


<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
Site Specific EMP	Note: Always print or copy to double-sided pages	REV: 09	Date: June 2017	Site Specific EMP




PLAN NO.	DATE REC'D
PARTY/0017	06 JUL 2017
DUBLIN CITY COUNCIL Planning Dept Compliance	

**Environmental Management Plan**  
**St. James Hospital NCH Project**  
**Main Contract Phase A**  
**Site Revision Rev 00**

<b>Environmental Dept. Revision No: 09</b>			
Reason For Issue: For client approval			<b>Client Approval (if required)</b>
<b>Originator</b>	<b>Reviewer</b>	<b>Approver</b>	
Heidi Murphy Yvonne Brophy	Jim Dillon	Darren Devane Aidan O'Connell	N/A
			N/A
			N/A

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2	Project Manager	Jim Dillon	BAM Building	NCH Site
4	General Foreman	Pat Fennelly	BAM Building	NCH Site
5	Site Health, Safety & Environmental Officer	Heidi Murphy	BAM Building	NCH Site
6	Co. Environmental Coordinator	Jan Gottsche	BAM Building	Head Office, Kill



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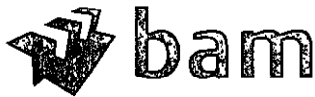
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## 1. General Project Details

<b>Project Name</b>	National Children's Hospital Project – Main Contract Phase A		
<b>Project Location</b>	St. James Hospital, Dublin 8		
<b>Client</b>	National Paediatric Hospital Development Board		
<b>Contract Manager</b>	Darren Devane / Aidan O'Connell		
<b>Start Date</b>	July 2017	<b>Duration (Months)</b>	48 Months
<b>Completion Date (Expected)</b>	December 2020		
<b>Primary Project Type</b>	Main Build		

### Project Description:

#### 1.1 Introduction

This environmental Plan has been written in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its Subcontractors.


This Plan has been approved by the HSE Department at Kill and has the commitment of the Project Manager and Engineers to fulfil the requirements of the plan.

#### 1.2 Description of the Works

Existing vehicular traffic and pedestrian access provisions shall be maintained to allow the continuation of SJH operations and emergency access in line with existing.

#### General Description

The NPH is the largest, most complex and significant capital investment project ever undertaken in healthcare in Ireland. It is the catalyst that will enhance how acute health services are delivered and will result in better clinical outcomes for children and young people. The hospital will bring together into one entity the three existing children's hospitals; Our Lady's Children's Hospital Crumlin, Temple Street Children's University Hospital and the National Children's Hospital at Tallaght Hospital. It will be tri-located on one campus with SJH and a planned maternity hospital. This tri-location model of service delivery is being undertaken to ensure the best outcomes for children, young people, mothers and infants.

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The NPH will be a world-class facility providing secondary paediatric services for the greater Dublin area and specialist services for the country as a whole. It will be an academic health sciences hospital that values world-class research, education and innovation, which in turn will drive excellence in clinical care. The proposed development consists of a 7 storey structure over 2/3 below ground levels within a gross internal floor area of 118,113m<sup>2</sup> with an additional 32,000 m<sup>2</sup> provided for underground parking, bringing the total floor area of the building to 150,113m<sup>2</sup>.

The NPH will provide:

- 380 in-patient beds including 60 critical care beds, all in single en-suite rooms;
- 93 day-care beds;
- Provision of outpatient consulting examination rooms ;
- Provision of an Emergency Department and urgent care facilities;
- Purpose built accommodation for parents;
- ED and urgent care facilities; and
- Provision of 1000 car parking spaces.

### Site Location

SJH Campus, James's Street, Dublin that includes the Davitt Road staging area.


This Dublin city centre site is located on a 4.85ha site at the western side of the St. James's Campus that is bound to the east by the existing adult hospital; the north by Mount Brown / Faulkner Terrace; the west by Cameron Square, Brookfield Road and South Circular Road; and to the south by St. James's Walk Park and the Rialto Luas stop. The site comprises of a number of buildings and services which are being decanted and vacated to make way for the new hospital. All Contractor vehicles accessing via Rialto Gate must be approved by SJH and access onto the NPH site from James's Street is strictly prohibited.

### Work Sequence

Hoarding  
 Archaeology  
 Service Diversion Works  
 Drimnagh Sewer  
 Utility Tunnel  
 Piling line / Secant Wall  
 Bulk Excavation of site  
 Management of Groundwater  
 Access Road Realignment  
 Waterproofing  
 Basement Works  
 Concrete Placement  
 Reinforced concrete Frame  
 Structural Steelwork  
 Façade Installation  
 M&E  
 Fitout

### Restrictions

Site Access  
 Parking  
 Working Hours

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Live Services  
 Live Hospital campus  
 Noise & Vibration levels  
 Aspergillus

