

<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>			1. CONTRACT ID CODE	PAGE OF PAGES 1   22
2. AMENDMENT/MODIFICATION NO. <b>0004</b>	3. EFFECTIVE DATE <b>01-Feb-2016</b>	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable)
6. ISSUED BY NAVFAC SOUTHEAST SOUTH TEXAS AREA PWD CORPUS CHRISTI/PWD INGLESIDE 8851 OCEAN DRIVE, BLDG 19 CORPUS CHRISTI TX 78419-5525	CODE <b>N69450</b>	7. ADMINISTERED BY (If other than item 6)  <b>See Item 6</b>		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		X	9A. AMENDMENT OF SOLICITATION NO. <b>N69450-16-Q-3212</b>	
		X	9B. DATED (SEE ITEM 11) <b>23-Nov-2015</b>	
			10A. MOD. OF CONTRACT/ORDER NO.	
			10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE			
<b>11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS</b>				
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
<b>13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.</b>				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  PLEASE SEE REVISED STATEMENT OF WORK ATTACHMENT E.  BIDS DUE DATE HAS BEEN EXTENDED. BIDS ARE DUE AT 5:00 P.M. C.S.T. ON 19 FEBRUARY 2016				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) JOEL OVERSON / CONTRACTING OFFICER TEL: 361-961-3397 EMAIL: joel.overson@navy.mil		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____		16C. DATE SIGNED 01-Feb-2016
(Signature of person authorized to sign)		(Signature of Contracting Officer)		

N69450-16-Q-3212

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

**SUMMARY OF CHANGES**

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text:

REVISED STATEMENT OF WORK

**ATTACHMENT E**

**3,000 lbs. CAPACITY HOIST REPLACEMENT SCOPE OF WORK  
FOR  
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST  
CORPUS CHRISTI, TEXAS**

October 2015

Revised January 2016

**PREPARED BY:  
NAVFAC SOUTHEAST  
BSVE WHE Group  
103 ranger road, NAS JAX  
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## Introduction

This specification is for the procurement of two 3,000 pound capacity hoists and all associated components, and electrical equipment in building 83, SIM Bay, located at NAS Corpus Christi, Corpus Christi Texas for Naval Facilities Engineering Command. Structural drawings for the building may be provided upon request.

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1. General

This specification is for the procurement of two 3,000 pound capacities, electrically powered wire rope hoists with powered trolleys. The two existing hoists shall be removed from each trolley girder and replaced with new hoists in an existing building (bldg. 83) at NAS Corpus Christi, Corpus Christi, Texas. The removed hoists shall be set on pallets ensuring the units are not damaged. The required lift of the new hoist/s is a minimum of 30ft (actual distance from floor to bottom of trolley girder is 29' 7"). Repair runway rail of alignment deficiencies at rail joint/s and girder joint/s where needed.

- 1.1 References (Contractor to utilize current versions as applicable)
  - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
    - AISC 325 Manual of Steel Construction
  - AMERICAN WELDING SOCIETY (AWS)
    - AWS D1.1/D1.1M Structural Welding Code – Steel

AWS D14.1/D14.1M	Welding Industrial and Mill Cranes and Other Material Handling Equipment
-ASME INTERNATIONAL (ASME)	
ASME B30.11	Monorails and Underhung Cranes
ASME B30.16	Overhead Hoists (Underhung)
ASME B30.17	Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
ASME HST-4	Performance Standard for Overhead Electric Wire Rope Hoists
- Society of Automobile Engineers (SAE) International	
SAE J123	Surface Discontinuities on Bolts, Screws, and Studs in Fatigue Applications
- ASTM INTERNATIONAL (ASTM)	
ASTM A 275/A 275M	Standard Test Method for Magnetic Particle Examination of Steel Forgings
ASTM A 668/A 668M	Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use
ASTM A 1023/A 1023M	Standard Specification for Stranded Carbon Steel Wire Ropes for General Purposes
-CRANE MANUFACTURERS ASSOCIATION OF AMERICA (CMAA)	
CMAA # 74	Specifications for Top Running & Underrunning Single Girder Electric Overhead Traveling Cranes Utilizing Under Running Trolley Hoist
-FEDERAL RAILROAD ADMINISTRATION (FRA)	
FRA Track Safety Standards	
-MATERIAL HANDLING INDUSTRY OF AMERICA INC (MHIA)	
MHI MH27.1	Specifications for Underhung Cranes and Monorail Systems
-NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)	
NEMA ICS 8	Industrial Control and Systems Crane and Hoist Controllers
NEMA MG 1	Standard for Motors and Generators
-UNDERWRITERS LABORATORIES (UL)	
UL 1004	Electric Motors
-NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
NFPA 70	National Electrical Code (NEC)
-NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)	
NAVFACINST 11230.1	Inspection, Certification, and Audit of Crane and Railroad Trackage
NAVCRANECENINST 11450.2	Design of Navy Shore Weight Handling Equipment

### 1.2 Verification of Dimensions

The crane contractor is responsible for the coordination and proper relation of his work to the building structure and to the work of all trades and sub-contractors. Verify dimensions of the building that relate to installation of the hoist/s (rail length, hanger attachments, etc) and notify the contracting officer of any discrepancy before finalizing the crane order.

