# ADDENDUM NO. 1

**PROJECT NAME:** **City Campus Central Utility Plant North Cooling Tower Replacement Project**
**UNL PROJECT NUMBER:** **C028P241**
**BID INVITATION NUMBER:** **2157-13-7200**

CONSULTANT: Lutz, Daily & Brain, LLC
ADDRESS: 6400 Glenwood, Suite 200 Overland Park, KS 66202

DATE OF ISSUANCE: May 17, 2013
REVISED DATE & TIME OF BID OPENING: May 23, 2013; 1:00PM CDT

The bid documents dated May 6, 2013 for the above referenced project are amended by this addendum.

NOTICE: This Addendum is issued to all interested prospective bidders as an amendment to the project manual or other parts of the bidding (contract) documents for the above named project. Reference to this Addendum must be included in the Bid proposal. The information contained herein shall be fully incorporated into the contract documents as though originally included therein.

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*QUESTIONS AND MODIFICATIONS TO THE PROJECT MANUAL:*

*QUESTIONS AND RESPONSES*

1. Question: What is the maximum flow rate possible with the existing pump head of 28' (ref basin top curb)?

   Response: The maximum possible flow rate is estimated to be over 20% above the specified design circulation rate of 26,000 gpm in the base bid.

2. Question: Are four (4) cells required?

   Response: Yes.

3. Question: Existing motor disconnect switches are rated for up to 250hp while existing installed motors are only 150hp. Please confirm maximum possible installed motor size. This is critical information needed for consideration of both the base and alternate bid preparations.

   Response: Cooling tower fan electrical supply conductor size, starters and possibly other electrical supply system components would need to be replaced to accommodate cooling tower fan motor sizes above 150hp.

4. Question: Can you provide some additional detail on what you are looking for with the following two items:
   2.8.1.1 Internal 12-inch square minimum size.
   2.8.1.2 Exterior/internal 1.25-inch architectural panel 8-inch length (we are providing our standard casing sample per 2.8.2)

   Response: Subparagraphs 2.8.1.1 and 2.8.1.2 will be deleted by this Addendum.

SECTION 42 21 00 QUESTIONS AND RESPONSES:

5. Question: 2.05 A - 20mil before forming fill thickness is very heavy and not necessary for cooling tower applications. 15mil is considered a heavy duty upgrade for the more commonly used 10mil. For cost savings, would the Owner consider 15mil throughout or a combination of 20mil for bottom or top layer only (bottom for overall structural stiffness or top for foot traffic/erosion resistance). Please advise if any alternates (deducts) would be considered.

   Response: Alternative deducts as described above may be considered if references can be provided that have been in service at least 5 years without experiencing any problems.

6. Question: 2.05 D - Can a fill bed with more than two layers be proposed? Standard height packs for most film fills is 2'-0". Typical total fill heights are 5' or 6' requiring three layers. Up to 7' is possible based on known fill performance (which would require four layers).

   Response: Additional layers of fill bed material may increase clogging potential due to the increased number of interfaces which will be considered in the evaluation.

7. Question: 2.06 G - Is 'branch arm' referring to the lateral pipe diameter? "Branch Arms' usually refers to a separate distribution part that attaches to the lateral pipe delivering water to two spray nozzles. Please clarify.

   Response: Paragraph 2.06G on page 7 of 15 of Section 42 21 00 will be deleted as part of this Addendum.

8. Question: 2.07 F - Should drift eliminator support spacing be on a *maximum* 3' centers (not *minimum*) ?

   Response: Yes, this proposed change has been incorporated in this Addendum.

9. Question: 2.14 A - From discussions at the pre-bid meeting it appears some custom louver design will be necessary to meet the Owners objectives. We request an extension of time for sample submittals (after bid) to determine final proposed materials and design.

   Response: This item has been addressed in this Addendum.

10. Question: 2.14 E - Standard cellular louver sample may be furnished for purposes of meeting bid sample requirement only - but final louver design should be done as a collaborative effort between Owner, Engineer, and Midwest Towers. Please advise if this would be an acceptable solution to the current unknown considering the short amount of remaining time to prepare this bid.

    Response: This item has been addressed in this Addendum.

*MODIFICATIONS:*

SECTION 00 01 05-Certifications Page

1. The P.E. Seal, filled in information and signature were filled in under the left column and should have been filled in on the right hand column. These changes will be made when “Conformed Copies of the Contract Documents are made.

SECTION 00 01 10-Table of Contents

1. Figure number callouts shall be revised to agree with the figure numbering in Appendix B as shown below.

   Tower Water (TW) Process & Instrumentation Diagram, Drawing No. 40213-CCUP-TW1-R0
   Figure No. 1 Aerial Site Plan
   Figure No. 2 Partial Site Plan
   Figure No. 3 Existing North Cooling Tower Basin Plan and Sections
   Figure No. 4 Existing North Cooling Tower Sections and Details
   Figure No. 5 North Cooling Tower Replacement Project Operator's Manual

SECTION 00 11 16-Invitation to Bid

1. On page 1 of 2 Paragraph 2.0 change closing date and time for receipt of bids from Tuesday, May 21, 2013, 2:00pm CDT to Thursday, May 23, 2013, 1:00pm CDT.

