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USACE / NAVFAC / AFCEA UFGS-11161 (October 2004)  
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Preparing Activity: USACE Superseding  
UFGS-11161 (March 2003)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 23 June 2005

Latest change indicated by CHG tags

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##### SECTION 11161

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10/04

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### SECTION 11161

#### DOCK LEVELERS 10/04

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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.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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## PART 1 GENERAL

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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.

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### 1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of

**SpecsIntact automated reference checking is  
recommended for projects based on older guide  
specifications.**

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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.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	(2000; R 2004) Industrial Controls and Systems: Controllers, Contactors, and Overload Relays Rated Not More than 2000 Volts AC or 750 Volts DC
NEMA ICS 6	(1993; R 2001) Industrial Control and Systems: Enclosures
NEMA MG 1	(2003; R 2004) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2005) National Electrical Code
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UNDERWRITERS LABORATORIES (UL)

UL 943	(1993; Rev thru Feb 2004) Ground-Fault Circuit-Interruption
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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

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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 projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Detail Drawings[; G][; G, [\_\_\_\_]]  
As-Built Drawings[; G][; G, [\_\_\_\_]]

Drawings depicting dimensions, tolerances, surface finishes, hardnesses, flush edge angles, method of mounting and anchoring, and control schematics and diagram.

#### SD-03 Product Data

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NOTE: On small jobs, e.g. replacement of one dock  
leveler, not all submitted requirements are  
necessary and must be edited to fit each job.  
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Loading Dock Levelers[; G][; G, [\_\_\_\_]]  
Dock Bumpers[; G][; G, [\_\_\_\_]]  
Restraining Device[; G][; G, [\_\_\_\_]]

Data including a complete list of equipment and materials,  
manufacturer's descriptive and technical literature, performance  
charts and curves, catalog cuts, and installation instructions.

#### SD-10 Operation and Maintenance Data

Operating and Maintenance Instructions[; G][; G, [\_\_\_\_]]

[Six] [\_\_\_\_] copies of operation and [six] [\_\_\_\_] copies of  
maintenance manuals for the equipment furnished. One complete set  
shall be furnished prior to performance testing and the remainder  
shall be furnished upon acceptance. Operating manuals shall  
detail the step-by-step procedures required for system startup,  
operation, and shutdown. Operating manuals shall include the  
manufacturer's name, model number, parts list, and brief  
description of all equipment and their basic operating features.  
Maintenance manuals shall list routine maintenance procedures,  
possible breakdowns and repairs, and troubleshooting guides.  
Maintenance manuals shall include piping and equipment layout and  
simplified wiring and control diagrams of the system as installed.  
After approval of the detail drawings, and not later than [\_\_\_\_]  
months prior to the date of beneficial occupancy, spare parts data  
for each different item of material and equipment specified are  
required. The data shall include 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.

Loading Dock Levelers[; G][; G, [\_\_\_\_]]  
Restraining Device[; G][; G, [\_\_\_\_]]

Submit Data Package 3 for Dock Leveler and Data Package 2 for  
Restraining Device in accordance with Section 01781 OPERATION AND  
MAINTENANCE DATA.

#### 1.4 GENERAL REQUIREMENTS

Materials and equipment shall be the standard products of a manufacturer  
regularly engaged in the manufacture of the products and shall essentially  
duplicate items that have been in satisfactory use for at least 2 years  
prior to bid opening. Equipment shall be supported by a service  
organization that is, in the opinion of the Contracting Officer, reasonably  
convenient to the site. Section 15050N BASIC MECHANICAL MATERIALS AND  
METHODS, applies to this Section, with the additions and modifications  
specified herein.

### 1.5 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 kilograms pounds.
- e. Shipping weight.
- f. Date of manufacture (month and year).

### 1.6 DELIVERY AND STORAGE

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.

### 1.7 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.

### 1.8 QUALITY ASSURANCE

#### 1.8.1 Detail Drawings

Submit drawings with 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, 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. [\_\_\_\_].

#### 1.8.2 As-Built Drawings

Submit record as-built drawings, including mechanical and electrical components, testing and acceptance (one copy sepia transparency) for each industrial dock leveler.

#### 1.8.3 Verification of Dimensions

The Contractor shall become familiar with all details of the work, shall

verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

## PART 2 PRODUCTS

### 2.1 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. Total leveler gross dynamic loads shall be determined by fork truck weight plus the maximum rated fork lift carrying capacity plus attachment handling device weight.  
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Provide permanent loading dock levelers 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, [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]. A truck restraint system shall be coordinated 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. A visual signal shall be incorporated 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.

