(d) Conduct snow machine operations with at least a team of two snow machines.

(e) When working more than five miles from a support base and using snow machines, use a supporting track vehicle.

18-9. Figures and Tables.
Not Applicable.

18-10. Checklists and Forms.

a. DA Form 348, Equipment Operator's Qualification Record (Except Aircraft) (https://armypubs.army.mil/ProductMaps/PubForm/DAForm1_1000.aspx) (18-10.a)

b. OF 346, U.S. Government Motor Vehicle Operator's Identification Card (https://www.gsa.gov/reference/forms/us-government-motor-vehicle-operators-identification-card) (18-10.b)

Chapter 19
Floating Plant and Marine Activities

19-1. References.

a. ABS Classification Certificate (https://ww2.eagle.org/en/rules-and-resources/rules-and-guides.html) (19-1.a)

b. American Boat and Yacht Council (ABYC) Standards (https://abycinc.org/page/standards) (19-1.b)

c. ASTM F1166, Standard Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities (https://www.astm.org/products-services/standards-and-publications.html) (19-1.c)

d. EP 1130-2-500, Partners and Support (Work Management Guidance and Procedures), Appendix L- Agreement Between USACE and U.S. Coast Guard (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/) (19-1.d)

e. ER 385-1-91, Training, Testing, and Licensing for Operators of Class A and Class I Motorboats (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Regulations/) (19-1.e)

f. ISO 15085, Small Craft - Man-Overboard Prevention and Recovery (https://www.iso.org/standards.html) (19-1.f)

g. National Association of Safe Boating Law Administrators (NASBLA), NASBLA Approved Education Courses (https://www.nasbla.org/education/approved-boating-courses) (19-1.g)

h. NAVMED P-5010-6, Manual of Provocative Medicine, Water Quality Afloat (https://www.med.navy.mil/Directives/All-Pubs-and-Manuals/) (19-1.h)

i. NFPA 70, National Electrical Code (NEC) (https://www.nfpa.org/Codes-and-Standards) (19-1.i)

j. NFPA 302, Fire Protection Standard for Pleasure and Commercial Motor Craft (https://www.nfpa.org/Codes-and-Standards) (19-1.j)

k. Title 33, United States Code (USC) Subchapter I (33 USC Subchapter I) - Oil Pollution Liability and Compensation (https://www.govinfo.gov/content/pkg/USCODE-2020-title33/pdf/USCODE-2020-title33-chap40-subchapI.pdf) (19-1.k)

l. USCG Form CG-835F, Facility Inspection Requirements (https://www.dcms.uscg.mil/forms) (19-1.l)

m. 33 CFR, Navigation and Navigable Waters (https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol1/pdf/CFR-2012-title33-vol1-chapI.pdf) (19-1.m)

n. 33 CFR 155, Oil or Hazardous Material Pollution Prevention Regulations for Vessels (https://www.govinfo.gov/content/pkg/CFR-2021-title33-vol2/pdf/CFR-2021-title33-vol2-part155.pdf) (19-1.n)

o. 33 CFR Part 156, Oil and Hazardous Material Transfer Operations (https://www.govinfo.gov/content/pkg/CFR-2021-title33-vol2/pdf/CFR-2021-title33-vol2-part156.pdf) (19-1.o)

p. 40 CFR 141, National Primary Drinking Water Regulation (https://www.govinfo.gov/content/pkg/CFR-2015-title40-vol23/pdf/CFR-2015-title40-vol23-part141.pdf) (19-1.p)

q. 46 CFR Shipping Subpart B – Special Rules Pertaining to Deck Cargo Barges (https://www.govinfo.gov/content/pkg/CFR-2016-title46-vol1/pdf/CFR-2016-title46-vol1.pdf) (19-1.q)

r. 46 CFR 25.30-15, Fixed Fire Extinguishing Systems (https://www.govinfo.gov/content/pkg/CFR-2022-title46-vol1/pdf/CFR-2022-title46-vol1-sec25-30-15.pdf) (19-1.r)

s. 46 CFR 58.50, Rudder Stops (https://www.govinfo.gov/content/pkg/CFR-2022-title46-vol2/pdf/CFR-2022-title46-vol2-sec58-25-50.pdf) (19-1.s)

t. 46 CFR 98.30, Portable Tanks and Intermediate Bulk Containers (https://www.govinfo.gov/content/pkg/CFR-2022-title46-vol4/pdf/CFR-2022-title46-vol4-part98-subpart98-30.pdf) (19-1.t)

u. 49 CFR 171, Hazardous Material Regulations, General Information, Regulations, and Definitions (https://www.govinfo.gov/content/pkg/CFR-2020-title49-vol2/pdf/CFR-2020-title49-vol2-part171.pdf) (19-1.u)

19-2. Definitions.

a. Crane, Floating. A rotating superstructure, power plant, operating machinery, and boom mounted on a barge or pontoon. The power plant may be installed below decks. The crane's function is to handle loads at various radii. (19-2.a)

b. Dredge. Any vessel fitted with machinery for the purpose of removing or relocating material from or in a body of water. (19-2.b)

c. Duck Pond. Openings between stationary vessels or vessels and other structures that create fully enclosed water areas (duck ponds) into which personnel could fall. (19-2.c)

d. Emergency (Marine). An unforeseen development that imposes an immediate hazard to the safety of the vessel, the passengers, the crew, the cargo, property, or the marine environment requiring urgent action to remove or mitigate the hazard. (19-2.d)

e. Floating Plant/Vessel. Used to transport personnel, work boats, floating cranes and derricks, barges, patrol boats, etc. (19-2.e)

f. Gangway. Any ramp, stairway, or ladder provided for personnel to board/leave a vessel. (19-2.f)

g. Manned Vessels. Vessels that operate with crews, quartered personnel, or that have work areas that are occupied by assigned personnel during normal work activities. (19-2.g)

h. Marine Activities. Operations and work involving proximity to or on water. (19-2.h)

i. Red Flag Barge/Vessel. A barge/vessel carrying in bulk hazardous cargoes regulated by Subchapter D (petroleum) and O (chemical) of 46 CFR Chapter I, or vessels whose primary purpose is the transporting of flammable or other hazardous cargos (for example, oil tankers, chemical parcel tankers, liquid chemical barges, liquefied gas tankers). (19-2.i)

j. Station Bill. A placard that designates vessel personnel duties and procedures to be followed in the event of an emergency or emergency drill. Placards must be

permanently placed in personnel quarters and work areas and are strategically located throughout the vessel. (19-2.j)

k. Unmanned Vessels. Vessels that carry cargo such as materials, supplies, equipment, or liquids, and do not have personnel on board during normal operations. (19-2.k)

l. Vessel. Every type of watercraft or artificial contrivance used, or capable of being used, as a means of transportation on water, including special-purpose floating structures not primarily designed for or used as a means of transportation on water. (19-2.l)

19-3. Personnel Required Qualification/Training.

a. Officers and crew must possess a current, valid USCG credential and/or correctly endorsed document according to 46 CFR 15.401 that must be posted in a public area on board the vessel. (19-3.a)

Note. Generally, vessels 100 gross tons and greater require credentialed officers and crew.

b. Motorboat Operators (vessels less than 26 feet (7.9 m) in length). All motorboat operators must complete and document the following training: (19-3.b)

(1) A boating safety course meeting the criteria of the USCG Auxiliary, NASBLA, or equivalent.

(2) Motorboat handling training based on the type of boats to be operated and taught by qualified instructors. Operators must pass a written and operational test.

(3) Current USCG licensed personnel are exempt from the boating safety course, but they must complete the written exam and operational test.

(4) Train USACE employees according to ER 385-1-91.

c. In addition to paragraphs 19-3.a and b, officers and crew of government floating plant must be licensed or credentialed by the USCG when the plant is subject to any of the following criteria: (19-3.c)

(1) The vessel is inspected and certified by USCG according to EP 1130-2-500, Appendix L.

(2) The vessel is normally engaged in or near a channel or fairway in operations that restrict or affect navigation of other vessels and is required by law to be equipped with radio-telephones of the 156-162 band frequency.

(3) The floating plant is engaged in the transfer of oil or hazardous material in bulk.

d. Operators of uninspected towing vessels, Masters, and Pilots on radar-equipped vessels 26 feet (7.9 m) and greater in length must possess a USCG Radar Observers endorsement issued by a USCG-approved training facility. (19-3.d)

e. Inspectors. All inspectors must have at least five years of experience in commercial marine plant and equipment and be accredited by the National Association of Marine Surveyors or the Society of Accredited Marine Surveyors (see para 19-5.a). (19-3.e)

19-4. Roles and Responsibilities.

a. Competent Persons (CP). Identify and control for duck ponds (see para 19-8.e). (19-4.a)

b. Vessel Operators. (19-4.b)

(1) Prepare float plans (see para 19-7-c).

