Rathcoole Housing Development

Climate
Appendix 10-1 – CCRA

Delivering a better world

RISK IDENTIFICATION								RISK ASSESSMENT																								ADAPTATION MEASURES																	
Risk ID	Climate variable	Risk statement	Direct or Indirect Impact	Proposed Development Sectors			Impact type	Planned Controls	Initial risk rating RCP4.5 (2021-2050)			Initial risk rating RCP4.5 (2041-2070)			Initial risk rating RCP4.5 (2071-2100)			Initial risk rating RCP8.5 (2021-2050)			Initial risk rating RCP8.5 (2041-2070)			Initial risk rating RCP8.5 (2071-2100)			Justification	Adaptation Measures	Residual risk rating RCP4.5 (2021-2050)			Residual risk rating RCP4.5 (2041-2070)			Residual risk rating RCP4.5 (2071-2100)			Residual risk rating RCP8.5 (2021-2050)			Residual risk rating RCP8.5 (2041-2070)			Residual risk rating RCP8.5 (2071-2100)		
				Civil infrastructure (roads/pavement)	Human Health & Safety (Public/Staff/Visitors)		e.g. Asset damage, Health & Safety, Operational, Environmental, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating
Construction:																																															
1	Flooding (Pluvial)	Extreme rainfall events causes surface water and or flash flooding to occur on the site, resulting in damage to ground-level infrastructure and critical infrastructure. This can also lead to disruption to construction if access to the site is limited due to local roads being flooded and equipment being damaged by water. Delays to construction activities can result in increased financial costs.	Direct	•		Asset damage, Operational and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. A flood risk assessment will be carried out. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consideration should be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the sites surface drainage capacity. Raise critical infrastructure to be above PMF (Probable maximum flood). Construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms, should be used, where feasible. Consideration should be given to installing additional attenuation storage tanks at key locations or identified flood risk areas, to increase the proposed developments drainage capacity.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Flooding (Fluvial and fluvial)	Extreme rainfall over an extended period can lead to nearby rivers exceeding their natural capacity causing flooding. This can result in ground-level infrastructure and equipment being damaged.	Direct	•		Asset damage, Operational and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. A flood risk assessment will be carried out. The Camac Flood Alleviation Scheme is currently underway, which is to assess the risk of flooding in key parts of the Camac catchment area which will in turn, inform engineering options to further reduce the risk of flooding in these areas. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consideration should be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the sites surface drainage capacity. Raise critical infrastructure to be above PMF (Probable maximum flood). Construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms, should be used, where feasible. Consideration should be given to installing additional attenuation storage tanks at key locations or identified flood risk areas, to increase the proposed developments drainage capacity.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Storm events	Storm events (high winds and hail) make work environments and the use of construction equipment and machinery unsafe for workers. Areas of the construction site may become slippery and those more exposed to winds will be particularly hazardous environments. This would result in delays and possible ceasing of construction if areas of the site had to be closed. Delays to construction activities can result in increased financial costs.	Direct	•	•	Asset damage, Operational, Health & Safety and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Unlikely	Moderate	Medium	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Moderate	Medium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The number of very intense storms is projected to increase over the North Atlantic region in the future, with severe storms happening up to 1.6 times more often by 2080 in the short-term, an increase is unlikely.	Construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms, should be used, where feasible. If applicable undertake regular monitoring of trees and vegetation in the area, pruning as necessary to avoid damage to the construction site or blocking access roads, in the event of a storm with high wind speed.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Storm events	Storm events and high winds can result in debris blowing/falling onto the construction site. This would result in delays and possible ceasing of construction, until the debris is removed. Delays to construction activities can result in increased financial costs.	Direct	•		Asset damage, Operational and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The number of very intense storms is projected to increase over the North Atlantic region in the future, with severe storms happening up to 1.6 times more often by 2080 in the short-term, an increase is unlikely.	Construction materials with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms, should be used, where feasible. If applicable undertake regular monitoring of trees and vegetation in the area, pruning as necessary to avoid damage to the construction site or blocking access roads, in the event of a storm with high wind speed.	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Changing Temperatures	Extreme heat event causes overheating of construction equipment resulting in delays, repairs and additional costs. Delays to construction activities can result in increased financial costs.	