UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION TABLE OF CONTENTS

DIVISION 11 - EQUIPMENT

SECTION 11 13 19.13

LOADING DOCK LEVELERS

08/09, CHG 1: 05/19

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Industrial Dock Leveler
1.2.2 Adjustable Loading Ramp
1.2.3 Fixed Type Industrial Dock Leveler
1.2.4 Velocity Fuse
1.2.5 Carrier
1.3 SUBMITTALS
1.4 QUALITY ASSURANCE
1.4.1 Manufacturer's Representative
1.4.2 Detail Drawings
1.4.3 Record Drawings
1.5 DELIVERY, STORAGE, AND HANDLING
1.6 EXTRA MATERIALS

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Standard Products
2.1.2 Exposed Surfaces
2.1.3 Nameplate
2.1.4 Toe Guards or Skirts
2.2 LOADING DOCK LEVELERS
2.2.1 Design Requirements
2.2.2 Dock Leveler Height Adjustment
2.2.3 Dock Leveler Extension and Retraction
2.2.4 Loading Ramp Compensation
2.2.4.1 Freight Carrier Out of Level
2.2.4.2 Loading and Unloading of the Freight Carrier
2.2.5 Safety Devices
2.2.5.1 Electro-Hydraulic System
2.2.5.2 Mechanical System

2.2.5.3 Air Powered System
2.2.5.4 Dock Bumpers
2.2.5.4.1 Bumper Construction
2.2.5.4.2 Steel Angles
2.2.5.4.3 Finish
2.2.6 Rated Capacity
2.2.7 Ramp Load Carrying Surface
2.3 OPERATION
2.3.1 Mechanical Control
2.3.2 Electro-Hydraulic Control
2.3.2.1 Pushbutton
2.3.2.2 Hinged Lip Ramp Movement
2.4 CONSTRUCTION AND MATERIALS
2.5 ELECTRO-HYDRAULIC SYSTEM
2.6 ELECTRICAL REQUIREMENTS
2.6.1 Motor
2.6.2 Controls
2.6.3 Transformer
2.7 ACCESSORIES
2.7.1 Restraining Device
2.7.2 Dock Bumpers

PART 3 EXECUTION

3.1 EXAMINATION
3.2 INSTALLATION
3.3 CLEANING, TREATMENT AND PAINTING
3.3.1 Workmanship
3.3.2 Dissimilar Metals Protection
3.3.3 Finish Coat Color
3.4 FIELD TESTS
3.4.1 Roll-Over Load Tests
3.4.2 Drop Tests
3.4.3 Acceptance Tests
3.5 INSTRUCTION TO GOVERNMENT PERSONNEL
3.6 OPERATING MANUALS

-- End of Section Table of Contents --

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023

SECTION 11 13 19.13

LOADING DOCK LEVELERS
08/09, CHG 1: 05/19

NOTE: This guide specification covers requirements for dock bumpers, truck-trailer restraining devices, and industrial, mechanical and electro-hydraulic dock levelers of the fixed hinged type.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

NOTE: Use dock levelers (ramps) to span and compensate for space and height differentials between loading docks and freight carriers in order to facilitate safe and efficient freight transfer. The ramps are recessed into preformed pits in the loading docks.

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide

specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS C2.18	(1993; Errata 1993; R 2001) Guide for the Protection of Steel with Thermal Sprayed Coatings of Aluminum and Zinc and Their Alloys and Composites

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A143/A143M	(2007; R 2020) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A153/A153M	(2023) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM D624	(2000; R 2020) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D2000	(2018) Standard Classification System for Rubber Products in Automotive Applications
ASTM D2632	(2015; R 2019) Standard Test Method for Rubber Property-Resilience by Vertical Rebound

MATERIAL HANDLING INDUSTRY OF AMERICA (MHI)

MHI MH30.1	(2015) Performance and Testing

	Requirements for Dock Leveling Devices
MHI MH30.3	(2005) Vehicle Restraining Devices

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	(2000; R 2020) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures
NEMA MG 1	(2021) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 943	(2016; Reprint Feb 2018) UL Standard for Safety Ground-Fault Circuit-Interrupters

1.2 DEFINITIONS

1.2.1 Industrial Dock Leveler

A manufactured structure designed to span and compensate space and height differentials between a loading dock and freight carrier to facilitate safe, efficient, freight transfer.

1.2.2 Adjustable Loading Ramp

Synonym for Fixed Type Industrial Dock Leveler.

1.2.3 Fixed Type Industrial Dock Leveler

A dock leveler that is permanently affixed to the dock structure, and usually incorporating [an electro-hydraulic] [a mechanical] [recessed into dock face further than 380 mm 15 inch] system to position the dock leveler with respect to the freight carrier at the lip end while being fixed at the opposite hinged end.

1.2.4 Velocity Fuse

A valve or similar device that goes into the hydraulic line. If the dock leveler becomes inadvertently or accidentally unsupported, this fuse will freeze the movement of dock leveler within 100 mm 4 inches of the dock leveler original position.

1.2.5 Carrier

A wheeled, enclosed trailer or container that, when attached to a heavy-duty truck or van, is used to carry bulk freight over long distances.

1.3 SUBMITTALS

****

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G[, [_____]]

SD-03 Product Data

Loading Dock Levelers; G[, [_____]]

Dock Bumpers; G[, [_____]]

Restraining Device; G[, [_____]]

SD-04 Samples

Fastening Materials

Angles

Rods

Fastening Hardware

Dock Bumpers

Rubber

Rubberized Fabric

SD-07 Certificates

Fastening Materials

Rubberized Fabric

Steel Angles

Hardware Items

SD-10 Operation and Maintenance Data

Loading Dock Levelers, Data Package 3; G[, [_____]]

Restraining Device, Data Package 2; G[, [_____]]

SD-11 Closeout Submittals

Record Drawings; G[, [_____]]

1.4 QUALITY ASSURANCE

1.4.1 Manufacturer's Representative

Furnish services of Fixed Type Industrial Dock Leveler technicians, experienced in installation and operation of the type of system being provided, to supervise installation, testing, adjustment of system, and instruction to Government personnel.

1.4.2 Detail Drawings

Submit drawings depicting dimensions, tolerances, surface finishes, hardnesses, flush edge angles, method of mounting and anchoring, and control schematics and diagram. Show complete wiring, schematic diagrams, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Show proposed layout and anchorage of equipment and appurtenances on Drawing Sheet No. [_____]. Show the concrete pit details including flush edge angles, dock bumpers including fastening materials in compliance with ASTM A123/A123M and ASTM D2000, and sloped pit bottom; method of mounting and anchoring; and location of control stations and disconnect switches on Drawing Sheet No. [_____]. For vertical, edge-of-dock, and free-standing board dock levelers, show details of required pit or foundation construction and dock bumpers and structural shapes installation, in lieu of concrete pit details on Drawing Sheet No. [_____]. Show all proposed dock bumper locations on drawings.

1.4.3 Record Drawings

Submit record as-built drawings depicting dimensions, tolerances, surface finishes, hardnesses, flush edge angles, method of mounting and anchoring, and control schematics and diagram, including mechanical and electrical components, testing and acceptance (one copy sepia transparency) for each industrial dock leveler.

1.5 DELIVERY, STORAGE, AND HANDLING

Matchmark and tag parts which are disassembled for shipment with metal tags. Provide waterproofed tags and markings. Protect the delivered equipment in storage from the weather, humidity and temperature variation, dirt and dust, or other contaminants.

1.6 EXTRA MATERIALS

After approval of the detail drawings, and not later than [_____] months prior to the date of beneficial occupancy, provide spare parts data for each different item of material and equipment specified. Furnish a complete list of parts and supplies, with current unit prices and source of supply and a list of the parts recommended by the manufacturer to be replaced after [1] [and] [3] year(s) of service.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Standard Products

Submit data including a complete list of equipment and materials, manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Provide materials and equipment, which are the standard products of a manufacturer regularly engaged in the manufacture of the products, and that essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Provide equipment supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site. Section 23 03 00.00 20 BASIC MECHANICAL MATERIALS AND METHODS, applies to this Section, with the additions and modifications specified herein.

2.1.2 Exposed Surfaces

Provide all exposed metal surfaces and fastening materials complying with the minimum requirements of ASTM A123/A123M, ASTM A143/A143M, and ASTM A153/A153M.

