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Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Manila

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DEPARTMENT ORDER NO: 74 Series of 2015 04.18.N

SUBJECT: SAFETY ON BOARD ALL DPWH DREDGES AND SUPPORT VESSELS

To improve and standardize safety management practices on board all DPWH dredges and support vessels, in adhering to national and international policies on water vessel safety, the *On-Board Dredge and Dredge Operations Safety Manual* as herein attached to form part of this Department Order, is hereby issued to all concerned personnel and offices to be used as guide for on board health and safety enforcement. The manual was formulated based on applicable provisions of the following international and local regulations:

- International Convention for Safety of Life at Sea (SOLAS) 1974, and
- Maritime Industry Authority (MARINA) Memorandum Circular No. 114 or more commonly known as the "PREVENTIVE SAFETY MEASURES AND OTHER CONCERNS",
- Department of Labor and Employment's Occupational Safety and Health Standards (As Amended, 1989),

and international best practices in the field of Dredge and Dredge Operations safety.

With the adoption of this safety manual, the Department expects to minimize lost time due to injuries/accidents and achieve an injury-free workplace on board all DPWH dredges as well as in the dredging site. Likewise, by complying with the required trainings and licenses prescribed by this manual, cost related to injury/emergency management will be minimized, if not eliminated.

This Order shall take effect immediately.

ROGELIO L. SINGSON
Secretary

Department of Public Works and Highways
Office of the Secretary
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Encl. :
1) On Board Dredge and Dredge Operations Safety Manual
2) Safety Commitment Form
3) Activity Hazard Analysis
4) Map to the Nearest Medical Facility
5) BOE Form 14421-01-Rev00
6) BOE Form 14418-01-Rev00

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2015

DPWH
Bureau of Equipment

On-Board Dredge and Dredge Operations Safety Manual

Risk Reduction Management Plan and Hazard Control

Table of Contents

List of Tables

List of Attachments

Acronyms and Abbreviations

AE	Amphibious Excavator
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
BOE	Bureau of Equipment
CPR	Cardiopulmonary Resuscitation
CSD	Cutter Suction Dredges
DM	Dredge Master
FED	Floating Equipment Division
MPAD	Multi-Purpose Amphibious Dredge
MSDS	Material Safety Data Sheet
ODDOSM	On-Board Dredge and Dredge Operations Safety Manual
PPE	Personal Protective Equipment
PSO	Project Safety Officer
POW	Program of Work
SSO	Site Safety Officer

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FOREWORD

The Department's dredging projects play a vital role in minimizing and averting the impact brought about by flooding. Our water-based fleet of equipment, through capital and maintenance dredging, retains a specific profile of the country's inland waterways, and improves channels' water carrying capacity and navigability. Our dredging fleet is currently deployed in various locations in the country and most of them are in major and critical rivers.

Much as we are committed to protecting lives and properties through our dredging projects, we must put prime emphasis and ensure the health and safety of our dredge crew who, being in the front line and most cases in isolated locations, are exposed to a multitude of risks and hazards associated with both the environment and the operation itself.

In this regard, the DPWH, through the Bureau of Equipment, has developed the **On-Board Dredge and Dredge Operations Safety Manual (ODDOSM)** based on applicable provisions of national and international treaties, regulations and policies on safety.

This Manual contains organizational responsibilities, necessary trainings, inspections and monitoring, personal protective equipment requirement, required plans and activity hazard analysis. This shall serve as the official DPWH guidebook in safety enforcement on board all DPWH dredges and shall pave the way in developing a culture of safety.

With the adoption of this Manual, the Department expects to minimize lost time due to accidents, achieve an injury-free workplace on board all DPWH dredges and prevent potential damage in the dredging site and periphery.

Our sincerest gratitude to all personnel who worked hard for the realization of this Manual.

All concerned personnel are enjoined to use this Manual in the proper safety enforcement on board all DPWH dredges.

ROGELIO L. SINGSON
Secretary

1.0 Background

This On-Board Dredge and Dredge Operations Safety Manual (ODDOSM) was developed to set the guidelines to protect the personnel involved in dredging activities carried out in various locations across the Philippines using DPWH dredges. This covers the general scope of authority, responsibilities for accident prevention, risk reduction and provides guidelines for BOE personnel involved in dredging operations to implement, enforce and monitor safe work practices and procedures.

The provisions herein are in accordance with the International Convention on Safety of Life at Sea (SOLAS), MARINA circulars, and international best practices in the field of maritime and dredge safety and health. The safety and health measures presented herein must be observed by all project personnel including inspectorate teams and visitors at all times. Furthermore, dredge personnel must comply with all applicable Philippine Coast Guard and MARINA regulations and environmental regulations not explicitly mentioned here. This manual will serve as a guide for accident prevention, emergency response, fire prevention, proper housekeeping and safety enforcement dredges on board all DPWH.

This manual addresses various issues regarding dredging operations and risks and hazards associated with it. AHA for dredging operations is included as Attachment 1 of this manual. An addendum to the existing AHA must be prepared if there is/are additional task(s) to be done. The addendum must include the scope of work to be done and the timeline of activities, activity hazard analysis specific to the scope of work and the PPE for the specific activities.

2.0 Statement of On-Board Dredge and Dredge Operations Safety Policy

The BOE places high premium on occupational health and safety of its personnel as it adheres to the DPWH quality policy, thus has committed to operate its equipment and facilities and projects in compliance with all health and safety laws, rules and regulations to which it subscribes. The BOE is committed to securing a high quality of life and keeping a safe and healthy work environment through these sustainable practices.

The Bureau recognizes the critical role each employee plays in promoting a positive and proactive safety attitude, and thus, expects all employees to exercise and uphold the highest safety standards. The success of a project depends on the level of planning and preparation taken before the actual project is started. An effective plan must include identification of risks and hazards associated with all activities to be performed in the project and planning of econtrol measures to minimize the identified risks and hazards to achieve an injury-free work environment. This Bureau is committed to continually improve environmental and occupational health and safety management strategy to achieve the highest level of health and safety in every workplace. The Bureau therefore, expects all employees and personnel to communicate this policy to persons working for the DPWH with the intent that they are made aware of their individual health and safety obligations.

With everyone's cooperation and commitment to advocate and practice this safety policy the Bureau can achieve its goals and exceed the minimum requirements set by applicable laws and regulations and emerge as a leader in all its business endeavors through stewardship-based approach for its employees, environment and the society.

The BOE hereby enjoin all its employees to abide by the rules, regulations and policies declared in this manual which:

- Will comply with all applicable laws, rules and regulations set by the state and international laws with consideration to international best practice in the industry;
- Recognize that workers have the right to a safe work environment;
- Identify and assess all risks and hazards associated with the operation and formulate appropriate control measures, and
- Will continuously improve safety management strategy of all employees.

In the event of an accident where a worker is injured, the Bureau's goals are:

- To ensure that there is an effective and efficient process to follow in handling the injured;
- To minimize the impact of work related injuries or illnesses;
- To reduce cost associated with injury management, and
- To reduce the number of days lost due to injuries.

3.0 Organization and Responsibilities

The BOE must work hand in hand with the implementing office in implementing this on-board dredge safety policy to achieve the Bureau's goal of zero accident in the workplace.

3.1 Bureau of Equipment- Floating Equipment Division

The BOE, through the Floating Equipment Division (FED), is responsible for formulating and enforcing health and safety requirements and implementing this ODDOSM. The Dredge Master or the Dredge Engineer, if there is a Dredge Engineer, shall be designated as the Site Safety Officer (SSO) and must be present on site at all times during operations and ensure that the work is done with the observance of the rules and guidelines set by this manual.

Authorized personnel from the FED will conduct periodic and random inspections of dredges to check compliance to these guidelines. These personnel shall assess the safety level of the dredge and will discuss their findings with the SSO and report to the FED chief their findings for his appropriate actions.

The following table lists the personnel from the BOE and the project implementing office who are in charge of the dredge and dredging operations, and are therefore responsible for enforcing the safety policy:

Table 3.1
Personnel Responsible for Implementation of the Safety Program

Bureau of Equipment			Implementing Office
CSD	MPAD	AE	
Dredge Master III	Dredge Master III	Dredge Master III	Project Inspector
Dredgeman Foreman	Dredgeman Foreman	Dredgeman Foreman	
Marine Engineman	Marine Engineman		

In the event that the SSO is on leave or the SSO is the one injured, the Dredgeman Foreman shall take the responsibilities of the SSO. The Dredgeman Foreman must therefore undergo the same trainings as the SSO.

3.2 Implementing Office

The implementing office for the project shall assign the Project inspector as the Project Safety Officer (PSO) who shall have the overall responsibility for the project and will ensure that the work is carried out in accordance with the guidelines set in this manual. The PSO must coordinate with the SSO regularly.

3.3 Responsibilities of the SSO and PSO

It shall be the duty of the SSO, as the first-line supervisor, to motivate his personnel to adhere to the guidelines set forth in this manual. All SSO must have knowledge of the safety procedures for all jobs and tasks under his supervision or when in doubt, must seek the assistance of a competent person before initiating the task. If the task cannot be accomplished safely, it must not be attempted.

The duties and responsibilities of the supervisor are listed as follows:

- Explain the safety procedure involved with a task to each employee, and check frequently if the employee understands and follows the instructions.
- Allocate sufficient time for the training and coaching of all employees to ensure everyone knows the correct safety procedure.
- Make sure that new employees are trained for the job before allowing them to perform the tasks.
- Immediately correct unsafe working conditions and practices.
- Ensure that employees are wearing the required PPE as specified in this manual.
- Set a good safety example.
- Obtain the cooperation of all employees.
- Provide a safe work environment for all personnel in the area.
- Report all accidents, near misses, and injuries in accordance with BOE form 14421-01-Rev00 "Accident Reporting".

4.0 Training

This section comprises general training, safety meetings, site-specific training, hazard communication, first aid and CPR, and other additional trainings, certification and licenses necessary to work on site.

4.1 General Training

The PSO or other competent/ authorized personnel is responsible for informing all site personnel and all visitors of the contents of this ODDOSM and ensures that each person signs the ODDOSM and Safety Commitment Forms prior to working on the site.

4.1.1 Visitor Training

Visitors and non-dredge personnel will be limited to support areas only. These persons will not be required to comply with training requirements as previously discussed. Authorization for limited site access will be determined on a case-by-case basis by the SSO. If authorized by the SSO, visitors must be accompanied by a competent dredge crew and must be provided with the proper PPE and briefing before proceeding.

4.2 Safety Meetings

Regular safety meetings and trainings shall be conducted to make sure that employees perform all tasks in a safe manner.

4.2.1 Pre-Operations Safety Briefing

The SSO shall conduct a pre-job safety briefing at the beginning of each shift to discuss the safety and health considerations for the day's work, pertinent aspects of AHA, necessary PPE and problems encountered in the preceding day. Attendance record and meeting notes shall be documented on the Dredge Log and maintained with the project files for future reference and to be used in improving safety management. If necessary, a debriefing for site employees shall be conducted at the end of the shift.