SECTION 00 21 13-Instructions to Bidders

1. On page 2 of 7 Paragraph 7.0B shall be deleted.

SECTION 00 41 13-Bid Proposal Form

1. Replace with the attached Section 00 41 13-Bid Proposal Form revised to reflect the following modifications:

   A. On page 2 of 2 the 4th Paragraph shall be revised to read as follows:

      The Contractor shall substantially complete their installation work by no later than January 15, 2014 based on a November 15, 2013 start of construction date as noted on pages 1 of 24 and 12 of 24 of the bidder's fill-in data sheets. In any event, the bidder agrees to substantially complete the work not later than _____calendar days from the start of construction date. (Bidder to enter number of days.) Time is of the essence and may be a factor in the award of this Contract.

   B. On page 23 of 24 under Paragraph 2.8 delete subparagraphs 2.8.1.1 and 2.8.1.2.

   C. On page 24 of 24 revise Paragraph 2.8.5 to read as follows:

      Air Intake Louver: 12-inch by 12-inch size including framing type. In the event that additional time is needed to provide custom louver sample, provide descriptive literature complete with photographs of other cooling tower installations and other information to clearly describe the air intake louvers that the bidder is proposing for this UNL North Cooling Tower Replacement.

   D. On page 23 of 24 in Paragraph 3.0 replace the text after the paragraph heading "EXCEPTIONS TO SPECIFICATIONS" and before the underscored lines with the following text:

      Each bidder shall carefully check all requirements herein set forth and shall offer materials and work which fully comply with these requirements or shall plainly set forth all points, features, conditions, specifications, etc., wherein their work does not meet these specifications. Such exceptions as are made shall be listed by specification section, page number and paragraph in the blanks. Exceptions shall be explained in detail in a letter accompanying the bid. General reference shall not be made to the bidder's proposal for exceptions and supplementary terms. Failure to clearly outline such exceptions as described above will require the successful bidder to comply with these specifications.

SECTION 01 10 00-Summary of Work

1. At the bottom of page 2 of 15, add the following to Paragraph 1.2F:

   6. Perimeter fencing around the Contractor's laydown area and staging area on the north side of the existing North Cooling Tower basin as generally shown on Figure No. 2.

      Owner will work with the Contractor on locating an swing out type access gate along either the north or west side of the fenced in area for bringing equipment, materials, vehicles, etc. in and out. Contractor shall be solely responsible for keeping the gate closed and for the security of their equipment, materials and any other items while in storage within this fenced in area.

SECTION 01 50 00-Temporary Facilities and Controls

1. On pages 7 of 9 and 8 of 9 Paragraph 3.4 Items E and F shall be replaced with the following:

   E. Enclosure Fence: Owner will provide an enclosure fence around Contractor's laydown and staging areas as generally shown on Figure No. 2 north of the existing north cooling tower.

   F. Security Enclosure and Lockup: Contractor shall be solely responsible for maintaining security within their area of work by keeping gate closed and locked whenever their workers are not on site and by other means as they deem necessary to prevent unauthorized entrance, vandalism, theft and similar violations of security. Also, this Contractor shall coordinate with Owner's security program to prevent unauthorized access to the UNL City Campus Central Utility Plant site.

SECTION 42 21 00-Replacement North Cooling Tower

1. On page 7 of 15 Paragraph 2.05D replace the words "one interface" with the words "one horizontal interface at a given level".

2. On page 7 of 15 Paragraph 2.05E; delete the words "at a minimum angle of 11 degrees from the vertical."

3. On page 7 of 15 Paragraph 2.06F after the words "large orifice" insert the words "(minimum of 3/4 –inch diameter)". Also, delete the last sentence.

4. On page 8 of 15 Paragraph 2.07F change the word "minimum" in the first line to "maximum".

5. On page 11 of 15 Paragraph 2.14A change the words "8 inches" to "12 inches" in the 1st line.

6. Page 12 of 15 Paragraph 2.15J delete the words "and be mounted on top of the cooling tower basin curb".

END OF ADDENDUM NO. 1

**SECTION 00 41 13 - BID PROPOSAL FORM**

# BID PROPOSAL

**TO:** THE BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA
c/o University of Nebraska-Lincoln
Business Services
Procurement Services Dept.
1700 Y Street
Lincoln, NE 68588-0645

**BID PROPOSAL FOR:** General Contractor

**PROJECT:** C028P241
City Campus Central Utility Plant
North Cooling Tower Replacement Project
Contract Package

**INVITATION NO.:** 2157-13-7200

☐ **COMPLETE THE FOLLOWING INFORMATION – BIDDERS NAME AND TYPE OF BUSINESS**:
This Bid is offered by _____, hereinafter referred to as the Bidder,
☐ a corporation organized and existing under the laws of the State of _____.
☐ a limited liability company organized and existing under the laws of the State of _____.
☐ a partnership doing business as _____.
☐ an individual doing business as _____.

