

**MEETING MINUTES**  
**NON-MANDATORY PRE-BID CONFERENCE**  
**GLENCOE WATER TREATMENT PLANT IMPROVEMENTS**  
**AND**  
**SMITH STREET PUMPING STATION PROJECT**  
**BID NO. 05-09**

**Date:** February 27, 2009  
**Time:** 10:00 am EST  
**Place:** Main Conference Room  
Utilities Commission, City of New Smyrna Beach  
200 Canal Street  
New Smyrna Beach, Florida 32168

- Attendees – see attached sign in sheet
- Meeting called to order at 10:00 AM.
- Review of Special Project Requirements
  - Major project elements
    - Transfer pumps and yard piping at Glencoe plant
    - Demolition of existing break room structure
    - New High Service Pump building
  - Project Team
    - Richard P. Dembinsky, P.E., Project Manager, UCNSB
    - Maureen Lynch, Interim Materials Manager, UCNSB
    - Fernand J. Tiblier, Jr., P.E., Engineering Manager, Black & Veatch
    - Bryan M. Martin, Staff Engineer, Black & Veatch
  - Engineer's Estimate
    - Estimated cost of construction is \$4,000,000 including \$800,000 in Owner purchased equipment
  - Important Project dates:
    - Bid Opening date is March 6, 2009 at 2:30pm
    - Tentative Bid Award date is April 13, 2009
    - Tentative Project Completion date is February 16, 2010.
  - Owner Purchased Materials
    - Backwash pump at Glencoe is NOT included in the purchase order and is the Contractors responsibility
  - Plant Security

- Plant sites must be secure at all times, Contractor must plan work schedule accordingly. Contractor is responsible upon acceptance of Owner purchased materials stored at the job site.
  - General Notes to Bidders
    - Work on the 20-Inch Transmission Main is to be completed under separate contract.
    - An RPR trailer is not required.
- Review of Contract Document Requirements
  - Contractor must fill out all forms included in the Bid Documents with the exception of Section 00510 Schedule of Values
  - Bidders must indicate the following information on the sealed envelope
    - Bid Number
    - Hour and Date of Bid Opening
    - Name of Bidder
- Bidder Questions
  1. Can each Ground Storage Tank(GST) be taken out of operation for 24 hours in order to make the piping connections & install the vortex plates inside them shown on sheet M-3?  
*Yes, the Contractor must coordinate with plant operators.*
  2. Will the Utility Commission(UC) reesterilize the GSTs once they're taken out of operation or is this the contractor's responsibility?  
*Sterilizing the tanks will be the Contractor's responsibility.*
  3. Can you provide the size of the vault shown on sheet C-6, detail F for the 20" PRV?  
*Exact dimensions were not given because there are valves of different sizes. It should be the Contractors understanding that the vault should be sized to fit the valve with sufficient clearance to allow regular maintenance on the valve with an aluminum hatch. There are two PRVs to be placed in vaults: a 14" PRV at Smith Street and a 6" PRV at Glencoe. The plans incorrectly call out a 20" PRV, the 20"x14" reducer should be located between the tie-in and the PRV.*
  4. Does the pump station floor receive paint or any coatings? If a floor sealer, please advise on the spec?  
*Floor sealer is required, see Section 09920.*
  5. Does the UC pay for the building permit fees or is the contractor responsible? If the contractor, can the building department provide a cost for this?  
*Building permit fees are the responsibility of the Contractor. It is recommended that all bidders include \$20,000 in their bid for building permit fees.*
  6. What permits are provided by the Owner?

*The Owner will provide the DEP stormwater permit for Smith Street, Volusia County Health Department permits for both facilities, and the City Site Planning Permit.*

7. Has the owner supplied equipment been ordered? Projected delivery for this equipment? Is the pump supplier the City is using providing the cans as well?  
*The purchase orders for the Owner furnished equipment have been issued. Equipment delivery varies with the longest lead item being the pumps at 180 days. Pump cans are the responsibility of the Contractor.*
8. Spec section 01015-2.0 states there is 16,750lf of 20" DIP or PVC to be installed as part of this job. Are there plan details for the pipe or can this be deleted out of the specs?  
*The Transmission Main work is not part of the Water Facility Improvements project.*
9. The soil borings reference the piping also & a pump station that is 15'-20' deep. The Smith Street pump station building footings appear to be right at existing grade with the slab actually elevated. Are the existing soils adequate for the building foundations or does structural fill need to be hauled in to replace any existing soil concerns?  
*The mention of a 15'-20' deep pump station relates to the depth of the pump cans. See section 2200 for structural backfill requirements.*
10. Is the building exterior stucco to be a colored stucco with no paint or a regular stucco & then painted?  
*Colored stucco is not required.*
11. What type of materials & sizes are to be used for the generator muffler support shown on sheet M-4?  
*The muffler support is detailed on sheet S-7. The material should be galvanized steel.*
12. Is the handrailing required to be aluminum or steel per the details shown on sheet 12?  
*Aluminum handrailing should be used.*
13. Does the fire alarm spec only refer to the new pump station at Smith Street?  
*Yes.*
14. What is the Owner's intent on the Modular Building?  
*The Contractor is responsible for the set-up and maintenance of the modular building over the duration of the project. The Contractor will also provide water, sewer and telephone service per Section 01500. It is the intent of the Owner to purchase the building after the project is complete. A purchase price for this*

*facility must not be included in the bid. If terms for purchase by the owner cannot be reached, the building will be removed from the site.*

15. Is it the Contractor responsibility to off-load the Owner furnished equipment?

*No.*

16. Is the transfer switch for the generator included in Owner furnished equipment?

*Yes.*

17. Are the Motor Control Centers included in Owner furnished equipment?

*The motor control centers are the responsibility of the Contractor.*

18. Is the fuel for the generator provided by the Contractor?

*Yes.*

19. Spec 00520 calls for ConVault which does not produce double-walled tanks.

*Please clarify.*

*Reference of ConVault has been removed from Section 00520.*

20. Please explain the 160 day contract timeframe.

*The project should be completed by February 16, 2010. In consideration of float time associated with lead times of Owner pre-purchased equipment, the 160 days should be considered as working days as opposed to contract duration time.*

21. How are we to install the 24" valve on the transfer pump header? We are concerned that it may not fit.

*Your bid should reflect that the valve will fit. This is consistent with our best information.*

- Acknowledgement of Addendum
  - Section 00520 – Schedule of Major Manufacturers
  - Section 14630 – Traveling Bridge Crane
  - Contractor is required to acknowledge the addendum on the bid form
- Site Visit Issues
  - The Owner will clear the Smith Street site of materials and equipment not related to the project.
  - The bridge crane at Glencoe will be in operation and available for use by Contractor
  - The soft starter on the backwash pump is not included in the Owner purchased equipment.
- Meeting adjourned at 12:30 PM.

**NON-MANDATORY PRE-BID CONFERENCE  
ATTENDEE SIGN-UP SHEET  
GLENCOE WATER TREATMENT PLANT IMPROVEMENTS  
AND  
SMITH STREET PUMPING STATION PROJECT**

**BID NO. 05-09**

**Date:** February 27, 2009  
**Time:** 10:00 am EST  
**Place:** Main Conference Room  
 Utilities Commission, City of New Smyrna Beach  
 200 Canal Street  
 New Smyrna Beach, Florida 32168.

Name	Affiliation	Phone	E-Mail
<u>JOHN JUSTUS JR.</u>	<u>McMANAW CONST. CO., INC.</u>	<u>386-734-1071</u>	<u>jejmcei@bellsouth.net</u>
<u>TOM CLARKE</u>	<u>FLORIDA DESIGN CONTR.</u>	<u>561-845-1233</u>	<u>TCLARKE@FLORIDADDESIGNCONTRACTORS.COM</u>
<u>Robert Hierholzer</u>	<u>RTD Construction</u>	<u>813 783 9119</u>	<u>roberthierholzer@rtdconstruction.com</u>
<u>Devin Call</u>	<u>RTD Construction</u>	<u>813-783 9119</u>	<u>devincall@rtdconstruction.com</u>
<u>MIKE McDONALD</u>	<u>BLACKTOP PAVING</u>	<u>386-767-2552</u>	<u>Michelle@BlacktopBeedePaving.com</u>
<u>Tony Lederman</u>	<u>Cogburn Electric</u>	<u>904-358-7344</u>	<u>tlederman@coburnbros.com</u>
<u>Mike Hugginbotham</u>	<u>Ortega Ind. Contr.</u>	<u>904-268-2181</u>	<u>thind@ortegaindustrial.com</u>
<u>Colleen Arnold</u>	<u>Island Dream Homes</u>	<u>(386)366-0763</u>	<u>colleenarnold1985@yahoo.com</u>
<u>DAN ROGERS</u>	<u>DSR CONST. INC</u>	<u>386/428-6288</u>	<u>DSRCONINC@EARTHLINK.NET</u>