(2) While operating in waters included in a small craft advisory, the sole duty of the operator is to operate the vessel.

c. Qualified Person (QP). (19-4.c)

(1) In the following circumstances, assign a QP to assist with deck duties of motorized vessels less than 26 feet (7.9 m) in length:

(a) When extended trips, including overnight trips, are made from the work site.

(b) When conditions of navigation make it hazardous for an operator to leave the wheel while underway.

(c) When operations, other than tying-in, require the handling of lines.

(d) When operating at night or during inclement weather.

(e) When towing.

(f) While a vessel is transporting crew or passengers.

(2) Perform inspections according to paragraph 19-5.

(3) Mobilize, demobilize, and relocate dredges, support barges, support tenders, tugs, and heavy equipment (see para 19-8.m).

d. Inspectors. Inspectors of other dredges, self-propelled vessels over 65 feet (19.8 m), crane barges, floating cranes, and floating plant with overnight/berthing accommodations not subject to USCG inspection and certification. Perform inspections according to paragraph 19-5. (19-4.d)

19-5. Inspection Requirements.

a. Floating Plant Inspection and Certification. (19-5.a)

(1) Ensure all USCG documentation is current for floating plants holding a USCG-issued Certificate of Inspection (COI) according to 46 CFR Part 91 before placing it in service. Post a copy of documentation in a public area on board the vessel. Make available to the USACE supervisor/KO or COR a copy of any USCG Form CG-835F (Facility Inspection Requirements) issued to the vessel in the preceding year and keep a copy on board the vessel.

(2) All dredges subject to load line regulations must obtain and maintain a valid load line. If applicable, maintain a valid USCG-issued COI according to 46 CFR Part 91 or ABS Classification Certificate. Ensure all USCG/ABS documentation is current before placing the vessel in service. Post a copy of the documentation in a public area on board the vessel. If applicable, make available to the USACE supervisor/KO or COR a copy of any USCG Form CG-835F issued to the vessel in the preceding year and keep a copy on board the vessel.

(3) Inspect annually in the working mode all other dredges, self-propelled vessels over 65-feet (19.8 m), crane barges, floating cranes, and floating plant with overnight/berthing accommodations not subject to USCG inspection and certification or not having a current ABS classification. A USCG Marine Inspector, an ABS surveyor, or a marine surveyor must perform all inspections. (See para 29-4.e)

(4) Inspect all other floating plant, motorized and non-motorized, before being placed in use and at least annually. Inspections must be completed by a QP.

(5) For all floating plants under paragraphs 19-5.a(3) and 19-5.a(4):

(a) Document the inspection using a hard copy or electronic checklist that is appropriate for the vessel being inspected that includes all 46 CFR and other applicable regulatory and safety requirements. Post a copy of the most recent inspection report in a public area on board the vessel, or, for smaller vessels, file and make available to the local SOHO/USACE supervisor/KO or COR upon request.

(b) The inspection must be appropriate for the intended use of the plant. At a minimum, include an evaluation of the structural condition, critical machinery components, watertight integrity (for example, bulkheads, seals), and lifesaving and safety devices and equipment according to NFPA 302.

(c) Conduct periodic inspections and tests to evaluate if a safe operating condition for all floating plants is being maintained.

(6) Remove from service all floating plants found in an unsafe condition and do not operate until all deficiencies have been corrected.

b. USACE Motorized Vessels (that is, less than 26 feet (19.8 m) in length) and Boat Trailers. Inspect, test, maintain, and repair vessels and boat trailers according to ER 385-1-91 and the manufacturer's instructions. (19-5.b)

(1) Inspections must be conducted and by a QP. Retain inspection records for a period of five years.

(2) Inspect all launches, motorboats, skiffs, boat trailers, and tow vehicles prior to each use and periodically using ENG Form 6175 (Small Boat (Less Than 26 Feet) and Equipment Checklist) (see para 19-10) and the manufacturer's recommendations.

c. Emergency Systems. Operate and inspect emergency lighting and power systems at least monthly to ensure proper operation (see para 19-8.b). (19-5.c)

d. Anchor Points. Inspect all anchor points prior to applying a load or putting cables under tension. (19-5.d)

e. Dredging. Conduct routine inspections of all submerged pipe to ensure anchorage (see para 19-8.m). (19-5.e)

f. Conduct documented inspections of life rings, ring buoys, and throw bags prior to placing in service and at least every six months. (19-5.f)

g. All motorboat operators must inspect and use the vessel engine cutoff device (kill switch) and safety lanyard and attach the safety lanyard to their person (exclusive use of wireless kill-switch devices are not authorized. (19-5.g)

19-6. Activity Hazard Analysis (AHA) Requirements.
Develop AHAs according to paragraphs 1-6 or 2-6, as applicable.

a. Identify locations and controls for operations where deck-edge perimeter protection is not present (see para 19-8.j). (19-6.a)

b. Include the locations and restricted activities for safe zones adjacent to Red Flag ships (see para 19-8.o). (19-6.b)

19-7. Minimum Plan Requirements.
Prior to beginning work, submit the below plans to the USACE supervisor for approval or acceptance by the KO or COR as applicable.

a. Emergency Plan for Marine Activities. Prepare an Emergency Plan for Marine Activities for response to marine emergencies (see para 19-8.b). The plan must include the following: (19-7.a)

(1) Identification of all reasonably anticipated types of emergencies (for example, fire, sinking, flooding, severe weather, man overboard, hazardous material incidents).

(2) Procedures for responding to all type of identified emergencies.

(3) Assignments of personnel and their roles and responsibilities. Include procedures to ensure personnel are trained in their assigned roles.

(4) Procedures for conducting required drills.

(5) Procedures for developing a Severe Weather Plan for Marine Activities (SWPMA) when required (see para 19-7.b).

(6) Include instructions for mustering personnel in “Abandon ship” and “man overboard” procedures.

Note. For fire, a USCG-approved fire plan meets this requirement.

b. Severe Weather Plan for Marine Activities (SWPMA). Prepare a SWPMA where floating plant, boats or other marine activities may be endangered by severe weather (for example, sudden and locally severe weather, storms, high winds, hurricanes, floods). The SWPMA must address removing or securing the plant and evacuation of personnel in emergencies to include the following: (19-7.b)

(1) A description of the types of severe weather hazards the plant, boats, or other marine activities may potentially be exposed to and the steps that will be taken to guard against the hazards.

(2) The time frame for implementing the plan using as a reference the number of hours remaining for the storm to reach the work site if it continues at the predicted speed and direction. Include the estimated time to move the plant to safe harbor after movement is started.

(3) The name and location of the safe location(s).

(4) The name of the vessel(s), type, capacity, speed, and availability that will be used to move any non-self-propelled plant or commercial towing companies, if applicable.

(5) River and tide gage readings at which the floating plant must be moved away from dams, river structures, etc., to safe areas.

(6) Method for securing equipment if not moved.

c. Float Plans. Vessel operators must prepare a Float Plan when engaged in surveying, patrolling, or inspection activities that are remote and are expected to take longer than 4 hours, or anytime an operator is traveling alone. File the plan with the boat operator's supervisor. The plan must address at least the following: (19-7.c)

(1) Vessel information (make and model or local identifier).

(2) Personnel on board.

(3) Activity to be performed and who is responsible to perform what actions.

(4) Expected time of departure, route, and time of return.

(5) Means of communication. Provide adequate means of communication.

(6) Control measures to be implemented when operating in waters covered by a small craft advisory (see para 19-6)

d. Tow Plans. Prepare a Tow Plan prior to conducting towing operations outside of a port. The plan must include the following: (19-7.d)

(1) What is being towed: name, type of vessel, characteristics (for example, length, width, draft).

(2) Owners of towed and towing vessels with contact information.

(3) Type of tow: stern, hip, or push.

(4) Riding crew: list of crew riding the tow.

(5) Special safety requirements and plan for safety briefings.

(6) Seaworthiness and hull inspection of the tow: stability, ballast type and amount, sea valves secured, and watertightness of openings.

(7) Emergency equipment and location: emergency pumps, hoses, and flooding alarms.

(8) Navigation information: departure and arrival locations, route, and communication procedures.

19-8. General Requirements.

a. Severe Weather and High Flow Precautions. (19-8.a)

(1) Prior to conducting towing operations outside of a port, submit a Tow Plan to the USACE supervisor/KO or COR according to paragraph 19-7.d.

(2) Before extended movement of floating plant and tows, conduct an evaluation of weather reports and flow conditions to ascertain that safe movement of the plant and tow can be accomplished.

(3) Evaluate weather reports and conditions before performing work or task orders to ascertain that safe working conditions exist and safe refuge of personnel is assured. When working in an exposed marine location, monitor the National Oceanic and Atmospheric Administration (NOAA) marine weather broadcasts and use other commercial weather forecasting services as may be available.

(4) All personnel on decks exposed to severe weather must wear the appropriate USCG approved PFD (that is, Types I, II, III, V) regardless of other safety devices used (see chapter 5).

(5) A sufficient number of vessels of adequate size and horsepower, each designed, outfitted, and equipped for towing service, must be available at all times to move both self- and non-self-propelled plants against tides, current, and winds during severe weather conditions.

(6) Do not operate floating plants in sea or weather conditions that go beyond the vessel's design limitations.

b. Emergency Planning. Vessels must follow USCG-applicable regulations for drills, equipment, inspections, training, and log keeping according to 46 CFR Part 199.180 and USCG COI requirements. (19-8.b)

(1) Prepare a station bill, setting forth the special duties and the duty station of each crewmember for various emergencies, and post it in conspicuous locations throughout the vessel.

(2) Provide each crewmember with a written description of their emergency duties and ensure that they are familiar with them and the vessel's emergency signals.

(3) On all floating plants that have a regular crew or on which people are quartered, conduct the following drills at least monthly during each shift, unless the vessel is required by USCG regulations to be drilled more frequently: abandon ship/boat drills, fire drills, and person overboard or rescue drills.

(a) Conduct the first set of drills within 24 hours of the vessel's occupancy or commencement of work.

(b) Where crews are quartered at night, include night drills within every four sets of drills. Conduct the first set of night drills within the first two weeks of the vessel's occupancy.

(c) Drills must include, where appropriate, how to handle a pump shell or pipe rupture or failure within the hull (for example, proper shutdown procedures, system containment), how to handle leaks or failures of the hull or portions of it (for example, what compartments to secure, how to handle power losses, pulling spuds to move to shallow water), and how to set up and operate portable emergency pumps.

(4) Conduct person overboard or rescue drills at least monthly at boat yards, locks, dams, and other locations where marine rescue equipment is required.

(5) Operate and inspect emergency lighting and power systems at least monthly to ensure proper operation.

(a) Operate under load all internal combustion engine driven emergency generators for at least two hours each month.

(b) Test storage batteries for emergency lighting and power systems at least once every two months.

(6) Record all drills and emergency system checks, including any deficiencies noted in equipment and corrective action taken, in the station bill.

(7) Assign at least one person to be on watch on all floating plants where personnel are quartered to guards against fire and provide watch person service. In lieu of a watch person, an automatic fire detection and fire and emergency warning system(s) can be used. (See para 19-8.c)

c. Equipment Requirements. (19-8.c)

(1) Provide fenders to prevent damage and sparking and to provide safe areas for workers exposed to pinching situations caused by floating equipment.

(2) Provide potable drinking water on all floating vessels according to 40 CFR 141 and NAVMED P-5010-6 from a potable water source which meets the federal and state requirements or, if generated on the vessel, the water is tested to ensure compliance with federal and state drinking water requirements (see para 35-8.b).

(a) Dedicate all hoses, pumps, and valves to be used potable drinking water only. Rinse before each use.

(b) Before connecting at shore side, flush the supply water for at least 30 seconds.

(c) After transfer is complete, first remove the vessel hose, then remove the shore side hose, then again flush the water supply source, and finally cap the source.

(d) Drain all hoses, pumps, and valves after each use.

(e) Chemically or mechanically disinfect the storage tanks on vessels when the water fails to meet two consecutive drinking water tests.

(3) Keep axes or other emergency cutting equipment on towing vessels and other floating plants (for example, work barges, floating cranes) sharp and locate them in accessible positions for immediate use (for example, freeing lines).

(4) Provide signal devices on all vessels to give signals required by the navigation rules applicable to the waters on which the vessel is operated.

(5) Locate all controls requiring operation in cases of emergency (for example, boiler stops, safety valves, power switches, fuel valves, alarms, fire extinguishing systems) so that they are protected against accidental operation but are readily accessible in an emergency.

(6) Electric lights used on or around gasoline and oil barges or other marine locations where a fire or explosion hazard exists must be explosion-proof or approved as intrinsically safe.

(7) Install and maintain general alarm systems on all floating plants where it is possible for either a passenger or crewmember to be out of sight or hearing from any other person.

(a) Where general alarm systems are used, operate them from the primary electrical system with standby batteries on trickle charge that will automatically furnish the required energy during an electrical-system failure.

(b) Place a sufficient number of signaling devices on each deck so that they can be distinctly heard above the normal background noise and seen at any point on the deck.

(c) Interconnect all signaling devices so that actuation can occur from at least one strategic point on each deck.

(8) Smoke alarms are required in all living quarters on floating plants. If wired, the smoke alarms should use the same electrical system as that of the electrical alarms.

(9) For floating plants with internal combustion engines, install and maintain marine quality listed CO monitors in all enclosed occupied spaces (for example, crew quarters, pilot houses).

(10) All doors must be capable of being opened from either side and provided with positive means to secure them in both the open and closed position.

(11) Mark all escape hatches and emergency exits on both sides with letters at least 1 inch (2.5 cm) high stating "EMERGENCY EXIT - KEEP CLEAR”.

(12) Each prime mover (for example, engine, turbine, motor) driving a dredge pump must be capable of being stopped by controls remote from the prime mover locations.

(13) Shore powered receptacles must have a grounding conductor to prevent potential difference between the shore and the vessel.

(14) Provide all electrical circuits in toilet or shower spaces, galley, machinery spaces, weather deck, exterior, or within 3 feet (0.9 m) of any sink and fit them with GFCI protection (see chapter 11).

(a) Connect all cord connected equipment used in any of these areas to an outlet with GFCI protection.

(b) Conspicuously mark ground-fault protected receptacles as “GFCI PROTECTED.”

(15) Where appropriate, vessels should have watertight compartments readily identified and properly maintained in a watertight condition (that is, sealable doors in place, fully functional). Maintain penetrations in a watertight condition.

(16) Properly guard all reciprocating, rotating, and moving parts of winch gears and other equipment.

(17) Outfit and operate all self-propelled vessels conducting independent hydrographic survey work in or near a commercial channel or shipping fairway and in a manner likely to restrict or affect navigation of other vessels, with an Automatic Identification System (AIS).

Note. Small vessels supporting active dredging operations that are not normally dedicated to survey work but performing temporary hydrographic survey work, are not required to carry AIS.

d. Fuel Systems and Fuel Transfers. Floating plant fuel systems and fuel transfer operations must be performed according to 33 USC Subchapter I, as applicable. (19-8.d)

(1) Do not install gauge glasses or trycocks on fuel tanks according to 46 CFR 58.50.

(2) Install a shutoff valve at the fuel tank connection. Locate the valve so that it can be operated from outside the compartment in which the tank is located, from outside the engine compartment, and outside the house bulkheads at or above the weather deck of the vessel.

(3) When the length of the supply pipe is greater than 6 feet (1.8 m), install a shutoff valve at the engine end of the fuel line.

(4) Equip all carburetors on gasoline engines with a backfire trap or flame arrestor.

(5) Provide all carburetors, except down-draft type, with a drip pan with flame screen that is continuously emptied by suction from the intake manifold or by a waste tank.

(6) Dike, curb, or control by other means all USCG compliant fuel and lubricant containers and tanks in order to contain the tank contents in case of leakage. Follow the leakage and discharge containment requirements of 46 CFR 98.30-17 and 33 CFR 155.320.

(7) Conduct fuel oil transfers for floating plants according to 33 CFR 155, and 33 CFR 156. For uninspected vessels, follow the USCG requirements in 33 CFR 156.120, 33 CFR 155.320, and 46 CFR 98.30-15 for fuel coupling devices and fuel oil discharge containment.

(8) Indicate the tank boundary on all decks, overheads, and bulkheads that serve as fuel oil tank boundaries with contrasting paint and label with “FUEL OIL TANK - NO HOT WORK.”

e. Safe Practices. (19-8.e)

(1) Clearly mark any obstructing cables or lines that cross waterways between floating plants or between plants and mooring.

