097.13 DPWH
10.21.2015

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

OCT 20 2015

DEPARTMENT ORDER NO: 160 Series of 2015 10.21.15

SUBJECT: GUIDELINES FOR THE DRY-DOCKING AND REPAIR OF DPWH DREDGES AND OTHER FLOATING EQUIPMENT

In order to enhance the quality and safety of water-based equipment of the Department of Public Works and Highways, and in compliance with existing national rules and regulations on water vessels, the Department shall adopt a dry-docking and repair protocol for all our dredges and water vessels.

Hence, all Dredge Masters (DMs) shall conduct inspection on their dredges and prepare a list of works needed to be done which shall be submitted to the Regional Director thru the Chief, Equipment Management Division who shall in turn prepare a proposed Project Plan. These shall then be submitted to the Bureau of Equipment (BOE) for evaluation and consolidation into a Program of Work and thereafter returned to the Regional Office for approval of the Regional Director. The approved POW shall be returned to BOE for the preparation of sub-allotment request and for budget earmarking at the Financial Management Service (FMS). After which, funds shall be sub-allotted to the concerned Regional Office for the conduct of public bidding as prescribed by R.A. 9184 or the "An Act Providing for the Modernization, Standardization and Regulation of the Procurement Activities of the Government and for Other Purposes."

Attached herewith as Annex A, Annex B and Annex C, respectively, are the Guidelines for the Dry Docking and Repair of Dredges and Other Floating Equipment, Process Flow for the Repair and Dry-docking of Dredges and Other Floating Equipment, and Project Plan Template.

Any violation of this Order, after due process, shall subject the erring party to disciplinary actions as prescribed by the Civil Service rules.

This Order shall take effect immediately and all other issuances inconsistent herewith are hereby modified, amended, or superseded accordingly.

ROGELIO L. SINGSON
Secretary

Department of Public Works and Highways
Office of the Secretary
WIN5T01294

Encl.: 1.) Guidelines for the Dry Docking and Repair of Dredges and Other Floating Equipment
2.) Process Flow for the Repair and Dry-docking of Dredges and Other Floating Equipment
3.) Project Plan Template
4.) Program of Work Template
5.) Sample PERT-CPM and Gantt chart
6.) Sample Safety Plan
7.) Accomplishment Monitoring Form
8.) Performance Trial Checklist

5.6.3 FLN/VJJ/FRF/TNLI

ANNEX "A"

Guidelines for the Dry-docking and Repair of Dredges and Other Floating Equipment

The following guidelines are set for guidance and strict observance at all times, to wit:
Based on the Maritime Industry Authority (MARINA) rules and regulations, marine vessels, including dredges and support floating equipment, are required to undergo regular dry-docking and repair. This is to ensure maritime safety through the conduct of both above-water and under-water inspection and the institution of needed repairs, with the purpose to make these vessels "fit to proceed".

I. OBJECTIVES:

1. To ensure maritime safety as well as safety of On-Board Officers and crew;

2. To strengthen the implementation of the required inspection, dry-docking, and repair of dredging equipment by providing applicable guidelines; and

3. To provide regulations that shall govern the conduct of inspection, dry-docking and repair of dredging equipment.

II. POLICY IMPACT

The policy to institutionalize the standards/guidelines for the regular dry-docking and repair of dredges and other floating equipment of the Bureau of Equipment is appropriate to make suffice the commitment of resources needed to implement and maintain compliance with said policy. It is also in line with the declared national policy to enhance the quality and safety of these equipment, in compliance with the following existing rules and regulations, to wit:

1. Maritime Industry Authority (MARINA) Memorandum Circular No. 152 Series of 1999, setting regulations on "Inspection, Dry-docking and Certificates Required";

2. Presidential Decree No. 1151 or the "Philippine Environment Policy", particularly "Section 4. Environment Impact Statements"; and

3. Presidential Decree No. 1152, or the "Philippine Environment Code", particularly "Title IV, Chapter IV, Section 34, Measures in Flood Control Program".

The present setup in the maintenance and repair of floating equipment employs the principle of programming based on prioritizing the vessels with the most extensive repairs needed. This policy is intended to rectify this process by scheduling the marine flee of the DPWH based on existing maritime rules and regulations. Further, it shall ensure that the dry-docking and repair of these vessels are conducted in a MARINA accredited shipbuilding/repair yard where quality of craftsmanship and warranty of works are guaranteed.

The regular dry-docking and repair of DPWH floating vessels is of paramount importance to achieve their optimum utilization and useful life, in partnership with the basic Preventive Maintenance activities that shall be included in an upcoming policy on the Preventive Maintenance of Dredges and Other Floating Equipment of the DPWH. Regular dry-docking and repair is considered the last activity in the performance of Preventive Maintenance.

Impact of sound maintenance management means:

a. 24-30% improvement in maintenance cost
b. 70-75% elimination of unplanned breakdowns
c. 35-40% uptime improvement
d. 20-25% increase in throughput
e. 33-66% Preventive Maintenance elimination
f. 45-50% Man-hour improvements
g. 10% less energy consumption and greenhouse gas emissions.
h. All from the simple task of doing the **RIGHT MANAGEMENT** at the **RIGHT TIME** for the **RIGHT REASONS** on the **RIGHT EQUIPMENT**.

III. DEFINITION OF TERMS:

Afloat inspection - a survey conducted on a ship while afloat.

Dry-docking - is a condition in which a ship is taken out of water for cleaning and repair of hull and its integral parts such as rudder, propeller, sea chests and sea valves, among others.

Emergency dry -docking – is a condition in which a ship is taken out of water at any time to undertake repairs of the affected part(s) of the hull or its integral parts; the emergency dry-docking is one which is over and above that which has been scheduled.

Environmental impact analysis - is a process that involves predicting and evaluating the likely impacts of a project (including cumulative impacts) on the environment during construction, commissioning, operation and abandonment. It also includes designing appropriate preventive, mitigating and enhancement measures addressing these consequences to protect the environment and the community's welfare.

Maintenance - ensuring that physical assets continue to do what their intended users want them to do, this is a function of keeping physical assets in or restoring them to serviceable condition. It includes servicing, test, inspection, adjustment/alignment, removal, replacement, reinstallation, troubleshooting calibration, condition determination, repair, modification, overhaul, rebuilding and dry-docking.

Preventive maintenance - is the performance of inspection and/or servicing tasks that have been pre-planned and scheduled for the accomplishment at specific points in time to

retain the functional capabilities of equipment. It is an activity or set of maintenance activities performed to avoid failures, unnecessary production loss and safety violations.

Corrective maintenance - formerly termed as interim repair, this is the performance of unplanned (unexpected) or unscheduled maintenance tasks to restore the functional capabilities of equipment due to failure, malfunction or breakdown.

Dredge - mechanical, hydraulic or electrical plant used for dredging.

Dredging - removal from beneath water and raising through water of soil, rock or debris.

Dredge master - the Captain of the ship. He is responsible for all activities in the dredging operation, maintenance, performance, conduct and safety of the crew and equipment on board.

Crew - a group of people who operate a ship/dredge; a company of people working on one job or under one foreman or operating a machine.

Contractor - is the Service Provider for the dry-docking and repair of the dredging equipment.

Survey - shall include a complete inspection of the ship's structure, machinery and equipment, including the outside of the ship's bottom and the inside and outside of the cisterns to ensure that the arrangements, material and scantling of the structure, cisterns and other pressure vessels and their appurtenances, main and auxiliary machinery, electrical, hydraulic and pneumatic installations, electronic installations including those used in life-saving appliances, fire protection, fire safety systems and appliances, life-saving appliances and arrangements, ship-borne navigational equipment, and other equipment comply with the requirements of present regulations. The survey is such as to ensure that the workmanship of all parts of the ship and its equipment is in all respects satisfactory, and that the ship is provided with lights, shapes, means of making sound signals, distress signals as required by existing regulations and the "International Regulations for Preventing Collisions at Sea" in force.