Name

Affiliation

Phone

E-Mail

Maureen Lynch

UCNSB

386 494 3046

mlynch@ucnsb.org

STEVE ROBERTSON

MASCI CONST

386 322 4500

STEVE.ROBERTSON@CFL.RR.COM

PATRICK HEWITT

Wharton Smith

407-321-8410

phewitt@whartonsmith.com

Bryan Martin

Black + Veatch

407-419-3564

MartinB@bv.com

Sid Morgan

Mersino Dewatering

386-426-2411

Sid.morgan@mersino.com

Chase Bolton

Jones Mechanical Corp

321 433 3422 office  
321 433 3420 Fax

David Emery

Palmetto Electric

386-437-3068

david@palmettoelectric.com

Richard Dembinsky

U.C.N.S.B.

386-424-3019

- N.A. -

Fernand Tiblier

Black + Veatch

407-419-3566

Tiblier-FJ@bv.com

**BID SHEET:**

**GLENCOE WATER TREATMENT PLANT IMPROVEMENTS**  
**AND**  
**SMITH STREET PUMPING STATION PROJECT**

**BID NO.05-09**

## 1. Base Bid – Schedule of Manufacturers

The undersigned as Bidder agrees that the Contract, if awarded, will be on the basis of the materials and equipment named in the Contract Documents. Bidder also agrees that for the Base Bid equipment and materials listed below, the Bidder will provide equipment/material from one of the listed manufacturers/suppliers by circling the letter next to the selected Manufacturer. No alternates to the base bid will be acceptable. Should a bidder fail to indicate which lettered item is bid or enter multiple entries, the bidder's bid may be disqualified as non responsive.

**Schedule of Base Bid Manufacturers**

<b>Section</b>	<b>Equipment Item</b>	<b>Spec. Section</b>		<b>Manufacturers / Suppliers</b>
	Transfer Pumps – Vertical Difussion Vane	11121	A	Owner Furnished
	High Service Pumps- Vertical Difussion Vane	11150	A	Owner Furnished
	Engine Generator	11910	A	Owner Furnished
	Control System	13500	A	GE Proficy
		13530	B	Schneider Automation Modicon Quantum Series PLCs
	Flow Meters – Magnetic	13562	A	Yokogawa
			B	ABB
			C	Krohne
	Transmitters – Smart Pressure and Pressure Sensing Level	13563	A	Yokogawa
			B	Rosemount
	Transmitters – Smart Differential Pressure	13563	A	Yokogawa
			B	Rosemount
			B	Honeywell
			C	GLI

*Bid sheet continued next page.*

Section 00520 Schedule of Major Manufacturers

**BID SHEET:**

**GLENCOE WATER TREATMENT PLANT IMPROVEMENTS**  
**AND**  
**SMITH STREET PUMPING STATION PROJECT**

**BID NO.05-09**

**Schedule of Base Bid Manufacturers**

	Variable Frequency Drives	16150	A	Owner Furnished
	Low Voltage Switch Gear	16346	A	Owner Furnished
	Motor Control Centers	16480	A	Owner Furnished

*Bid sheet continued next page.*



Section 14630

TRAVELING BRIDGE CRANES

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing and installation of traveling bridge cranes, complete with trolleys and hoists, and accessories as indicated herein.

Equipment designation.	Bridge Crane
Number of units.	1
Equipment tag numbers.	CRT-1
Equipment location.	Smith Street PS

Runway beams/crane rails are covered in the Structural and Miscellaneous Metals section.

Each bridge crane assembly shall consist of structural members fabricated by the crane supplier and components (end trucks, wheels, bridge drive mechanism, trolley, and hoist). Equivalent products of other manufacturers regularly engaged in the production of equipment of this type may be furnished subject to acceptance by Engineer. All modifications necessary to accommodate the equipment shall be subject to review and acceptance by Engineer and shall be made at no additional cost to Owner.

1-2. GENERAL. Equipment and accessories furnished and installed under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

1-2.01. Coordination. Contractor shall verify that each component of the system is compatible with all other parts of the system and that all devices necessary for a properly functioning system have been provided.

