Chapter 7.
Light Tactical Rafts and Bridges

Light tactical rafts (LTRs) and bridges consist of aluminum deck sections supported by aluminum pontons. One set of LTR equipment is most commonly used to construct a floating raft which can provide the crossing force commander with an MLC 16 capability in currents up to 7 FPS. The LTR equipment can also be used to construct light tactical bridges capable of crossing MLC 16 equipment in currents up to 5 FPS. The LTR can be used to cross lighter loads in currents up to 10 FPS. Proper military nomenclature for this set is *Bridge, Floating Raft Section, Light Tactical Raft.* Aluminum footbridge can also be used to construct light floating bridges and is discussed in Appendix E.

COMPONENTS

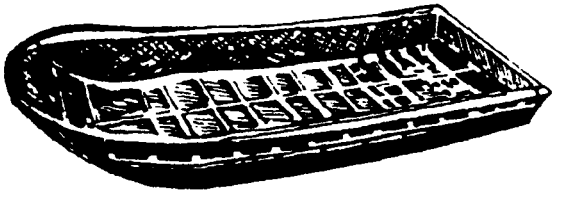
Half-ponton

The aluminum alloy half-ponton has an effective length of 18 feet 6 inches, is 6 feet 8.5 inches wide, and 2 feet 10 inches high. The bow of each half-ponton is raised approximately 7 inches higher than the stem to prevent the ponton from swamping when rafting in swift currents. The half-ponton weighs approximately 650 pounds and has a displacement of 6.25 tons. Two half-pontons are joined stem to stem to form a whole ponton which supports the light floating bridge or raft.

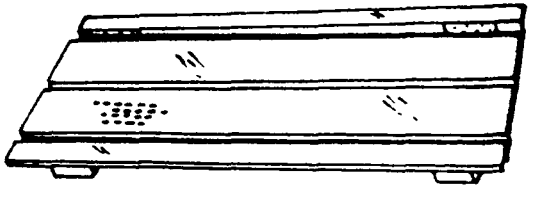
Deck Panels

Each deck panel has an effective length of 11 feet and weighs 565 pounds. Two deck panels are placed side by side on a whole ponton (with a space between) to form one normal bay of LTR. The deck panels are held in place by four retainer lugs located on the pontons. Each deck panel has a male end and a female end.

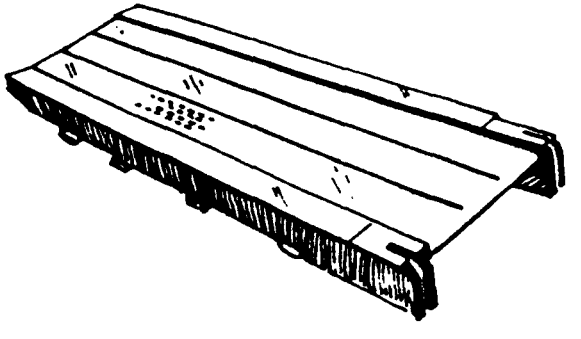
Half–ponton



Deck panel



Deck filler panel



Deck Filler Panels

Refer to the figure on page 93. The deck filler panel is approximately one-half the effective length of a deck panel and weighs 95 pounds. Two deck filler panels are used to fill the space between one pair of deck panels. Deck filler panels are normally held in position by pintles, but they can also be bolted directly to the deck panels.

Ramp Panels

The two types of ramp panels in a set of LTR are male and female. One like pair of ramp panels is used at each end of the LTR raft or bridge to allow for the loading and unloading of traffic. The male ramp panel is 8 feet long 3.5 feet wide, and weighs 330 pounds. The female ramp is slightly over 7 feet long 3.5 feet wide, and weighs 400 pounds.

Ramp Filler Panels

Ramp filler panels are 3 feet long and weigh 65 pounds. These panels are used to fill the gap between two adjacent ramp panels.

Articulating Assembly

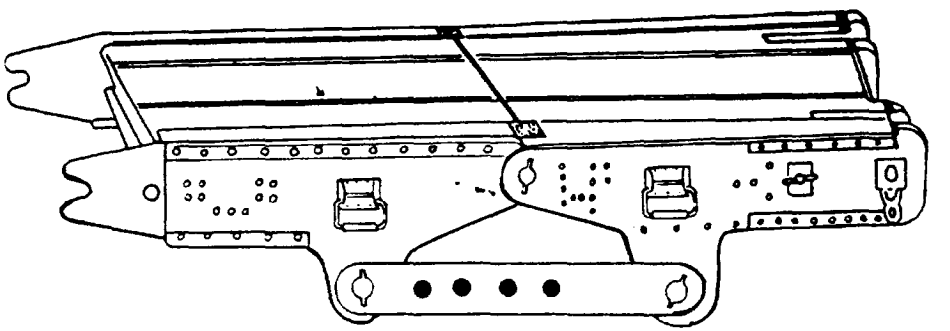
The articulating assembly is provided to permit variations in the inclination of the raft ramps to allow for various shore conditions. The articulating assembly allows the ramp panel to be raised up to 41 inches above and lowered to 19 inches below the horizontal. Each articulator weighs about 640 pounds and has a male section and a female section. A connecting pin and adjusting bar are used to join the two sections. A carrying bar is used to carry the newer model articulating assembly. The older version is equipped with carrying handles.

Curbs

Two sizes of curb are used in assembly of LTR rafts and bridges. Deck panel curbs are a little less than 11 feet long and are placed along both sides of normal LTR bays. Short curbs are almost 3 feet long and are placed along the ramps. Both types of curbs are held in position by holding lugs that extend from the bottom of the curb and bear directly on the underside of the top flange on the deck panel.

Male ramp panel

Articulating assembly (older version)



Other Accessories

Additional items which are issued with the LTR include the following:

Anchors

Two fluked, 30-pound, steel, marine anchors are issued on the basis of one per whole ponton.

