

FOREST ENGINEERING

RESEARCH INSTITUTE

Western Division

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INSTITUT CANADIEN DE RECHERCHES EN GÉNIE FORESTIER Division de l'ouest

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FIELD NOTE NO.: Water Transportation 1 Previous Note Reference Nos.: None (see TN-73)

SUBJECT: BOOMCHAIN SPECIFICATIONS

Boomchains are a critical element of coastal log transportation. Chain strength, and wear/corrosion resistance are the major considerations influencing service life. However, it is impossible to visually evaluate boomchain quality because of the variety of available grades and heat treatments used in fabrication. The problem is further complicated as used chains pass through a central transportation pool. Therefore, minimum strength standards are necessary to maintain boom security over chain service life.

FERIC was asked by our member companies to prepare a set of strength standards for new chain. Investigations of various international chain standards and discussions with boomchain users and suppliers led to the development of a Boomchain Specification Proposal.

These specifications are intended to provide guidance for both purchasers and manufacturers. They are not intended to stifle innovation and will be amended periodically as required.

SPECIFICATIONS:

Type: Pacific Coast or Columbia River Pattern (Figure A).

<u>Material</u>: Chain body and ring should be a carbon steel (AISI classification 1022) or high-tensile chain (high-strength, low-alloy steel; boron steel; or carbon/manganese steel).

Toggles can be of flame-cut steel, forged steel, cast steel, or cast iron, providing the appropriate dimension is used (Figure B).





FIGURE A. Typical Pacific Coast Boomchain. FIGURE B. Examples of Boomchain Toggles.

Welding:

All chain welds shall be free of welding defects and injurious imperfections.

Ductility: Chain elongation at failure - 10% minimum (i.e., 21.3 cm (8.4 in.) for a 2.13-m (7 ft) chain).

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Dimensions: Overall Nominal Length - 2.13 m (7 ft) Chain Link Nominal Diameter - 19-mm (3/4-in.) high-tensile chain - 22.2-mm (7/8-in.) standard chain Ring Nominal Diameter - 25.4-mm (1-in.) high-tensile chain - 28.6-mm (1 1/8-in.) standard chain

Average Breaking Strength: 36 288 kg (80 000 lbs) for high-tensile chain 31 752 kg (70 000 lbs) for standard chain

> Individual breaking strength of any one sample must be no less than 90% of the average breaking strength requirement. The average breaking strength of the complete chain should be determined with the following test procedure.

SUGGESTED CHAIN-TESTING PROCEDURE:

Test Bench Certification: Lloyd's Marine Standard or ASTM E-4

Chain Securement: Ring end of chain shall be retained by a shackle or pin of no greater than 51-mm (2-in.) diameter (Figure C).

Toggle end shall be retained with a "D" style adapter similar to the one illustrated in Figure D or, alternatively, by two shackles with pin centres 10.2-cm (4-in.) apart.



FIGURE C. Ring Securement During Testing.



FIGURE D. Jig for Securing Toggle During Testing.

Loading: Load shall be gradually and smoothly applied until failure. (During testing, the chain must be free of twists.)

Test Sample Size:	Production Lot Size	Sample Size
	0 - 500	3
	501 - 1000	14
	1001 +	5

Results: Failure of any one chain to meet the minimum standards will result in rejection of the lot.

INFORMATION: The information contained in this report is based on limited field observation and is only published to disseminate information to FERIC member companies. More information may be obtained from:

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