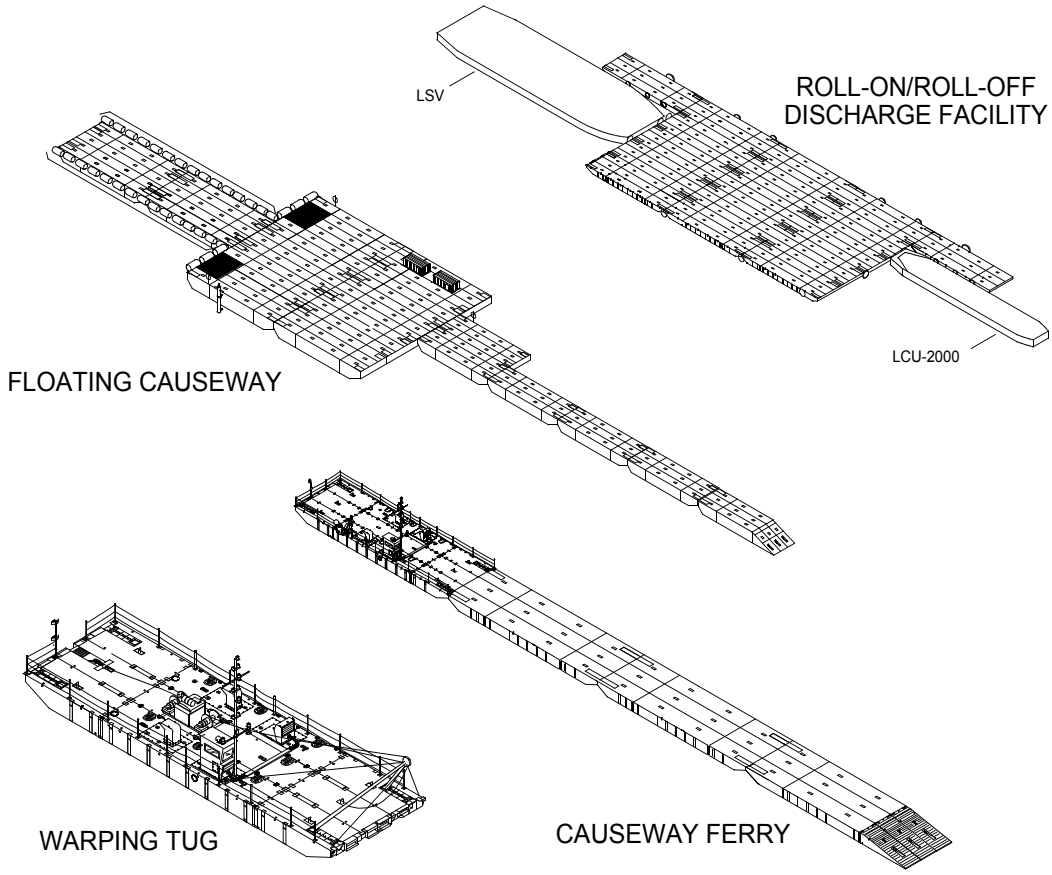
TM 55-1945-205-10-1

TECHNICAL MANUAL

OPERATORS MANUAL
FOR

MODULAR CAUSEWAY SYSTEM (MCS)
CAUSEWAY FERRY (CF)
CF-1
NSN 1945-01-398-3856



This manual supersedes TM 55-1945-205-10 dated 29 August 1997 including all changes.

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HEADQUARTERS, DEPARTMENT OF THE ARMY
13 SEPTEMBER 2003

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HOW TO USE THIS MANUAL

This manual contains certain features to improve the convenience of using this manual and increase the user's efficiency. These features include:

a. Accessing Information

Information is accessed by referring to the Table of Contents, located in the front of this manual, or by looking in the Alphabetical Index, located in the back of this manual.

b. Illustrations

Various methods are used to locate and repair components. Locator illustrations in Controls and Indicator tables, PMCS tables, exploded views and cut-away diagrams make the information in the manual easier to understand and follow.

c. Using This Manual

When using this manual, read and understand the entire maintenance action before performing the task. Also, read and understand all warnings, cautions and notes as well as general safety precautions that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be worked on. However, the summary is not all inclusive and personnel should be aware at all times of hazardous conditions that may arise.

Prior to starting the procedures in this manual, the initial setup requirements are located directly above each procedure. The information is given to ensure all materials, expendables, tools and any other equipment necessary are readily available for use. The initial setup will be accomplished prior to starting the actual steps of each maintenance procedure.

Locating Major Components

Obtain the manual for the system to be worked on. Open to the Table of Contents located in the front of this manual. Find Chapter 1, *Description and Theory of Operation*. Under the chapter title you will find the work package titled *Location and Description of Major Components*. Turn to the work package indicated. This work package will give a brief description of the major components, and show an illustration of what the component looks like and its location.

The Alphabetical Index, located in the back of this manual, contains an alphabetical list of all sections of this manual. *Location and Description of Major Components* is found in section L. The work package is found on the right side of the title where the *Location and Description of Major Components* is located. Turn to the work package indicated to find the description and location of each component.

Operator Instructions

To locate an operator task, open the manual to the Table of Contents located in the front of this manual. Locate the procedure that is to be performed. Next to the procedure, on the right, locate the work package number. Turn to the work package number in the manual. Perform the initial setup by obtaining the expendables, tools, materials and other items listed prior to starting the task. Perform the listed steps in order. The Alphabetical Index can also be used to locate the item and procedures to follow.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Materials/Parts: Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 4, *Supporting Information*.

Personnel Required: Lists all personnel necessary to perform the task.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 4, *Supporting Information*.

Location of Controls and Indicators

To locate a particular control and/or indicator, open the manual to the Table of Contents located in the front of the manual. Find Chapter 2, *Operator Instructions*. Locate the work package titled *Description and Use of Operator Controls and Indicators*. Turn to the work package indicated. Locate the control and, or indicator that you are attempting to identify. Take note of the number pointing to the control or indicator. Refer to the table below the picture and find the number in the column on the far left hand side. Reading from left to right, find the number that matches the number from the picture, then read the name of the control/indicator and following function of the item, as detailed in the far right hand column.

Troubleshooting Procedures

The Table of Contents or Alphabetical Index may be used to locate sections within this manual. To locate a particular troubleshooting procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 3, *Troubleshooting Procedures.* Under this section, find a work package titled *Troubleshooting Index*. Turn to the work package indicated, which lists all of the troubleshooting procedures. Look down the list until you find the appropriate work package for the problem you are trying to solve. To the right side of the procedure will be a work package number. Turn to the work package indicated and follow the steps to complete the troubleshooting procedure. The procedures list the malfunction, symptom and the corrective action. The corrective action will indicate which maintenance procedure to go to for the repair of the symptom or what level of maintenance is capable of repair of the problem. Follow the procedures indicated to complete the task. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test and inspect the equipment covered in this manual. The test equipment is identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Personnel Required: Lists all personnel necessary to perform the task.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 4, *Supporting Information*.

Maintenance Instructions

To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 4, *Maintenance Instructions.* Look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated.

Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Materials/Parts: Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 4, *Supporting Information*.

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CHAPTER 1

DESCRIPTION AND THEORY OF OPERATION FOR CAUSEWAY FERRY (CF)

OPERATOR MAINTENANCE
CAUSEWAY FERRY
GENERAL INFORMATION

SCOPE

This manual contains descriptions and instructions for the Causeway Ferry (CF).

Type of Manual: Operators Manual.

Purpose of Equipment: The purpose of the CF is for Logistics-Over-The-Shore (LOTS) deployment and handling of supplies between ship and beach. CF sections are connected together to form a floating powered causeway.

MAINTENANCE FORMS, RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS); and AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If any component in your system needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368, Product Quality Deficiency Report. Mail it to the address specified in DA PAM 738-750, or as specified by the contracting activity. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling or breaking of the materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as “corrosion”, “rust”, “deterioration” or “cracking” will ensure that the information is identified as a CPC Problem. The form should be submitted to the address specified in DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS).

OZONE DEPLETING SUBSTANCES (ODS)

The continued use of ODS has been prohibited by Executive Order 12856 of 3 August 1993.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The procedures for destruction of Army materiel to prevent enemy use are contained in TM 750-244-6.

PREPARATION FOR STORAGE AND SHIPMENT REFERENCE

Reference WP 0036 00 through WP 0049 00 for preparation for storage or shipment of the CF.

OPERATOR MAINTENANCE
CAUSEWAY FERRY
DESCRIPTION AND DATA

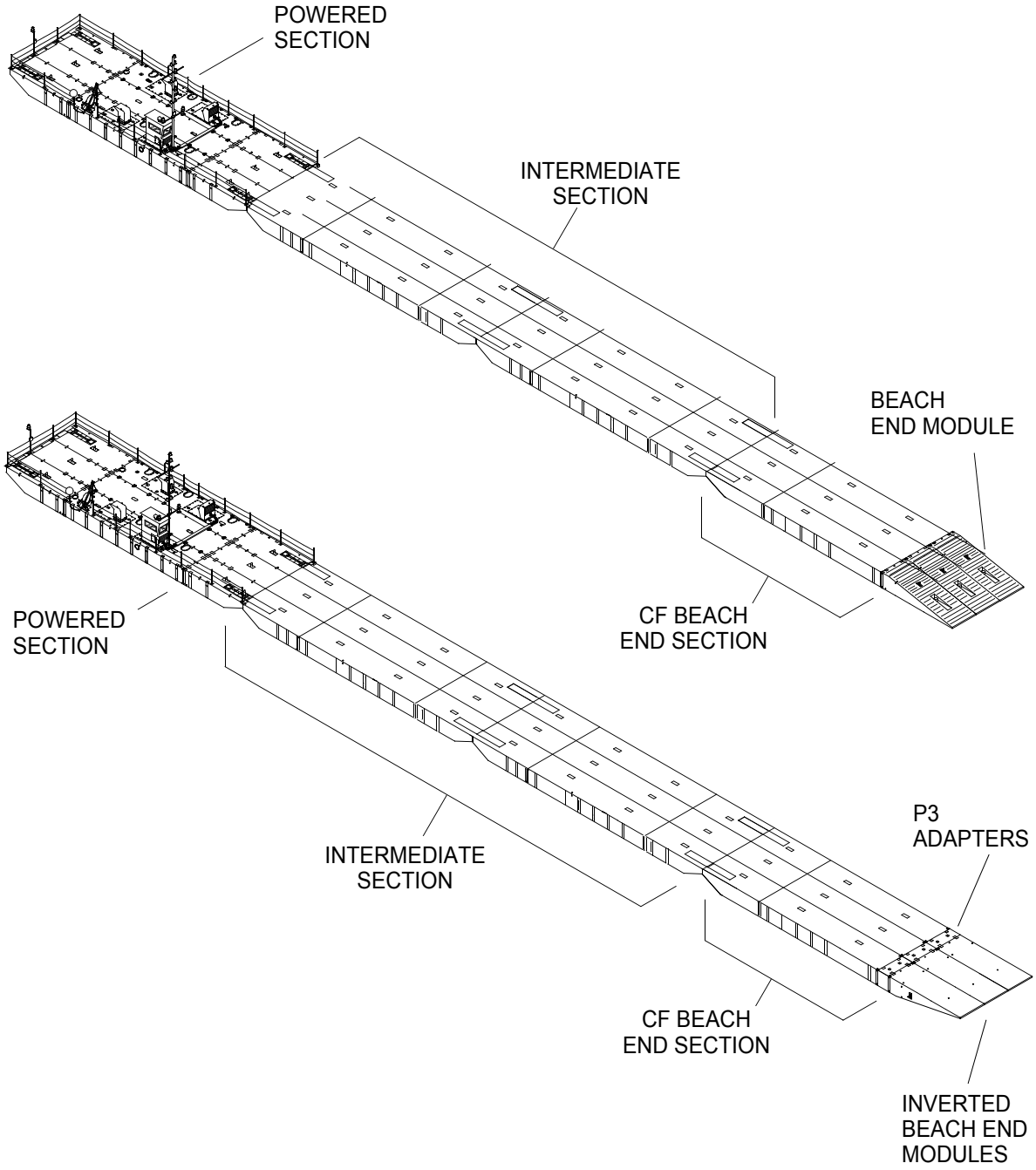
EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The Causeway Ferry (CF) system is a combination of modules assembled to form section assemblies. The assembled CF consists of four sections: one propulsion (powered) section, two non-powered intermediate sections and one causeway ferry beach end section. The powered section and the non-powered intermediate sections are 24 ft wide and 80 ft long. The non-powered causeway ferry beach end section is 24 ft wide and 85 ft long. When all four sections are connected end-to-end they form a single CF, 24 ft wide and 325 ft long. The powered section is assembled with two propulsion modules that facilitate self-powered movement and maneuvering. Individual modules are connected together by male/female locking assemblies located around the parameter of each module. Section assemblies are then connected end-to-end to form the completed CF. The system utilizes the Navy flexor and shear connector system for causeway end-to-end connection and is interchangeable with existing Navy Lighter (NL) and Army hardware at the sectional level.

The powered section is fitted with an operators cab, intake and exhaust plenums, main navigational mast, stub mast, anchorboard assembly, and life lines.

The CF is used to transport containerized, rolling break bulk cargo from ocean going vessels in the stream to the beach. The disassembled components of the CF are transported in an International Standards Organization Package (ISOPAK) configuration by Fast Sealift Ship (FSS) and/or commercial container ships to the operational area and assembled after arrival. The CF modules are ISO container compatible and are outfitted with ISO corner fittings. Components can also be transported by rail and motor vehicle over improved and unimproved roads. Upon arrival in the operational area, the CF can be assembled on deck, on land or in water of Sea State 0. The CF is designed to augment the Modular Causeway System (MCS) in applications where powered assemblies are required.

The CF, with maximum payload, is capable of beaching and retracting under its own power in those gradients commonly found in beach environments and operating in surf conditions up to 5 ft.



CAUSEWAY FERRY SYSTEM

OPERATOR MAINTENANCE
CAUSEWAY FERRY
DESCRIPTION AND DATA

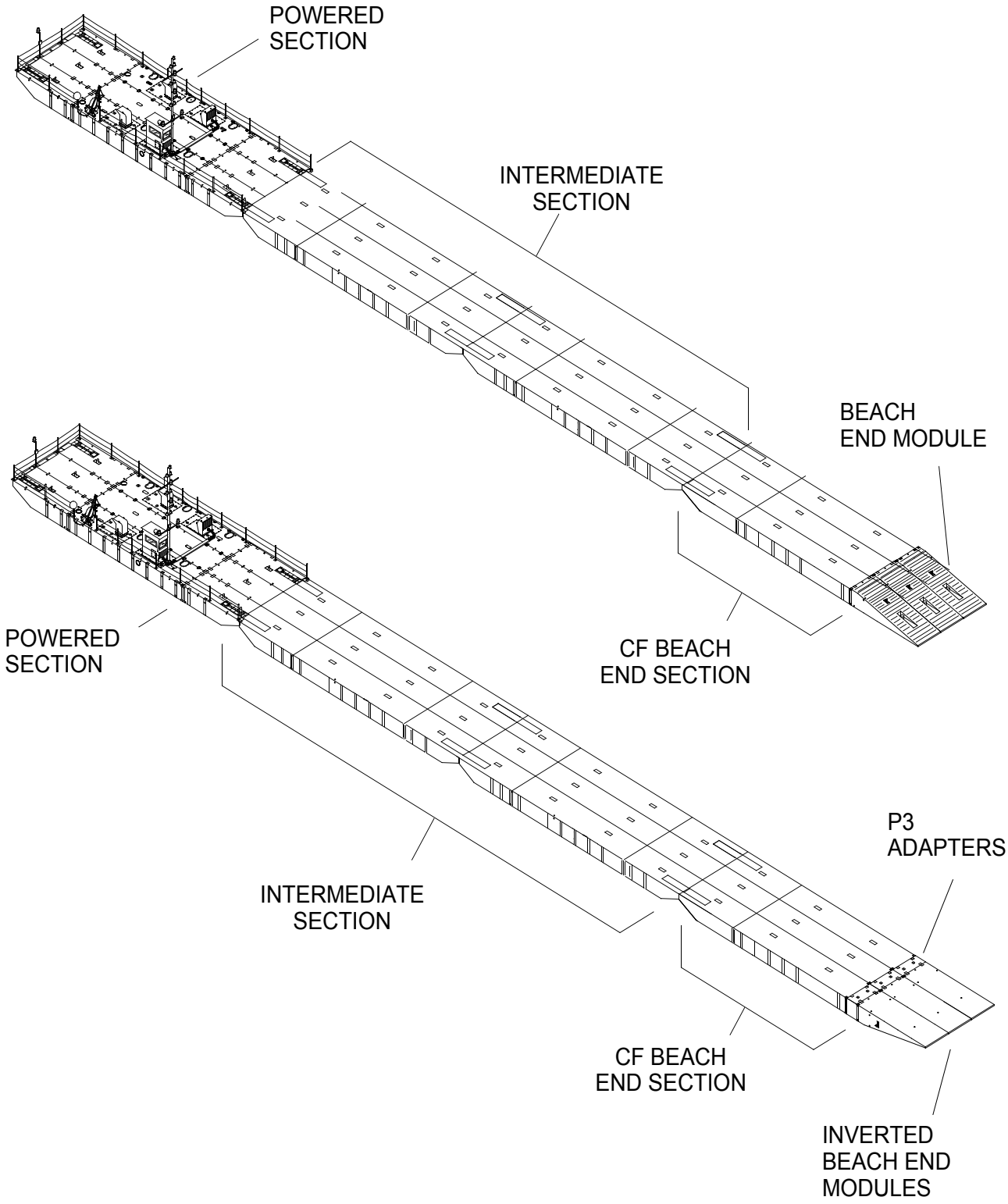
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

CAUSEWAY FERRY SYSTEM

The Causeway Ferry (CF) system consists of one powered section, a number of intermediate sections and one causeway ferry beach/sea end section. The powered section consist of two propulsion modules, the non-powered center module, six end rake modules, (two right, two left and two center), operators cab, intake and exhaust plenums, main navigation and a stub mast, module electrical interconnect assembly, anchor board and life lines. The powered section is the prime mover for the CF and is powered by two 8 cylinder, 600 hp water cooled, marine diesel engines driving two 360° steerable, 5000 lbs output pump-jets. The intermediate sections are assembled with three non-powered center modules and six end rake modules. The causeway ferry beach end section consists of three non-powered center modules, three end rakes and three beach end modules. The completely assembled CF is 325 ft long, 24 foot wide. When operating in an optional configuration, using P3 adaptor modules called inverted beach end modules, the length is increased to approximately 329 ft.

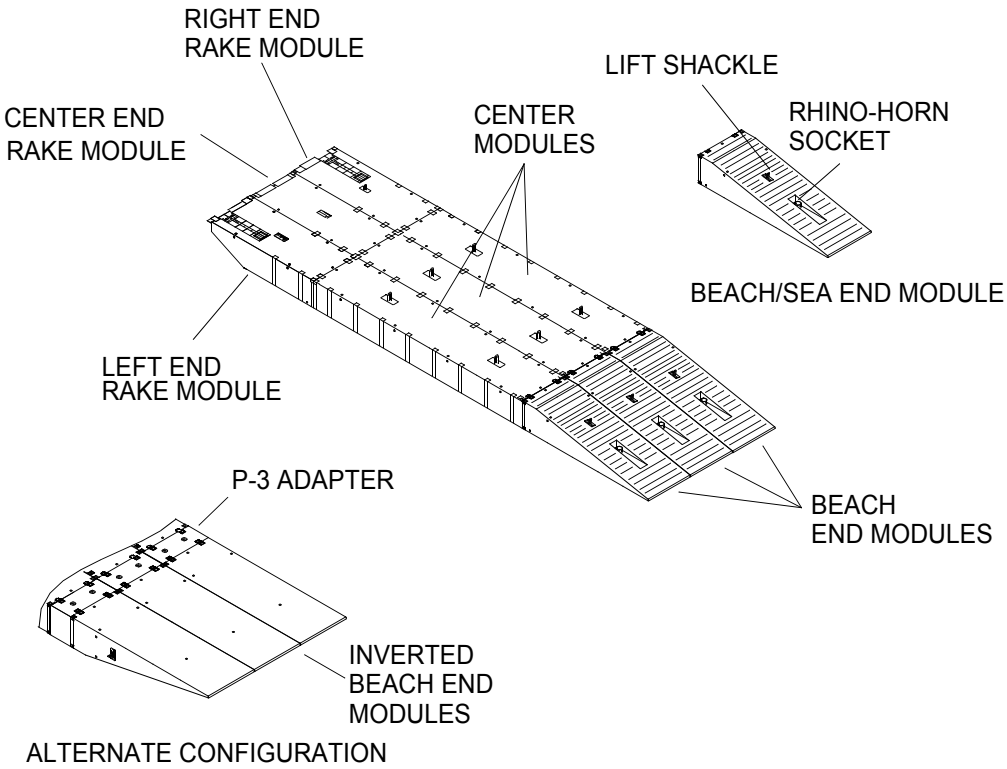
The modules are connected together by male/female locking assemblies. At each connector location there are upper and lower engagement points. Both engagement points are actuated simultaneously by lifting the guillotine bar vertically from the deck. The pairs of vertical connectors are spaced evenly around the perimeter of each module allowing for universal module configuration. The male connector assembly contains a retractable connector pin designed to be flush with the surface when in a stowed position. In the stowed position, the tapered shear lugs of the lock housings protrude around the pin housing. In the retracted position, the pin is compressed against the deployment spring and is held in place by the guillotine bar. The female connector assembly receives the male connector pin and, when locked, forms a positive mechanical interlock. The female connector assembly can be identified by the projecting shear lug which completely surrounds the housing. The female connector shear lug is internally tapered and sized to fit tightly with the mating lugs on the opposing male connector. This arrangement enhances the strength of the connectors, enabling it to withstand heavy shear loads.