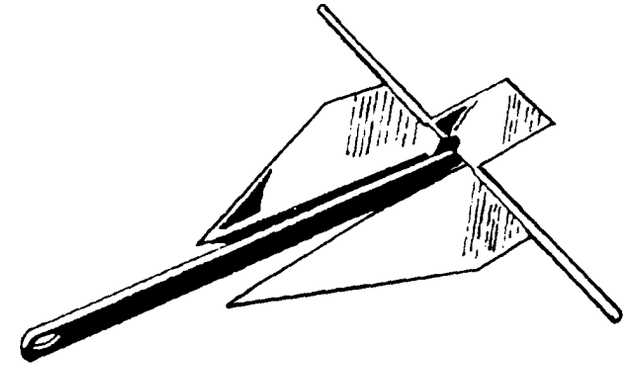
Outboard motor brackets

These brackets are used to connect outboard motors to the stern of LTR pontons. One motor bracket is issued for each whole ponton.

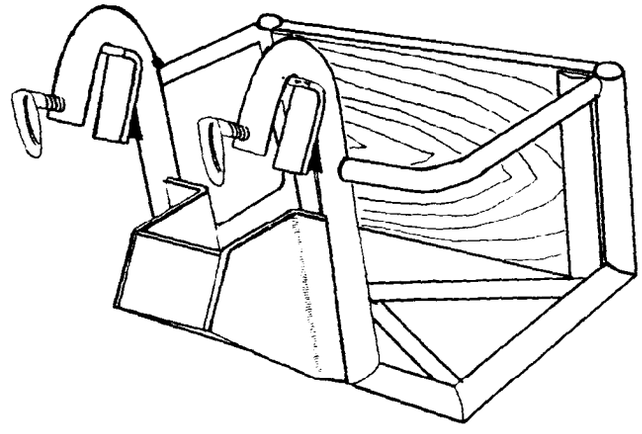
Ponton cradle

The ponton cradle is issued on the basis of one per set of LTR. The cradle is placed on a 2 1/2-ton pole trailer or on a 4-ton bolster trailer and is used to carry eight half-pontons.

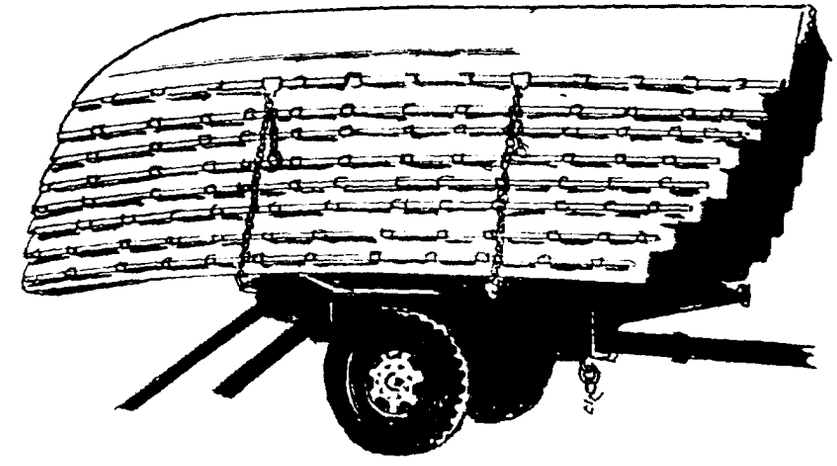
Fluked anchor



Outboard motor bracket



Ponton cradle



Chain assembly with binders

Four chain assemblies with binders are issued to secure the raft set during transportation.

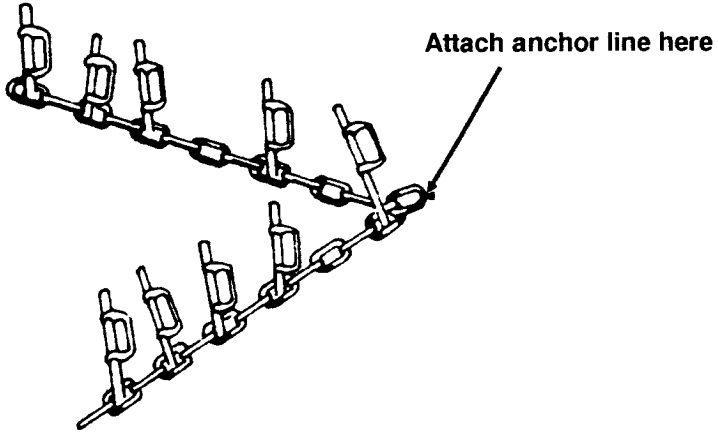
Holdfasts

Four prefabricated holdfasts for use as anchorages are issued with the raft set. Nine steel pickets and a holdfast chain comprise each holdfast.

ALLOCATION

Each set of LTR can be used to construct either a four-ponton, three-bay raft; a four-ponton, four-bay raft; or 44 feet of light tactical bridge. The LTR is not currently authorized by Table of Organization and Equipment (TOE) in float bridge companies and its role in future river crossing operations is uncertain.

Installed holdfast



TRANSPORTATION OF LTR

The components of one set of LTR are normally carried on two 2 1/2-ton trucks and either one 2 1/2-ton pole trailer or one 4-ton bolster trailer. The chains and binders which come with the set are used to secure the components onto the vehicles. The cradle is used to nest the eight half-pontons on the trailer. More specifically, the trucks are loaded IAW Table 29.

Table 30. Draft of LTR

LTR propelled by outboard motor	24 inches
LTR propelled by BEB–SD	22 inches
LTR propelled by a 27–foot BEB	40 inches

CONSIDERATIONS FOR THE TACTICAL EMPLOYMENT OF LTR

The LTRs and bridges will not normally be used during hasty river crossings, and are of very limited use during retrograde or deliberate crossings. The inability to carry heavy loads

Table 29. Transportation of LTR

Truck #1 (superstructure load)	
Component	**Quantity**
Deck panels	8 ea
Filler panels	8 ea
Deck curbs	8 ea
Trailer	
Component	**Quantity**
Half-pontons	8 ea
Truck #2 (accessory load)	
Component	**Quantity**
Anchors	4 ea
Carrying bars	8 ea
Brackets, outboard motor	4 ea
Short curbs	12 ea
Holdfasts	4 ea
Paddles (in bag)	9 ea
Articulating assembly	4 ea
Ramp filler panels	6 ea
Ramp panels	4 ea
Pin, panel connector	10 ea
Pin, curb	12 ea
Pump, reciprocating	2 ea
Retainer bridge pin	44 ea
Rope, fibrous, 2 1/4 inch	500 ft
Screw, cap	60 ea

makes their value to the crossing force commander quite doubtful. The roadway width of LTR (only 9 feet) also limits its usefulness, Water depth requirements are given in Table 30.

LTR RAFTING OPERATIONS

Capabilities

The LTR can be built in the configurations shown in Table 31. When deciding what type of raft to construct, one must consider the required classification of the raft, the required load space of the raft, and whether or not articulating assemblies will be needed to adapt the raft ramps to the shore conditions which exist at the rafting sites. When some doubt exists as to the need for articulators, always plan to use them.

Assembly times

The assembly times for LTRs are shown in Table 31. It is assumed that one combat engineer platoon will be used for construction during daylight hours. These times will increase by 50 percent for construction at night.

EXAMPLE: How much time is required for the construction of a four-ponton, four-bay LTR assembled with articulating assemblies, at night?

SOLUTION: Refer to Table 31. This table states that one platoon can build this raft in 36 minutes during the day. Adding 50 percent for construction at night, one platoon can assemble this raft in 54 minutes.

Load space

The load space for LTRs is shown in Table 31. Never load ramps or articulating assemblies.

Table 31. Capabilities of LTR

Type of raft	Assembly time[1] (min)	Load space[2] (ft)	Classification based upon current velocity					
			0–5 FPS	7 FPS	8 FPS	9 FPS	10 FPS	11 FPS
4–ponton, 3–bay with articulators	30	30	12	12	12	8	4	0
4–ponton, 3–bay without articulators	25	30	16	16	12	8	4	0
4–ponton, 4–bay with articulators	36	41	10	10	10	6	2	0
5–ponton, 5–bay with articulators	40	52	9	9	9	8	5	2
5–ponton, 5–bay without articulators	35	52	16	14	11	8	5	2
6–ponton, 4–bay with articulators	45	41	13	13	13	13	12	5
6–ponton, 5–bay without articulators	45	52	18	18	18	18	12	6

Notes.

1. Assembly times are based upon daylight construction. Increase times by 50 percent at night.
2. Roadway width of only 9 feet is a critical consideration when loading rafts.

When planning to load these rafts, it is important to remember that the roadway width of the LTR is only 9 feet.

EXAMPLE: How much load space is available on a four-ponton, three-bay LTR built with articulating assemblies?

SOLUTION: Refer to Table 31. A four-ponton, three-bay LTR has 30 feet of available load space.

Classification of LTRs

Raft classification is based upon the current velocity of the river at the rafting site. Table 31 provides the classification of LTRs. Note that the addition of articulating assemblies will norreally decrease the classification of an LTR.

EXAMPLE: What is the classification of a five-ponton, five-bay LTR constructed without

articulating assemblies, if the current velocity at the rafting site is 7 FPS?
SOLUTION: Refer to Table 31. A five-ponton, five-bay LTR constructed without articulators can carry vehicles with an MLC of 14 or less when the river is flowing at a velocity of 7 FPS.

Organization for the Construction of LTRs

Rafts are normally constructed using one combat engineer platoon. Table 32 provides a description of the crews required. A description of the duties of each crew is provided below

Table 32. Organization for the construction of LTR

Assembly crew	Number of crews	Crew size	
		NCO	EM
Carrying	1	1	10
Ponton connecting	1	1	6
Deck panel unloading	1	1	6

Carrying

The carrying crew removes the half-pontons from the trailer and carries them to the water. Once all pontons are in the water, this crew carries the deck panels, filler panels, and curbs from the truck to the assembly site.

Ponton connecting

The ponton connecting crew connects the half-pontons at their sterns. Once the half-pontons are connected, this crew delivers the whole pontons to the superstructure placement site as required. After all pontons are delivered, this crew helps to position and connect the deck panels, filler panels, and curbs onto the raft.

Deck panel unloading

The deck panel unloading crew removes the tie-down chains and unloads the curbs and filler panels while the pontons are being assembled. This crew then unloads the remaining superstructure with the help of the carrying crew.

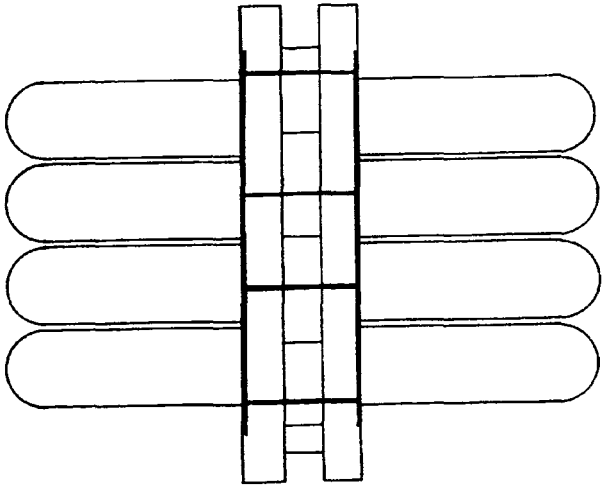
Construction of a Four-Ponton, Three-Bay LTR

This raft can be constructed from one set of LTR and consists of four pontons and three pairs of deck panels with ramps attached at each end. The normal sequence of construction is as follows:

1. Once the platoon is formed into crews and the vehicles are positioned so that they are as close to the water as practical, the carrying crew begins unloading the half-pontons and carrying them to the water. Pontons are unloaded by–

- Disconnecting the ponton cradle from the trailer.
- Attaching the trailer ramps to the rear of the trailer.
- Attaching a line to the bottom ponton on the trailer.

Four-ponton, three-bay LTR without articulators

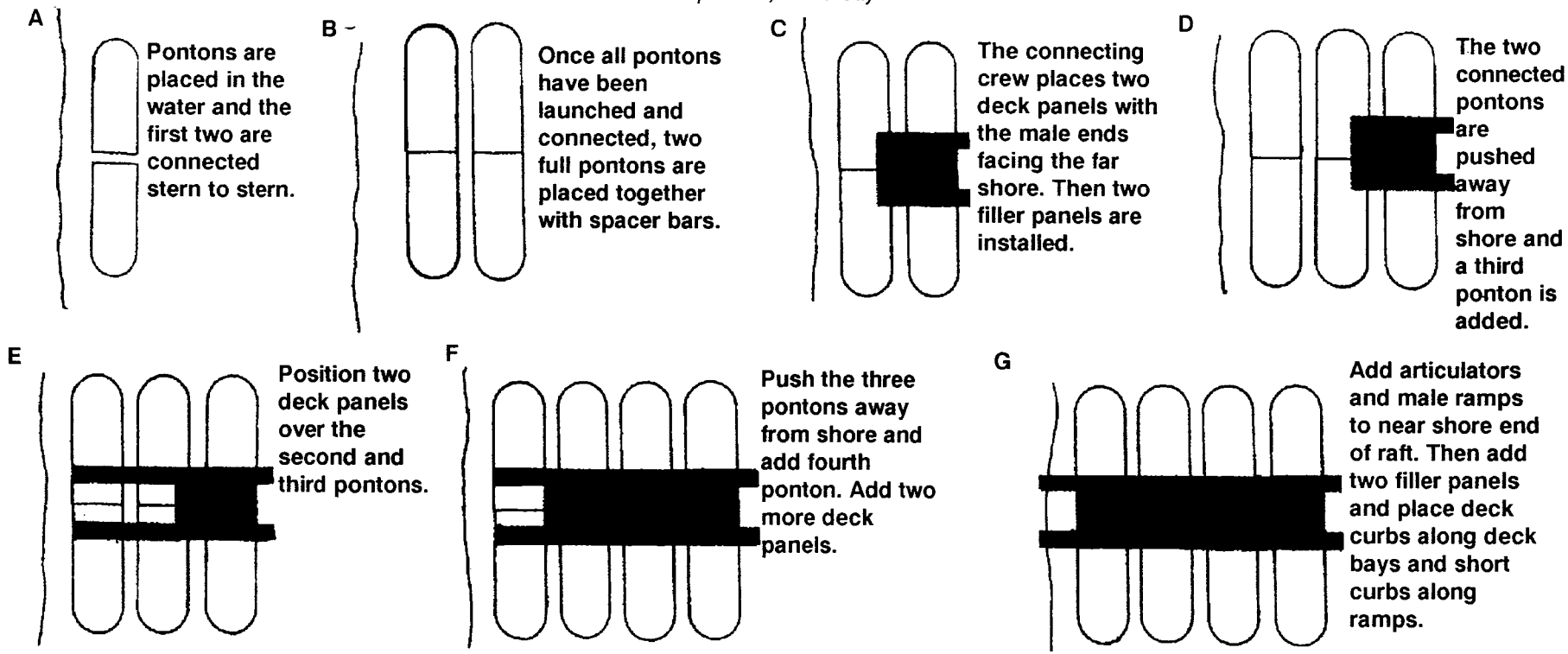


Securing the line to a deadman or similar anchorage.

Pulling the truck forward, allowing the nested pontons and cradle to slide off the trailer, down the ramps, to the ground,

2. As soon as the nested pontons are removed from the trailer, the deck panel unloading crew disconnects the trailer from the truck, removes the tie-down chains, and unloads the curbs and filler panels.
3. As half-pontons are placed in the water, the ponton connecting crew attaches tag lines to them and connects the half-pontons, stern to stern. Once all the half-pontons are launched and connected to form full pontons, two of these full pontons are positioned together by spacer bars. Spacer bars are allocated in the LTR set, and are used to provide the proper spacing between pontons and to prevent pontons from shifting.
4. Once the first two full pontons are spaced correctly, the carrying crew delivers two deck panels to the ponton connecting crew. The connecting crew places the panels into position over the two pontons with the male ends of the deck panels facing the far shore. Fasten these deck panels into place using the retaining lugs on the pontons.
5. Place two filler panels between the two installed deck panels to ensure that the deck panels are properly aligned.
6. The two connected pontons are now pushed away from the shore to make room for the addition of the third ponton, which is brought in by the ponton connecting crew.
7. Position two deck panels over the second and third pontons. Then push the three pontons away from the shore and position the fourth ponton. Add two more deck panels.
8. The articulators and male ramps are now added to the near shore end of the raft. If articulators are not needed, add the male

Construction of a four-ponton, three-bay LTR



ramps directly to the fourth pair of deck panels.

9. Add two filler panels between each pair of deck panels. Place deck curbs along the deck bays and short curbs along the ramps.

10. Turn the raft around, using tag lines, so that the articulators and female ramps can be added to the other end of the raft.

Construction of a Four-Ponton, Four-Bay LTR

This raft can be constructed using one set of LTR. The normal sequence of construction is as follows:

1. Establish crews, position vehicles, and unload the half-pontons as described for the construction of a four-ponton, three-bay LTR on page 98.

2. Once the nested pontons are removed from the trailer, the deck panel unloading crew disconnects the trailer from the truck, removes the tie-down chains, and unloads the curbs and filler panels.

3. As half-pontons are-placed in the water, the ponton connecting crew attaches tag lines to them and connects the half-pontons, stem to stern. As the first full ponton is completed, this crew takes it to the assembly site.

4. The carrying crew delivers two deck panels to the ponton connecting crew. These deck panels are centered on the full ponton, with the male ends toward the far shore, and connected with the retaining lugs. Two filler panels are added to ensure proper spacing between the deck panels.

5. Now deliver the second full ponton to the ponton connecting crew. Center two deck panels on this ponton and connect them in the same manner as the first. Push the first ponton away from the shore and connect it to the second ponton.

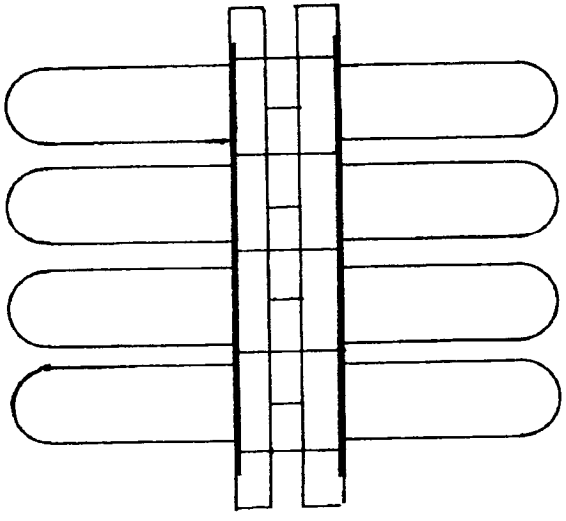
6. Construct two additional bays and add them to the raft in the same manner until four pontons and four bays are completed.

7. Connect the articulators and male ramps to the near shore end of the raft. If articulators are not used, pin the male ramps directly to the deck panels on the near shore ponton.

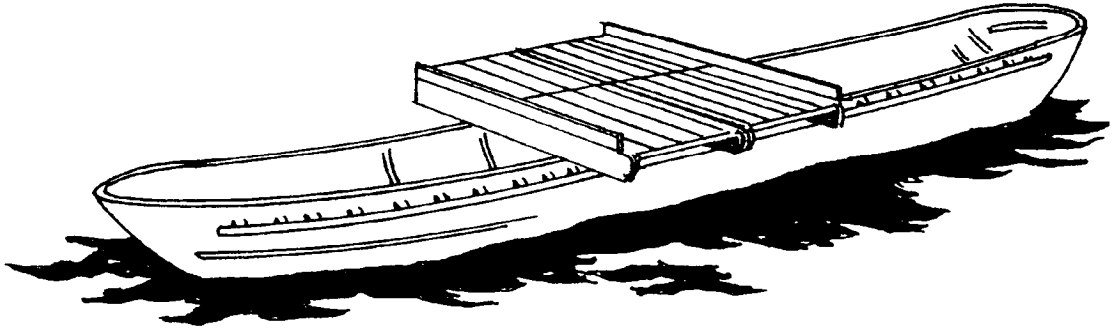
8. Place two filler panels between each pair of deck panels and a ramp filler panel between the ramp panels. Connect deck curbs along both sides of each deck bay and short curbs along the ramp panels.

9. Turn the raft around, using tag lines, so that the articulators and female ramps can be added to the other end of the raft. Complete this ramp by adding the short curbs and a ramp filler panel.

Four-ponton, four-bay LTR without articulators



One normal LTR bay



Construction of a Five-Ponton, Five-Bay LTR

Two sets of LTR are required to construct this raft. The five-ponton, five-bay LTR is built in exactly the same manner as the four-ponton, four-bay raft except that one additional bay (one ponton with one pair of deck panels centered upon it) is added prior to construction of the first ramp.

Construction of a Six-Ponton, Four-Bay LTR

Two sets of LTR are required to construct this raft which consists of six full pontons supporting four pairs of deck panels, or bays. The sequence for the construction of this raft is as follows:

1. Construct a four-ponton, three-bay raft (without ramps and articulators).

2. Once four pontons and three bays are connected, push this raft away from the shore to provide room for the placement of the next two pontons. Connect these pontons to the constructed portion of the raft using spacer bars.

3. Add two deck panels. This provides the fourth bay of the raft.

4. Articulators must be used on a six-ponton, four-bay raft. Add the male articulator sections and male ramps to the near shore end of the raft.

5. Add filler panels between each pair of deck panels and a short filler panel between the ramps. Add deck curbs to both sides of the roadway on the deck bays and ramp curbs on both sides of the ramp.

6. Turn the raft around using tag lines. Connect the female articulator assemblies to the end of the raft. Connect the female ramps and add the short tiller panel and short curbs to complete the ramp.

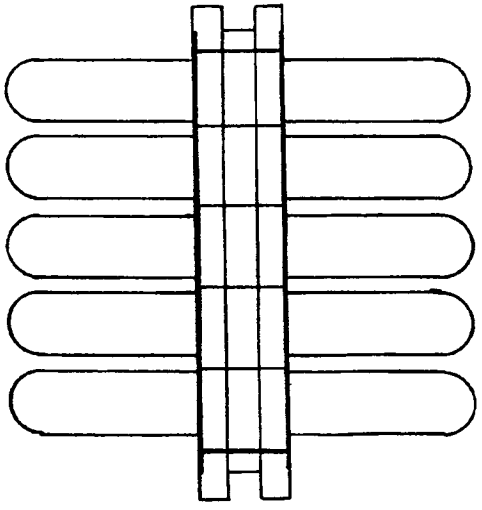
Construction of a Six-Ponton, Five-Bay LTR

Two sets of LTR are required to construct this raft which consists of six full pontons supporting five pairs of deck panels, or bays. The sequence for the construction of this raft is as follows:

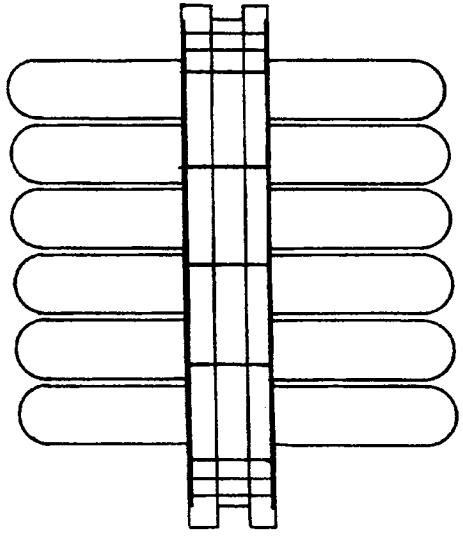
1. Construct a four-ponton, three-bay raft (without ramps and articulators).

2. Once four pontons and three bays are connected push them away from the shore to provide room for the placement of the next two pontons. Connect these pontons to the constructed portion of the raft using spacer bars.

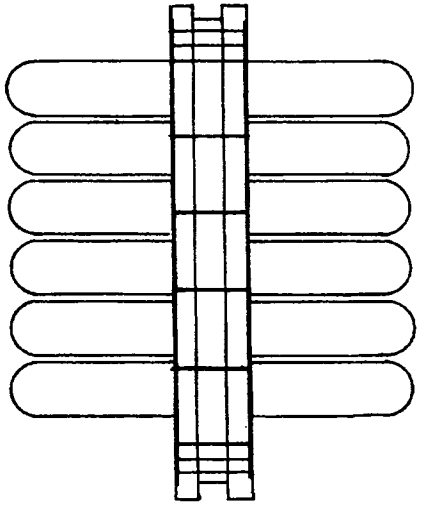
Five-ponton, five-bay LTR without articulators



Six-ponton, four-bay LTR with articulators



Six-ponton, five-bay LTR with articulators



3. Add two deck panels. This provides the fourth bay of the raft.
4. Connect two more deck panels. This provides the fifth bay of the raft.
5. Connect the male ramp section to the near shore bay. Articulators are not used in constructing this raft.
6. Position two filler panels between each pair of deck panels, short filler panels between the ramp panels, deck curbs along both sides of the roadway deck panels, and short curbs along both sides of the ramp.
7. Turn the raft around using tag lines. Add the female ramp panels, ramp filler panel, and short curbs to complete the raft.

Propulsion of LTRs

Use of outboard motors

The 25- or 40-horsepower outboard motor provides an excellent means of maneuvering LTRs. These motors can be attached to the downstream end of the raft's pontons, using the motor brackets which are part of the LTR set. Normally, four outboard motors will be used to propel an LTR although as few as two can be used in currents up to 5 FPS.

Bridge erection boats

One BEB, attached to the downstream side of an LTR, will normally provide sufficient means of propulsion. When attaching the boat to the raft, a timber or some other device must be lashed to the ends of the pontons to provide a surface against which the boat can push.

Towlines

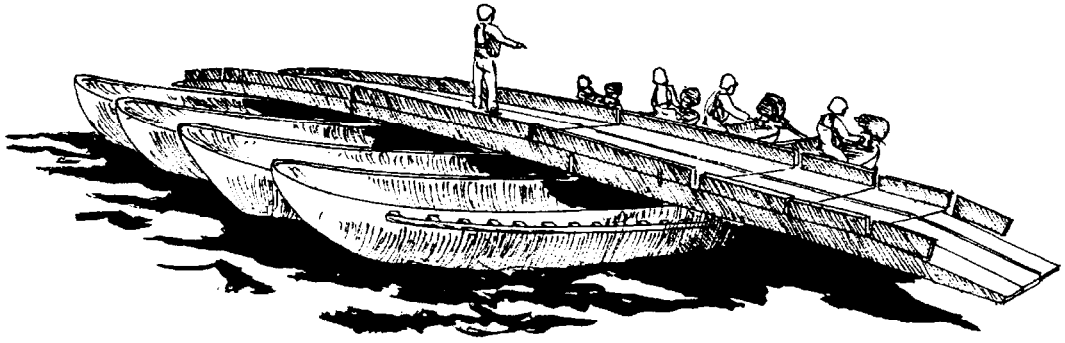
In slight currents over narrow gaps, rafts may be propelled by the use of towlines. The towlines are attached to each end of the raft and may be operated from either one or both banks of the river. With light loads, personnel may be used to pull the raft. When rafting heavier loads, winches on trucks may be used. Two winches on each bank will provide maximum control and allow for faster crossings.

Ferry systems

The bicycle traveler which is provided in the ferry conversion set will allow a raft to move smoothly along a ferry cable. Using the bicycle traveler, either a trail ferry or a flying ferry may be established.

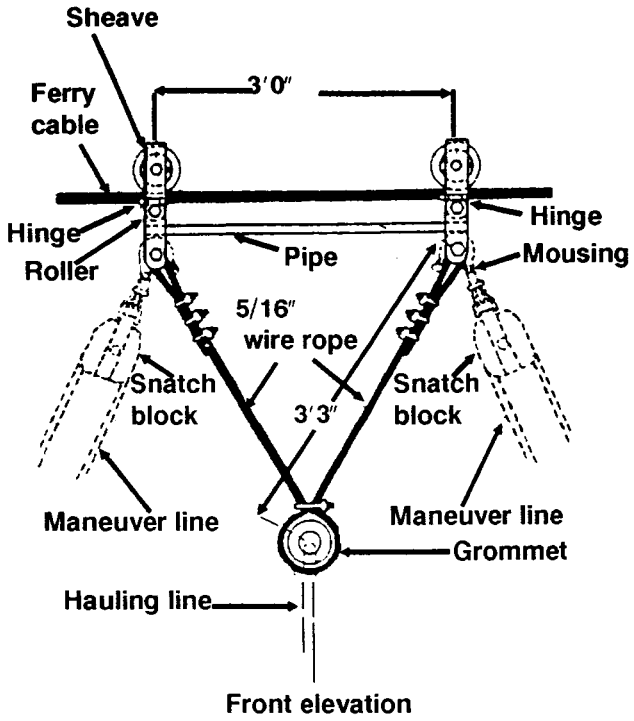
Trail. The trail ferry principle may be used to propel rafts in rivers where the current velocity exceeds 3 FPS. The ferry cable is stretched across the river and attached to a deadman or some other holdfast. When necessary, the cable may be elevated by passing it over an A–frame erected on each bank. Sag is taken out of the cable using ratchet chain hoists. The bicycle traveler is attached to the cable so that its sheaves roll smoothly over the cable. The hauling line is attached to the grommet, and the maneuver lines to the snatch blocks. On the raft, the hauling line is attached to the upstream end of the center ponton, as shown. The maneuver lines are attached to the gunwales of the outside pontons. The trail ferry is operated

Attachment of outboard motors to LTR



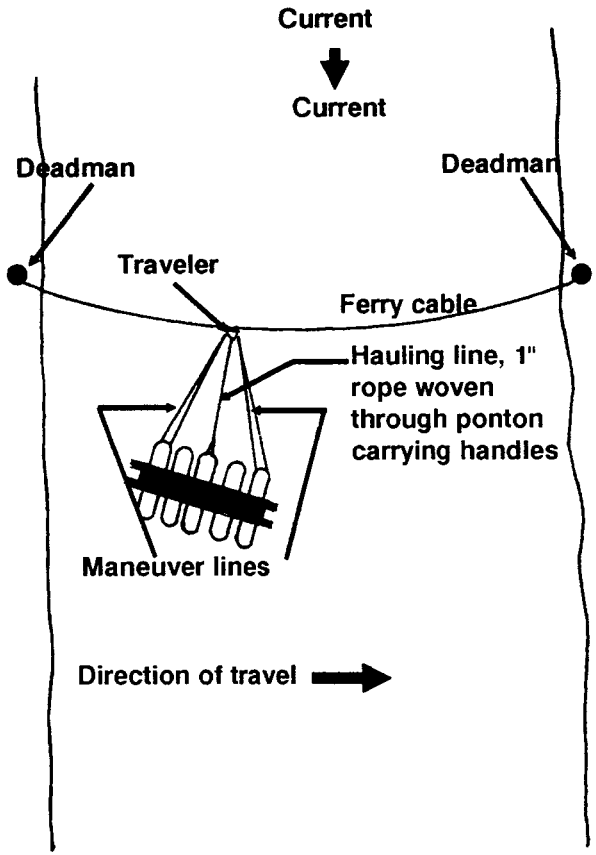
is operated by adjusting the maneuver lines so the raft is turned at an angle with the stream current. The upstream ponton should angle towards the opposite shore. The current pushes against the upstream side of the pontons and forces the raft across the stream. Maximum speed is attained by adjusting the angle of the pontons to about 45 degrees.

Bicycle traveler

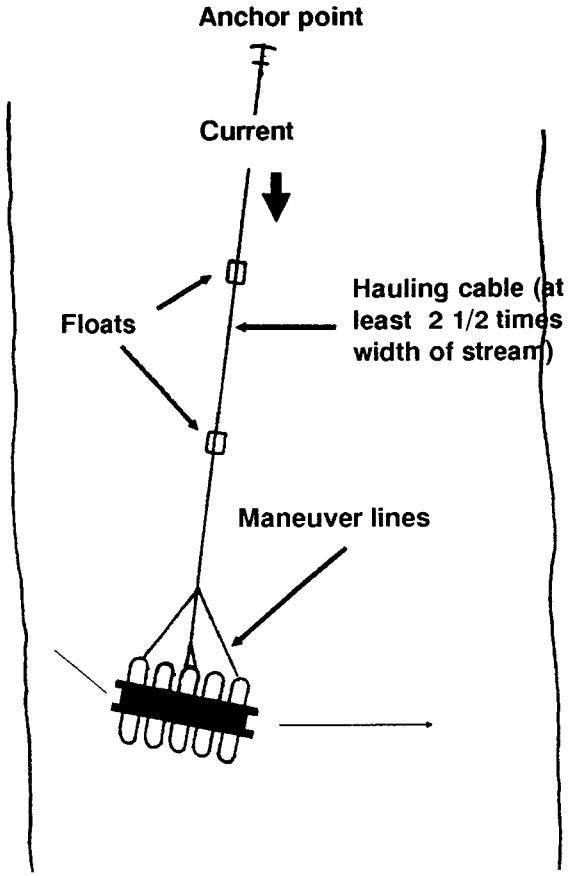


Flying. The flying ferry works along the same principle as the trail ferry. Flying ferries can be used in rivers with currents of 4 FPS or greater. The flying ferry runs along a line attached to an anchor which is placed upstream of the raft. If the current is strongest near one shore, the anchor must be nearer the opposite shore. If the current is uniform, the anchor should be placed in midstream. The length of the cable must be at least 1 1/2 times the width of the stream. Floating supports should be used to raise the cable clear of the water. The cable is attached to the center of the raft, and maneuver lines are attached at one end to the cable and at the other end to the gunwales on the outside pontons. As the raft moves from shore to shore,

Flying ferry



Trail ferry



it swings in the arc of a circle with the center of the circle at the anchor.

LTR BRIDGING OPERATIONS

Design of Light Tactical Bridges

Capabilities

Light tactical bridges are not normally constructed because of their inability to carry heavy loads. When light tactical bridges are constructed, the designer must consider the number of sets needed to construct the bridge, the time needed to assemble the bridge, and the load classification required.

Sets required to construct a light tactical bridge

One set of LTR can be used to provide 44 feet of bridge. The number of sets needed to bridge a given gap can be determined using the formula:

$$\text{Number of sets} = \frac{\text{Gap (ft)}}{44}$$

OR

$$\text{Number of sets} = \frac{\text{Gap (m)}}{14}$$

EXAMPLE: How many sets of LTR are needed to construct 150 feet of light tactical bridge?

SOLUTION: Number of sets =

$$\frac{\text{Gap (ft)}}{44} = \frac{150}{44} = 3.41 \text{ sets}$$

Therefore, four sets are needed to complete this bridge.

Assembly times

Light tactical bridges can be constructed at the rate of 150 feet per hour by an experienced unit during daylight hours. Construction times increase by 50 percent for assembly at night.

EXAMPLE: How much time is required to construct a 200-foot long light tactical bridge during the day?

SOLUTION: Since the rate of assembly is 150 feet per hour, Assembly time =

$$\frac{\text{200 feet of bridge}}{\text{150 ft/hr}} = 1.33 \text{ hours}$$

Therefore, assembly time during the day would be 1.33 hours or 1 hour 20 minutes.

Classification of light tactical bridges

The classification of a light tactical bridge is based only upon the current velocity of the river at the bridge site. Table 33 provides the classification of LTR bridges in varying current conditions.

EXAMPLE: What is the classification of a light tactical bridge constructed in a current of 7 FPS? Assume a normal crossing will be conducted.

SOLUTION: Refer to Table 33. The classification of this bridge is MLC 13 (for wheeled and tracked vehicles).

Table 33. Classification of light tactical bridges

Type of crossing	Classification based upon current velocity					
	0–3 FPS	5 FPS	7 FPS	8 FPS	9 FPS	11 FPS
Normal	16	16	13	11	8	2
Caution	18	18	15	12	9	3
Risk	21	21	17	14	11	5

Table 34. Organization for the normal assembly of light tactical bridges

Assembly site crews	Number of crews	Crew size	
		NCO	EM
Carrying crew	3	1	10
Ponton connecting	3	1	6
Panel unloading	3	1	6
Raft delivery	2	1	6
Far shore	1	1	8

Construction of Light Tactical Bridges

Organization

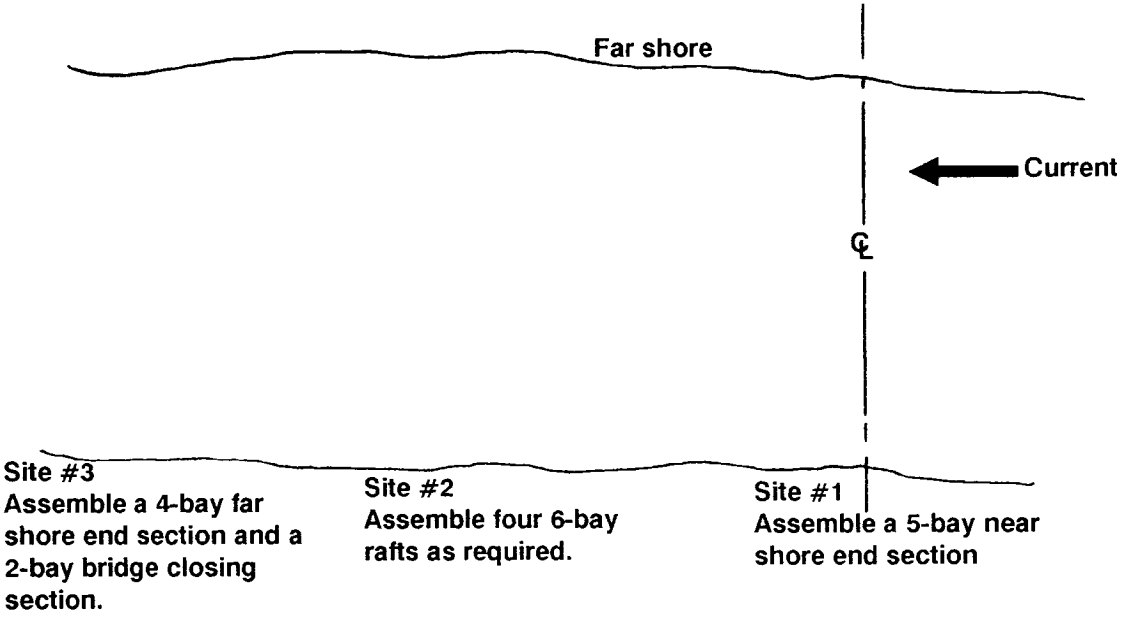
Light tactical bridges are constructed in a normal configuration, each bay providing about 11 feet of normal bridge. When constructing LTR bridges in this manner, the use of three assembly sites is recommended. One assembly site is located at the bridge centerline with the other two sites placed a short distance downstream. Bridges under 100 feet long can normally be built using one combat engineer platoon. Longer bridges may require up to one combat engineer company. The recommended organization of construction crews is provided in Table 34.

Construction sequence

Light tactical bridges are generally constructed in the following sequence:

1. Assembly sites are established, equipment delivered, and crews organized, as shown on page 102 and in Table 34.
2. As the anchorage crew begins installation of the anchor cable, the ponton crews unload, launch, and join half-pontons at all three sites.
3. Crews at site 1 and site 3 begin construction of the near and far shore end sections, respectively. The near shore end section consists of five normal bays and one ramp section. The far shore end section is built with four normal bays and a ramp section. These end sections should be in place as the anchorage crew completes its duties.
4. The bridge can now be constructed from both shores towards the middle. The crews at site 2 construct rafts consisting of four to six normal bays. Remember that one normal bay is simply one pair of deck bays centered on one full ponton. Each bay is completed by adding two filler panels and two deck curbs. A 32-foot rope bridle line is attached to each pair of normal bays. The completed rafts are taken to the bridge connecting crew which attaches each raft to the bridge.
5. The anchorage crew can connect the bridle line attached to each bay to the completed overhead cable. The near shore abutment crew assists in maintaining bridge alignment as the construction proceeds.
6. Assembly crews at site 2 continue to construct rafts until the bridge is completed. Personnel at site 3 may also construct rafts, if a longer bridge is being built. As a minimum, the personnel at site 3 will construct one raft consisting of two normal bays. This raft is used to close the bridge.
7. In closing the bridge, the near shore end section is pulled into the shore as far as possible to allow the final two-bay raft to be connected. This end section is then pushed back toward the river into its final position. Ensure that there is sufficient water to prevent the first pontons from resting on the river bottom.
8. Adjust all bridle lines and make final corrections to bridge alignment. Tighten all approach guys on the near and far shore.

Site layout for LTR bridge construction



MAINTENANCE OF LTR EQUIPMENT

Maintenance of Pontons

Pontons should be checked frequently during rafting and bridging operations. The raft commander is responsible for ensuring that all pontons are serviceable and relatively free of water. Minor repairs can be made in several ways.

If a hole is found in a ponton, it can be filled with wadded fabric or cloth. The fabric should be soaked with grease or a sealing compound before inserting it into the hole. Once this is done, the fabric should be forced into the hole in the same direction in which the hole was made. Enough material should be left on both sides of the hole to ensure that the hole remains plugged. Rather than use cloth to fill the hole, a tapered wooden plug can also be driven into the hole. The plug should be driven in the same direction from which the puncture occurred.

Short and regular tears above the waterline can be hammered sufficiently to make a temporary watertight seal. First, flatten the dent in the material around the tear. Secondly, hold a float dolly on one side of the torn surface and close the tear by hammering on the other side of the ponton just above and below the tear with the ball end of a ball peen hammer. The hammering action forces the material at the tear together so that the application of a coat of plastic cement will form a watertight joint. Clean the area around the tear prior to applying the plastic compound.

Hasty repairs can also be made by placing a board over the opening with a piece of impregnated fabric between the wood and the aluminum ponton. Bolt or nail the board over the holes. When impregnated fabric is unavailable, a piece of canvas or gasket material is a satisfactory substitute.

Badly damaged and leaking pontons should be replaced. To avoid breaking a bridge, unfasten all the gunwale retaining lugs which hold the damaged ponton in place. Allow the ponton to float downstream. Weight the ponton with personnel or water to ease its removal if necessary. To insert the new ponton, weight it with personnel or water and push or pull it into position. Remove the weight and fasten the ponton to the gunwales using the retaining lugs. The bridge must be closed to traffic during this removal and replacement process.

Deck Maintenance

The decks on LTRs and bridges do not normally require extensive maintenance. The gunwale retaining lugs should be checked periodically to ensure they are in the LOCKED position and are in serviceable condition. During periods of heavy traffic, the deck may become littered with mud, dirt, or debris from the vehicles using the bridge or raft. The LTR roadway should be washed periodically to ensure safe operation of the raft or bridge.