(2) Prevent accumulation of fuel and grease on floors, decks, and in bilges.

(3) Swimming or diving is prohibited, except for certified divers in the performance of their duties to prevent injury or loss of life or during required training, or as a component of ER 385-1-91 related motorboat operator training.

(4) Wading is allowed only when there are no severe underwater hazards (for example, sudden drop-offs, heavy surf above 3 feet (1 m), dangerous aquatic life). When personnel are wading, they must wear an approved PFD (see chapter 5) and be

monitored by personnel who are nearby and equipped to conduct a rescue, if needed. Discontinue wading when the feet cannot easily touch bottom, regardless of depth.

(5) Consider any person in the water as a person overboard. Take appropriate action.

(6) When barriers or blanks are installed in piping systems as a lockout procedure, use positive means (for example, protruding handles) to easily recognize their presence. Mark barriers (that is, name of installer, name of inspector, date of installation) and account for them prior to installation and subsequent to removal. (See chapter 12)

(7) Limit deck loading to safe capacity. Secure loads and provide holdbacks or rings to secure loose equipment during rough weather.

(8) Protect deck openings and other fall hazards not addressed by paragraph 19-8.j according to chapter 18.

(9) Provide safeguards, such as barriers, curbs, or other structures, to prevent front-end loaders, bulldozers, trucks, backhoes, track hoes, and similar operating equipment on floating equipment from falling into the water. Whenever this equipment is operating on deck, deck surfaces of the floating plant must remain above water and the entire bottom area of a floating plant must remain submerged. Align equipment operations on floating plants with chapters 16 and 18.

(10) Eliminate projection and tripping hazards or identify them with warning signs or distinctly mark them with safety yellow.

(11) Place deck cargo carried on fuel barges on dunnage.

(12) When two or more pieces of floating plant are being used as one unit, securely fasten them together to prevent openings between them or cover and guard the openings.

(13) When three or more floating plants are configured for stationary work, a CP must identify any openings between decks of stationary vessels or vessels and other structures that create fully enclosed water areas (that is, duck ponds) into which personnel can fall. If such openings are detected, take measures to protect personnel from the hazard.

(a) When practical, duck pond protection must consist of guardrails, nets, or other physical barriers to prevent employees from falling into the openings.

(b) When physical barriers are not practical, install ladders and ring buoys in each enclosed water area to allow personnel to self-rescue. Ladders must be a rigid type or Jacob’s ladder and must be securely anchored to the vessel or structure. Ring buoys

must have a sufficient length of rope to allow them to float on the water surface and the rope must be securely anchored to the vessel. Provide a sufficient number of ladders and ring buoys and place them so that the maximum swimming distance to them is no more than 25 feet (7.6 m). Ladders and ring buoys may be retracted during reconfiguration or movement of the plant.

(14) Clearly identify anchor points and inspect them prior to applying a load or putting cables under tension. Cut out, remove, or weld over structurally unsound anchor points to preclude usage. Make visual checks and sound “all clear” warnings prior to tensioning cables.

(15) Make provisions to protect persons being transported by water from the elements.

(16) Designate within plant fleeting areas where all idle plants must be moored. Mark areas with warning buoys, signs, and lights in prominent locations.

(17) The USACE supervisor/KO or COR must provide information to the local USCG Office identifying the marine activity and hazards.

(18) Use mechanical means such as securing pins to hold spuds safely in place before transiting from one site to another.

(19) Perform work inside confined and enclosed spaces in ships and vessels according to chapter 34.

(20) When there is a potential for marine activities to interfere with or damage utilities or structures, including those underwater, conduct a survey to identify the utilities or structures in the work area and the recommended steps to be taken to prevent interference or damage.

f. Life Rings and Ring Buoys. (19-8.f)

(1) On USCG-inspected vessels, ring buoys must have automatic floating electric water lights according to 46 CFR 160.

(2) On all other floating plants, lights on life rings are required only in locations where adequate general lighting (for example, floodlights, light stanchions) is not provided. For these plants, at least one life ring and every third one thereafter must have an automatic floating electric water light attached.

(3) Life rings (that is, rope attachment not required) and ring buoys (that is, rope attachment required) must be USCG-approved and must have at least 60 feet (18.3 m) of five-sixteenth (5/16) inch (7.9 mm) solid braid polypropylene line, or equivalent, attached to the ring buoy. Throw bags may be used in addition to life rings or ring buoys. Store them in such a manner as to allow immediate deployment and so they are

protected from degradation from weather and sunlight. Make life rings or ring buoys readily available and provide them at the following places:

(a) On all motorboats up to 26 feet (7.9 m) in length, at least one 20 inches (50.8 cm) in diameter.

(b) On all motorboats greater than 26 feet (7.9 m) and up to 65 feet (19.8 m) in length, at least one 24 inches (61 cm) in diameter.

(c) On all motorboats greater than 65 feet (19.8 m) in length, a minimum of three life buoys of not less than 24 inches (61 cm) and one additional for each increase in length of 100 feet (30.5 m) or fraction thereof.

(4) For additional life ring requirements during stationary work from floating plant, see paragraph 19-8.e.

g. Ventilation. (19-8.g)

(1) Equip motor vessels or boats powered by internal combustion engines having electric spark ignition systems or having auxiliary engines of this type in cabins, compartments, or confined spaces with an exhaust fan(s) for ventilating engine space and bilges.

(2) Provide at least two ventilators fitted to remove any flammable or explosive gases. The ventilators must have fans capable of ventilating each machinery space and fuel tank compartment, including bilges. Ventilators are not required for vessels constructed with the greater portions of the bilges open or exposed to the natural atmosphere at all times.

Note. This requirement does not apply to diesel engines.

(3) Adequately ventilate living spaces, including the galley, in a manner suitable to the purpose of the space.

(4) For launches and motorboats having diesel power plants not equipped with fans, ventilate by natural draft through permanently open inlet and outlet ducts extending into the bilges. Equip inlet and exhaust ducts with cowls or exhaust heads.

(5) For launches, motorboats (for example, survey boats), and skiffs having deck-mounted internal combustion engines (for example, generators, jigger pumps) and not equipped with fans, locate the exhaust piping away from personnel spaces to minimize CO infiltration in the workspace.

(6) Vent and ventilator requirements.

(a) Fans must be rated for Class I hazardous locations and located as remotely from potential explosive areas as practical (see chapter 11).

(b) The vent intake must extend to within 1 foot (0.3 m) of the bottom of the compartment.

(c) In case of fire, provide means for stopping fans in ventilation systems serving machinery components and for closing doorways, ventilators, chases, and annular spaces around tunnels and other openings from outside these spaces.

(7) Do not start engines until the engine space and bilges have been ventilated to remove fuel vapor.

h. Access. (19-8.h)

(1) General.

(a) Secure, guard, and maintain means of access free of slip and trip hazards (see chapter 24).

(b) Provide non-slip surfaces on working decks, stair treads, ship ladders, platforms, catwalks, and walkways, particularly on the weather side of deck doorways.

(c) Do not use double rung or flat tread type Jacob's ladders unless no safer form of access is practical. When in use, they must hang without slack and be properly secured.

(d) Vertical ladders must comply with ASTM F1166.

(e) No more than one person at a time can climb a ladder between the same set of rails.

(2) Access To/From Vessels.

(a) Provide safe means for boarding or leaving a floating plant, to include guarding, to prevent persons from falling or slipping. Avoid walking on rip-rap, where practical.

(b) Wherever there is a break of 19 inches (48.3 cm) or more in elevation at personnel points of access, provide a stairway, ladder, ramp, gangway, personnel hoist, or other safe means of access.

(c) Ramps for access of equipment and vehicles to or between vessels must be of adequate strength, be provided with sideboards, and be well maintained.

(d) Gangways and ramps must be:

(d-1) Secured at one end by at least one point on each side with lines or chains to prevent overturning.

(d-2) Supported at the other end in such a manner to carry them and their normal load during use in the event they slide off their supports.

(d-3) Placed at an angle no greater than that recommended by the manufacturer.

(d-4) Provided with a standard guardrail. Toe boards are optional depending on their usefulness and the hazard involved. (See chapter 21)

(3) Access on Vessels.

(a) Provide vertical access between various decks by means of stairs, ramps, or vertical ladders installed according to ASTM F1166.

(b) Do not pass fore and aft, over, or around deck loads unless there is a safe passage.

(c) If cargo or materials are stored on deck of barges, scows, floats, etc., do not use the outboard edge as a passageway unless at least 2 feet (0.6 m) of clearance is maintained.

(d) Limit vessel loads so that access and passageways in use will remain above the waterline. Except in an emergency, do not use decks and passageways for access if submerged or subject to constant breaking waves.

(4) Emergency Access.

(a) Equip vessels not easily boarded from the water with the following:

(a-1) At least one portable or permanent ladder of sufficient length to allow a person to self-rescue by boarding the ladder from the water.

(a-2) Other methods or means designed to assist in the rescue of an incapacitated person overboard.

(b) Provide two means of escape for normal work, assembly, sleeping, and messing areas on floating plants.

(c) Maintain means of access safe and functional.

(5) Access on Floating Pipelines.

(a) Equip floating pipelines used as accessways with a walkway and handrail on at least one side (see chapter 24).

(b) Walkways must be at least 20 inches (50.8 cm) wide and anchored to the pipeline.

(c) Personnel on pipelines must wear PFDs at all times (see chapter 5).

(d) When walkways and handrails are not provided (that is, the pipeline is not intended for access), barricade the pipeline at both ends to prevent access by anyone.

i. Marine Fall Protection Systems. (19-8.i)

(1) On decks or work surfaces 6 feet (1.8 m) or more above the main deck or adjacent vessel decks, docks, or other hard surfaces, provide Railing Type A or Type B according to paragraph 19-8.k., or bulwarks, coamings, or other structures meeting the height and strength requirements of these railing systems, except as excluded in paragraphs 19-8.i(3) and 19-8.i(4).

(2) Provide deck edge toe boards at least 3.5 inches (8.9 cm) high for Type A and 2 inches (5.1 cm) high for Type B railings when the railings are used for fall protection. Toe boards must meet the strength requirements in chapter 21. Install scuppers and/or drainage holes as needed if the top edge of the toe board is intact and the strength requirements are retained.

(3) When railing systems are not installed, use personal fall protection systems according to chapter 21.

(4) Railing systems and personal fall protection systems are not considered feasible on the main deck of vessels that perform duty cycle material loading and unloading operations from barges, scows, or other vessels alongside.

j. Main Deck Perimeter Protection. (19-8.j)

(1) Provide main deck perimeter protection on all manned vessels according to paragraph 19.8.k. See paragraph 19-8.j(5) for applicable exceptions to this requirement.

(2) Provide manned vessels over 26 feet (7.9 m) in length operating in unprotected or partially protected waters, as defined in 46 CFR 175.400, with Type B Railings around the deck edge, except where excluded in paragraph 19-8.j(5).

(3) Provide manned vessels over 26 feet (7.9 m) in length operating in rivers or protected waters with Type B or Type C Railings around the deck edge, except where excluded in paragraph 19-8.j(5).

(4) Provide Type D Grab Rails on all manned vessels in the following instances:

(a) On deckhouses or other similar permanent structures more than 48 inches (121.9 cm) from deck edge rail systems.

(b) On deckhouses or similar permanent structures that are within 8 feet (2.4 m) of the deck edge in areas where the deck edge rail has been omitted or temporarily removed according to paragraph 19-8.j(5).

(5) The following are main deck areas where perimeter protection may be omitted or temporarily removed:

(a) Deck perimeter rails may be omitted from deck work areas specifically intended for line handling, working over the side of the vessel, load handling operations, and designated boarding areas. Railings in these areas may obstruct work or access and present additional hazards such as pinch points against railings. Such deck edge areas may include those for line handling, fleeting scows, mooring vessels, towing, pile driving activities, and handling or placing of construction materials and equipment pipelines and anchors.

(b) Deck perimeter rails may be omitted from main deck areas where the overall walkway width is less than 2 feet (0.6 m) between deck structures or permanent equipment and the deck edge.

(c) Removable perimeter rail sections may be installed in areas where activities such as working over the side of the vessel or loading operations are performed. Maintain these rails in place when vessel operations do not include activity in these areas or during periods of tie-up or inactivity.

(6) When deck-edge perimeter protection is not present, develop standard operating procedures, AHAs, or other documents to address the hazards involved and the controls to be implemented to prevent persons from falling. All crew members must review these documents during initial orientation and at regular intervals thereafter. The following operational procedures must be followed:

(a) Personnel must wear PFDs in areas where deck perimeter protection is not present (see chapter 5).

(b) Block off areas where railings are removed from access by a suitable barrier, or clearly mark them as PFD-required areas by signage, deck markings, or other means.

(c) Maintain continuous sight and verbal or radio contact between personnel in the non-protected deck perimeter areas and the vessel operator, or a designated crew member who is in sight and verbal or radio contact with the operator and who will monitor the workers in the area.

(d) A safety skiff or equivalent rescue vessel must be readily available throughout the duration of these activities according to chapter 5.

(7) Provide boats under 26 feet (7.9 m) with integrated combinations of two or more of the below listed items to provide continuous perimeter protection around the vessel. Install them according to either ABYC Standards or ISO Standard 15085, as demonstrated by a manufacturer's certificate, label, or other documentation.

(a) Cockpits.

(b) Coamings.

(c) Handholds.

(d) Toe rails.

(e) Life rails.

(f) Deck rails.

(g) Stern rails.

(h) Bow rails.

k. Marine Railing Types. (19-8.k)

(1) Allowable types of railings on vessels (that is, A, B, C, D) are identified below. Specific requirements for the vessel types and areas where each are to be used are delineated in paragraphs 9-8.i and 19-8.j.

Note. Solid bulwarks or coamings providing equal perimeter protection to a height of 39 in (1 m) may also be provided. Bulwarks may be constructed of structural plate and shapes. Bulwarks must meet all strength, deflection, and open spacing requirements presented below for Type B railings.

(2) Railing Type A: Two-Tier Rigid Fall Protection Rail. This railing type must meet the requirements of a guardrail system according to chapter 21 (see figure 19-1).

(3) Railing Type B: Three-Tier Marine Rigid or Tensioned Railing. This railing is comprised of rigid vertical stanchions and three rigid or tensioned horizontal tiers and must meet the following (see figure 19-2):

(a) Clear spacing between tiers must be no greater than 9 inches (22.9 cm), 15 inches (38.1 cm), and 15 inches (38.1 cm), respectively, where the 9 inches (22.9 cm) space is closest to the deck surface. The height from the deck to the top tier must be at least 39 inches (99 cm).

(b) The bottom tier may be omitted if it is in the way of deck fittings or to facilitate line handling. The space resulting from the removed lower tier cannot extend more than 2 feet (0.6 m) beyond either side of the deck fitting.

(c) Vertical stanchions must be pipe or structural sections. Horizontal tiers must be constructed from rigid (for example, pipe, structural sections) or non-rigid (for example, wire rope, chain) components or from combinations of these components. Tension non-rigid tiers with turnbuckles or similar components.

(d) Railings may be either fixed or removable in sections. All vertical stanchions must be adequate to withstand a 200 lbs. (90.7 kg) load applied horizontally at the top of the stanchion and be spaced no more than 8 feet (2.4 m) apart.

(e) Size pipe and structural section rail components appropriately to meet the performance criteria of chapter 21.

(f) Chain or wire rope and all the associated connection fittings together must have minimum breaking strength of 4,000 lbs. (1814.4 kg).

(g) Tension the chain or wire rope horizontal tiers so that:

(g-1) There is no slack.

(g-2) Sag does not exceed one-quarter (¼) inch (0.6 cm) at any point between stanchions.

(g-3) The lowest point from deck to the top of the upper rail is not less than 39 inches (99 cm) at any point between the stanchions. Tensioned railing tiers must not deflect more than 1 inch (2.5 cm) under a load of 200 lbs. (90.7 kg).

(4) Railing Type C: Non-Tensioned Railings and Flexible or Swing-Away Railings. This railing must consist of rigid vertical stanchions with horizontal non-tensioned chain, wire rope, or rigid tiers that clip to the verticals (see figure 19-3).

(a) Non-Tensioned Railings must consist of horizontal tiers constructed from chain, wire rope, pipe, or structural sections or combinations of these components.

Vertical stanchions must be pipe or structural sections. Vertical support spacing must not exceed 8 feet (2.4 m).

(b) Flexible or Swing-Away Rails must consist of chain or wire rope tensioned vertical support lines with non-tensioned chain, wire rope, or clip-on rigid horizontal tiers. Vertical support line spacing must not exceed 6 feet (1.8 m).

(c) Size pipe or structural section rail components appropriately to meet the performance criteria of chapter 21. Chain or wire rope and all the associated connection fittings together must have minimum breaking strength of 4,000 lbs. (1814.3 kg).

(d) For Non-Tensioned Railings and Flexible or Swing-Away Railings, sag of horizontal tiers must not exceed 3 inches (7.6 cm) between vertical supports.

(e) Configure Non-Tensioned Railings and Flexible or Swing-Away Railings with four or more horizontal tiers. The number of horizontal tiers must be sufficient to meet the following requirements:

(e-1) Effective clear spacing between the deck and bottom tier is no greater than 9 inches (22.9 cm).

(e-2) Effective clear spacing between all tiers above the bottom tier is no greater than 15 inches (38.1 cm).

(e-3) Effective minimum height from deck to the top tier must be at least 39 inches (99 cm).

(f) The effective tier spacing includes the effect of the increased spacing associated with sag in the tiers, applied either up or down. Make clear spacing measurements with the railing tiers spread to form the largest opening.

(g) To account for the sag, measure for the minimum railing height at the lowest point in the rail.

(h) The bottom tier may be omitted in way of deck fittings or to facilitate line handling. The space caused by the removed lower tier cannot extend more than 2 feet (0.6 m) beyond either side of the deck fitting.

(i) The top tier must not deflect to a height less than 39 inches (99 cm) above the deck under a force of 200 lbs. (90.7 kg), applied vertically. In addition, the top tier must not deflect more than 12 inches (30.4 cm) horizontally under a force of 200 lbs. (90.7 kg) applied horizontally.

(j) Tensioning springs in the vertical support lines, if provided, must be of the compression with drawbar type.

(5) Railing Type D: Grab Rails. Grab rails are railing sections mounted to deckhouse sides or to the sides of other permanent structures.

(a) Grab rail height must match the height of the deck top rail or tier. Where there is no top rail near the grab rail, grab rail height must be 39 inches (99 cm).

(b) Grab rail strength must be adequate to withstand a 200 lb. (90.7 kg) load applied in any direction.

(c) Size grab rails dimensionally comparable to 1.5 inch (3.8 cm) pipe. Clear distance between the rail and house side must be at least 3 inches (7.6 cm).

l. Launches, Motorboats, and Skiffs. (19-8.l)

(1) Personnel and Cargo Requirements.

(a) Post the maximum number of personnel and weight that can safely be transported on all launches, motorboats, and skiffs. The number of personnel, including crew, must not exceed the number of PFDs aboard.

(b) Each boat must have sufficient room, freeboard, and stability to safely carry the cargo and number of persons allowed with consideration given to the weather and water conditions in which it will be operated.

(c) Launches, motorboats, and skiffs less than 20 feet (6.1 m) in length must meet 33 CFR 183 requiring level floatation after flooding or swamping.

(d) Equip all open cabin launches or motorboats with engine cut-off devices (that is, “kill switches”). The vessel operator must be tethered via lanyard to the engine cut-off device and must test the device prior to each operation. Operators may supplement the lanyard tether with additional fail safes, such as wireless engine cut-off devices, but a lanyard system must be in place and used by the vessel operator while underway. Exclusive use of wireless engine cut-off devices is not authorized.

(2) Fire Protection.

(a) Equip all launches and motorboats, including outboards, with fire extinguishers according to table 19-1.

(b) Equip all launches and motorboats having gasoline or liquid petroleum gas power plants or equipment in cabins, compartments, or confined spaces with a built-in automatic CO_2 fire extinguishing system meeting the requirements of 46 CFR 25.30-15.

(3) Lifesaving and/or safety skiffs are required during construction activities where work is performed over or immediately next to water or during any operations and

maintenance activities that cause an employee to work outside the designated permanently installed safety controls (that is, guardrails).

(a) Provide personnel trained in launching and operating the skiff readily available during working hours (see para 29-3.b).

(b) Skiffs must be readily available during working hours. During construction activities, have at least one skiff immediately available at locations where employees work over or immediately next to water. Skiffs must be kept afloat or ready for instant launching.

(c) Lifesaving personnel must perform a lifesaving drill, including the launching and recovery of the skiff before the initiation of work at the site and periodically thereafter as specified by the USACE supervisor/KO or COR (but at least monthly or whenever new personnel are involved).

(d) Required equipment must be on board and meet or exceed USCG requirements and the requirements of this chapter. Skiffs must be equipped as follows:

(d-1) Four oars, or two if the skiff is motor powered.

(d-2) Oarlocks attached to gunwales or the oars.

(d-3) One ball-pointed boat hook.

(d-4) One ring buoy with 60 feet (18.3 m) of three-eighths (3/8) inch (0.9 cm) solid braid polypropylene, or equivalent, line attached.

(d-5) PFDs in number equaling the skiff rating for the maximum number of personnel allowed on board.

(d-6) One 1-A:10B:C fire extinguisher.

(d-7) In locations where waters are rough or swift, or where manually operated boats are not practical, provide a power boat suitable for the waters and equip it for lifesaving.

(d-8) Skiffs and power boats must have buoyant material capable of floating the boat, its equipment, and the crew.

(d-9) Equip vessels without permanently mounted navigation lights (for example, skiffs), with portable battery-operated navigation lights and use them during night operations.

m. Dredging. (19-8.m)

(1) Prior to repair or maintenance on the pump, suction, or discharge lines below the water line or within the hull, raise the ladder (that is, drag arm) above the waterline and positively secure it. This provision is in addition to the normal securing of hoisting machinery. Blank or block plates must also be set in suction or discharge lines, as appropriate.

(2) Dredge pipelines that are floating or supported on trestles must display appropriate lights at night and in periods of restricted visibility according to USCG regulations and 33 CFR 83.27.

(3) Submerged and Floating Dredge Pipeline.

(a) Where a pipeline crosses a navigation channel, the pipeline must be submerged and any anchor securing the pipeline must rest on the channel bottom. Provide the depth of the submerged pipeline to the USCG for publication.

(a-1) Whenever buoyant or semi-buoyant pipeline is used, the dredge operator must assure that the pipeline remains fully submerged and on the bottom. Whenever it is necessary to raise the pipeline, maintain proper clearances and adequately mark the entire length of the pipeline.

(a-2) Mark submerged pipelines according to local USCG requirements and as required by the USACE supervisor/KO or COR.

(a-3) Unless otherwise specified by the USCG, submerged pipelines require special marks and must have a USCG-approved flashing yellow light.

(a-4) Place indicators, such as signs or buoys that state “DANGER SUBMERGED PIPELINE” at the beginning and end of the pipeline.

(a-5) In addition, indicators are required beginning in areas which reduce the charted depth by more than 10%, and, as a minimum, every 1000 feet (304.8 m) to clearly warn of the pipeline length and course.

(a-6) If barges or other vessels are used to anchor the beginning or end of the submerged pipeline, they must be lighted according to 33 CFR 83.30.

(a-7) Within a navigation channel, identify each end of the pipeline with a regulatory marker buoy.

(a-8) Identify lengths of submerged pipeline that are located outside of the navigation channel and that reduce the charted depth by more than 10 percent with high visibility buoys marked with 360-degree visibility retro-reflective tape. An acceptable

arrangement is orange neoprene buoys placed at an interval not to exceed 500 feet (152.4 m) that clearly show the pipeline length and course.

(a-9) Conduct routine inspections of the submerged pipe to ensure anchorage.

(a-10) Remove all anchors and related material when the submerged pipe is removed.

(b) Floating pipeline is any pipeline that is not anchored on the channel bottom. Pipelines must be either fully floating or fully submerged. Do not allow pipelines to fluctuate between the water surface and the channel bottom.

(c) Mark all pipelines with the owner's name for positive identification in the event of loss (that is, adrift) or damage to vessels operating in the area.

(4) Identification and avoidance of submerged and buried pipelines and obstructions.

(a) Prior to the start of any dredging, the dredger must conduct a thorough investigation to identify any underwater or underground pipeline utility lines that exist within the project area, to include the navigation channel, its set back, and the dredged material placement facility. Verify all pipeline information provided in USACE contract documents.

(b) Precautionary measures such as no spud, no anchor, no dredge, and tolerance zones must be understood, agreed to, and in place before the project begins. Communicate these zones on all project documents and strictly enforce them during the project.

(c) Identify temporary submerged obstructions and dangers, such as anchors and supporting rigging, and review them at least once per shift, if not more often as the situation changes.

(5) Design dredges so that a failure or rupture of any of the dredge pump components, including dredge pipe, will not cause the dredge to sink. Make the data or plans supporting this capability available to the USACE supervisor/KO or COR upon request.