**Other Work Activities on Site:**

Live Hospital Environment

**Sensitive Receptors:**

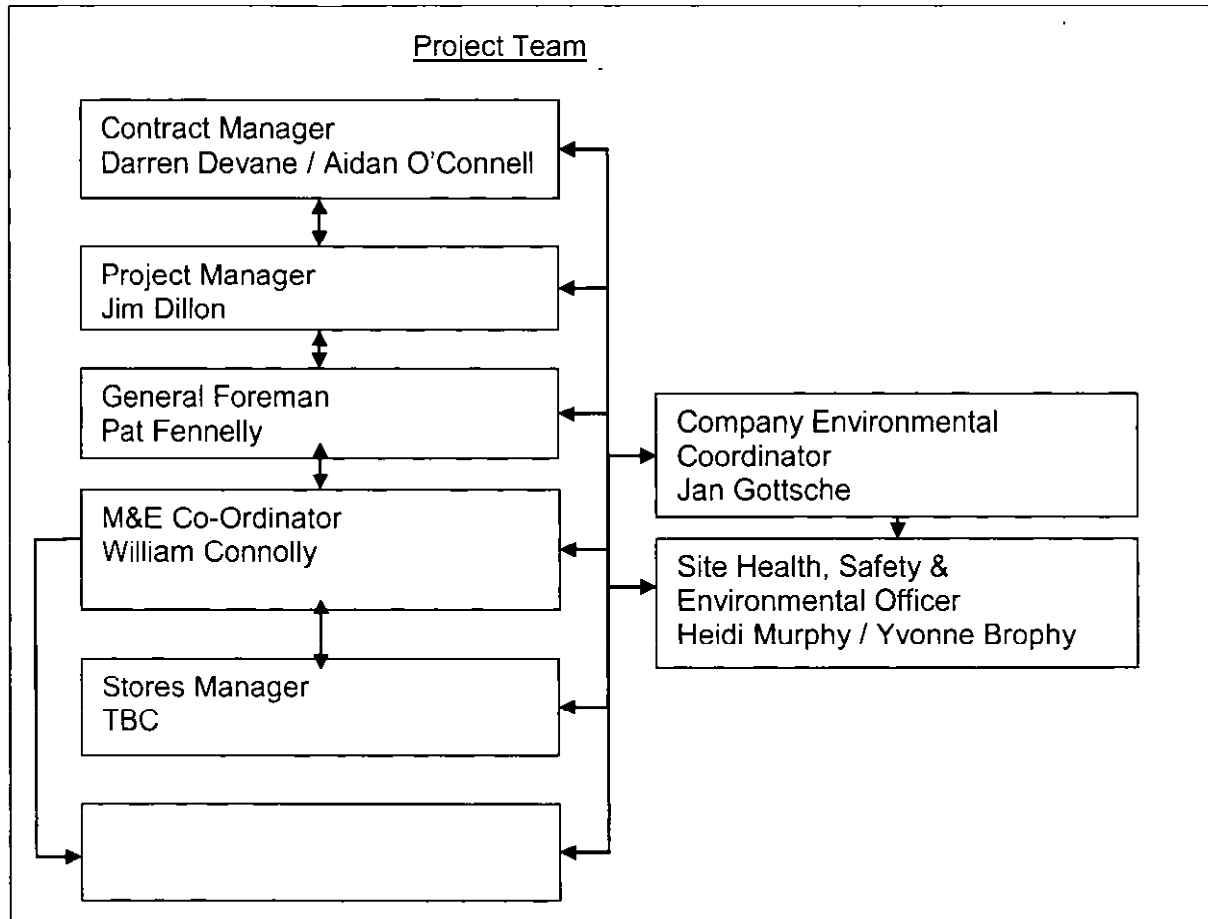
- Nearby live Hospital
- Shops
- Luas Line
- Public Car Parks
- Residential area

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## 2. Environmental Management System

### Project Roles and Responsibilities

#### 2.1 Organisation Chart




#### 2.2 Communication

The principal lines of internal communication in relation to the EMP are shown above. Environmental issues are communicated to staff through the site induction, toolbox talks and monthly safety meeting.

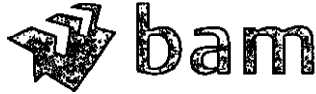
Communication with other external parties will be in accordance with the consultation requirements (section 6) and in response to complaints (section 3).



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### 2.3 Responsibilities

Name	Initials	Company	Role (Job title)	Environmental Management Responsibilities
Jan Gottsche	JG	BAM	Company Environmental Coordinator	Conducts Environmental Risk Assessment, advises on environmental issues and controls, and conducts internal environmental audits.
Darren Devane Aidan O'Connell	DD AOC	BAM	Contract Manager	Approves and implements EMP
Jim Dillon	JD	BAM	Project Manager	Monitors implementation of control measures, ensures that activities, including subcontractor activities, comply with the requirements of the relevant performance requirements.
Heidi Murphy Yvonne Brophy	HM YB	BAM	Site Safety, Health Environmental Officer	Conducts weekly environmental inspections; carries out toolbox talks on environmental issues. Coordinates emergency response, including spills. Checks spill kits and orders spill control materials when required
Cathal Sweeney	CS	BAM	Site Engineer	Ensures that works are carried out in accordance with the EMP and with the approved works method statement. Includes Environmental matters in weekly site inspections.
Pat Fennelly	PF	BAM	Foreman	Carry out toolbox talks; coordinates water/noise/dust monitoring and remedial actions; ensures that works are carried out in accordance with the EMP and with the approved works method statement. Performs environmental inspections.
Keith Davey Brendan Phelan	KD	BAM	Quantity Surveyors	Tracks the costs associated with the implementation of environmental matters and forwards to the Company Environmental Coordinator as required.

