



THE TIPI COMPANY
WEATHER MANAGEMENT PLAN



Weather Management Plan

Version 1.0 – March 2018

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1. Introduction

The Tipi Company manufacture large event tipis, smaller glamping and accommodation tipis, and accompanying accessories for all. The majority of tipi use takes place in the countryside, and therefore are susceptible to harsh weather conditions, which can prove to be extremely hazardous to staff, exhibitors, external contractors, and the public using these structures.

2. Who should use this guide

Clients who own 'The Tipi Company' tipis should use this guide as a benchmark for the planning, implementation and evaluation of weather conditions and the effect on their tipis, staff members and the general public.

Clients who comply these guidelines will maintain safety before, during and after an event through the awareness and processes highlighted.

2.1. Background

The Tipi Company has a vast portfolio of clients using tipis, often interlinked, to host a variety of events around the UK, dealing with differing weather conditions from site to site.

The main factors contributing to the safe delivery of an event in a tipi is the adherence to training provided by The Tipi Company, either through on-site training, use of The Online Portal, or through the On-Field Training Programme document. If you feel you require further training through any of the above offerings, please get in touch.

In addition, understanding, following and adapting this Weather Management Plan to your company and your site, will enable you and your staff to be confident in erecting and dismantling the tipi structure in challenging conditions, and when to use/change your action plan to protect the safety of everybody involved.

2.2. Objectives

The objectives of this plan are to ensure that the effect of challenging and adverse weather are dealt with appropriately, and that injury and incidents caused by weather conditions or the impact of them are avoided where possible. The main priority on site during these conditions is to ensure the safety of all people on the site, and to ensure that no damage is done to the tipis or surrounding areas, due to flying debris from strong winds.



3. Responsibilities

It is the responsibility of Tipi owners to monitor weather forecasts for their clients' event prior to the build, right through to the dismantle of the tipis. If these forecasts predict hazardous weather then the relevant action must be taken in order to ensure the safety of all people involved. If dangerous weather is forecast, you and your client should be prepared to cancel or postpone the event. If the conditions on site become poor without warning during the build, event, or dismantle, the appropriate action must be taken in line with the Action Plan listed in this document.

Your Operations Manager should be responsible for the monitoring of weather forecasts prior and during events. The weather monitoring process is listed below.

If poor weather conditions are forecast for the event date then the event organisers should be made aware, and Emergency Plan provisions put in place.

If poor weather conditions are forecast for the tipi build and/or tipi dismantle, then all site staff should be informed, with work altered or cancelled accordingly, with the Operations Manager and Site Team Leader communicating and agreeing to make such decisions.



4. Monitoring

For your client's event to be both successful and safe, it is vital for you to monitor the weather forecast. The British weather is known for its rain and wind and being prepared for this can prevent staff and event attendees being put at risk.

All precautions must be taken to ensure that staff can be informed of what to expect and be prepared, and the effects of any adverse weather can be dealt with before it is too late.

Weather monitoring is the easiest and most successful approach to adverse weather conditions and allows you to act before the conditions take over your tipi, either before, during or after an event. Your Operations Manager should monitor the weather through online sources including (but not limited to) The Met Office and the BBC. Alongside this, your Crew Chief should use on-site monitoring techniques such as visual assessments and the use of an anemometer for accurate readings.

We suggest your Operations Manager creates a Weather Monitoring Table (similar to the one shown in figure 1, below). The table should be filled in twice prior to the event, at around 10 days before (the long-range forecast) and 1 day before (the short-range forecast). This allows you, your staff and your client to be aware of the potential weather, and the affects it will have on the event. It allows you to make changes to a set-up, either through the venue location or the tipi configuration, and can assist you in making the tough decision to postpone or cancel an event.

Following the event, you can update the Weather Management Plan to include details such as: the effect the weather conditions had on staff safety; tipi condition; public safety. This post-event information can allow you to make better recommendations and plans when similar weather conditions are predicted for a future event. The more you use this document, the more familiar you will become with how your staff and your equipment copes with the differing weather conditions.



4.1. Pre-event weather monitoring

The Met Office (<https://www.metoffice.gov.uk/public/weather/forecast>) and the BBC (www.bbc.co.uk/weather) should be used regularly to monitor the weather.

We recommend using a long-range forecast that monitors the weather for the event 10 days in advance, including top temperatures, wind speed, rain. This will all be recorded in your Weather Management Table, enabling your Operations Manager to pass the information on to your Crew Chief prior to the tipi build day, so they can prepare both the staff and the kit for any adverse weather.