### 1.3 Trade Coordination

The crane contractor is responsible for the coordination of his work with the work of all trades involved and as it relates to the building structure and crane rail. Verify all building and rail dimensions that relate to installation of the hoist/s and notify the contracting officer of any discrepancy prior to ordering the bridge systems.

### 1.4 Submittals

The contractor shall submit to the contracting officer all items of technical documentation listed hereinafter. Government approval is required for all submittals. The contractor shall ensure that all submittals are entirely legible and suitable for reproduction. Compliance with the requirements of this specification will be determined by a review of the design and construction submittals by the contracting officer and by field inspection.

#### SD-01 Preconstruction Submittals

Within 21 days of contract award, submit an initial crane milestone schedule developed by the crane contractor which identifies key milestone events in the design and installation of the hoist/s. At a minimum, the schedule shall include the following:

- a. General Arrangement and Design Submittals
- b. Fabrication Initiation
- c. Fabrication Complete
- d. Crane Delivery
- e. Crane Installation
- f. Field Acceptance Test
- g. Crane Acceptance
- h. Completion of Warranty

#### SD-02 Drawings

##### SD-02.G General Arrangement Drawings

The hoist/s shall be shown in plan, elevation, and end views to demonstrate proper interface with the facility building. All major features of the monorail crane systems shall be shown including: clearances, lifts, hook approaches on both sides, and maximum wheel loads. In addition, estimated weights shall be shown for the completely assembled crane.

##### SD-02.E Electrical Drawings

These drawings shall show the electrical layout of the crane including, but not limited to, fuse ratings, transformer ratings, and motor horsepower.

##### SD-02.M Mechanical Drawings

These drawings shall show the list of materials and fabrication details.

##### SD-02.S Structural Drawings

These drawings shall show the list of materials and fabrication details including all weldments, fastener joint details, and size of all structural members.

SD-03 Product Data

Manufacturer's catalog data shall be provided for all major components of the hoist/s. The catalog cuts shall be marked-up or supplemented with additional sheets to clearly identify the model or size, selected options, features, and/or modifications to demonstrate compliance with specification requirements. Catalog cuts which show modifications beyond the standard options and all supplemental pages shall bear original signatures and dates of the equipment manufacturer's authorized representative. Each catalog cut and each supplemental sheet shall clearly identify the item to which it applies. All catalog cuts shall be submitted in files viewable in Adobe Acrobat. The contractor shall submit for approval the catalog cuts listed below (as applicable):

SD-03.M Mechanical Product Data

- SD-03.M1 Complete hoist/trolley units
- SD-03.M2 Brakes, including (as applicable) torque and air gap setting ranges (with minimum and maximum tolerances) and brake minimum lining thickness
- SD-03.M3 Hooks and load blocks

SD-03.E Electrical Product Data

- SD-03.E1 Pendant push-button station
- SD-03.E2 Variable frequency drive settings (If applicable)

SD-03.S Structural Product Data

Not applicable for this specification

SD-04 Samples

Not applicable for this specification.

SD-05 Design Data

These calculations shall demonstrate compliance with all design requirements. Design data will not be approved if their evaluation/review is dependent on data or information not previously approved. All variables shall be listed and defined at the beginning of each calculation section; variables shall be in accordance with required references. The design data shall include sufficient information so that they may be approved without reference to detail (shop) drawings.

SD-05S Structural Calculations

SD-05M Mechanical Calculations

SD-05E Electrical Calculations

- SD-05.E1 Electrical schematics including layout and sizing information

SD-06 Test Reports

- SD-06.T1 Hook Non-Destructive Test (NDT) Report  
Refer to section 2.1.4.2 for hook NDT requirements

SD-07 Certificates

All certifications shall be dated and shall bear the original signature (above the printed name) of the authorized representative of the contractor or the manufacturer of the items or equipment being certified. Each certification shall clearly identify the hoist, drives, components, and location (as applicable) to which it applies.

SD-07.1 Wire Rope

The contractor shall provide the wire rope manufacturer's certification that the wire rope meets the published breaking strength or actual breaking strength of a sample taken from the reel and tested. Certification shall be traceable to the crane.

SD-07.2 Testing

The contractor shall certify the crane and support systems are capable of being load tested semi-annually up to 131.25% of the rated capacity without any detrimental effects.

SD-07.3 Loss of Power Test

The contractor shall certify that the crane may be tested annually for loss of power (i.e. while hoisting the load, the power shall be removed from the crane) without detrimental effect.