In response to the Bidding Requirements for the construction of the project identified above by name, invitation number, and project number, the Bidder hereby makes the following representations:

Bidder has received the drawings and specifications for the project prepared by **Lutz, Daily & Brain, LLC, Consulting Engineers**.

Bidder has examined the Bidding Documents, visited the site, and otherwise familiarized itself with the local conditions affecting the construction of the project.

☐ **COMPLETE THE FOLLOWING INFORMATION – BASE BID**:
Bidder agrees to furnish all labor, materials, tools, equipment, services, transportation, and supervision required to complete the work indicated in the Bidding Documents within the time set forth herein for the lump sum Base Bid amount of
_____ Dollars ($_____).

☐ **COMPLETE THE FOLLOWING INFORMATION – ALTERNATE PROPOSALS**:
The Base Bid amount given above may be increased or decreased by the acceptance of any of the Alternate Proposals listed below. The full and complete description of the work to be added to or deleted from the scope of the project by each of the Alternate Proposals is that found in Division 01, Section 01 23 00 - Alternates.

ALTERNATE NO. 1 ADD Provide a Counterflow Cooling Tower with a higher water circulation rate than the base bid water circulation rate of 26,000 gpm at the same other design conditions as the base bid.

ADD the sum of _____ Dollars ($_____).

☐ **PROVIDE THE FOLLOWING INFORMATION – BID SECURITY:**
Included with this Proposal is Bid Security of the type and in the amount required by the Bidding Instructions.

**SECTION 00 41 13 - BID PROPOSAL FORM**

☐**COMPLETE THE FOLLOWING INFORMATION – NUMBER OF ADDENDA RECEIVED:**

Bidder has received Addenda Nos. _____, and has included their provisions in this Bid.

☐**COMPLETE THE FOLLOWING INFORMATION – CALENDAR DAYS TO COMPLETE THE WORK**:

The Contractor shall substantially complete their installation work by no later than January 15, 2014 based on a November 15, 2013 start of construction date as noted on pages 1 of 24 and 12 of 24 of the bidder's fill-in data sheets. In any event, the bidder agrees to substantially complete the work not later than _____ calendar days from the start of construction date (Bidder to enter number of days). Time is of the essence and may be a factor in the award of this Contract.

☐**COMPLY WITH THE FOLLOWING INFORMATION:**
In submitting this Bid, Bidder agrees to the following:

1. To hold this Bid open for 60 days following the bid date.
2. To enter into and execute the "University of Nebraska Standard Form Construction Agreement" based upon this Bid, if accepted by Owner.
3. To perform all work required by the Contract Documents.
4. That this Bid has been arrived at without collusion with other Bidders and without any effort or activity which might prevent the University of Nebraska from receiving the lowest possible competitive Bid.
5. To comply with Nebraska Fair Employment Practice Act, understanding that a breach of this provision will be regarded as a material breach of contract.
6. To review and comply with University of Nebraska-Lincoln Standard Terms of Purchase. View at http://www.nebraska.edu/administration/business-and-finance/purchasing/terms-of-purchase.html.
7. To comply with all other applicable policies, procedures and requirements of the Board of Regents of the University of Nebraska with respect to this Bid, the Project, the bid invitation and/or the bidding process.

☐**COMPLETE THE FOLLOWING INFORMATION – SIGNATURE AND CONTACT INFORMATION**:

Address: _____

_____

_____

Tele. No.: _____

Fax. No.: _____

Email Address: _____

Signature: _____

Printed Name: _____

Title: _____

Dated this _____ day of _____, 20

**SECTION 00 41 13 - BID PROPOSAL FORM**

**1.0 BIDDERS SHALL FILL IN THE FOLLOWING DATA AND SUBMIT IT WITH THEIR BASE BID:**

**1.1** **BASE BID**

**APPLICATION**: UNL City Campus Central Utility Plant
North Cooling Tower Replacement

**Name of Bidder** _____

**SCHEDULE**, (Calendar Dates)

Notice to Proceed (NTP) _____

Submit General Arrangement Drawings _____

Submit All Certified Shop Drawings _____

Submit Operations Manuals _____

Mobilize On Site _____

Materials Arrive On Site _____

Begin Tower Preassembly _____

Begin Erecting Tower on Basin _____

Early Start Date (Approximately No Earlier than November 15, 2013) _____

Tower Erection Complete (Approximately No Later Than January 15, 2014) _____

Begin Checkout (Approximately April 1, 2014) _____

Cooling Tower Ready for Operation (No Later than May 5, 2014) _____

Conduct Performance Test (During July-August 2014 Timeframe) _____

TRIMMED

**PERFORMANCE**

DESIGN CONDITIONS

Number of Cells 4

Water Circulation Rate, gpm 26,000

Inlet Water Temperature, °F 101

Outlet Water Temperature, °F 85

Inlet Wet Bulb Temperature, °F 78

Drift Loss, % of total water circulated _____

**BASE BID, Continued:**

| | | |
|---|---|---|
| **Name of Bidder** | | _____ |
| Will new replacement North Cooling Tower operate in a satisfactory manner with either or both the existing West Cooling Tower and the East Cooling Tower out of service or in service (Yes/No) | T | _____ |
| **GENERAL** | R | |
| Manufacturer of cooling tower | I | _____ |
| Type of cooling tower | M | Counterflow |
| Style or model number | | _____ |
| Number of tower sections | L | _____ |
| **MATERIALS** | I | |
| Type & grade structural members | N | _____ |
| Column anchor clips | E | _____ |
| Column Baseplates | | _____ |
| Column anchor bolts | | _____ |
| Type & grade of fill | | _____ |
| Fill supports | | _____ |
| Drift eliminators | | _____ |
| Eliminator spacers | | _____ |
| Fan stacks | | _____ |
| Louvers | | _____ |
| Fan Deck | | _____ |

**BASE BID, Continued:**

| **Name of Bidder** | | _____ |
|---|---|---|
| Headers | T | _____ |
| Spray orifices | R | _____ |
| Structural connectors | I | _____ |
| Stairway & handrails | M | _____ |
| Caged ladder | | _____ |
| Bolts & nuts | | _____ |
| Washers | L | _____ |
| Baseplates | I | _____ |
| Fan hub hardware | N | _____ |
| Fan blade material | E | _____ |
| Hub material | | _____ |
| Fan cylinder joints | | _____ |
| Drive shaft bolting | | _____ |
| Fan cylinder spider & assembly | | _____ |
| Manifold pipe bends | | _____ |
| Mechanical equipment support | | _____ |

**DESIGN & OPERATING PARAMETERS AT SITE CONDITIONS**

| | |
|---|---|
| Tower water losses: | |
| Evaporation at rated tower conditions, % | _____ |
| Drift loss at rated tower conditions, % | _____ |
| Total loss at rated tower conditions, % | _____ |
| Water to air ratio (lb/lb) | _____ |

**BASE BID, Continued:**

**Name of Bidder** _____

Air flow rate through tower, lb per hr (high speed) T _____

Air velocities, fpm average: R
- Through inlet louvers _____
- I
- Fill _____
- M
- Drift eliminators _____
- Fan ring _____

**EXISTING COOLING TOWER BASIN**

Are modifications required? (Yes/No) _____

If yes, please describe _____

L

(Descriptive drawings are to be _____

I

Provided with proposal.) _____

N

**WATER DISTRIBUTION SYSTEM**

E

Water concentration, gpm per sq ft _____

Number of inlet/distribution headers _____

Size of inlet headers, inches _____

Size of distribution headers, inches _____

Description of connection & protective coating provided _____

Type of spray devices _____

Total pumping head at top of basin curb at rated conditions, ft (To match West Cooling Tower) _____

Recommended distance between normal water level in basin and top of basin curb, ft _____

Total friction loss in distribution piping furnished with tower, ft. (Contractor to list loss for type of pipe offered.) _____

**BASE BID, Continued:**

**Name of Bidder** _____

**FANS**

| | | |
|---|---|---|
| Number | T | _____ |
| Type or model | R | _____ |
| Manufacturer | I | _____ |
| Diameter, ft | M | _____ |
| Number of blades/fan | | _____ |
| Maximum fan speed, rpm | L | |
| Forward: | I | _____ |
| Reverse: | N | _____ |
| Minimum fan speed, rpm | E | |
| Forward: | | _____ |
| Reverse: | | _____ |
| Critical fan speed range, rpm | | _____ |
| Maximum tip speed, fpm | | _____ |
| Fan weight, hub and blades, lbs | | _____ |
| BHP/fan-driver output | | _____ |
| Fan static efficiency, % | | _____ |
| Fan tip clearance from stack wall, in. | | _____ |

Fan Performance, each fan at design conditions:

| | |
|---|---|
| Power, hp | _____ |
| Air flow at fan inlet, cfm | _____ |
| Air flow, lb/hr | _____ |
| Air density at fan, lb/cu ft | _____ |
| Air/vapor temp. at fan inlet, ºF | _____ |
| Total dynamic fan pressure, in. $H_2O$ | _____ |

**BASE BID, Continued:**

**Name of Bidder** _____

**FANS, Continued**

Static pressure, in. $H_2O$

| | | |
|---|---|---|
| Inlet louvers | T | _____ |
| Fill | R | _____ |
| Drift eliminators | I | _____ |
| Fan ring | M | _____ |
| Total | | _____ |
| Fan discharge velocity head, in. $H_2O$ | L | _____ |
| Fan efficiency, % | I | _____ |
| Air vapor mixture flow through fan stack, lbs/hr | N | _____ |
| Mixture temperature at fan inlet, ºF | E | _____ |
| Mixture pressure at fan inlet, in. $H_2O$ | | _____ |

Fan Noise

| | |
|---|---|
| Noise level, dBA | _____ |

**GEARBOXES (SPEED REDUCERS)**

| | |
|---|---|
| Manufacturer | _____ |
| Model | _____ |

Minimum operational speed, rpm

| | |
|---|---|
| Forward: | _____ |
| Reverse: | _____ |

Maximum operational speed, rpm

| | |
|---|---|
| Forward: | _____ |
| Reverse: | _____ |
| Input shaft material | _____ |
| Output shaft material | _____ |
| Description of internal components & materials used | _____ |