Direct	•		Asset damage, Operational and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.7°C when comparing 1991-2020 mean annual air temperature with that of 1961-1990. In the shorter-term (2021 – 2050) the average annual temperatures are projected to increase by between 0.22-0.76°C and 0.24-0.98°C (compared to a 1981-2010 baseline) depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently. However it should be noted that the hottest temperature recorded in Ireland to date, since the 1830s, was 33.0°C in July 2022.	Construction materials and equipment with superior properties that offer increased tolerance to fluctuating temperatures, heavy precipitation and other extreme weather events such as storms, should be used, where feasible. E.g. construction equipment that can withstand conditions greater than 50°C	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	Changing Temperatures	Extreme heat event causes disruption and delays to the construction site due to working conditions being unsuitable. e.g. Increased risk of workers experiencing sunstroke and dehydration.	Direct		•	Operational, Health & Safety and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation.	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.7°C when comparing 1991-2020 mean annual air temperature with that of 1961-1990. In the shorter-term (2021 – 2050) the average annual temperatures are projected to increase by between 0.22-0.76°C and 0.24-0.98°C (compared to a 1981-2010 baseline) depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently. However it should be noted that the hottest temperature recorded in Ireland to date, since the 1830s, was 33.0°C in July 2022.	Ensure all outdoor construction workers have access to indoor facilities, air conditioning, breaks in shaded areas and water breaks. Cease outdoor and non-essential work if working conditions are too dangerous and could result in injury to workers and damage to equipment Adequate cooling and ventilation systems is vital in the design of temporary office buildings and construction worker facilities, that's sufficient to deal with hotter and more extreme temperatures.	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	Rare	Minor	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	Storm events	Hot and dry temperatures coupled with strong winds can result in excess dust being generated from construction site activities. This can lead to delays in construction work if working conditions are too poor due to dust being blown around the site. In addition equipment may need to be repaired/maintained if there's dust after gathering in it, this can result in increased financial costs.	Direct	•	•	Asset damage, Operational, Health & Safety and Financial	A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. The CEMP will set out the standard measures that will be taken to govern the activities on the construction site and minimise environmental impacts. The CEMP will also covers matters of safety and response to potential environmental incidents. The contractor shall be in compliance with the criteria set out in the 'SAFETY, HEALTH AND WELFARE AT WORK (CONSTRUCTION) REGULATIONS 2013' Irish regulation. Dust shall be controlled by the use of water spray during the works. Wheel washing at site exits will reduce dirt on the local roads.	Unlikely	Insignificant	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Insignificant	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.7°C when comparing 1991-2020 mean annual air temperature with that of 1961-1990. In the shorter-term (2021 – 2050) the average annual temperatures are projected to increase by between 0.22-0.76°C and 0.24-0.98°C (compared to a 1981-2010 baseline) depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently. However it should be noted that the hottest temperature recorded in Ireland to date, since the 1830s, was 33.0°C in July 2022.	Ensure all outdoor construction workers have access to indoor facilities. Cease outdoor and non-essential work if working conditions are too dangerous, and could result in injury to workers and damage to equipment	Unlikely	Insignificant	Low	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Insignificant	Low	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operation:																																														
8	Flooding (Pluvial)	Extreme rainfall events causes surface water and or flash flooding to occur, resulting in damage to ground-level infrastructure and critical infrastructure. (e.g. onsite power facilities being down)	Direct	•		Asset damage, Operational and Financial	National, regional and local planning policy and guidelines require the incorporation of SuDS measures in new development proposals. Where increases in hardstanding areas are proposed, the run-off will be managed through the application of SuDS source control measures such as filter drains along access roads. All SuDS components should be evaluated for extreme event (such as extreme heavy rainfall) exceedance and be provided with overflow systems where a certain level of service cannot be assured and there is a risk of flooding as a result. Consideration of topography is important to ensure overland flows are directed away from critical infrastructure and buildings. A flood risk assessment will be carried out. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change.	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consider introducing a drainage maintenance and operation plan, that ensures the drainage system is monitored and kept blockage free. Consider re-paving key areas with a permeable material to allow water to be absorbed into the ground and not gather on the surface area. It is recommended that critical infrastructure is raised above PMF (Probable maximum flood).	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low
9	Flooding (Pluvial)	Extreme rainfall events causes surface water and or flash flooding to occur resulting in damage to external ground-level infrastructure and critical infrastructure.	Direct	•		Asset damage, Operational and Financial	National, regional and local planning policy and guidelines require the incorporation of SuDS measures in new development proposals. Where increases in hardstanding areas are proposed, the run-off will be managed through the application of SuDS source control measures such as filter drains along access roads. All SuDS components should be evaluated for extreme event (such as extreme heavy rainfall) exceedance and be provided with overflow systems where a certain level of service cannot be assured and there is a risk of flooding as a result. Consideration of topography is important to ensure overland flows are directed away from critical infrastructure and buildings. A flood risk assessment will be carried out. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change.	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consider introducing a drainage maintenance and operation plan, that ensures the drainage system is monitored and kept blockage free. Consider re-paving key areas with a permeable material to allow water to be absorb into the ground and not gather on the surface area. It is recommended that critical infrastructure is raised above PMF (Probable maximum flood).	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium	Unlikely	Minor Air	Medium
10	Flooding (Pluvial and fluvial)	Extreme rainfall over an extended period can lead to nearby rivers exceeding their natural capacity causing flooding. This can result in ground-level infrastructure and equipment being damaged.	Direct	•		Asset damage, Operational and Financial	A flood risk assessment will be carried out. The Camac Flood Alleviation Scheme is currently underway, which is to assess the risk of flooding in key parts of the Camac catchment area which will in turn, inform engineering options to further reduce the risk of flooding in these areas. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change. National, regional and local planning policy and guidelines require the incorporation of SuDS measures in new development proposals. Where increases in hardstanding areas are proposed, the run-off will be managed through the application of SuDS source control measures such as filter drains along access roads. All SuDS components should be evaluated for extreme event (such as extreme heavy rainfall) exceedance and be provided with overflow systems where a certain level of service cannot be assured and there is a risk of flooding as a result. Consideration of topography is important to ensure overland flows are directed away from critical infrastructure and buildings. SUDS measures will provide storage volume for a 1 in 10 year rainfall event, plus an additional 20% climate change allowance.	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consider introducing a drainage maintenance and operation plan, that ensures the drainage system is monitored and kept blockage free. Consider re-paving key areas with a permeable material to allow water to be absorb into the ground and not gather on the surface area. It is recommended that critical infrastructure is raised above PMF (Probable maximum flood).	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium
11	Flooding (Pluvial and fluvial)	Extreme rainfall over an extended period can lead to nearby rivers exceeding their natural capacity causing flooding or surface water drainage being overwhelmed This can result in flooding of the substation building and suspention of energy provision	Direct	•		Asset damage, Operational and Financial	A flood risk assessment will be carried out. The Camac Flood Alleviation Scheme is currently underway, which is to assess the risk of flooding in key parts of the Camac catchment area which will in turn, inform engineering options to further reduce the risk of flooding in these areas. To further mitigate against pluvial flood risk, an effective surface water strategy will be developed for the site which includes a 20% increase for Climate Change. National, regional and local planning policy and guidelines require the incorporation of SuDS measures in new development proposals. Where increases in hardstanding areas are proposed, the run-off will be managed through the application of SuDS source control measures such as filter drains along access roads. All SuDS components should be evaluated for extreme event (such as extreme heavy rainfall) exceedance and be provided with overflow systems where a certain level of service cannot be assured and there is a risk of flooding as a result. Consideration of topography is important to ensure overland flows are directed away from critical infrastructure and buildings. SUDS measures will provide storage volume for a 1 in 10 year rainfall event, plus an additional 20% climate change allowance.	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Ireland is expected to experience an increase in the frequency of very wet days, particularly in autumn and winter. Rathcoole and the vicinity surrounding it has experienced flood events in the past and is expected to continue to experiencing them in the future, with a number of these flood events reoccurring in the same area.	Consider introducing a drainage maintenance and operation plan, that ensures the drainage system is monitored and kept blockage free. Consider re-paving key areas with a permeable material to allow water to be absorb into the ground and not gather on the surface area. It is recommended that critical infrastructure is raised above PMF (Probable maximum flood). Energy infrastructure to be designed to Irish Grid Standards	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium	Unlikely	Moderate Air	Medium
12	Storm events	Severe wind event has higher wind loading then that of the designed infrastructure. This causes stress on the infrastructure, resulting in damage or reduced design life and potential safety hazard.	Direct	•	•	Asset damage, Operational, Health & Safety and Financial	Buildings and structures will be built in line with the design standard, such as Eurocode EN 1991-1-4, for wind loading.	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	The number of very intense storms is projected to increase over the North Atlantic region in the future (2041-2060), under both RCP4.5 & RCP8.5.	Wind patterns should be monitored and an early warning system should be in place at the proposed development. This will allow for contingency plans to be put in place in advance of predicted storm and windy conditions. A wind monitoring plan which establishes procedures and measures that should be initiated during periods of strong winds should be developed.	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low