SD-07.4 Welding Certifications

Not applicable for this specification

SD-07.5 Design Review by Professional Engineer

Not applicable for this specification.

SD-8 Manufacturer's Instructions

SD-08.1 Crane Installation Plan

The contractor shall submit a plan detailing the logistics involved in the removal and installation of the hoist/s. The plan shall include, as a minimum, detailed sequence of lifts, rigging sketch(s) with details of rigging equipment's and methods of attachment to the component being lifted for installation. The plan shall be submitted by the contractor, for review by the Contracting Officer a minimum of 30 days prior to mobilization. The construction crane and rigging gear shall comply with OSHA requirements and any local requirements. Lifts of all major components for hoist installation are considered to be critical lifts and include any lifts performed by equipment such as forklifts and jacks. Actual locations of center of gravity and location of lifting points for components shall be provided with the crane installation plan.

NOTE: On site changes of the plan are not allowed without Government review.

SD-08.2 Training Course Outline

The contractor shall prepare and submit to the Contracting Officer for approval, a training course outline. The outline shall contain enough detail for the Government to determine that all topics are adequately covered as prescribed in section 1.9 of this specification.

SD-09 Manufactures Tests

SD-09.1 Field Testing

The contractor shall witness government testing as described in Enclosure 1 that will demonstrate operation, capacity, and safety of the cranes. Any deviations to the field test required by the contractor must be approved by the Contracting Officer.

SD-10 Operation and Maintenance Data

The contractor shall submit crane maintenance requirements, including, but not limited to weekly, monthly, semi-annual, and annual required maintenance items.

1.5 Quality Assurance

1.5.1 Manufacturer Qualification

Hoist/s, including sub-system components manufactured by vendors, must be designed and manufactured by a company with a minimum of 5 years of specialized experience in designing and manufacturing the type of overhead crane required to meet requirements of the contract documents and conforming to ASME B30.17.

1.5.2 Certifications

- a. Certification of minimum wire rope breaking strength, clearly indicating that wire rope meets the published breaking strength, or the actual breaking strength of a sample taken from the reel and sampled, and clearly identified for traceability.

- b. Semi-annual overload/safe for testing certification that the hoist, hook, and trolley systems are safe to test on a semi-annual basis with a load test of 131.25% (125% +5% -0%) of rated capacity with no detrimental effects.
- c. Submit a loss of power (panic test) certificate stating that a test may be performed in which power is removed from the crane while the hoist, bridge and trolley are in operation to simulate a loss of power.

#### 1.5.3 Drawings: Monorail System

Submit shop drawings showing the general arrangement of all components in plan, elevation, and end views; hook approaches on both sides, clearances and principal dimensions, assemblies of hoist, and trolley drives, motor nameplate data, overcurrent protective device ratings, and electrical schematic drawings. Include weights of components and maximum trolley wheel loads and spacing.

Shop drawing quality must be equivalent to the contract drawings. Drawings must be reviewed, signed and sealed by a licensed professional engineer.

Provide integral schedule of crane components on each drawing. Provide maximum wheel loads (without impact) and spacing imparted to the monorail beam. Indicate the trolley speeds along the monorail beam and the hoist lifting speeds; all speeds indicated are speeds with hoist loaded with rated crane capacity load.

#### 1.5.4 Design Data: Load and Sizing Calculations

Not applicable for this specification.

#### 1.5.5 Welding Qualifications and Procedure

Not applicable for this specification.

#### 1.5.6 Pre-Erection Inspection

Before erection, the Contractor shall inspect the trolley and hoist systems and components at the job site to determine compliance with specifications and manufacturer's data and shop drawings as approved. Notify the contracting officer 14 days before the inspection. Provide written notice of compliance to the contracting officer before proceeding to erection.

### 1.6 Delivery, Storage, and Handling

#### 1.6.1 Delivery and Storage

Inspect material delivered to the site for damage, unload and store with minimum handling. Store materials on-site in enclosures or under protective coverings. Protect materials not suitable for outdoor storage to prevent damage or corrosion during periods of inclement weather, including subfreezing temperatures, precipitation, and high winds. Store materials susceptible to deterioration by direct sunlight under cover and avoid damage due to high temperatures. Do not store materials directly on the ground. When special precautions are required, prominently and legibly stencil instructions for such precautions on outside of equipment or its crating.

#### 1.6.2 Handling

Handle materials in such a manner as to ensure delivery to final location in undamaged condition. Make repairs to damaged materials at no cost to Government.

### 1.7 Maintenance

Submit hoist and trolley system maintenance requirements to Contracting Officer.

1.8 Warranty

Provide a one year warranty period for all parts and labor on all installed equipment with an effective start date of the acceptance date of the monorail crane by the government.

1.9 Training

Provide a one-day maintenance training class for up to 5 personnel with training supplies and hands-on training. Government shall provide classroom space and any audio/video equipment required. Notify contracting officer 14 days before the training class. Training shall include operation of hoist and trolley, maintenance requirements, and general troubleshooting.

2 Products

2.1 Hoist

Provide two 3,000 lbs. rated capacity Cable King BEWN2-10232-RT22D2-11450.2 or equivalent electrically driven hoists and trolleys to ASME HST-4 H3 Duty Class C for indoor service except as modified and supplemented in this section. Hoist/s shall be controlled by pendant style push button controller, shall be wire rope hoists and shall be equipped with a hoist monitor card. Monitor car with ability for Bluetooth functionality in the future without replacement is preferred.

Hoist shall be double reeved and equalized.

Reference in publications to the "authority having jurisdiction" means the "Contracting Officer."

The hoist/s shall be designed to operate in an indoor environment with an ambient temperature of 80 degrees Fahrenheit. Operation of the hoist/s shall not appreciably increase ambient noise level and shall in no case exceed 90 dB from the operator's location when loaded at rated capacity and unloaded.

2.1.1 Power Characteristics

Provide crane operating from a 480 volt AC, 30 Amp, 60 Hz three phase power source.

2.1.2 Capacity

Provide two hoists with a rated capacity of 3,000 pounds. Mark the rated capacity in pound units with two sets of markings located on each side of the hoist/s body. Capacity marks must be clearly legible to the operator at ground level. Mark the rated capacity in pounds on both sides of the hook block.

2.1.3 Speeds and Crane Control Parameter Settings

Provide two speeds (dual speed) for hoist and trolley motions within the ranges as shown below.

- a. Hoist – dual speed hoist with a speed of 22/7.33 feet per minute (fpm) (fast speed/slow speed)
- b. Trolley – dual speed trolley with a Magnetek G+ mini Variable Frequency Drive rated speed of 45 max/10-20 feet per minute (fpm) (fast speed/slow speed)

Feet per minute speeds above are based off part number provided. Equivalent hoist speeds may be different. Provided max and min speeds outside above shall be adjustable to prevent hard starts and skewing.

Motors shall be a minimum of 60 minute duty rated motors.

Motor insulation shall be Class F minimum

Motors shall be equipped with thermal overload protection and overcurrent protection.

Motors shall be energized at a frequency not exceeding 60 Hz at the highest speed.

Designed parameter range shall be obtained from the crane OEM for each parameter which is anticipated to need adjustment during the life of the crane. This crane designed parameter range shall be the applicable portion of the drive's default range for each parameter and shall be the range in which each parameter can be safely tuned by the end user. At a minimum, the ranges for acceleration and deceleration parameters shall be provided.

A suspension hook, connecting the hoist unit to the trolley, shall not be used.

#### 2.1.3.1 Load Block

Construct the load block so that the hook and hook nut may be removed from the load block without disassembly of the block. Provide hook and hook nut forged from steel conforming to ASTM A 668/A 668M. The hook shall rotate freely with 131.25% of rated load.

Mark hoist capacity in pounds on both sides of the load block.

The design and arrangement of the load block shall be such that the wire ropes will not be pinched or cut in case of two-blocking.

#### 2.1.3.2 Hook and Hook Nut

The hook shall be single barb forged carbon steel. The hook nut shall be secured to the hook by a commercial standard removable and reusable means (tack-welding is prohibited). The hook shall be provided with a safety latch. The hook and hook nut shall be uncoated. The hook shall be uniquely marked in a permanent fashion that is traceable to the NDT certification. The nut shall be marked to match with the hook. The markings shall be visible when the hook and hook nut are assembled on the hook block. Documentation of hook material shall be provided to the Contracting Officer.

An easily removable and reusable means shall be provided to positively secure the hook nut to the hook shank. Shank and nut threads shall have a Class 2 fit, per ASME B1.1.

Hooks shall have a means to prevent an attached item from coming free under a slack condition.

Hooks shall not be welded, except by the original hook manufacturer prior to heat treatment

Hooks and nuts should be proof tested as an assembly in accordance with the hook proof test requirements of ASME B30.10

A suspension hook, connecting the hoist unit to the trolley, shall not be used.

Hooks shall be non-destructively tested (NDT) in accordance with NAVFAC P-307. Inspect each hook over the entire surface area by magnetic particle inspection IAW NAVFAC P-307.

- a. Procedure: Conduct magnetic particle inspection in accordance with ASTM A 275/A 275M with the following restrictions:
  1. DC yokes (including switchable AC/DC yokes used in the DC mode) and permanent magnet yokes must not be used.
  2. Do not use automatic powder blowers or any other form of forced air other than from a hand-held bulb for the application or removal of dry magnetic particles.
  3. Remove all arc strikes.
  4. Equipment ammeters must have an accuracy of +/- 5 percent of full scale (equipment ammeter accuracy other than that stated is acceptable provided the MT procedure states that a magnetic field indicator is used to establish and verify adequate field strength for all aspects of the inspection.)