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### 3. Environmental Management Arrangements

#### 3.1 Environmental Management

The environmental management system (EMS) complies with the ISO 14001:2015 standard. Those aspects of the EMS relevant to this project are outlined in this document which also contains references to specific procedures.

##### 3.1.1 Planning

The environmental planning for the project is based on information from:-

- The clients project information and tender documentation
- Local Authority Planning Permission
- Appropriate Assessments
- Bid Submission

Such information has been used in the environmental assessment of the activities for this project.

##### 3.1.2 Monitoring and checking

The significant environmental aspects of the project are monitored regularly by carrying out the following at the frequency stated below:

<b>Monitoring and Checking</b>	<b>Frequency</b>
Environmental Inspections by Site Managers	Monthly
Environmental Inspection by Foremen	Weekly
Environmental Inspections by HSE Officer	Weekly
Environmental Audits by Env Co-ordinator	Quarterly
<i>Noise and Vibration Monitoring</i>	<i>Daily</i>
<i>Dust deposition monitoring</i>	<i>Daily</i>
<i>Dust Monitoring (visual)</i>	<i>Daily</i>

##### 3.1.3 Action Register

A record of environmental management actions is to be kept on site. The progress for all actions is reported regularly to the appropriate member of the Management Team. Such actions will include information taken from:-


- Environmental inspections
- Audit actions: non-conformances and observations
- Progress of actions following environmental incidents
- Significant communications with stakeholders
- Project issues requiring management action
- Complaints

These actions will be closed out, signed and dated by the appropriate person in the appropriate timeframe.

##### 3.1.4 Performance

Environmental Performance of the project is monitored by:-

- Environmental review meetings as a part of the Monthly Safety Meetings
- Site inspections
- Audits conducted by the HSE Department, by external organisations or by the Client

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- A review of the quantities of waste created
- External communications and feedback
- Review of objectives and targets (targets table section 7)
- Corporate Social Responsibility (CSR) reporting

### 3.2 Communications

#### 3.2.1 Environmental Complaints

All environmental complaints will be recorded in the project Complaints Register. The Register is maintained on site by a nominated member of the Management Team who also allocates responsibility for resolving any issues and follows up complaints to ensure they are resolved. Any issues that are deemed to be significant will be reported to the Site Management Team and the relevant authorities as appropriate. Complaints are reviewed during internal audits by the Environmental Coordinator, where any additional measures to improve performance are discussed. Complaints are reported to Head Office also. See EP-24 Complaints Procedures for more details.

All complaints received from external sources and incidents must be reported to the Project Manager and a representative of *St. James Hospital/Dublin City Council*

#### 3.2.2 Environmental Incidents

Environmental incidents are categorised in terms of major or minor.

**Major environmental incident** is any situation which has resulted in significant pollution requiring high levels of resources for response and remedy and must therefore be reported to Site/Company Management, the Client and or any relevant statutory authority.

**Minor environmental incident** is any situation which has resulted in environmental pollution which required minimal action to aid recovery from Site/Company Management. Non reportable to the Client and/or any relevant statutory authority unless this requirement is stated elsewhere.


Refer to Environmental Procedures EP-06 and EP-24 for more details.

The Site HSE Officer shall:-

- Inform Site Management Team
- Report Environmental Incident immediately to the Environmental Department;
- Investigate and issue reports on environmental incidents (using the Incident Report Form – Dangerous Occurrences / Near Misses / Environmental Incident); and
- Advise the Site Agent (or similar) on corrective action (where necessary)
- Maintain an Environmental Incidents Register

Actions with regard to specific incidents including water pollution and exceeding the limit levels for dust, noise and vibration, are detailed in Section 8.

**Report all Environmental Incidents immediately to the HSE Department 045-886557.**

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### 3.3 Suppliers and Subcontractors

#### 3.3.1 Subcontractors

All subcontractors will be required to work in accordance with BAM Contractors Environmental Management Plan. Work operations will be managed by the relevant Project Managers / Site Agents to ensure appropriate procedures are being followed. ISO 14001 states consideration should be given to the aspects related to the organisations activities, products and services such as environmental performance, lifecycle perspectives and practices of contractors and suppliers. In order to achieve this, we ensure our subcontractors sign contracts which state they must comply with our Environmental Policy, our EMS and work within the Environmental Legal Framework while working for us on our projects.

During the recruitment stage, we would enquire as to whether they had been prosecuted with regard to breaching environmental legislation and this would also be considered. We would also enquire to the progress of their environmental management system (or equivalent) to ensure they were working in a responsible fashion and in a way which would be of a similar fashion to BAM Contractors. Lines of communication would also be outlined during this recruitment stage to ensure they were aware of our environmental management system and how this will affect them and what they need to achieve in order to be suitable candidates for our Projects.

BAM have developed an online appraisal system which assesses the performance of current and previous subcontractors contracted by the company. The system requires project staff to assess and grade individual subcontractors on categories including Health, Safety and Environment, Quality, Programme and Commercial. Under our Commercial procedures, staff contracting and procuring from subcontractors and suppliers must review the appraisal system prior to any contractual agreement. Under the appraisal management system if subcontractors or suppliers fail to meet the minimum rating, a warning is issued and the subcontractor is removed from our approved subcontractors and suppliers list.