Where two or more traveling bridge cranes are required, they shall be the product of a single manufacturer; however, all the component parts of the system need not be the products of one manufacturer. Similar component parts of bridge cranes shall be from the same manufacturer to facilitate maintenance and stocking of repair parts. Whenever possible, identical units shall be furnished.

Each manufacturer of major equipment shall have a local service center, or with written consent of Engineer, shall be able to provide service from other locations within 24 hours. The service center shall be equipped and staffed to service the system and shall maintain a local parts supply. Information on equipment manufacturers' representatives shall be included with the submittals.

Where several manufacturers' names have been listed in this section as possible suppliers, only the products of the first manufacturer listed have been checked for size, functions, and features.

Each bridge crane assembly shall be preassembled and run in the shop, then matchmarked and disassembled for shipment.

1-2.02. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.

1-2.03. Governing Standards. Except as modified or supplemented herein, all work covered by this section shall be performed in accordance with all applicable municipal codes and ordinances, laws, and regulations. In case of a conflict between this section and any state law or local ordinance, the latter shall govern.

All work shall comply with Underwriters' Laboratories (UL) safety requirements.

Equipment furnished under this section shall comply with the applicable requirements of the following:

Occupational Safety and Health Standards of the U.S. Department of Labor; Subpart N, Materials Handling and Storage.

For top running multiple girder electric overhead cranes:

Crane Manufacturers Association of America (CMAA) Specification No. 70, "Specifications for Electric Overhead Traveling Cranes".

For top running and under-running single girder overhead cranes:

Crane Manufacturers Association of America (CMAA) Specification No. 74, "Specification for Top Running & Under Running Single Girder Electric Overhead Traveling Cranes".

For underhung electric or manual cranes:

ANSI MH27.1, "Specifications for Underhung Cranes and Monorail Systems".

ANSI/ASME HST-2M, "Performance Standard for Hand Chain Manually Operated Chain Hoists".

ANSI/ASME HST-4M, "Performance Standard for Overhead Electric Wire Rope Hoists".

1-2.04. Power Supply. Power supply to the equipment shall be 480 volts, 60 Hz, 3 phase. Power supply for controls shall be 120 volts, 60 Hz, single phase unless otherwise indicated or required for a properly operating system.

1-2.05. Labels. Each bridge, trolley, and hoist shall have a conspicuous, easy-to-read label showing manufacturer's name, crane serial number, and rated capacity. The rated capacity of the hoist shall also be shown on the load block.

1-2.06. Metal Thickness. Gages specified herein refer to US Standard gage.

1-3. SUBMITTALS.

1-3.01. Drawings and Data. Complete assembly and installation drawings, wiring and schematic diagrams, together with detailed specifications and data covering materials, parts, devices, and accessories forming a part of the equipment furnished, shall be submitted in accordance with the Submittals section. Device tag numbers indicated on the drawings shall be referenced on the wiring and schematic diagrams where applicable.

Drawings shall include electrical connection diagrams and schematics identifying all items requiring electrical control or power in the operation of the traveling crane assembly, and complete details and information of the power feed system.

1-3.02. Operation and Maintenance Data and Manuals. Adequate operation and maintenance information shall be supplied as required in the Submittals section. Operation and maintenance manuals shall be submitted in accordance with the Submittals section. The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered.

1-4. QUALITY ASSURANCE.

1-4.01. Welding Qualifications. All welding procedures and welding operators shall be qualified by an independent testing laboratory in accordance with the applicable provisions of AWS Standard Qualification Procedures. All procedure and operator qualifications shall be in written form and subject to Engineer's review. Accurate records of operator and procedure qualifications shall be maintained by Contractor and made available to Engineer upon request.

1-4.02. CONTRACTOR's Qualification. Contractor shall submit qualifications to do the work.

1-4.03. Manufacturer's Certification. The equipment manufacturer shall certify that each hoist provided has been load tested in accordance with ANSI/ASME B30.16 with a load of at least 125 percent of the rated load. A certificate shall be submitted for each hoist supplied and shall include the name of the project, the serial number on the hoist, and a description of the test performed. Testing of the equipment shall be the responsibility of the manufacturer and the certification shall be submitted before the equipment will be accepted for the project.

1-5. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the Shipping section. Handling and storage shall be in accordance with the Handling and Storage section.