**BASE BID, Continued:**

**Name of Bidder** _____

**FAN MOTORS**

Manufacturer _____

Motor model _____

Size of motor, hp _____

Volts _____

Phases _____

Rated frequency, Hz _____

Motor output, at rated tower conditions and maximum fan speed, Bhp _____

Motors suitable for Use of VFD's (Yes/No) _____

Motor efficiency (input-output) at rated tower conditions, % _____

Guaranteed total input to the total of all motors at rated tower conditions, kw _____

Bearing type _____

Maximum motor continuous speed, rpm

Forward: _____

Reverse: _____

Minimum motor continuous speed, rpm

Forward: _____

Reverse: _____

Frame number _____

Enclosure type _____

NEMA code letter _____

NEMA design letter _____

Class of insulation _____

TRIM LINE

**BASE BID, Continued:**

**Name of Bidder** _____

**FAN MOTORS, Continued**

Temperature rise, ºC at site design service conditions _____

Service factor _____

Efficiency, %

Full load _____

75% load _____

50% load _____

Fan acceleration time, seconds

Maximum speed _____

Motor locked rotor current, amperes _____

Space heater power requirements volts/watts _____

Load capability $WH^2$, pounds/$ft^2$ _____

Successive starting limitations/day for max. $WH^2$ _____

Weight, lbs _____

Is special reduced voltage, speed and/or torque control required? _____

Vibration cutout switches:

Manufacturer _____

Model number _____

Enclosure _____

Contactor _____

Low oil level switch _____

**ELECTRICAL EQUIPMENT**

Cooling tower vibration switches:

Manufacturer _____

Model number _____

**BASE BID, Continued:**

**Name of Bidder** _____

**DIMENSIONS**

Overall size: Width, ft _____

Length, ft _____

Height, basin curb to fan deck, ft _____

Height, fan deck to top of fan stack, ft

Plenum height (top of eliminators to bottom of fan deck), ft & in. _____

Air inlet opening height (top of water to bottom of fill pack), ft & in. _____

Dimension from bottom of spray nozzle to top of fill, ft & in. _____

Nominal overall cell dimensions, L x W, ft _____

Total lineal feet of structural support columns in tower, ft _____

Width of louvers, in. _____

Spacing of louvers, in. _____

Spacing of louver supports:

Horizontal, ft & in. _____

Vertical, ft & in. _____

Louvered area, total $ft^2$ _____

Net inlet area, $ft^2$ _____

Thickness of louvers, mils _____

Column size, in. _____

Column spacing:

Horizontal, ft _____

Vertical, ft _____

Column load (max. lb) _____

Fill support members size, in. _____

Horizontal spacing of fill support members, ft _____

Vertical spacing of fill hangers, ft & in. _____

TRIMLINE

**BASE BID, Continued:**

**Name of Bidder** _____

**DIMENSIONS, Continued**

| | | |
|---|---|---|
| Fan deck: Thickness of deck, in. | | _____ |
| Safe loading, lb/ $ft^2$ | | _____ |
| Thickness of transverse partitions, in. | | _____ |
| Thickness of longitudinal partitions, in. | | _____ |
| Dimensions of fill, in. | | _____ |
| Projected fill plan area, $ft^2$ | T | _____ |
| Effective splash surface area, $ft^2$, fill only | R | _____ |
| Effective cooling volume, $ft^3$ | I | _____ |
| Total fill volume, $ft^3$ | M | _____ |
| Fill height, ft & No. of Interfaces | | _____ |
| Fill Sheet thickness before forming, mil | L | _____ |
| Total wetted surface area including fitting, $ft^2$ | I | _____ |
| Total number of fill units/cell | N | _____ |
| Drift eliminators: Total area, $ft^2$ | E | _____ |
| Number of passes | | _____ |
| Orientation of drift eliminators from vertical: | | |
| $1^{st}$ pass, degrees | | _____ |
| $2^{nd}$ pass, degrees | | _____ |

**WATER DISTRIBUTION BASIN**

| | |
|---|---|
| Height, basin curb to centerline of water distribution header, ft & in. | _____ |
| Fan stack height, ft & in. | _____ |
| Overall tower height, ft & in. | _____ |
| Inside basin dimensions, ft & in. | _____ |
| Height of inlets (above basin curb), ft & in. | _____ |
| Width, in. | _____ |

**BASE BID, Continued:**

**Name of Bidder** _____

STAIRWAY

| | | |
|---|---|---|
| Slope, degree | T | _____ |
| Rise, in. | R | _____ |
| Run, in. | I | _____ |
| Provisions for Avoiding Stair Accumulation of Snow and ice on stair treads and landings | M | _____ |