(6) A QP must perform mobilization, demobilization, and relocation of dredges, support barges, support tenders, tugs, and heavy equipment.

(7) Hopper dredges must offer a safe means and process to load and unload personnel.

(8) Any dredge that has a dredge pump below the waterline must have a bilge alarm or shutdown interface.

(9) Secure covers of "stone boxes" with at least two positive means when the boxes are working under positive pressure.

(10) Dredge Disposal Sites.

(a) Drinking water. Provide an adequate supply of drinking water at all dredge disposal sites according to chapter 35. Provide cool water during hot weather.

(b) Toilet facilities. Provide toilet facilities according to the requirements of chapter 35.

(c) Medical and first-aid requirements. Provide first-aid and CPR trained personnel and medical equipment according to chapter 3 at all disposal areas.

(d) Operate amphibious excavators according to the manufacturer's operating instructions. Keep a copy of the operator's manual with the equipment. (See chapter 18)

(e) Lighting. Provide lighting according to chapter 7 of this manual. The minimum lighting level in the vicinity of the disposal site shelter (that is, dump shack) is 5 foot-candles.

(f) Disposal Site Shelters (Dump Shacks)

(f-1) Provide disposal site shelters (dump shacks) to protect personnel from inclement weather and environmental hazards. The shelter must be large enough to accommodate a minimum of four workers. The shelter must have adequate seating for the workers, heating equipment, water cooler, and space to store all hand tools and PPE. The shelter must be weather tight with operable windows with screens for ventilation.

(f-2) All electrical systems must comply with the NFPA 70 (NEC). All flexible electrical cords must be hard usage or extra-hard usage. All frayed, patched, oil-soaked or worn electrical cords must be taken out of service. (See chapter 11)

(f-3) Portable generators used for lighting must comply with the requirements of chapter 11 of this manual and must be located downwind of shelters.

(f-4) Do not use fossil fuels for heating.

(f-5) Cover all rigid insulation with a non-combustible material to prevent accidental ignition.

(f-6) Equip all shelters with a minimum of one multi-purpose fire extinguisher (see chapter 9).

n. Scows and Barges. (19-8.n)

(1) Equip scows that dump in open ocean waters with remote opening devices to preclude the transfer of personnel between the vessels.

(2) Provide a safe means for transferring personnel between the towing vessels and scow according to paragraph 19-8.h(2).

(3) Identify general and site-specific adverse weather and water conditions (for example, currents) under which the towing of scows or cargo barges is prohibited.

(4) All barges and scows that are used as deck cargo barges must comply with 46 CFR Subpart B for intact stability of deck cargo barges.

(5) Use personal fall protection devices or other fall protection according to chapter 21 and paragraph 19-8.i on all scows and open barges to prevent personnel transiting between the stern and bow of the vessel from falling into the hopper or falling off the side of the vessel to structures (for example, dock, vessels) located 6 feet (1.8 m) or more below.

o. Navigation Locks and Vessel Locking. (19-8.o)

(1) Smoking, open flames, or other ignition sources is prohibited on lock structures within 50 feet (15.2 m) of vessels containing hazardous cargos of flammable or other HAZMAT (that is, “Red Flag” vessels) during approach and lockage.

(a) When construction, maintenance, and other non-navigational related activities are taking place on or adjacent to the lock structure, the supervisor will relay information to supervisory personnel in these activities regarding the approach and passage of Red Flag vessels.

(b) Prior to the start of work on these activities, the Work Crew Supervisor must establish safe zones that maintain at least the minimum 50 feet (15.2 m) required distance between Red Flag vessels and sources of ignition such as hot work and smoking areas.

(b-1) Calculate the minimum distance vertically and horizontally throughout a lock chamber when the chamber is pumped out for maintenance.

(b-2) Mark, barricade, or otherwise designate these zones so that personnel can easily distinguish them.

(b-3) Include the location of and the restricted activities within these zones in the AHA and discuss them with workers prior to start of work.

(2) Lockage of Red Flag Vessels.

(a) Do not lock pleasure and commercial recreational craft through a lock chamber with Red Flag vessels.

(b) When river traffic in the approach to a lock is light, do not simultaneously lock two Red Flag Vessels or tows, or simultaneously lock another vessel or tow carrying non-dangerous cargoes with a vessel or tow carrying dangerous cargoes.

(c) When the river approach to a lock is congested, simultaneous lockage of the aforementioned vessels or tows, other than pleasure craft, may be permitted provided the following conditions are met:

(c-1) The first vessel or tow entering and the last vessel or tow exiting are secured before the other enters or leaves.

(c-2) Any vessel or tow carrying dangerous cargoes is not leaking.

(c-3) All Masters involved have agreed to the joint use of the lock chamber.

19-9. Figures and Tables.

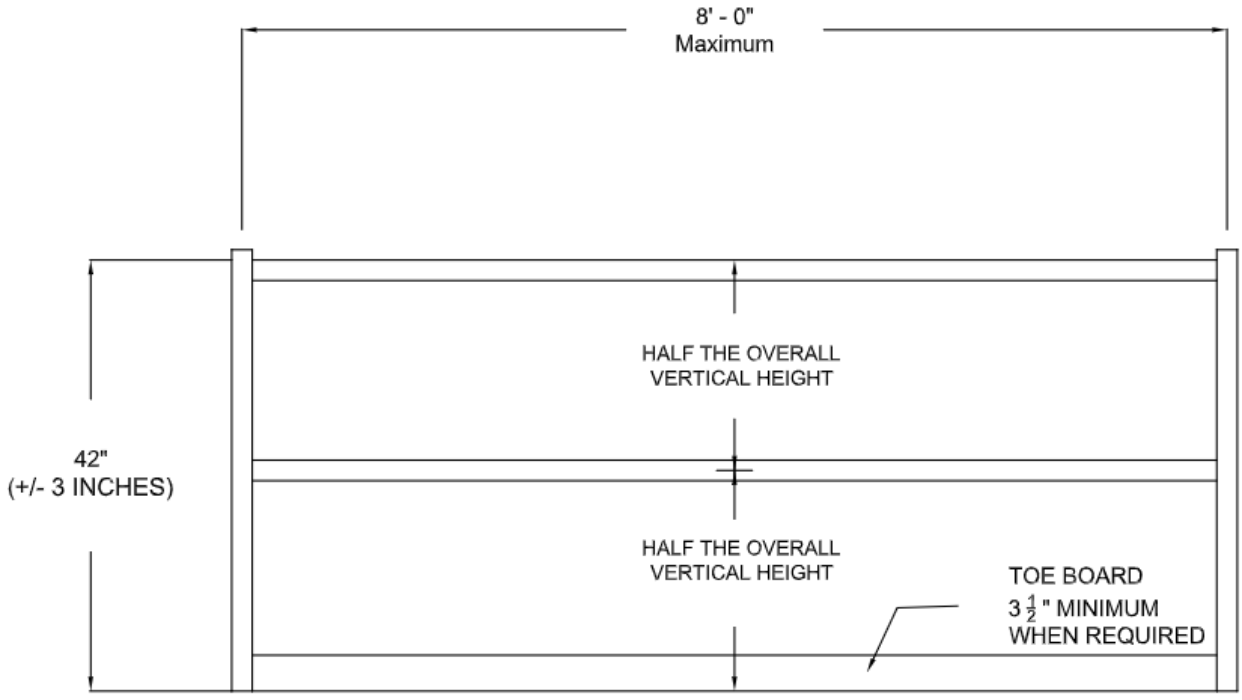
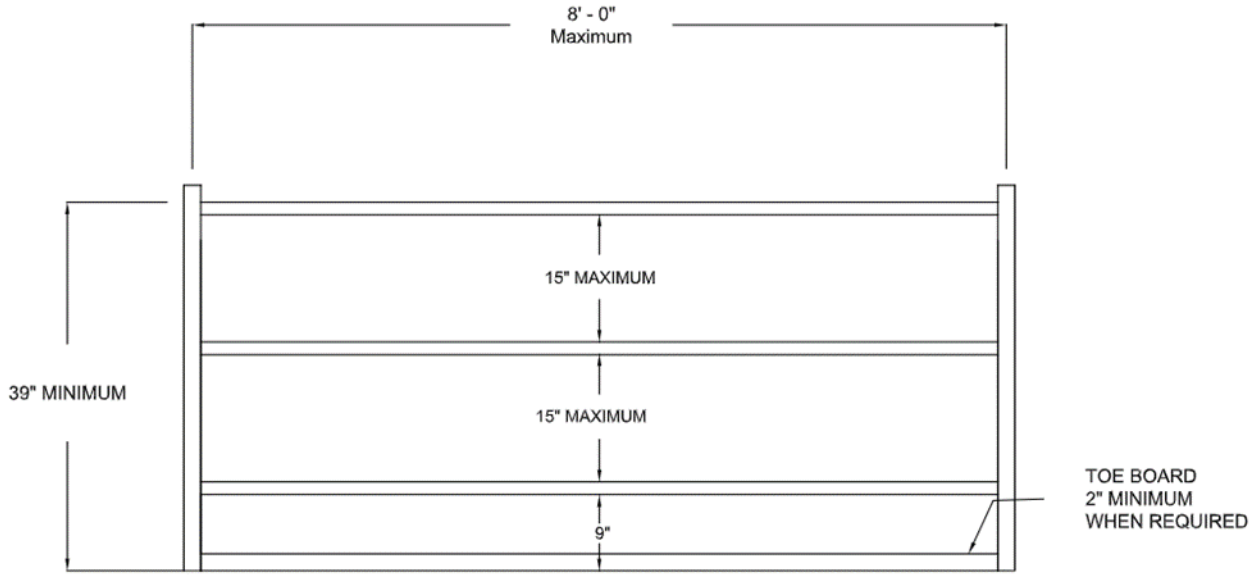


