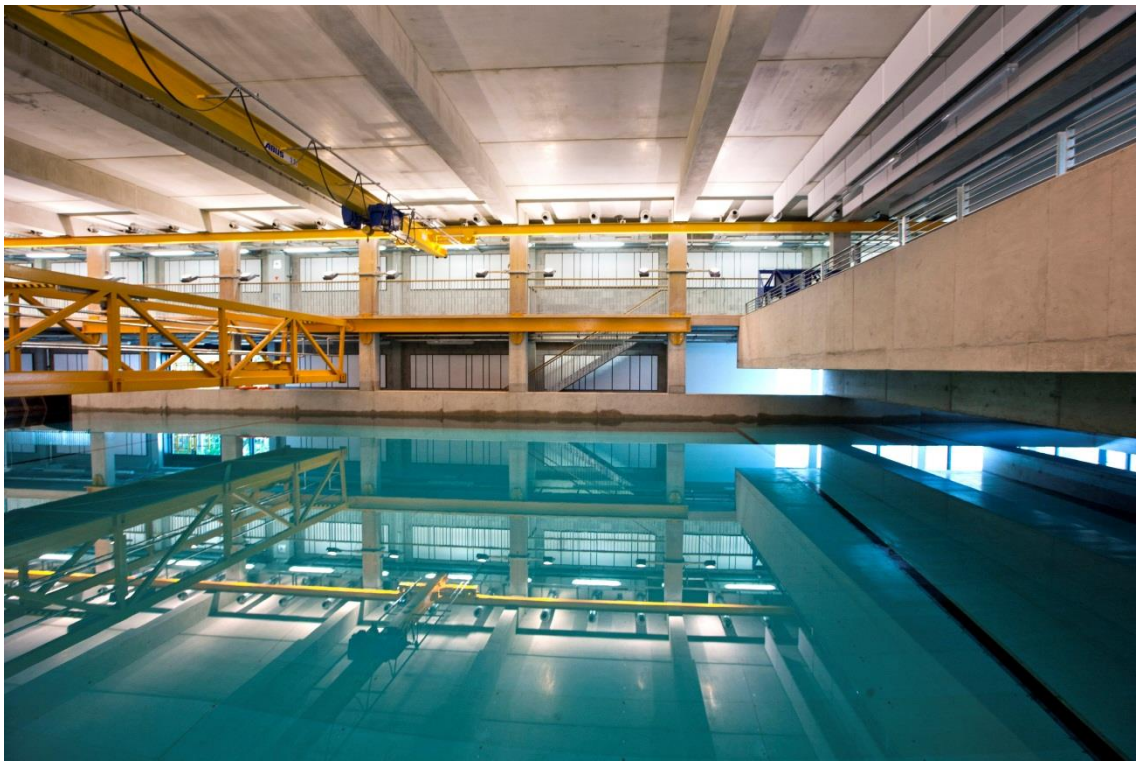
Health & Safety Procedure for Physical Models and Experimentation in COAST laboratory

Marine Building, Plymouth University



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MARINE SCIENCE & ENGINEERING WITH PLYMOUTH UNIVERSITY

COAST LABORATORY WITH PLYMOUTH UNIVERSITY

COASTAL OCEAN & SEDIMENT TRANSPORT

Document Information

Project	Health & Safety Procedure
Report title	Health & Safety Procedure for Physical Models and Experimentation in COAST laboratory
Responsible for H&S	Head of School – Prof. Neil James
School Safety Officer	Mr Robert Bray
Modelling Facility Manager	Dr Stuart Stripling

Document History

Date	**Release**	Prepared	Approved	Authorised	Notes
8 November 2012	**D1.0**	SS			First draft to form basis of style/ format and content for discussion
8 March 2013	**D2.0**	SS			Extended guidance notes and incorporation of RB comments
20 March 2013	**D3.0**	SS			Incorporation of DM review comments. For review monthly after approval.
19 July 2013	**D4.0**	SS			Incorporation of SSW for the flumes – Appendix 2.
6 January 2014	**R1.0**	SS			First release incorporating feedback from SoMSE H&S Committee

Table of Contents

Introduction

This document constitutes the procedures and safe systems of work for all physical modelling and experimental facilities in Plymouth University's Marine Building COAST laboratory. The contents apply to all staff and students (henceforth referred to as "users") and to their project work.

It is the responsibility of the COAST Scientific Manager to ensure that all operations are conducted in accordance with the standards herein, which are presented in the spirit of safe, effective, efficient and successful experimentation.

Hazards associated with activities not identified in this document, but highlighted in the activity Risk Assessment (RA), may require additional mitigation measures.

Referenced documentation

School of Marine Science and Engineering (SoMSE) Safety Handbook

Control of Substances Hazardous to Health 2002 (COSHH) guidelines
http://www.hse.gov.uk/coshh/index.htm

Plymouth University COP Manual Handling

Plymouth University COP Working at Height

Five Steps to Risk Assessment -
https://exchange.plymouth.ac.uk/intranet//somse/public/Health_Safety_Man/1.%20School%20Policy%20and%20Procedures/5%20steps%20to%20risk%20assessment.pdf

Other useful documentation

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) http://www.hse.gov.uk/work-equipment-machinery/loler.htm

Provision and Use of Work Equipment Regulations 1998 (PUWER) http://www.hse.gov.uk/work-equipment-machinery/puwer.htm

Copies of these documents can be obtained from the University Safety Officer.

Contacts

School of Marine Science & Engineering Safety Contacts:

Safety Manager – Head of School

Safety Co-ordinator – School Technical Manager

List of Trained University Fire Marshals
https://exchange.plymouth.ac.uk/intranet/intrsafe/Public/fire//FIRE%20MARSHAL%20Spreadsheet%20%20-Portal%20%2029.10.12.xlsx

List of Trained University First Aiders

https://exchange.plymouth.ac.uk/intranet//intrsafe/public/FAid/First%20Aid%20Spreadsheet%2001.11.12.xlsx

COAST Safety Manager – COAST Laboratory Manager

Identification of hazards

This procedural document requires that each experimental or maintenance activity within COAST is risk assessed. The level of risk associated with a particular hazard is considered a product of likelihood and consequence. Part of the RA process is to identify potential hazards. The main hazards associated with physical modelling and experimentation in COAST includes:

Hazard	Summary	Possible consequences
Electricity	Use of and proximity to electrical supplies (including 110V, 240V single phase and 415 three-phase).	Danger of death and serious injury from electrical shock, burns. Possible damage to infrastructure and plant, ignition source for fire.
Fire	Heat from fire and smoke and fume inhalation.	Danger of death and serious injury. Possible damage to infrastructure and plant. Significant effects on others within building.
Water	Use of working in, near or over deep, shallow, and/ or moving chemically treated water. Slippery surfaces.	Danger of death, serious injury, infection dermatitis from contact, legionella from aerosol. Slips and falls.
Fork-lift operations	Vehicle/ pedestrian collisions in and around COAST, overturning or failure due to overloading.	Danger of death and serious injury. Possible damage to infrastructure and plant.
Noise	Sustained level of significant noise at or close to occupation exposure limits sudden peak levels due to experimentation.	Discomfort and damage to hearing. Unexpected sudden shock levels causing secondary accidents.