2.1.3 Nameplate

Attach corrosion-resistant metal plate securely and legibly on the exterior surface of the dock leveler. Include the following information indented or embossed on the plate:

a. Description of the equipment: Describe procedures for operating and services equipment, and warnings or cautions of hazardous procedures.

b. Name of the manufacturer.

c. Serial and model number.

d. Rated capacity in kgpounds.

e. Shipping weight.

f. Date of manufacture (month and year).

2.1.4 Toe Guards or Skirts

Provide sides or edges, except front and rear edges, of the ramps which rise above the surrounding loading dock with sheet carbon steel skirts or toe guards of minimum 1.8 mm 14 U.S.S. gage nominal thickness. Furnish smooth faced toe guards or skirts and mount flush with the edges of the ramp surface. Ensure sufficient depth of toe guards or skirts to protect the full operating range of dock travel. Ensure the construction capable of resisting a minimum lateral force of 4.5 kg 10 pounds with a maximum deflection of 13 mm 1/2 inch.

2.2 LOADING DOCK LEVELERS

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NOTE: Electro-hydraulic type loading dock levelers, supplied with electrical power from a building system, must be equipped with overload protection as provided by preset main system relief valve in the manufacturer's power unit, which will prevent operation of the elevating device when elevating device is loaded to 125 percent or more of the rated capacity. Determine total leveler gross dynamic loads by fork truck weight plus the maximum rated fork lift carrying capacity plus attachment handling device weight.

On small jobs, e.g. replacement of one dock leveler, not all submitted requirements are necessary and must be edited to fit each job.

****

Provide permanent loading dock levelers in accordance with MHI MH30.1 with minimum performance characteristics based on the following:

a. Service Period:
   (1) Number of shift operations: [1] [2] [3].
   (2) Maximum number of trucks per shift opening: [_____].
   (3) Maximum number of days per week: [_____].

b. Fork Lift Loads:
   (1) Design levelers to accommodate [3] [4] wheel fork trucks.
   (2) Design levelers to handle [_____] gross dynamic load.
   (3) Base load leveler design on number of cycles per loading/unloading operation per truck and of [_____].

Provide loading dock leveler with [electro-hydraulic type with electric motor and hydraulic pump operating a hydraulic cylinder that adjusts dock leveler board position] [mechanical type which is manually released at dock leveler and raises by spring action and is lowered by walk-on of dock operator] [air powered type with an industrial fan motor operating a

polyvinylchloride air bag that adjusts dock leveler board position]. Coordinate a truck restraint system with the dock leveler via an interconnect function such that the restraint and dock leveler will engage with a single push-button, if a powered trailer restraint is selected to lock truck or trailer into position during loading and for overnight security. Incorporate a visual signal to inform dock operator and driver of locked or unlocked status. Make provision for maintenance access to understructure and lifting mechanism. Provide steel tread plate lip and platform, hinged and supported from beneath by steel framework that contains lifting, positioning, and lowering assembly. Ensure that platform surface is flush with surrounding floor surface of loading dock when not in service. Provide integral positive restraint when leveler is in maintenance position.

2.2.1 Design Requirements

Design, fabricate, and finish loading ramp to permit washing with water and detergents, and operating in an ambient temperature from minus 17 to plus 43 degrees C 0 to plus 110 degrees F.

2.2.2 Dock Leveler Height Adjustment

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NOTE: Maximum vertical adjustment could be 900 mm 36 inches, if needed.
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Provide a ramp whose incline can be adjusted to suit the height of the freight carrier. Allow the loading ramp a minimum of [0] [610] mm [0] [24] inches of vertical adjustment. Divide height adjustments [0] [305] mm [0] [12] inches above and [0] [305] mm [0] [12] inches below the dock level to provide coverage between [760] [685] [_____] mm [30] [27] [_____] inches and [1370] [1295] [_____] mm [54] [51] [_____] inches above grade.

2.2.3 Dock Leveler Extension and Retraction

Extend non-fixed end of the dock leveler from a retracted position behind the line of the loading dock platform bumpers to at least 300 mm 12 inches beyond the forward edge of the dock platform bumpers so as to rest on the bed of the freight carrier. The difference in length of the platform from its fully retracted position to its fully extended position must be practically constant throughout the ramp, including the ramp extension.