Figure 1 - Example Weather Monitoring Table

Event Name	Event Date	Event Location	10 Day Prior Weather Forecast					1 Day Prior Weather Forecast				
			Wind Speed and Direction	Rain chance % and duration	Top Temp	Extreme Weather	NOTES	Wind Speed and Direction	Rain chance % and duration	Top Temp	Extreme Weather	NOTES
Jane Smith - Wedding	06/01/2018	Stanley Park, Liverpool	9mph - North Westerly	80% Heavy Rain for 2 hrs	6 degrees	None	Check again 3 days prior, consider adding Weatherproofing Kit	11mph - North Westerly	30% Light Rain for 1hr	5 degrees	None	W/P Kit not necessary
Steve Hall - 18th Birthday	06/01/2018	Alderley Edge, Cheshire	7mph - Westerly	70% Heavy Rain for 1hr	6 degrees	None	Check again 3 days prior, consider adding Weatherproofing Kit or Entrance Porch.	8mph - Westerly	20% Light Rain for 1hr	6 degrees	None	W/P Kit not necessary

Figure 2 - Weather Monitoring Table - Key

Key				
	Wind Speed =	Rainfall =	Top Temp =	Extreme weather =
Red =	>48mph	Heavy	> 25 C	Any
Yellow =	35mph - 48mph	Light/Moderate	15 C - 24 C	
White =	0-10mph	None	3 C - 14 C	None

4.2. Event construction monitoring

Short-range forecasts should also be used a day before the build, and also on the day of build too. These forecasts offer more accurate information, giving you a better idea of how to plan and act on the weather conditions you will be facing. You should also record this data in the Weather Monitoring Table, shown above.



5. Identification of Adverse Weather conditions

Each differing weather condition will have a different effect on the tipis, and the event being hosted, so it is important to identify the weather condition, taking into consideration the effects of each (listed below), and the procedure to avoid injury or incident (also listed below).

5.1. Wind Speeds

High wind speed can cause major disruption to tipis, especially linked or lifted configurations. This is why it is vital to monitor the weather running up to a tipi event, using a Weather Monitoring Table. As shown in the Figure 2, wind speeds over 48mph should be highlighted as red in the table. If the winds are forecast to be between 35mph and 48mph, they should be highlighted in yellow. This allows your Operations team to take action to prevent the risks high wind brings.

5.2. Rainfall

Heavy rainfall can cause localised flooding in and around the event site, especially in countryside fields. The safety of your staff and clients can be at risk through soft and uneven ground. This can result in pegs and stakes pulling out, in addition to vehicle problems getting on and off the site. If the ground is particularly soft, conduct a Stake Pull-Out Test (see Point 6)

Although the tipi fabric is fully water repellent, you must have a correctly erected and tensioned tipi to prevent water pooling and ingress through overlapping areas.

On your Weather Monitoring Table, you should highlight heavy rain as red, moderate to light rain as yellow, and no rain as white.

5.3. Maximum Temperatures

Both high and low temperatures can cause risks when building and dismantling tipis, in addition to during the tipi event. Although the tipi fabric is breathable, colourfast and sun protective, temperatures inside the tipi can climb to high levels when the outside temperature exceeds 20degrees. When this occurs, we recommend you lift the sides, open the Smoke Hood and unzip the large zips on the main canvases – this will aid in air flow and will assist in keeping the temperatures lower inside the space. Also note that high temperatures can cause dehydration to staff and the public (and is something that should be avoided at all costs).

Low temperatures are also a safety risk – in particular during the build and break of the tipis. Surfaces can become frozen, and therefore slippery and hazardous - especially when handling heavy and awkward equipment as a member of tipi staff. Low temperatures, mixed with rain, wind or snow must be classed as high risk. On the Weather Management Table, temperatures over 25C and below 3C should be highlighted as red, with temperatures between 15C and 24C as yellow. Temperatures between 4C and 14 C can remain white, as they pose little risk.



5.4. Extreme Weather

Any type of storm forecast should be entered into the extreme weather column. Examples of this could be; lightening, monsoons, high winds, and generally stormy conditions. Although most of the 'storm' characteristics have previously been highlighted, and will be showing in the Weather Management Table, it is still important to highlight a predicted storm – the more information you include, the better prepared your team can be for the predicted weather.



