Operational Management and Monitoring – 06.JA0040

Topic	Phase	Operational Management	Ongoing Monitoring
5- Population & Human Health			
	Construction		
	Construction and Traffic Management Plan	An outline Construction and Traffic Management Plan has been prepared by Roughan and O'Donovan, the project engineers, and provided under separate cover. This document provides the outline/framework for the establishment of detailed construction management practices to be agreed by the contractor, SDCC, Coillte and other stakeholders in the event of development approval.	
	Operational		
	Operational Management Plan	An Operational Management Plan has been prepared and submitted under separate cover. This document sets out the envisaged structure and responsibilities for management of the proposed development during operation. The measures include the establishment of a permanent management steering group comprised of SDCC, Coillte and the DMP with responsibility for: -management and maintenance of the development overall, and specifically the facilities outside of the direct responsibility of the private operator; -management of the contract, lease or license of the private operator of the facilities; -liaison with neighbouring landowners, residents and stakeholders, facilitated through the consultation forum of the Dublin Mountains Partnership; -coordination of forest operations ongoing in the western part of the Hell Fire forest property (the area largely unaffected by the proposed development), and -monitoring and management programmes for: • the trails network; • archaeological and architectural heritage features, and • ecology (specifically the Key Ecological Receptors identified in the EIA process). The Operational Management Plan also identifies access and parking management measures including:	

		• car park monitoring and variable message signs to prevent queuing and overspill parking; • the proposed shuttle bus from Tallaght; • the proposed park and ride facility at Tallaght Stadium	
6- Biodiversity & NIS			
	Construction		
	Construction Method Statement	• Site Foreman shall read, sign and abide by the Construction Method Statement. A signed copy will be submitted to the District Conservation Officer of the National Parks and Wildlife Service. • Works Team will be inducted on the ecological considerations listed in the Construction Method Statement by the Site Foreman.	
	Construction and Traffic Management Plan	• A Construction and Traffic Management Plan (CTMP) shall be developed by the Contractor prior to the commencement of works. It shall be developed in accordance with the description of the Outline CTMP	
	Habitat Retention	• Mature trees and scrub outside of the footprint of the proposed car park, visitor centre and canopy bridge will be retained. Fencing will be erected around trees which are to be retained and will include the Root Protection Area, as defined by a professionally qualified Arborist. It is recommended than an Arborist be retained as required by the principal contractor to monitor and advise on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. All recommendations contained in the tree survey report will be followed. • Fallen trees, standing dead trees and stumps outside the footprint of the proposed car park, visitor centre and canopy bridge will be retained as habitat for invertebrates, bryophytes and fungi. Similarly, native trees that are felled to facilitate the proposed development will be moved to areas of the Hell Fire Club where they will provide dead wood habitat.	
	Ecological Clerk of Works	• An Ecological Clerk of Works (ECoW) shall be appointed by SDCC prior to the commencement of works. It shall be their responsibility to supervise and provide recommendations on the execution of any and all works which have the potential to give rise to negative effects on biodiversity/ecological integrity. The ECoW will have similar professional	

		experience of recreation based projects and be a member of the Chartered Institute for Ecology and Environmental Management (CIEEM). • The exact route of the canopy bridge, new trail and surface water drainage in Massy's Estate will be agreed with the ECoW and a qualified arborist, and will adapted to retain as many trees below the proposed visitor centre as possible and minmise damage to tree roots.	
	Site Environmental Manager	• The Contractor will appoint a Site Environmental Manager (SEM) prior to the commencement of works. This person shall be responsible for carrying out environmental monitoring of the works and ensuring that the mitigation measures proposed in this EIAR (as well as the CTMP) are adhered to.	
	Vegetation Clearance/ Invasive Species	• A pre-construction survey will be undertaken 2-3 weeks prior to construction to ensure that protected species such as Red Squirrel and Badger have not taken up residence within the construction envelope. The survey will cover the footprint of the proposed development and a 50m buffer. Should any protected species shelters (e.g. dreys, setts) be found, the ECoW will seek direction from the NPWS. • Site clearance including vegetation removal will take place from October to January inclusive. This has taken early nesting birds, such as Common Crossbill, as well as late nesting birds into account and will therefore avoid direct impacts on nesting birds. Nonetheless, a pre-clearance survey will be carried out for nesting birds prior to the felling of conifers. No trees with features suitable for roosting bats will be felled as part of the proposed development. • Tree planting the Hell Fire Club will consist of at least 10% Scots Pine and shrub planting will include 20% hazel. In the context of the wider landscape and the South Dublin red squirrel population, which currently depends on monocultures of conifers that are subject to clear-felling, a permanent native woodland will be a positive impact.	
	Ground Protection	Appropriately sized machinery with low pressure tyres/ tracks will be used for the trail construction, landscaping and all works in Massy's Estate.	