Underwater inspection - an inspection/survey of the ship's hull and its integral parts which are below waterline conducted while the ship is afloat.

Underwater ultrasonic thickness gauging - an underwater activity used in determining the thickness of steel plates and other metals of the ship such as aluminum and other non-ferrous materials.

IV. CLASSIFICATION OF DPWH DREDGES AND SUPPORT VESSELS:

The Bureau of Equipment, Department of Public Works and Highways has in its inventory, the following types of dredges:

A. STATIONARY CUTTER SUCTION PIPELINE DREDGE:

This type of dredge is non-propelled. It basically dislodges and transport dredge materials employing the principle of vacuum pump. The setup employs a cutter in disturbing in situ materials and excavates through the suction mouthpiece by means of a centrifugal pump and discharges this combination of spoils and water through the discharge pipeline towards a designated spoils site. This may be deployed at the river mouth/delta, or along rivers with a width of at least 20 meters and in situ materials from 6 to 10.7 meters below water surface. The overall length ranges from 13 to 34 meters. The hull may either be a one-piece fixed type seamless construction or of the demountable type which may either be of three (3) - or six (6)- piece hull components that are collapsible. The three (3) - piece type consists of the main pontoon or center hull, containing the engine room, two (2) side pontoons. The 6-piece type consists of a main pontoon, a U-shaped pontoon located at the aft portion, two pontoons at the forward starboard and portside and two (2) pontoons at the aft starboard and portside. For the one-piece hull, mobilization is done by towing, considering that the dimensions may reach up to lengths of more than 30 meters, a width of more than 10 meters and a depth of up to 3 meters. For the demountable type, the dimensions of all parts of the latter type are such that they can be transported by road, rail or sea. Mounted in or on the main pontoon are the cutter, ladder, two swing winches, ladder hoisting winch and spud hoisting/lowering winch. The dredge is maneuvered using a system of winches and cables that enables the dredge to move sideways and forward by means of a swing line anchored at both sides of the waterway. Likewise, this system enables the dredge to boom up and down two (2) pieces of spud that serve as pivot points in moving forward. Further, the dredge ladder in which the cutter and suction pipe are installed is controlled by this system. The dredge pump is directly coupled to the dredge pump engine, with a reduction gear, which is started either electrically or pneumatically, supplied by the main generator engine. Dredge material may be hard sedimentary formation, hard-packed clay, gravel, coral, shell, sand, sandy clay or weathering sandstone. Effective discharge rate ranges from 60 to 850 cubic meters per hour. The discharge pipeline consists of pontoon pipes (from 8-20 inch diameter) that float on the waterway by means of floaters, and shore pipes that are placed on the shore up to the spoils site.

B. MULTI-PURPOSE AMPHIBIOUS DREDGE:

This type of dredge is self-propelled, employing two (2) principal modes of dredging:

1. Suction, and
2. Excavation by backhoe.

The first mode undertakes dredging by suction, with a capacity of up to 110 cubic meters per hour, effective rate, up to a distance of 1,000 meters. The second mode employs dredging by the use of a back hoe, bucket, clamshell, or rake. The dredge also has provisions for the option of using a pile driver, mainly used for reinforcing river

banks and building marinas. This dredge is ideal for restoring shallow and narrow waterways, marshy and hard to reach places and shores (river, lake, canal, channel and marina). Applications include prevention of floods and clean environment, construction projects, and maintenance of waterways where in situ materials are located at most 5.4 meters below the water surface.

The principal features are as follows:

1. Self-loading and self-unloading for easy mobilization
2. Self-propelled
3. Suction Head can be dismantled and can be replaced with bucket, clamshell, rake and pile driver
4. No need for excavators on pontoons
5. No need for cranes
6. No need for tugboats or dredge tenders, and
7. No need for assisting vessels for anchorage.

C. AMPHIBIOUS EXCAVATOR:

This type is basically a back hoe mounted on a pontoon or barge, also called undercarriage, consisting of two pieces, each connected at the center platform and equipped with hydraulic cylinders that enables it to expand and/or retract sideways for stability. It is designed to dredge waterways employing side dumping or directly disposing dredge spoils into a waiting dump truck. This is equipped with two supplementary pontoons, also known as side pontoons, attached to the starboard side and portside, for greater stability. The excavator component is installed on the center platform using mounting bolts and nuts. The undercarriage utilizes track chain with axle bearing and rollers and tension adjuster for suitable tension. This enables the vessel to move forward as the track chain moves clockwise and counterclockwise. It is designed to operate at dredging depths ranging from 1 to 4 meters.

D. SUPPORT VESSELS:

This covers all other floating vessels in support of dredging operation. They are classified as Dredge Tenders, Tug Boats, Work Boats, Push Boats, Multi-Cats, Dumping Scows and Garbage Bin. Under Item No. V., Specific Provisions of MARINA Memorandum Circular No. 152, Series of 1999, all dredging equipment, "classified as **other ships**, shall be dry- docked twice within a period of five (5) years. The next scheduled dry-docking shall be undertaken on the 24th month after the last dry-docking, which may be extended twice but not to exceed six (6) months per extension, provided that afloat inspection shall be conducted prior to any such extension."

V. GENERAL POLICY GUIDELINES:

1. All dredging equipment are required to undergo regular dry-docking and repair at twice within a period of five (5) years.

2. The next scheduled dry-docking of the dredging equipment shall be on the twenty-fourth (24^{th}) month after the last dry-docking, which may be extended twice but not to exceed six (6) months per extension, provided that afloat inspection shall be conducted prior to any such extension.

3. Survey and inspection of dredging equipment shall be carried out by the Bureau of Equipment or its authorized inspectors.

4. Underwater inspection (UWI) shall be required prior to dry-docking and repair and shall be conducted only by a MARINA accredited underwater surveying company/entry that is required to adopt MARINA issued guidelines.

5. The conduct of UWI shall be performed on waters that offer good visibility of at least one (1) meter from the hull and with currents of no more than one and a half knots.

6. Dry-docking and repair works shall be undertaken in a reputable shipyard.

VI. Requirements for the Approval of Request for Dry-docking and Repair of Dredges

The request for dry-docking and repair of dredges shall originate from the Dredge Master who, after conducting a thorough inspection of his dredge, determines if the dredge needs to be dry-docked or repaired. The DM shall also check the history of repair of the dredge. He shall then prepare and submit a comprehensive report, complete with actual photos of the subject dredge, to the Regional Director thru the Chief, Equipment Management Division. If based on his judgment the dredge needs to be repaired or dry-docked, he shall prepare a Detailed Budgetary Cost Estimate for the Dry-docking and Repair of his dredge to be submitted to the Regional Director thru the Chief, EMD to be submitted to the Bureau of Equipment for consolidation into a Program of Work. A detailed proposed Project Plan shall also be prepared by the EMD and submitted to BOE together with the Inspection Report and Budgetary Cost Estimate.

The process flow for the submission and approval of request for dry-docking and repair of dredges and the offices/personnel responsible for each process is shown in Annex C of this Department Order.

VII. Roles and Responsibilities

A. Dredge Master

The Dredge Master shall:

1. Conduct a thorough inspection of his dredge to assess its condition and determine if the dredge needs repair or is due for dry-docking;
2. Prepare a comprehensive inspection report and a detailed budgetary cost estimate for the repair/dry-docking of his dredge to be submitted to the Chief, Equipment Management Division;
3. Assist the Inspectorate Team from the Floating Equipment Division, BOE during inspection of the dredge;
4. Help in the preparation of a Detailed Project Plan for the proposed repair/dry-docking of his dredge;
5. Once the program has been approved and started, monitor the conduct of repair works on his dredge on a daily basis and submit a comprehensive report of the works done on the dredge, complete with photos, to the EMD, copy furnished the BOE, at the end of each week; and
6. Ensure strict compliance to the provisions of this Department Order.