PART 2 - PRODUCTS

2-1. SERVICE CONDITIONS. Equipment specified herein will be installed in the High Service Pump Building and will be used for the removal/installation of the high service pumps.

All equipment shall be designed to operate under the following service conditions:

Type of environmental exposure.	Indoor
Ambient air temperature range.	20 to 110 °F
Site elevation.	7.0 ft

2-2. PERFORMANCE AND DESIGN REQUIREMENTS. Each traveling bridge crane shall be designed for the specific hoist, trolley, and bridge performance and design requirements as follows:

<u>Traveling Bridge Crane</u>	CRT-1
Use classification	CMAA,ANSI, Class A1

Hoists

Hoist and trolley arrangement	Hoist integral with trolley
Hoisting capacity.	5 tons
Hoist operation.	Electric
Elevation of hook at highest position.	28.33 ft

Elevation of hook at lowest position.	13.00 ft
Hook speed.	15 to 20 fpm

True vertical lift required.	Yes
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Trolleys

Trolley and bridge arrangement.	Underhung trolley
Trolley operation.	Electric
Motor type.	Single speed

Bridges

Bridge operation.	Electric
Motor type.	Single speed

Runway Beams

Size of runway beams.	S12x50
Maximum available clearance beyond centerline of runway beams, each side.	20 in
Maximum available clearance above top of runway beams.	10 in
Elevation of bottom of runway beam.	30.33 ft
Operating floor elevation.	11.00 ft
Center-to-center distance.	26 ft
Approximate length.	48 ft

Controls

Pendant mounting.	Mounted to trolley
Pendant control station height above floor	30 in

2-3. ACCEPTABLE MANUFACTURERS. Acceptable manufacturers for travelling bridge cranes shall be Lift-Tech International, Morris/P&H, R&M Material Handling Inc., or equal.

Equivalent products of manufacturers regularly producing traveling bridge crane systems, shall be subject to acceptance by Engineer.

All modifications necessary to accommodate the travelling bridge cranes shall be subject to acceptance by Engineer and shall be made at no additional cost to Owner.

2-4. HOISTS AND TROLLEYS. The hoist and trolley arrangement shall be Army-type.

2-4.01. Hooks. The hook shall be a slow opening, non-fracturing, forged steel type with a safety latch. The hook shall be mounted on a ball or roller thrust bearing for easy turning.

2-4.01.01. Manual. Not used.

2-4.01.02. Electric. Electric driven hoists shall consist of a single-speed electric motor, a grooved winding drum, and gearing. Antifriction bearings shall be used throughout. The winding drum shall have machined grooves designed to receive the full run of hoisting cable without overwrapping. True Vertical Lift hoists shall be provided where specified herein. The ratio between the diameter of the drum and the diameter of the hoisting cable shall be at least 20 to 1. At least two laps of cable shall remain on the drum when the lifting hook is in the lowest position.

Hoist gearing shall be spur or helical type and shall be fully enclosed in an oil-tight housing. All bearings shall be antifriction type, with oil lubrication or lifetime grease packing.

The hoist shall be provided with mechanical and electrical load brakes arranged so that the load may be raised or lowered by electric power and automatically sustained at any position of the hook when the power is cut off. The mechanical load brake shall prevent acceleration of the load when lowering and shall completely sustain the load when brought to rest, independent of the electric brake. The electric brake shall be released whenever current is flowing to the hoist motor and shall be automatically activated when the current is shut off or interrupted. The mechanical load brake shall operate in oil in a sealed enclosure.

The hoist shall be provided with adjustable limit switches to stop the hoisting mechanism at the upper and lower limits of hook travel.

The lifting tackle shall consist of a lower block and hook, necessary sheaves, and wire rope, made especially for hoisting service. Wire rope shall be as recommended by the rope manufacturer for use on the specified drum. The lower block shall be of the safety type, with guarded sheaves. The sheaves shall have antifriction or sleeve type bearings.

2-4.02. Trolleys. The trolley frame shall be rigid. The trolley and bridge arrangement shall be as specified herein. For underhung type trolleys, the trolley frame shall be provided with lugs or wrap around side plates on both sides of the bridge. Wheels shall be double flange type for top-running trolleys, and single flange type for underhung trolleys. Wheels shall be made from rolled, forged, or cast steel, machined universal crowned or tapered treads. Wheel bearings shall be permanently shielded, lifetime-lubricated, antifriction type, adequate for radial and end thrust loading..