Figure 19-1. Railing Type A, Two Tier Rigid Fall Protection Railing

Marine Railing Type B, Three Tier Rigid Railing



Marine Railing Type B, Three Tier Tensioned Railing

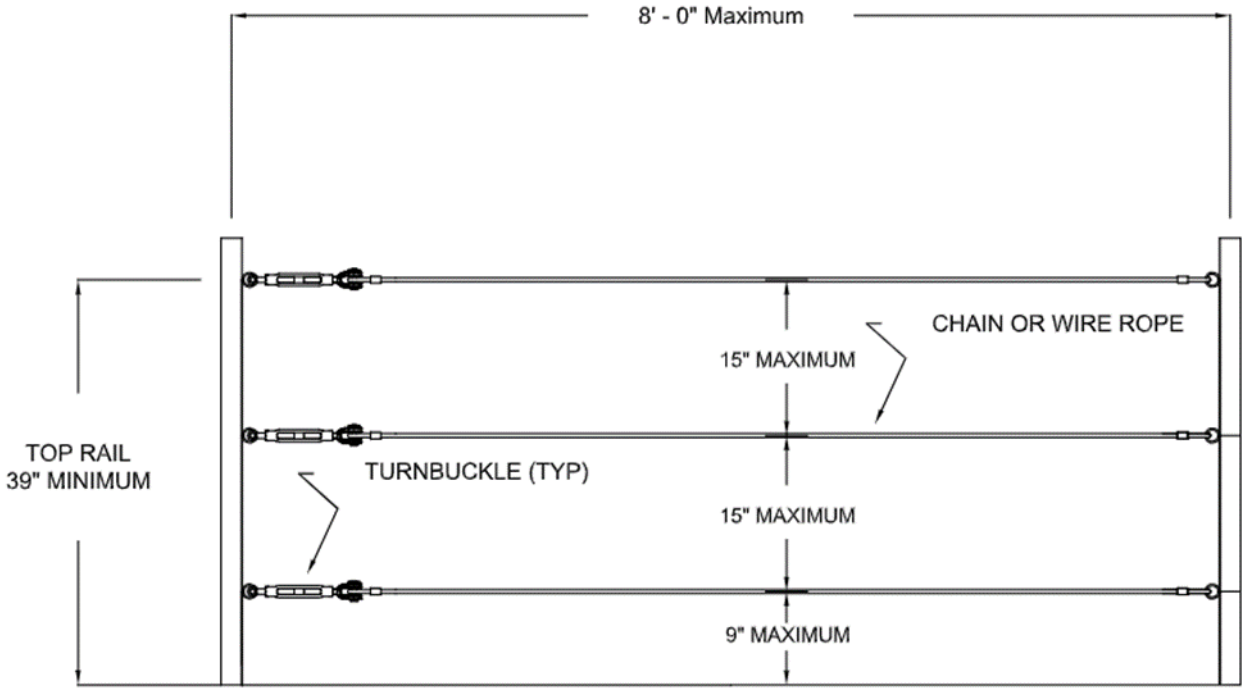
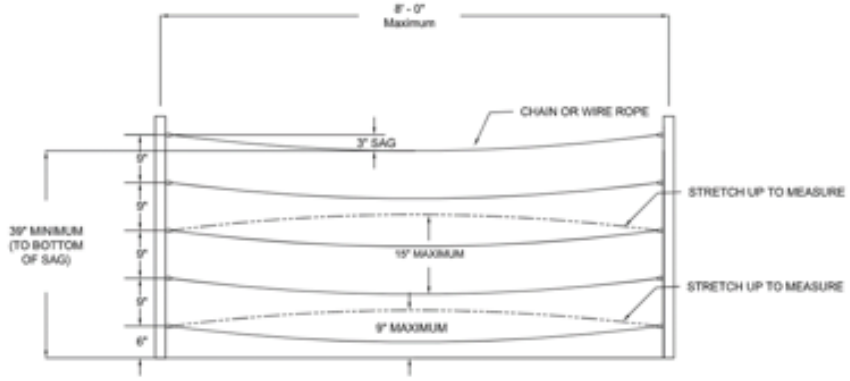
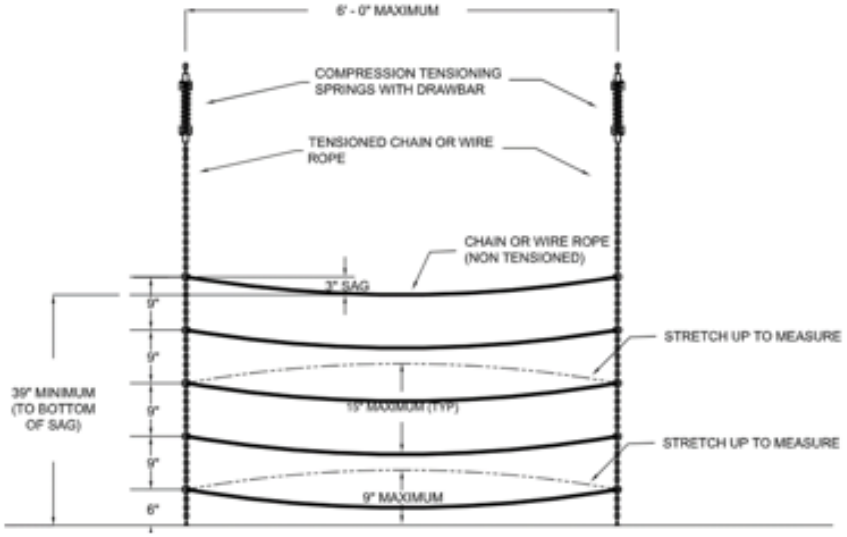


Figure 19-2. Marine Railing Type B

Marine Railing Type C, Non-Tensioned Railing (3" sag shown)



Marine Railing Type C, Flexible/Swing-Away Railing with Flexible Tiers (3" sag shown)



Marine Railing Type C, Flexible/Swing-Away Railing with Rigid Tiers

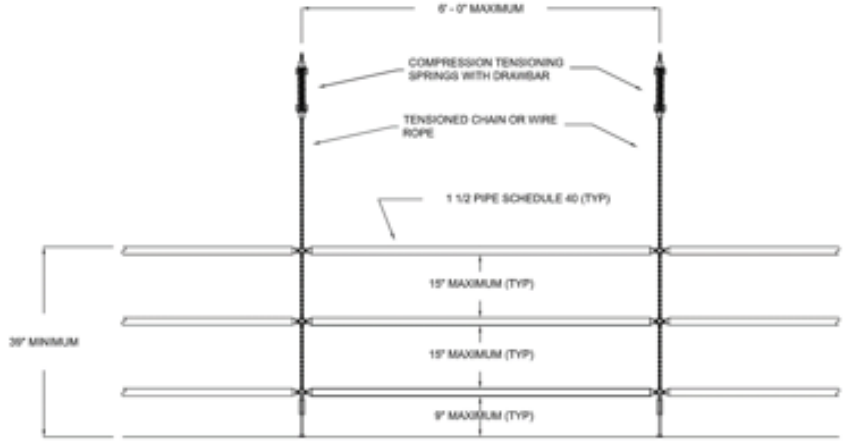


Figure 19-3. Marine Railing Type C