SOCIALIST REPUBLIC OF VIETNAM

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NATIONAL TECHNICAL REGULATION ON CLASSIFICATION AND CONSTRUCTION OF SHIP LIFT PLATFORM

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Preamble

National Technical Regulation on Classification and Construction of Ship Lift Platform QCVN 57: 2015/BGTVT is compiled by Vietnam Register, verified by the Ministry of Science and Technology, promulgated by the Minister of Transport under Circular No. 72/2015/TT-BGTVT dated November 9th 2015.

NATIONAL TECHNICAL REGULATION ON CLASSIFICATION AND CONSTRUCTION OF SHIP LIFT PLATFORM

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1.1 Application and Scope

1.1.1 Application

1 The present National Technical Regulation (hereinafter referred to as “Regulation”) applies to ship lift platforms which are subject to the technical survey and classified by Vietnam Register.

2 Relevant requirements in QCVN 21: 2010/BGTVT "National Technical Regulation - Rules for the classification and construction of sea-going steel ships" also apply to ship lift platforms, except otherwise specified in this Regulation.

3 The requirements of this Regulation apply to ship lift and transfer system installations in which vessels are raised and lowered by means of winches or jacks when docked on an articulated or rigid platform structure.

4 The vessel may be docked on a system of blocks, cradles or an air/hydraulic cushion arrangement for subsequent transfer.

5 Docking systems which incorporate a combination of both mechanical lift dock and floating dock principles will be specially considered on the basis of these requirements and National Technical Regulation on Classification and Construction of Floating Dock (QCVN 55: 2013/BGTVT)

1.1.2 Scope

The present Regulation is to apply to organizations and individuals involving activities relating to ship lift platforms and falling under the application as specified in 1.1.1 above, including Vietnam Register (hereinafter referred to as "VR"); ship lift platform owners (hereinafter referred to as "Owner"); ship lift platform operators, designers, building yards, renovating and repairing yards.

1.2 References, Definitions and Explanations

1.2.1 References

1 QCVN 21: 2010/BGTVT, "National Technical Regulation - Rules for the classification and construction of sea-going steel ships" promulgated in accordance with Circular 12/2010/TT-BGTVT dated 21 April 2010.

2 QCVN 23: 2010/BGTVT, "National Technical Regulation - Rules for cargo handling appliances of ships" promulgated in accordance with Circular 11/2010/TT-BGTVT dated 20 April 2010.

3 QCVN 55: 2013/BGTVT, "National Technical Regulation on Classification and Construction of Floating Dock" promulgated in accordance with Circular 06/2013/TT-BGTVT dated 02 May 2013.

4 ISO 898-1: Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread.

5 ISO 4309: 2010: Cranes - Wire ropes - Care and maintenance, inspection and discard.

1.2.2 Definitions and explanations

1 Maximum distributed load (MDL)

(1) Maximum distributed load (MDL) is the maximum load, in tonnes/metre, without any wind loading, which can be uniformly distributed along the centreline of the platform, or where docking is only via transfer cradles which are evenly distributed along the inner longitudinal transfer rails over the maximum docking length of the platform or which has been used in establishing the scantlings of the platform and capacity of the hoist units.

It is to be taken as capacity of one pair of hoists minus deadweight of the length of pontoon associated with these hoists and then divided by the hoist spacing

(2) For transfer systems that incorporate trestles and independent bogies, special attention is to be given to the local platform structure supporting any load concentrations from the trestle legs.

(3) The maximum distributed load on the platform includes the weight of cradles, trestles or blocks used for supporting the ship.

(4) In addition, the MDL may also be expressed as being exclusive of the transfer system and this would relate directly to the weight distribution of the ships being docked.

2 Maximum lifting capacity (MLC)

This is the maximum theoretical load, in tonnes, without wind loading, which can be lifted on the platform. It is to be taken as:

MLC = MDL $\times$ maximum effective docking length.

This capacity takes no account of dynamic loading or uncertainties in the weight distribution of the ship being docked and consequently this will not be used for operational purposes. Where specially requested, this value may be included in the issued certificate

for information purposes only.

3 Nominal lifting capacity (NLC)

(1) This is the maximum displacement, in tonnes, of a ship of normal form which can be lifted without exceeding the maximum distributed load for which the platform is designed, and is to be taken as:

NLC = MDL × maximum effective docking length × a distribution factor.

(2) The NLC is calculated to provide Operators with a guide of the load to which the platform may be subjected from a ship of normal form, so that the MDL is not exceeded at any point on the platform during docking or transfer operations. This may be used, for example, when the weight distribution of the ship being docked is not accurately known.

(3) Normal form is taken to differentiate between conventional mono-hull ships, which would usually dock along the keel block centreline of the platform, and other ship forms such as catamarans, trimarans, swaths, semi-subs, ships with moonpools, etc., which would require specific blocking arrangements.

4 Distribution factor

(1) The distribution factor is to ensure that the maximum distributed load is not exceeded anywhere along the effective length of the platform and to allow for dynamic factors. The following values are generally to be adopted:

(a) Platforms of articulated design (that have no longitudinal stiffness or bending rigidity) and incorporating conventional block, cradle or trestle arrangements: 0.67.

(b) Platforms of articulated design incorporating flexible (fluid bed) cradles, or platforms of rigid design (a rigid design is one where moments are carried through the platform structure) incorporating flexible or rigid cradles: 0.83. Distribution factors in excess of 0.83, requested by the designer, will be specially considered.

(2) Special consideration may be given to platforms with a fluid bed transfer system which is used to redistribute local peak ship loadings in excess of the MDL. Calculations in support of these requests must be submitted for consideration by VR.

5 Effective docking length

(1) For ships with direct blocking, the maximum effective docking length on the platform is taken as the total length between hoists plus the length of end cantilevers. Each of these cantilevers is to be taken as not greater than 0.4 times the hoist spacing.

(2) Special consideration will be given to cantilever overhangs that are greater than 0.4 x hoist spacing, where they are supported by the dockside during transfer operations.

(3) For shiplifts where vessels dock directly on to transfer cradles, the docking length is typically less than the effective docking length where ships dock directly on the platform centreline. The effective docking length when docking directly on to the transfer system (cradles or trestles) occurs may be determined by:

(a) The number of cradles × cradle spacing; or

(b) The number of trestles × trestle spacing.

6 The lifting capacities will be specially considered in cases where:

(1) The block or cradle arrangement is such that the loads are not applied along the centreline of the platform, i.e., asymmetric loading;

(2) The design incorporates different maximum distributed loads along the length of the platform.

7 Length of ship lift platform is the over all length disregarding appendages.

8 Breadth of ship lift platform is the over all breadth disregarding appendages.

9 Anniversary Date is the day corresponding to the expiry date of the Classification Certificate for ship lift platform, excluding the expiry date of the Classification Certificate

II TECHNICAL REGULATIONS

CHAPTER 1 GENERAL

1.1 General

1.1.1 Equivalency

Alternative ship lift platform construction, equipment, arrangement and scantlings will be accepted by VR, provided that VR is satisfied that such construction, equipment, arrangement and scantlings are equivalent to those required in this Regulation.

1.1.2 Other requirements

1 In addition to those requirements for classification and construction of ship lift platform in this Regulation, the Owners, building yards and designers are to abide by other rules of law for occupational safety and health and requirements in other national technical regulations applicable to ship lift platforms.

2 When specifically requested, end and side transfer arrangements will be examined and included in the class notation or certificate issued. However, where the design concept of the platform involves an interaction or interdependence between the platform and transfer system, as in the case of a rigid platform with flexible ship support system, the transfer system will be considered as an essential and integral aspect of class or certification.

3 Requirements in this Regulation are based on an assumption that the shiplift will, at all times, be properly loaded and operated. Concentrations of loading greater than that indicated by the specified maximum distributed load, or for any loading situations or weather conditions which may result in the rated capacity of individual hoists being exceeded are not allowed for.

4 Ship lift platform operators are to be provided with sufficient information incorporated in Operating Manual in order to ascertain the safety of ship lift platform.

CHAPTER 2 CLASSIFICATION SURVEY

2.1 Classification Survey during Construction

2.1.1 General

1 In the Classification Survey during Construction of ship lift platform, its structures, equipments, machinery installations and control systems are to be examined in order to ascertain that they meet the relevant requirements in this Regulation.

2 New installation of materials which contain asbestos is to be prohibited.

2.1.2 Plans and Documents for Approval

1 Plans and documents in which scantlings of structural members, arrangement and detail of main parts of structure, as well as relating data are clearly indicated, are to be submitted to VR. The number of copies of plans and documents for approval is to be in accordance with requirements in 1.3.2-1(3)(a) Section III. In general, the plans and documents are to include those listed from (1) to (4) below:

(1) Structural plans of the platform for approval:

(a) Structural plans of the platform;

(b) Structural plans of the transfer system if it is required that this is to be included in the certification or class of the installation;

(c) Upper and lower sheave housings;

(d) Winch bedplate;

(e) Rope or chain specification;

(f) The material specification for steels used in the construction.