	Boundary Treatment	The construction envelope associated with the proposed development will be temporarily fenced off at the outset of the construction phase of the project and will avoid the potential for un-necessary loss of habitat outside of the construction footprint.	
	Lighting	The use of artificial lighting on site will be minimised in terms of the area required to be illuminated and the length of time for which any lighting is switched on. Light spillage will be prevented as far as reasonably practicable. Artificial lighting will be shut off at night when not in use or when works cease at the end of the day in order to minimise the effects of light pollution and disturbance to crepuscular and nocturnal species. Security lighting, if required, will be cowled, to prevent light spill outside the compound. The ECoW will ensure that light spill is reduced as much as possible.	
	Excavations	Any excavations deeper than 1m will be either covered or have ramps fitted outside of working hours, which will allow badgers and other wildlife to escape.	
	Red Squirrels	• Site clearance will take place between October and January which is outside the period when Red Squirrel will be nursing young. • Mature trees will be checked by the ECoW immediately prior to felling to ensure no red squirrels are in the area. If any red squirrel are in the trees, or in the immediate vicinity, felling will be postponed until they have left the area. • Tree planting the Hell Fire Club will consist of at least 10% Scots Pine and shrub planting will include 20% hazel. In the context of the wider landscape and the South Dublin red squirrel population, which currently depends on monocultures of conifers that are subject to clear-felling, a permanent native woodland will be a positive impact. Broadleaved woodland can support a higher population density of red squirrels and provide a year-round food source for the species. • Two rope bridges will be constructed, one on each side of the canopy bridge. The siting of the bridges will be agreed with the ecologist and the contractor, depending on ground conditions and suitable trees to link the rope bridges to. The rope bridge will be 6.25m above the road level to accommodation traffic and to match the height of the canopy bridge. The use of rope bridges to reduce road fatalities for red squirrels has been widely documented in Europe and is listed as a ‘proposed action’ in Section 5.3.8 of the All-Ireland	

		Red Squirrel Species Action Plan (NPWS/ EHS, 2008). • The proposed interpretive signage at the site will include information on red squirrel ecology and notices requesting the public not to feed grey squirrels. • Two artificial dreys will be erected the Hell Fire Club. The location will be directed by the ECoW. Suggested locations are presented in the draft Red Squirrel Management Plan. • The draft Red Squirrel Management Plan will be implemented and will include measures to control grey squirrels, if required.	
	Bryophytes and Tufa Springs	• In order to protect the area containing Orthotrichum stramineum in the vicinity of the proposed canopy bridge and the population of Plagiothecium laetum in the vicinity of the proposed visitor centre, a pre-construction survey will be carried out to determine the abundance of these species. • The populations of O. stramineum will marked by the ECoW and the populations will be protected from damage during construction. • The paths near the proposed visitor centre will be routed locally to avoid the populations of Plagiothecium laetum. • The populations will be protected during the operational phase by fencing, as directed by the ECoW. • The tufa springs adjacent to the paths, including their sources, will be marked out by the ECoW and protected during the path upgrades. • The northern link path which was proposed in the original EIAR has been removed from the design to avoid the potential for impacts on the tufa springs.	
	Badger	• A pre-construction survey will be undertaken 2-3 weeks prior to construction to ensure that Badger have not taken up residence within the construction envelope. The survey will cover the footprint of the proposed development and a 50m buffer. Should any protected species shelters (e.g. dreys, setts) be found, the ECoW will seek direction from the NPWS.	
	Pine Marten	• Two pine marten nest boxes will be erected. The locations will be directed by the ECoW. Suggested locations are presented in the draft Red Squirrel Management Plan • A pre-construction survey will be undertaken 2-3 weeks prior to construction. The survey will cover the	