#### 2.1.1 Environmental 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.



### 2.1.2 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] inch above and [0] [305] mm [0] [12] inch below the dock level to provide coverage between [760] [685] [\_\_\_\_\_] mm [30] [27] [\_\_\_\_\_] inch and [1370] [1295] [\_\_\_\_\_] mm [54] [51] [\_\_\_\_\_] inch above grade.

### 2.1.3 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 inch 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 shall be practically constant throughout the ramp, including the ramp extension.

### 2.1.4 Loading Ramp Compensation

Provide automatic compensation with ramp platform loaded or unloaded for:

#### 2.1.4.1 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 inch 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.

#### 2.1.4.2 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 inch for carrier spring deflection so that contact will be maintained between lip and carrier bed.

### 2.1.5 Safety Devices

#### 2.1.5.1 Electro-Hydraulic System

Provide velocity fuse, ballcheck valve, or other device to automatically prevent a drop of more than 100 mm 4 inch 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.

#### 2.1.5.2 Mechanical System

Include a three-position safety system to limit platform fall to dock level

and 100 and 200 mm 4 and 8 inch below dock level by means of double structural steel safety legs. Safety legs shall not be deactivated 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.

#### 2.1.5.3 Air Powered System

When in use, and the dock leveler is above the dock, an automatic safety device shall be provided to prevent a drop of more than 50 mm 2 inch 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.

#### 2.1.5.4 Dock Bumpers

Provide ramp and load dock face with laminated rubber, tire-fabric, or equivalent dock bumpers recommended by the dock leveler manufacturer.

#### 2.1.6 Rated Capacity

Minimum 9070 kilograms 20,000 pounds roll over capacity.

#### 2.1.7 Ramp Load Carrying Surface

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**NOTE:** Board width should be up to maximum leveler width of 2135 mm (7 foot) 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.

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The live load carrying surface of the ramp shall 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.

## 2.2 OPERATION

### 2.2.1 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.

### 2.2.2 Electro-Hydraulic Control

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

#### 2.2.2.1 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 shall stop all dock leveler movement, regardless of the position of the ramp or lip at the time the "STOP" button is depressed.

#### 2.2.2.2 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 shall automatically fall or retract to its down position, and the ramp shall return to its stored dock level position. The ramp, in its stored position, shall 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.

## 2.3 CONSTRUCTION AND MATERIALS

Construct all load carrying parts of forged or welded steel.

### 2.3.1 Structure

The entire live load carrying surface of the ramp and rear attachment shall 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.

### 2.3.2 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. Toe guards or skirts shall be smooth faced and mounted 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.

## 2.4 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.

## 2.5 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.

### 2.5.1 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.**  
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**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.

#### 2.5.2 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.

#### 2.5.3 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.

### 2.6 ACCESSORIES

#### 2.6.1 Dock Truck or Trailer Restraining Device

Self-aligning device. 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. This device must be able to 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.

#### 2.6.2 Dock Bumpers

Provide bumpers capable of sustaining repeated impacts from trucks or trailers without damage to the dock, dock levelers, or bumpers.

## PART 3 EXECUTION

### 3.1 INSTALLATION

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

- a. 2-1/2 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.

### 3.2 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). Ferrous surfaces shall be cleaned, [shot panned, and the base metal protected with an application of 99.9% pure zinc coating with a thickness of 0.010 to 0.012 IAW ANSI/ANS C2.18-93.] [and the base metal protected with an application of Rustoleum paint with 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.

#### 3.2.1 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.

### 3.2.2 Dissimilar Metals Protection

Insulate control surfaces by electrolytically inactive materials.

### 3.2.3 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).

## 3.3 FIELD TESTS

The Contractor is fully responsible to 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 will certify the test load.

### 3.3.1 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. No permanent deformation [or hydraulic system leakage] shall occur subsequent to examination after these roll-over tests.

### 3.3.2 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. [There shall be no leakage from the hydraulic system.]

### 3.3.3 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.

## 3.4 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. The period of instruction shall be not less than one nor more than two eight-hour working days. The training shall be conducted at the job site or at any other location mutually satisfactory to the Government and the Contractor.] The Contractor shall submit Operating and Maintenance Instructions as specified in the Submittals paragraph.

-- End of Section --