(2) Structural plans of the platform and documents for reference purposes:

(a) Calculations clearly indicating the basis of design, nominal lifting capacity, maximum distributed load weights and centres of gravity of the component parts and any other relevant design criteria;

(b) Platform assembly;

(c) Arrangement of decking;

(d) Rail arrangement and details;

(e) Hoist and rigging arrangements;

(f) Cradle and block arrangements;

(g) Welding specifications.

(3) Plans and documents relating to mechanical, electrical and control system for

approval:

(a) Diagrammatic plan of hydraulic or pneumatic systems, where fitted;

(b) Plans of winch gearing, shafts, clutches, brakes, coupling bolts, welded drums, and similar items and their materials and stresses;

(c) Plans of circuit diagram of electrical system, showing load currents and ratings of all electrical equipment, types and sizes of cables, rating type and make of all protecting devices;

(d) Arrangement plan and circuit diagram of switchboard;

(e) General arrangement of control centre;

(f) Schematic diagrams of control panels;

(g) Details of alarms and protection circuits.

(4) Plans and documents relating to mechanical, electrical and control system for reference purposes:

(a) Calculations of short-circuit currents and main busbars, sub-switchboard busbars and the secondary side of transformers;

(b) Load analysis of electrical equipments of ship lift platform.

2.1.3 Classification Survey during Construction

1 From the commencement to the completion of the construction of ship lift platform, materials, workmanship and equipments are to be tested and examined by the Surveyors. Mandatory items are as follows:

(1) Tests on materials and equipments prescribed in Part 7A and 7B Section II QCVN 21: 2010/BGTVT;

(2) Welding procedure examinations and welding inspections by radiographic examination prescribed in Part 6 Section II QCVN 21: 2010/BGTVT;

(3) Surveyor inspection on shop work, sub-assembly or block-assembly;

(4) Inspection on each part of ship lift platform after completion;

(5) Inspection during tests in accordance with requirements in 2.1.4.

2.1.4 Testing

1 General

(1) The test criteria specified in this section are applicable to all installations where the control system has an acceptable method of measuring the actual load on each individual hoist and where over-hoist and overload cut-outs and leveling devices are fitted in accordance with Chapter 4;

(2) The test criteria will be specially considered where an inherent feature of the design requires a departure from the safety control requirements;

(3) In all cases, a detailed test procedure based upon the requirements of this section is

to be submitted for approval;

2 Load tests

(1) Hoists:

(a) Light running tests on each hoist unit are to be carried out at the manufacturer's works;

(b) For installations with a large number of identical hoists, consideration may be given to selective proof load testing, at the factory, provided that all hoists are fully load tested during the completed installation test. Proof loads are given in Table 2.1.4-1;

(c) For factory testing of the hoist units, the SWL detailed in Table 2.1.4-1 is to be taken as the single line tension to the winch.

Table 2.1.4-1 Proof loads for hoists and cradles

Rated capacity, SWL	Proof load, in tonnes
SWL ≤ 20 tonnes	1.25 × SWL
20 tonnes < SWL ≤ 50 tonnes	SWL + 5
SWL > 50 tonnes	1.1 × SWL

(2) Transfer systems:

(a) All end and side transfer cradles are to be proof load tested in accordance with Table 2.1.4-1, based upon the rated capacity of the cradles;

(b) Transfer systems that incorporate a series of trestles and bogies are also to be individually tested in accordance with Table 2.1.4-1, based upon the rated capacity of the trestles and bogies;

(c) For installations with a large number of cradles, consideration may be given to selective proof load testing of the cradles.

(3) Hydraulic cylinders:

(a) Cylinders used in hoist platforms or in transfer system cradles and bogies are to be pressure tested at the factory to 1.5 x design pressure;

(b) Cylinders fitted to transfer cradles and bogies are to be proof load tested as part of the load test on the cradle or bogie.

(4) Platforms:

(a) The platform is to be load tested following installation on site:

(i) In an unloaded or partially loaded condition; and

(ii) With 100 per cent of the MDL.

(b) The unloaded, or partially loaded, test is to be carried out to demonstrate the efficient operation of the platform systems;

(c) The 100 per cent MDL load test may be carried out in stages by testing opposite

pairs or sets of hoists if the size of the installation makes testing the entire platform in one operation unreasonable.

(d) Where the 100 per cent MDL test is carried out in stages, it is to be ensured that each hoist unit is subjected to its rated capacity. This is of particular importance for platforms of rigid design.

(5) Other items:

Loose gear, ropes and chains are to be in accordance with the requirements of 2.5-2(2) and (3) Section II QCVN 23: 2010/BGTVT.

3 Operational tests

(1) In addition to the load tests required in -1, a complete operational test of the whole system is to be carried out with a vessel having a displacement approximately equal to the NLC of the installation. This test is to be performed over a complete operating cycle, that is, hoisting, docking, transfer ashore, transfer whilst ashore on transfer carriages (if appropriate), transfer back onto the platform and lowering;

(2) Where, for practical considerations, it is not possible to test to the full nominal capacity, this test may be carried out with a reduced test load but not less than 60 per cent of the nominal lifting capacity;

(3) Where only a limited operational test is carried out, the certificate will be initially endorsed reflecting the limitation on testing and transfer operations that will be restricted to the tested displacement under (2) until such time as a ship of suitable displacement is available to test the installation to the full nominal lifting capacity. This operational test at 100 per cent of the nominal lifting capacity is generally to be carried out within one year of the completion of the test. This re-test is to be witnessed by the Surveyor;

(4) Tests for machinery installations, electrical and control systems are to be in accordance with requirements in Chapter 4.

2.2 Classification Survey of Ship lift platform not Built under Survey

2.2.1 Submission of plans and documents

Plans in which specifications of the existing ship lift platform are clearly specified are to be submitted to VR for review. All reports relating to structures of ship lift platform are also to be submitted to VR upon request.

2.2.2 Surveys

1 During the surveys, the Surveyor is to consider the compliance of workmanship and verify the scantlings of structural members and equipments in accordance with reviewed plans and documents. To verify the state of any deterioration, where necessary, structural parts are to be drilled for inspection. Ship lift platform of novel structural design is to be specially considered.

2 A thorough examination of the steel structure. The scantlings of material present and the extent of any deterioration is to be recorded. Non-destructive testing is to be carried out in accordance with follows:

(1) All fillet and butt welds in the area of support for sheave housings, transverse butt welds in main girders and similar critical areas. Butt welds to have 100 per cent MPI and US examination with 100 per cent MPI on fillet welds;

(2) 20 per cent of all other fillet welds in primary structural members to be subject to MPI.

3 A thorough examination of all the hoist ropes or chains, together with sheaves and hoist sets. Ropes or chains are to be renewed as may be required by 2.3.2-3. The requirements of 2.3.2-4(2) to (4) are to be applied and the initial extent of renewal is to be agreed with the Surveyor.

4 A thorough examination of all the hoists and of the electrical and control system in accordance with 2.3.2-6, -7 and -9 respectively.

5 The installation is to be tested in accordance with 2.1.4.

Where the transfer system is to be included in the Class notation, the requirements of 2.3.2-8 are to be complied with, except that 25 per cent of the axle pins to the bogie wheels are to be withdrawn for inspection.

2.3 Periodical Surveys and Occasional Surveys

2.3.1 General

1 For maintenance of class, ship lift platform is to be subject to periodical surveys and occasional surveys (in case of damage, repair, alteration and modification etc.) in accordance with 2.3.2 and 2.3.3 below.

2.3.2 Periodical Surveys

1 Periodical Surveys are to be carried out on a 5-yearly Continuous Survey in accordance with approved Inspection plan on the basis of the requirements of -2 to -13 below. Periodical survey is to be completed not later than anniversary date.

2 20 per cent of main and secondary transverse and longitudinal girders are to be examined. This may require the removal of limit switch operating rods to enable submerged areas of the platform to be raised clear of the water. The examination is to include:

(1) The connection or seating arrangements at the junction of longitudinal and transverse girders for signs of work hardening and cracking and other defects;

(2) A general examination of protective coatings;

(3) Examination of the rails for alignment and signs of wear, giving particular attention to connecting arrangements and the connecting rail between the platform and shore.

Decking is to be removed as necessary to allow these examinations.

3 The Surveyor is to be satisfied with regard to the maintenance condition and lubrication of the hoist ropes. Concurrent with Periodical Surveys, the Surveyor is to carry out a

complete in situ visual examination as far as is practicable for signs of corrosion, wear or broken wires.

(1) In general, wire ropes are to be renewed where there are 5 per cent or more of broken, worn or corroded wires in any length of ten rope diameters. However, reference is to be made to ISO 4309:2010 in determining specific discarded criteria;

(2) At the second Annual Survey and each subsequent year a minimum number of ropes is to be removed from installations as follows:

Up to 6 hoist units: 1 rope;

Over 6 to 20 hoist units: 2 ropes;

More than 20 hoist units: 4 ropes.

A test to destruction is to be carried out on a sample length selected by the Surveyor from each of the ropes being replaced. Where the test piece fails at breaking loads more than 10 per cent below the minimum required values, consideration will be given to the need to select for test and replacement some or all of the remaining ropes;

(3) It is the intention that all ropes be replaced in sequence at a rate determined by wear, chemical attack, corrosion or other forms of deterioration associated with the particular installation. For small installations, this will result in a replacement cycle of about 5 years. Proposals for the replacement cycle for large installations to exceed 10 years will be specially considered in the light of the test results obtained.