Conduct this inspection at the factory of the hook or hoist manufacturer. It is recommended to utilize Crosby or Gunnebo Johnson hooks as these manufacturer's procedures are approved by the Navy Crane Center and require only the inspection report from these companies. Alternately, a recognized independent testing lab may conduct the inspections if equipped and competent to perform such a service, and if approved by the Contracting Officer. The performing organization must provide a written statement of certification to ASTM E 543, have the procedures used for testing of the hook reviewed and approved by an independent Level III examiner, and submit the approved procedures and certification along with copies of the certifications of the Level II and Level III examiners to the Contracting Officer with the test report.

- a. Acceptance Criteria: Defects found on the hook will result in rejection of defective items for use on furnished hoist. For this inspection, a defect is defined as a linear or non-linear indication for which the largest dimension is greater than 1/16 inch. Acceptance criteria for external hook threads may be based on the acceptance criteria in SAE standard J123.
- b. Test Report: Provide a test report of the magnetic particle inspection of each hook and submit to and secure approval from the contracting officer prior to final acceptance of hoist installation. Test reports must be certified by the testing organization.
- c. Weld Repair: Weld repairs for defects on hooks or hook nuts are not acceptable.

#### 2.1.3.3 Wire Rope

Rope length shall be sufficient to maintain a minimum of two full wraps of rope at the dead end(s) of the drum with the block in its lowest indicated position.

Hoisting ropes shall conform to ASTM A 1023/A 1023M, improved or extra improved plow steel, regular lay, uncoated, 6 by 37 class construction with an independent wire rope core. Provide wire rope certificate that the wire rope meets the published breaking strength or the actual breaking strength of a sample taken from the reel and tested.

The hoist wire rope shall have at least a 5:1 design factor, based on the catalog breaking strength, for the rated capacity divided by the number of parts of wire.

#### 2.1.3.4 Hoist Brake

Provide both a mechanical load brake and an electro-mechanical brake (shoe or disc). The mechanical load brake and the electro-mechanical brake must each, independently, stop and hold 131.25% of rated capacity. The electro-mechanical brake must be adjustable to 50% of its rated capacity, and must have an externally accessible, self-return to ON means of manual release. Procedures for manually releasing the electro-mechanical brake from the OEM shall be provided to the Contracting Officer

#### 2.1.4 Trolley

Configure trolley such that the trolley has an extended wrap-around trolley frame that prevents the trolley from dropping more than one inch in the event of an axle or wheel failure. No hollow stamped steel wheels are permitted. The weight of the new trolley and wheel spacing shall not increase the shear or moment in the existing bridge beam (and the existing wheel spacing and maximum wheel loads shall be provided)

##### 2.1.4.1 Trolley Drive

Provide Magnetek G+ mini VFD on trolley 2 speed

##### 2.1.4.2 Trolley Brake

Provide trolley brake or non-coasting worm drive capable of stopping the trolley within a distance in feet equal to 10% of the rated speed in feet per minute when traveling at rated speed with rated load.

Provide brake with a minimum torque rating of 50 percent of the drive motor rated torque.

Provide brakes with an externally accessible means to manually defeat the brake.

#### 2.2 Structural

##### 2.2.1 Welding

Not applicable for this specification.

##### 2.2.2 Structural Bolted Connections

Major structural bolted connections shall be designed and installed in accordance with RCSC Specification for structural joints using high-strength bolts.

#### 2.3 Mechanical

##### 2.3.1 Threaded Fasteners

All base-mounted and flange-mounted components and all mechanical connections subjected to calculable loads shall be fastened with SAE J429, Grade 5 or Grade 8 fasteners, ASTM F436 washers, and SAE J995 Grade 5 or Grade 8 nuts. Mounting fasteners from flange-mounted components, including keeper bars, may be installed into tapped holes provided that adequate thread engagement is provided to develop the full tensile strength of the fastener. All nuts shall have a minimum of one thread pitch of the bolt protruding above the nut top surface.

- 2.3.2 Bumpers and stops  
Not applicable for this specification

## 2.4 Electrical

The design, selection, rating, and installation of the electrical portions of the hoist and its accessories must conform to the requirements of NEMA ICS 8, ASME HST-1, NFPA 70, and other requirements specified herein.

NFPA 70, the National Electrical Code (NEC), CMAA #74, ASME HST-4, SAE J1292, and various CFRs, prescribe the criteria that apply to virtually all electrical components of cranes. Other criteria beyond those are addressed herein. Some elements of those design criteria are recommendations (“should” statements), but are considered mandatory by this scope.

Electrical connections shall be installed in accordance with NFPA 70 sections 110.14 or 430.9, as applicable, or as recommended by the device manufacturer.

All electrical components are required to be located so they are easily accessible for inspection and maintenance.