A list of subcontractors has been identified below:- Please refer to appendix 6 for details

<b>Contract</b>	<b>Company</b>	<b>Environmental Contact</b>	<b>Commencement Date</b>	<b>Duration</b>

#### 3.3.2 Suppliers

All suppliers and sub-contractors are made aware of the company's environmental and CSR policies and the project specific environmental requirements. BAM aim to collaborate with supply chain partners so as implement circular economic business models and achieve a positive environmental and economic impact. Innovative thinking between suppliers and subcontractors are therefore encouraged to promote recycling of materials and the use of sustainable materials.

An employee supervises all deliveries of environmental hazardous materials.

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**4. Summary of Emergency Procedures**

- Emergency Procedures for sediment release to water (EP-23)
- Containing and cleaning up spills (EP-15)
- Environmental Incident Procedure (EP-06)
- Environmental Complaints and Incidents Procedure (EP-24)
- SharePoint online incident tracking system
- For more detailed information please refer to the Environmental Emergency Plan

**5. Environmental Planning, Aspects and Controls**

**5.1 Environmental Risk Assessment**

During the first visit to site, notes were produced which identified any significant environmental aspects. These notes are compared with the environmental information supplied by the client and used as a basis for performing the environmental risk assessment.

**5.2 Environmental Risk Assessment Report**

The significance of all the environmental aspects for each activity on the project have been assessed. The assessment followed the method defined in EP-02 Environmental Risk Assessment.

Please see appendix 3 for the risk assessment report for this project.

**5.3 Environmental Assessment and Management Controls**

The management controls, which have been put in place, are appropriate to the nature, duration and scale of the activity on this project and the particular sensitivity of the local environment. They will be revised in the event of any significant changes to the scope of the activity during this project, especially when there is additional works, or a change in the method of works.

Additional management controls shall be adopted when there are changes to client requirements, stakeholder interests to a particular local environmental sensitivity.


The significant risks which are highlighted in the risk assessment and the management controls are communicated to the workforce by site inductions and toolbox talks.

**5.4 Method Statements**

The significant environmental aspects and the actions to apply the required controls are described in the method statement.

Method statements are produced in accordance with the contract requirements by the Site Management Team and reviewed by the Project Managers / Site Agents prior to submission for approval. When developing method statements, the EMP, Site Maps and any other relevant environmental management documents shall be reviewed to assess the potential impacts of the particular activity.

All method statements shall include a section entitled “Environmental & Waste Management”. For activities that have significant potential to cause adverse environmental impacts reference will be made in this section of the M/S to the control measures in Section 8 of the EMP. Additional control measures may be included where those in Section 8 prove inadequate to suit the local conditions at the site of the activity, and/or where specific measures are required by any of the authorities.

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The method statement must include:-

- Reference to the EMP and WMP
- The proposed method of construction and how impacts shall be mitigated
- Waste (storage, removal, end disposal sites where known)
- Hazardous Substances (storage, removal and end disposal sites where known)
- Works close to waterways (sediment controls if needed)
- Dust
- Noise and Vibrations
- Refuelling
- Fuel storage
- Drip trays/spill kits and other precautionary measures

Prior to the commencement of the works, all Method statements will be reviewed by a competent person by referring to Section 8 of the EMP. Following the review, improvements will be made to the method statements as required.

## 6. Environmental Compliance Requirements

In accordance with Environmental Procedure 01 (EP-01) Environmental Compliance Assessment, a review of all relevant literature and contractual requirements relevant to the contract will be completed.

- Planning Conditions
- Contract Documents
- Preliminary Health and Safety Plan
- All other contractual conditions and documents

These requirements have been tabulated in Appendix 2 (table of contractual requirements) to demonstrate how each of the requirements is addressed in the EMP.

### Evaluation of Compliance

Compliance will be evaluated through inspections and audits and also reviewed at the regular site management meetings.

#### 6.1 Consultation with Relevant Authorities

Consultation has been undertaken with the following authorities:


- St. James Hospital
- Dublin City Council
- National Parks and Wildlife Services (NPWS)
- Department of Arts Heritage and Gaeltacht (DAHG)

#### 6.2 Site Restrictions & Hold Points


In accordance with the contract clauses or notification from the Client or similar the following environmental restrictions apply to the construction of the works:

#### 6.3 Table of Environmental Licences, Permits and Permissions

Clause	Restriction – refer to Contract for complete details
6.	The development shall comply with the following requirement of the City Archaeologist. <ul style="list-style-type: none"> <li>i. The developer shall retain a suitable qualified licenced archaeologist to advise regarding the archaeological implications of site clearance, demolition and/or construction methodology and to make appropriate recommendations for mitigation including the detailed survey as necessary.</li> </ul>