Slips, trips and falls	Movement around the laboratory including in and out of model basins and experimental facilities.	Serious or minor injury.
Working at height	Use of ladders, scaffolding, platforms, gantry. Scaling and working from basin/ flume. Falling objects.	Danger of death, serious or minor injury.
Use of machinery	Refers to fixed machinery such as wave paddles, plant, and other equipment including overhead gantry cranes	Serious or minor injury including traps, cuts, crushes and wounding.
Manual handling	Awkward, heavy materials and equipment, repetitious movement, sharps.	Minor injuries and back/limb injuries.
Hazardous substances	Working with or near substances which may be hazardous to health (e.g. chemicals/ dust) – covered under COSHH.	Negative impact on health; acute and/ or chronic.
Lasers	Lasers up to Class 4 are used.	Burns and loss of sight to users and others

Hazard management

During project planning stages, users will make reference to the requirements stated in the project-specific RA, the relevant safety standards (e.g. COSHH), the MSE Health & Safety manual and the safe systems of work presented in Appendix 2. A sample RA for COAST laboratory modelling activities is given in Appendix 1, and the project-specific RA will consider specific activities (e.g. use of gantry crane)

The COAST Scientific Manager, or Appointed Person, will ensure that the appropriate Safe Systems of Work are in place, and that the RA is relevant, prior to work commencing. Safe Systems of Work for the four key areas identified by the Faculty Safety Co-ordinator are given in Appendix 2.

Inspection and maintenance schedules are currently under development pending advice from installation engineers.

Electrical safety

Users are referred to, and will utilise and follow, advice and guidance provided by the SoMSE Safety Handbook, COAST Scientific Manager, and Estates' Electrical Safety Adviser.

- Equipment / machinery of 110v shall be used wherever reasonably practicable. Where 220v equipment/ machinery is used employees should follow the advice and guidance given by the SoMSE Safety Handbook, COAST Scientific Manager, and Estates' Electrical Safety Adviser.

> **Guidance: Plugs and cables for 110v and 220v**
>
> Most portable equipment used in the model area operates at 110v. The cables and plugs are YELLOW. Some equipment operates at 220v. Extension cables and sockets for 220v are BLUE. In COAST lab, there are single phase and 3-phase sockets. The 3-phase sockets will only permit connection to a correctly oriented plug. Do not force any plug into a socket. Other equipment usually operates at 220v via 13A square-pin plugs and sockets. If used outside or in the lab, such 220v equipment MUST be protected with an RCD (Residual Current Device).

- Avoid placement of electrical equipment in, over or adjacent to water, so far as is reasonably practicable. Avoid operation of electrical equipment/ machinery whilst standing in wet/ damp areas and ensure that hands are dry when starting/ using electrical equipment/ machinery.
- Where power cables have to traverse flumes or basins appropriate and securely fixed cable trays and conduits shall be used. Avoid trailing leads through water unless specifically designed for use in water (e.g. signal cables for wave gauges and pressure transducers).
- All power cables and leads, other than extension cables that are to be used on a temporary basis, should be properly secured and protected to minimise tripping hazards and to protect the cable from vehicle movement damage.
- Maintenance and repair of all electrical plant/machinery/equipment in the COAST lab shall be carried out by suitably qualified and authorised personnel.
- Only suitably qualified/ authorised personnel shall attempt to gain access to the main Power Supply Boxes.
- Faults and suspected faults with electrical supplies/ equipment shall be reported immediately to a member of COAST laboratory technical staff.
- Hands should be dried before touching electrical equipment.

All portable equipment/ machinery shall be subject to regular portable appliance testing (PAT). Employees shall not use any portable equipment/ machinery for which the relevant PAT has not

been carried out. Please refer to Plymouth University's Code of Practice for the use of portable electrical equipment.

Guidance: Portable Electrical Equipment

Anybody using portable equipment should check the condition of the equipment and its cables(s) before use. Portable Electrical Equipment is equipment that has a lead or extension cable with a plug (110v or 220v) which can be easily moved from place to place e.g. drills, heater, radios, fans, printers, desktop computers, lights. It includes the cables, extension leads and plugs that are often subject to ill-treatment.

Often, all that is required is a visual inspection by the user checking for damage (exposed wires, damaged casings, damaged plugs etc.). Some items require a formal inspection and labelling of the equipment to confirm that it has been checked and that the certification is still valid. If the date on the label has expired, please do not use the equipment, but ask for it to be re-tested. PAT testing is carried out by ……. How often equipment is tested depends on depends on its use. There is no set frequency for PAT testing as it depends upon an assessment of the risks associated with the use of the equipment. Portable electrical equipment used in the modelling areas or outside is likely to require formal testing every six months to a year while equipment used in offices may only require testing every two to four years.

When checking portable electrical equipment, think about:

The plug; is the plug cracked or broken? Are the pins loose? Are the pins bent? Is a pin missing? Are there any signs of over-heating? Is the correct fuse in the plug?

Cable covering; are there any cuts or abrasions in the cable covering (apart from light scuffing)? Is the cable free from contaminating materials that could degrade the protective coating? Is the cable grip properly tightened where the cable enters the plug?

Power tools/ saws; is the casing cracked or broken? Are the guards operating correctly?

Residual Current devices; is the case intact? Has the "test" button been checked to ensure that it is working correctly?

Casing; are any screws loose? Is there damage to the outer casing? Is there any evidence of burn marks?

Personal safety

Users are required to follow the advice and guidance provided by members of the SoMSE Safety Team (see "Contacts" above) with regard all aspects of personal safety. COAST adopts a "see it, sort it" principle. This requires that hazards are not ignored when noticed, and immediate action is taken to manage the hazard. Please approach a member of COAST lab technical staff for assistance if necessary.

Lone working

The University adopts a "No Lone Working" policy in all of its laboratories. Please refer to Plymouth University's Lone Working Code of Practice.

Cables and hoses

Avoid trailing cables and hoses where reasonably practicable. Where necessary, such cables and hoses shall be equipped with protective covers available from the COAST lab workshop stores.

Personal Protective Equipment (PPE)

Appropriate PPE shall be used by users when undertaking any activity that a code of practice or RA has identified the need or a dynamic assessment at that time indicates that it would be advisable due to specific circumstances. Note that ear defenders/ plugs may be required to minimise adverse effects on hearing in some circumstances and users are requires to be vigilant with regard this particular hazard. COAST laboratory holds a stock of PPE items which is periodically checked and maintained (room M06). Staff should own and use toe protectors where necessary, and these items can be purchased through either the Engineering Technical Manager or the COAST Scientific Manager. Visitors engaged in modelling tasks are able to borrow some items of PPE, but are generally expected to provide their own and should wear appropriate PPE for the activities being carried out.