		footprint of the proposed development and a 50m buffer. Should any protected species shelters (e.g. dreys, setts) be found, the ECoW will seek direction from the NPWS.	
	Birds	• If any vegetation needs to be removed outside the permitted period (October-January), the area shall be checked by an experienced ecologist for nesting birds. If nesting birds are found, the works will be postponed until the chicks have fledged. • Where larger trees are removed and to further minimise the loss of nesting sites, 20 nest boxes will be erected. The nest boxes will be located at a sufficient distance from the construction envelope and the type and location will be directed by the ECoW. • Bird-friendly glass (e.g. www.ornilux.com or equivalent) or retrofitted measures such as tape and film, which will reduce the reflectivity of glass facades and windows, will be used on all buildings. This will not prevent all bird collisions but will reduce the risk of collisions significantly. These measures will be approved by the ECoW and will follow the guidance published by the American Birds Conservancy (ABC, undated)	
	Otters	• Prior to any works being carried out, a pre-construction survey will be undertaken 2-3 weeks prior to works to ensure no Otters have taken up residence within 150m of works. • Any temporarily exposed open pipe system will be capped to prevent otters from gaining access when contractors are off site to avoid risk of otters becoming trapped.	
	Newts & Amphibians	• The three ponds will be retained. • The scrub and grassland habitats within 25m of the pond where newts were recorded (Pond 1) will not be disturbed. • Prior to the construction phase the ponds will be demarcated during the construction phase to prevent accidental damage. • Six ponds will be constructed as part of the drainage plan which will provide wetland habitat for amphibians (See previously submitted EIAR: Volume 1 Chapter 8 Water & Hydrology). One of these ponds will be permanently wet; the others will be ephemeral. This will create a wetland habitat mosaic with a mixture of permanent and seasonal ponds, which will provide habitat for a variety of wildlife. • The use of a pond lining may be required and will be determined by the local ground conditions.	

		• The creation of the ponds will follow the guidance in Guidance on good practice in the management and creation of small waterbodies in Scotland (SEPA, 2000) in order to maximise their biodiversity potential. • Terrestrial refugia will be created at each pond which will consist of either log piles or clean inert material covered with topsoil. • Permanent fencing and signage will be erected around the existing and created permanent pond as part of the trail upgrades to protect this habitat from disturbance. The fencing will be set back from the pond edge as far as practicable to provide a buffer of vegetation around each pond.	
	Bats	• In order to avoid impacts on bats, a pre-construction bat suitability assessment will be undertaken. This shall be undertaken no more than 3 weeks prior to the works to identify any new features that have been created since the surveys which informed this EIAR were undertaken. • The construction of the canopy bridge may require some pruning of branches or felling of immature trees. The trees in this area have low bat potential and as such, shall be left on the ground for 24 hours once felled. • Should any bat roost be detected during the pre-construction survey which will be disturbed or lost during construction, a derogation licence will be required from the NPWS. • Following an assessment by a conservation architect, any proposed works to the structures will be reviewed by the ECoW and bat surveys shall be undertaken, if required. • The chimney flues in the Hell Fire Club building will be sealed using a single iron bar or similar. This will be off centre so as to prevent people climbing up the chimney while leaving as much of an open gap as possible. Signs of recent fire lighting mean the flues are likely unsuitable bat roosting habitat. • Three crevice type bat boxes will be placed in the application site. The bat boxes will be located at a sufficient distance from the construction envelope to limit any disturbance and the type and location will be directed by the ECoW and in accordance with Kelleher & Marnell (2006).	
	Upland habitats	• Information boards will be provided at the proposed visitor centre, in the car park, at the entrances to Massy's Estate and at the	