6. Arrangements and Procedures

This section identifies the actions you should take once one or more of the highlighted adverse weather conditions happens before, during or after an event.

To ensure these procedures are ready to be implemented when needed, they have been added to a table at the end of this document, labelled the Weather Management Action Plan. Your Operations team should be familiar with the action plan and have a copy with them at all times on site.

Please remember that no event is more important than the safety of staff and / or clients – if their safety is under threat due to weather conditions, you must not continue with the build or event.

6.1. Strong Winds

Strong winds can be devastating to any outdoor event and temporary structure. There are different actions to be taken in regards to strong winds, depending on when you receive the information of high winds. The different scenarios and actions are listed below.

6.1.1 During setup and break of the tipis

MODERATE - HIGH WIND SPEEDS (Yellow in the table)

Speak to the client. Advise them that the wind levels are predicted to be moderately high, and some preventative action will be taken when the build takes place:

- All Smoke Hoods should be closed (without permission for the opening of them).
- If it is deemed fit and safe to still have a side of the tipi lifted for entry / exit, then attach extra strapping to the D-rings on the mudwall, securing the lifted side to the ground at more points with longer stakes
- Strengthen tipis anchorage by using larger/longer stakes, and additional stakes if deemed necessary.

If winds are predicted to increase further, you should advise the client that lifting the tipi (for entrance / weatherproofing kit / panoramic window) will be forbidden, and an Entrance Porch, or a simple zip entry should be offered as an alternative. Please note – this is your decision to make to ensure the safety of your client. Do not be pressurised by the client to make an arrangement that is against your experience and better judgement.

- While building the tipis, the progress may need to be delayed/postponed to ensure the staff's safety.



- When building and breaking, do not attempt to pull over or remove the main tipi canvas, as the wind could bellow inside it and create a huge kite, potentially injuring a member of staff, a member of the public or damaging the kit.

DANGEROUS WIND SPEEDS (Red in the table)

Advise your client that it is unsafe to build the tipis and hosting an event in wind of such speed would be extremely irresponsible. The preventive action to be taken is:

- Delay the build / break of the tipis (If wind levels are predicted to drop) – with client made aware the wind must drop below 48mph for building to commence.
- If high wind speeds are predicted to continue, then you will need to cancel the build / break / event – re-arranging for a later date, on the condition of lower wind speeds.
- The Crew Chief must consider the wind speeds as part of ongoing safety assessment for each stage of the tipi build, and the effect high winds will have when moving to the next stage (e.g. fitting the tipi canvas).
- The Crew Chief must be confident the tipi structure being erected/dismantled and used during the event can not only withstand the current wind speed, but also forecasted wind speeds for the duration of the event. The Crew Chief should liaise with management to make a joint decision.
- If there is any doubt as to the safety of Tipi staff, contractors or the public, then tipi structures should not be erected, and if they already are, the immediate area should be evacuated until a time when the wind speed drops.
- If the tipis have already been built and the event taken place, but the wind speed has increased too high for the break of the tipis, it is not advised to progress to stages such as pulling the canvas off the frame, as once the canvas is un-pegged from the ground, injury is highly likely to occur, either by staff members attempting to hold the canvas to the ground to prevent it blowing away, or by trying to take the canvas off.
- The Crew Chief must be confident the tipi structure being dismantled can not only withstand the current wind speed, but also forecasted wind speeds for the duration of the dismantle. If event stronger winds are imminent, it might be better to leave the canvas pegged into the ground, rather than rushing to take the canvas off the frame. The Crew Chief should liaise with the Operations Manager.
- If there is any doubt as to the safety of Tipi staff, contractors or the public, then tipi structures should not be worked on or inside of, and if they already are, the immediate area should be evacuated until a time when the wind speed drops.



6.1.2 During the event

If you use the Weather Monitoring Table, you should never find yourself unprepared for high winds during an event. If there is a situation where unpredicted winds are going to affect a tipi event, there are a number of actions you should follow and implement. Be aware that during the rental period, your client is responsible for the safe-keeping of your tipis and will therefore be the person who will implement any safe-guarding processes.

If the weather forecast predicts high wind conditions during the event, there are a number of actions you can implement before the event in preparation:

- Provide the client with an Action Plan to be kept on site at all times, which is referred to when needed.
- Provide the client with an anemometer to take accurate wind level reading, allowing them to make any necessary decisions in line with the Action Plan table provided.
- If the client is not confident / comfortable with the responsibility of the weather management (and has nobody in their party that can be), you should use one of your own staff to be on site during the event, to implement any actions if poor weather conditions occur.

If the wind speed is recorded at between 35mph-48mph (highlighted yellow in Weather Monitoring Table) during the event, your client should follow the below action plan:

- Call the On-call Crew Chief or Operations Manager at your company to notify them of the current weather condition and the actions to be taken.
- Evacuate all pop-up catering marquees.
- All smoke hoods should be closed and re-tensioned.
- If on-call, staff can get on site, changes to the structure can be made to protect the event, although guests may need to move from the area of the tipi / exit the structure whilst these changes take place (Please note, this action should only be taken if you and / or your staff are confident the wind speeds will not increase further). This could be:
 - Dropping any lifted sections and pegging the canvas into the ground with suitable stakes.
 - Adding extra strapping and pegging to anchor the structure to the ground.



If the wind speed is recorded above 48mph (highlighted as red in the Weather Monitoring Table), and the tipi hasn't been altered to improve the structures stability (highlighted in previous bullet points), the tipis should be evacuated immediately. Guests / staff should be moved to an area well clear of the tipi structure. Until the wind level drops, there should be nobody re-entering the tipi.

If the tipi structures' stability has been improved by lowering all lifted sections and / or extra anchoring (as highlighted in previous bullet points), then guests can stay in the tipis unless wind speeds reach the higher rate of 53mph.

If 53mph is recorded (and the tipi's structural stability has been improved), then guests and staff must again evacuate the tipi structure and remain at a safe distance from it. They must be made aware of the potential for flying debris due to the extremely unsafe wind speeds.



6.2 Rainfall

Although the tipi fabric is fully water resistant, persistently heavy rain can cause flooding to the site, creating numerous problems for you and your client. Below is an action plan for moderate and heavy rain before an event, during the tipi build, during the event and during the tipi dismantle.

If the rainfall is predicted to be 'moderate' (highlighted yellow in Weather Monitoring Table) or 'high' (highlighted red in the Weather Monitoring Table), during the tipi set-up, break or during the event, you should review the set-up details for the build, and from there act accordingly. You should advise your client that the rainfall forecast has increased to a moderately high level, and preventative action needs to be taken to ensure the safety of the tipi staff, and the public attending the event.

1. At all stages of the build, ensure your staff have the correct equipment with them for a long day of working in the pouring rain. A waterproof coat, waterproof trousers, steel toe-capped boots, PPE, a change of clothes and a change of shoes is a must for a wet weather build – staff without this kit not only put themselves at risk, but their teammates.
2. Always use a groundsheet to lay the tipi canvas on, to protect them from the wet and potentially muddy surfaces
3. Refrain, where possible, from driving onto the tipi site, so as not to get any of your vehicles stuck in the ground – stay on hard surfaces to get as close as possible to the site.
4. Consider changing any lifted sides (for entry / exits) to closed down sides with zip / Entrance Porch assess, or a Weatherproofing Kit. If the rain will be particularly strong, then insist on these alternatives to the client.
5. Consider delaying the build / break of the tipis, and or the event, if the rain is excessive and is flooding the site.
6. All smoke hoods should be closed and secured to the ground and should not be opened until the rain stops.
7. Re-check all strapping is tensioned so that pooling of water does not occur. Ensure any lifted sides, have straps attached the D-rings and tensioned downwards to the ground to keep water flowing off the tipi, rather than sitting on the top and creating sagging.
8. Ensure your Crew Chief assesses the ground conditions and informs the team of any changes to the size of pegs / stakes used to secure the canvas (the ground may be very soft due to the wet weather, and 500mm spikes could pull out under tension, with 750mm stakes being more suitable). Conduct a Peg Pull-Out Test to assess the strength of the ground.



6.3 Maximum Temperatures

Although high temperatures will not affect the structural stability of the tipis, it can have a physical effect on your staff, and guests when visiting the event being held in the tipi.

On the Weather Management Table, temperatures over 25C should be highlighted as red, with temperatures between 15C and 24C and under 2C highlighted as yellow. Temperatures between 3C and 14 C can remain white, as they pose little risk.

Prior to tipi set-up: Through the use of the Weather Monitoring Table, you should be able to identify the potential for dangerous (red level), or intermediate, (yellow level) temperatures during the tipi build, event, or breakdown, and if so, there are many things you should consider.