2.2.4 Loading Ramp Compensation

Provide automatic compensation with ramp platform loaded or unloaded for:

2.2.4.1 Freight Carrier Out of Level

Out of level freight carrier bed condition (difference in elevation from side to side at the rear of the carrier bed): Allow a minimum correction of 25 mm one inch for each 450 mm 18 inches and maximum 100 mm 4 inch correction of ramp width over the width of the ramp. Ensure the rear edge of the ramp parallel with the rear of the frame in order to prevent tripping or be a pinching hazard.

2.2.4.2 Loading and Unloading of the Freight Carrier

Provide mechanical type dock levelers with manual load compensation for

truck beds lowered below dock height. Provide [semi automatic] [manual] air powered dock levelers for trailer movement. When the lip is extended so as to rest on the bed of motor truck or trailer, provide compensation of 100 mm 4 inches for carrier spring deflection so that contact will be maintained between lip and carrier bed.

2.2.5 Safety Devices

2.2.5.1 Electro-Hydraulic System

Provide velocity fuse, ballcheck valve, or other device to automatically prevent a drop of more than 100 mm 4 inches of the lip, should the freight carrier move away from the dock leaving the lip unsupported. Activate this device with a static, dynamic, or impact load exceeding 10 percent of the rated load on the lip and ramp.

2.2.5.2 Mechanical System

Include a three-position safety system to limit platform fall to dock level and 100 and 200 mm 4 and 8 inches below dock level by means of double structural steel safety legs. Do not deactivate safety legs by dock leveler. This ensures that safety legs are independent of dock leveler motion and retractable from the top of the platform for below dock level control.

2.2.5.3 Air Powered System

When in use, and the dock leveler is above the dock, provide an automatic safety device to prevent a drop of more than 50 mm 2 inches at the outer end of the board, should a truck or trailer be moved away leaving the board unsupported. When in use, and the dock leveler is below dock, the dock leveler will drop to the below dock stops, at the outer end of the board, should a truck or trailer be moved away leaving the board unsupported.

2.2.5.4 Dock Bumpers

Submit certificates showing conformance with the referenced standards contained in this section. Provide ramp and load dock face with laminated rubber, tire-fabric, or equivalent dock bumpers recommended by the dock leveler manufacturer. Submit one typical Loading Dock Bumper completely assembled with supporting rods, end angles, bolts, and nuts. (This may be the smallest size bumper required.) One section of 203 mm 8 inches wide by full depth and height of bumper including one end angle with the opposite end exposed for inspection.[Solid Rubber pieces conforming to ASTM D2000, Grade 4AA612A13B13F17 may be used instead of rubberized fabric.]

[2.2.5.4.1 Bumper Construction

Construct bumpers of resilient, laminated, rubberized-fabric pads, assembled on steel frames. Provide rubberized fabric conforming to ASTM D2000. Punch material to receive 19 mm 3/4 inch supporting rods. Provide bumpers that are 115 mm 4-1/2 inches thick, stand out from the dock, and closed with two structural steel angles under 6895 pascal 1,500 pounds.

][2.2.5.4.2 Steel Angles

Provide angles that are 75 by 65 by 6 mm 3 by 2-1/2 by 1/4 inch steel welded to 19 mm 3/4 inch Rods at one end (head of rods exposed on face of angle leg) and closed with Fastening Materials, to include threaded rod ends and fastening hardware at the other end. Submit one sample of each, individually tagged and identified for use and location. Quantity of rods required for each bumper must be as indicated and in accordance with approved drawings. The 65 mm 2-1/2 inch leg of the steel angle on the face of the wall must have M20 13/16 inch bolt holes, quantity and spacing as required.

]2.2.5.4.3 Finish

Provide hot-dip galvanized metal for dock bumpers, including Hardware Items, conforming to ASTM A123/A123M.

2.2.6 Rated Capacity

Minimum 9070 kg 20,000 pounds roll over capacity.

2.2.7 Ramp Load Carrying Surface

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NOTE: Board width should be up to maximum leveler width of 2130 mm 7 feet nominal. Board length must be sized based on the maximum operating slopes of the loading equipment used. Manufacturer's literature must be checked to verify that desired length of boards are available. Pallet, skid, and electric fork trucks should not be required to negotiate greater than 10 percent grade. Gasoline fork trucks should not be required to negotiate greater than 15 percent grade. EXAMPLE:

Given:

Height differential (dock to truck bed): 300 mm 12 inch
Dock leveler nominal overall length: 2400 mm 96 inch

Required:

Check for use of electric fork truck.

Grade Calculation:

Percent grade equals height differential divided by overall leveler length times 100 which equals 300 mm 12 inch divided by 2400 mm 96 inch times 100 which equals 12.5 percent.

Conclusion:

Grade exceeds 10 percent; therefore, length of dock leveler should be increased until grade is 10 percent or less. Use 3000 mm 120 inch; that way grade equals 300 mm 12 inch divided by 3000 mm 120 inch times 100 which equals 10 percent.

If dimensions for width and length of dock leveler ramp platform surface vary from that specified, so indicate.
****

The live load carrying surface of the ramp must be [1825] [_____] mm [6] [_____] feet plus or minus 75 mm 3 inch wide and [3050] [_____] mm [10] [_____] feet plus or minus 225 mm 9 inch long with the dock leveler lip retracted.

2.3 OPERATION

2.3.1 Mechanical Control

Mechanical chain-activated, with extension-spring operation and counter-balance non-manual, raising and lowering system. Once the freight carrier has departed, manually return the platform to the stored, level position. Ensure the ramp, in its stored position capable of being lowered below dock platform level without extending the lip of the ramp.

2.3.2 Electro-Hydraulic Control

Provide each dock leveler with a pushbutton station to activate motor, pump, and valves.

2.3.2.1 Pushbutton

Heavy-duty dust tight and oil tight type rated in accordance with NEMA ICS 2, Part ICS2-216 for alternating current. To prevent accidental operation and damage, ensure each button to be recessed in its station or be protected by a peripheral collar (ring) or shroud. Indelibly identify each pushbutton by means of cast or etched letters on the station. Provide emergency "STOP" button of momentary type with manual reset or continuous pressing (constant pressure) type. This stop button must stop all dock leveler movement, regardless of the position of the ramp or lip at the time the "STOP" button is depressed.

2.3.2.2 Hinged Lip Ramp Movement

Apply continuous pressure on the "UP" button to raise the loading ramp, descend the lip onto the bed of the freight carrier. Once the freight carrier has departed, the lip must automatically fall or retract to its down position, and the ramp must return to its stored dock level position. The ramp, in its stored position, must have the capability of being lowered below dock level without extending the lip of the ramp to service truck end loads which may be lower than loading dock surface position. Allow 4 to 6 seconds to fully extend or retract the lip.

2.4 CONSTRUCTION AND MATERIALS

Construct all load carrying parts of forged or welded steel. The entire live load carrying surface of the ramp and rear attachment must be not less than 6 mm 1/4 inch thick, 350 MPa 55 ksi minimum yield strength, low alloy, nonskid steel tread plate. Provide minimum 16 mm 5/8 inch vertical projections on the live load carrying surface. Bevel the lip or ramp extension. Design load carrying surfaces to permit free movement of powered hand or platform trucks, low lift pallet trucks, and fork lift trucks. Fabricate lip hinge of not less than 6 mm 1/4 inch wall seamless

steel tubing.

2.5 ELECTRO-HYDRAULIC SYSTEM

Provide a separate and complete system for each dock leveler. Include an electric motor, motor drive, hydraulic pump, hydraulic ram, pressure relief valve, fluid reservoir, strainer, filter, hydraulic control-valve cylinders, hose, piping, fittings, and hydraulic fluid. Incorporate a means for filling and draining hydraulic fluid. Design cylinders, pump, and control valves to withstand not less than 150 percent of the design operating pressure. Provide hydraulic hose, fittings, pipe, and tubing with working pressures based upon a minimum 4 to 1 safety factor of bursting pressure.

2.6 ELECTRICAL REQUIREMENTS

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NOTE: Standard available ratings for 3 phase motors are 230 or 460 volts. If motors are used with 208 volt distribution systems, a booster transformer must be provided.