4 Where the Annual Survey incorporates the use of non-destructive examination equipment to inspect hoist ropes, the following procedures are to be adopted:

(1) The accuracy and reliability of the NDE equipment is to be demonstrated to the satisfaction of the Surveyor;

(2) Field tests are to be carried out to the Surveyor's satisfaction to verify the suitability of the equipment for the particular hoist and rope arrangement and rope speed;

(3) The annual rope Survey is to be as follows:

(a) Complete visual inspection of all ropes for signs of broken wires. Particular attention is to be given to the condition of the ropes in way of the rope terminations as these areas are unlikely to be accessible to NDE equipment (See (4) Test A);

(b) NDE of a selected number of ropes using approved equipment operated by skilled personnel. The number of ropes selected for inspection is to be in accordance with 2.3.2-3(2) but not less than 10 per cent of the total number of ropes in the installation. Ropes are to be tested over their full length and are to be selected in accordance with a planned programme of inspection to ensure an even distribution of ropes, selected on an annual rotation basis (See (4) Test B);

(c) Two years after installation of the ship lift, one rope that has been subjected to NDE is to be selected for a test to destruction to verify the NDE results. Thereafter, one rope is to be selected for a break test each year (See (4) Test C).

(4) The results of the tests in (3) will be used to determine, to the satisfaction of the Surveyor, whether rope replacement or further testing is necessary for the particular installation. In general, the following criteria are to be used in determining the adequacy of the ropes to be retained in service:

Test A: The number of broken wires is not to exceed the guidance given in ISO 4309:2010 for the type of rope fitted;

Test B: The cross-sectional area is not be reduced by more than 10 per cent of the original area. Where the loss in area is found to be between 5 and 10 per cent, consideration is to be given to including these ropes in subsequent examinations in addition to ropes selected for normal annual NDE;

Test C: The reduction in breaking strength when the combined effect of metal loss, corrosion pitting and broken wires has been taken into account is not to exceed 10 per cent of the minimum specified rope breaking strength. The minimum specified rope breaking strength will be specified by the wire rope manufacturer.

5 The maintenance, condition and lubrication of hoist chains are to be to the satisfaction of the Surveyor. In general, any length of chain so worn that its mean diameter at its most worn part is reduced by 4 per cent or more from its nominal diameter is to be renewed.

6 20 per cent of the upper and lower sheaves, bearings, axles and housings are to be examined, with at least two complete sets of sheaves opened up for examination. All sheaves are to be opened up at least once in the 5-yearly Survey cycle. Attention is to be paid to lower blocks in way of drain holes and the attachment of sheave housings to upper and lower supports is to be examined.

7 Covers on 20 per cent of the hoists are to be removed to allow for the following inspections:

(1) The tooth alignment of open gears is to be checked;

(2) Main shaft pillow block bearings are to be opened up;

(3) Cap screws securing final spur wheels to the drum are to be checked and tightened with a torque spanner;

(4) Primary gears and all open gear shafts and bearings are to be examined;

(5) The hoist frame and bolting arrangements are to be examined.

8 Where the transfer system is included in the class notation, 20 per cent of the transfer bogies are to be examined.

(1) Wheels are to be examined for wear and the condition of linkages between bogies is to be checked;

(2) A random selection of 10 per cent of the axle pins to the bogie wheels is to be withdrawn for inspection for signs of excessive wear and other defects;

(3) The rails are to be examined for alignment and signs of wear and to verify the adequacy of the locating and locking arrangements.

9 An insulation resistance test (megger test) is to be carried out on all electrical systems, and all electrical cables are to be examined. In addition:

(1) Breakers, relays and all other mechanical electrical gear are to be examined;

(2) 20 per cent of electric motors including bearings and magnetic brakes are to be examined;

(3) All circuit-breakers to be tested for overload tripping;

(4) Air compressors for hoist ratchet and arrangement are to be generally examined together with the air tank;

(5) The efficiency of all safety devices is to be demonstrated.

10 At a convenient time close to each Periodical Survey, the Surveyor is to attend during a hoist and transfer operation at the facility to check the general operation of the installation.

11 Decking is not a class matter. However, the general condition of the decking may be reported.

12 Any other matter which may have a bearing on the class of the installation is also to be reported.

13 The requirements for Periodical Survey for small installations will be specially considered.

2.3.3 Damage, Alteration and Modification

Where damages or the alteration of structures, machinery installations or equipments etc. affect or may affect the class of ship lift platform, the Owner or their representatives are to report and request VR for inspection.

2.4 Preparation and assistance for survey

2.4.1 Preparation and assistance for survey

1 All such preparations as required for the surveys as well as those which may be required as necessary by the Surveyor are to be made by the Owners or their representatives at their responsibilities. The preparations are to include provisions of an easy and safe access, necessary facilities and documents for the execution of the survey. Inspection, measuring and test equipment, which Surveyors rely on to make decisions affecting classification are to be individually identified and calibrated to a standard deemed appropriate by VR. However, the Surveyor may accept simple measuring equipment (e.g. rulers, measuring tapes, weld gauges, micrometers) without individual identification or confirmation of calibration, provided they are of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces. The Surveyor may also accept equipment used in examination (e.g. pressure, temperature or rpm gauges and meters) based either on calibration records or comparison of readings with multiple instruments.

2 An applicant for survey(s) is to arrange a supervisor (hereinafter referred to as owner's representative) who is well conversant with the intended survey items for the preparation of the survey in order to provide the necessary assistance to the Surveyor according to his requests during the surveys.

3 Prior to the commencement of survey, a meeting about the commencement time of the surveys and measurements as well as a survey plan is to be held by the surveyor(s), the owner's representative, the measurement company representative and others where involved in order to ascertain the good quality of measuring equipments and the safety of surveys and measurements.

4 Surveys may be suspended where necessary preparations have not been made, any appropriate attendee in accordance with -2 is not present, or the Surveyor considers that the safety for execution of the survey is not ensured.

5 When repairs are considered to be necessary as a result of surveys, the Surveyor notifies his findings to the survey applicant. The applicant, when he receives such notification, is to obtain the Surveyor's verification after carrying out the necessary repairs.

6 Replacement of equipments and spare parts etc.

Where the replacement of equipments and spare parts etc. on the installation is necessary, such replacement is to comply with requirements for that existing installation. However, where such equipments are clearly specified or considered necessary by VR, VR may require the compliance of those with present Regulation. In addition, the replacing equipments are not to contain asbestos.

CHAPTER 3 SHIP LIFT PLATFORM CONSTRUCTION

3.1 Requirements

3.1.1 Design loads

1 Dead loads

The self-weight including weight of all steelwork, rails, welding, paint systems and platform decking are to be taken into account in the calculations. Where timber decking is used, due consideration of the moisture content of the timber is to be taken into account.

2 Docking and transfer loads

(1) The design is to be based on the maximum distributed load per metre applied as a keel block loading along the centreline of the platform, or along the inner set of transfer rails and/or trestle feet, where docking directly onto the platform does not occur;

(2) The loading imposed on the platform from the cradle or bogie wheels is to be applied during transfer operations as follows:

(a) Over the entire docking length of the platform to the shore end of the platform for end transfer operations;

(b) Over the entire length of side transfer rails for side transfer operations.

(3) The block or cradle arrangement is, in general, to be such as to ensure that the pressure on the hull of a docked ship is not greater than that for which its structure is suitable. In general, this pressure will be the range between 200 to 230 t/m^2. Particular circumstances may, however, result in a greater or lesser pressure being appropriate;

(4) The effects of the forces required to overcome friction in the transfer system are to be allowed for in the horizontal strength of the platform. The friction force is to be taken as not less than 1.5 per cent of the cradle wheel loads when roller bearings are fitted to the wheels, and 4 per cent when plain or bushed bearings are fitted.

3 Access and general decking loads

(1) The access and decked-in areas of the platform are also to be designed for pedestrian and maintenance purposes to:

(a) A superimposed load of 5 kN/m^2, uniformly distributed; and

(b) A point load of 10 kN at any one point.

Higher values may be required to meet operational equipment criteria.

(2) Where vehicular access is required, the decking and deck support structure are to be designed in accordance with 8.9, 10.7 and 15.5 Part 2A QCVN 21: 2010/BGTVT, as

appropriate for the intended vehicles. These loadings will not normally influence the lifting capacity specified in 1.2.2 Section I.

4 Wind loads

(1) Each ship lift and transfer system and its supporting arrangements is to be capable of withstanding:

(a) The loading from the wind on both the ship and platform from the specified maximum wind speed in which the shiplift will continue to operate;

(b) The loading from the wind on the platform from an extreme out-of-service wind speed based on a 1:50 year return period.

(2) The design wind speeds are to be based on local climatology data. Where the wind speeds are not defined by reliable local meteorological records, the following values may be used:

(a) 20 m/s for the normal in-service condition;

(b) 63 m/s for the out-of-service condition.

5 Seismic loading

(1) Shiplifts located in areas of high earthquake risk are to be designed to be capable of withstanding the accelerations resulting from an Operating Basis Earthquake (OBE). This is the acceleration for which the installation is expected to remain operational. An event of this magnitude/intensity can be reasonably expected to be experienced at the site during the operating life of the installation.

(2) Consideration of the maximum credible seismic event at the site may be required if catastrophic failure of the installation results in significant loss of life or unacceptable environmental damage.

6 Load combinations

(1) Shiplift platforms and transfer systems are to be considered for the design loadings resulting from the following load cases:

(a) Case 1: Operational: docking and transfer with no wind

The shiplift and transfer system are to be considered with respect to its self-weight plus the applied vertical load from the docked ship and transfer system, together with the horizontal loads resulting from the traction/friction loads during transfer operations.

(b) Case 2: Operational: docking and transfer with wind

The shiplift and transfer system are to be considered with respect to its self-weight plus the applied vertical load from the docked ship and transfer system, together with the horizontal loads resulting from the in-operation wind speed (actual data to be provided or 20 m/s will be used) applied to both the ship and the platform, and also to traction/friction loads during transfer operations.

(c) Case 3: Survival: ship on transfer system on land during extreme wind conditions

The transfer system is to be considered with respect to its self-weight plus the applied vertical load from the docked ship, together with the horizontal load resulting from the extreme wind condition (actual data to be provided or 63 m/s will be used) applied to both the ship and the platform. Where appropriate, consideration may also need to be given to the OBE (Operating Basis Earthquake) seismic event, either:

- Separately; or

- Together with the extreme wind condition.

(2) In way of platform bilge blocks, the platform structure is to be designed for the maximum loads resulting from load case 2. This load is to be not less than 20 per cent of the maximum distributed load per metre.

3.1.2 Allowable stresses

1 The allowable stress, σ_a, is to be taken as the failure stress of the component concerned, multiplied by a stress factor, F, which depends on the load case considered. The allowable stress is given by the general expression:

$\sigma_a = F\sigma$; or

$\tau_a = F\tau$.

Where:

σ_a is allowable direct stress, N/mm^2;

τ_a is allowable shear stress, N/mm^2;

σ and τ are failure stress, N/mm^2.

2 The stress factors, F, for steels in which $\sigma_y/\sigma_u \leq 0.85$, are given in Table 3.1.2-1, where:

σ_y is yield stress of material, N/mm^2;

σ_u is ultimate tensile stress of the material, N/mm^2.

Table 3.1.2-1 Stress factor F

Load case	1	2	3
Stress factor F	0.67	0.75	0.85

3 For steel with $\sigma_y/\sigma_u > 0.85$, the allowable stress is to be derived from the following expression:

$\sigma_a = 0.46(\sigma_u+\sigma_y)$

$\tau_a = 0.27F(\sigma_u+\sigma_y)$

Where, σ_a and τ_a are defined in -1.

4 Steels with $\sigma_y/\sigma_u > 0.94$ are not generally acceptable and are to be specially considered.

5 The failure stresses for the elastic modes of failure are given in Table 3.1.2-2.

Table 3.1.2-2 Failure stress

Mode of failure	Symbol	Symbol Failure stress
Tension	σ_t	$1.0\sigma_y$
Compression	σ_c	$1.0\sigma_y$
Shear	τ	$0.58\sigma_y$
Bearing	σ_{br}	$1.0\sigma_y$

6 For components subjected to combined stresses, the following allowable stress criteria are to be used:

$\sigma_{xx} < F\sigma_t$

$\sigma_{yy} < F\sigma_t$

$\tau_0 < F\tau$

$$\sigma = \sqrt{\sigma_{xx}^2 + \sigma_{yy}^2 - \sigma_{xx}\sigma_{yy} + 3\tau_0^2} \le 1.1F\sigma_t$$

Where:

σ_{xx} is applied stress in x direction, N/mm^2;

σ_{yy} is applied stress in y direction, N/mm^2;

τ_0 is applied shear stress, N/mm^2.

7 The allowable stresses may be reduced in areas where openings or details in the structure may lead to the creation of stress concentrations.

8 For members subject to compression, the allowable axial stress for compression members is to be taken as the critical compressive stress σ_{cr}, determined in accordance with following formula and multiplied by the allowable stress factor F, as defined in Table 3.1.2-1.

$$\sigma_{cr} = \frac{\sigma_y + (1+\eta)\sigma_e}{2} - \sqrt{\left(\frac{\sigma_y + (1+\eta)\sigma_e}{2}\right)^2 - \sigma_y\sigma_e}$$

Where:

$$\sigma_e = \frac{\pi^2 E}{\left(\frac{KL}{r}\right)^2}$$

$$\eta = 0.001a\left(\frac{KL}{r} - 0.2\pi\sqrt{\frac{E}{\sigma_y}}\right)$$

E is Young's modulus;

L is length of member;

r is radius of gyration of member;

a is Robertson's constant as in Table 3.1.2-4;

σ_y is yield stress;

K is constant dependent on the end constraint condition of the member and can be obtained from Table 3.1.2-3.

Table 3.1.2-3 Value K

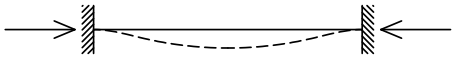
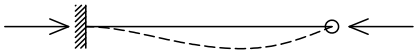
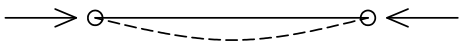
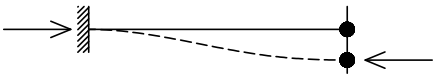
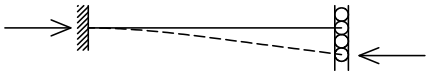
Diagrammatic representation	Restraint conditions	K
	Constrained against rotation and translation at both ends	0.7
	Constrained against rotation and translation at one end and translation only at other end	0.85
	Constrained against translation only at each end	1.0
	Constrained against rotation and translation at one end and against rotation only at other end	1.5
	Constrained against rotation and translation at one end and free to rotate and translate at other end	2.0

Table 3.1.2-4 Values of Robertson's constant, a

Type of section	Thickness of flange or plate, in mm	Axis of buckling	a
Rolled I section (universal beams)		xx	2.0
		yy	3.5
Rolled H section (universal beams) (1)	≤ 40	xx	3.5
		yy	5.5
	> 40	xx	5.5
		yy	8.0
Welded plate I or H sections (1) (2) (3)	≤ 40	xx	3.5
		yy	5.5
	> 40	xx	3.5
		yy	8.0
Rolled I or H section with welded flange cover plates (1) (4)		xx	3.5
		yy	
		xx	2.0
		yy	
Welded box sections (1) (3) (4)	≤ 40	Any	3.5
	> 40	Any	5.5
Rolled channel sections, rolled angle sections or T-bars (rolled or cut from universal beam or column)		Any	5.5
Hot-rolled structural hollow sections		Any	2.0
Rounds, square and flat bars (1)	≤ 40	Any	3.5
	> 40	Any	5.5
Compound rolled sections (2 or more I, H or channel sections, I section plus channel, etc.)		Any	5.5
Two rolled angle, channel or T-sections, back-to-back		Any	5.5
Two rolled sections laced or battened		Any	5.5
Lattice strut		Any	2.0

Notes:

(1) For thicknesses between 40 mm and 50 mm, the value of σ_{cr} may be taken as the average of the value for thicknesses less than 40 mm and the value for thicknesses greater than 40 mm.

(2) For welded plate I or H sections where it can be guaranteed that the edges of the flanges will only be flame-cut, a = 3.5 may be used for buckling about the y-y axis for flanges up to 40 mm thick and a = 5.5 for flanges over 40 mm thick.

(3) Yield strength for sections fabricated from plate by welding reduced by 25 N/mm^2.

(4) "Welded box sections" includes those fabricated from:

- Four plates;
- Two angles;
- An I or H section and two plates,

but not box sections composed of two channels or plates with welded longitudinal stiffeners.

The value of σ_{cr} for steel is given in Table 3.1.2-5. VR may accept recognized alternative methods for the calculation of σ_{cr}.

Table 3.1.2-5 Values of σ_{cr} (N/mm^2) for steel for varying σ_y

Yield stress, N/mm^2		240				260				360			
Slenderness ratio, s	Robertson's constant, a	2.0	3.5	5.5	8.0	2.0	3.5	5.5	8.0	2.0	3.5	5.5	8.0
20		239	239	238	237	259	258	257	255	356	353	350	345
30		234	230	224	218	253	248	242	234	348	339	328	316
40		228	220	210	199	246	237	226	214	337	322	305	286
50		221	209	195	181	238	225	210	194	323	301	278	256
60		212	196	180	163	228	210	192	174	302	275	249	225
70		200	182	163	146	214	193	174	156	272	245	219	196
80		185	165	147	131	196	175	155	138	237	213	190	170
90		167	148	131	116	175	156	138	122	202	182	164	147
100		149	132	117	103	154	137	122	108	171	156	141	127
110		131	117	103	92	134	121	107	96	146	134	122	111
120		115	103	92	82	117	106	95	85	125	116	106	97
130		101	91	82	73	102	93	84	76	108	101	93	85
140		89	81	73	66	90	83	75	68	94	89	82	76
150		78	72	66	59	79	74	67	61	83	78	73	68
160		70	65	59	53	71	66	60	55	73	69	65	61
180		56	53	48	44	57	53	49	45	59	56	53	49
190		51	48	44	40	51	48	45	41	53	51	48	45
200		46	44	40	37	47	44	41	38	48	46	44	41
210		42	40	37	34	42	40	38	35	43	42	40	38
220		39	37	34	32	39	37	35	32	40	38	37	35
230		35	34	32	29	36	34	32	30	36	35	34	32
240		33	31	29	27	33	31	30	28	34	32	31	30

The slenderness ratio for members with constant radius of gyration is obtained from the following formulae:

$s = KL/r$

Where:

K is a constant which depends on the end constraint conditions of the member and is obtained from Table 3.1.2-3;

L is length of member;

r is radius of gyration of member.