2-4.02.01. Manual. Not used.

2-4.02.02. Electric. Electric trolley drives shall be a sealed worm or spur gear units, permanently lubricated with an oil bath. Drive wheels shall have integrally cut spur gear teeth or machine-cut gears pressed on hubs. Drive wheel treads shall be hardened.

The trolley speed at the rated capacity shall be 40-60 fpm [200-300 mm/s].

2-5. BRIDGES. Each bridge shall be the double girder type, shall be rigidly supported by end trucks, and shall operate on a runway beam type of running surface. The bridge shall be constructed to accommodate the type of trolley specified. When underhung trolleys are specified, the wearing surface of the bridge's lower flanges shall be either specially fabricated flanges or standard flanges ground smooth.

Steel design and fabrication shall comply with applicable portions of the specifications of the American Institute of Steel Construction. Loadings, impact allowances, and allowable stresses shall be in accordance with the governing standards. Deflection of the main girder shall not exceed 1/800 of the span, with the maximum hoist load at any point.

2-5.01. End Trucks. End trucks, each fabricated from structural steel members, shall be designed to distribute the loading equally to each wheel, shall be securely attached to the beam by welding or with fitted bolts in reamed holes, and shall be provided with heavy gusset plates to ensure adequate rigidity and squareness. Each truck shall have heavy end plates to engage the stops located on the specified running surface. End trucks shall have a wheelbase of approximately 1/7 the bridge span. Underhung end trucks shall be provided with lugs or wrap around side plates on both sides of the track.

The end trucks and wheels shall be designed to operate on the specified running surface, and shall clear all fittings, anchors, and splices located on, or near, that surface.

2-5.02. Wheels. Bridge crane wheels shall be made of rolled, forged, or cast steel, with machined universal crowned or tapered hardened treads, designed to

operate on the specified running surface. Drive wheels in each truck shall have integrally cut spur gear teeth, or machine-cut gears pressed on hubs. The other wheels in each truck shall be idlers. Axles may be either rotating or fixed type. Wheel bearings shall be permanently shielded, lifetime-lubricated, antifriction type, adequate for radial and end thrust loading.

For top running bridges, each end truck shall have double flange wheels and one drive wheel. For underhung bridges, each end truck shall have single flange wheels and one pair of drive wheels.

2-5.03. Bridge Drive Mechanism. Gearing for the bridge drive mechanism shall be helical, spur, or herringbone type, made from rolled or cast steel, and shall have machine-cut teeth. All shafts shall be made from alloy steel and shall be heat treated.

2-5.03.01. Manual. Not used.

2-5.03.02. Electric. The bridge drive shall consist of a single speed electric motor for single speed bridge drives, or a specially designed dual speed electric motor for two speed bridge drives, enclosed reduction gearing, and a cross shaft connected to the drive wheel(s) of each end truck. The shaft shall be designed to withstand torsional strain and shall be supported with self-aligning, lifetime-lubricated bearings at intervals sufficient to prevent distortion of the shaft.

The drive motor shall contain a built-in adjustable mechanical brake. The bridge brake shall be solenoid operated, adjustable shoe or disc type, acting directly on the bridge drive motor shaft.

The bridge speed at the rated capacity shall be 50-75 fpm [250-380 mm/s].

2-6. BUMPERS AND STOPS. Bumpers and stops in compliance with the governing standards shall be installed on the bridge, trolley, and the specified running surface. The bumpers and stops shall be located so that no part of the bridge or trolley encroaches on the clearances specified or indicated on the drawings.

## 2-7. ELECTRICAL.

2-7.01. Motors. Motors shall be high-starting torque, squirrel-cage, totally enclosed type, designed especially for crane and hoist service and suitable for operation on the power supply specified. Motor size and speed shall be adequate to start the fully rated load capacity.

2-7.02. Controllers. Control of all electric hoist, trolley, and bridge motions shall all be from a single pendant push-button station. Controllers shall be of the reversing, magnetic contactor type, with thermal overload protection, and shall be

installed at the motor and operated from the pendant station. Bridge and trolley controllers shall be provided with ballast resistance for cushioned starting.