4.2.2 Supervisors Safety Meetings

A supervisor meeting which shall be conducted by the PSO or other authorized person must be held at the end of each month. The meeting shall cover the following:

- Activities for the whole month;
- Plans for new activities;
- Review of AHA;
- Establishment of safe working procedures for anticipated hazard;
- Necessary safety and health training and motivation;
- Worker feedback and suggestions to improve safety management program.

4.3 Site-specific Training

Although this manual tries to capture all aspects of on-board safety, there may be hazards that are unique to a specific project or project site which may become obvious only during the design of the project. Both BOE and implementing office personnel are therefore required to attend a safety orientation meeting prior to working on site. The training will include the following topics:

- Purpose of ODDOSM and review of pertinent sections including emergency response procedures
- Review of applicable AHAs
- Names of personnel accountable for site safety
- The contacts and location of medical care and facilities and the name of CPR and first aid trained personnel assigned to the project.
- Pre-operation safety and preparatory meeting procedures
- Safety and health hazards in the work place and the appropriate control measures
- Procedures for reporting and correcting unsafe conditions or practices
- PPE use and care
- Location and use of safety equipment
- Standard operating procedures, safety rules and safe work practices for the project
- Marine activities
- Lockout procedures
- Drills

4.4 First Aid and CPR

If there are at least two personnel working at the project, there shall be at least one with first aid and CPR training and certification, certified by the Philippine Red Cross or other competent agency. This person must train the other personnel working on the project regarding first aid.

4.5 Training and Certifications

The following training and certifications must be required in addition to the previously stated requirements:

- The SSO must have completed an 8-hour Safety class within the last three years.
- Confined space entry, attendant and supervisory personnel shall be trained as previously specified.
- Personnel working from ladders must have undergone training on Ladder Safety Course.
- Personnel operating arc-welding equipment shall have a certificate designating them as qualified operator.
- Personnel operating gas welding and cutting equipment shall have a certificate designating them as qualified operator.
- Personnel must have training on how and when to use small fire extinguishers, and which type of fire extinguisher to use.
- Proper wearing and use of PPE.
- All personnel working on the project must undergo training on emergency response procedures which must be conducted by an authorized and competent person.

- The FED shall conduct hazard communication training for all field personnel. The training involves review of the written hazard communication program, MSDSs, container labeling and chemical health hazard. Proper handling and use of these hazardous materials and chemicals must also be discussed to field personnel.

5.0 Safety Enforcement Check

The inspectorate team from the FED will conduct periodic and random inspection of dredges and the project site in accordance with the Secretary's Memorandum dated February 4, 2015, "DPWH Dredges and Support Vessels Safety On-Board" and the Safety Enforcement Check BOE form 14421-01-Rev00 to assess the safety of the workplace and the safety measures being practiced on site. The SSO will conduct a daily safety inspection of work processes, site condition and equipment condition using BOE form 14417-01-Rev00. Any safety deficiency observed by employees shall be posted at the project safety bulletin board and will be documented by the SSO. The SSO will then report and discuss the deficiencies with the concerned FED unit. The log will include the following:

- Date deficiency is identified
- Details of the deficiency
- Name of person responsible for correcting the deficiency
- Expected resolution date
- Date corrective action is taken
- Verification that corrective action has been taken
- Validation of the corrective action

5.1 Equipment Inspection

All equipment must be inspected and tested before using for the project. The test must be conducted in accordance with the manufacturer's recommendations and the equipment must be certified by a competent person to have met the requirements stated in the manufacturer's manual. If at least one safety deficiency is observed during the testing, it must be corrected first before putting the machine into operation. A regular inspection will be conducted by authorized FED personnel at least quarterly thereafter. If in any case the machine is taken out of the project and subsequently returned, it must be re-inspected before it is put to operation. The SSO will conduct a daily safety and maintenance inspection of the equipment using BOE form 14418-01-Rev00. All deficiencies must be reported in the inspection form and must be addressed immediately. The form must be submitted to the FED together with the other BOE mandated reports.

The FED, through the Dry-docking and Maintenance Services Section (DMSS), will evaluate the submitted inspection forms and determine if the equipment is in need of repair and must be taken out of service. If major repairs are done on the equipment, it must undergo performance trial and must show satisfactory results before it can be put to operation.

6.0 Safety On Board Expectations and Compliance

6.1 BOE Safety Program Goals

With the Bureau's current strategic plan and its thrust to comply with the requirements set by the International Maritime Organization during the 1974 International Convention on Safety of Life at Sea (SOLAS), and to increase equipment utilization by reducing equipment downtime and lost time due to work related accidents and injuries while maintaining a safe and healthful work environment, the Bureau has taken the initiative to achieve the goal of zero reported accident on all its equipment. A series of seminar-workshops on project planning and management was undertaken to train employees on how to properly and effectively plan activities to achieve zero accident. Dredge on-board safety was also given emphasis on the said seminars. Project planning helps identify the resources needed for the project as well as the hazards associated with every activity to be performed and the measures needed to eliminate the impact of such hazards and to reduce the probability of incidents, accidents or injuries. Planning and scheduling also help finish a certain task in the shortest time possible by following a clear predefined procedure.

Through surveys and inspections, the FED gains feedback and input from field personnel who are doing the actual work regarding the actual or potential hazards they observe in their workplace. The feedback and input from field personnel will be used to further improve the safety management strategy of the Bureau.

By recognizing one's responsibility for his personal safety as well as the safety of others in the area he will use all equipment and machineries provided in a safe and responsible manner and will follow all safety policies stated herein. Employees may stop from doing a certain work if in his judgment serious injury could result from continued activity. On the other hand, employees who intentionally disregard the safety rules may be subject to disciplinary actions in order to protect other personnel in the workplace.

6.2 Employee Participation and Responsibility

Participation of all employees working for the project is very important to achieve the success of the safety program. Only the qualified and trained personnel shall be assigned to take part in the project. A detailed project plan must be prepared before starting the project and must be strictly implemented. Any changes in the project plan must be discussed with all concerned personnel. It shall be the duty of the SSO and the PSO to motivate all personnel to adhere to the policy and procedures and reinforce positive behavior in the workplace.

6.3 Disciplinary Actions for Non-Compliant Personnel

Employees who jeopardize the safety of their fellow workers shall be subject to sanctions/ disciplinary actions depending upon the BOE Director's discretion.

6.4 Safety Bulletin Board

A bulletin board dedicated for safety announcements must be placed in a conspicuous place on board the dredge and must be protected against elements and unauthorized removal. The bulletin board must contain the following safety and health information:

- Map of the area with route to the nearest medical care facility;
- Emergency telephone numbers;
- A copy of the most up-to-date AHA;
- Safety and health promotional posters and reminders;
- Date of last injury/ accident.

6.5 Authorized Personnel On Board

Only authorized personnel and crew are allowed on board DPWH dredges. During operation, only the dredge crew and the PSO are allowed on board the dredge. Visitors must seek permission from the DM first and undergo safety briefing before they can be allowed on-board, and must be given the proper PPE upon entry to the dredge.

7.0 Accident Reporting

7.1 Lost Time due to Work-related Injury

The SSO shall submit on a monthly basis a record of occupational injury and illness using BOE form 14421-01-Rev00.

7.2 Accident Reports

Dredge personnel must immediately notify the SSO when an accident, near miss or injury occurs. Once the injured is given medical attention, the SSO must complete the Accident Report Form BOE 14421-01-Rev00 and submit the accomplished form to the FED. The SSO and PSO will investigate the cause of the accident or injury using the Root Cause Failure Analysis (RCFA) methods discussed in the seminars conducted by the BOE. Corrective actions will be determined and implemented to prevent future recurrence of the accident.

In the unfortunate event where an employee is sent to a doctor, a Return-to-work clearance must be issued by the attending physician before the employee can get back to work. A copy of the clearance must be submitted to FED along with the Accident Report Form.

8.0 Medical Support

In the event of a medical emergency, the following personnel and offices must be notified accordingly as follow:

1. SSO
2. PSO
3. Police
4. Nearest Medical care facility

The contact details of the abovementioned persons and offices can be found in the Safety and Health Bulletin Board.

8.1 On-the-Spot Medical Support

To facilitate handling of injured personnel, the following must be observed:

- Effective communication devices must be available in the workplace.
- Employees working alone or in remote locations must be provided with an effective means of emergency communication. The device must be tested and must be serviceable before the starting to work.
- A first aid kit shall be provided on the dredge and must be maintained and inspected weekly or monthly.
- At least one personnel on board must have training on first aid and CPR.

8.1.1 Contents of First Aid Kit

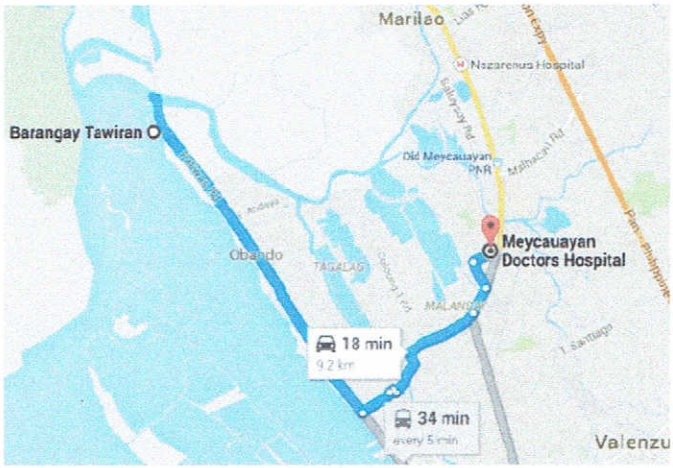
The first aid kit, at the minimum, must contain medicines or treatment for the following:

- Allergies
- Cold and flu
- Dental emergencies
- Common eye and ear conditions
- Gastro intestinal conditions
- Pain management
- Skin conditions
- Sprains and strains
- Airway management
- Simple wound management
- Simple burns

8.2 Off-site Medical Support

In case of medical emergency, the SSO must contact the nearest medical facility. A list of emergency contacts and hospital information must be prepared for each dredge by the SSO before the start of the project and must be posted on or beside the Safety Bulletin Board. The list must follow the format that follows.

Table 8-1
Sample Emergency Information

Office/ Service	Contact Details
Primary Medical Facility: Meycauyan Doctors Hospital Location: Malanday Street Direction :  	(044) 840-8140
Meycauayan Police Station	(044) 840-7998
Obando Fire Station	(044) 299-7996
Rescue 117	760-7049
Red Cross	(044) 662-5922

9.0 Personal Protective Equipment (PPE)

Several hazards exist on board the dredge and in the dredging site as well. Rule 1081.04 of the Occupational Safety and Health Standards under Article 162 of the Labor Code of the Philippines states that "No person shall be subjected or exposed to a hazardous environmental condition without protection".

9.1 Personal Protective Equipment

This section specifies the level of PPE required for the dredging activity. All site personnel must be trained on the proper use, donning and doffing of PPE.