		southern end of Massy's Estate. The boards shall be aesthetically engaging to encourage buy-in from visitors. • The information boards will communicate the following to visitors: • The presence of Natura 2000 sites. • The presence of ground nesting birds and other sensitive wildlife. • The presence of sensitive heath habitats. • A request to remain on the paths and to keep dogs on the lead. • A map showing the waymarked trails in Massy's Estate, the Hell Fire Club and the Dublin Mountains Way but not the trails leading into the SAC or SPA. • A number of looped, waymarked walking routes will be established in Massy's Estate and at the Hell Fire Club. These will be on the existing trails, with some sections improved and a small section of new trail forming a new link path. The establishment of these walks shall involve: • The placement of suitably spaced colour-coded way marker posts at appropriate locations along the trails; and, • The erection of a sign at the outset of the routes displaying a map of the routes with approximate length (km), duration (hours/minutes) and a conservative estimate of difficulty level (i.e. easy/moderate/strenuous).	
	Invasive Species	• During the construction phase, to prevent/minimise potential negative effects as a result of the introduction and/or spread of invasive during the operation of the proposed development, SDCC will adopt an invasive species management plan, a draft of which is presented in Appendix S10. • The invasive species management plan adopted by SDCC will seek to eradicate invasive species in Massy's Estate and at the Hell Fire Club and promote the regeneration of native species. • Herbicides will be used in accordance with the European Communities (Plant Protection Products) Regulations, 2012 (S.I. No. 159 of 2012) and the (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012) (as amended). • Landscaping of the proposed development shall use native species of plants of national provenance only and, insofar as possible, soil reused from on-site excavations. If soil/substrate needs to be imported to the site for the purposes of the proposed development, the Contractor shall ensure that the imported soil/substrate is free from invasive species	

	Glendoo Brook	• In order to prevent pollution of surface water during the construction of the proposed development, which could potentially give rise to negative effects on biodiversity and freshwater habitats, all of the mitigation measures contained in the previously submitted EIAR Chapters 8 (Water and Hydrology) and 10 (Landscape and Visual) shall be implemented. • All machinery will be refuelled from mobile tankers on the local/access/haul/site roads. No refuelling will take place within 50m of any watercourse. • Mobile storage facilities, such as fuel bowsers, will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators will be double skinned. • When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. • Only dedicated trained and competent personnel will carry out refuelling operations. A spill kit and drip tray will be on site at all times and available for all refuelling operations. Equipment will not be left unattended during refuelling. All pipework from containers to pump nozzles will have anti siphon valves fitted. • Strict procedures for plant inspection, maintenance and repairs will be detailed in the contractor's method statements and machinery will be checked for leaks before arrival on site. • All site plant will be inspected at the beginning of each day prior to use. Defective plant will not be used until the defect is satisfactorily fixed. • All major repair and maintenance operations will take place off site. • Care will be taken at all times to avoid contamination of the environment with contaminants other than hydrocarbons, such as uncured concrete and other chemicals. • The track on the western side of the Glendoo Brook within Massy's Estate will be realigned further west/uphill (away from the Glendoo Brook) and will comprise the upgrading of an existing earthen track along the nearby small stream, which is a less ecologically sensitive corridor, located within a mature Beech wood. The route will connect to the existing river trail where the eastern route already crosses the river, avoiding the need for a new crossing of the watercourse. This will minimise works along the Glendoo Brook and allow this area to remain undisturbed by a formalised new trail and increased visitor numbers.	