The pendant shall contain a separate push button for each of the following motions: off, on, hoist up and down (when electric hoists are specified), trolley forward and reverse (when electric trolleys are specified), and bridge forward and reverse (when electric bridges are specified). The pendant shall be mounted as specified herein. Push buttons shall be of the interlocking type to prevent possibility of damage to equipment should two or more buttons be pressed simultaneously. Push buttons shall be provided with a spring return to neutral and shall automatically return to the off position when pressure on the button is released. A control power transformer with one secondary lead fused and the other grounded shall be provided to reduce voltage at the push-button station to a maximum of 120 volts. The pendant control cable shall be heavy duty type with extra flexible stranding and neoprene jacket. Support for the pendant station shall be provided by a stainless steel wire rope or chain equipped with a suitable strain relief clamp for the conductor cable.

2-7.03. Power Feed System. When any part of the crane system is electrically operated, a complete electric power feed system shall be provided. The system shall be festooned type. The current and voltage rating of the conductors and collectors shall be not less than 90 amperes continuous duty, 135 amperes intermittent duty.

The festooned system powering the runways shall be installed adjacent to the west face of the east runway in the high service pump building. The festooned systems shall consist of rigid "C" tracks, installed with supports and brackets as required, and the necessary number of four wheel trolleys with saddles and clamps. The cables shall be flat PVC jacketed multi-conductor type, with stranded, flexible conductors. The festooned system shall be installed in conformity with the recommendations and instructions of the manufacturer of the system furnished.

The feeder circuit for the crane assembly will be furnished and installed under the Electrical section, to the location indicated on the drawings. A suitable surface-mounted junction box, with all hanger brackets and other accessories required for a complete installation, shall be furnished and installed under this section at the location indicated, and the feeder circuit wired in.

2-7.04. Wiring. All insulated wire shall be heat resisting and shall be insulated for 600 volts.

## PART 3 - EXECUTION

3-1. ERECTION. Each crane, hoist, and trolley shall be erected by workers who are regularly engaged in crane erecting and who are acceptable to the crane manufacturer. The orientation of installation of the hoist and trolley on each crane bridge shall be as directed by Engineer.

3-2. WIRING. All wiring shall be installed in intermediate metal conduit in accordance with the National Electrical Code.

### 3-3. FIELD QUALITY CONTROL.

3-3.01. Installation Check. An experienced, competent, and authorized representative of the manufacturer shall visit the site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. The representative shall be present when the equipment is placed in operation in accordance with Startup Requirements section, and shall revisit the job site as often as necessary until all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of Engineer.

The manufacturer's representative shall furnish a written report certifying that the equipment has been properly installed and lubricated; is in accurate alignment; is free from any undue stress imposed by connecting piping or anchor bolts; and has been operated under full load conditions and that it operated satisfactorily.

All costs for these services shall be included in the contract price.

3-4. FIELD TESTING. After complete assembly and installation, each crane shall be subject to an acceptance test. A manufacturer's representative shall be present during all testing. The inspection and testing shall verify that each crane has been assembled properly and that all required adjustments have been made.

3-4.01. Acceptance Testing. Each crane shall be subject to operational and rated load testing.

Each crane shall raise, lower, hold in any position, and transport a test load equal to 125 percent of the rated capacity of the crane, with no detrimental effects on the crane. All motions shall be executed satisfactorily. Contractor shall provide the test weights.

The following functions shall be tested:

Hoisting and lowering.

Trolley travel.

Bridge travel.

Limit switches, locking and safety devices.

The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located to trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.

Hoisting and lowering tests will be conducted with 0, 50, 100, and 125 percent of the nominal or rated load.

The rated load test shall consist of the following operations:

The test load shall be lifted a sufficient distance to ensure that the load is supported by the crane and held by the hoist brakes.

The test load shall be transported by means of the trolley for the full length of the bridge.

The test load shall be transported by means of the bridge for the full length of the runway in one direction with the trolley as close to the extreme righthand end of the crane as practical and in the other direction with the trolley as close to the extreme left-hand end of the crane as practical.

The test load shall be lowered, stopped, and held with the brakes.

Wiring shall be given an insulation resistance test using a 500 volt megger.

Following completion of the tests, each crane shall be inspected by Contractor and the manufacturer's representative, in the presence of Engineer, for misalignment, breakage, and undue wear. All deficiencies shall be corrected by Contractor in a manner acceptable to Engineer.

3-4.02. Test Reports. Field inspection and testing of each crane shall be documented by the crane manufacturer's representative through Contractor, noting the deficiencies and corrections and certifying that each crane is acceptable for operation. Certification of the inspection shall be submitted to Engineer.

End of Section