9 The allowable stress for plate buckling failure is to be as the critical buckling stress σ_{cb}, σ_{bb} or τ_b as appropriate and determined as follows, and multiplied by the stress factor F, as defined in Table 3.1.2-1.

(1) For components subject to compression stress, the critical buckling stress is given by:

(a) For $\sigma_{cb} < 0.5\sigma_y$

$$\sigma_{cb} = K_c E \left(\frac{t}{b}\right)^2$$

(b) For $\sigma_{cb} \geq 0.5\sigma_y$

$$\sigma_{cb} = \sigma_y \left(1 - \frac{\sigma_y}{4K_c E \left(\frac{t}{b}\right)^2}\right)$$

Where:

σ_{cb} is critical compression buckling stress;

E is Young's modulus;

t is plate thickness;

b is plate width, i.e., normal to direction of stress;

a is plate length;

K_c is compression buckling constant, defined as follows:

- For α = a/b $\geq$ 1 then $K_c = \frac{\pi^2}{12(1-\mu^2)} \frac{8.4}{2.1} = 3.615$

- For α = a/b < 1 then $K_c = \frac{\pi^2}{12(1-\mu^2)} \left(\alpha + \frac{1}{\alpha}\right)^2$

μ is Poisson's ratio.

The graphical representation of K_c is provided in Figure 3.1.2-1.

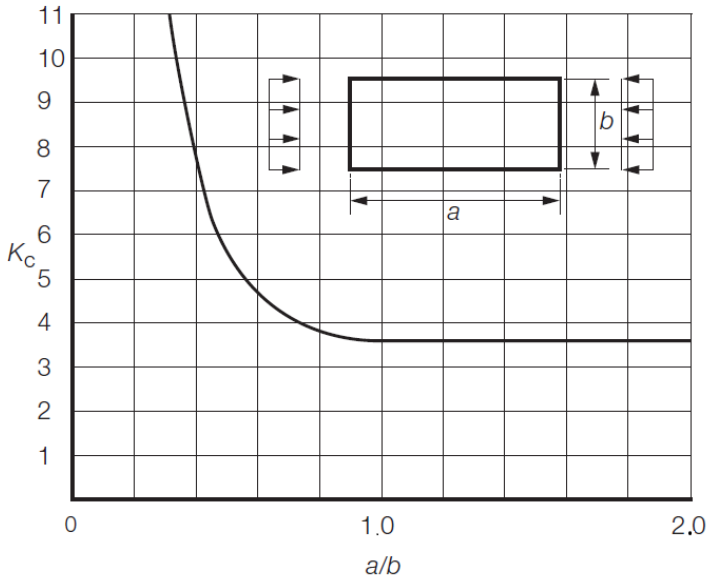


Figure 3.1.2-1 Values of K_c

(2) For components subject to shear stress the critical buckling stress is given by:

(a) For $\tau_b < 0.29\sigma_y$

$$\tau_b = K_s E\left(\frac{t}{b}\right)^2$$

(b) For $\tau_b \geq 0.29\sigma_y$

$$\tau_b = 0.58\sigma_y\left(1-\frac{0.58\sigma_y}{4K_sE\left(\frac{t}{b}\right)^2}\right)$$

Where:

τ_b is critical shear buckling stress;

b is smallest plate dimension;

a is plate length corresponding to b;

K_s is compression buckling constant, defined as follows:

- For α = a/b $\geq$ 1 then $K_s = \frac{\pi^2}{12(1-\mu^2)}\left(5.34+\frac{4.0}{\alpha^2}\right)$

- For α = a/b < 1 then $K_s = \frac{\pi^2}{12(1-\mu^2)}\left(4.0+\frac{5.34}{\alpha^2}\right)$

μ is Poisson's ratio.

The graphical representation of K_s is provided in Figure 3.1.2-2.

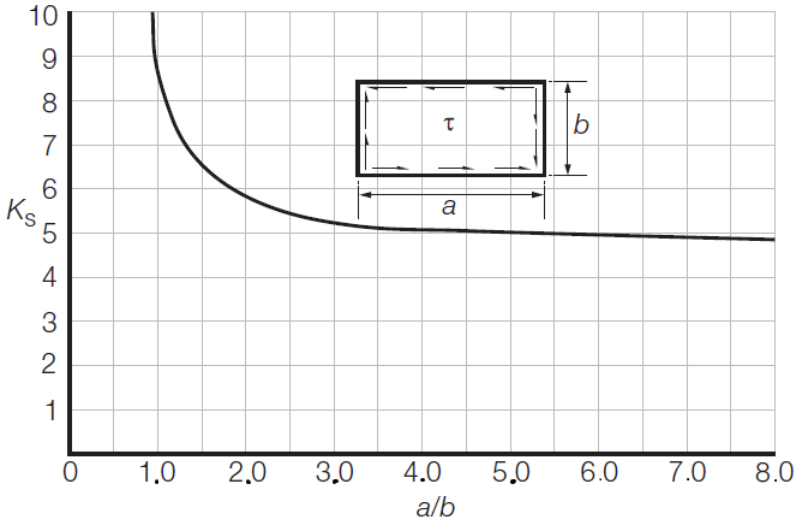


Figure 3.1.2-2 Values of K_s

(3) For components subject to bending stress, the critical buckling stress is given by:

(a) For $\sigma_{bb} < 0.5\sigma_y$

$$\sigma_{bb} = K_b E\left(\frac{t}{b}\right)^2$$

(b) For $\sigma_{bb} \geq 0.5\sigma_y$

$$\sigma_{bb} = \sigma_y\left(1 - \frac{\sigma_y}{4K_b E\left(\frac{t}{b}\right)^2}\right)$$

Where:

σ_{bb} is critical buckling stress;

b is plate width, i.e., normal to direction of stress;

a is plate length, i.e., in the direction of stress;

K_b is compression buckling constant, defined as follows:

- For α = a/b $\geq$ 2/3 then $K_b = \frac{\pi^2}{12(1-\mu^2)} 23.9 = 21.6$

- For α = a/b < 2/3 then $K_b = \frac{\pi^2}{12(1-\mu^2)}\left(15.87 + \frac{1.87}{\alpha^2} + 8.6\alpha^2\right)^2$

μ is Poisson's ratio.

The graphical representation of K_b is provided in Figure 3.1.2-3.

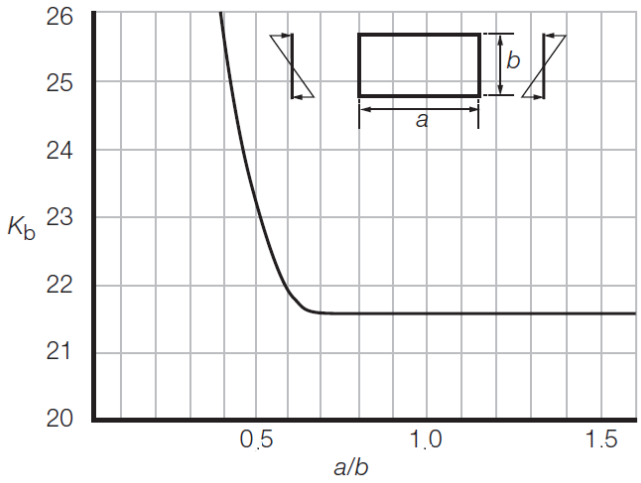


Figure 3.1.2-3 Values of K_b

(4) For components subject to combined compression and shear stress, the following allowable stress criteria are to be met:

(a) $\sigma_c \leq F\sigma_{cb}$

(b) $\tau \le F\tau_b$

(c) $\left(\frac{\sigma_c}{\sigma_{cb}}\right)+\left(\frac{\tau}{\tau_b}\right)^2 \le F$

Where: σ_c and τ are applied compression stress and applied shear stress, respectively.

(5) For components subject to combined bending and shear stress, the following stress criteria are to be met:

(a) $\sigma_b \le F\sigma_{bb}$

(b) $\tau \le F\tau_b$

(c) $\left(\frac{\sigma_b}{\sigma_{bb}}\right)^2+\left(\frac{\tau}{\tau_b}\right)^2 \le F$

Where: σ_b and τ are applied compression stress and applied shear stress, respectively.