Predicted for the tipi set-up: If the temperature is predicted at between 15C – 24C, (highlighted yellow in Weather Monitoring Table), during the tipi set-up, you should provide extra provisions for your team, allowing them to safely complete the build.

- Consider providing fresh, cooled water throughout the day.
- Consider allowing the team to have additional short breaks throughout the day. Although you are giving the team extra time off, it can increase productivity as they are refreshed and hydrated throughout the day.
- Provide caps for the team and allow warm weather clothing such as vests and shorts.

If you are predicting the temperature to rise above 24C at any point during the tipi build, the previous actioning applies, but the considerations become a must. In addition:

- Provide sunscreen for staff members
- Take breaks in shaded areas and try to limit the amount of time staff spend in direct sunlight.

Predicted for the tipi event: If the temperature is predicted at between 15C – 24C, (highlighted yellow in Weather Monitoring Table) or over 24C (highlighted red in the Weather Monitoring Table), during the tipi event you should speak to the client. Advise them that the temperature is predicted to be moderately high, and some preventative action will be taken when the build takes place:

- All Weatherproofing Kits should be rolled up or cancelled, allowing fresh air flow through the tipi. If you allow your clients to roll the panels up, it means they can drop them again if the temperature falls as the night draws in.
- Smoke Hoods should be opened to allow for extra ventilation.



Predicated for the tipi break-down: If the temperatures are predicted between 15C – 24C for the tipi break-down (Yellow in the Weather Management Plan), you should follow the same action plan as listed for the tipi build:

- Consider providing fresh, cooled water throughout the day.
- Consider allowing the team to have additional short breaks throughout the day. Although you are giving the team extra time off, it can increase productivity as they are refreshed and hydrated throughout the day.
- Provide caps for the team and allow warm weather clothing such as vests and shorts.

If you are predicting the temperature to rise above 24C at any point during the tipi break-down (highlighted as Red in the Weather Management Plan), the previous actioning applies, but the considerations become must-do. In addition:

- Provide sunscreen for staff members
- Take breaks in shaded areas and try to limit the amount of time staff spend in direct sunlight.

During the tipi set-up and tipi dismantle: If the temperature unexpectedly reaches levels between 15C – 24C whilst your staff are working on-site, your Team Leader should consider the following actions:

- Source and provide fresh, cooled water throughout the day.
- Allow the team to have additional short breaks throughout the day. Although you are giving the team extra time off, it can increase productivity as they are refreshed and hydrated throughout the day.

If the temperatures continue to rise above 24C whilst on site, the previous considerations should now become must-do.



6.4 Reporting of dangerous occurrences or injury

The final information you should input to the Weather Management Table involves the feedback of your team leader on the weather conditions, the effect it had on the build/event/break-down, and how the action plan aided them in making the correct decisions, at the right time.

Inputting these reviews will help you to further prepare for the differing weather forecasts, as you will have evidence of how the weather effected your staff and client, and the best course of action to prevent damage or injury. You may feel the need to tweak or expand on the Weather Management Action Plan to suit your team's experience on site in the highlighted conditions.



7 Weather Management Action Plan

Weather Condition	Weather Key	Measure	Prior to the tipi set-up	During the tipi set-up	During the tipi event	During the tipi dismantle
Strong Winds	Yellow:	35mph-48mph	- All Smoke Hoods should be closed (without permission for the opening of them). - Extra strapping will be added to the D-rings on the midwall of the lifted canvases. - Strengthen tipi anchorage by using larger/longer stakes, and additional stakes if deemed necessary. - If winds are predicted to reach the higher levels of this range (30mph), you should advise the client that lifting the tipi (for entrance / weatherproofing kit / panoramic window) will be forbidden, and an Entrance Porch, or a simple zip entry should be offered as an alternative.	- All smoke hoods will be closed (without permission for the opening of them). - If it is deemed fit and safe to still have a side of the tipi lifted for entry / exit, then attach extra strapping to the D-rings on the midwall, securing the lifted side to the ground at more points with longer stakes. - If it is deemed unsuitable and unsafe to have a side of the tipi lifted for entry / exit, then you will need to secure all sides of the tipi down and use with an Entrance Porch or zip opening as the entry / exit point. Inform the client as soon as you have made this decision. - Please note – this is your decision to make to ensure the safety of your client. Do not be pressured by the client to make an arrangement that is against your experience and better judgement. - While building the tips, the progress may need to be delayed/postponed to ensure the staff's safety.	- Providing an Action Plan table to be kept on site at all times, that are referred to if needed. - Providing the client with an anemometer to take an accurate reading of the wind levels, allowing them to make any necessary decisions in line with the Action Plan table provided. - If the client is not confident / comfortable with the responsibility of the event management (and has nobody in their party that can be), you should use one of your own staff to be on site during the event, to implement any actions if poor weather conditions occur. - Providing an Action Plan table to be kept on site at all times, that are referred to if needed.	- All smoke hoods will be closed (if still in place). - If it is deemed fit and safe to still have a side of the tipi lifted for entry / exit, then attach extra strapping to the D-rings on the midwall, securing the lifted side to the ground at more points with longer stakes. - If it is deemed unsuitable and unsafe to have a side of the tipi lifted for entry / exit, then you will need to secure all sides of the tipi down and use with an Entrance Porch or zip opening as the entry / exit point. Inform the client as soon as you have made this decision. - Do not attempt to remove the main tipi canvas, as the wind could blow inside it and create a huge kite, potentially injuring a member of staff, a member of the public or damaging the bit.
	Red:	>48mph	- Delay the set-up of the tips (if wind levels are predicted to drop) – with client made aware the wind must drop below 25mph for building to commence. - Cancel the set-up and whole event – re-arranging for a later date, on the condition of lower wind speeds.	- The Tipi Team Leader must consider the wind speeds as part of ongoing safety assessment for each stage of the tipi build, and the effect high winds will have when moving to the next stage (e.g. fitting the tipi canvas). - The Tipi Team Leader must be confident the tipi structure being erected/dismantled and used during the event can not only withstand the current wind speed, but also forecasted wind speeds for the duration of the event. The Tipi Team Leader should liaise with the Operations Manager. - If there is any doubt as to the safety of Tipi staff, contractors or the public, then tipi structures should not be erected, and if they already are, the immediate area should be evacuated until a time when the wind speed drops.	- Call the On-call Tipi Team Leader or Operations Manager to notify them of the current weather condition and the actions to be taken. - Evacuate all pop-up catering marquees. - All smoke hoods should be closed and re-secured. - If on-call staff can get on site, changes to the structure can be made to protect the event, although guests may need to move from the area of the tipi / exit the structure whilst these changes take place (Please note, this action should only be taken if you and / or your staff are confident the wind speeds will not increase further). This could be: - Dropping any lifted sections and pegging the canvas into the ground with suitable stakes. - Adding extra strapping and pegging to anchor the structure to the ground.	- The Tipi Team Leader must consider the wind speeds as part of ongoing safety assessment for each stage of the tipi dismantle, and the effect high winds will have when moving to the next stage (e.g. unpegging the tipi canvas). - The Tipi Team Leader must be confident the tipi structure being dismantled can not only withstand the current wind speed, but also forecasted wind speeds for the duration of the event. If event forecasted winds are imminent, it might be better to leave the canvas pegged into the ground, rather than rushing to take the canvas off the frame. The Tipi Team Leader should liaise with the Operations Manager. - If there is any doubt as to the safety of Tipi staff, contractors or the public, then tipi structures should not be worked on or inside of, and if they already are, the immediate area should be evacuated until a time when the wind speed drops.



8 Beaufort (Gale Force) Scale

Beaufort Scale (Gale Force)

Reference: https://en.wikipedia.org/wiki/Beaufort_scale

Beaufort Number (Gale Force)	Description	Wind Speed	Land Conditions
0	Calm	<1mph	Calm. Smoke rises vertically
1	Light air	1-3mph	Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
2	Light breeze	4-7mph	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	Gentle breeze	8-12mph	Leaves and small twigs constantly moving, light flags extended.
4	Moderate breeze	13-18mph	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	19-24mph	Branches of a moderate size move. Small trees in leaf begin to sway.
6	Strong breeze	25-31mph	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic bins tip over.
7	High wind, moderate gale, near gale	32-38mph	Whole trees in motion. Effort winded to walk against the wind.
8	Gale, fresh gale	39-46mph	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
9	Strong / severe gale	47-54mph	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.
10	Storm, whole gale	55-63mph	Trees are broken off or uprooted, structural damage likely.
11	Violent storm	64-72mph	Widespread vegetation and structural damage likely.
12	Hurricane force	>73mph	Severe widespread damage to vegetation and structures. Debris and unsecured objects are hurled about.



9 Wind Loadings

Where Wind Loadings are concerned, the standard throughout the tipi industry (and what is used by its competitors) is “Hand Calculations”. Given the complex shapes of the tipis, calculating the wind loading using these Eurocodes is not simple, nor necessarily accurate. Therefore, The Tipi Company has spent many tens of thousands of pounds and two years having their wind loadings calculated (to code) using **Computational Fluid Dynamics** (CFD). This is the same technique used to design F1 racing cars and aircraft.

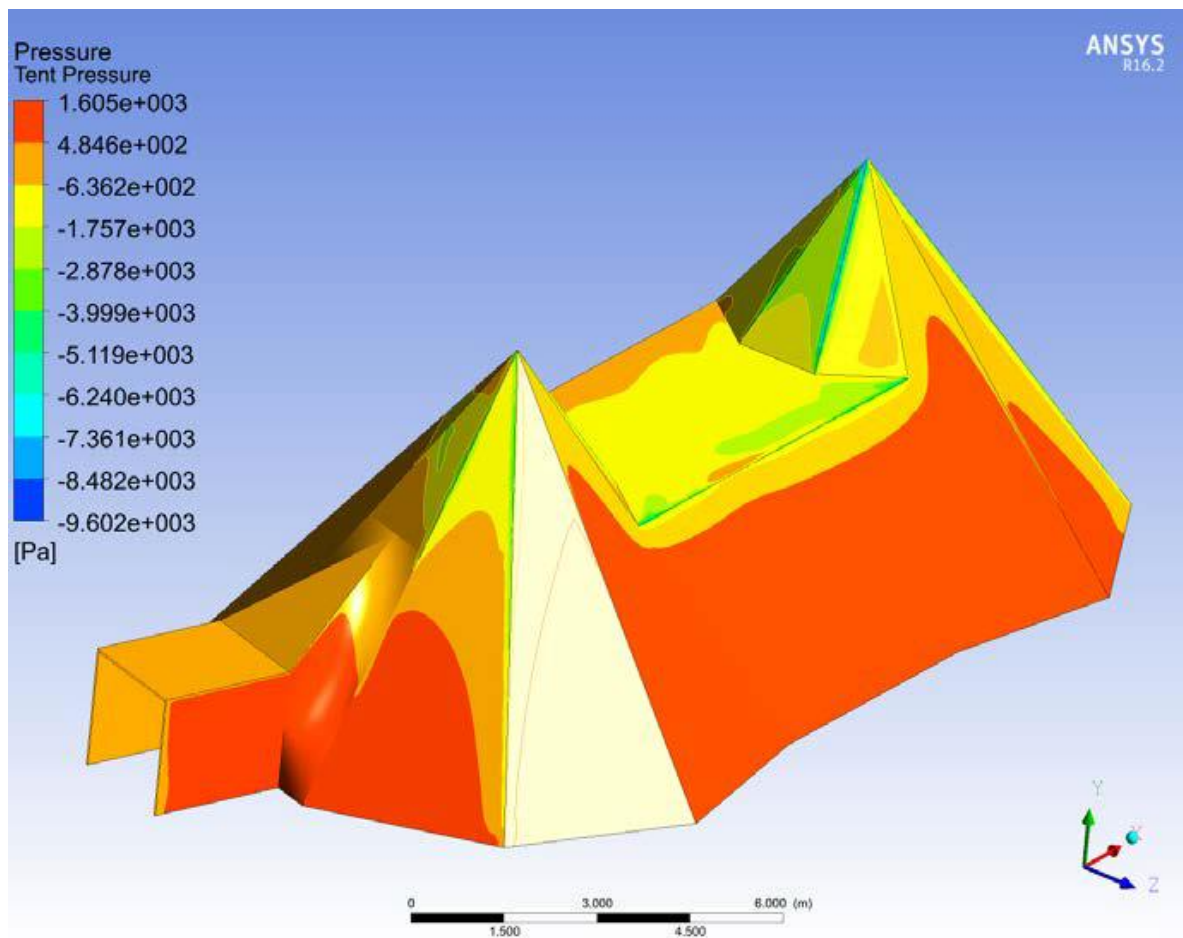
With the weather becoming increasingly difficult throughout the UK and beyond, The Tipi Company believe that hand calculations aren’t sophisticated or safe enough and as a result, the Computational Fluid Dynamics are a much more detailed and reliable way of working when it comes to outdoor event structures. These CFDs now prove that The Tipi Company tipis can withstand up to 53mph winds (dependant on the tipi configuration), without the use of extra bracing devices, which is the highest in the industry. This means that our tipis are the strongest tipis in the wind. Being a client of ours you can now display the logo below on all of your marketing collateral.