B. Chief, Equipment Management Division (EMD)

The Chief, EMD shall:

1. Thoroughly review the inspection report and budgetary estimate submitted by the DM before its submission to BOE;
2. Prepare a Detailed Project Plan for the repair/dry-docking of subject dredge(s);
3. Monitor the conduct of repair works on all dredges assigned to the EMD; and
4. Ensure strict compliance to the provisions of this Department Order.

C. Floating Equipment Division – Bureau of Equipment (FED-BOE)

The Floating Equipment Division-Bureau of Equipment shall assign a team that will regularly monitor the progress of the repair/dry-docking of DPWH dredges. The Team shall:

1. Conduct ocular inspection of dredges to validate the report and budgetary estimate submitted by the DM;
2. Prepare and submit to the Division Chief a comprehensive inspection report of their findings and recommend further actions to be taken;

3. Regularly monitor the conduct of repair and submit a report of their observations to the Chief, FED;

4. Represent the BOE during the performance trial of the dredge and the turn-over ceremony; and

5. Ensure strict compliance to the provisions of this Department Order.

The EMD Chief, Dredge Master, EMD Inspectorate Team and FED-BOE Inspectorate Team shall collectively be called the Project Management Team (PMT).

Annex B of this Order shows the responsibilities of various offices and personnel thru a detailed process flow for the repair and dry-docking of dredges and support vessels.

VIII. Project Plan

Planning is essential to the successful and prompt execution of a project. A project plan serves as the basis for all management efforts related to the project, and shall consist of the following:

1. Defined sequence of tasks to be performed.

2. All deliverables associated with the project.

3. An estimate of the resources required to perform each task.

4. Timeline/schedule of all tasks to be performed.

5. A defined budget estimate for the entire project.

6. Roles and responsibilities of various personnel involved in the project.

7. Identification of risks associated with each task and the precautionary measures to be employed.

8. Quality management plan.

The project plan defines the objectives of the project and the approach to be taken. It shall serve as an agreement between all concerned parties. The plan contains the details required to successfully carry out the project. However, once the project commences, the plan should be reviewed and updated regularly.

To set the standard design of Project Plans for the repair and dry-docking of dredges, a Project Plan Template, developed by BOE, is attached to this Department Order as Annex C.

IX. Quality Management Plan

Overview

The Quality Management Plan (QMP) details the quality control and quality assurance measures and procedures to be observed during the implementation of the program so that it will meet the requirements as specified.

Objectives

The QMP aims to:

- Describe and define the quality program to be enforced to ensure the project's conformance to specifications and industry standards;
- Set the guidelines for inspection and documentation of activities;
- Establish a process for detecting, documenting and addressing unexpected changes or conditions that could affect the quality of operations.

Performance Monitoring

The Project Management Team shall oversee the dry-docking and repair to ensure adherence to the approved POW and conformance to requirements.

Inspections

Inspections shall be conducted to verify compliance to instructions, procedures and requirements as defined in the Project Plan.

A four-phase inspection shall be adopted for the monitoring of dry-docking and repair works. The following are the phases of the inspection:

1. Preparatory Inspection

The PMT shall conduct preparatory inspections prior to beginning any work on any definable feature of the project. The preparatory inspection shall:

- Include a review of the plan requirements;
- Check that all materials and equipment have been tested, inspected and approved;
- Examine the work area to make sure all preliminary works had been completed;
- Examine equipment and materials to make sure that they conform to standards and are properly calibrated and in proper working condition;
- Be documented in the PMT's logbook and documentation system.

2. Initial Inspection

The PMT shall conduct initial inspection soon as representative portion of the definable feature of work has been accomplished. This inspection shall:

- Examine the quality of workmanship;
- Review control testing for compliance with requirements;
- Review dimensional aspects of the project;
- Be documented in the PMT's logbook and documentation system.

3. Follow-up Inspection

Follow-up inspections shall be conducted daily, and shall:

- Monitor continuing compliance with design requirements;
- Be documented in the PMT's logbook and documentation system.

4. Wrap-up/Post Repair Inspection

The wrap up inspection will:

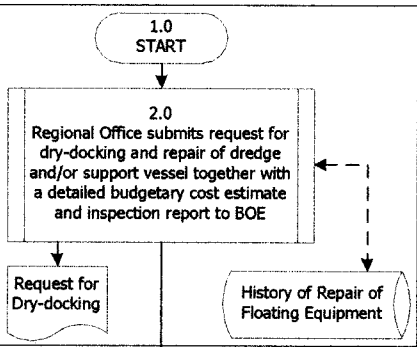
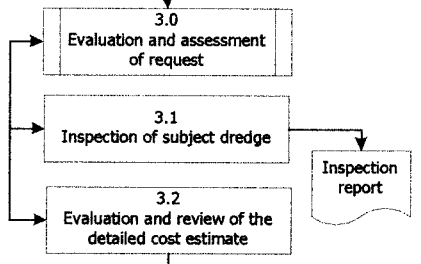
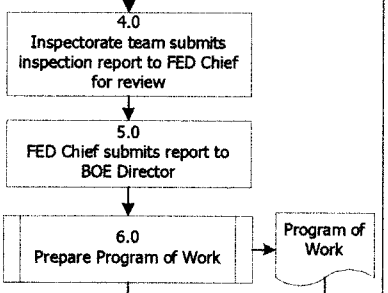
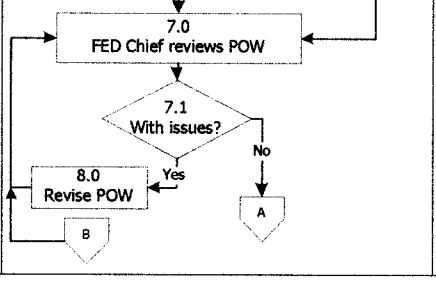
- Check the conformance of the finished work to design plans;
- Determine items that do not conform to the approved plan;
- Determine deficiencies/unaccomplished tasks.

After the completion of the repair, the PMT shall submit a comprehensive report on the activities performed, compliance of the repair to the POW, conformance of the finished work to design and deficiencies, if any.

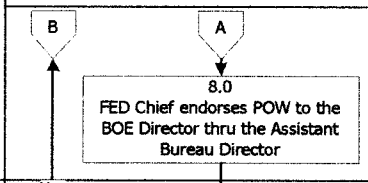
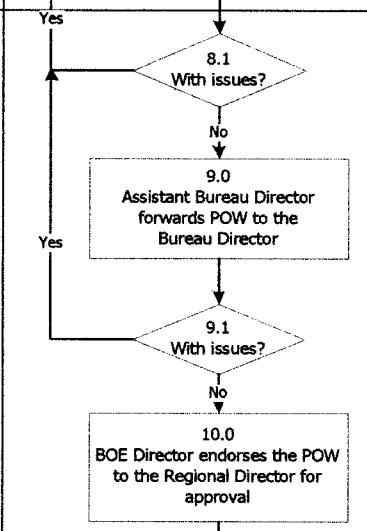
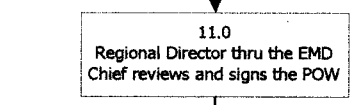
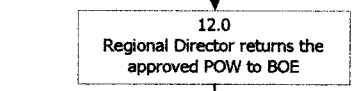
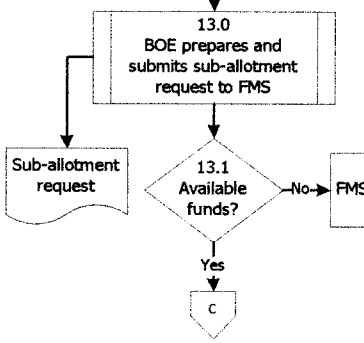
ANNEX "B"