(6) For components subject to combined bending and compression stress, the following allowable stress criteria are to be met:

(a) $\sigma_c \le F\sigma_{cb}$

(b) $\sigma_b \le F\sigma_{bb}$

(c) $\left(\frac{\sigma_c}{\sigma_{cb}}\right)+\left(\frac{\sigma_b}{\sigma_{bb}}\right)^2 \le F$

(7) For components subject to combined compression, bending and shear stress, the following allowable stress criteria are to be met:

(a) $\sigma_c \le F\sigma_{cb}$

(b) $\sigma_b \le F\sigma_{bb}$

(c) $\tau \le F\tau_b$

(d) $\left(\frac{\sigma_c}{\sigma_{cb}}\right)+\left(\frac{\sigma_b}{\sigma_{bb}}\right)^2+\left(\frac{\tau}{\tau_b}\right)^2 \le F$

10 The allowable stress for joints and connections are to be in accordance with follows and multiplied by the stress factor F, as defined in 3.1.2-1.

(1) For welded joints, the physical properties of the weld metal are considered as equal to the parent metal. For full penetration butt welds, the allowable stress is equal to the allowable tensile stress of the parent material.

(2) For fillet welds and partial penetration welds, the allowable stresses are reduced. Values of these reduced stresses are given in Table 3.1.2-6. Where F is the stress factor. Figure 3.1.2-4 shows the stresses in a typical fillet weld. The actual stress in

the fillet welds is to be less than or equal to the allowable stresses and is to be evaluated as follows:

(a) Evaluation of perpendicular weld stresses:

$$\sigma_{\perp}^{C-D} = \tau_{\perp}^{D-E} \leq 0.7F\sigma_y$$

or

$$\sigma_{\perp}^{D-E} = \tau_{\perp}^{C-D} \leq 0.7F\sigma_y$$

(b) Evaluation of longitudinal weld stresses:

$$\tau_{\parallel} \leq 0.58F\sigma_y$$

(c) Combined weld stresses :

$$\sqrt{\sigma_{\perp}^2 + \tau_{\perp}^2 + \tau_{\parallel}^2} \leq 0.7F\sigma_y$$

Table 3.1.2-6 Allowable stresses in welds

Type of weld	Allowable stress	
	Tension and compression	Shear
Full penetration butt weld	$1.0F\sigma_y$	$0.58F\sigma_y$
Fillet welds	$0.7F\sigma_y$	$0.58F\sigma_y$

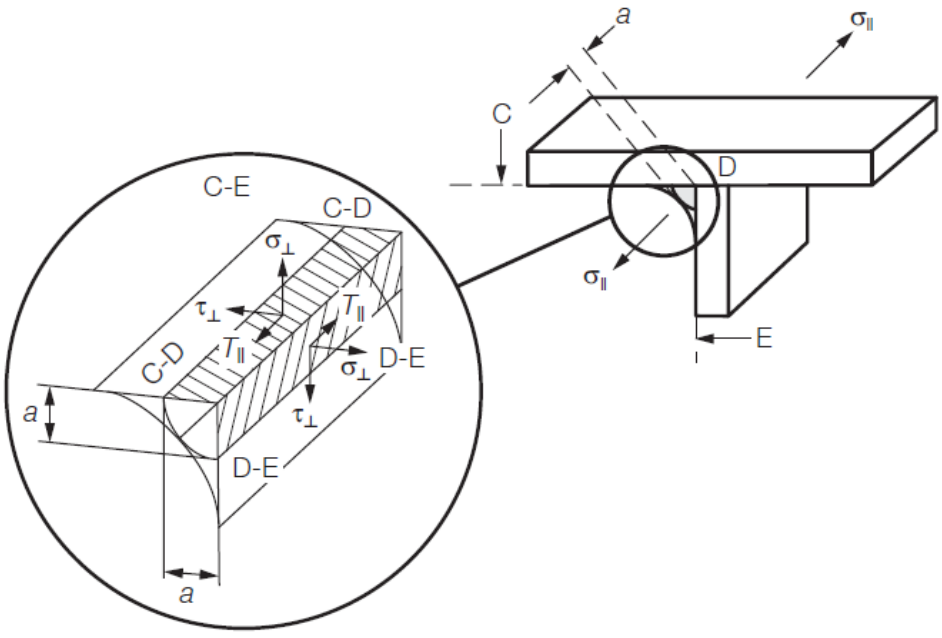


Figure 3.1.2-4 Stresses in welds

(3) The actual stress in fillet welds is to be calculated on the ‘throat’ dimension a of the weld (see Figure 3.1.2-4).

(4) The strength of joints using pre-tensioned bolts to transmit shear and/or tensile forces, e.g., high strength friction grip bolts, are to be determined in accordance with an appropriate and recognized National or International Standard.

(5) For joints using precision bolts, defined as turned or cold finished bolts fitted into drilled or reamed holes whose diameter is not greater than the bolt diameter by more than 0.4 mm, the allowable stress due to the externally applied load is given in Table 3.1.2-7.

Table 3.1.2-7 Allowable stresses for fitted bolts

Type of loading	Allowable stress	
	Load cases 1 and 2	Load case 3
Tension	$0.4\sigma_y$	$0.54\sigma_y$
Single shear	$0.38\sigma_y$	$0.51\sigma_y$
Double shear	$0.57\sigma_y$	$0.77\sigma_y$
Tension and shear $\left(\sigma_{yy}^2 + 3\tau^2\right)^{1/2}$	$0.48\sigma_y$	$0.64\sigma_y$
Bearing	$0.9\sigma_y$	$1.2\sigma_y$

(6) The allowable stresses for non-fitted bolts are to be taken as per Table 3.1.2-8.

Table 3.1.2-8 Allowable stresses for non-fitted bolts

Type of loading	Allowable stress	
	Load cases 1 and 2	Load case 3
Tension	$0.4\sigma_y$	$0.54\sigma_y$
Single shear	$0.32\sigma_y$	$0.43\sigma_y$
Double shear	$0.36\sigma_y$	$0.48\sigma_y$
Tension and shear $\left(\sigma_{yy}^2 + 3\tau^2\right)$	$0.48\sigma_y$	$0.64\sigma_y$
Bearing	$0.7\sigma_y$	$0.9\sigma_y$

(7) Where joints are subjected to fluctuating or reversal of load across the joint the bolts are to be pre-tensioned by controlled means to 70 per cent to 90 per cent of their yield stress.

(8) Black bolts (ordinary grade bolts) are not to be used for primary joints or joints subject to fatigue.

(9) Carbon steel bolts are to be specified in accordance with ISO 898 or equivalent recognized standards. Bolts are to be selected within the range 8.8 to 10.9 (inclusive). Applications for use of 12.9 bolts will be subject to special consideration. Bolt materials in other materials such as stainless steels are to be specified in accordance with a recognized National or International Standard.

(10) Alternative proposals for the calculation of allowable bolt stresses in accordance with an appropriate and recognized National or International Standard will be specially considered. The requirements in the standard need to provide sufficient equivalence to the requirements given in this section and need to be agreed with VR.

11 The allowable stresses in sheaves, shackles and other loose items are to comply with the requirements of 6.4 Section II QCVN 23: 2010/BGTVT.

12 Items of structure which are subjected to wind forces only, irrespective of load combination, may be determined on the basis of a stress factor of F = 0.85.

3.1.3 Rope and chain factors of safety

1 Rope factor of safety

(1) The safety factor required for ropes used to raise and lower the platform is to be not less than 3:1 based upon the certified breaking strength of the rope and the maximum rope tension. The maximum rope capacity is to be calculated from the rated capacity of the hoists with an allowance for the cumulative effect of sheave friction and wire rope stiffness of 1.5 per cent for ball or roller bearings and 5 per cent for plain or bushed bearings. Sheave friction and wire rope stiffness loss numbers derived from field measurements of similar shiplift equipment will be considered, provided data is from both new and existing shiplift installations.

(2) For shiplifts with side transfer facilities where the platform is held on the ropes during side transfer, the rope capacity will need to be based on the maximum hoist reaction from the MDL during the side transfer operation.

(3) It is recommended that, where side transfer operations take place or where docked vessels may remain on the platform for extended periods, consideration be given to a locking or suspension device to transfer the platform loads directly to the supporting structure.

2 Chain safety factors

(1) The safety factor required for chains used to raise and lower the platform is to be not less than 3:1 based upon the certified breaking strength of the chain and the maximum chain tension. The maximum chain tension is to be based upon the rated capacity of the hoists.

(2) In view of the possibility of stress corrosion cracking, grade 80 or a similar type alloy chain is not to be used.

(3) Increased safety factors may be required where:

(a) The hoisting speed of the platform exceeds 0.5 m/min;

(b) The mode of operation of the hoist system may produce significant shock loading.

3.1.4 Materials of construction

1 Materials of construction are to comply with Part 7A Section II QCVN 21: 2010/BGTVT.

2 Steel for the primary strength members is to comply with Table 3.1.4-1.

Table 3.1.4-1 Steel Grades

Minimum design temperature	Thickness, (mm)	Steel grade
Above 10 °C	t ≤ 40	A/AH
	40 < t ≤ 80	D/DH
	t > 80	E/EH
Above 0 °C to 10 °C	t ≤ 20	A/AH
	20 < t ≤ 25	B/AH
	25 < t ≤ 40	D/DH
	t > 40	E/EH
Above -10 °C to 0 °C	t ≤ 12.5	B/AH
	12.5 < t ≤ 25.5	D/DH
	t > 25.5	E/EH
Above -25 °C to -10 °C	t ≤ 40	D/DH

Remarks: AH, DH and EH are corresponding to (AH: A32, A36 and A40; DH: D32, D36 and D40; EH: E32, E36 and E40).

3 Alternative proposals in respect of the notch toughness characteristics of the materials will be considered when the service location of the particular installation is such that low temperatures are not climatically probable.

CHAPTER 4 MACHINERY AND ELECTRICAL INSTALLATIONS, CONTROL AND OPERATIONAL SYSTEMS

4.1 Machinery installations

4.1.1 General

1 Machinery installations of ship lift platform are to comply with Part 3 Section II QCVN 21: 2010/BGTVT, except where expressly provided by this Regulation, considering the following requirements:

(1) Machinery installations are to comply with only requirements for strength;

(2) Allowable stresses may vary depending on types, purposes, manufacturing methods and service conditions of machinery installations;

(3) For gears, strength calculation is only required where the gears are subject to maximum torsional loads and concentrating stress factor at the root of the tooth is also to be considered.

4.2 Electrical installations

4.2.1 General

1 Electrical equipments are to be so installed that the risks of short circuit, fire etc. are reduced to minimum in accordance with Part 4 Section II QCVN 21: 2010/BGTVT.

2 Cable and generators are to be of suitable type in accordance with present standards recognized by VR, safe and efficient in service corresponding to environment condition where installed.

3 Electric circuits are to be protected against accidental overcurrents including short circuit. These protecting devices are to be capable of breaking a fault circuit, eliminating the expansion of the faults and the hazards of fire and securing to serve electric power to essential driving sources, lights, internal communications and alarm devices.

4.3 Control and operational systems

4.3.1 Requirements

1 Means are to be provided to indicate at each control station that the motion of the ship lift platform is maintained in the horizontal plane. An alarm is to give warning in the event that tilt or skew of the platform exceeds a predetermined limit.

2 In addition to the normal quay level stop units, independent means are to be provided automatically to stop the ship lift platform movement in the event of upper or lower overrun.

3 Where multiple winches or jacks are employed, means are to be provided to:

(1) Synchronize their operation;

(2) Display the load on individual units at each control station.

4 The total load on the platform is to be displayed at each control station.

5 Means are to be provided automatically to hold the platform in position and operate an alarm in the event of a slack hoisting rope or chain.

6 Where a platform is secured by retractable locks, pawls or latches, means are to be provided to ensure that power is not disconnected until all locks, pawls or latches have been engaged, and descent is not possible until all locks, pawls or latches have been disengaged.

III REGULATIONS ON MANAGEMENT

1.1 General

Where compliance with this Regulation is made, ship lift platform or ship lift platform together with transfer system will have an additional notation appended to class notation specified in 2.1.2-1 Part 1A Section II QCVN 21: 2010/BGTVT. The detail is as follows:

(1) Where only ship lift platform is classed:

Shiplift for service at …….*

(2) Where ship lift platform together with transfer system is classed:

Shiplift and transfer system for service at …….*

Note:

* The name of port, yard or a specific location where the ship lift platform is operated is to be clearly specified.

1.2 Regulations on technical supervision

Ship lift platforms are to be subject to surveys specified in Chapter 2 Section II of this Regulation.

1.3 Certification

1.3.1 Certificate

1 Certificate of design approval

Where the compliance with this Regulation is made, a certificate of design approval is to be issued to the ship lift platform in a form specified in Appendix A of this Regulation.

2 Ship lift platform classification certificate and provisional classification certificate

(1) Where a ship lift platform is surveyed by VR in accordance with requirements in this Regulation, an provisional classification certificate is to be issued to the ship lift platform.

(2) Before the expiration date of provision classification certificate, VR will issued a classification certificate to the ship lift platform in a form specified in Appendix B of this Regulation where the ship lift platform is completely in compliance with requirements in this Regulation.

(3) VR will endorse the classification certificate of ship lift platform after a satisfactory annual survey is carried out by VR to verify the compliance of the ship lift platform with this Regulation.

3 Validity of classification certificate and provisional classification certificate

(1) A classification certificate is to be valid for a period not exceeding five years from the date of the completion of the classification survey or the expiration date of the previous classification certificate. A classification certificate of the ship lift platform will be reissued when expired provided that scope of the fifth annual survey is completed in accordance with requirements in this Regulation.

(2) A provisional classification certificate is to be valid for a period not exceeding 5 months from the date of issue. The provisional classification certificate becomes invalid upon the issuance of classification certificate.

4 Other certificates of test and examination

The issuance of certificates of test of loose gear, rope and chain is to be in accordance with relevant requirements in 1.3.1 Section III QCVN 23: 2010/BGTVT.

1.3.2 Certification procedure

1 Procedure for issuance of certificate of ship lift platform design approval.

(1) Sequence

(a) Organizations, individuals are to prepare documents as required and send to Vietnam Register;

(b) Vietnam Register is to receive the documents, check the content of those: in case of insufficiency of documents, a guidance letter is to be made within 2 days of the receipt to instruct organizations, individuals on the completion of the documents; otherwise, application receipt is to be made with a release date;

(c) Vietnam Register is to carry out the document review: organizations, individuals are to be noticed in case of unsatisfactory, otherwise certificate of design approval is to be issued.

(2) Methods to carry out

Organizations, individuals are to submit the application and receive the result by post or directly at office of VR's body or by another appropriate method.

(3) Content and number of document set

(a) Content of document

01 (original) request letter in a form specified in Appendix C of this Regulation; 03 (original) copies of design documentations;

(b) Number of documentations: 01 set.

(4) Processing time

20 days or longer from the receipt of a required complete documentation but not exceeding 90 days for ship lift platforms constructed from novel materials or by novel technology or of novel, complicated design…

(5) Body to carry out the procedure

Vietnam Register.

(6) Result of the procedure

Certificate of design approval of ship lift platform and stamped design documentation.

(7) Requirements for ship lift platform design

Ship lift platform design documentation is to be in accordance with this Regulation.

(8) Fees and charges

Fees and charges are to be in accordance with regulation of Ministry of Finance and are to be directly paid or transferred to the body issuing the certificate.

2 Procedure for issuance of classification certificate of ship lift platform.

(1) Sequence

(a) Organizations, individuals are to prepare documents as required and send to Vietnam Register;

(b) Vietnam Register is to receive the documents, check the content of those: in case of insufficiency of documents, a guidance letter is to be made within 2 days of the receipt to instruct organizations, individuals on the completion of the documents; otherwise, application receipt is to be made for the date and location of the practical inspection upon applicant request;

(c) Vietnam Register is to carry out the practical inspections: organizations, individuals are to be noticed by a written letter in case of unsatisfactory, otherwise classification certificate is to be issued.

(2) Methods to carry out

(a) Organizations, individuals are to submit the application by post, fax or directly at office of VR's body or by another appropriate method.

(b) Organizations, individuals are to receive the result by post, fax or directly at office of VR's body or by another appropriate method.

(3) Content and number of document set

(a) Content of document: 01 original request letter (or copied, scanned one in case application is submitted by fax or email) in a form specified in Appendix D of this Regulation;

(b) Number of documentations: 01 set.

(4) Processing time

The certificate is to be issued within 03 working days from the completion of classification survey; and 01 working day from the completion of the fifth annual survey.

(5) Body to carry out the procedure

Vietnam Register.

(6) Result of the procedure

Classification certificate of ship lift platform in a form specified in Appendix B of this Regulation.

(7) Requirements and conditions for the issuance

Ship lift platform which is subject to the issuance is to be in accordance with requirements in this Regulation.

(8) Fees and charges

Fees and charges are to be in accordance with regulation of Ministry of Finance and are to be directly paid or transferred to the body issuing the certificate.

IV RESPONSIBILITIES OF ORGANIZATIONS, INDIVIDUALS

1.1 Responsibilities of ship lift platform owners, operators, design companies, yards of construction, conversions, renovations and repair of ship lift platforms

1.1.1 Ship lift platform owners, operators

1 To apply all relevant requirements in this Regulation for ship lift platforms being constructed, converted, renovated, repaired and during operation in order to ensure and maintain good technical condition of ship lift platforms.

1.1.2 Ship lift platform design companies

1 Are to design ship lift platforms in accordance with this Regulation.

2 Are to prepare sufficient design documents as required and submit those in accordance with this Regulation.

1.1.3 Yards of construction, conversions, renovations and repair of ship lift platforms

1 Are to be capable in terms of warehouse, manufacturing shop, building facilities etc. and competent manpower to meet requirement for new manufacture, conversions, renovations/modernization and repairs of the ship lift platforms.

2 Are to comply, in addition to approved design, with standards of quality, safety and environmental protection while manufacturing, converting, renovating and repairing the ship lift platforms.

3 Are to undergo VR's supervision on the quality, safety and environmental protection during new manufacture, converting, renovation and repairing of ship lift platforms.

1.2 Responsibilities of Vietnam Register

1.2.1 Design approval, technical supervision

To assign surveyors having competence and of sufficient standard to carry out the approval of design documents, inspecting and testing during manufacture, conversions, renovations/modernization and repairs of the ship lift platforms in accordance with technical requirements specified in this Regulation.

1.2.2 To give instructions for implementation/application

To give instructions for the application of requirements of this Regulation to ship lift platform owners, operators, design companies, yards of construction, conversions, renovations and repair of ship lift platforms, inspection offices of Vietnam Register throughout the country.

1.2.3 To amend and supplement the Regulation

Based on the fact, Vietnam Register is to have responsibility to petition the Ministry of Transport for amendment, supplementation of the Regulation on a yearly basis.

1.3 Responsibilities of the Ministry of Transport

The Ministry of Transport (Science and Technology department) is responsible for verifying on the regular or random basis the implementation of this Regulation by relating organizations.

V IMPLEMENTATION

1.1 It is the responsibility of Vietnam Register to manage the survey system, technical supervision, classification and technical registration of ship lift platforms. It is also to include organizing the printing, dissemination and instructions for the application of this Regulation for organizations and individuals falling within the scope of this Regulation.

1.2 In case of inconsistency between the requirements in this Regulation and those in other rules, standards or technical regulations relating to ship lift platform, the requirements of this Regulation is to prevail over those of others.

1.3 In case the documents referred to in this Regulation are amended, implemented or replaced, the latter is to prevail over the former.

1.4 This Regulation and its amendment applies to ship lift platform constructed on or after effective date of this Regulation.

1.5 In case that the compliance with any of requirements of this Regulation is impracticable, or in case of necessity, the decision is to be made by the Ministry of Transport on a case by case basis.

Appendix A

FORM OF CERTIFICATE OF SHIP LIFT PLATFORM DESIGN APPROVAL

CỤC ĐĂNG KIỂM VIỆT NAM
VIETNAM REGISTER

Issued under provisions of National Technical Regulation QCVN 57: 2015/BGTVT

CERTIFICATE

OF SHIP LIFT PLATFORM DESIGN APPROVAL

No.:

VIETNAM REGISTER CERTIFIES THAT:

Name/ Design symbol:.....
Type of design: .....
Length: .....(m); Breadth: .....(m)
Nominal lifting capacity (NLC): .....(t); Effective docking length: .....(m)
Maximum lifting capacity (MLC):.....(t);
Class of ship lift platform:.....
Service area:.....
Approval No.:.....
No. of request for approval: .....Date:.....
Design company:.....
Owner:.....
Yard:.....
VR unit of supervision:.....
Remarks:.....

Issued in: .....Date: .....

VIETNAM REGISTER

RECEIVERS:

- Design company 01;
- Supervision unit 01;
- Keep as achieves in VR head office 01;
- Keep as achieves in approval unit 01.

Appendix B

FORM OF CLASSIFICATION CERTIFICATE

CỤC ĐĂNG KIỂM VIỆT NAM
VIETNAM REGISTER

GIẤY CHỨNG NHẬN PHÂN CẤP SÀN NÂNG TÀU

CLASSIFICATION CERTIFICATE FOR SHIP LIFT PLATFORM

Số: .....
No.

Cấp theo các quy định của Quy chuẩn kỹ thuật quốc gia QCVN 57: 2015/BGTVT
Issued under the provisions of National Technical Regulation QCVN 57: 2015/BGTVT

Tên sàn nâng: ..... Số phân cấp: .....
Name of Ship Lift Platform Class Number
Chiều dài: ..... Chiều rộng: ..... (m)
Length Breadth
Chiều dài hiệu dụng: ..... (m) Sức nâng lớn nhất: ..... (t)
Effective docking length Maximum lifting capacity
Sức nâng danh nghĩa: ..... (t)
Nominal lifting capacity

Năm và nơi đóng: .....
Year and Place of Build .....
Chủ sàn nâng: .....
Owner .....

Căn cứ kết quả kiểm tra đã tiến hành, chứng nhận rằng sàn nâng này và các trang thiết bị của sàn nâng thỏa mãn các yêu cầu của Quy chuẩn kỹ thuật quốc gia về phân cấp và đóng sàn nâng tàu (QCVN 57: 2015/BGTVT), do đó sàn nâng được nhận cấp/ phục hồi cấp (*) với ký hiệu dưới đây:
This is to certify that as a result of the survey performed the Ship lift platform, its equipment and arrangments are found to be in compliance with the requirements of National Technical Regulation on Classification and Construction of Ship lift platform (QCVN 57: 2015/BGTVT), based on which class with the following notation is assigned/renewed(*) to the Ship Lift Platform:

Các hạn chế thường xuyên: .....
Permanent restrictions .....
Các đặc tính khác: .....
Other characteristics

Giấy chứng nhận có hiệu lực đến ngày ..... với điều kiện phải có xác nhận hàng năm phù hợp với Quy chuẩn.
This Certificate is valid until Subject to annual confirmation in accordance with the Regulation.

Cấp tại ..... Ngày .....
Issued at Date

CỤC ĐĂNG KIỂM VIỆT NAM
VIETNAM REGISTER

(*) Gạch bỏ khi không thích hợp
Delete as appropriate

XÁC NHẬN CẤP SÀN NÂNG TÀU HÀNG NĂM LẦN THỨ NHẤT
FIRST ANNUAL CONFIRMATION OF THE CLASS

Căn cứ kết quả kiểm tra đã tiến hành, cấp sàn nâng được xác nhận.
On the basis of the survey performed, the class is confirmed

Nơi kiểm tra: .....
Place
Ngày: .....
Date

CỤC ĐĂNG KIỂM VIỆT NAM (VR)

XÁC NHẬN CẤP SÀN NÂNG TÀU HÀNG NĂM LẦN THỨ HAI
SECOND ANNUAL CONFIRMATION OF THE CLASS

Căn cứ kết quả kiểm tra đã tiến hành, cấp sàn nâng được xác nhận.
On the basis of the survey performed, the class is confirmed

Nơi kiểm tra: .....
Place
Ngày: .....
Date

CỤC ĐĂNG KIỂM VIỆT NAM (VR)

XÁC NHẬN CẤP SÀN NÂNG TÀU HÀNG NĂM LẦN THỨ BA
THIRD ANNUAL CONFIRMATION OF THE CLASS

Căn cứ kết quả kiểm tra đã tiến hành, cấp sàn nâng được xác nhận.
On the basis of the survey performed, the class is confirmed

Nơi kiểm tra: .....
Place
Ngày: .....
Date

CỤC ĐĂNG KIỂM VIỆT NAM (VR)

XÁC NHẬN CẤP SÀN NÂNG TÀU HÀNG NĂM LẦN THỨ TƯ
FOURTH ANNUAL CONFIRMATION OF THE CLASS

Căn cứ kết quả kiểm tra đã tiến hành, cấp sàn nâng được xác nhận.
On the basis of the survey performed, the class is confirmed

Nơi kiểm tra: .....
Place
Ngày: .....
Date

CỤC ĐĂNG KIỂM VIỆT NAM (VR)

NHỮNG LƯU Ý VÀ HẠN CHẾ TẠM THỜI
TEMPORARY RESTRICTIONS AND REMARKS

Chú ý: Giấy chứng nhận này mất hiệu lực trong các trường hợp sau: Giấy chứng nhận hết hạn; Sau tai nạn mà sàn nâng không báo kiểm tra; Khi vi phạm vùng hoạt động hoặc chất tải quá sức nâng của sàn; Khi sàn nâng không tuân theo các yêu cầu hoặc hướng dẫn của Cục Đăng kiểm Việt Nam.

Notes: The Certificate shall cease to be valid in the following cases: After the expiry of terms; After an accident, unless it is submitted to a survey; If violating the specified area of navigation or loading the platform exceeding its lifting capacity; If requirements or instructions of Vietnam Register have not been complied with.

Appendix C

FORM OF REQUEST FOR APPROVAL

SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom – Happiness

REQUEST FOR APPROVAL OF SHIP LIFT PLATFORM

No.:.....Date:.....

To: .....

Design company:.....

Address:.....

Phone number:.....Fax:.....Email:.....

Name/Design symbol: ..... / .....

Main particulars of ship lift platform:

Length:.....(m)

Effective docking length :.....(m)

Breadth: .....(m)

Maximum lifting capacity (MLC): .....(tonnes)

Nominal lifting capacity(NLC): .....(tonnes)

Material of construction: .....

Service area: ……..……..……(*)

Owner: .....

Yard: .....

Applicant

(Sign & stamp)

(*) The name of port, yard or a specific location where the ship lift platform is operated is to be clearly specified.

Appendix D

FORM OF REQUEST FOR CLASSIFICATION SURVEY OF SHIP LIFT PLATFORM

SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom – Happiness

REQUEST FOR CLASSIFICATION SURVEY OF SHIP LIFT PLATFORM

No.:.....Date:.....

To: (Name of VR unit/branch)

Name of organization/individual:……..……

Address:……..…….…….

……

Phone number:…….……Fax:……..……Email:……..…..…….

Main particulars of ship lift platform:

Type of design: .....

Length:.....(m)

Effective docking length :.....(m)

Breadth: .....(m)

Maximum lifting capacity (MLC): .....(tonnes)

Nominal lifting capacity(NLC): .....(tonnes)

Material of construction: .....

Service area: ……..……..……..……

Detail of request:

…….……..

…….……..

…….……..

…….……..

Location and time:……..……..……...

…….……..

ORGANIZATION/INDIVIDUAL

(Sign & stamp)

Receivers:

- As above;
- Keep as achieves:…….