The crane contractor must furnish and install all electrical equipment on the crane conforming to NEMA ICS 8, including motors, electrically released brakes, switches, crane controllers, panels, operating station, wiring system, cables, and bridge crane electrification up to and including the crane disconnect switch as applicable.

Provide Visual indicating panel assembly on the bottom of the bridge with lights sized and positioned to be visible from the ground. LED type lights shall be used for all indicator lights. Provide an amber rotating beacon light that is illuminated at all times during movement of the hoist, trolley, or bridge function. Provide a white light to indicate that power is available on the load side of the crane disconnect and a blue light to indicate that the main contactor is energized. A red motor over temperature pilot light is required if there is a motor over temperature device. This informs the operator the motor got too hot and is the reason the hoist is not hoisting (until the motor cools down). It is a light that triggered by the thermal overload device. If the crane is equipped with a slow speed or micro speed mode then a yellow light is required to indicate slow Voltage of the lights must be 115 VAC. Provide nameplates that are legible from ground level. The name plates may be posted on a tag above the pendant. The nameplates must read, in their respective order. "POWER AVAILABLE" and "CRANE ENERGIZED". Energization of the "POWER AVAILABLE" light must be supplied by a separate, fused transformer

For hoists utilizing brake failure detection, a dedicated indicating light shall be provided to alert the operator of a brake failure.

Provide for lockout/tagout of all hazardous energy sources.

A separate grounding wire, sized in accordance with Section 250-122 of NFPA 70, shall be routed with all ungrounded conductors. All wiring shall be numbered or tagged at all connection points.

#### 2.4.1 Pendant Control

Currently crane has separate festoon track system to which pendant is connected. All existing wires on festoon system shall be connected IAW applicable electrical codes and OEM guidance. A wiring diagram is provided of the pendant wires. Should there be insufficient wires for the addition of the light package then contractor shall supply festoon system IAW the following.

An independent festoon system dedicated to the pushbutton station shall be used.

Cable loops for festoon systems shall not extend low enough to come into contact with any obstructions.

Twenty percent of the control conductors included in a new festoon conductor system or cable carrier system should be spares.

Conductors used in a festooned or cable carrier system shall be designed to be used in these types of electrification systems.

A method of strain relief shall be provided with all pendant pushbutton stations to protect the electrical conductors from strain. Method shall be stainless steel wire rope strain lead having a diameter of 1/8 inch (minimum) or an internal strain relief cable built into the multiconductor cable.

The minimum wire size of multiconductor flexible cords for pendant pushbutton stations shall be #16 AWG.

Pendant pushbutton stations shall have a grounding conductor between a ground terminal in the station and the crane.

The pendant pushbutton station shall be rated appropriately by NEMA for the environment in which it will be used in with the exterior being made of non-conductive material.

Pendant pushbuttons shall be spring return to the OFF position.

Stepped control and stepped pushbuttons for hoist functions shall be provided.

The maximum voltage in pendant pushbutton stations shall be 150 Volts AC or 300 volts DC.

#### 2.4.2 AC Controls

Provide dynamic braking for all electric drives. Speed control must be of the two-step fixed speed type for the hoist and trolley functions. The hoist and trolley brakes must set only after the associated controller decelerates the motor to a controlled stop.

The use of definite purpose contactors is prohibited. All contactors must be NEMA rated. Feed control circuits from a single phase, air cooled, double wound transformer with a grounded metal screen between the primary and secondary windings of the transformer.

#### 2.4.3 Protection

Protection must not be less than that required by NFPA 70.

Under voltage protection shall be provided for all motor control systems

#### 2.4.4 Limit Switches

Geared upper (primary) and lower limit switches shall be provided for the hoist electric drives (rope guided actuated limit switches are not acceptable).

In addition to the geared limit switches, a block actuated (weighted or paddle type) secondary upper limit shall be provided.

The block actuated limit switch shall remove all power from the affected hoist drive motor independent of the directional contactors to prevent two-blocking of the hoist during a reverse phase condition. If a micro-processor (Normally a Variable Frequency Drive, VFD) drive is utilized for hoist motor control, the block actuated limit switch shall remove all power from the affected hoist drive motor and brake independent of the hoist drive controller, utilizing a hoist line contactor, and set the hoist brake.

A maintained keyed bypass switch shall be provided on the hoist control panel. This bypass switch shall allow resetting of the secondary upper limit switch prior to resuming operation. During resetting of the secondary limit, the hoist shall operate in the lowering direction only.

When the geared upper (primary) limit is reached, the operator shall still be able to lower the block out of the geared upper limit switch. Lowering of the block shall automatically reset the geared upper (primary) limit switch.

When the lower limit is reached, the operator shall still be able to raise the block. Raising of the block shall automatically reset the limit switch.

The primary upper limit switch shall be set at the maximum practical hook height but not lower than high hook position shown in the contract drawings. The lower limit switch shall be set at a position such that the hook is approx. 18" above the highest grade of the floor.

#### 2.4.5 Hoist overload limiting device

Provide hoist overload limiting device that is adjustable between 80 and 150 percent of hoist capacity, initially set to 100% of rated capacity.

Provide a maintained keyed bypass switch on the control panel for bypassing the overload limiting device for annual load testing.

Hoist drive shall be equipped with a motor overtorque limit to lock out the hoist and prevent gross overload of the hoist. The overtorque limit should be set such that an overload test can be performed without tripping the overtorque fault.

#### 2.4.6 Overload Protection

Provide overload protection in the form of circuit breakers or fuses for each motor, motor controller, and branch circuit conductor in accordance with the NEC.

#### 2.4.7 Enclosures

Provide enclosures for control panels, controls, and brakes in accordance with NEMA 250 Classification Type 12.

Provide a non-resettable hour meter, readable from the exterior of the main control panel, to indicate the elapsed number of hours the hoist is energized.

#### 2.4.8 Electrification

Pendant and trolley festoon system shall have at least 20% spare wires available.

### 2.5 Crane Painting

Factory paint electrical and mechanical equipment in accordance with the manufacturer's best standard practice (for the specified environment).

### 2.6 Identification Plates

Provide non-corrosive metal identification plates with clearly legible permanent lettering giving the manufacturer's name, model number, serial number, capacity in pound units, and other essential information or identification.

#### 2.6.1 Markings on hoist/s

Markings include bridge and trolley motion direction. The markings on the pendant shall match the directional markings on the trolley and bridge motion direction.

Markings must be visible from operator's station and from the loading point, corresponding to the push button labeling on the pendant pushbutton controller. Mark the hook rated capacity on both sides of the hoist and hoist load block in pounds.

### 2.7 Runway Rails

Repair deviations/misalignments on the bridge rails as required IAW FRA Track Safety Standards and NAVFACINST 11230.1. Additionally, rails shall meet the requirements of CMAA #74

#### Execution

### 2.8 Removal and Installation

Remove and install the hoist/s, complete in accordance with the approved submittals and in condition to perform the operational and acceptance tests.

### 2.9 Erection Services

Provide supervisory erection services from the hoist system manufacturer if available.

### 2.10 Field Quality Control

#### 2.10.1 Post-Installation Inspection

After installation, the crane contractor, the contracting officer, and a representative of the activity crane maintaining organization shall jointly inspect the hoist and components to determine compliance with specifications and approved submittals. Notify the contracting officer 14 days before the inspection. NAVFAC P-307 Annual Maintenance, Inspection and Specification Record shall be documented with all applicable checks for the entire crane as part of acceptance prior to the allowance of testing. A list of deficient items,

including a determination of criticality will be provided to the crane contractor for corrective action. Outstanding items shall be noted for correction during the inspection. Items considered critical (load bearing, load controlling, or operational safety devices) shall be corrected prior to further testing. Upon correction, provide a report of the inspection indicating the bridge systems are considered ready for operational tests.

#### 2.10.2 Field Testing

After installation and inspection, load test the hoist and trolley systems as specified in enclosure 1. Load testing shall be directed by government crane maintaining organization personnel. Test the system in service to determine that each component of the system operates as specified, is properly installed and adjusted, and is free from defects in material, manufacturing, installation, and workmanship. Rectify all deficiencies disclosed by testing and retest the system or component to prove the monorail system is operational.

Furnish operating personnel, instruments, and all other necessary apparatus. The government shall furnish to the crane contractor certified test weights and rigging gear for load testing.

Testing shall include a no-load operational test, 100% (+0%, -5%) load test, and a 125% (+5%, -0%) overload test. Record any deficiencies found during any testing. Secure from testing if deficiencies to load bearing, load controlling, or operational safety devices are found.

**ENCLOSURE 1): Field Testing Report for BridgeCrane**

Supported Command: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_  
Contract No.: \_\_\_\_\_  
Crane USN: \_\_\_\_\_

Names and Titles of Participating Government, Supported Command, and Contractor Representatives:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

General instructions

The crane and supporting structure shall be tested in accordance with the applicable paragraphs of this guide. Assure that all components and features that affect load bearing, load controlling, or operational safety devices of the cranes are properly tested. Perform all the tests described below along with any other tests required to verify that the crane meets the contract requirements including any contract modifications. The sequence of testing is at the option of the contractor's test director except that the no-load test shall be performed first. Determine the tools, meters, measuring devices, etc. that are required to perform the test and have them available at the site.

Inspection Codes: SAT = Satisfactory, meets specification and/or design requirements  
UNSAT = Unsatisfactory, does not meet specification and/or design requirements

Equipment monitoring

During testing, check for the proper operation and condition of safety devices, electrical components, mechanical equipment, and structural assemblies. Immediately report any observed defects critical to continuing testing to the test director, who shall suspend the testing until the deficiency is corrected.