		• A low-key estate-type railing, which is common in the country houses in the area, will restrict access to the steeper sections of the river banks, which would otherwise cause erosion and likely sediment input. Access will be deterred more subtly in other areas by placing logs along the edge of the path. • Surface water from the Hell Fire Club will travel under the Military Road in a pipe and flow into an open drain along the Military Road where it will flow into the Glendoo Brook. Run-off will be treated in attenuation ponds and a petrochemical interceptor prior to entering Massy's Estate. • Run-off generated from the new hardstanding areas is initially stored on site before being gradually released at the rate that water naturally flows from the site. Therefore, there is no significant change to the quantity or rate of water flowing into the Glendoo Brook. The proposed development will not lead to an increase in the rate or quality of run-off entering Massy's Estate or the Glendoo Brook.	
	Operational		
	Trail Design	The proposed trail improvement and new trails have been designed as Classes 1, 2 and 3 in accordance with the National Trail Office's Classification and Grading of National Trails (2008). This will ensure that proposed increase in footfall will not damage the existing paths which could lead to erosion outside this area.	
	Oversight	A Strategic Oversight Group comprised of representatives at Senior Management / Director Level from SDCC and Coillte will be established to provide formal high-level governance in relation to the proposed Dublin Mountains Visitor Centre. This group will meet at least every two months in the initial year following opening of the centre in order to address strategic and governance issues in relation to the proposed visitor centre as well as responding to issues arising from the Management Steering Committee. It is proposed that the Strategic Oversight Group will be responsible for carrying out an annual inspection of the site trails during the operational phase of the development. The inspections will be carried out by the Dublin Mountains Partnership (DMP) and Coillte. The annual inspections will establish the condition of all trails with reference to National Trails Office standards. If necessary, the trails will be closed and/ or repair works will be specified, and implementation will be supervised by the DMP and Coillte. The trails	

		inspection and specification of works will be informed by the results of the annual ecological surveys, in order that any necessary protection measures for heritage resources are incorporated. This may include temporarily restricting or prohibiting access to areas where erosion is a problem.	
	Information Boards	Information boards will be provided at the proposed visitor centre, in the car park, at the entrances to Massy's Estate and at the southern end of Massy's Estate. The boards shall be aesthetically engaging to encourage buy-in from visitors. Signage has been demonstrated to effectively manage the negative impacts of recreation on wildlife. Herstine et al. (2006) concluded that signage can be an effective approach for passively managing human behaviour and tourism in natural resource settings. A study from Iceland (Marschall et al., 2017) on the impact of signage on visitor behaviour around seals showed that signage was effective, but in particular, 'teleological' signage which provided an explanation as well as a command was more effective. The information boards will provide information on the ecology of the site and include a request for visitors to remain on the trails and to keep dogs on leads	
	Quiet Zones	The series of improved trails will maintain 'quiet zones' (areas away from trails) which will reduce the impact of noise and visual disturbance on species such as Red Squirrel and birds. The quiet zones include blocks of woodland and edge woodland edge habitat away from the trails.	
	Opening hours	The opening hours of the visitor centre are 8am-8pm from April to September and 9am-5pm from October to March. This will limit the presence of light spill from the visitor centre and outside lighting after dark. For a short period, light spill from the visitor centre will be felt over a small area. However, this will be significantly less after the vegetation matures and during the summer months when the trees are in leaf and artificial lighting is not required as much.	
	Drainage	The construction and operation of the proposed development will maintain a drainage neutral situation i.e. there will be no increase or decrease in the flow discharge rate from the application site. The drainage design includes a hydrocarbon interceptor and the construction of ponds and swales to attenuate surface water, which will also provide additional wetland habitat.	

	Native Planting	The landscaping plan includes the widespread planting of native Irish species of trees and shrubs. The eastern slopes of the Hell Fire Club will be planted before construction work begins so as to enhance the existing habitat and reduce the impacts during construction. The biodiversity value of the woodlands will be low at first but will improve with time as the trees grow and a diverse field layer becomes established. The conversion of the conifer plantations to native woodland will take place after the construction phase and will involve the felling of a maximum of 10% of mature conifers per annum.	
	Ecological Regeneration	There will be no seeding carried out as part of the proposed development, with the exception of the wildflower meadow in the walled garden. The disturbed habitats, including areas where invasive species have been removed, will be allowed to regenerate naturally with locally occurring native species	
	Perimeter Fencing	Perimeter fencing will allow wildlife such as badger and hedgehog to pass through it. Crossing points will be located a minimum of every 50m along new perimeter fences and will be at least 30cm × 20cm.	
	Ongoing Surveys	Inspections will establish the condition/prevalence of each habitat or species on the site. If necessary (caused by deterioration of habitat, reduction of species, increase in the spread of an Invasive Alien Plant Species (IAPS) are identified), management measures will be prescribed by the ecologist.	• An annual review over an initial period of 5 years by the management steering group of all Key Ecological Receptors (habitats and species) shall be conducted • Such measures may involve: 1) additional habitat development 2) restriction of public access to affected areas for a prescribed period, 3) IAPS clearance programmes Following the initial 5 year monitoring period, the requirement for the annual ecological inspection/survey will be reviewed and a new regime of inspections/surveys at wider or shorter intervals will be implemented.
7- Land			
	Construction		
	Chemical Storage	Bunded storage units for oil/fuel/hydrocarbons/chemicals are to be provided on impermeable surfaces with a minimum 110% capacity.	
	Refueling	There will be designated refuelling points selected which will be located on hard standing areas with no pathway to the surface water drainage system.	
	Interceptors	Oil interceptors will be provided in order to prevent runoff of pollutants to the soils and sub soils. The use of interceptors will be in compliance with Pollution Prevention Guidelines (PPG) 3.	

	Vehicle Wash	No detergents will be discharged to interceptors. A designated vehicle wash down area will be identified with consideration to drainage arrangements and will be located away from surface water discharge point. Wash water will be collected and contained for disposal off site. Concrete washout will not be permitted to enter the surface water system.	
	Drainage Testing	All new drainage systems will require pressure testing by the contractor and a CCTV survey to discover any possible defects.	
	Excavated Materials	All excavated materials will be assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred at the proposed development site. Should it be determined that any of the soil excavated is contaminated, this will be managed according to best practice and disposed of accordingly by a licensed waste disposal contractor.	
	Construction Guidance	Construction operation will be required to take cognisance of the following guidance documents for construction work on, over or near water. CIRIA C532D Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors	
	Operational		
	Drainage	All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational. All fuel tanks will be required to be double bunded and leak detection measures to be put in place to prevent any accidental discharge. A petrol interceptor will be used to capture any pollutants arising from vehicles in the car park	
8- Water and Hydrology			
	Construction		
	Chemical Storage	Bunded storage units for oil/fuel/hydrocarbons/chemicals are to be provided on impermeable surfaces with a minimum 110% capacity.	
	Refueling	There will be designated refuelling points selected which will be located on hard standing areas with no pathway to the surface water drainage system.	
	Interceptors	Oil interceptors will be provided in order to prevent runoff of pollutants to the soils and sub soils. The use of interceptors will be in	

		compliance with Pollution Prevention Guidelines (PPG) 3.	
	Vehicle Wash	No detergents will be discharged to interceptors. A designated vehicle wash down area will be identified with consideration to drainage arrangements and will be located away from surface water discharge point. Wash water will be collected and contained for disposal off site. Concrete washout will not be permitted to enter the surface water system.	
	Drainage Testing	All new drainage systems will require pressure testing by the contractor and a CCTV survey to discover any possible defects.	
	Surface Water Storage	The surface water drainage system will be developed as part of the works with sufficient storage capacity for any additional runoff. A new surface water drainage system has been designed to cater for the new hardstanding areas additional surface water runoff of 792 cu. m in the 1 in 100 year event. Runoff will be stored on site with an allowable outflow of 2 l/s/ha and to limit the flow into the open stream in the Massy Estate. The existing site has a low permeability and runoff from the non-hardstanding areas currently flows into the stream.	
	Operational		
	Drainage	All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational. All fuel tanks will be required to be double bunded and leak detection measures to be put in place to prevent any accidental discharge. A petrol interceptor will be used to capture any pollutants arising from vehicles in the car park.	
	Discharge Control	A range of mitigation measures have been proposed for the operational phases of the project. These measures, as detailed on the drawings DMVC-ROD-C-DR-XX-ZO-0030-32, seek to ensure that all discharges from the development are controlled to prevent impacts to receiving systems.	
9- Air Noise and Vibration			
	Construction		
	Construction management	Air and noise impacts from the construction works will be mitigated via the following measures to be incorporated in the Works Requirements • Appointment of competent contractor and use of standard construction practices;	