**WEIGHTS**

| | | |
|---|---|---|
| Overall weight of complete tower: Dry, lb | L | _____ |
| Operating, lb | I | _____ |
| Component weights of new materials, parts and equipment provided by this Contractor, lbs. | N | |
| Structural framing | E | _____ |
| Fill | | _____ |
| Primary distribution system | | _____ |
| Drift eliminators | | _____ |
| Fan deck | | _____ |
| Fans and cylinders | | _____ |
| Fan drives | | _____ |
| Fan supports | | _____ |
| Casing | | _____ |
| Inlet louvers | | _____ |
| Stairways | | _____ |

**RECOMMENDED SPARE PARTS LIST**

_____

_____

_____

_____

**1.2** **ALTERNATE NO. 1**

**APPLICATION**: UNL City Campus Central Utility Plant
North Cooling Tower Replacement

**Name of Bidder** _____

**SCHEDULE**, (Calendar Dates)

| | | |
|---|---|---|
| Notice to Proceed (NTP) | | _____ |
| Submit General Arrangement Drawings | T | _____ |
| Submit All Certified Shop Drawings | R | _____ |
| Submit Operations Manuals | I | _____ |
| Mobilize On Site | M | _____ |
| Materials Arrive On Site | L | _____ |
| Begin Tower Preassembly | I | _____ |
| Begin Erecting Tower on Basin | N | _____ |
| Early Start Date (Approximately No Earlier than November 15, 2013) | E | _____ |
| Tower Erection Complete (Approximately No Later Than January 15, 2014) | | _____ |
| Begin Checkout (Approximately April 1, 2014) | | _____ |
| Cooling Tower Ready for Operation (No Later than May 5, 2014) | | _____ |
| Conduct Performance Test (During July-August 2014 Timeframe) | | _____ |

**PERFORMANCE**

DESIGN CONDITIONS

| | |
|---|---|
| Number of Cells | 4 |
| Water Circulation Rate, gpm | _____ |
| Inlet Water Temperature, °F | 101 |
| Outlet Water Temperature, °F | 85 |
| Inlet Wet Bulb Temperature, °F | 78 |
| Drift Loss, % of total water circulated | _____ |

**ALTERNATE NO. 1, Continued:**

| | | |
|---|---|---|
| **Name of Bidder** | | _____ |
| Will new replacement North Cooling Tower operate in a satisfactory manner with either or both the existing West Cooling Tower and the East Cooling Tower out of service or in service (Yes/No) | T | _____ |
| **GENERAL** | R | |
| Manufacturer of cooling tower | I | _____ |
| Type of cooling tower | M | Counterflow |
| Style or model number | | _____ |
| Number of tower sections | L | _____ |
| **MATERIALS** | I | |
| Type & grade structural members | N | _____ |
| Column anchor clips | E | _____ |
| Column Baseplates | | _____ |
| Column anchor bolts | | _____ |
| Type & grade of fill | | _____ |
| Fill supports | | _____ |
| Drift eliminators | | _____ |
| Eliminator spacers | | _____ |
| Fan stacks | | _____ |
| Louvers | | _____ |
| Fan Deck | | _____ |

**ALTERNATE NO. 1, Continued:**

| **Name of Bidder** | | _____ |
|---|---|---|
| Headers | T | _____ |
| Spray orifices | R | _____ |
| Structural connectors | I | _____ |
| Stairway & handrails | M | _____ |
| Caged ladder | | _____ |
| Bolts & nuts | | _____ |
| Washers | L | _____ |
| Baseplates | I | _____ |
| Fan hub hardware | N | _____ |
| Fan blade material | E | _____ |
| Hub material | | _____ |
| Fan cylinder joints | | _____ |
| Drive shaft bolting | | _____ |
| Fan cylinder spider & assembly | | _____ |
| Manifold pipe bends | | _____ |
| Mechanical equipment support | | _____ |

**DESIGN & OPERATING PARAMETERS AT SITE CONDITIONS**

| | |
|---|---|
| Tower water losses: | |
| Evaporation at rated tower conditions, % | _____ |
| Drift loss at rated tower conditions, % | _____ |
| Total loss at rated tower conditions, % | _____ |
| Water to air ratio (lb/lb) | _____ |

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

Air flow rate through tower, lb per hr (high speed) _____

Air velocities, fpm average:

Through inlet louvers _____

Fill _____

Drift eliminators _____

Fan ring _____

**EXISTING COOLING TOWER BASIN**

Are modifications required? (Yes/No) _____

If yes, please describe _____

(Descriptive drawings are to be _____

Provided with proposal.) _____

**WATER DISTRIBUTION SYSTEM**

Water concentration, gpm per sq ft _____

Number of inlet/distribution headers _____

Size of inlet headers, inches _____

Size of distribution headers, inches _____

Description of connection & protective coating provided _____

Type of spray devices _____

Total pumping head at top of basin curb at rated conditions, ft (To match West Cooling Tower) _____

Recommended distance between normal water level in basin and top of basin curb, ft _____

Total friction loss in distribution piping furnished with tower, ft. (Contractor to list loss for type of pipe offered.) _____