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<b>Clause</b>	<b>Restriction – refer to Contract for complete details</b>
	<ul style="list-style-type: none"> <li>ii. The developers archaeologist shall allow for the resolution of archaeology (both on site and necessary post excavation) in the project budget timetable.</li> <li>iii. The developers archaeologist shall undertake licensed archaeological monitoring or all demolition and sub-surface work associated with the development including the breaking and removal of any floor slabs, levelling of ground etc.</li> <li>iv. The archaeologist shall consult with and forward their Method Statement in advance of commencement to the City Archaeologist.</li> <li>v. In the event of archaeological features being located in the course of the monitoring, the developer shall facilitate the archaeologist in fully recording such features, including if necessary the archaeological excavation of such features, in the event of significant archaeological features on site, the archaeologist retained by the developer shall immediately contract the City Archaeologist. The City Archaeologist (in consultation with the National Mounments Service, Department of Arts Heritage and the Gaeltacht) shall determine the further archaeological resolution of the site.</li> <li>vi. A written and digital report containing the results of the archaeological monitoring shall be forwarded on completion to the City Archaeologist and the National Monuments Service, Department Arts Heritage and the Gaeltacht.</li> <li>vii. Following submission of the final report the City Archaeologist where archaeological materials is shown to be present the archaeological paper archive shall be compiled in accordance with the procedures detailed in the Dublin City Archaeological Archive Guidelines (2008 Dublin City Council) and lodged with the Dublin City Library and Archive 138-144 Pearse Street, Dublin 2.</li> </ul>
8	<p>The development shall comply with the following conditions during the demolition and construction stages: -</p> <ul style="list-style-type: none"> <li>i. During the demolition and construction phase the proposed development shall comply with the British Standard 5228: 2009 – Code of Practice for noise and vibration control on construction and open sites, Part 1 Noise and Part 2; Vibration. In addition the mitigations measures for demolition and construction of works as detailed in volume 2 of the EIS shall be followed.</li> <li>ii. During the demolition and construction phase of the development, Best Practicable Means shall be employed to minimise air blown dust being emitted from the site. This shall include covering skips (including those being transported from the site) and stack-heaps, netting of scaffolding, watering of rubble chutes, daily washing down of pavements or other public areas, and any other precautions necessary to prevent dust nuisance.</li> <li>iii. The watering down of the area should be carried out where necessary to minimise dust transfer into neighbouring premises.</li> <li>iv. Stockpiles of earth shall be damped down or otherwise suitably treated to prevent the emission of dust from the site. The stockpiles should be planned and sited to minimise the potential for dust nuisance.</li> <li>v. Prior to the commencement of development a demolition and construction method statement and plan addressing the issues of noise, dust, vibration (such as from pile driving) odour, construction traffic management, and their mitigation shall be submitted to the Planning Authority for their written agreement.</li> </ul> <p>Reason: In the interest of minimising adverse impact during the demolition and construction phased of development in the interests of amenities and the proper planning and development of the area.</p>
9.	<p>The development shall comply with the following conditions for Waste Management:</p> <ul style="list-style-type: none"> <li>i. Prior to the commencement of any works a Construction and Demolition Waste Management Plan must be furnished to and approved by Dublin City Council.</li> <li>i. Prior to the construction phase the quantity of C&amp;D waste shall be determined in order to ensure that the required regulatory permit (issued by Dublin City Council or Licence issued by the EPA) is in place prior to the commencement of the development.</li> </ul>

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Clause	Restriction – refer to Contract for complete details
	<p>ii. During the Construction phase, Waste Management Services requests the provision of monthly statistics regarding waste arising, verification of quantities recycled and disposed and the location of disposal facilities. A construction Liaison contact should be identified by the developer and the information forwarded electronically to Waste Management Services on a monthly basis in order to ensure compliance with legislation.</p> <p>iii. The works must comply with the following:</p> <ol style="list-style-type: none"> <li>Waste Management Act 1996, as amended.</li> <li>Dublin City Council Commercial Waste Bye-Laws 2008 (Bye-Laws for the storage, separation at source and presentation for collection of commercial waste) as amended.</li> <li>Dublin Region Waste Management Plan 2005 – 2010 as amended.</li> <li>Any other relevant Waste Management related regulations.</li> </ol> <p>Reason: In the interests of the protection of the environment having regard Circular WPR 07/06 – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition published by the DoEHLG 2006 and Dublin City Waste Management Guidelines.</p>
10.	<p>(a) The site and building works required to implement the development shall only be carried out between the hours of</p> <ul style="list-style-type: none"> <li>• Monday to Friday – 7:00am to 7:00pm</li> <li>• Saturday – 8:00am to 2:00pm</li> <li>• Sunday and Public Holidays – No activity on site.</li> </ul> <p>(b) Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received from Dublin City Council. Such approval may be given subject to conditions pertaining to the particular circumstance being set by Dublin City Council.</p> <p>Reason: In order to safeguard the amenities of adjoining occupiers.</p>
11.	<p>The site development works and construction works shall be carried out in such a manner as to ensure that the adjoining street(s) are kept clear of debris, soil and other material and if the need arises for cleaning works to be carried out on the adjoining public roads, the said cleaning works shall be carried out at the developer's expense.</p> <p>Reason: To ensure that the adjoin roadways are kept in a clean and safe condition during construction works in the interest of orderly development.</p>
12	<p>The development shall comply with the following requirements.</p> <p>(a) Noise levels from the site, during both the construction and operational phases, measured as a LAeq (5min at night, 15min in day) when all proposed plant is operating, shall not exceed the LA90 by 5dB(A) or more.</p> <p>(b) Noise levels should not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any premises in the neighbourhood or to a person lawfully using any public place. All mechanical plant and ventilation inlets and outlets should be attenuated as necessary to ensure that the noise level as expressed as Laeq over 15 minutes at one metre from the façade of any noise sensitive premises does not exceed the background level by more than 10dB(A) for daytime and shall not exceed the background level for night – time.</p> <p>(C) Details relating to the likely sound power levels of all externally located plant including roof access level and equipment associated with this development shall be submitted to the Planning Department prior to installation.</p> <p>Reason: To protect the amenities of adjoining occupiers.</p>

### 6.3.1 Maintaining arrangements for environmental licence, permits and permissions


These are all legal documents associated with the work and may be from a contractor/supplier/client, or it may be an EPA or Local Authority Licences/Permit and will be maintained by the Management Team on site.

### 6.3.2 Licences and Permits

The Client will be requested to supply information on the licences and permissions that are required for the project. The responsibility for licence applications will be established at the start of the project or when changes occur.

The relevant environmental regulator may be informed early in the project of the environmental aspects of the work. A meeting on site will be arranged where applicable.



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**N.B. a copy of all formal licences is to be sent to the HSE Department, Kill.**

The following table indicates the licences that may be required:-

<b>Licence / Permission</b>	<b>Regulator</b>	<b>Operations</b>
Discharge consent into watercourse or sewer	Local Authority/Irish Water	Any solid or liquid entering controlled waters (river, pond, stream, ditch) unless it is clean water
Permissions / Licences	National Parks and Wildlife Services	Cutting of protected trees, derogation licences for protected species (bats, badgers, frogs etc), work in or near any SPA, SAC, NHA. Licences for managing invasive species
Permissions / Licences	Department of Environmental, Communities and Local Government	Excavation work in any site containing archaeological remains or natural habitat, protected Monument.
Planning Permissions	Bord Pleanala/LA	All planning permissions constraints
Waste licences/permits	EPA/LA/NWCPO	Transport and removal of waste offsite

#### **6.4 Company Policy & Procedures**

A copy of the Company Environmental Policy is displayed at the project site offices. The policy determines the company's overall approach to environmental management, which is developed through the EMS. This EMP has been developed taking into account the:

- Company Environmental Policy;
- Objectives and targets as specified in the Yearly Environment Plan; and
- Requirements of relevant specific procedures as contained in the Environmental Procedures Manual

#### **6.5 Relevant Statutory Provisions**


A library of environmental legislation, relevant codes of practice, standards and best practice guidance documents is maintained at the BAM Head office in Kill, Co. Kildare. This library is updated by the Company Environmental Coordinator through regular reviews or as required by changes in legislation and standards and developments in industry best practice. A register of legal and compliance obligations is on SharePoint for general viewing.

#### **6.6 Design and Life Cycle Perspectives**

The environmental and sustainability requirements for the project design are reviewed by project designers and construction management team and incorporated into the project as appropriate. The design and lifecycle perspectives are also reviewed by the Project Managers and Engineers to ensure that the environmental and sustainability considerations relevant to the construction works are incorporated into the works.

All environmental impacts and aspects of the project's lifecycle, from the raw materials used, procurement processes, the transportation and delivery to site, material use in the building product or service, to the end-of-life treatment and final disposal of the materials and products will be assessed, with the most favourable environmental option used where possible.

Input and consideration from relevant stakeholders will also be incorporated into both the design and construction processes. Communication with stakeholders may take place at various stages and means e.g. planning process, community newsletters, project website, Client meetings etc.

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
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### 6.7 Control of Documents

All documents relevant to the construction works shall be kept and stored in accordance with the below table. Documents that are part of the site environmental management system, including inspection reports, monitoring records and meeting minutes shall be kept for the duration of the project as per UKAS (United Kingdom accreditation scheme).

No.	Document	Raised By	Retained By	Statute or UKAS	Currently Held	Retention times (years)
1	Register of Environmental Aspects	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
2	Waste Transfer notes (where applicable)	External	Env Co-ordinator Site	Statute	Sites	3
3	Hazardous waste transfer notes	External	Env Co-ordinator Site	Statute	Sites	5
4	Waste Collection Permits	Local Authority	Env Co-ordinator	UKAS	Sites	Period of validity +1
5	Waste Facility Permits/Licences	Local Authority/EPA	Env Co-ordinator	UKAS	Sites	Period of validity +1
6	Energy Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
7	Water Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Sites	3
8	Local Authority / Environmental Protection Agency Licences	Local Authority / EPA	Env Co-ordinator Site	UKAS	Sites	Period of validity + 1
9	Environmental communication from external sources	External	Env Co-ordinator	UKAS	Sites	3
10	Audit Reports	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
11	Corrective Action Forms	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
12	Env N/C or Env Incident Report	Any member of staff	Env Co-ordinator Head Office	UKAS	Head Office	3
13	Water treatment log sheets	Site Staff	Site Staff	UKAS	Site	3
14	Calibration Certificates	External testers	Site Staff/ Env Co-ordinator	Statue	Site	3
15	Environmental Management Plans	Site Staff	Site Staff	UKAS	Sites	3
16	Waste Management Plans	Site Staff	Site Staff	UKAS	Sites	3
17	Environmental Risk Assessment	Env Co-ordinator	Env Co-ordinator and HSE Officer	Best Practice	Head Office	3
18	Department of Arts Heritage and Gaeltacht	Env Co-ordinator	Env Co-ordinator Site	Best Practice	Sites	3

Controlled documents will be:

- Reviewed at least annually and updated as appropriate;
- Marked as superseded once obsolete or destroyed;

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
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- Dated and marked with dates of revisions.

### 7.0. Environmental Objectives & Targets


The objectives and targets are set in relation to the aspects identified from each site in order to reduce our significant aspects. As a minimum they should include:-

- The prevention of pollution, including missions to air, water and land
- Nuisance impacts including dust, noise and vibration
- Protection of habitat areas and individual species, if applicable
- Storage and use of fuels and hazardous substances, including spills
- Waste management


### 7.1 Environmental Management Targets

The environmental management targets for the project are as follows.

Targets	Measurable	Methodology	Responsibility	Timescale
<i>Achieve Zero incidents of contamination to ground water from concrete works</i>	<i>Incidents, site inspections, quarterly audits, complaints</i>	<i>BAM procedures to be followed when working with concrete and washing out concrete chutes</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Ensure sediment on roads is cleared.</i>	<i>Raise needs for road cleaning duties during wet or busy periods</i>	<i>Ensure roads are swept and cleaned on a regular basis. Road conditions within the site should be kept clean at all times.</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Generate &lt;11.1t C&amp;D waste per 100m<sup>2</sup> (gross internal floor area)</i>	<i>Lean Construction Techniques, segregation more, reuse more (waste hierarchy)</i>	<i>Purchase less, ensure packaging is removed by supplier where possible and other materials reused &amp; recycled</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Lower fuel and oil spillages from site activities. Bunds to be used with all fuels and oils</i>	<i>Environmental incidents, spills contained in bunds</i>	<i>Ensure that drip trays are used at all times under static plant, when refilling, &amp; storing. ensure fuel storage areas are bunded.</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
<b>Site Specific EMP</b>	Note: Always print or copy to double-sided pages	<b>REV: 09</b>	<b>Date: June 2017</b>	<b>Site Specific EMP</b>


<b>Targets</b>	<b>Measurable</b>	<b>Methodology</b>	<b>Responsibility</b>	<b>Timescale</b>
Ensure correct disposal of all hazardous wastes	Waste segregation, waste costs	All hazardous wastes to be disposed as per Irish Legislation and BAM requirements	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion
Ensure no incidents of pollution to water. Where incidents unfortunately occur - target of <7% of total site environmental incidents to be adhered to	Water monitoring and sampling activities. Environmental Incident.	Sediment controls to be used, no waters to be discharged to any controlled waters or drainage systems without approval. Work with CIRIA guidelines and apply BAM precautionary measures	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion
Lower consumption of materials and fuel on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion
Reduce site electricity by 2.5% on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion
Lower emissions of dust, smoke and fumes during works	Air quality, dust particle increase	Ensure all equipment is well serviced and maintained. Switch of equipment when not in use. Use dust suppression techniques when applicable	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion
Reduce amount of Public complaints	Complaints received to Site Management Team	Ensure when works which will impede public access are taking place, all residents are informed for the timescale (where applicable) and all restrictions are kept to a minimum	Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy	Start to completion

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
<b>Site Specific EMP</b>	Note: Always print or copy to double-sided pages	<b>REV: 09</b>	<b>Date: June 2017</b>	<b>Site Specific EMP</b>

<b>Targets</b>	<b>Measurable</b>	<b>Methodology</b>	<b>Responsibility</b>	<b>Timescale</b>
<i>Minimise water usage consumption</i>	<i>Water charges, waste water disposal (discharge volumes)</i>	<i>All grey water to be reused on site where possible. 'Fresh' water supply to be kept to a minimum where possible. TBT-12 Water on Construction Sites</i>	<i>Aidan O'Connell Darren Devane Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Minimise risk of Aspergillus</i>	<i>Air quality, dust particle increase</i>	<i>National Guidelines for the Prevention of Noncomial Invasive Aspergillus during Construction / Renovation activities on Aspergillus Control will be adhered to</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Minimise airborne &amp; ground bourne noise</i>	<i>Noise triggers breached (where applicable)</i>	<i>All construction noise limits set out in the requirements will be adhered to.</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Minimise vibration</i>	<i>Vibration triggers breached (where applicable)</i>	<i>All vibration limits set out in the works requirements will be adhered to.</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>
<i>Ensure no vehicle movement and material placement does not cause damage to flora and fauna</i>	<i>Correct habitat protection used. Wildlife surveys where applicable</i>	<i>All fauna/animal species to be untouched where possible. Professional advice to be sought on removal procedures</i>	<i>Darren Devane Aidan O'Connell Jim Dillon William Connolly Cathal Sweeney Ross Burns Pat Fennelly Heidi Murphy Yvonne Brophy</i>	<i>Start to completion</i>

The standard environmental management goals for the project are to:

- Conduct all activities in accordance with the:
  - Company environmental policy and procedures;
  - Relevant statutory regulations and provisions;
  - Contractual requirements with the client; and
  - Requirements of relevant authorities;
- Minimise adverse environmental impacts during construction;
- Enhance natural environments during the course of construction, where practical
- Reduce the significance of our aspects and impacts through our working methods

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
<b>Site Specific EMP</b>	Note: Always print or copy to double-sided pages	<b>REV: 09</b>	<b>Date: June 2017</b>	<b>Site Specific EMP</b>

- Increase subcontractor awareness of our EMS
- Increase company awareness of sustainability issues

BAM Contractors has established company environmental and sustainability targets which are documented in the 2017 Environmental Year Plan. These targets include


- 8% reduction of total construction waste (*relative to total revenue*) compared to 2015.
- 4% reduction of the relative CO<sub>2</sub> emissions (*total CO<sub>2</sub> per total revenue*) compared to 2015.
- Achieve >96% recovery rate for all C&O waste.
- < 3 reported environmental incidents annually.
- Achieve zero spillages to water courses.
- < 8 reported environmental complaints annually.
- ≤ 10.5t C&D waste generated per 100m<sup>2</sup> (gross internal floor area)\*

\*Target only applicable to building sites

In order to help achieve these targets, the below table highlights compliance tools.