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NFPA 70, NEMA ICS 2, NEMA ICS 6 and NEMA MG 1. Provide [230] [or] [460] volt electrical characteristics, three phase, 60 Hz alternating current power supply. Provide all electrical equipment on the loading ramp. Provide interconnecting wiring for components of packaged equipment as an integral part of the equipment. Include motor, switches, junction box, conduit, wiring cables, panel enclosed control station, motor controller, heater coils, timer, transformer, terminal blocks, and fuses. Provide NEMA ICS 6, Type 4, electrical enclosures. Color code all wiring.

2.6.1 Motor

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NOTE: Only electrohydraulic and air powered loading dock levelers are equipped with electric motor which activate the power system to raise and operate leveler.

Totally enclosed, non-vented motor (TENV) is the preferred motor for loading dock applications since the motor is not run continuously and only for short periods to raise the dock and extend the lip.

****

Conform to NEMA MG 1 and continuous duty or 60-minute time rated, industrial type, single speed rated for operating conditions. Provide electrical insulation systems conforming to NEMA MG 1, Class B. Provide permanently lubricated antifriction ball or roller bearings. Equip each electrohydraulic loading dock leveler with a [totally enclosed fan cooled (TEFC)] [totally enclosed non-ventilated (TENV)] squirrel cage induction electric motor. Equip each air powered loading dock leveler with a 115v, single phase, 60 Hz, self cleaning, two stage, UL approved industrial fan motor, which will not exceed its rated capacity under full load conditions of the loading dock leveler.

2.6.2 Controls

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NOTE: Controls are required for electrohydraulic ramps. If dual controls are provided, the designer will indicate the location on the drawings.

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NEMA ICS 2, size 0 controller for heavy industrial service. Provide an electrically operated, full magnetic, nonreversing type controller for the motor. Equip all control enclosures with locks and keys.

2.6.3 Transformer

Totally enclosed, self-cooled, dry type. Feed the transformer from the load side of the main disconnecting device. Incorporate circuit breakers with ground fault interrupting protection conforming to UL 943.

2.7 ACCESSORIES

2.7.1 Restraining Device

Provide self-aligning device in accordance with MHI MH30.3. Mount this device as recommended by the manufacturer to engage the ICC bar of the truck/trailer with a positive restraining force of not less than 8150 kg 18,000 pounds. Service all truck or trailers having ICC bars located between 300 and 750 mm 12 and 30 inch above ground level (when truck or trailer is unloaded) and recessed up to 225 mm 9 inch from the rear of truck or trailer. Provide a means to protect the device from disabling damage in the event that more than 8150 kg 18,000 pounds of force is exerted by the restrained truck or trailer. Manually control activation and deactivation from inside the building. Submit data packages in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA for restraining device and loading dock levelers.

2.7.2 Dock Bumpers

Provide bumpers in accordance with ASTM D2632 and ASTM D624 that are capable of sustaining repeated impacts from trucks or trailers without damage to the dock, dock levelers, or bumpers.

PART 3 EXECUTION

3.1 EXAMINATION

After becoming familiar with all details of the work, verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing the work.

3.2 INSTALLATION

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NOTE: As a minimum, the following are required on drawings:

a. 2.5 to 3 meters 8 to 10 feet wide loading dock space behind ramp for vehicle maneuvering.

b. Ramp located in the middle of one truck space.

c. Location of control station for power operated ramps.

d. Location of disconnect switch with provisions for padlocking in the open position which should be just inside the nearest building door.

e. Ramp pits which should have steel angles anchored to concrete on top three sides and dock wall edge in bottom front of dock leveler pit.

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Install and adjust in accordance with NFPA 70, manufacturer's approved detail drawings, and as-built system assembly drawings. Install controls so operator can see dock leveler while manipulating controls. Do not pour the pit for the adjustable loading ramp until the design and detail drawings have been approved. If the pit size is limited by construction conditions involved, alter the dock leveler equipment to fit the pit. Clearly indicate these alterations or modifications on the drawings. Check and verify the appropriate measurements at the building. Do not exceed 50 mm 2 inch clearances between the ramp and pit.