Ad hoc visitors to COAST are not required to wear safety footwear unless identified in the RA. High-heels are not prohibited, but visitors should be forewarned to wear appropriate footwear.

Guidance: Safety footwear

All employees, visiting researchers, students and client representatives shall wear the appropriate safety footwear when actively working in any of the experimental areas on the COAST lab.

Short-term visitors to the experimental areas, e.g. employees not normally working on model investigations but needing to visit and consult with staff in the laboratory, employees accompanying external visitors and the visitors themselves need not wear safety footwear, though this will depend upon particular circumstances and any appropriate risk assessment.

Those wearing high-heeled shoes may have difficulty in certain areas of the laboratory. Visitors should be warned in advance to wear appropriate footwear.

Slips and trips

Trailing cables and hoses should be avoided if possible, and protected with covers if unavoidable. Please ask technical staff for availability. Spilled water should be dealt with accordingly and "Wet Floor" signage erected as appropriate. Users' working practice should avoid introducing trip hazards, and "see it, sort it" principle applied.

Spillages

University COP for spillages must be followed. It is a requirement to contact Estate's Helpdesk with a request for a spill kit and engineer.

Hazardous substances

Users shall be trained and conversant with COSHH.

Manual handling

Users shall be trained and conversant with Manual Handling procedures in accordance with the University Safety Training Programme. This states that all persons required to carry out manual handling are required to undergo training and approval as provided by the University:

- Principles and Practices of Manual Handling, Stage 1
- Manual Handling Risk Assessment, Stage 2, covering key areas of safe lifting
- Manual Handling Assessment (approved by the School Safety Team)

Practical skills training can be arranged by the Engineering Technical Manager or COAST Scientific Manager if required.

Provision and use of work equipment

Users shall be trained in the use and operation of the laboratory facilities, plant, machinery and equipment appropriate to the tasks and activities to be undertaken.

Operational plant and equipment in basins and flumes (pumps, wave paddles etc.) must be switched off before being approached. All such plant and equipment shall be fitted with suitable guards where practicable.

Faults and suspected faults with laboratory facilities/ plant/ machinery/ equipment shall be reported immediately to the Laboratory Scientific Manager.

Working in basins

Users are required to be familiar with the Safe Systems of Work provided in Appendix 2.

Avoid, where practicable, working in water/ wet areas (drain models). Do not enter sumps unless authorised to do so.

Users should make themselves aware of and familiar with the design/ layout of the model areas – particularly with respect to submerged obstructions/ hazards.

Suitable access and egress routes shall be provided for each laboratory facility. Access to and egress from model basins shall be via such designated access routes (i.e. use the steps and walkways provided). Such routes shall be kept clear at all times.

Due regard shall be paid to flowing water and users shall avoid attempting to access/ cross fast-flowing water.

Safety of students carrying out project work

It is recognised that there will be transient users of the COAST laboratory facilities, and these are most likely to constitute project students. Should project students require access to any of the COAST laboratory facilities, this must be agreed between their supervisors and the technicians working within the laboratory who are assigned to support them.

Where possible, students will be required to work in pairs. Students, together with their academic supervisors, will be required provide an experimental design document for review of feasibility and safety requirements by the laboratory Scientific Manager or representative prior to approval for access being granted. This experimental design document must include an appropriate risk assessment covering the expected activities.

Upon obtaining approval, students will be issued with temporary swipe-card access. At the time of issue, technical staff will also provide the student(s) with a safety induction.

Students are to provide their own PPE for use in the COAST laboratory.

Working at height

Users are required to be familiar with the University's procedure: "Working at Height COP"

https://exchange.plymouth.ac.uk/intranet/intrsafe/Public/policies//Working%20at%20Height%20CoP.doc%20October%202005.doc"

Appropriate care shall be used when using ladders and step-ladders:

- Only ladders and step-ladders conforming to the relevant standards and marked as being passed for use with an appropriate "Laddertag" shall be used.
- Ladders shall be erected with a slope of approx. 4:1 (76°).
- Ladders shall be tied-off/ secured as appropriate.

Try to ensure that no work is done at height (a place is at height if (unless the Regulations are followed) a person could be injured falling from it even if it is at or below ground level (Work at Height Regulations 2005)) if it is safe and reasonably practical to do it other than at height. Any work at height must be properly planned, appropriately supervised and carried out in as safe a way as is reasonably practicable. This should only be done if a suitable and sufficient risk assessment has been undertaken. The Work at Height Regulations 2005 set out the duties of the employer and give detailed requirements for means of access, collective fall prevention (guard rails, toe boards), working platforms, collective fall arrest (nets, air bags), personal fall protection (restraints, harnesses, fall arrestors) ladders and step-ladders, and inspections.

Fork-lift operations

Fork-lift is only to be used by competent (i.e. appropriately trained) Appointed University employees in accordance with guidance given by HSG6 Safety in Working with lift trucks. A list of approved operators is provided in Appendix 4 to this document.

Slinging and lifting

Overhead crane operation (slinging and lifting) is only permitted by competent (i.e. Certified) Appointed University employees or University employees supervised by Competent Appointed Persons in accordance with Safe Systems of Work (Appendix 2). A list of approved operators is provided in Appendix 4 to this document.

Laser safety

Laser (Class 3) scanning equipment is used in the laboratory. It is sufficient to ensure that occupants of COAST are aware that scanning is in progress, and to ensure that no individual is closer than 10 m (manufacturer's recommendation) to the scanner. Occupants will be advised not to look directly into the scanner regardless of proximity.

Laser-Doppler Velocimetry (LDV-Class 3B) and Particle Imaging Velocimetry (PIV-Class 4) instrumentation will be used within the laboratory and covered under separate laser safety documentation and local rules (to be determined).

Visitors' safety

Users' attention is drawn to the RA and Method Statement presented in Appendix 5 to this document. The user is responsible for ensuring that visitors are briefed, supervised, and that they abide by and adhere to the relevant procedures described in this document.

Client visitors, where engaged with laboratory activities, are to be briefed on the Systems of Safe Work and always supervised while within the COAST laboratory. Appendix 6 provides an RA and Method Statement for active Clients.

Training

The Engineering Technical Manager and COAST Scientific Manager are responsible for ensuring that all users have received relevant and current training prior to commencement of activities.

Reporting of incidents

All significant incidents shall be reported in accordance with the SoMSE H&S handbook. Assistance shall be gained from a First Aid Officer as soon as practicable. First Aiders details are posted in the foyer of the Marine Building. Staff should report the incident to the University Safety Officer and additionally complete the accident book held by the Schools Safety Coordinator – located SoMSE Office.