		• Noise and vibration monitoring at key receptors and along neighbouring property boundaries; • The contractor will be required to use off-site parking and provide shuttle service to the site; • Construction will be limited to 07:00-19:00 Monday to Friday and 08:00-13:00 on Saturday. No works will be allowed to take place on Sundays and bank holiday weekends which are the busiest times at the Hellfire Club.	
	Operational		
		None	
10- Landscape and Visual			
	Construction		
		None	
	Operational		
	Hell Fire Forest Property	• Planting and development, on Montpelier Hill, of a mixed predominantly broadleaved forest landscape over a 10 year period to enhance landscape capacity, compose a new sustainable landscape, and maximise biodiversity and habitat whilst facilitating access and trails to the new woodland park; • The retention, where feasible, of existing mature broadleaved specimen trees currently within the forest canopy and setting a precedent for the new woodland landscape; • Management of woodland to enhance panoramic views; • Management including removal of woodland / forest to enhance views towards Montpelier Hill including the restoration of the legibility of the Hell Fire Club on the summit in distant views; • Planting to screen site infrastructure and integrate built development; • Use of materials appropriate to location and place; • Sensitive and simple presentation of site heritage and culture – the idea of conserved ruins retaining mystery and romantic character; • Trails and walkways will generally follow existing routes and be surfaced in traditional quarry dust / rolled gravel, or simple grassed / earthen tracks; • Existing uses will be maintained and enhanced.	

	Massy's Wood	Existing management of the area as an amenity woodland and habitat will be enhanced and invasive species programmes accelerated to improve habitat further. Existing trails will be improved, and new trails provided to manage access through the site – away from more sensitive ecological features with rest points provided with suitable surfacing and seating.	The maintenance programme will be organised on the basis of specific performance standards which must be met by the contractor at all times and will be the basis on which this contract will be assessed. Along with these performance standards an annual report sheet shall be filled out and returned annually.
11 & 12- Cultural Heritage and Archaeology			
	Construction		
	Design	The circular walk, though located close perimeters of the passage tombs (DU025-001001 and DU025-001002) has been designed and set back from the monuments so that it will not directly impact on the underlying archaeology	
		• Where archaeological features or potential archaeological features are likely to be impacted, a licensed archaeologist shall be appointed to carry out the recommended walkover survey, archaeological monitoring, and subsequent archaeological excavations in fulfilment of the DOCHGs recommendations and subject to ministerial consent and permissions under Section 26 of the National Monuments Act 1930 and Section 14 (2) (a) of the National Monuments Act 2004 , particularly in the areas of the proposed car park, visitors centre and where service runs and trails are to be routed before or during the construction phase • All information recovered from advance archaeological investigations (subject to the project's approval) will be incorporated into the exhibition along with information on the archaeology of the wider Dublin Mountains Region and how they fit in to a the regional, national and international context.	• It is proposed that there will be long term management of the sites in order to monitor any changes to the condition of the various monuments in the form of flood damage, erosion and wear and tear. • Inspections of the sites are to be carried out during the operational phase in order to identify any conservation issues or residual impacts that arise from increased visitor's numbers weathering anti-social behaviour. The development will thus improve the protection of archaeological resources • A licensed archaeologist shall be appointed to carry out the recommended walkover survey, archaeological monitoring, and subsequent archaeological excavations in fulfilment of the DOCHGs recommendations and subject to ministerial consent under Section 26 of the National Monuments Act 1930 and Section 14 (2) (a) of the National Monuments Act 2004
	Conservation Works	Subject to the necessary permissions and ministerial consent, small areas on the lower ground and first floors of the Hell Fire Club will be investigated to determine their nature. The proposed stone floor is intended to protect any underlying archaeological features that may be found. • The instalment of discreet lighting in the Hell Fire Club will not involve the chasing of walls. Where possible, wires will be hidden by the proposed stone flooring. • Most of the other works to the Hell Fire Club and the various structures in	

		Massy's Wood involve closer inspection and repairs. • Where vegetation is being removed it must be done with care so that removal does not cause damage. • The widening of the R115 will result in the realignment of a small part of the boundary wall to Massey's Woods. It is proposed to rebuild the wall, using the same materials, along the newly aligned boundary. This is intended to ensure a retention of character along the Boundary to Massy's Wood. • Although no works are currently proposed for the Gothic Gate lodge in Massy's Woods, the realigned boundary wall will be built very close to the rear wall of the lodge. Measures will therefore be taken to ensure that the lodge is protected from damage during the demolition and construction works. • The lodge is currently hidden by the boundary wall. The proposal will reveal the lodge more fully. • The blocking of the chimney flues in the Hell Fire Club is intended to curb people from climbing up on the roof. It will not prevent it altogether however as it is possible to climb up the building via the lean-to wings.	
	Roads	Careful road widening, including a small buried retaining wall to accommodate the level difference between the road and the ground level at the Gothic gate lodge (Massy's Wood), will ensure no damage to the building, and the western elevation of the gate lodge will became the boundary at this point, revealed to public view (the lodge is currently hidden from view).	
	Operational		
		• During operation, the circular path on Montpelier Hill will encourage pedestrians to use this route, reducing wear and tear elsewhere on the summit and protecting the two tombs. • The blocking of the chimney flues in the Hell Fire Club during the construction phase is intended to curb people from climbing up on the roof during the operational phase. It will not prevent it altogether however as it is possible to climb up the building via the lean-to wings.	• Long term management of the sites will monitor any changes to the condition of the various structures and monuments. • Inspections of all structures and sites are to be carried out by suitably qualified professionals (Licenced Archaeologist and Conservation Architect) during the operational phase to identify any conservation issues or residual impacts that arise from increased visitor's numbers, wear and tear or anti-social behaviour. • The optimal frequency will be determined in the initial phase of inspections, thus improving the protection of archaeological and built heritage resources. • If necessary repair works will be specified, and implementation will be supervised by

			a licensed conservation architect or archaeologist. • If necessary, management measures will be prescribed to protect the feature. Such measures include: - additional signage/ information requesting visitors' assistance in conserving the features; - re-routing of trails - Sensitive features might be sensitively enclosed by fencing.
13- Forestry			
	Construction		
	None		
	Operational		
	Forest Activities	Commercial forest activities such as road maintenance, thinning and clear-felling will be planned well in advance and organised during winter months when visitor numbers are lower. Pedestrian diversions will be installed off paths etc. to allow forest activities as normal if necessary. Certain car parks may need to be closed during these operations also.	
	Barriers	For security and health and safety, barriers shall be kept in place to prevent vandalism, dumping, anti-social behaviour, rallying and overnight parking. Car parks shall close during the night.	
	Tree Shelters	Specific types of trees shelters shall be used instead of deer fencing where areas are being converted from conifer to broadleaf.	
14- Traffic and Roads			
	Construction		
	Car Parking	Management of extended carpark	
	VMS	Installation and use of a Variable Message Sign (VMS) on M50 with live updates on parking at Hell Fire Woods.	
	Operational		
	Footpaths	• Provision of 1.8 -1.5m width (dependant on road width) footpath on one side of Gunny Hill Road, Stocking Lane and Killakee Road/Old Military Road. Provision of footpaths will also act as a traffic calming measure.	
	Cycle Lane	• Provision of an advisory slow-moving uphill cycle lane by the removal of the existing centre line and the addition of a cycle lane marking during road resurfacing • Provision of cycle lane will also act as a traffic calming measure.	
	Car Parking		Active future monitoring and management of car parking utilisation includes the use of electronic car park monitoring system to link occupancy rate to VMS - If Hell Fire Woods

			parking area is full, drivers will be directed to Tallaght P&R.
	Shuttle Bus	Shuttle Bus (midi-coach) from Tallaght Stadium at 15-30min intervals, thereby minimising the volume of single car users on Stocking Lane and Killakee Road/Old Military Road.	
	Roads	Proposed one-way systems at notated Pinch Points in EIAR will act as a traffic calming measure.	