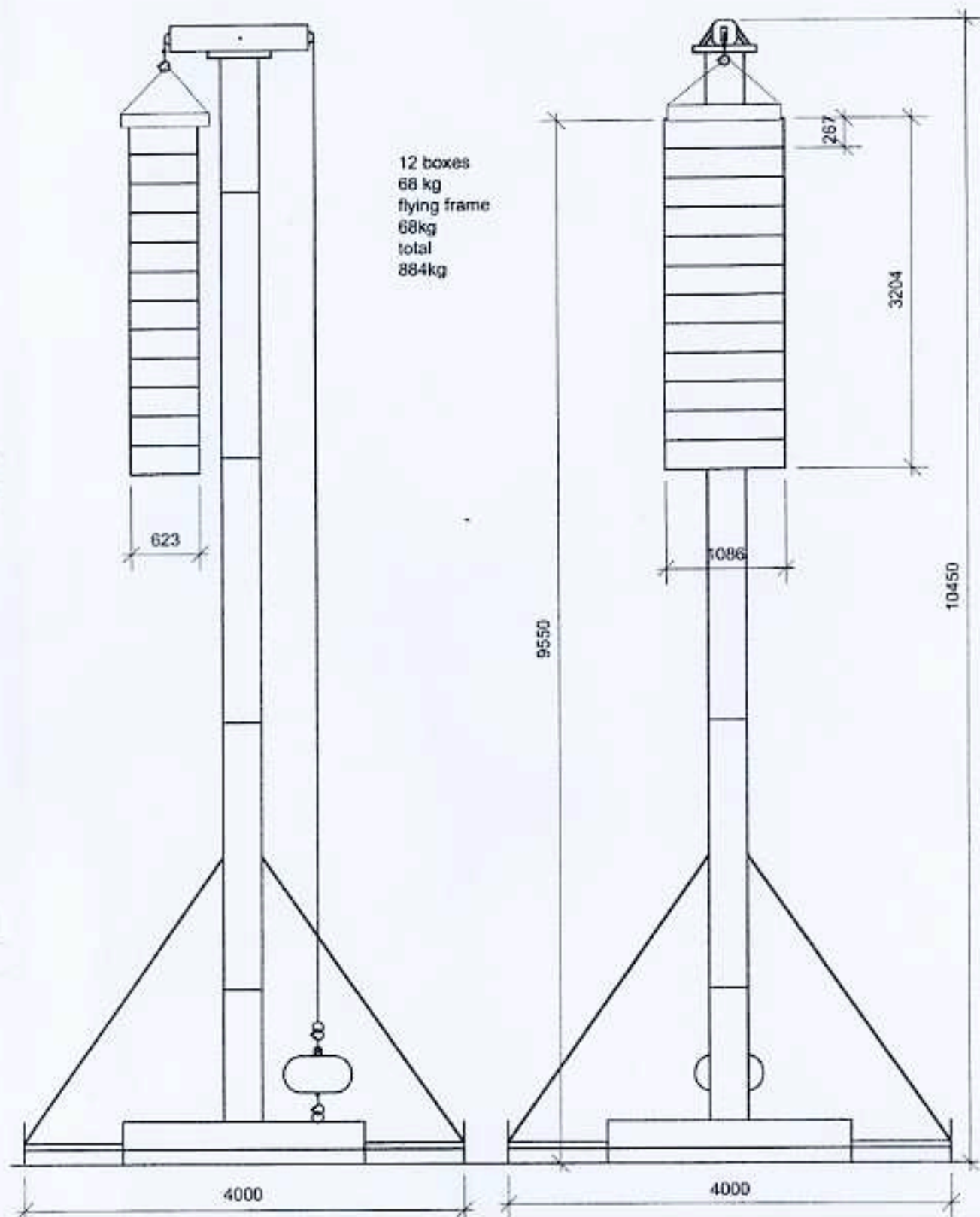
1:50

DRAWN

NGR

DRG NO

2220/PA2



12 boxes  
68 kg  
flying frame  
68kg  
total  
884kg

**SYSTEM SOUND**

1 Liddall Way  
West Drayton  
Middlesex, UB7 8PG  
01895 432 995

description  
PAM 2004  
Main PA towers  
Adamson Y10 sytem

scale 1:50    date 17/5/04    by N.G.

drawing no. R.

**2000/3**

**IVAN ATKINS Structural Design.**  
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**Mobile:** (07939) 515532.

Performing Arts	<b>Location/Job:</b>			Lytham Green	
Job No.:	2269				
Delay Tower	base width	4 M	pressure	1.02 (68 mph)	
OTM	sq.M	la	press	otm kN.M	
	spkr area	3.5	7.948	1.02	28.37
Effective	mast area	1.75	5	1.02	8.93
moving light	area	0	8.8	1.02	0.00
			total otm		37.30 kN.M
Restraining Mt.					0
	kg	la ctr base	la front		rm kN.M
	spkr	884	0.68	1.32	23.34
	flying gear	15	0	2	0.30
	mast	300	0	2	6.00
	base	1000	0	2	20.00
	ballast	500			
total	base+blst	1500	0	2	12.32
			total rm		61.96 kN.M
Factor of Safety against overturning.			=		1.66

**NOTE:**

Speaker stack is suspended by a pulley system centred on the mast thus the load is balanced by a portion of the ballast such that its centroid is centred on the base. Thus speaker restraining moment is based on double the speaker load at the centre of the mast. The balancing load for the speakers is deducted from the total ballast figure to give the ballast restraining moment.

**De-Rig Limit 55mph**

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**Wind Calculations to BS 6399: Part 2: 1997.**

**Site:**  
Lytham Green

**Job no.**  
2269

**Date:**  
18-Jun-04

Dynamic Augmentation factor:

K<sub>b</sub> (from table 1.)            8.00  
Building Height                10.00 metres

DAF (from fig. 3)                0.16            OK - i.e within limits

Basic Wind Speed:                24.00 M/s

Site Wind Speed:

S<sub>a</sub> =            1.00            Height above OD =            2.00 Metres  
S<sub>d</sub> =            1.00  
S<sub>s</sub> =            0.71  
S<sub>p</sub> =            1.00  
  
V<sub>s</sub> =            17.07 M/s

Terrain Considerations:

Effective Height, H<sub>e</sub> =            10.00 Metres

Use STANDARD Method

Effective Wind Speed:

S<sub>b</sub> (From table 4) =            1.78

Effective wind speed - V<sub>e</sub> =            30.39 M/s (i.e.            67.98 mph)

Dynamic pressure: q<sub>s</sub> =            0.57 kN/sq.M

External Surface Pressures:

C<sub>pe</sub> (signboards - Cl. 2.8.2) =            1.80

**Design Pressure =            1.02 kN/sq.M**

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**Mobile: (07939) 515532.**

Performing Arts

**Location/Job:**

Norwich

Job No.: 2269

Delay Tower base width 4 M pressure 1 (68 mph)

OTM	sq.M	la	press	otm kN.M
spkr area	3.5	7.948	1	27.82
Effective mast area	1.75	5	1	8.75
moving light area	0	8.8	1	0.00
			total otm	36.57 kN.M

Restraining Mt.	kg	la ctr base	la front	rm kN.M
spkr	884	0.68	1.32	23.34
flying gear	15	0	2	0.30
mast	300	0	2	6.00
base	1000	0	2	20.00
ballast	500			
total base+blst	1500	0	2	12.32
			total rm	61.96 kN.M

Factor of Safety against overturning.

= 1.69

**NOTE:**

Speaker stack is suspended by a pulley system centred on the mast thus the load is balanced by a portion of the ballast such that its centroid is centred on the base. Thus speaker restraining moment is based on double the speaker load at the centre of the mast. The balancing load for the speakers is deducted from the total ballast figure to give the ballast restraining moment.

**De-Rig Limit 55mph**

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**Wind Calculations to BS 6399: Part 2: 1997.**

**Site:**  
Norwich

**Job no.**  
2269

**Date:**  
18-Jun-04

Dynamic Augmentation factor:

Kb ( from table 1.)            8.00  
Building Height            10.00 metres

DAF (from fig. 3)            0.16            OK - i.e within limits

Basic Wind Speed:            25.00 M/s

Site Wind Speed:

Sa =            1.02            Height above OD =            20.00 Metres  
Sd =            1.00  
Ss =            0.71  
Sp =            1.00  
  
Vs =            18.11 M/s

Terrain Considerations:

Effective Height, He =            10.00 Metres

Use STANDARD Method

Effective Wind Speed:

Sb (From table 4) =            1.67 (interpolated)

Effective wind speed - Ve =            30.14 M/s (i.e.            67.43 mph)

Dynamic pressure: qs =            0.56 kN/sq.M

External Surface Pressures:

Cpe (signboards - Cl. 2.8.2) =            1.80

**Design Pressure =            1.00 kN/sq.M**



System Control (UK) Ltd

1 Liddall Way, Horton Road  
West Drayton, Middlesex  
UB7 8PG  
Tel: 01895 432 995  
Fax: 01895 432 976  
e-mail: [nigel@systemcontrol.co.uk](mailto:nigel@systemcontrol.co.uk)  
Web: [www.systemsound.com](http://www.systemsound.com)

**Sign Off Certificate**  
**PAM Masts**

<b>Venue</b>	
<b>Show</b>	
<b>Job Number</b>	
<b>Date</b>	

<b>ITEM</b>	<b>CHECKED</b>
Leg Bolts	
Square on pads	
Levelling	
Truss Orientation	
Truss Pins	
Truss Pin Clips	
Hoist Attachment	
Chain Straight	
Stabiliser Rod Bolts	
Stabiliser Steel Rope attached	
Adjustable Jack Guards	
Safety Chain	
Anemometer attached	
General Visual Check	

<b>Signed</b>	
<b>Name</b>	