3.3 CLEANING, TREATMENT AND PAINTING

In accordance with manufacturer's standard practice, shop clean, treat and paint ferrous surfaces including platform, lip, frame, [springs,] [motor,] [pump,] cylinders, [valves,] and any other non-cadmium plated or non-galvanized surface (but not including bearings, gear contact surfaces, parts protected by lubrication, or other surfaces not usually painted or coated). Clean ferrous surfaces[, shot pen, and protect the base metal with an application of 99.9 percent pure zinc coating with a thickness of 0.010 to 0.012 in accordance with AWS C2.18] [and protect the base metal with an application of a paint manufactured with rust inhibiting chemical additives to a thickness of 0.062 to 0.075 mm 2.5 to 3 mils followed by a final coat of standard primer with a thickness of 0.062 to 0.075 mm 2.5 to 3 mils]. Protect nonferrous parts against corrosion as necessary.

3.3.1 Workmanship

Conduct field touch-up work as to avoid damaging other surfaces and public property in the area. Do not apply field applied paint during foggy, damp, rainy weather, or the ambient temperatures below 7 degrees C 45 degrees F and above 35 degrees C 95 degrees F.

3.3.2 Dissimilar Metals Protection

Insulate control surfaces by electrolytically inactive materials.

3.3.3 Finish Coat Color

Brilliant yellow and black. Paint 75 mm 3 inch wide black and yellow diagonal stripes on all vertical surfaces of pit, skirts, and platform edges exposed above adjacent surfaces at any ramp position. Paint similar stripes on top of ramp surfaces in 150 mm 6 inch wide band around outside edges (except for fixed edge).

3.4 FIELD TESTS

Provide personnel, instruments, materials, and equipment, including test vehicles, for the administration and direction of the tests. Correct defects and repeat tests under the cognizance of the Contracting Officer and the dock leveler manufacturer. The Contracting Officer is responsible for certifying the test load.

3.4.1 Roll-Over Load Tests

Move roll-over load of 9070 kg 20,000 pounds over the dock leveler between the bed of a freight carrier and the building loading dock surface for 10 cycles. With the ramp extension retracted and the ramp platform leveled with the building loading dock surface, run a 9070 kg 20,000 pound roll-over load over the ramp in various directions for 20 cycles. Do not allow permanent deformation [or hydraulic system leakage] to occur subsequent to examination after these roll-over tests.

3.4.2 Drop Tests

Twice, drop test the dock leveler at the indicated rated capacity as follows: With the load on the platform and the lip resting on a vehicle carrier bed not less than 250 mm 10 inches above loading dock surface, pull the carrier or pull away from the lip, leaving the loading ramp unsupported. Do not exceed 100 mm 4 inch for the measured vertical drop of the dock leveler taken at the point where the lip rests on the vehicle carrier during each of the drop tests. Inspect the loading ramp after each drop and ensure no damage or distortion to the mechanical, [electrical] or structural components. [Do not allow leakage from the hydraulic system.]

3.4.3 Acceptance Tests

Perform an acceptance test in the presence of the dock leveler manufacturer and the Contracting Officer subsequent to roll-over load tests and drop tests. Conduct operation of the equipment through all of its motions and specified checks as follows: (a) extend lip to rest on a variety of freight carriers with beds up 300 mm 12 inch above and below dock level; (b) test 100 mm 4 inch drop limitation with 3175 kg 7000 pound load on ramp, evenly distributed; (c) test level compensation with the ramp, loaded with a minimum of 3175 kg 7000 pounds; and (d) test proper compensation (float) for various compression of countersprings, with ramp loaded and unloaded.

3.5 INSTRUCTION TO GOVERNMENT PERSONNEL

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NOTE: The brackets have been provided because replacement of one dock leveler at an existing facility may not require training. Check with facility before deciding whether this training is required since existing personnel may be knowledgeable of dock leveler operations and maintenance.

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[Upon completion of the work and at a time designated by the Contracting Officer, provide the services of a competent Technician regularly employed or authorized by the manufacturer of the dock leveler to instruct

Government personnel in the proper operation, maintenance, safety, and emergency procedures of the dock leveler. A minimum of one and no more than two eight-hour working days of instruction is required. Conduct the training at the job site or at any other location mutually satisfactory to the Government and the Contractor.]

3.6 OPERATING MANUALS

Detail the step-by-step procedures required for system startup, operation, and shutdown. Include the manufacturer's name, model number, parts list, and brief description of all equipment and their basic operating features. List routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides in the maintenance manuals. Also include piping and equipment layout and simplified wiring and control diagrams of the system as installed.

-- End of Section --