SAFE WIND LOADS FOR THE TIPI COMPANY EVENT TIPIS

Tipi Configuration	Wind Direction	C16 Strength Limit* Windspeed	Limiting Operational** Windspeed	Predicted Failure*** Windspeed
1 - Single Tipi with Entrance Open	Side Wind	19.2 m/s (42.9mph)	21.75 m/s (48.7mph)	27.0 m/s (60.4mph)
1 - Single Tipi with Entrance Open	Frontal Wind	19.8 m/s (44.3mph)	23.75 m/s (53.1mph)	29.5 m/s (66.0mph)
2 - Single Tipi with Front Open	Side Wind	12.8 m/s (28.6mph)	16.5 m/s (36.9mph)	20.5 m/s (45.9mph)
2 - Single Tipi with Front Open	Frontal Wind	15.6 m/s (34.9mph)	20 m/s (44.7mph)	23.6 m/s (52.8mph)
3 - 2 Tipi's Side-by-Side with Entrance Open	Side Wind	11.7m/s (26.2mph)	19 m/s (42.5mph)	23.6 m/s (52.8mph)
3 - 2 Tipi's Side-by-Side with Entrance Open	Frontal Wind	16 m/s (35.8mph)	22 m/s (49.2mph)	27.3 m/s (61.1mph)
4 - 2 Tipi's Side-by-Side with Full Front Open	Side Wind	19.2 m/s (42.9mph)	26.8 m/s (59.9mph)	33.3 m/s (74.5mph)
4 - 2 Tipi's Side-by-Side with Full Front Open	Frontal Wind	15.6 m/s (34.9mph)	20 m/s (44.7mph)	23.6 m/s (52.8mph)
5 - 3 Tipi's Side-by-Side with Entrance Open	Side Wind	11.7 m/s (26.2mph)	18.3 m/s (40.9mph)	22.7 m/s (50.8mph)
5 - 3 Tipi's Side-by-Side with Entrance Open	Frontal Wind	9 m/s (20.1mph)	15.5 m/s (34.7mph)	19.2 m/s (42.9mph)
6 - 3 Tipi's Side-by-Side with Full Front Open	Side Wind	17 m/s (38.0mph)	22.5 m/s (50.3mph)	27.9 m/s (62.4mph)
6 - 3 Tipi's Side-by-Side with Full Front Open	Frontal Wind	9.2 m/s (20.6mph)	11.9 m/s (26.6mph)	14.8 m/s (33.1mph)
7 - 3 Tipi's in a Triad with Full Front Open	Side Wind	17 m/s (38.0mph)	26.5 m/s (59.3mph)	32.9 m/s (73.6mph)
7 - 3 Tipi's in a Triad with Full Front Open	Frontal Wind	14.1 m/s (31.5mph)	18.6 m/s (41.6mph)	22.0 m/s (49.2mph)
Recommended Action		Normal care and monitoring to continue	Special care and monitoring to condition of tipis	Evacuate tipis immediately



Given the sensitivity of these structures to changing wind conditions and the potential hazard to occupants, it is recommended that each unit should include a wind speed sensor and alarm to alert users to a developing hazardous condition. It is also recommended that all operators put in place evacuation procedures in the event that the wind develops during an event to unsafe levels. Once you become a client of The Tipi Company, you will have the TTC Wind Management Plan document to use to guide you.

*The C16 Strength limit is deemed the 'normal operating' wind speed limit and is based on a statistical representation of the properties of the main timber structural sections that ensures that 95% of all specimens subject to this load level will survive. The Tipi Company is the only tipi manufacturer to grade their timbers to this class of strength – ensuring maximum safety for our customers and their guests.

**The 'limiting operating' wind speed, is the point at which the first element in the structure reaches its design permissible stress (65% of measured failure stress for timber and 71% of failure strength of connections).

***The predicted failure wind speed is extrapolated from the design stress results and should be used as a guide only. The natural variability in the timber may well result in an earlier or later failure than indicated by this column.