Monitoring

All employees have a duty under the Health & Safety at Work Act 1974, Section 7 to;

- Take reasonable care of their own health and safety and that of others who may be affected by their acts or omissions.
- To cooperate with the employer so as to ensure that the employer can comply with his statutory obligations.

The COAST Scientific Manager is responsible for ensuring that the procedures and Safe Systems of Work as defined in this document are followed and implemented.

APPENDIX 1 – Sample Risk Assessment (RA) for COAST laboratory

Date:		Assessed by:		Activity/Location	

Work Activities	Hazards	No. at risk	Controls in place at present	L (1 – 2)	M (3 – 4)	H (6 – 9)	(List additional controls as required) Comment
General lab use	Various	1	No testing will be conducted within the lab without a second person present	2			
Use of boat in ocean basin	Drowning	1	Life jacket to be warn at in all times in boat, at least one other person must be present at all times when in the boat. Boat not to be operated while wave machines are operating.		3		
Use of electronics around water	Electrocution	1	All electronics to be used are PAT tested. Only gauges designed for underwater use will be allowed near the water, the rest kept as far away as practical.		3		
Use of Ocean basin gantry	Head collisions	1	Warning tape is in place.	2			
Use of wave paddles	Trap hazards	All	Checks made that everyone is clear before paddles are used. Paddles will be fully shut down and the power isolated before any work is done around them or any work involving contact with water in the tank.	2			
Use of temporary bow section gantries	Fall hazards	1	Avoid walking along these temporary gantries.	1			
Wires running between gauges and control equipment	Trip hazard	All	Where possible wires will be run above head height to prevent trip hazards. Where not possible covers will be placed over the wires to prevent tripping.	2			

Use of LDV and PIV (Class 4 laser)	Laser	All	This equipment is currently not in use. If this changes all relevant laser safety regulations must be adhered to	1			Risk assessment must be updated if LDV or PIVs are used.
Use of crane to place model into and out of tank	Crush hazard	All	Crane will only be operated by trained crane operator. Model will not be taken higher than necessary. Nobody to stand underneath model while it is in the air.		3		
Testing of model WED	Snapping of mooring line – possible damage to tank.	All	Moored device will have a slack 'backup' line attached to the gantry to prevent it from being smashed against the beach in case of the mooring line snapping.	1			
Spillages	Slip hazard if water exits the tanks		A spilled water to be mopped up immediately and wet floor signs placed around the area	2			
Wet hands	Skin irritation from chlorinated water		Wash hands and arms if they come into contact with the water	1			

SIGNATURE: _____ *(Responsible Person)*

PRINT: _____

SIGNATURE _____ (Head of School/Dept)

PRINT: _____

DATE: _____

REVIEW DATE: _____

Risk Rating Matrix

			Likelihood (see Table 3)		
			Unlikely	Likely	Almost Certain
			1	2	3
Severity (see table 2)	Major	3	M	H	H
	Moderate	2	L	M	H
	Minor	1	L	L	M

Conduct Risk Assessment in conjunction with Code of Practice

APPENDIX 2 – Safe Systems of Work for COAST laboratory

Ocean Basin

Coastal Basin

Ocean Basin Gantry

Gantry Crane

Flume Crane

Use of Flumes

SAFE SYSTEM OF WORK
DESCRIPTION OF THE TASK Use of Ocean Basin
LOCATION Marine building
KEY STEP **Lone working** No lone working is to take place at any time in the ocean tank. **Access** Limited access only authorised persons on ground floor around ocean tank. Access over tank wall; steps must be used in a suitable position. Tank access when floor raised; ensure wave and floor control panels are locked off. Avoid approaching edge of raised floor at east and west ends. Tank access in inflatable; one person only with colleague(s) made aware of intent to enter and duration of activity monitored, life jacket must be worn, paddle must be carried, a suitable throw line must be on the boat. Ensure wave generation is locked off. PPE to include hard hat due to overhead obstacles. **Use of wave generators** Only persons trained in software and emergency procedure to use. Avoid overtopping of tank walls. Signs and barriers to be used to sign when floors are wet. Access to paddle dry-backs will only be necessary during periods of maintenance for which a separate Risk-Assessment/ Method Statement is required. Access to paddle dry-backs is not permitted during normal everyday use. **Electrical equipment** 240V power tools are not be used directly over water. Do not move 240v instruments near to the tank when connected to mains.

House keeping

Ensure all tools and equipment that are not in use are stowed safety and that walkways and assembly areas are maintained clear and free from trip-hazard.

Ensure all safety equipment is stored in the correct place.

Manual Handling

All users should complete the University's Manual Handling training in accordance with Manual Handling COP.

LEGAL REQUIREMENTS AND GUIDANCE

All users should be provided with a suitable induction which should include

Briefing on evacuation procedure (including exits and fire assembly point), how to raise an alarm in an emergency, position and function of emergency stops and fire points and any hazards associated with their expected activities.

Specific briefing/training on the operation of any equipment they may need to use.

Method statements for standard operations.

Outcomes of any risk assessments as appropriate to their activities within the laboratory.

POTENTIAL HAZARDS

Trip, slip, fall, drowning, electric shock, fire, suspended loads, forklift truck movements

MAGNITUDE OF RISK

Trip, slip minimal risk with medium injury

Fall, minimal risk with possible high injury

Drowning, medium risk.

Electric shock medium risk with possible high injury

Fire minimal risk.

Suspended loads, medium risk with potential for death

Collision with vehicles; minimal with potential for serious injury	
PPE REQUIREMENT	AVAILABILITY
Wellington boots/Waders on raised floor Lifejacket/ hard hat on inflatable	Yes Yes
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Use of Overhead Crane. Movement of Gantry	
ISOLATIONS OR LOCKING OFF REQUIRED	
As required in key steps	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
See Coastal tank SSW See Gantry SSW See Overhead Crane SSW	
THOSE WHO NEED TO BE NOTIFIED Before commencement of operation.	
Laboratory Manager, Technical Manager, Technicians, others in vicinity who may be affected by the work.	
EMERGENCY AND FIRST AID ARRANGEMENTS	
As per University policy, Fire marshals assigned and 1st Aiders listed in building reception.	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Laboratory Manager and Specialist technicians	

SAFE SYSTEM OF WORK
DESCRIPTION OF THE TASK Use of Coastal Basin
LOCATION Marine building
KEY STEP

Lone working

No lone working is to take place at any time in the Coastal tank.

Access

Controlled Area; only authorised persons permitted on walkways around Coastal Basin. West End Mezz door swipe access has restricted permission on "need only" basis.

Access into basin; steps to be used in a suitable position as required. If a model is present, care must be taken to avoid trips and falls.

No access to basin permitted when wave generator powered up.