13	Storm events	Severe wind affects vegetation/ landscaping including trees on or near the proposed development, causing damage, uprooting or breakage, resulting in damage to infrastructure and potential safety hazard.	Direct	•	•	Asset damage, Operational, Health & Safety and Financial	Buildings and structures will be built in line with the design standard, such as Eurocode EN 1991-1-4, for wind loading.	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	The number of very intense storms is projected to increase over the North Atlantic region in the future (2041-2060), under both RCP4.5 & RCP8.5.	Wind patterns should be monitored and an early warning system should be in place at the proposed development. This will allow for contingency plans to be put in place in advance of predicted storm and windy conditions. A wind monitoring plan which establishes procedures and measures that should be initiated during period of strong winds should be developed. If applicable undertake regular monitoring of trees and vegetation in the area, pruning as necessary to avoid damage to the construction site or blocking access roads, in the	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low
14	Changing Temperatures	Extreme heat can result in overheating and faults within the substation building and associated infrastructure. This can result in disruption of energy supply and discomfort for building occupants	Direct	•	•	Asset damage, Operational, Health & Safety and Financial	- Building layouts and designs will consider ways to maximise daylight and natural ventilation. -Where necessary and feasible external shading devices will be favoured over glazing color coatings as this will allow for sunlight to be absorbed in winter but reflected in summer. -High efficiency heating, ventilation, and air conditioning (HVAC) systems and high efficacy lighting with occupancy and daylight control where applicable.	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.7°C when comparing 1991-2020 mean annual air temperature with that of 1961-1990. By the middle of this century (2041 – 2070) the average annual temperatures are projected to increase by between 0.2-1.3°C and 0.3-1.66°C (compared to a 1981-2010 baseline) depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently. However it should be noted that the hottest temperature recorded in Ireland to date, since the 1830s, was 33.0°C in July 2022.	HVAC systems to be considered for buildings containing critical electrical equipment	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium
15	Changing Temperatures	Extreme heat days results in discomfort to building occupants due to overheating of buildings and indoor areas. Warm indoor environments can result in health hazards as occupants may become dehydrated or suffer from other heat associated health risks. (This risk is exacerbated by urban heat island effect).	Direct		•	Health & Safety	- Building layouts and designs will consider ways to maximise daylight and natural ventilation. -Where necessary and feasible external shading devices will be favoured over glazing color coatings as this will allow for sunlight to be absorbed in winter but reflected in summer. -High efficiency heating, ventilation, and air conditioning (HVAC) systems and high efficacy lighting with occupancy and daylight control where applicable.	Rare	Insignificant	Low	Unlikely	Insignificant	Low	Unlikely	Insignificant	Low	Rare	Insignificant	Low	Unlikely	Insignificant	Low	Unlikely	Insignificant	Low	Rare	Insignificant	Low	Ireland's climate is changing in line with global trends, with a temperature increase of, on average, 0.7°C when comparing 1991-2020 mean annual air temperature with that of 1961-1990. By the middle of this century (2041 – 2070) the average annual temperatures are projected to increase by between 0.2-1.3°C and 0.3-1.66°C (compared to a 1981-2010 baseline) depending on the emissions trajectory. The number of warm days is expected to increase and heat waves are expected to occur more frequently. However it should be noted that the hottest temperature recorded in Ireland to date, since the 1830s, was 33.0°C in July 2022.	Weather forecasts should be monitored and an early warning system should be in place at the proposed development. This will allow for contingency plans to be put in place in advance of predicted extreme heat events. In advance of expected periods of extreme heat check all HVAC system are working correctly and assess if further temporary fans need to be dispersed in indoor areas.	Rare	Insignificant	Low	Unlikely	Insignificant	Low	Unlikely	Insignificant	Low	Rare	Insignificant	Low	Unlikely	Insignificant	Low	Unlikely	Insignificant	Low	Rare	Insignificant	Low
16	Changing Temperatures	Extreme cold days results in discomfort to building occupants due to prolonged periods of extreme cold affecting heating. Insufficient heating indoors can result in discomfort to occupants and an increased in costs.	Direct		•	Health & Safety and Financial	- Building layouts and designs will consider ways to maximise daylight and natural ventilation. -Where necessary and feasible external shading devices will be favoured over glazing color coatings as this will allow for sunlight to be absorbed in winter but reflected in summer. -High efficiency heating, ventilation, and air conditioning (HVAC) systems and high efficacy lighting with occupancy and daylight control where applicable.	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	It is projected that there will be a decrease in frost days and an increase in winter temperatures.	Weather forecasts should be monitored and an early warning system should be in place at the proposed development. This will allow for contingency plans to be put in place in advance of predicted extreme weather events.	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low