The minimum level of PPE to be used in dredging activity must consist of the following:

- Head protection[1]

    1) Hard hats for the protection of workers from impact, penetration, from falling and flying objects, blows, and from limited electric shock and burns shall be provided where there is reasonable probability of exposure to such hazards.
    2) Hard hats shall be made of non-combustible or slow-burning materials and when used in electrical environment shall be non-conductor of electricity.
    3) The total weight of complete hard hat should not be more than .45 kg.
    4) Hard hats shall have a brim all around to provide protection for the head, face and back of the neck.
    5) Hard hats without brim and low crowns may be allowed only in confined spaces.
    6) The cradle and sweatband of hard hats shall be detachable and replaceable.
    7) For work in excessive moisture, hard hats shall be of water-proof material.
    8) For the proper selection, design, construction, testing and use of head protectors, the American National Standards Safety Requirements for Industrial Head Protection (ANSI z59-1-1969) is adopted.

- Eye and face protection[2]
  Eye and face protection shall be provided where there is exposure to hazards of flying objects, liquids, injurious radiation, glare or combination of these hazards, and shall conform with the following requirements:

    1) Provide adequate protection against the particular hazard for which they are designed or intended;
    2) Be reasonably comfortable to use;
    3) Fit snugly and shall not unduly interfere with the movement of the user;
    4) Be durable, easily cleaned and capable of being disinfected;
    5) Be kept in good condition, and
    6) Be of the approved type.

[1]Occupational Health and Safety Standards, Rule 1084.01
[2]Occupational Health and Safety Standards, Rule 1082

Whenever eye protection is needed, persons whose visions require the use of corrective lenses shall wear goggles or spectacles of any of the following type:

1) Spectacles which provide optical correction;
2) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles; or
3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

- Short or long sleeved shirt

- Safety shoes[3]
  Workers shall be provided with approved safety shoes and leg protection. For dredging activities, steel-toed safety boot is required.

- Hearing protection (as needed)

- Hair protection[4]

  1) All persons with long hair employed around machinery shall cover their hair with well fitting caps other equivalent protection.
  2) Caps shall be of materials not easily flammable and sufficiently durable to withstand regular laundering, disinfecting and cleaning.

- Respiratory protection[5]
  The primary corrective measure in the control of occupational diseases caused by harmful dusts, fog, mists, gases, smokes, sprays or vapors shall be to prevent atmospheric contamination. This shall be accomplished through the use or application of accepted engineering control measures, like enclosure or confinement of the operation, general and local ventilation and substitution of less toxic materials or combination of these. When effective engineering control measures are not feasible or when they are in process of being instituted, appropriate respirators shall be used.

- Hand and arm protection[6]

  1) When selecting gloves, consideration should be given to the hazards to which the wearer may be exposed to and the ease and free movement of the fingers.
  2) Gloves shall not be worn by workers operating hand drills, punch presses or other machinery in which the hand may be caught by moving parts.

- Class III high visibility work vest

- Fall protection

[3]Occupational Health and Safety Standards, Rule 1087
[4]Occupational Health and Safety Standards, Rule 1084.02
[5]Occupational Health and Safety Standards, Rule 1083
[6]Occupational Health and Safety Standards, Rule 1085

Safety belts, life lines and safety nets[7]

1) Workmen working in unguarded surface above open pits or tanks, steep slopes, moving machinery and similar locations, or working from unguarded surfaces six (6) meters or more above water or ground, temporary or permanent floor platforms, scaffold construction or where otherwise exposed to the possibility of falls hazardous to life or limb, shall be secured by safety belts and life lines. In situations where safety belts and life lines in guarded platforms and scaffolds or temporary floors are not feasible, safety
2) Nets shall be provided and installed.
3) Workmen entering a sewer, flue, duct, or other similar confined places shall be provided and required to wear safety belts with life lines attached and held by another person stationed at the opening ready to respond to agreed signals.
4) Workers who are required to climb and work on top of poles six meters or more shall use safety belts. On top of structures where there is no place to strap a safety belt, a messenger line shall be installed for strapping the safety belt or life line.

- Personnel and visitors shall wear type III, IV or better Coast Guard approved Personal Floatation Devices (PFD). For works conducted during night time, PFDs must be equipped with retro reflective tape.

  PFDs must be worn under the following circumstances:

  a. On floating pipelines;
  b. Working alone at night where there are drowning hazards, regardless of other safeguards provided;
  c. When working adjacent of the shoreline;
  d. In skiffs, small boats or launches;
  e. Wherever there are drowning hazards.

During the site safety orientation, the following must be elucidated:

- When PPE is required;
- The proper PPE for the job tasks;
- How to properly don, doff and adjust PPE;
- The limitations of the PPE and,
- The maintenance, testing, useful life and disposal of the PPE.

The BOE shall provide all dredge personnel with the necessary PPE for dredging. If in case a PPE was damaged or lost, it must be replaced by a new one which is of the same specifications as the damaged item.

9.2 Hazard Assessment

Hazards such as excessive noise, heat, falling objects, electrical, etc. are present in dredging activity and must be given due consideration to minimize or eliminate impact on safety and health of personnel on board. The anticipated hazards and control measures are presented in Section 12 "Hazard Assessment and Control".

[7]Occupational Health and Safety Standards, Rule 1086

10.0 Required Plans

10.1 Layout Plans

A layout plan must be provided by the implementing office together with the Program Of Work for the project. The dredge must also have on board a layout plan showing clearly the emergency exits and the location of emergency equipment.

10.1.1 Means of Escape and Emergency Exits

Two means of escape/ emergency exits must be accessible to all personnel on board in case of emergency. No locking doors leading to these two emergency exits must be employed. A clear and readable signage shall be posted to notify the personnel of the emergency exits.

10.2 Emergency Response Plan and Contingency Procedures

Safety enforcement starts even before mobilization of the equipment to the project site. Effective means of emergency communications must be provided prior to start of the project.

In the event of medical emergency, the appropriate immediate response must be taken by the first person to recognize the situation. The person shall immediately notify the supervisor of the incident, and the appropriate emergency service organization shall be contacted.

When injury or illness arises, a trained employee shall render the proper emergency first aid care to the injured. First aid kit and equipment must be available and properly maintained in the workplace.

Unless the emergency is extreme and obvious, the decision to stop operations and evacuate the site shall be made by the PSO. Field personnel must gather in a pre-designated area if possible. Decisions to evacuate surrounding community shall be made by the local authorities.

10.2.1 SSO

With regard to Emergency response, the following are the responsibilities of the SSO:

- To evaluate and assess emergency situations;
- Assign personnel and coordinate response activities on site;
- Inform personnel of potential hazards associated with the site;
- Summon emergency response personnel;
- Notify the PSO of the emergency situation;
- Verify that all emergency equipment are inspected and are serviceable;
- Coordinate with the PSO to correct unsafe work practices or conditions that may result to injury;
- Inform the emergency response agencies of the provisions made herein;
- Evaluate safety of site personnel in the event of an emergency.

10.2.2 PSO

The PSO shall provide appropriate resources and support to emergency responders. When the need arises, the PSO will mobilize additional personnel and equipment to the site to help in the emergency response effort.

10.2.3 List of Emergency Contacts

The local fire department as well as the Red Cross shall be notified regarding new activities on site. They must be notified regarding potential emergencies associated with new activities on site. This is done to ascertain response capabilities and obtain a response commitment.

The SSO will evaluate the incident, and if necessary, notify the emergency response personnel or agency. Contact numbers of medical facilities are listed in Table 8-1 and are also posted in a conspicuous place on board the dredge.

When reporting an incident to the emergency service, the following information must be given:

- Name and telephone number of the individual reporting the incident;
- Location and type of the incident;
- Nature of incident (e.g. fire, explosion) and substances involved (if any);
- Number and nature of medical injuries;
- Potential for additional risks or dangers;
- Potential off-site risks or dangers;
- Response action currently in progress;
- Status of incident;
- Other pertinent information.

10.2.4 Medical Emergency Response

Minor injuries that do not require immediate hospitalization will be treated by qualified first aid/ CPR provider. The Emergency Response team shall be summoned when the injury is moderate to severe, which requires immediate medical care.

10.2.5 Personal Exposure or Injury

The following procedures must be observed in the event of a personal injury (other than first aid only)

10.2.5.1 Injuries Requiring Transport by Ambulance

Upon realizing the need to transport the injured to a hospital via an ambulance, the following procedures will be observed if applicable:

- Administer first aid to the injured and contact the nearest emergency service;
- Move the person to a support area if there is no risk of further injury;

- Assign an individual to meet the emergency service at the site entrance to minimize time needed to locate the injured;
- Document the event;

In the event of chemical exposure, the following procedures must be observed after calling for emergency assistance:

- Skin contact:
    1. Brush dry powder chemical from skin before flushing with water
    2. Rinse with large amount of water
    3. Remove clothing, flush skin with water, then cover the burn with dry, non-stick, sterile dressing
    4. Obtain prompt medical attention
- Inhalation:
    1. Remove the person from the area
    2. Administer first aid/ CPR if needed
    3. Obtain immediate medical care
- Ingestion:
    1. Contact the medical facility for treatment, then obtain medical attention
- Eye Contact:
    1. Rinse eyes immediately with clean water
    2. Obtain medical attention, if necessary

10.2.6 Fire Control

The MARINA set a required number of fire extinguishers for different classes of vessels which must be kept in an accessible location within the vessel.

In case of fire or explosion, the following procedures must be observed:

- Evacuate all personnel to a safe location;
- Concurrent with the above, contact the fire department as appropriate;
- If someone with training on how to use fire extinguisher is on site, use available fire extinguishers to put out small fires if it can be done safely;
- Alert the local hospital of the possibility of fire victims, as appropriate;
- Document the incident and accomplish the Accident Report Form

Fire Control Equipment Maintenance and Inspection:

The firefighting equipment on board dredges will be inspected by the FED inspectorate team during the periodic and random inspections. The SSO will also inspect the fire control equipment on a monthly basis and see to it that all firefighting equipment on board are serviceable and ready to use.

10.2.6.1 Fire Prevention and Control

Rule 1941 of the Occupational Safety and Health Standards under Article 162 of the Labor Code of the Philippines states that "Fire tests of building materials and fire protection equipment used in any place of employment shall be those provided for the Fire Code of the Philippines. Standards for the design and installation of indoor, outdoor general

storage, sprinkler system and fire protection system shall be those provided for by Chapter 9 of the Philippine Society of Mechanical Engineers (PSME) Code."

10.2.6.2 Construction and Facilities

- Exits[1]

    1) At least two exits shall be provided in every floor and basement of every workplace capable of clearing the work area in five (5) minutes.
    2) Additional exits shall be provided if the travel distance from any occupied space in a high-hazard occupancy exceeds twenty-three (23) meters.
    3) The width of the exits shall be computed by dividing the total occupants of a floor or a storey (maximum allowable) by sixty (60) in industrial and commercial establishments by forty-five (45) in service establishments, and by seventy-five (75) in places of assembly and the quotient multiplied by fifty-five (55) to get the width of the exit in centimeters.
    4) Slide escapes may be considered as exits in building housing house hazard occupancies but these shall not constitute more than twenty-five (25) percent of the total number of the required means of egress.

- Stairways[2]

    1) All approaches to fire exits shall be cleared of any obstruction and properly marked to make the direction of egress clear.

- Fire Doors[3]

    1) Doors giving access to stairways shall not open directly on stairs, but shall open on landings leaving a path of travel equal to at least the width of the door at any point during its swing.
    2) Doors swinging at both sides, vertical-sliding doors, rolling shutters and revolving doors shall not be allowed as exits.

10.2.6.3 Fire Fighting Facilities

- Water Supply[4]

    1) Where connection from a public water supply system is not available, an adequate private water supply reservoir capable of supplying all firefighting systems for eight (8) hours shall be provided.

[1]Occupational Health and Safety Standards, Rule 1943.03
[2]Occupational Health and Safety Standards, Rule 1943.04
[3]Occupational Health and Safety Standards, Rule 1943.05
[4]Occupational Health and Safety Standards, Rule 1944.02

- Portable Extinguisher[5]

1) General Requirement

a) All places of employment, including those where automatic-sprinkler protection system is installed, shall be provided with portable fire extinguishers for protection against incipient fires.
b) Portable extinguishers shall be maintained in fully charged and operable condition and kept in their designated places at all times when not in use;
c) Approved fire extinguishers shall be used;
d) extinguishers shall be installed on hangers or brackets conspicuously located in unobstructed areas readily accessible in the event of fire;
e) Extinguishers having group weight not exceeding 18 kilograms shall be installed so that the top is not more than meter above the floor. Those exceeding 18 kg, except wheeled types, shall be installed not more than 1 m above the floor;
f) Extinguishers shall be inspected monthly or at more frequent intervals where circumstances require to ensure they are in their designated places, to determine physical damages and that they are in good operable condition;
g) At regular intervals of not more than one year, or when specifically indicated by an inspection, extinguishers shall be thoroughly examined, recharged or repaired; and
h) On the place where extinguishers are located, the type and use of the extinguishers and instructions on its proper use shall be marked in visible and easily readable letters.

2) Selection of Extinguishers

Extinguishers shall be selected for the specific class or classes or hazards to be protected against in accordance with the following:

a) Extinguishers for Class "A" hazards, such as wood, cloth, paper, rubber and other similar ordinary materials, shall be selected from foam, loaded stream, multipurpose dry chemical and water types;
b) Extinguishers for Class "B" hazards, fires in flammable liquids, gases and greases, shall be selected from carbon dioxide, dry chemical, foam, loaded stream and multipurpose dry chemical;
c) Extinguishers for Class "C" hazards, fires which involve energized electrical equipment where the electrical non-conductivity of the extinguishing media if of importance, shall be selected from carbon dioxide, dry chemicals, and multipurpose dry chemicals;

When the electrical energy is disconnected, Class "C" fire may be treated as either Class "A" or Class "B";

d) Toxic vaporizing extinguisher is not recommended for any type of fire;
e) Extinguishers which need to be inverted to operate are not recommended for use;
f) Soda acid fire extinguishers are not recommended for use.

[5]Occupational Health and Safety Standards, Rule 1944.05

10.2.7 Explosives Discovery

Should the personnel working on site discover a suspected munitions or explosives, the SSO must be notified and the following actions must be taken:

- Evacuate all personnel to a safe location;
- Inform the local police of the discovery;
- Do not return to the area until the police have cleared the place.

10.2.8 Spill Prevention and Control

This section sets the guidelines for spill prevention and control coordination and response.

10.2.8.1 Preventive Measures

The following control measures must be observes to minimize the risk of spill:

- Strictly implement restrictions on access to work areas to authorized personnel only;
- Brief personnel regarding spill control measures;
- Appropriate secondary containment structures will be used for storage of hazardous materials;
- Storage shall be inspected daily.

10.2.8.2 Spill Response

In the event of a spill, the PSO and the FED must be notified immediately. An assessment will be made of the magnitude and potential impact of the spill. If possible, locate the source of release, prevent further release, and contain the spilled substance as follows:

- The spill or release area must be approached from upwind;
- Hazards will be identified based on available information from MSDS. The material hazards will be evaluated to determine the necessary protection levels and method;
- If necessary, evacuate and isolate the spill area;
- If possible, spill containment will initially be made without entering the immediate hazard area;
- Only trained personnel and with the proper PPE can enter the hazard area and perform the containment;
- Store the spilled material for treatment or disposal.

If site personnel cannot respond to the environmental release, or if it is too risky for the personnel to do so, the local fire department or DENR and other concerned government offices must be notified about the release.

10.2.9 Site Evacuation Procedures

In case of serious emergency that prompts personnel to evacuate the vessel, air horn blast shall be sounded. All effective means must be used to notify personnel and provide special

instructions. All personnel must be evacuated to a safe location upwind, and a headcount must be performed.
A site emergency map that clearly shows the evacuation routes, location of emergency air horns or buzzers, first aid kits and rally points must be prepared before the start of the project.

10.2.10 Emergency Equipment

The following emergency equipment, but not limited to, must be maintained on board the dredge at all times:

- Fire extinguishers;
- First aid kits;
- Blood-borne pathogen control kit;
- Emergency eyewash;
- Communication devices

The SSO will regularly inspect these items to make sure they are in good condition and ready to use.

10.2.10.1 Emergency Alarms and Signals

In case of emergency situations, alarms and signals must be sounded to alert all dredge personnel and call the attention of nearby vessels. The following procedures must be taken when using emergency alarms during an emergency situation:

- In case of fire, sound the fire alarm immediately and if evacuation is required, sound the air horn for an uninterrupted 10 seconds;
- As pre-warning for other incoming traffic, at least 15 meters from the site, sound the air horn for two seconds;
- In case of other emergency that prompts evacuation, sound the air horn/ alarm for an uninterrupted 10 seconds.

10.2.10.2 Visual Distress Signal

To alert other vessels in the area of the emergency situation in the dredge, a visual distress signaling device may be used in conjunction with alarms. DPWH dredges must be equipped with two visual distress signaling devices:

- One day non-pyrotechnic device (SOS flag)
- One night non-pyrotechnic device (SOS light)

10.2.11 Follow-up of Emergency Procedures

The FED-BOE shall be notified immediately and receive a written notification within 24 hours of all accidents or incident fires or explosions. The report shall follow the BOE form 14421-01-Rev00 "Accident Report Form".

The FED and the PSO will investigate the cause of the incident to prevent recurrence. The investigation must be conducted soon as the area is cleared and before work resumes. The following are guide for the investigation:

- Interview witnesses or participants as soon as possible;
- Determine the chronological sequence of events that lead to the incident;
- Note all observations made by the witnesses or participants;
- Obtain weather data;
- Verify the condition of all safeguards;
- Determine if a revision to existing emergency procedures is warranted.

10.2.12 Man Overboard/ Abandon Ship

Type III, V or better PFDs must be worn by workers when working wherever there is drowning hazard. Inflatable PFDs are not permitted on this project. The PFDs must be equipped with automatically activated light and reflective tape for operations during the night. A motorized boat must be available to assist the personnel in case of emergency. When working on high areas or at least 6 feet from the lower level, personnel must wear safety harness with properly attached lifelines if protective guardrails are not in place.
Ring buoys must be provided for each personnel working over the water or floating vessels and must be fitted with at least 90 feet of rope.
Whenever possible, personnel must work in pairs and each one is accountable for each other.

10.2.12.1 Emergency Planning

To effectively respond to marine emergencies, plans shall be prepared as follows:

- Each crew member must be assigned special duties for various emergencies and this must be formally written and displayed in a conspicuous place on board the dredge;
- Each crew member must become familiar with his duties and with the vessel's emergency signals;

The following drills must be performed at least monthly on all floating plants or on which crew members are quartered:

Abandon ship drills, fire drills, man overboard or rescue drills.

The first set of drills shall be conducted within 24 hours of vessel's occupancy or start of the project.
Where crews are employed or quartered at night, every third month a set of drills shall be conducted at night; the first set of night drills must be conducted within 2 weeks of the vessel's occupancy.
Drills on how to handle pump shell or pipe rupture or failure in the hull and how to handle leaks in the hull shall also be conducted.
Emergency lighting and power systems shall be inspected and tested every month to ensure that they are in good working condition and ready for use.
A record of all drills and emergency checks must be made and maintained in the station log.

10.3 Health Hazard Control Plan

10.3.1 Physical Hazard

A lot of physical hazards exist on the deck of a dredge and must be given consideration to prevent injuries or accidents.

10.3.1.1 Slips, Trips, fall

The following safety precautions would help prevent slips, trips and falls:

- Keep working areas clean and orderly. Use and store tools, equipment and materials properly and appropriately;
- Do not leave small, loose items lying around especially in areas where people walk and work;
- Walkways shall be kept free of obstacles, and surfaces must be maintained well. Holes in walkways must be repaired. Otherwise the walkway shall not be used.
- Access points or holes in gratings shall be provided with adequate guardrails;
- Spills shall be cleaned up immediately;
- Take extra precaution when walking during wet weather;
- Do not jump from elevated places or equipment;
- Do not walk on areas not designated as walking surfaces;
- Electrical cords shall be kept clear of walking and working areas and must be covered or buried;
- Watch out for uneven terrain;
- Do not run on the workplace unless under an emergency situation.

10.3.1.2 Fire, Explosions and Hot Work

The following are the requirements before hot works can be done:

- The SSO will inspect and establish areas approved for welding, cutting and other hot working processes;
- The SSO is responsible for authorizing hot works to be done in areas not designated as approved for hot works;
- All personnel shall be protected from welding radiation, flashes, sparks, molten metal and slag;
- All welding, cutting and similar equipment must be inspected regularly by the operator to ensure they are in good working condition;
- All operators must have proper training on the proper use of the equipment, and the necessary protection when operating such equipment.
- Before welding, cutting or other hot works can be performed, the SSO shall inspect the area to make sure that the following are properly observed:

    1. Cutting, welding equipment and other machines are in good and safe working condition.
    2. Flammable materials are properly secured and guarded from sparks and arcs.
    3. At least two serviceable fire extinguishers must be available in the area and of the type suitable for the possible type of fire.

4. When hot work is done in hazardous locations, a fire watch is required.
5. The work area is free of contaminants at concentrations in excess of established PEL or all personnel working in the area must be provided with respiratory protection and protective apparel necessary for the degree of exposure.
6. When doing hot work operation in vessels containing or have contained flammable substance, the vessel must be cleaned, purged and isolated to reduce the concentration of vapor to a safe level.
7. The hot work permit is good only for one day or the 8-hour shift. When continuation of the work is needed on the following day, a new hot work permit must be secured.

10.3.1.3 Use of Small Tools

Hand held tools must be inspected regularly to make sure that they are in good working condition and are working according to the manufacturer's instructions and recommendations. The following requirements must be observed at all times when using small tools:

- When tools are designed to accommodate guards, install the guards when using such equipment;
- Tools must be inspected and tested regularly and kept clean;
- Electrical cords must be of hard usage type, and must not be used if damaged, worn or frayed;
- Electric power tools and cords shall be used with ground fault interrupter;

10.3.1.4 Use of Cutting Tools

Paper cutting tools such as scissors, snips, etc. shall be used in lieu of box cutters if possible. If box cutter is the most appropriate for the job, it must be of self-retracting blade type. When cutting using knives and blades, the worker must wear the appropriate PPE. The right cutting tool must be selected based on the kind of cutting task done. If knife is the appropriate tool, make sure it is clean and sharp. A dull knife is more likely to cause accidents than a sharp one. When cutting, do not cut downwards and towards your body.

10.3.1.5 Use of Heavy Equipment

Use of quick-connect/ disconnect system

Follow manufacturer's instructions specified in the equipment manual when using equipment with quick connect and disconnect system.

10.3.1.6 Material Handling

To avoid possible injuries and accidents associated with material handling, the following safety precautions must be observed:

- When the object to be lifted is more than 30 kg, the lifting must be done by multiple personnel;
- Proper lifting techniques must be observed to prevent back pains and losing balance:
    a. The feet must be far apart;
    b. Back must be straight;
    c. Avoid twisting motions;
    d. From bending position straighten the legs to lift the object;
    e. Make small turning steps until the target area is reached
    f. When placing down the object, spread the feet apart and start to bend the knees keeping the back straight
- Make sure the hands are free of oil, grease or other slippery substance that may cause the object to slip[from the hand

10.3.2 Heat Related Hazard

Heat hazards exist on deck and in the engine room of the dredge. The warm ambient temperature aggravated by the heat from the engine can cause heat stress disorders such as:

- Heat Stroke;
- Heat Rash;
- Heat Cramps;
- Heat Exhaustion

Treatment for and symptoms of these heat related disorders shall be included in the Safety Orientation and Training before the start of the project.

10.3.3 Noise Hazard

Personnel working in or near the engine room of the dredge must always wear hearing protection. Hearing protection is necessary particularly when sound exceeds 85 decibels or the threshold of pain for noise. Warnings and signage shall be posted in areas where noise hazard exists. Visitors must also wear hearing protection when entering noise hazard zones in the dredge.

10.3.4 Weather Hazard

Severe weather conditions can cause harm to personnel and damage to property when proper preparation is not taken. Personnel on board must be aware of the latest weather conditions to be able to perform precautionary measures should bad weather conditions come. Because DPWH dredges are positioned in big rivers where water current and volume flow are high during rainy seasons and during typhoons, the SSO is tasked to ensure the safety of the crew members as well as the equipment during severe weather conditions. When there is an impending bad weather system, the dredge must be moored to safety and the crew members must be evacuated to a safe location.

10.3.5 Moving Machineries Hazard

Moving spuds, cables, and other machineries on board are among the hazards that fall under this classification and must be given attention during operation. These components of the dredge must be properly guarded against accidental contact to avoid injuries or accidents. Restricted zones must be strictly enforced particularly during operation.

10.3.6 Housekeeping

Good housekeeping eliminates workplace hazards and lessens injuries and accidents. It should be a continuous process and maintained to secure a safe working environment. Poor housekeeping can cause accidents such as tripping over loose objects, being hit by falling objects, slipping on greasy, wet or dirty surfaces, poorly stacked items or misplaced material and cutting, puncturing or tearing the skin from sharp edge objects.

Ministry Order No. 4, Series of 1985, Guidelines on Good Housekeeping Practices for Government Properties in the Custody and Care of MPWH, hence applicable to DPWH dredge fleet, particularly:

- A-2 "Equipment should not be abandoned along highways/ roads/ streets/ thoroughfares, project sites, yards, and other unlikely places. They should be hauled and stored in areas/ places for deadline or unserviceable equipment."
- A-3 "All operating equipment should not have an embarrassing appearance. They should not be in a dilapidated or run down condition. They should be regularly cleaned. Damaged, corroded, rusted parts such as hoods, cabs, fenders, bodies, etc. should be repaired, replaced and painted. They should be properly marked with MPWH codes, logos and official signs as required by MPWH and Commission on Audit (COA) rules and regulations."
- B-3 "Parts and components removed from equipment should be cleaned, identified, and stored in bins that can be locked. Adequate measures should be taken to prevent their loss."
- B-5 "Tools, test instruments, shop equipment should be used properly. They should be cleaned before being returned to the tool room."
- B-6 "Shop equipment and test instrument should be maintained. Electric cables with broken insulation, leaking compressed air lines, and water pipes etc. should be repaired or replaced."
- B-7 "Firefighting equipment, water and sand should be strategically located in the shops and fire drills should be made."
- C-1 "Spare parts and components should be properly identified, stored and protected from the adverse effects of the elements. Regular inspection, cleaning, rust prevention of these items particularly these made to precise tolerances, fits and finish should be instituted. Information on stock cards and other documents should be kept up to date and protected from loss, deterioration and fire."
- C-3 "Welding rods should be stored in dry well ventilated bins, not in dam, wet places or on the floor."
- C-4 "Lubricants and fuel should be properly stored and issued. These should be protected from adverse effects of the elements, from contamination, and should not be fire hazards."
- D-1 "These should be clean, adequately lighted and ventilated. Repairs and painting should be made as needed to prevent deterioration/ decay."

- D-3 "Comfort rooms should be clean. They should not be offensive to those that will them."
- D-4 "Important office/ files/ records/ documents should be protected from the elements, termites, vermin, loss and fire."
- E-1 "Metal portions of bridges, guardrails, signs should be painted."
- E-3 "Leaking water mains, hydrants, pipes should be repaired."

Effective housekeeping results in:

- fewer tripping and slipping accidents in clutter-free and spill-free work areas;
- decreased fire hazards;
- lower worker exposures to hazardous substances;
- better control of tools and materials;
- more efficient equipment cleanup and maintenance;
- better hygienic conditions leading to improved health;
- more effective use of space;
- reduced property damage by improving preventive maintenance;
- improved productivity and efficiency.

5S is a method of work organized with the goal of significantly improving the order, efficiency and cleanliness in the workplace. An effective way of good housekeeping is adopting these five (5) simple principles:

- Sort/ Clearing up
  Unnecessary items should be cleaned and disposed after use.
- Systematize/ Organize
  Arrange necessary items in good order. Things should be organized in its proper locations to allow for easy and immediate retrieval.
- Sweep/ Sanitize/ Clean
  Keep the workplace neat and clean.
- Standardize
  Maintain high standard of housekeeping by sustaining order and cleanliness.
- Self-discipline/ Training
  Do these effective ways spontaneously with self-commitment.

10.4 Safety Signage

Safety signs are vital in promoting a safe working environment by keeping employees aware of potential hazards and reminding them of the proper precautions to take to avoid injuries/accidents. Under the Updated Project Procurement Management Plan for Fiscal Year 2015 submitted by the Floating Equipment Division, the BOE will be procuring materials for signage to be installed on all DPWH dredges starting the second quarter of 2015. The table below shows the safety signs and the number of signs to be installed in each dredge according to class.

- D-3 "Comfort rooms should be clean. They should not be offensive to those that will them."
- D-4 "Important office/ files/ records/ documents should be protected from the elements, termites, vermin, loss and fire."
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Table 10.1
Safety Signs To Be Installed On All DPWH Dredges

Signage \ Dredge	CSD	MPAD	AE
No Smoking	4	1	1
Safety First	2	1	1
Authorized Personnel Only	1	1	1
Caution: Low Beam	4	N/A	N/A
Engine Room	4	1	1
Captain's Cabin	1	N/A	N/A
Mess Hall	1	N/A	N/A
Pilot House	2	1	1
Toilet	1	N/A	N/A
Restricted Area	3	1	N/A
Fire Extinguisher	4	1	1
Medicine Cabinet	1	1	1
Crew's Quarter	2	N/A	N/A
Store Room	1	N/A	N/A
Dredge Pump Engine	1	N/A	N/A
Main Generator Engine	1	1	N/A
Auxiliary Engine	1	N/A	N/A
Air Compressor	1	N/A	N/A
Central Winch	1	N/A	N/A
Dredge Pump	1	N/A	N/A
Electrical Panel Board	1	1	1
Working Bench	1	N/A	N/A
Trash Bin	2	N/A	N/A

ATTACHMENT 1
ACTIVITY HAZARD ANALYSIS

Dredging

Activities	Hazards	Significance	Recommended Controls	First Aid Requirement
Mobilization Set-up Dredging	Miscommunication	Can range from lesser harm to significant harm	• All dredge crew will review all aspects and impacts of AHA prior to beginning any work tasks. • All dredge crew will sign off on safety commitment form verifying that all stipulations will be followed. • AHA will be amended to reflect changes that need to be made to activity prior to the implementation of the change, by both Operations and Health and Safety.	
	Improper Set-up	Likely to cause significant harm	• Properly mark the work zone by use of caution tape or rope. • Ensure the work areas are secured and separate from other operations. • Keep other non-essential personnel out of the area. Only task specific personnel shall be allowed in the work area.	
	High Noise Level	Can range from lesser harm to significant harm	• Use hearing protection when exposed to excessive noise levels.	
	Caught In/ Between Moving Parts	Likely to cause significant harm	• Review/ Study the equipment manual to have knowledge of moving parts and the hazards associated with the operation of the equipment. • Make sure moving parts of equipment are properly guided accidental contact. • Provide and use proper work gloves when the possibility of pinching, or other injury may be caused by moving/ handling large or heavy objects. • Maintain all equipment in a safe condition. • Keep all guards in place during use. • Power off equipment before maintenance or service.	
	Cuts/ Punctures	Can range from lesser harm to significant harm	• Wear prescribed hand protection. • Beware of sharp equipment, tools, and other materials. • Maintain all hand and power tools in a safe condition.	Ice packs, bandages, wound dressings, splint

Activities	Hazards	Significance	Recommended Controls	First Aid Requirement
Mobilization Set-up Dredging	Fire/ Explosion	Likely to cause significant harm	• Smoking is restricted to designated areas. A designated smoking area must be provided. • "Hot Work Permit" must be secured before starting such kind of works. • Practice good housekeeping.	
	Crane	Can range from lesser harm to significant harm	• Crane operator must be certified by a physician as fit for the job. • Only qualified personnel shall be permitted to operate the crane. • The crane must be inspected regularly by the operator. • Clearance from all overhead electrical wires shall be maintained. • The crane operator shall ensure all the mechanical guards are in place and functioning properly. • Personnel are prohibited from standing or working under the boom. • Chains shall not be used for lifting unless chains are made of alloy steel and are manufactured for use in lifting.	
	Heavy Materials Movement	Can range from lesser harm to significant harm	• Ground personnel shall not position themselves between equipment and stationary objects and shall only approach equipment after a signal from the operator. • Personnel shall maintain eye contact with the operator when approaching equipment. • Personnel are prohibited from entering the swing radius of booms. Equipment load capacities shall not be exceeded. • Only one person is to give hand signals/ direction to an operator at any given time.	
	Underground/ Overhead Utilities	Can range from lesser harm to significant harm	• Identify all utilities around the site before work commences.	

Activities	Hazards	Significance	Recommended Controls	First Aid Requirement
Mobilization Set-up Dredging	Work Near Water	Can range from lesser harm to significant harm	• Wear PCG approved TYPE III, V, or better, personal floatation devices for work activities on or near water where potential for drowning exists. Inflatable PFDs are not permitted. PCG approved PFDs equipped with automatically activated lights for all work outside of daylight hours. • Each task, on/ above or near water, must be evaluated by a competent person, e.g. SSO, for safety and the work halted if conditions are deemed too hazardous. • Provide a floating ring buoy with at least 90 feet in the immediate boat launch/ land areas.	
	Strains from Manually Moving Materials and Equipment	Likely to cause significant harm	• Direct personnel to use proper lifting techniques such as keeping back straight, lifting with legs, limiting twisting, and getting help in moving bulky/ heavy materials and equipment.	
	Sharp Objects	Can range from lesser harm to significant harm	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects. • Maintain all tools in a safe condition.	
	Slips, Trips, and Falls	Can range from lesser harm to significant harm	• Visually inspect work areas, and mark, barricade, or eliminate slip, trip, and fall hazards. • Maintain good housekeeping.	
	Use of Power and Hand Tools	Likely to cause significant harm	• Personnel shall maintain a steady pace when using tools and take adequate rest periods. • Tools shall be appropriated for the task and maintained in good condition. • Inspect all power and hand tools before each use. • Train personnel in the use of all power equipment. • Keep electric cords tangle-free and out of the way of rotating tools.	
	High/Low Ambient Temperature	Likely to cause significant harm	• Provide fluids to prevent worker dehydration.	

Motor Boat Activities

Activities	Hazards	Significance	Recommended Controls	First Aid Requirement
Boat Mobilization/ Launching	Slips, Trips, Falls	Can range from lesser harm to significant harm	• Wear boots with non-slip soles when launching soles • Wear PCG approved floatation devices when working on/ near water • Keep ropes and lines coiled and stowed to eliminate trip hazards • Maintain 3-point contact on dock/ pier ladders	
	Drowning	Likely to cause significant harm	• Wear PCG approved personal floatation devices when working on or near water • Provide a floating ring buoy with at least 90 feet of rope in the immediate boat launch/land areas	
Boat Mobilization	Capsizing (Slips, Trips, Falls)	Can range from lesser harm to significant harm	• Stay into the center of the boat to maintain its stability • Keep your weight low when moving in the boat, move slowly and deliberately • Steer boat facing forward • Watch for floating objects in the water • Right-of-way is yielded to vessels on your boat's right (and vessels with limited ability to maneuver)	
On-Water Boat Operations	Handling Heavy Objects	Can range from lesser harm to significant harm	• Observe proper lifting techniques • Use mechanical lifting equipment (pulleys, winches) to move large, awkward loads • Use mechanical means to lift large/ heavy objects from the water	
	Sharp Objects	Can range from lesser harm to significant harm	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects	
	Insect Bites	Can range from lesser harm to significant harm	• Avoid insect nests areas, likely habitats along shorelines • Use insect repellant wear PPE to protect against sting/ bite injuries	

Activities	Hazards	Significance	Recommended Controls	First Aid Requirement
	Drowning	Likely to cause significant harm	• Wear PCG approved personal floatation devices for work activities on or near the water • Provide a floating ring buoy with at least 90 feet of rope in the immediate boat launch/ land areas	
	Capsizing (Slips, Trips, Falls)	Can range from lesser harm to significant harm	• Stay into the center of the boat to maintain its stability • Keep your weight low when moving in the boat, move slowly and deliberately • Steer boat facing forward • Watch for floating objects in the water • Right-of-way is yielded to vessels on your boat's right (and vessels with limited ability to maneuver)	
	Inhalation and Contact with Hazardous Substances	Likely to cause significant harm	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties on site contaminants with workers before operations begin • Monitor breathing zone air to determine levels of contaminants	
	Severe Weather	Likely to cause significant harm	• Halt all on water operations for lightening, high winds and severe weather	
	High/ Low Ambient Temperature	Likely to cause significant harm	• Monitor for Heat/ Cold stress in accordance with BOE Health and Safety Procedures • Provide fluids to prevent worker dehydration	

ATTACHMENT 2
SAFETY COMMITMENT FORM

SAFETY COMMITMENT FORM

I hereby certify that I have read and understood the On-Board Dredge and Dredge Operations Safety Manual and commit to abide by all the procedures and regulations and comply with the requirements set forth in the manual. I will exercise utmost care and precaution in performing all tasks for safe performance of my job.

Name	Signature	Position	Date

ATTACHMENT 3
MAP TO THE NEAREST MEDICAL FACILITY

AMPHIBIOUS EXCAVATOR

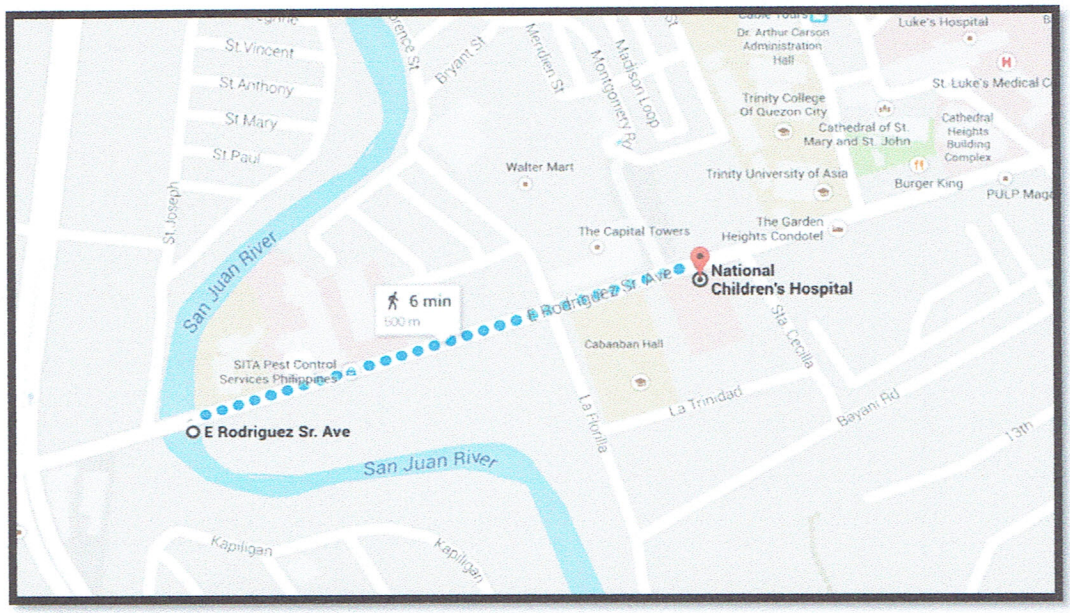

Figure 1. AE 3. San Juan River, E. Rodriguez, Quezon City [1]

[1] https://www.google.com.ph/maps/dir/14.619145,121.0164025/National+Children's+Hospital,+New+Manila,+Quezon+City,+Metro+Manila,+Philippines/@14.6196,121.0186842,17z

DREDGES

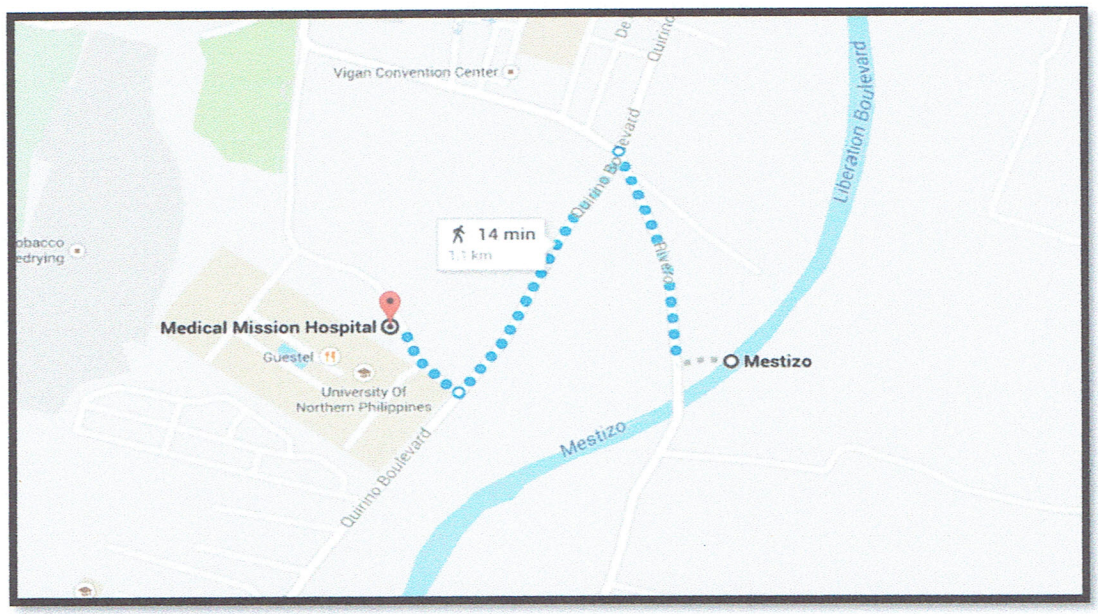

Figure 2. Dredge 14-A. Mestizo River, Vigan, Ilocos Sur [2]

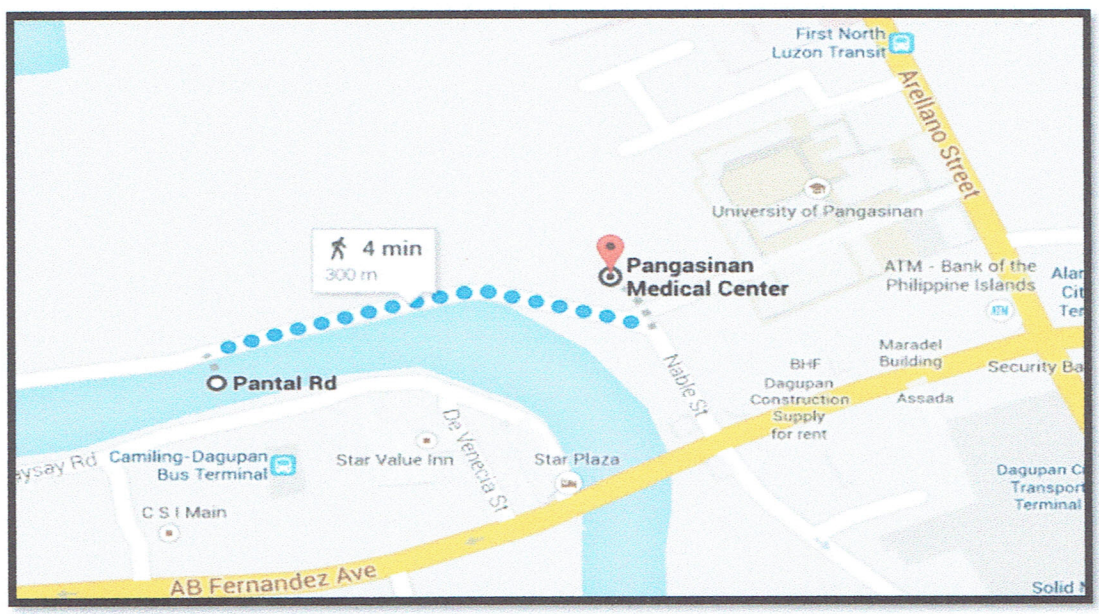

Figure 3. SDS 8-2. Pantal River, Dagupan City [3]

[2] https://www.google.com.ph/maps/dir/17.5607745,120.389033/Medical+Mission+Hospital,+Vigan+City,+Ilocos+ Sur,+Philipines/@17.561811,120.384171,17z

[3] https://www.google.com.ph/maps/dir/16.0457105,120.3381494/Pangasinan+Medical+Center,+Nable+St,+Dagu pan,+Pangasinan,+Philippines/@16.046379,120.340457,444m

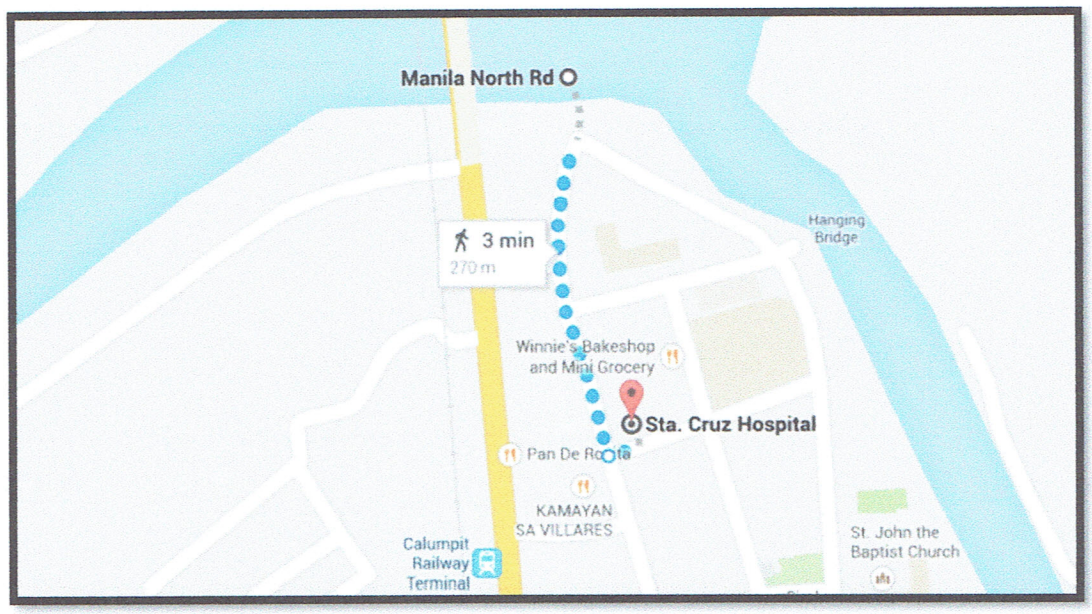

Figure 4. SDS 18-1. Calumpit River, Calumpit, Bulacan [4]

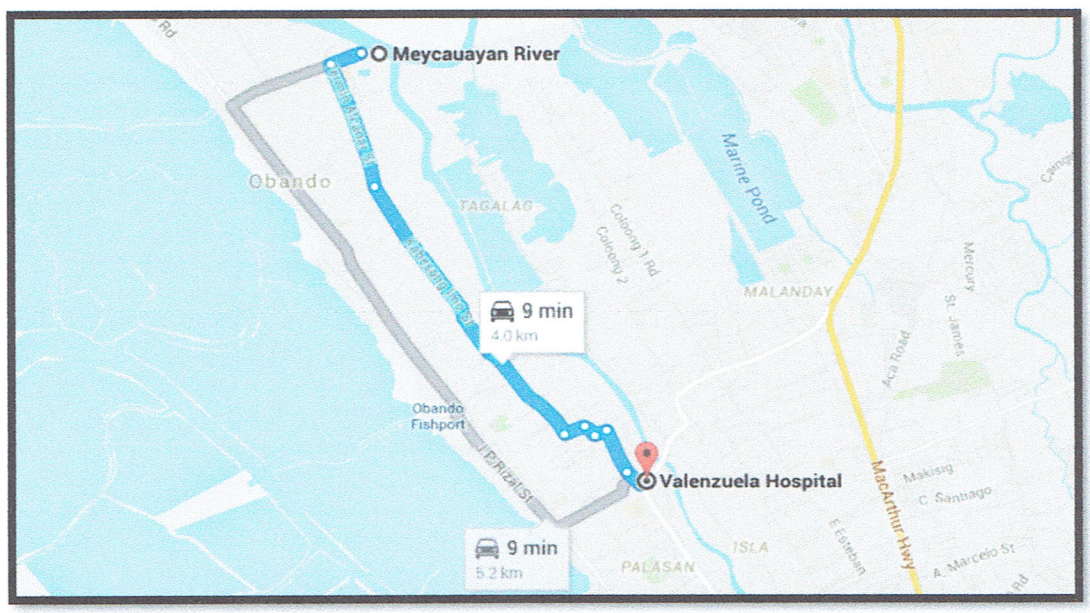

Figure 5. SDS 20-1. Barangay Tawiran, Obando, Bulacan [5]

[4] https://www.google.com.ph/maps/dir/14.9195729,120.7662196/Sta.+Cruz+Hospital,+Calumpit,+Bulacan,+Philip pines/@14.9179314,120.7657379,18z

[5] https://www.google.com.ph/maps/place/Valenzuela+Hospital/@14.7297339,120.931403,16z

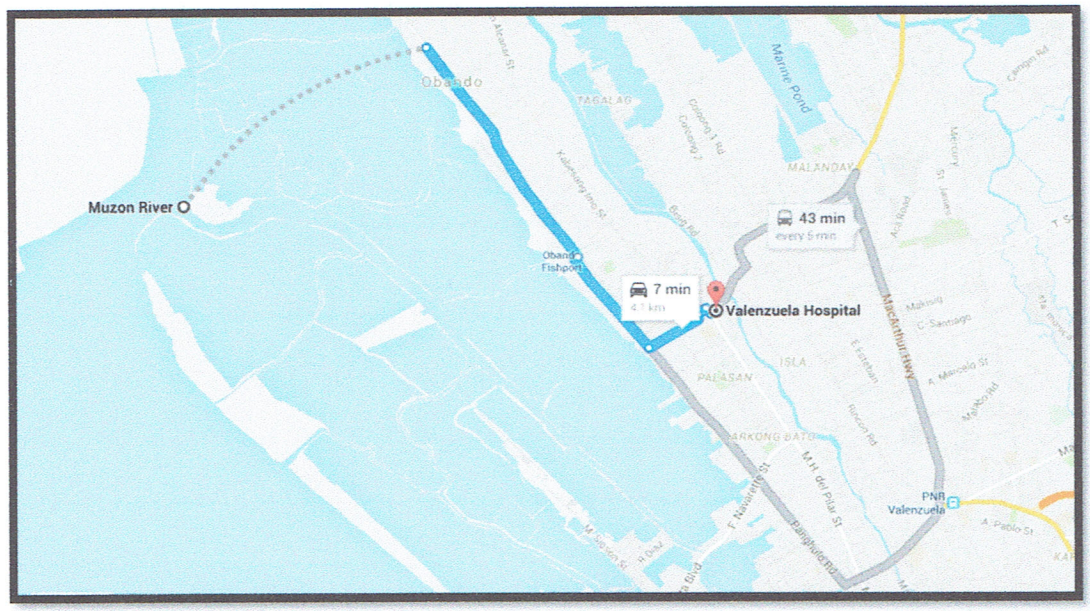

Figure 6. SDS 20-2. Barangay Binuangan, Obando, Bulacan [6]

Figure 7. Dredge PDDP III. Kalaklan River, Olongapo [7]

[6] https://www.google.com.ph/maps/place/Valenzuela+Hospital/@14.7297339,120.931403,16z
[7] https://www.google.com.ph/maps/place/Baypointe+Hospital+%26+Medical+Center/@14.823928,120.272263,17z

Figure 8. Watermaster 9, SDA 12. Kalaklan River, Olongapo [8]

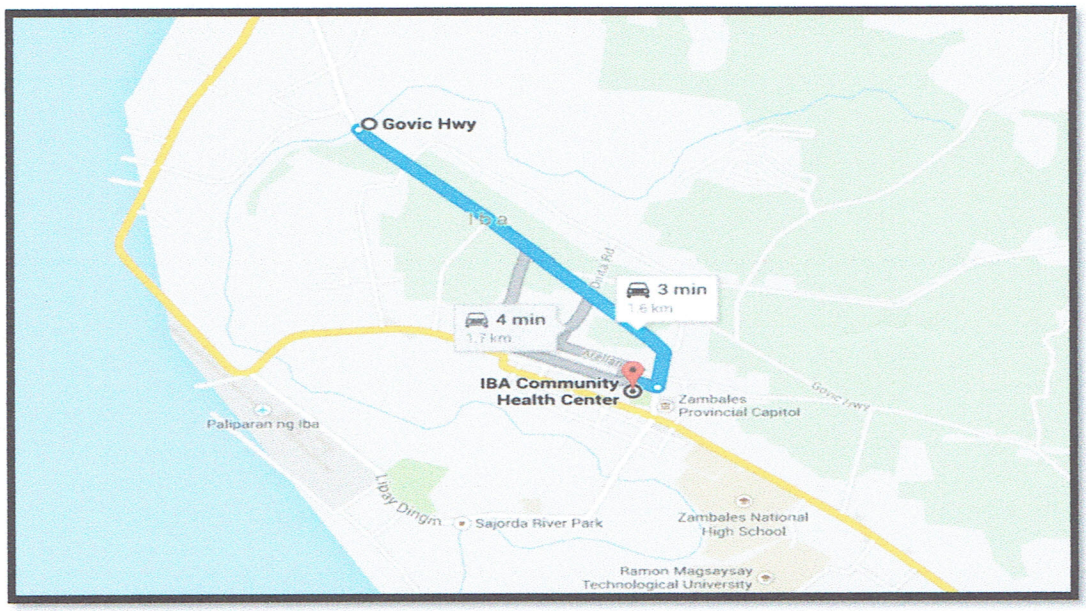

Figure 9. Watermaster 2, SDA 5 [9]

[8] https://www.google.com.ph/maps/place/Baypointe+Hospital+%26+Medical+Center/@14.823928,120.272263,17z
[9] https://www.google.com.ph/maps/place/IBA+Community+Health+Center/@15.326232,119.980085,17z

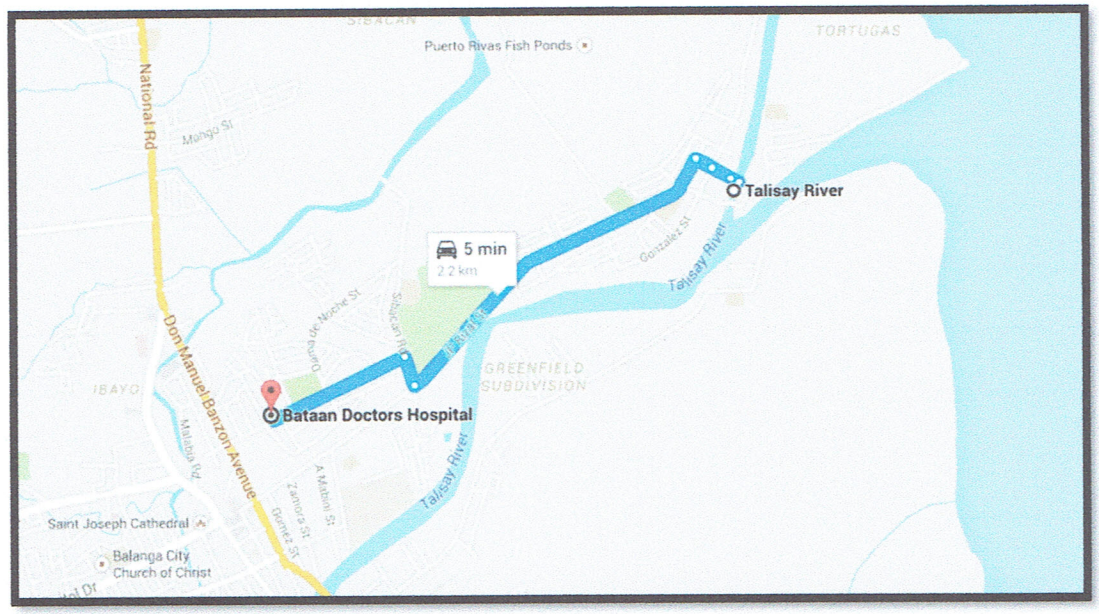

Figure 10. Watermaster 10, SDA 13 [10]

[10] https://www.google.com.ph/maps/place/Bataan+Doctors+Hospital/@14.682811,120.542692,17z

Republic of the Philippines
Department of Public Works and Highways
Bureau of Equipment

Quaterly Dredge Safety Enforcement Check

STEP	ACTIVITY	DURATION (MINUTES)	CRAFT	DAYS																													
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	Walk around inspection before dredging operation	5.00	Dredge Master/ Engineer																														
2	Check for cleanliness of the Deck area	5.00	Dredge Foreman																														
3	Check for cleanliness of the Engine area	5.00	Dredge Master/ Engineer																														
4	Check oil level	1.00	Dredge Master/ Marine Engine																														
5	Check electrical system	2.00	Electrician																														
6	Check hull	2.00	Dredge Foreman																														
7	Check suction pipes	2.00	Dredge Foreman																														
8	Check discharge pipes	2.00	Dredge Foreman																														
9	Check spuds	2.00	Dredge Foreman																														
10	Check winch	2.00	Dredge F'man/ Marine E'man																														
11	Check lever room	2.00	Dredge Foreman																														
12	Check swing line	10.00	Dredge Foreman																														
13	Check anchor	4.00	Dredge Foreman																														
14	Check cables	2.00	Dredge Foreman																														
15	Check fuel line and level	2.00	Dredge Master/ Marine E'man																														
16	Check spoil site	10.00	Dredge Foreman																														

Accomplished by:

Checked by:

Republic of the Philippines
Department of Public Works and Highways
Bureau of Equipment
Quarterly Dredge Safety Enforcement Check

Date of QDSEC: _____

Dredge Information:

Dredge Name: _____ Type: _____
Dredge Master: _____ No. of Crew on Board: _____
Registration or Documentation No _____
Powered by: ☐ Gas ☐ Diesel Self-propelled: ☐ Yes ☐ No
Length: _____ (m) Gross tonnage: _____
Area of Operation: _____
MGE No. _____ DPE No. _____ AuxE No. _____

DREDGE SAFETY ENFORCEMENT CHECKLIST

	Item	Y	N	N/A	Remarks
1	Display of Numbers				
2	Personal Floatation Devices (PFD)				
	a. Are there enough PFDs for all crew on board?				
	b. Are all the PFDs in good working condition?				
3	Personnel Protective Equipment (PPE) and Uniform				
	a. Are all dredge personnel provided with PPE?				
	b. Are all dredge personnel wearing uniform?				
4	Visual Distress Signals (VDS)				
	a. Day non-pyrotechnic device (flag)				
	b. Night non-pyrotechnic device (SOS light)				
5	First aid and Life-saving equipment				
	a. Do all dredge personnel have training on first aid and CPR?				
	b. Are first aid kits readily accessible?				
	c. Are vaccines against venom and insect bites available?				
	d. Are adequate means of communication and transportation to effectively handle injured workers provided?				
	e. Are life rings and lifelines serviceable?				
	f. Is a properly equipped life-saving skiff available?				
6	Fire Extinguishers				
	a. Are the fire extinguishers readily accessible?				
	b. Are the fire extinguishers verified as serviceable?				
7	Engine Room Ventilation				
	a. Natural ventilation				
	b. Powered ventilation				
8	Backfire Flame Control				
9	Sound Producing Devices				
	Are the sound producing devices serviceable?				
10	Navigation lights				
	Are the navigation lights operational?				

	Item	Y	N	N/A	Remarks
11	Pollution Placard				
12	Marine Sanitation Devices				
	a. Are the installed toilets Coast Guard approved devices?				
	b. Are overboard discharge outlets capable of being sealed?				
	c. Are taps for non-potable water properly identified?				
	d. Are hygiene kits available in washrooms?				
13	Mess Facility				
	a. Is the mess facility operated in accordance with DPWH prescribed Standards and Rules?				
	b. Are food and beverages properly stored and free from contaminations?				
	c. Are waste receptacles provided in the mess facility?				
14	Overall Dredge Condition				
	1 Deck free of Hazards				
	a. Are flammable items such as paint, thinners, etc. properly stored?				
	b. Are spuds, rotating machinery, hot pipes and moving cables guarded against accidental contact?				
	c. Are special tools and other dredge tools properly stored and cleaned after use?				
	d. Are guardrails provided on landings, stairs and openings?				
	e. Are safety belts and ladder climbing devices provided for the greasing of spud sheaves and changing spud pins?				
	f. Is the bilge alarm operational?				
	g. Are walkways provided with non-skid surface and clean of from oil and grease?				
	h. Are smoke alarms installed in all-living quarters?				
	i. Are tripping hazard, deck fittings, etc. painted yellow?				
	j. Are there two ways of exit in case of emergency?				
	k. Are there safety signage on the dredge?				
	l. Is there any dewatering device on board?				
	2 Electrical and Fuel Systems				
	1 Are gasoline and other flammable liquids properly stored and handled?				
	b. Is there shutoff valve at the end of each fuel line?				
	c. Are switchboard and transformer banks adequately protected and labelled?				
	d. Is the electrical system protected by fuses or circuit breakers?				
	e. Are switches and panel boards protected from rain or water spray?				
	f. Are all wirings in good condition (i.e. no exposed wires or deteriorating insulation)?				
	g. Are batteries secured and protected from accidental arching?				
	h. Are portable electric tools inspected and tested regularly?				
	i. Are the emergency lighting and power system inspected and verified as serviceable?				
	j. Are all fuel tanks properly ventilated?				
	k. Acetylene, oxygen, and other compressed gas cylinders and equipment properly stored and handled?				

15	Drills					
	Are the following drills conducted and logged at least monthly?					
	a.	Abandon ship drill				
	b.	Fire drill				
	c.	Rescue drill				
	Are records of tests, drills, and system checks made in the station log?					

ACCIDENT REPORT

1. Was there any reported accident/ incident? ☐ Yes ☐ No
   (If there is (are) reported accident(s) fill out the Accident Report Form)

2. How many accidents occurred during the period? ☐1 ☐2 ☐3 ☐4 ☐5 ☐more than 5

Accomplished by:

_____

Reviewed by:

_____

Approved by:

_____

ACCIDENT REPORT FORM

Date and Time of Accident/ Incident: _____ Time: _____

Date and Time Accident was Reported: _____ Time: _____

This is a report of: ☐ Death ☐ Lost Time ☐ First Aid Only ☐ Near Miss

Description of Accident/ Incident: (what caused the accident/incident? Was there equipment or people involved?)

_____

_____

_____

_____

_____

_____

Location/ area of Accident/ Incident or Hazardous Situation: _____

Part(s) of the body injured:	Nature of injury:	Type of incident:
☐ Head	☐ Abrasion	☐ Flying object
☐ Neck	☐ Amputation	☐ Falling object
☐ Eyes	☐ Broken bone	☐ Falling
☐ Shoulder	☐ Bruise	☐ Electricity
☐ Arms	☐ Burn (heat)	☐ Poisoning
☐ Forearms	☐ Burn (chemical)	☐ Manual handling
☐ Trunk	☐ Concussion (to the head)	☐ Struck by
☐ Leg	☐ Crushing injury	☐ Other
☐ Knee	☐ Cut, laceration, puncture	
☐ Foot	☐ Hernia	
☐ Multiple	☐ Illness	
☐ General	☐ Sprain	
☐ Other:	☐ Damage to a body system	
	☐ Other:	

Contributing Factors: (check all applicable factors)

Unsafe workplace conditions:	Unsafe acts by people:
☐ Inadequate guard	☐ Operating without permission
☐ Unguarded hazard	☐ Operating at unsafe speed
☐ Defective safety device	☐ Servicing equipment with power on
☐ Defective tool or equipment	☐ Using defective equipment
☐ Hazardous workstation layout	☐ Using equipment in an unapproved way
☐ Unsafe lighting	☐ Unsafe lifting
☐ Inadequate ventilation	☐ Taking unsafe position or posture
☐ Inadequate personal protective equipment	☐ Distraction, teasing, horseplay
☐ Lack of appropriate equipment/ tools	☐ Failure to wear personal protective equipment
☐ Unsafe clothing	☐ Failure to use the available equipment
☐ Inadequate training/ instructions	☐ Other:
☐ Inexperience of person in the task	
☐ Other	

Treatment of Injury:

1. Did the injured personnel receive First Aid and by whom? ☐Yes ☐No

   If YES, give treatment details: _____

2. Did the injured personnel visit Hospital and/or Physician? ☐Yes ☐No

   If YES, what hospital, date and time and transportation details:

_____

The accident/ incident was reported to:

☐ Barangay ☐ COA ☐ Police ☐ BOE

Recommended actions to prevent recurrence:	
☐ Contact Operational Health and Safety for assistance	☐ Guard the hazards
☐ Repair or replace tool/ equipment	☐ Redesign workstation
☐ Install guard or safety devices	☐ Retrain the employees
☐ Reinstruct person involved	☐ Train the supervisors
☐ Request ergonomic assessment	☐ Improve personal protective equipment
☐ Stop the activity that led to the incident	☐ Enforce existing policies
☐ Redesign task steps	☐ Other:
☐ Routinely inspect for hazards	

ACTION PLAN		
Action Plan (recommendations)	Party responsible	Follow up

WITNESS STATEMENT:

Name of witness: _____

Contact Information: _____

Injured personnel's name: _____

Short account of the incident: _____

_____

_____

Accomplished by: Reviewed by:

_____ _____

Approved:

_____