No access to basin permitted when currents are in use unless express permission granted by Lab Manager,

Barriers in place surrounding the perimeter of the wave generators to prevent trap hazard.

PPE to worn in the basin to suit the activity e.g. to avoid cold water exposure galoshes are provided, gloves to be worn when shovelling sand to prevent blistering. Steel toe protectors to be used when working within the dry basin.

Objects to be craned into the basin via the east end gates. Barriers present along this edge reduce fall risk. However, care must still be taken when working near the edge. Clear way below must be established prior to any craning.

Use of wave generators

Only persons trained in software and emergency procedure to use.

Avoid overtopping of tank walls. Signs and barriers to be used to sign when floors are wet. Access to paddle area is prohibited while paddles powered-up.

Electrical equipment

240V power tools are not be used directly over water.

Do not move 240v instruments near to the tank when connected to mains.

House keeping

Ensure all tools and equipment that are not in use are stowed safety and that walkways and assembly areas are maintained clear and free from trip-hazard.

Ensure all safety equipment is stored in the correct place.

Manual Handling

All users should complete the University's Manual Handling training in accordance with Manual Handling COP.

LEGAL REQUIREMENTS AND GUIDANCE

Brief on evacuation procedure (including exits and fire assembly point) and emergency stops for all new users.

POTENTIAL HAZARDS

Trip, slip, fall, drowning, electric shock, fire

MAGNITUDE OF RISK

Trip, slip minimal risk with medium injury

Fall, minimal risk with possible high injury

Drowning, medium risk.

Electric shock medium risk with possible high injury

Fire minimal risk.

PPE REQUIREMENT	AVAILABILITY
Wellington boots/Waders in wet basin. Steel toe protectors when basin dry and	Yes

construction planned. Gloves.	 Yes
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Use of Overhead Crane. Construction of scale models.	
ISOLATIONS OR LOCKING OFF REQUIRED	
As required in key steps	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
See Ocean Basin SSW See Overhead Crane SSW	
THOSE WHO NEED TO BE NOTIFIED	
Laboratory Manager, Technical Manager, Technicians	
EMERGENCY AND FIRST AID ARRANGEMENTS	
As per University policy, Fire marshals assigned and 1st Aiders listed in building reception.	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Laboratory Manager and Specialist technicians	

SAFE SYSTEM OF WORK

DESCRIPTION OF THE TASK Ocean Basin gantry use, movement and access

LOCATION Ground floor Marine Building

KEY STEPS

Movement

1. The moving of the gantry is to be supervised by competent staff members.
2. At least 2 persons are required to move.
3. It must be pushed /pulled from the raised floor.
4. When floor lowered pushing from the wall must be done with life jacket and steps for access

Access

1. Only authorised persons (i.e. aware of SSW and permitted by COAST lab staff) can access the gantry.
2. No lone working on the gantry.
3. Use moveable floor based steps where possible.
4. Fitting of gantry steps must be done by 2 persons.
5. The steps must be climbed carefully as they have overhead obstructions.
6. Barrier chain must be in place restricting access when floor panels are removed.
7. Life-jackets (provided) are to be worn when floor panels are removed.
8. Life-jackets (provided) are to be worn if accessing equipment through the side of the gantry.

Use

1. Maintain a clear working area
2. Working surfaces tables must be made stable and safe
3. Any instrumentation must be safe from knocking into tank
4. Waterproof areas with electrical items at risk of splashing.
5. Any electrical equipment must be used in a safe manner.
6. Avoid excess electrical cables on floor
7. Removal and replacement of gantry floor panels requires PPE consisting of gloves and steel toe-caps.
8. If gantry floor panels are removed, lifejackets are to be worn and warning barriers erected.

LEGAL REQUIREMENTS AND GUIDANCE	
POTENTIAL HAZARDS/ MAGNITUDE OF RISK	
Falling/ low, Drowning/low , Tripping/ med, Bumping head,/med, Strains/ low, Electric shock/low.	
PPE REQUIREMENT	AVAILABILITY
Steel toe caps when lifting, Gloves for panel removal. Helmet for access. Life-jackets for specific usages.	Supplied by PU
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Ocean Tank, Coastal Tank, Overhead Crane	
ISOLATIONS OR LOCKING OFF REQUIRED	
Ensure electrical items are disconnected when not in use.	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
Ocean Basin, Coastal Basin, Overhead Crane	
THOSE WHO NEED TO BE NOTIFIED	
Technicians	
EMERGENCY AND FIRST AID ARRANGEMENTS	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Technicians, Lab managers, Trained staff.	
SUPERVISOR	
Scientific Lab manager/Technical manager	

SAFE SYSTEM OF WORK	
DESCRIPTION OF THE TASK	
Use of Overhead Crane	
LOCATION	
COAST Facility	
KEY STEPS	
• User's must be appointed as competent slinger's/crane user's having completed **recognised** training. • Is all lifting equipment in test date and fit for use? • SWL's on the crane and all slinging and lifting equipment must not be exceeded. • Weights of loads should be assessed before lifting • Can you safely attach/ detach equipment from load • Has account been taken of lack of dedicated lift points? • Where the load will damage the sling or the sling damage the load, has packing been applied to prevent damage occurring? • If lifting aids required (plate clamps / eye bolts etc.) are they correctly fitted? • Attach tag line if required • Is lift route and lay down area clear of obstruction with other persons in vicinity aware of intended route/task. • Is load free to lift? • Have you established communications with all persons involved in the lift? • No persons should stand under slung load. • Allowance should be made for clearance of movement over gantry and Coastal tank wall. • Ensure the replacement battery for the controller is charging.	
LEGAL REQUIREMENTS AND GUIDANCE	
Appointed competent users only	
POTENTIAL HAZARDS	
Falling, slipping load	
MAGNITUDE OF RISK	
low	
PPE REQUIREMENT	AVAILABILITY
Protective boots, hard hat. Gloves where	Uni supplied

necessary.	
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Use of Ocean, Coastal basins or Gantry	
ISOLATIONS OR LOCKING OFF REQUIRED	
Crane hand controller stored securely. Tank hall isolators.	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
SSW Ocean, Coastal basins and Gantry	
THOSE WHO NEED TO BE NOTIFIED	
Lab manager/ Senior Technicians	
EMERGENCY AND FIRST AID ARRANGEMENTS	
As per directions in building reception	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Trained/Experienced, appointed persons	
SUPERVISOR	
Technical Manager	