Hooks

Record hook serial number. Install two tram points on hook throat and measure the distance between these tram points (+/- 1/64 inch). Record this base dimension. Measure the distance between tram points before and after load test. An increase in the throat opening from the base measurement is cause for rejection. Ensure hook safety latches are functioning correctly.

Load Hook Unique Identification Number \_\_\_\_\_

Load Hook Nut Unique Identification Number \_\_\_\_\_

Load Hook Tram Measurement - Before Load Testing \_\_\_\_\_

Load Hook Safety Latches ( ) SAT ( ) UNSAT

**Preparing for load test**

-Select a safe test area and clear all traffic, unauthorized personnel, and equipment from test area. This test area shall be roped off or otherwise secured to prevent entry of unauthorized personnel and equipment.

-All rigging used in crane load testing shall conform to NAVFAC P-307 requirements. Note that test loads INCLUDE the weight of rigging used to connect them to the load block.

-Ensure brakes are set within OEM parameters

-Ensure all gearboxes are adequately filed with lubrication and other components (wire rope, bearings, etc) are adequately lubricated.

**Precautions during load testing**

- 0 Observe extreme caution at all times.
- 0 Personnel shall remain clear of suspended loads and areas where they could be struck in the event of component failure. At no time shall personnel be under any suspended load.
- 0 Raise test load only to a height sufficient to perform the test.
- 0 Check entire operating envelope to ensure there are no obstructions.

**No-Load Test**

Raise and lower the hook through the full range of normal travel at slow speed for two complete cycles. Verify hoist operating speeds are within specification ranges

Raise and lower the hook through the full range of normal travel at fast speed for two complete cycles. Verify hoist operating speeds are within specification ranges

Hoist fast speed \_\_\_\_\_ fpm                      Hoist slow speed \_\_\_\_\_ fpm

Verify proper operation of hoist limit switches including bypassing primary upper limit switches and testing function of secondary upper limit switch.

Lower Limit Switch                      ( ) SAT    ( ) UNSAT  
 Primary Upper Limit Switch            ( ) SAT    ( ) UNSAT  
 Secondary Upper Limit Switch        ( ) SAT    ( ) UNSAT

Operate the trolley in each direction the full distance between end stops using both slow and fast speed. Perform one complete cycle to check various speeds and verify proper brake operation. Verify satisfactory performance of the bumpers and the alignment of the bumpers with the end stops by contacting the trolley bumpers with their end stops in slow speed.

Trolley fast speed \_\_\_\_\_ fpm                      Trolley slow speed \_\_\_\_\_ fpm  
 Trolley bumpers ( ) SAT    ( ) UNSAT

Ensure all indicator lights function properly. ( ) SAT    ( ) UNSAT

**Hoist and trolley function:**

Hoist                      ( ) SAT    ( ) UNSAT  
 Trolley                    ( ) SAT    ( ) UNSAT

**Hoist Load Testing****100% of rated capacity (+0%, -5%) load test**

Record the actual load test weight (including rigging gear): \_\_\_\_\_ lbs.

**Hoist functionality test**

Operate the hoist the full lift height for 5 minutes using both hoist speeds stopping at least once in each direction to verify proper brake operation.

SAT  UNSAT

**Trolley functionality test**

Operate the trolley function the full distance of the bridge girder in both directions for two cycles (two runs in each direction) using both trolley speeds stopping at least once in each direction to verify proper brake operation. Observe for any binding and verify proper brake operation.

SAT  UNSAT

**125% of rated capacity (+5%, -0%) load test**

Record the actual load test weight (including rigging gear): \_\_\_\_\_ lbs.

**Hoist overload limiting device**

Attempt to lift the test load and ensure hoist overload limiting device does not allow load to be lifted. Bypass hoist overload limiting device.

SAT  UNSAT

**Dynamic test**

Raise and lower test load and visually observe smooth control. Stop the load during hoisting and lowering to verify that the brakes stop and hold the load.

SAT  UNSAT

**Hoist brake test**

Raise the test load approximately one foot and hold for 10 minutes. Ensure there is no vertical movement of the load. Rotate load and hook 360 degrees clockwise and 360 degrees counterclockwise to check bearing operation.

SAT  UNSAT

Raise test load approximately 5 feet. With neither pushbutton depressed, release (by hand) the electro-mechanical brake. The mechanical load brake shall hold the test load. Again with the electro-mechanical brake in the released position, start the test load down (slow speed) and then release the pushbutton as the test load lowers. The mechanical load brake must prevent the test load from accelerating.

SAT  UNSAT

Reset the primary holding brake

SAT  UNSAT

**Hoist Loss of Power (Panic Test) Certificate**

Raise the test load to approximately 5 feet. While slowly lowering the test load, disconnect the crane's power source. Verify that the test load does not lower and that the electro-mechanical brake is set.

SAT  UNSAT