Process Flow for the Repair and Dry-docking of Dredges and Support Vessels

PROCESS FLOW FOR THE DRY-DOCKING OF DREDGES AND SUPPORT VESSELS

PROCESS FLOW	RESPONSIBLE	DETAILS
	1. Dredge Master 2. Chief, EMD 3. Regional Director/ UPMO	The Dredge Master conducts an afloat inspection to determine if the dredge needs dry-docking and prepares a detailed cost estimate for the repair and dry-docking. Based on MARINA Circular No. 152, Series of 1999, the next dry-docking of a vessel shall be done on the 24th month after the last dry-docking. If, however, an underwater inspection and afloat inspection warrant the need for dry-docking of the dredge, an emergency dry-docking shall be performed. This is over and above that which has been scheduled.
	1. Dredge Master 2. FED-BOE Inspectorate Team 3. Maintenance and Dry-docking Services Section, FED-BOE	Inspectorate team from the Floating Equipment Division, BOE conducts an ocular inspection of the subject dredge to assess its condition and to validate the scope of the submitted cost estimate. MDSS staff reviews and evaluate the cost estimate and make corrections, if needed, on the indicated costs based on established Tariff for spare parts and repair of dredges.
	1. Dredge Master 2. FED-BOE Inspectorate Team 3. FED Chief 4. Maintenance and Dry-docking Services Section, Chief	FED Chief submits the inspection report to the Bureau Director and informs the concerned Regional Director of the findings and assessment through a memorandum with the inspection report attached. The MDSS prepares a Program of Work based on the detailed cost estimate prepared by the Dredge Master submitted by the Regional office, and the findings during the ocular inspection.
	FED Chief	

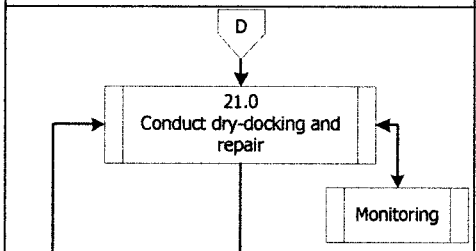
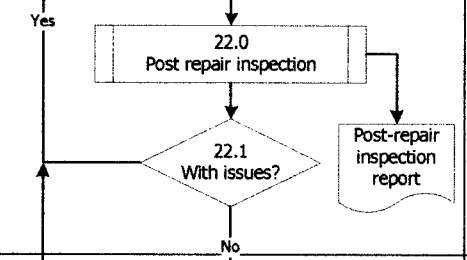
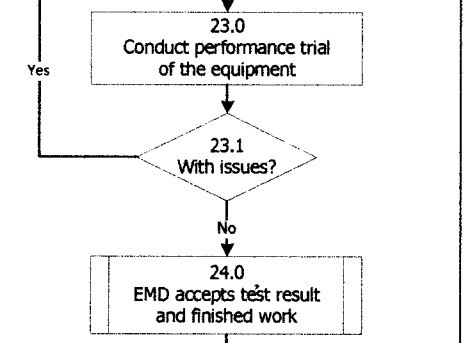
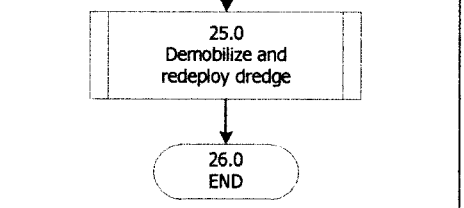
PROCESS FLOW FOR THE DRY-DOCKING OF DREDGES AND SUPPORT VESSELS

PROCESS FLOW	RESPONSIBLE	DETAILS
	1. FED Chief 2. Assistant Bureau Director	
	1. Assistant Bureau Director 2. FED-BOE 3. BOE Director 4. Regional Director 5. BOE Director	Assistant Bureau Director reviews POW. If the contents are all right, Assistant Director forwards the POW to the BOE Director, otherwise returns the POW to FED for revision.
	1. EMD Chief 2. Regional Director	
	1. FED-BOE 2. Regional Director	BOE endorses the POW to the Secretary thru the Undersecretary for Technical Services for approval of funds.
	1. FED-BOE 2. FMS	BOE prepares and submits request for sub-allotment to FMS for budget earmarking. Copy furnished the Regional Director. FMS checks for availability of funds.

PROCESS FLOW FOR THE DRY-DOCKING OF DREDGES AND SUPPORT VESSELS

PROCESS FLOW	RESPONSIBLE	DETAILS
C 14.0 FMS forwards sub-allotment request to Undersecretary for Technical Services 15.0 Undersecretary for Technical Services recommends approval to the Secretary	1. FMS 2. Undersecretary for Technical Services	
16.0 Secretary approves release of funding	Secretary	
17.0 FMS releases funds to the Regional Office and notifies BOE 18.0 Regional Office prepares PPMP	1. FMS 2. Regional Office 3. BOE	
19.0 BAC conducts public bidding 20.0 BAC awards contract to the winning bidder D	BAC Regional office	BAC Regional office conducts biding in accordance with RA 9184. The contract is then awarded to the winning bidder.

PROCESS FLOW FOR THE DRY-DOCKING OF DREDGES AND SUPPORT VESSELS

PROCESS FLOW	RESPONSIBLE	DETAILS
	1. Service Provider 2. EMD 3. FED-BOE	The EMD and FED-BOE shall regularly monitor the progress of the project throughout its entire duration.
	FED-BOE	Maintenance and Dry-docking Services Section, FED-BOE conducts post repair inspection to check for any issues or work overlooked.
	1. Service Provider 2. Regional Office 3. EMD 4. COA Representative 5. FED-BOE	The contractor conducts performance trial of the newly repaired equipment in the presence of representatives from FED-BOE, EMD, COA for five (5) days.
	Service Provider	

ANNEX "C"

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
Regional Office No. _____

Project Management Plan

Name of Project

Implementing Office

Date

Table of Contents

I. Project Summary

The project summary should contain the following information:

- Name of the project;
- Implementing office;
- Start date;
- Date contract is awarded;
- Estimated cost of the project;
- Project deliverables;
- Estimated project duration;
- Purpose of the project;
- Acceptance and completion criteria; and
- Major constraints

The project summary also includes the list persons involved in the implementation and management of the project and their contact details. The above information are presented in tabular form.

II. Project Organization

This section shall contain the description of the organization and defines the responsibilities of personnel involved in the project. A narrative of key project member responsibilities may be included in the plan.

Small projects may require fewer personnel and less complex organizational responsibilities; nevertheless, responsibilities have to be defined.

III. List of Activities/Program of Work

This section shall contain the list of items of work to be performed, estimated duration of each task, materials and personnel needed, and list of tools/equipment to be used. The target start and finish for each activity shall also be indicated in this section.

Attached to this Department Order as Annex D is the sample Program of Work for the repair and dry-docking of a large cutter suction dredge which shall serve as the template for POW preparation.

IV. Project Schedule and Timeline

Based from the activity list prepared, a project schedule shall be prepared by constructing a PERT-CPM diagram and Gantt Chart. These tools help visualize the dependencies of each

task, the slack or the allowable time to delay a particular task, and the allocation of resources to each task. Attached as Annex E of this Order is the sample PERT-CPM and Gantt Chart for the activity list presented in Annex D.

V. Project Staffing Plan

The project staffing plan shall show the number of personnel required on the project at any particular time presented in graphical form. This shall be checked and compared against the actual number of personnel present on the project for a particular time.

VI. Safety Plan (Risk Identification and Reduction)

This section shall contain the description of all the risks identified for the project. The contractual, management and technical risks are identified and assessed to identify the necessary control measures to be taken. A sample safety plan is attached to this Order as Annex F.

Project Plan Template:

ANNEX "D"

Republic of the Philippines
Department of Public Works and Highways
Regional Office No. ___
EQUIPMENT MANAGEMENT DIVISION

Program of Work for the Repair and Dry Docking of Dredge [Dredge Name]

Dredge

		Scope of Work	Duration (Days)	Materials	Qty	Unit	Unit Cost	Material cost	Personnel Needed	Qty	Rate/ Day	No. of days	Labor Cost	Total Cost	Schedule	
															Start	End
I		**Docking and Undocking Services**														
	1	Docking and undocking														
	2	Mooring and unmooring														
	3	Erection of Keel blocks														
	4	Wharfage														
	5	Dock rental														
II		**Hull Preservation Works**														
	1	Scraping/removal of marine growth														
	2	Hydro blasting to remove mineral deposits and contaminants														
	3	Sandblasting to remove oxidized portions (when and where allowed)														
	4	Airblowing hull plates prior to painting works														
	5	Painting														
	6	Spraying of fresh water prior to second coating														
	7	Cut and furnish waterline at port and starboard side														
	8	Replacing of zinc anodes														
	9	Painting of forward and aft draft marks														
III		**General Services**														
	1	Hammer test of Hull														
	2	UUTG testing of thin/deteriorated plates														
	3	Megger (Megohmmeter) testing of machineries and insulation														

ANNEX "D"

	Scope of Work	Duration (Days)	Materials	Qty	Unit	Unit Cost	Material cost	Personnel Needed	Qty	Rate/ Day	No. of days	Labor Cost	Total Cost	Schedule	
														Start	End
IV	**Replating**														
	1 Bottom and side hull														
	2 Deck														
	3 Floorings and walls														
	4 Pilot house														
	5 Frames/brackets/stiffeners														
	6 Fenders														
V	**Sea Chests and Sea Valves**														
	1 Servicing														
	2 Replacement of defective parts														
VI	**Pump Works**														
	1 Servicing														
	2 Replacement of defective parts														
VII	**Winch Mechanism Works**														
	1 Servicing														
	2 Replacement of defective parts including steel cables														
VIII	**Cooling System Repair/Overhauling**														
	1 Servicing														
	2 Replacement of defective parts														
IX	**Electrical System**														
	1 Repair/replacement of parts for motor control, panel boards, lightings, 3-phase motors														

X	**Ladder Works**														
	1 Repair/replacement of ladder structure														
	2 Repair/replacement of gear mechanisms, lubricating system														

ANNEX "D"

	Scope of Work	Duration (Days)	Materials	Qty	Unit	Unit Cost	Material cost	Personnel Needed	Qty	Rate/ Day	No. of days	Labor Cost	Total Cost	Schedule	
														Start	End
	3 Repair/replacement of suction pipes, adaptors, suction mouth, mouth rings, elbows, valves, hoses, bolts and nuts, cutter head/teeth, flanges, gaskets, idlers, roller pulleys, swing line and other support appurtenances														
XI	**Dredge Pump Engine Works**														
	1 Overhauling														
	2 Replacement of defective parts														
	3 Machining works														
	4 Servicing and replacement of defective parts of attached pumps														
X	**Main Generator Engine Works**														
	1 Overhauling (general or top)														
	2 Replacement of defective parts														
	3 Machining works														
	4 Servicing/replacement of parts of all attached pumps														
XI	**Main Generator Set AC-DC**														
	1 Servicing														
	2 Replacement of defective parts														
XII	**Auxiliary Engine Works**														
	1 Overhauling (general or top)														
	2 Replacement of defective parts														
	3 Machining works														
	4 Servicing/replacement of parts of all attached pumps														
XIII	**Auxiliary Generator Set AC-DC**														
	1 Servicing														
	2 Replacement of defective parts														

ANNEX "D"

		Scope of Work	Duration (Days)	Materials	Qty	Unit	Unit Cost	Material cost	Personnel Needed	Qty	Rate/ Day	No. of days	Labor Cost	Total Cost	Schedule	
															Start	End
XIV		**Tank Works**														
	1	Checking of all tanks														
	2	Replacement of gaskets														
	3	Repair of deteriorated portions														
	4	Application of cement wash on water tank surface														
XV		**Hydraulic System Works**														
	1	Servicing of hydraulic motors, pipes, hoses, fittings and tanks														
	2	Replacement of solenoid valves. Cartridges and other parts														
XVI		**Piping System Works**														
	1	Replacement of defective pipings, adaptors and connectors for fuel, raw water, fresh water, and flushing and toilet discharge pipe														
XVII		**Miscellaneous Works**														
	1	Repair of expansion joints														
	2	Repair of on-board discharge pipes, elbows, S-pipes, adaptors														
	3	Repair of spreaders														
	4	Repair of transmission/reduction gear parts														
	5	Repair of swivel joint for discharge pipe elbow														

Support Vessel

ANNEX "D"

	Scope of Work	Duration (Days)	Materials	Qty	Unit	Unit Cost	Material cost	Personnel Needed	Qty	Rate/ Day	No. of days	Labor Cost	Total Cost	Schedule	
														Start	End
I	**Propulsion System**														
	1 Servicing of propeller/pitch and static balance														
	2 Checking of alignment of tailshaft with respect to main engine														
	3 Replacement of flax packing														
II	**Rudder Works**														
	1 Servicing and replacement of defective parts														
	2 Servicing of rudder stock														
	3 Alignment of rudder stock														
	4 Polishing of rudder stock sleeves and refacing of flange														

Prepared by:

Reviewed and submitted by:

Project Plan Template:

Republic of the Philippines
Department of Public Works and Highways
Regional Office No. ___
EQUIPMENT MANAGEMENT DIVISION

Program of Work for the Repair and Dry Docking of Dredge [Dredge Name]

Dredge

	Scope of Work		Tools/Equipment Needed	Qty	Rate/day	Days	Cost	Safety		
								Hazard	Precaution	PPE
I	**Docking and Undocking Services**									
	1	Docking and undocking								
	2	Mooring and unmooring								
	3	Erection of Keel blocks								
	4	Wharfage								
	5	Dock rental								
II	**Hull Preservation Works**									
	1	Scraping/removal of marine growth								
	2	Hydro blasting to remove mineral deposits and contaminants								
	3	Sandblasting to remove oxidized portions (when and where allowed)								
	4	Airblowing hull plates prior to painting works								
	5	Painting								
	6	Spraying of fresh water prior to second coating								
	7	Cut and furnish waterline at port and starboard side								
	8	Replacing of zinc anodes								
	9	Painting of forward and aft draft marks								
III	**General Services**									
	1	Hammer test of Hull								
	2	UUTG testing of thin/deteriorated plates								
	3	Megger (Megohmmeter) testing of machineries and insulation								

Scope of Work			Tools/Equipment Needed	Qty	Rate/day	Days	Cost	Safety		
								Hazard	Precaution	PPE
IV	**Replating**									
	1	Bottom and side hull								
	2	Deck								
	3	Floorings and walls								
	4	Pilot house								
	5	Frames/brackets/stiffeners								
	6	Fenders								
V	**Sea Chests and Sea Valves**									
	1	Servicing								
	2	Replacement of defective parts								
VI	**Pump Works**									
	1	Servicing								
	2	Replacement of defective parts								
VII	**Winch Mechanism Works**									
	1	Servicing								
	2	Replacement of defective parts including steel cables								
VIII	**Cooling System Repair/Overhauling**									
	1	Servicing								
	2	Replacement of defective parts								
IX	**Electrical System**									
	1	Repair/replacement of parts for motor control, panel boards, lightings, 3-phase motors								
X	**Ladder Works**									
	1	Repair/replacement of ladder structure								
	2	Repair/replacement of gear mechanisms, lubricating system								

		Scope of Work	Tools/Equipment Needed	Qty	Rate/day	Days	Cost	Safety		
								Hazard	Precaution	PPE
	3	Repair/replacement of suction pipes, adaptors, suction mouth, mouth rings, elbows, valves, hoses, bolts and nuts, cutter head/teeth, flanges, gaskets, idlers, roller pulleys, swing line and other support appurtenances								
XI		**Dredge Pump Engine Works**								
	1	Overhauling								
	2	Replacement of defective parts								
	3	Machining works								
	4	Servicing and replacement of defective parts of attached pumps								
X		**Main Generator Engine Works**								
	1	Overhauling (general or top)								
	2	Replacement of defective parts								
	3	Machining works								
	4	Servicing/replacement of parts of all attached pumps								
XI		**Main Generator Set AC-DC**								
	1	Servicing								
	2	Replacement of defective parts								
XII		**Auxiliary Engine Works**								
	1	Overhauling (general or top)								
	2	Replacement of defective parts								
	3	Machining works								
	4	Servicing/replacement of parts of all attached pumps								
XIII		**Auxiliary Generator Set AC-DC**								
	1	Servicing								
	2	Replacement of defective parts								