SAFE SYSTEM OF WORK	
DESCRIPTION OF THE TASK	
Use of Overhead Crane	
LOCATION	
FLUMES	
KEY STEPS	
• User's must be appointed as competent slinger's/crane user's having completed **recognised** training. • Is all lifting equipment in test date and fit for use? • SWL's on the crane and all slinging and lifting equipment must not be exceeded. • Weights of loads should be assessed before lifting • Can you safely attach/ detach equipment from load • Has account been taken of lack of dedicated lift points? • Where the load will damage the sling or the sling damage the load, has packing been applied to prevent damage occurring? • If lifting aids required (plate clamps / eye bolts etc.) are they correctly fitted? • Attach tag line if required • Is lift route and lay down area clear of obstruction with other persons in vicinity aware of intended route/task. • Is load free to lift? • Have you established communications with all persons involved in the lift? • No persons should stand under slung load. Allowance should be made for clearance of movement over flume edges. • Allowance should be made for clearance of movement over flume edges. • Ensure the replacement battery for the controller is charging.	
LEGAL REQUIREMENTS AND GUIDANCE	
Appointed competent users only	
POTENTIAL HAZARDS	
Falling, slipping load	
MAGNITUDE OF RISK	
low	
PPE REQUIREMENT	AVAILABILITY

Protective boots, hard hat. Gloves where necessary.	Uni supplied
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Use of Ocean basin/ Gantry	
ISOLATIONS OR LOCKING OFF REQUIRED	
Crane hand controller stored securely. Tank hall isolators.	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
SSW Ocean Basin and Gantry	
THOSE WHO NEED TO BE NOTIFIED	
Lab manager/ Senior Technicians	
EMERGENCY AND FIRST AID ARRANGEMENTS	
As per directions in building reception	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Trained/Experienced, appointed persons	
SUPERVISOR	
Technical Manager	

SAFE SYSTEM OF WORK
DESCRIPTION OF THE TASK Use of Flumes
LOCATION Marine building
KEY STEP

Lone working

No lone working is to take place at any time in the Flumes.

Access

Controlled Area; only authorised persons permitted in the flume area. Walkways between the OCEAN Basin/tilting flume, the 35m Flume/North wall and West End of the OCEAN Basin are restricted areas. West End swipe access has restricted permission on "need only" basis.

Access into flumes; steps to be used in a suitable position as required. If a model is present, care must be taken to avoid trips and falls.

PPE to worn in the flumes to suit the activity e.g. to avoid cold water exposure galoshes are provided, gloves to be worn when shovelling sand to prevent blistering. Stout sensible footwear to be worn, steel toe protectors to be used when working with heavy objects within the dry flume.

Heavy objects to be craned into each flume via the east end. Clear way below must be established prior to any craning.

Protective plastic matting (provided) must be placed on flume floor within the working area whilst working within dry flume. No loose tools or materials may be placed on the upper sides of flumes. Avoid impacts from sharp or heavy objects onto glass sides or base.

Use of wave generators

Only persons trained in software and emergency procedure to use.

Avoid overtopping of tank walls. Signs and barriers to be used to sign when floors are wet. Access to paddle area is prohibited while paddles powered-up.

Use of current generators

Only persons trained in control system and emergency procedure to use.

Access to the flume is prohibited when currents are in operation.

Use of tilting flume control

Only persons trained in control system and emergency procedure to use.

Access to the flume is prohibited when tilting mechanism is in operation.

All persons within the flume area are to be notified and all obstructions cleared before operation.

Electrical equipment

240V power tools are not be used directly over water. 12V only.

Do not move 240v instruments near to the tank when connected to mains.

House keeping

Ensure all tools and equipment that are not in use are stowed safety and that walkways and assembly areas are maintained clear and free from trip-hazard.

Ensure all safety equipment is stored in the correct place.

Manual Handling

Students would not have completed this course. Better to say only lift safety within personal limits. Request assistance if heavy or awkward objects.

All users should complete the University's Manual Handling training in accordance with Manual Handling COP.

LEGAL REQUIREMENTS AND GUIDANCE

Brief on evacuation procedure (including exits and fire assembly point) and emergency stops for all new users.

POTENTIAL HAZARDS

Trip, slip, fall, drowning, electric shock, fire

MAGNITUDE OF RISK

Trip, slip minimal risk with medium injury

Fall, minimal risk with possible high injury

Drowning, medium risk.

Electric shock medium risk with possible high injury

Fire minimal risk.

PPE REQUIREMENT	AVAILABILITY
Wellington boots/Waders in wet flume.	Yes

Steel toe protectors when basin dry and heavy construction planned. Gloves.	Yes
OTHER ACTIVITIES WHICH MIGHT/WILL AFFECT THE TASK	
Use of Overhead Crane. Construction of scale models.	
ISOLATIONS OR LOCKING OFF REQUIRED	
As required in key steps	
OTHER AREAS/PROCEDURES WHICH MIGHT/WILL BE AFFECTED	
See Ocean Basin SSW See Overhead Crane SSW	
THOSE WHO NEED TO BE NOTIFIED	
Laboratory Manager, Technical Manager, Technicians	
EMERGENCY AND FIRST AID ARRANGEMENTS	
As per University policy, Fire marshals assigned and 1st Aiders listed in building reception.	
PERSON(S) AUTHORISED TO CARRY OUT THE TASK (TRAINING REQUIREMENT)	
Laboratory Manager and Specialist technicians	

APPENDIX 3 – Manual Handling

Over 33% of all reported injuries have been attributed to the manual lifting and handling of loads (HSE). Injuries can easily arise from activities such as stooping while lifting; holding the load away from the body, twisting movements, frequent or prolonged effort, heavy/bulky/unwieldy/unstable loads, sharp/hot/slippery surfaced loads, restricted movement and lack of an individual's capability. If a work activity involves any of the above a manual handling risk assessment should be carried out.

The requirements and guidelines for completing a Manual Handling Risk Assessment within the University of Plymouth is covered by the document Manual Handling Code of Practice, this document is regularly reviewed and is available from the University Safety Office or on line from https://staff.plymouth.ac.uk//intrsafe/policies/intranet.htm

Further Guidance is available from the HSE web site:- http://www.hse.gov.uk

APPENDIX 4 – Lists of Appointed Persons

Overhead Gantry Cranes

COAST Instrumentation Specialist:	Alastair Reynolds
COAST Specialist Technician:	Peter Arber
Senior Laboratory Technician:	Andy Oxenham
Laboratory Technician:	Bob Mann

Fork Lift

Senior Laboratory Technician:	Andy Oxenham
Laboratory Technician:	Bob Mann

APPENDIX 5 – RA and method statement for management of visitors' safety

Risk Assessment and Method Statement for Group Visits to the Marine Building.

Method Statement:

This method statement outlines the basic principles for visits to the Marine Building, including the major laboratory areas, by those who may not be familiar with the hazards associated with experimental facilities of this nature.

Variations to this are expected and accepted provided these continue to follow established pedestrian access areas and do not penetrate any areas signposted as restricted access or require the operation of any equipment.

Guides should attend a briefing session for the laboratory/building before escorting groups. Guides would normally be a member of the University staff or student community and will be familiar with the area and the detailed content of this method/risk statement, supervisors may be a visitor with responsibility for control of the group and be briefed by the guide on entering the building. Groups should not exceed 10 for each guide including supervisor except in exceptional circumstances to be approved by the Laboratory Manager; larger groups should be split and each provided with a guide. The supervisor should support the guide by helping to keep the group together and be vigilant to prevent inappropriate actions.