## 7.2 Initiatives to ensure compliance with BAM Targets

Sites	Area	Objectives & Targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
All sites and offices	Waste	Reduce waste sent to landfill by 4%	Adhere to the waste hierarchy. Lean construction techniques	EA-30 Excavated materials on site ( <i>Article 27 Notification Forms</i> ). CIRIA documents on Lean Construction	Site Teams and HSE Dept.
		Increase site segregation of construction waste by 4%	Additional recycling skips on site Increase staff knowledge and participation	EP-16 waste definitions and classifications, TBT-03 Managing Waste, TBT-02 Environmental Awareness, EB-11 Site Set up	Site Teams and HSE dept.
		Increase recycling rates	Increase site awareness of improved waste management practices	Waste posters, environmental alerts and bullets to be issued focusing on new waste strategies	Site Teams and HSE Dept.
All sites and offices	Energy	SMART Meters for all sites	SMART meters installed in cabins	Advice on installation and data collected	Site Teams and HSE Dept
		Reduce CO <sub>2</sub> emissions by 2%	Implement an energy reduction initiative in sites and offices	Environmental information to be issued focusing on new waste strategies	Site Teams and HSE Dept
		Temperature control in cabins	Thermostats installed	Advice on installation and data collected	Site Teams and HSE Dept
		Energy initiatives	SEAI Initiatives	<ul style="list-style-type: none"> <li>• Online calculation tools (energy)</li> <li>• Energy posters</li> <li>• Relatively paperless sites</li> </ul>	HSE Dept IT Dept.
		Reduction in fuel usage / air emissions	Car Purchasing	Procurement of low emissions vehicles by Plant Department. Video conferencing capabilities in Offices to cut down on travel times, emissions.	Site Teams and HSE Dept

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
<b>Site Specific EMP</b>	Note: Always print or copy to double-sided pages	REV: 09	Date: June 2017	<b>Site Specific EMP</b>

Sites	Area	Objectives & Targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
All sites and offices	<b>Env Auditing &amp; Performance</b>	All sites to achieve 'Pass' mark from quarterly audits	Quarterly audits	Regular environmental information and directions to be issued to the sites	Sites Teams and HSE Dept.
		Appraisal system for environmental performance	Subcontractor appraisal system (COINS)	Detailed information of the systems and scores circulated to all.	Sites Teams and HSE Dept.


**BREEM:**

Pre-demolition audit – The demolition contractor would identify different reuse strategies for parts of the buildings on the NCH site.

Tree Protection

Ecology

Note: CSR quarterly data will be placed on 4 projects

<b>SS EMP</b>	<b>NCH Project – Main Contract Phase A</b>			
<b>Site Specific EMP</b>	Note: Always print or copy to double-sided pages	<b>REV: 09</b>	<b>Date: June 2017</b>	<b>Site Specific EMP</b>

**8.0. Environmental Control Measures**

Control measures will be implemented both on an activity specific basis for the area of works, and independently of any specific activities as part of the general site management. Throughout this section reference may be made to standard procedures contained in the Environmental Procedures Manual that shall be adopted on site. The Environmental Procedures are available on SharePoint.

The project shall be developed in accordance with the control measures and with reference to the following guidance documents:-

- BRE (2003) Control of dust from construction and demolition activities;
- BS 5228-1: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 1: Noise
- BS 5228-2: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 2: Vibration
- BS 5837: 2012 Trees in relation to design, demolition and construction works
- BS8895-1:2013 Designing material efficiency in building projects Part 1: CoP for strategic definition
- CIRIA 650 (2005) Environmental Good Practice On Site (Second Edition);
- CIRIA 532 (2001) Control of Water Pollution from Construction Sites – Guidance for consultants and contractors;
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in adjacent to Waters
- Fisheries Guidelines for Local Authority Works (Department of Marine and Natural Resources, 1998).

Other guidance documents may be referenced for specific issues throughout this section. Copies of these documents are held by the Company Environmental Coordinator and on SharePoint.

The control measures and monitoring requirements listed in this section must be implemented throughout the project.

**8.1 Water Pollution Control**

All watercourses that are potentially impacted by the works are identified on the site maps included in Appendix 4.

**8.1.1 Water Pollution Control Measures**

All water run off or ground water encountered in excavations will be treated prior to discharge into any conduit. Depending on the quantity of the water there will be two distinct methods of treatment:

- A. For small quantities, usually to dewater a trench that has no significant water ingress, the water will be pumped and dispersed in adjacent landscape areas which will act as a filter.
- B. For larger quantities of water a silt trap will be set up.