The fully assembled CF has a cargo capacity of 350 short tons and can maintain a speed of 6 knots at a maximum load capacity in SEA STATE condition 2. The powered section carries enough fuel to operate under these conditions for 10 hours. The fully loaded CF will maintain a minimum vertical distance from the surface of the water to the gunwale (freeboard) of approximately 12 in., it can execute a 180° turn within two minutes, a 360° turn within four minutes and can be brought from full speed of 6 knots to a complete stop within 320 ft.


POWERED SECTION
INTERMEDIATE SECTION
BEACH END MODULE
CF BEACH END SECTION
POWERED SECTION
P3 ADAPTERS
INTERMEDIATE SECTION
CF BEACH END SECTION
INVERTED BEACH END MODULES

CAUSEWAY FERRY BEACH END SECTION AND P-3 ADAPTOR

The causeway ferry beach end section is attached to the last intermediate section of the beach end of the causeway. The causeway ferry beach end section is made up of three center modules, three end modules (left, center and right) and three beach/sea end modules. The beach end section weighs approximately 37,500 lbs, are 8 ft wide, 3 ft long, 4 ft 6 inches high and provide an alternate configuration capability. The P3 adaptors allow the beach end modules to be mated in the inverted position, referred to as inverted beach end modules.



COMBINATION BEACH/SEA END SECTION

END RAKE MODULES

The left, right and center end rake modules are empty modules which are 8 ft wide, 20 ft long and 4 ft 6 in. high. Each left, right and center end rake module has one 25 ton capacity lifting shackle, which is flush mounted in the deck. The textured deck and smooth bottom are free of any protrusions that might obstruct packing. Access for internal leak detection of each compartment is provided by a recessed threaded plug. The left end rake has a flexor connector pocket for flexor connector installation in the left corner of the module. The right end rake has a flexor connector pocket for flexor connector installation in the right corner of the module. Weight of the left right and center end rake modules is approximately 12,500 lbs.