Induction Briefing:

- All visitors on entering the building should be made aware of fire evacuation procedures and assembly points unless this has been already covered by another general induction.
- All safety signage, e.g. indicating restricted access is to be observed for your own and others safety.
- Follow advice and guidance of supervisors or demonstrators.
- Equipment or other controls should not be operated or handled unless instructed to do so – effects may not be immediately apparent and considerable damage or unseen accident could occur. (In the case of young people supervisors' vigilance will be required.)

COAST Laboratory Mezzanine Floor:

- Accessed via stairs or lift and entrance to the mezzanine area is controlled by restricted Staff ID Card

  - Organisers should have contacted laboratory manager or senior technical staff prior to visit to arrange access and discuss visit requirements and route.
- Visitors can safely leave the laboratory via the same mezzanine floor entrance or alternatively via the lower tank hall by walking clockwise around the mezzanine and down the interconnecting service stairs.
  - These stairs are metal checker plate service stairs with open risers; supervisors should dynamically assess if any of the party will have difficulty with this route and not use this option if this is the case.
  - The mezzanine corridor narrows as the stairs are approached due to the stairs penetrating the corridor and visitors should be advised to taker care.
  - There is restricted access to the coastal basin area due to increased risk from slip trip and fall hazards and closer inspection than from the restricted access barriers is only possible if directly authorised and supervised by COAST laboratory staff or marshals following a more detailed briefing. Visitors must be instructed to stay away from the edge of the basin. The Coastal Basin working area is strictly out of bounds to all except those previously granted permission.

Ocean Basin

- On the ground floor the Ocean Basin can be safely observed in normal operation along the South and East sides, visitors are not permitted to climb access ladders or the tank wall.
- From the bottom of the service stairs viewing of the Ocean tank can take place safely however access to the West end corridor is restricted due to increased risks associated with splash.
- The flume area is under construction and a temporary floor has been installed. At this time there still remain restricted areas where cordoned off and visitor access beyond is strictly forbidden.
- Visitor access is not permitted along the walkway north of the 35m flume.
- This is a working laboratory and as such there could be object stored around the perimeter, care needs to be taken.
- Visitors should not normally handle the water but if they do should be advised to, wash their hands afterwards.
- Exit via the main door to reception area.
- Visitor should be advised of the possibility that some splashing outside the tank is possible and to take care if the floor is wet.
- Large waves will create noise.

Marine Navigation Suite

This can be considered conventional office and laboratory accommodation and therefore presents no significant risks, however additional consideration should be given on entering the full mission bridge.

- Accessed via stairs or lift to 1st Floor
  - Organisers should have contacted laboratory manager or senior technical staff prior to visit to arrange access and discuss visit requirements and route.
- Open atriums are used as part of the natural ventilation design in the building and visiting groups are requested to understand the need for minimal levels of noise to prevent disturbance to staff working on other floors.
- Full Mission Bridge.
  - Visitor should be advised that they will be moving into a darkened area which, depending on simulation run, may be completely blacked out. (Supervisors should ascertain if this is the case from the demonstrator).
  - The moving horizon can sometimes affect visitors balance or produce sea sickness like symptoms visitors should be advised that if affected they should close their eyes for a short period and if this does not help step outside.
  - Simulation of lightning is another effect often demonstrated and visitors should be advised of this.
  - Sound is sometimes used to create realism; visitors should be advised in advance.

Upper Office Accommodation

Group guides are ask to ensure their group are respectful of staff privacy and need for low levels of noise in these areas and not to access areas that have not been previously agreed by the visit organisers.

General Note;

Age, physical and mental capacity of the group members will have a bearing on the level of risk and in consideration of these factors the visit should be modified as necessary to accommodate these. E.g. some groups would not be able to manage the service stairs with in the COAST laboratory and transit between the levels may be better managed via the lift. The large number of visitors during this event requires that marshals are given proper briefing in advance, and that adequate marshals are available.

(Revised March 2010)

Date:	**5th October 2012**	Assessed by:	RG Bray	Activity/Location	Group Visits to the Marine Building

Work Activities	Hazards	No. at risk	Controls in place at present	L (1 – 2)	M (3 – 4)	H (6 – 9)	(List additional controls as required) Comment
Passive observation whilst visiting.		Up to 125 per floor	Method statement describes safe route and actions for visitors.	2			At all times thought-out the visit guides and marshals should adhere to prescribed spaces. 1 marshal per 10 visitors. Marshalls to prohibit venturing. Fire marshals are required at exits to manage numbers of visitors expected to exceed floor capacity by 10%. Fire exits are to be opened to fullest extent by exit marshals in the event of fire.
	Slips and trips		Follow method statement, good quality surfaces.	2			Trip hazards identified and, in the case of the temporary floor north of Ocean Basin, hazards addressed. Water drummers require ingress and egress to the Coastal Basin, and matting is provided at the edge of the basin to reduce slip risk.
	Water / Drowning		Follow method statement. Lifesaving equipment available.	2			Exit from Ocean Basin should be via the beach at the west end.

							Poles for reaching are also available.
	Impact, pinch injury		Follow method statement. Visitors will not have access to moving equipment.	2			
	Falls		Follow method statement, stairs will only be used if groups abilities are suitable.	2			
	Contamination		Follow method statement.	2			
	Heat		Temperature of environment controlled by BMS.	2			Note that it can get warm in the laboratory, and it may be necessary to vent air via manual windows.
	Motion Sickness		Follow method statement.	2			
	Flashing lights		Follow method statement	2			
	Noise		Follow method statement	2			

SIGNATURE: _____ *(Responsable Person)*

PRINT: _____

SIGNATURE _____ (Head of School/Dept)

PRINT: _____

DATE: _____ *REVIEW DATE*: _____

Risk Rating Matrix

			Likelihood (see Table 3)		
			Unlikely	Likely	Almost Certain
			1	2	3
Severity (see table 2)	Major	3	M	H	H
	Moderate	2	L	M	H
	Minor	1	L	L	M

APPENDIX 6 – Method statement and RA for active Client visitors

Risk Assessment and Method Statement for Client Projects within COAST lab

Method Statement:

This Method Statement outlines the basic principles for managing the risks associated with Client presence during projects within the COAST laboratory. It is assumed that such Clients may not be familiar with the hazards associated with experimental facilities of this nature, and that they may wish to be involved with scientific experiments.

Variations from this Method Statement are not expected to be commonplace, and the assessment of risks contained herein requires updating as and when variations are required. In any case Clients will be permitted established pedestrian access and will not penetrate any areas signposted as restricted access unless accompanied by University Staff, nor operate any equipment unless suitably trained and supervised accordingly.

A member of University Staff assigned to the Client Project will not be distracted from their experimental role and will be in attendance with the Client during the duration of their time within the COAST laboratory. The Client, or their representative, will be issued with a temporary pass allowing egress and ingress to the east and west end Ground Floor laboratory doors for their convenience and comfort.

Clients will be granted access to:

Ocean Basin Gantry

Ocean Basin Model Assembly Area

Coastal Basin Area

Flume Area

in accordance with the requirements of their Projects.

Any boating works found to be necessary within the Ocean or Coastal Basins will not be permitted without the use of a lifesaver, two of which are maintained and made available within the COAST lab.

Induction Briefing:

- All visitors on entering the building should be made aware of fire evacuation procedures and assembly points unless this has been already covered by another general induction.
- All safety signage, e.g. indicating restricted access, Emergency Exits etc. is to be observed for your own and others safety.

- Follow advice and guidance of COAST laboratory staff.
- Equipment or other controls should not be operated or handled unless instructed to do so – effects may not be immediately apparent and considerable damage or unseen accident could occur.

COAST laboratory access:

- Access via stairs or lift and entrance to the Mezzanine area is controlled by restricted Staff ID Card.
    - COAST laboratory staff may discuss and arrange access if deemed necessary.
- Visitors can safely leave the laboratory via the same Mezzanine floor entrance or alternatively via the Ground Floor by walking clockwise around the Mezzanine and down the interconnecting service stairs.
    - These stairs are metal checker plate service stairs with open risers; COAST lab staff should dynamically assess if any of the party will have difficulty with this route and not use this option if this is the case.
    - The Mezzanine corridor narrows as the stairs are approached due to the stairs penetrating the corridor and visitors should be advised to taker care.
    - There is restricted access to the Coastal Basin due to increased risk from slip trip and fall hazards and access is only possible if directly authorised and supervised by COAST laboratory staff following a more detailed briefing.
- On the Ground Floor, the Ocean Basin can be safely observed in normal operation along the South and East sides. Clients are not permitted to climb access ladders at the East End, and no objects will be thrown or discarded in the dry-back paddle area.
- Only COAST lab staff (the Operator) will have access to wave generating controls. No power will be supplied to wave generating equipment if any obstruction exists. The Operator will check that the working area is clear of obstruction before any power-up is commenced. The Operator will remain vigilant at all times and prohibit any obstruction of the same during normal operation. In the event that such an on obstruction unavoidably occurs, equipment will be immediately shutdown and the obstruction cleared prior to any further power-up cycle.
- Access to the Gantry is permitted, though care must be taken to ensure appropriate footwear is worn. Access to the Gantry is via a removable step on the South side where possible. When not possible, access to the Gantry is achieved via the basin wall and care must be taken here to ensure firmness of foothold.
- At times it may be necessary to access water bodies within the laboratory via an inflatable boat. Lifesavers will be worn by Users of the boat at all times whilst the boat is required. Boat Users will ensure that they inform at least one other laboratory. Getting into and out of the boat is best performed at the beach ends of the Basins.

- From the bottom of the service stairs viewing of the Ocean Basin can take place safely. However, access to the West end corridor is restricted during experiments due to increased risks associated with splash.
- The flume area is under construction at this time, and is a restricted area for the time-being.
- COAST is a working laboratory and as such there could be objects stored around the perimeter; care needs to be taken to avoid trips and knocks.
- The Loading Bay and Model Assembly Area are open to vehicular access, including fork-lift, and should be kept free of obstacles. Particular care should be taken when vehicles are moving in this area. The Model Assembly Area should be kept tidy and clear when possible. Any risks affecting access in this area as identified by lab Users should be mitigated immediately for the benefit and safety of all.
- The water in the laboratory is chemically treated and all Users of the facilities are advised to wash their hands after contact.
- Exit is normally via the main door to reception area, though the north side loading bay may be required. Additional Emergency Exit is located at the West End of the Ground Floor.
- Visitor should be advised of the possibility that some splashing outside the tank is possible and to take care if the floor is wet.
- Large waves will create noise.

3rd Floor Office Accommodation

From time to time Clients may require access to the 3rd Floor Office space. Visitors are asked to remain respectful of staff privacy and need for low levels of noise in these areas and not to access areas that have not been previously agreed by the hosting party.

General Note;

Age, physical and mental capacity of the group members will have a bearing on the level of risk and in consideration of these factors the visit should be modified as necessary to accommodate these. For example, some visitors would not be able to manage the service stairs with in the COAST laboratory and transit between levels may be better managed via the lift.

Risk Assessment for Client Access

(Form Revision March 2010)

Date:	**5th October 2012**	Assessed by:	RG Bray	Activity/Location	Student and VIP Visits to the Marine Building

Work Activities	Hazards	No. at risk	Controls in place at present	L (1 – 2)	M (3 – 4)	H (6 – 9)	(List additional controls as required) Comment
General lab use	Various	1	No Client access within the lab without COAST staff member present and induction procedure adhered to.	2			Note that Lone Working is not permitted
Use of boat	Drowning	1	Life jacket to be warn at in all times in boat, at least one other person must be present at all times when in the boat. Boat not to be operated while wave machines are operating.		3		Second person to be informed of need to use boat.
Use of electronics around water	Electrocution	1	All electronics to be used are PAT tested. Only gauges designed for underwater use will be allowed near the water, the rest kept as far away as practical.		3		
Working at height	Fall	1	Familiarity with PU safe working practice for working at height.				
Use of Ocean Basin Gantry	Head collisions	1	Brightly coloured impact absorbing material has been deployed.	2			
Use of wave paddles	Trap hazards	All	Only COAST staff to operate. Checks made that everyone/ potential obstructions are clear before paddles are used. Paddles will be fully shut down and the power isolated before any work is done around them or any work involving contact with water in the tank.	2			
Use of Model Assembly Area	Vehicular access, trip hazards	All	Remaining vigilant while vehicles in operation. All Users to keep Area clear and tidy and remove trip hazards if possible.	1			
Wires running between	Trip hazard	All	Where possible wires will be run above head height to prevent trip hazards. Where not possible covers will be	2			

gauges and control equipment			placed over the wires to prevent tripping.				
Use of LDV and PIV	Laser	All	There is no current plan to use this equipment. If this changes all relevant laser safety regulations must be adhered to	1			Risk assessment must be updated if LDV or PIVs are used.

SIGNATURE: _____ *(Responsable Person)*

PRINT: _____

SIGNATURE _____ (Head of School/Dept)

PRINT: _____

DATE: _____ *REVIEW DATE*: _____

Risk Rating Matrix

			Likelihood (see Table 3)		
			Unlikely	Likely	Almost Certain
			1	2	3
Severity (see table 2)	Major	3	M	H	H
	Moderate	2	L	M	H
	Minor	1	L	L	M