Scope of Work			Tools/Equipment Needed	Qty	Rate/day	Days	Cost	Safety		
								Hazard	Precaution	PPE
XIV	**Tank Works**									
	1	Checking of all tanks								
	2	Replacement of gaskets								
	3	Repair of deteriorated portions								
	4	Application of cement wash on water tank surface								
XV	**Hydraulic System Works**									
	1	Servicing of hydraulic motors, pipes, hoses, fittings and tanks								
	2	Replacement of solenoid valves. Cartridges and other parts								
XVI	**Piping System Works**									
	1	Replacement of defective pipings, adaptors and connectors for fuel, raw water, fresh water, and flushing and toilet discharge pipe								
XVII	**Miscellaneous Works**									
	1	Repair of expansion joints								
	2	Repair of on-board discharge pipes, elbows, S-pipes, adaptors								
	3	Repair of spreaders								
	4	Repair of transmission/reduction gear parts								
	5	Repair of swivel joint for discharge pipe elbow								

Support Vessel

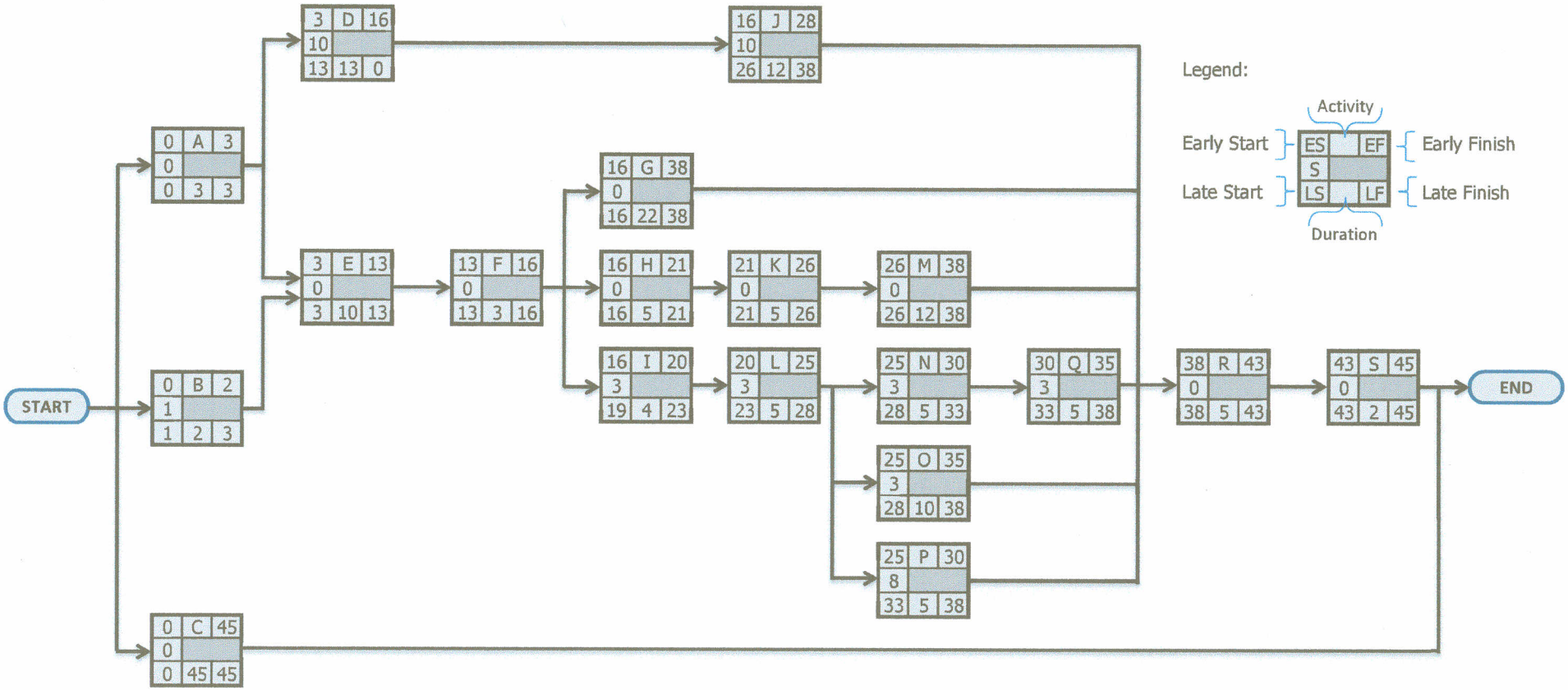
		Scope of Work	Tools/Equipment Needed	Qty	Rate/day	Days	Cost	Safety		
								Hazard	Precaution	PPE
I		**Propulsion System**								
	1	Servicing of propeller/pitch and static balance								
	2	Checking of alignment of tailshaft with respect to main engine								
	3	Replacement of flax packing								
II		**Rudder Works**								
	1	Servicing and replacement of defective parts								
	2	Servicing of rudder stock								
	3	Alignment of rudder stock								
	4	Polishing of rudder stock sleeves and refacing of flange								

Prepared by:

_____

ANNEX "E"