TRIM LINE

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**FANS**

| | | |
|---|---|---|
| Number | T | _____ |
| Type or model | R | _____ |
| Manufacturer | I | _____ |
| Diameter, ft | M | _____ |
| Number of blades/fan | | _____ |
| Maximum fan speed, rpm | L | |
| Forward: | I | _____ |
| Reverse: | N | _____ |
| Minimum fan speed, rpm | E | |
| Forward: | | _____ |
| Reverse: | | _____ |
| Critical fan speed range, rpm | | _____ |
| Maximum tip speed, fpm | | _____ |
| Fan weight, hub and blades, lbs | | _____ |
| BHP/fan-driver output | | _____ |
| Fan static efficiency, % | | _____ |
| Fan tip clearance from stack wall, in. | | _____ |

Fan Performance, each fan at design conditions:

| | |
|---|---|
| Power, hp | _____ |
| Air flow at fan inlet, cfm | _____ |
| Air flow, lb/hr | _____ |
| Air density at fan, lb/cu ft | _____ |
| Air/vapor temp. at fan inlet, ºF | _____ |
| Total dynamic fan pressure, in. $H_2O$ | _____ |

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**FANS, Continued**

Static pressure, in. $H_2O$

| | | |
|---|---|---|
| Inlet louvers | T | _____ |
| Fill | R | _____ |
| Drift eliminators | I | _____ |
| Fan ring | M | _____ |
| Total | | _____ |
| Fan discharge velocity head, in. $H_2O$ | L | _____ |
| Fan efficiency, % | I | _____ |
| Air vapor mixture flow through fan stack, lbs/hr | N | _____ |
| Mixture temperature at fan inlet, ºF | E | _____ |
| Mixture pressure at fan inlet, in. $H_2O$ | | _____ |

Fan Noise

| | |
|---|---|
| Noise level, dBA | _____ |

**GEARBOXES (SPEED REDUCERS)**

| | |
|---|---|
| Manufacturer | _____ |
| Model | _____ |

Minimum operational speed, rpm

| | |
|---|---|
| Forward: | _____ |
| Reverse: | _____ |

Maximum operational speed, rpm

| | |
|---|---|
| Forward: | _____ |
| Reverse: | _____ |
| Input shaft material | _____ |
| Output shaft material | _____ |
| Description of internal components & materials used | _____ |

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**FAN MOTORS**

Manufacturer _____

Motor model _____

Size of motor, hp _____

Volts _____

Phases _____

Rated frequency, Hz _____

Motor output, at rated tower conditions and maximum fan speed, Bhp _____

Motors suitable for Use of VFD's (Yes/No) _____

Motor efficiency (input-output) at rated tower conditions, % _____

Guaranteed total input to the total of all motors at rated tower conditions, kw _____

Bearing type _____

Maximum motor continuous speed, rpm

Forward: _____

Reverse: _____

Minimum motor continuous speed, rpm

Forward: _____

Reverse: _____

Frame number _____

Enclosure type _____

NEMA code letter _____

NEMA design letter _____

Class of insulation _____

TRIMMED LISTING

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**FAN MOTORS, Continued**

Temperature rise, ºC at site design service conditions _____

Service factor _____

Efficiency, %

Full load _____

75% load _____

50% load _____

Fan acceleration time, seconds

Maximum speed _____

Motor locked rotor current, amperes _____

Space heater power requirements volts/watts _____

Load capability $WH^2$, pounds/$ft^2$ _____

Successive starting limitations/day for max. $WH^2$ _____

Weight, lbs _____

Is special reduced voltage, speed and/or torque control required? _____

Vibration cutout switches:

Manufacturer _____

Model number _____

Enclosure _____

Contactor _____

Low oil level switch _____

**ELECTRICAL EQUIPMENT**

Cooling tower vibration switches:

Manufacturer _____

Model number _____

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**DIMENSIONS**

Overall size: Width, ft _____

Length, ft _____

Height, basin curb to fan deck, ft _____

Height, fan deck to top of fan stack, ft

Plenum height (top of eliminators to bottom of fan deck), ft & in. _____

Air inlet opening height (top of water to bottom of fill pack), ft & in. _____

Dimension from bottom of spray nozzle to top of fill, ft & in. _____

Nominal overall cell dimensions, L x W, ft _____

Total lineal feet of structural support columns in tower, ft _____

Width of louvers, in. _____

Spacing of louvers, in. _____

Spacing of louver supports:

Horizontal, ft & in. _____

Vertical, ft & in. _____

Louvered area, total $ft^2$ _____

Net inlet area, $ft^2$ _____

Thickness of louvers, mils _____

Column size, in. _____

Column spacing:

Horizontal, ft _____

Vertical, ft _____

Column load (max. lb) _____

Fill support members size, in. _____

Horizontal spacing of fill support members, ft _____

Vertical spacing of fill hangers, ft & in. _____

TRIMLINE

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

**DIMENSIONS, Continued**

| | | |
|---|---|---|
| Fan deck: Thickness of deck, in. | | _____ |
| Safe loading, lb/ $ft^2$ | | _____ |
| Thickness of transverse partitions, in. | | _____ |
| Thickness of longitudinal partitions, in. | | _____ |
| Dimensions of fill, in. | | _____ |
| Projected fill plan area, $ft^2$ | T | _____ |
| Effective splash surface area, $ft^2$, fill only | R | _____ |
| Effective cooling volume, $ft^3$ | I | _____ |
| Total fill volume, $ft^3$ | M | _____ |
| Fill height, ft & No. of Interfaces | | _____ |
| Fill Sheet thickness before forming, mil | L | _____ |
| Total wetted surface area including fitting, $ft^2$ | I | _____ |
| Total number of fill units/cell | N | _____ |
| Drift eliminators: Total area, $ft^2$ | E | _____ |
| Number of passes | | _____ |
| Orientation of drift eliminators from vertical: | | |
| $1^{st}$ pass, degrees | | _____ |
| $2^{nd}$ pass, degrees | | _____ |

**WATER DISTRIBUTION BASIN**

| | |
|---|---|
| Height, basin curb to centerline of water distribution header, ft & in. | _____ |
| Fan stack height, ft & in. | _____ |
| Overall tower height, ft & in. | _____ |
| Inside basin dimensions, ft & in. | _____ |
| Height of inlets (above basin curb), ft & in. | _____ |
| Width, in. | _____ |

**ALTERNATE NO. 1, Continued:**

**Name of Bidder** _____

STAIRWAY

| | | |
|---|---|---|
| Slope, degree | T | _____ |
| Rise, in. | R | _____ |
| Run, in. | I | _____ |
| Provisions for Avoiding Stair Accumulation of Snow and ice on stair treads and landings | M | _____ |

**WEIGHTS**

| | | |
|---|---|---|
| Overall weight of complete tower: Dry, lb | L | _____ |
| Operating, lb | I | _____ |
| Component weights of new materials, parts and equipment provided by this Contractor, lbs. | N | |
| Structural framing | E | _____ |
| Fill | | _____ |
| Primary distribution system | | _____ |
| Drift eliminators | | _____ |
| Fan deck | | _____ |
| Fans and cylinders | | _____ |
| Fan drives | | _____ |
| Fan supports | | _____ |
| Casing | | _____ |
| Inlet louvers | | _____ |
| Stairways | | _____ |

**RECOMMENDED SPARE PARTS LIST**

_____

_____

_____

_____

## 2.0 BIDDERS SHALL SUBMIT WITH THEIR BID THE FOLLOWING:

2.1 Furnish outline drawings including plan & sectional elevation views of the proposed cooling tower showing principal dimensions.

2.2 Furnish drawing(s) showing the details of the louver construction, if inlet louvers are required.

2.3 Furnish outline drawing of the fan motors showing principal dimensions.

2.4 Description of stair tower construction & configuration.

2.5 List of similar cooling towers of equal or greater capacity that the bidder has designed, manufactured, erected and placed in successful operation over the past ten years complete with owner contact information.

2.6 Furnish product information sheets.

2.7 Furnish separately filled in data sheets.

2.8 Furnish samples for the following:

2.8.1 Spray nozzle; one(1) each type.

2.8.2 Casing material

2.8.3 Fill material; 12-inch cube minimum size.

2.8.4 Drift Eliminator; 12-inch size.

2.8.5 Air Intake Louver; 12-inch by 12-inch size including framing type. In the event that additional time is needed to provide custom louver sample, provide descriptive literature complete with photographs of other cooling tower installations and other information to clearly describe the air intake louvers that the bidder is proposing for this UNL North Cooling Tower Replacement.

2.9 If a bidder proposes to modify the existing north cooling tower basin, the bidder shall provide a written description of how they propose these modifications are to be made by the Owner complete with descriptive drawing.

2.10 Itemized list of exceptions to specifications as further described in Paragraph 3.0 below.

**3.0 EXCEPTIONS TO SPECIFICATIONS** Each bidder shall carefully check all requirements herein set forth and shall offer materials and work which fully comply with these requirements or shall plainly set forth all points, features, conditions, specifications, etc., wherein their work does not meet these specifications. Such exceptions as are made shall be listed by specification section, page number and paragraph in the blanks below. Exceptions shall be explained in detail in a letter accompanying the bid. General reference shall not be made to the bidder's proposal for exceptions and supplementary terms. Failure to clearly outline such exceptions as described above will require the successful bidder to comply with these specifications.

_____

_____

_____

_____

**4.0 TIME PROGRESS SCHEDULE:** The Bidder is requested to furnish a "Time Progress Schedule" showing the starting and completion dates for all principal trades and subdivisions of the Work.

**5.0 SCHEDULE OF VALUES:** The Bidder is requested to submit as part of their proposal a complete, itemized and detailed "Schedule of Values" including Alternates elected, if any, showing the amount allocated to the various trades and subdivisions of the work, aggregating the Total Price.

The undersigned has included in each part of his proposal the following values for the trades and/or subdivisions of the work as listed below.

Address: Signature:

Printed Name:

Tele. No.: Title:

Fax. No.: Dated this day of , 20

Email Address: