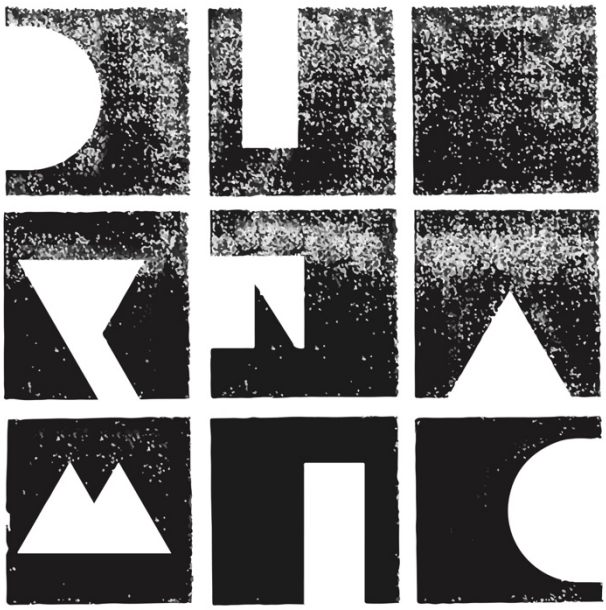

Appendix N
Wind Management Plan

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Wind Management Plan

This wind management plan has been developed to ensure proactive and reactive wind management, should Diynamic Festival London experience unusually high winds/gusts. As we have a range of temporary structures it is important to gain consistent wind speed readings to ensure event management can remain informed of constantly changing conditions.

There will be **2** anemometers installed on the event site.

We have defined 3 levels of response, dependent on the circumstance and wind speed readings.

Guidance has been taken from the industry document 'Guidance for the Management & Use of Stages and related temporary structures 2015'. This guidance is not only for the management of stages and similar structures but also to be taken into account as a site-wide guide to wind management for the safety of the public, performers & all other workers at the event. Decisions regarding the safe running of an event need to be taken well in advance of reaching the operational wind loading capacities of the stage itself, specifically it should be noted that other structures may have much lower tolerances.

The wind reference chart below will help to clarify the relationship between various wind measurements and it must be noted that 12 metres per second is a strong wind and site conditions may start to become hazardous at this speed. Each site has its own topography and local conditions and response to wind. The wind management plan must therefore be adjusted to include this data.

Wind Reference Chart

Beaufort Scale & Description		**Average Speed at 10 meters above ground**	
0	**Calm**	**Meters Per Second**	**Miles Per Hour**
1-3	Light Breeze	0.3 to 5.4 m/s	0.7 to 12.2 Mph
4	Moderate Breeze	5.5 to 7.9 m/s	12.3 to 17.8 Mph
5	Fresh Breeze	8.0 to 10.7 m/s	17.9 to 24.0 Mph
6	Strong Wind	10.8 to 13.8 m/s	24.1 to 31.0 Mph
7	Nr Gale Force	13.9 to 17.1 m/s	31.1 to 38.3 Mph
8	Gale Force	17.2 to 20.7 m/s	38.4 to 46.4 Mph
9	Strong Gale Force	20.8 to 24.4 m/s	46.5 to 54.7 Mph
10	Storm Force	24.5 to 28.4 m/s	54.8 to 63.6 Mph

- Careful considerations must be given to wind management throughout all phases. At the planning stage, Phase A, advice should be given from the contractor the event organiser regarding site layout, taking into account stage and structure orientation in relation to topographical location. A full site risk assessment should be done to ensure that factors such as construction on headlands, on the coast or in valleys where wind can funnel are taken into account, and suitable design changes are implemented where necessary.
- IStructE guidance regarding temporary structures is that they should be designed to withstand the loads created by wind gusts of 25 metres per second (55mph). The guidance does however allow for the removal of sheeting. Many structures have a much lower tolerance when fully sheeted and event organisers should be aware of this when constructing wind management plans.
- In view of this potential confusion, HSE have strongly recommended that during phases C & D, roof sheets should be removed should gusting become hazardous, as screens, stage sets, drapes and lighting rigs inside the stage structure, exposed to high winds, become dynamic loads rather than static and themselves put under undue strain when on the structure. Some stage designs need low level wall sheeting to be removed at certain wind speeds and the requirements for this and the potential issues that may arise need to be clearly documented by the contractor in advance of the event.

Planning	Normal Conditions	Action Level 1	Action Level 2	Action Level 3 STOP!
Site topography & prevailing winds	Monitor Forecast Review	Alert Risk Assess	Enhanced Action Response Plan	May involve Event Cancellation

The following procedures take into account all of the event production elements rather than the just the structure itself.

- An anemometer should be installed as soon as reasonably practicable and must be constantly monitored when conditions are likely to cause a hazard.
- Each structure should have its own specific wind action plan that can be integrated into the overall event safety management plan taking into account site specific topography and seasonality. The event safety management plan should identify what actions should be taken, when and by whom in relation to each specific structure.
- There should be monitoring of weather forecasts for the area at all times from beginning of construction until deconstruction is complete.
- During Phase B & C, the use of access equipment or roof climbing must cease if gusting becomes continuous above 12 metres per second (27 MPH) based on industry standard access equipment manufacturers recommended maximum operational wind speed.

The following action chart is a guide to operational monitoring throughout the event:

Wind Speed Metres/sec	Monitoring Interval	Action Level	Action
Below 6	8 hourly		Regular Weather Forecast Review
7 – 11	Hourly		Regular on Site Assessment
12 – 18	30 mins	1	Prepare to halt erection operations until safe working conditions have resumed. During Phase D (Show) it is likely that Show Stop will occur in this range due to factors other than TDS safety.
18 – 22	15 mins	2	Site Safety meeting and risk assessment Prepare for full site evacuation
Over 22	Constant	3	Site evacuation procedure to be implemented

At Action Level 1:
When monitoring registers, a gust of wind speed in excess of 12 metres per second, in conjunction with an increasing general trend of recorded wind speeds, then subject to risk assessment, all staff are involved with the installation/ erection of the structure(s) should be put on alert that action may be required to delay the erection process until safe working conditions have returned. This process should be adopted into the overall site wind management plan.

At Action Level 2:
It is recommended as safe practice for a site safety measure to be convened to assess the overall site conditions when monitoring registers, a gust wind speed in excess of 15 metres per second in conjunction with an increasing general trend of recorded high wind speeds. (This can be varied subject to onsite risk assessment). This should be

adopted into the overall event safety management plan and preparations should be made regarding show stop procedure and full or partial evacuation of the site should wind speeds increase making site conditions unsafe.

At Acton Level 3:
When monitoring registers, a gust wind speed in excess of 22 metres per second in conjunction with an increasing general trend of high recorded wind speeds, and determined by risk assessment:

- Site evacuation may have to be implemented
- A safety meeting must be called to identify subsequent action such as lowering production
- The structure must immediately become a hard hat area for essential personnel only
- The stage may be evacuated, and a safe perimeter imposed around all temporary structures
- Before performances resume, or deconstruction begins, there must be a structural inspection and new sign off.

Understanding the effect of wind on structures:

It is important to recognise that it is wind pressure on a structure that poses an issue not merely wind speeds themselves. The relationship between pressure and wind is not linear. The applied pressure is proportional to the square of the wind speed.

For example: An increase in wind speed from 12 meters per second to 17 meters per second will approximately double the pressure on the structure. Between 12 metres per second and 24 metres per second, pressure on the structure approximately quadruples. See table below.

Surface Pressure Chart

Wind Speed Metres Per Second	Wind Speed Miles Per Hour	Surface Pressure In kN/m2
12 m/s	26.88 Mph	0.088
13 m/s	29.12 Mph	0.104
14 m/s	31.36 Mph	0.120
15 m/s	33.6 Mph	0.138
16 m/s	35.84 Mph	0.157
17 m/s	38.08 Mph	0.177
18 m/s	40.32 Mph	0.199
19 m/s	42.56 Mph	0.221
20 m/s	44.8 Mph	0.245
21 m/s	47.04 Mph	0.270
22 m/s	49.28 Mph	0.297
23 m/s	51.52 Mph	0.324
24 m/s	53.76 Mph	0.353
25 m/s	56 Mph	0.383