SAMPLE PERT-CPM FOR DRY-DOCKING AND GENERAL REPAIR

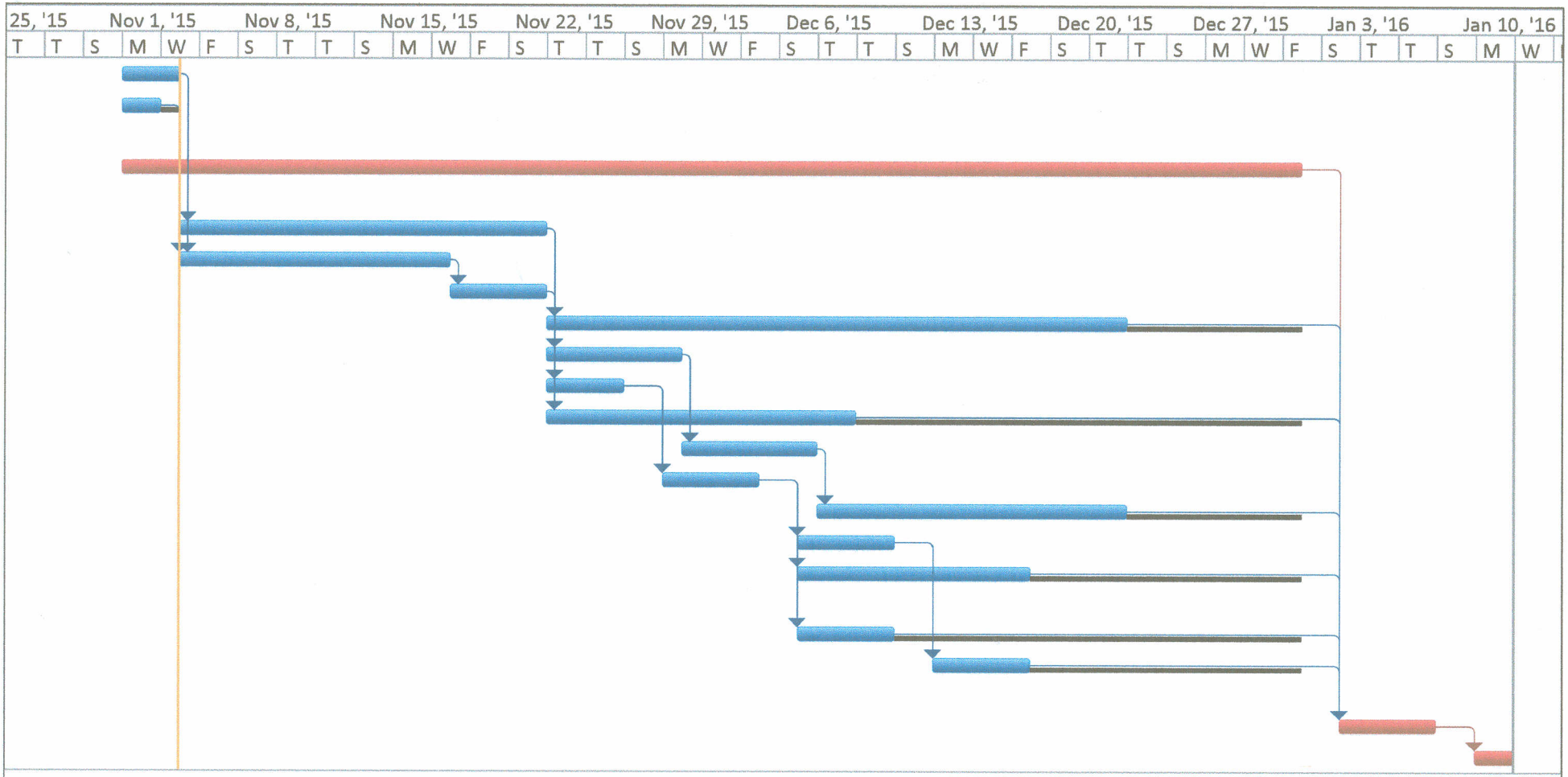


	ACTIVITIES	Duration (days)	Early Start (ES)	Early Finish (EF)	Late Start (LS)	Late Finish (LF)	Slack (S)
A.	Docking and Undocking Services	3	0	3	0	3	0
B.	Line connection and disconnection of shore power and Megger test	2	0	2	1	3	1
C.	Daily galley garbage and supply of fresh water onboard during entire repair.	45	0	45	0	45	0
D.	Dredge Pump Engine Works	13	3	16	13	26	10
E.	Hull preservation works	10	3	13	3	13	0
F.	Hull gauging	3	13	16	13	16	0
G.	Plates and section works	22	16	38	16	38	0
H.	Dredging Pump Works	5	16	21	16	21	0
I.	Sea Valves and Sea Chests Works	4	16	20	19	23	3
J.	Main Generator Engine Works	12	16	28	26	38	10
K.	Winch Repair Mechanism Works	5	21	26	21	26	0
L.	Cooling System Repair/Overhauling	5	20	25	23	28	3
M.	Repair/Replacement of Electrical System	12	26	38	26	38	0
N.	Crop-out and Renew Lubricant System	5	25	30	28	33	3
O.	Unship to shop for repair one gate valve for suction pipe and one unit heat exchanger.	10	25	35	28	38	3
P.	Crop-out and Renew suction pipeline inside engine room.	5	25	30	33	38	8
Q.	Crop-out and renew suction pipe adaptor, mouth, pipe support and base of swivel for swingline.	5	30	35	33	38	3
R.	Testing of Dredge	5	38	43	38	43	0
S.	Towing/Demobilization of Dredge	2	43	45	43	45	0

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		A. Docking and Undocking Services	3 days	November 2, 2015	November 4, 2015	
2		B. Line connection and disconnection of shore power and Megger test	2 days	November 2, 2015	November 3, 2015	
3		C. Daily galley garbage and supply of fresh water onboard during entire repair.	45 days	November 2, 2015	January 1, 2016	
4		D. Dredge Pump Engine Works	13 days	November 5, 2015	November 23, 2015	1
5		E. Hull preservation works	10 days	November 5, 2015	November 18, 2015	1,2
6		F. Hull gauging	3 days	November 19, 2015	November 23, 2015	5
7		G. Plates and section works	22 days	November 24, 2015	December 23, 2015	6
8		H. Dredging Pump Works	5 days	November 24, 2015	November 30, 2015	6
9		I. Sea Valves and Sea Chests Works	4 days	November 24, 2015	November 27, 2015	6
10		J. Main Generator Engine Works	12 days	November 24, 2015	December 9, 2015	4
11		K. Winch Repair Mechanism Works	5 days	December 1, 2015	December 7, 2015	8
12		L. Cooling System Repair/Overhauling	5 days	November 30, 2015	December 4, 2015	9
13		M. Repair/Replacement of Electrical System	12 days	December 8, 2015	December 23, 2015	11
14		N. Crop-out and Renew Lubricant System	5 days	December 7, 2015	December 11, 2015	12
15		O. Transport to shop for repair one gate valve for suction pipe and one unit heat exchanger.	10 days	December 7, 2015	December 18, 2015	12
16		P. Crop-out and Renew suction pipeline inside engine roo	5 days	December 7, 2015	December 11, 2015	12
17		Q. Crop-out and renew suction pipe adaptor, mouth, pipe support and base of swivel for swingline.	5 days	December 14, 2015	December 18, 2015	14
18		R. Testing of Dredge	5 days	January 4, 2016	January 8, 2016	7,10,13,17,15,16,3
19		S. Towing/Demobilization of Dredge	2 days	January 11, 2016	January 12, 2016	18

Project: Damayan II.mpp
Date: November 5, 2015

Task	Inactive Task	Start-only
Split	Inactive Milestone	Finish-only
Milestone	Inactive Summary	Deadline
Summary	Manual Task	Critical
Project Summary	Duration-only	Critical Split
External Tasks	Manual Summary Rollup	Progress
External Milestone	Manual Summary	Slack



Project: Damayan II.mpp
Date: November 5, 2015

Task		Inactive Task		Start-only	
Split		Inactive Milestone		Finish-only	
Milestone		Inactive Summary		Deadline	
Summary		Manual Task		Critical	
Project Summary		Duration-only		Critical Split	
External Tasks		Manual Summary Rollup		Progress	
External Milestone		Manual Summary		Slack	

ANNEX "F"

Safety Plan (Risk and Hazard Identification and Reduction) Template

Category	Impact	Risk	Control Measure
Management			
Personnel Availability			
Personnel Skills			
Schedule			
Cost			
Change Control			
Technical			
Mobilization and Set up			
Repair Works*			
Performance Trial			
Demobilization			

* Repair works should be broken down into individual work items. Risks associated with each item should be identified and control measures should be presented therfor.

All applicable provisions of DO No. 74 Series of 2015, Safety On Board All DPWH Dredges and Support Vessels, shall be observed during the conduct of dry-docking and repair to ensure safety of all personnel.

Accomplishment Monitoring Form

	Scope of Work		Duration (Days)	Schedule		Percentage of Work Completed	
				Start	End	%	As of (date)
I	**Docking and Undocking Services**						
	1	Docking and undocking					
	2	Mooring and unmooring					
	3	Erection of Keel blocks					
	4	Wharfage					
	5	Dock rental					
II	**Hull Preservation Works**						
	1	Scraping/removal of marine growth					
	2	Hydro blasting to remove mineral deposits and contaminants					
	3	Sandblasting to remove oxidized portions (when and where allowed)					
	4	Airblowing hull plates prior to painting works					
	5	Painting					
	6	Spraying of fresh water prior to second coating					
	7	Cut and furnish waterline at port and starboard side					
	8	Replacing of zinc anodes					
	9	Painting of forward and aft draft marks					
III	**General Services**						
	1	Hammer test of Hull					
	2	UUTG testing of thin/deteriorated plates					
	3	Megger (Megohmmeter) testing of machineries and insulation					
IV	**Replating**						
	1	Bottom and side hull					
	2	Deck					
	3	Floorings and walls					
	4	Pilot house					
	5	Frames/brackets/stiffeners					
	6	Fenders					
V	**Sea Chests and Sea Valves**						
	1	Servicing					
	2	Replacement of defective parts					
VI	**Pump Works**						
	1	Servicing					
	2	Replacement of defective parts					
VII	**Winch Mechanism Works**						
	1	Servicing					
	2	Replacement of defective parts including steel cables					
VIII	**Cooling System Repair/Overhauling**						
	1	Servicing					
	2	Replacement of defective parts					

Scope of Work			Duration (Days)	Schedule		Percentage of Work Completed	
				Start	End	%	As of (date)
IX	**Electrical System**						
	1	Repair/replacement of parts for motor control, panel boards, lightings, 3-phase motors					
X	**Ladder Works**						
	1	Repair/replacement of ladder structure					
	2	Repair/replacement of gear mechanisms, lubricating system					
	3	Repair/replacement of suction pipes, adapters, suction mouth, mouth rings, elbows, valves, hoses, bolts and nuts, cutter head/teeth, flanges, gaskets, idlers, roller pulleys, swing line and other support appurtenances					
XI	**Dredge Pump Engine Works**						
	1	Overhauling					
	2	Replacement of defective parts					
	3	Machining works					
	4	Servicing and replacement of defective parts of attached pumps					
X	**Main Generator Engine Works**						
	1	Overhauling (general or top)					
	2	Replacement of defective parts					
	3	Machining works					
	4	Servicing/replacement of parts of all attached pumps					
XI	**Main Generator Set AC-DC**						
	1	Servicing					
	2	Replacement of defective parts					
XII	**Auxiliary Engine Works**						
	1	Overhauling (general or top)					
	2	Replacement of defective parts					
	3	Machining works					
	4	Servicing/replacement of parts of all attached pumps					
XIII	**Auxiliary Generator Set AC-DC**						
	1	Servicing					
	2	Replacement of defective parts					
XIV	**Tank Works**						
	1	Checking of all tanks					
	2	Replacement of gaskets					
	3	Repair of deteriorated portions					
	4	Application of cement wash on water tank surface					
XV	**Hydraulic System Works**						
	1	Servicing of hydraulic motors, pipes, hoses, fittings and tanks					
	2	Replacement of solenoid valves. Cartridges and other parts					

Scope of Work			Duration (Days)	Schedule		Percentage of Work Completed	
				Start	End	%	As of (date)
XVI	**Piping System Works**						
	1	Replacement of defective pipings, adaptors and connectors for fuel, raw water, fresh water, and flushing and toilet discharge pipe					
XVII	**Miscellaneous Works**						
	1	Repair of expansion joints					
	2	Repair of on-board discharge pipes, elbows, S-pipes, adaptors					
	3	Repair of spreaders					
	4	Repair of transmission/reduction gear parts					
	5	Repair of swivel joint for discharge pipe elbow					
Support Vessel							
I	**Propulsion System Works**						
		Servicing of propeller/pitch and static balance					
		Checking of alignment of tailshaft with respect to main engine					
		Replacement of flax packing					
II	**Rudder Works**						
		Servicing and replacement of defective parts					
		Servicing of rudder stock					
		Alignment of rudder stock					
		Polishing of rudder stock sleeves and refacing of flange					

ANNEX "H"

Republic of the Philippines
Department of Public Works and Highways
Regional Office No. ___
EQUIPMENT MANAGEMENT DIVISION

Performance Trial Checklist

Cutter Suction Dredge

Name of Dredge: _____
Date:

Activity			Day 1			Day 2			Day 3			Day 4			Day 5		
			Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
			Start	End		Start	End		Start	End		Start	End		Start	End	
I	**Engine Room Trials**																
		Dredge pump engine test															
			Endurance trial														
			Overload running trial														
			Minimum RPM trial														
			Torsional vibrations test														
		Main generator engine test															
			Endurance trial														
			Overload running trial														
			Minimum RPM trial														
			Torsional vibrations test														
		Auxiliary engine test															
			Endurance trial														
			Overload running trial														
			Minimum RPM trial														
			Torsional vibrations test														
II	**Deck Equipment Trials**																
		Winch mechanisms trial															
			Anchor winches														
			Ladder winch														
			Spud winches														
		Capstan															
		On-board crane															
III	**Emergency Equipment Test**																
		Alarm system															
		Fire fighting equipment															

	Activity	Day 1			Day 2			Day 3			Day 4			Day 5		
		Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
		Start	End		Start	End		Start	End		Start	End		Start	End	
IV	**Electrical System Test**															
	Check panel boards															
	Check voltage and amperage															
	Check lightings															
V	**Control Panel Test**															
	Check all controls in the control desk															
VI	**Dredging Trial**															
	Cutter suction dredging for 2 straight hours @ rated RPM															
	Cutter suction dredging for 2 straight hours @ 80% RPM															
	Cutter suction dredging for 2 straight hours @ 50% RPM															
	Spud test (advancing using spuds only)															
	*max swing of 30 degrees on both sides															

Remarks _____

Inspected by:

Concurred:

Republic of the Philippines
Department of Public Works and Highways
Regional Office No. ___
EQUIPMENT MANAGEMENT DIVISION

Performance Trial Checklist

Multi-Purpose Amphibious Dredge

Name of Dredge: _____
Date:

Activity	Day 1			Day 2			Day 3			Day 4			Day 5		
	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
	Start	End		Start	End		Start	End		Start	End		Start	End	
I Engine Test															
Diesel engine test															
Endurance trial															
Overload running trial															
Minimum RPM trial															
Torsional vibrations test															
II Deck Equipment Trials															
Hydraulic system															
Boom and Arm															
Front Stabilizers															
Spuds															
On-board crane (if any)															
III Emergency Equipment Test															
Alarm system															
Fire fighting equipment															
IV Electrical System Test															
Check panel boards															
Check voltage and amperage															
Check lightings															
Side lights															
Mast lights															
Stern lights															
Red lights															
White lights															
Anchor lights															

Activity				Day 1			Day 2			Day 3			Day 4			Day 5		
				Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
				Start	End		Start	End		Start	End		Start	End		Start	End	
V	**Control Panel Test**																	
		Check all controls in the control desk																
VI	**Dredging Trial**																	
		Cutter suction dredging for 2 straight hours @ rated RPM																
		Cutter suction dredging for 2 straight hours @ 80% RPM																
		Bucket dredging for 2 hours																
VII	**Navigational and Stability Test**																	
		Cruising without side pontoons																
			with 1/3 floater in water															
			with floaters in upright position															
		Cruising with side pontoons																
			with 1/3 floater in water															
			with floaters in upright position															
		Maneuvering test																

Remarks _____

Inspected by:

Concurred:

Republic of the Philippines
Department of Public Works and Highways
Regional Office No. ___
EQUIPMENT MANAGEMENT DIVISION

Performance Trial Checklist

Amphibious Excavator

Name of Dredge: _____
Date:

Activity			Day 1			Day 2			Day 3			Day 4			Day 5		
			Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
			Start	End		Start	End		Start	End		Start	End		Start	End	
I	**Engine Test**																
		Diesel engine test															
		Endurance trial															
		Overload running trial															
		Minimum RPM trial															
II	**Hydraulic System Test**																
		Boom and Arm															
		Bucket															
III	**Emergency Equipment Test**																
		Alarm system															
		Fire fighting equipment															
IV	**Electrical System Test**																
		Check panel boards															
		Check voltage and amperage															
		Check lightings															
V	**Control Panel Test**																
		Check all controls in the control desk															

Activity			Day 1			Day 2			Day 3			Day 4			Day 5		
			Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail	Time		Pass/ Fail
			Start	End		Start	End		Start	End		Start	End		Start	End	
VI	**Dredging Trial**																
		Bucket dredging for 2 hours															
VII	**Navigational and Stability Test**																
		Cruising and maneuvering without side pontoons															
		Cruising and maneuvering with side pontoons															

Remarks _____

Inspected by:

Concurred: