

# **ADDENDUM NO. 4**

**May 19, 2021**

**BIDDING AND CONTRACT DOCUMENTS**

**FOR**

**SKYE HALL HVAC REPLACEMENT**

**PROJECT NO. 950583**

**CONTRACT NO. 950583-LF-2020-100**



The following changes, additions, or deletions shall be made to the following documents as indicated for this Project; and all other terms and conditions shall remain the same. Each bidder is responsible for transmitting this information to all affected subcontractors and suppliers before the Bid Deadline.

1. **ADVERTISEMENT FOR BIDS FROM PREQUALIFIED CONTRACTORS**

**Remove** the Advertisement for Bids from Prequalified Contractors and **replace** it with the one issued in this Addendum.

2. **BID FORM**

**Remove** the Bid Form and **replace** it with the one issued in this Addendum.

3. **AGREEMENT**

**Remove** the Agreement and **Replace** it with the one issued in this Addendum.

4. **SPECIFICATION**

**Remove** and **replace** Division 1 Specification Table of Contents and replace with the one issued in this Addendum.

**Remove** and **replace** Division 2 + Specification Table of Contents and Replace with the one issued in this Addendum.

**Add** Specification section 01 2300, Alternates.

**Remove** and **replace** Specification section 23 0548, Vibration and Seismic Controls For HVAC.

**END OF ADDENDUM**

## ADVERTISEMENT FOR BIDS FROM PREQUALIFIED CONTRACTORS

Subject to conditions prescribed by the University of California, Riverside, sealed bids for a lump sum contract are invited from prequalified contractors for the following Project:

**SKYE HALL HVAC REPLACEMENT**  
PROJECT NO. 950583  
CONTRACT NO. 950583-LF-2020-100  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
RIVERSIDE, CALIFORNIA

Replacement of seventeen (17) existing roof-mounted RTUs, replacement of ten (10) existing 10 VVT boxes with replacement of actuators on eighty-seven (87) existing VVT boxes, upgrade of existing controls to ALC [Automated Logic Controls] standard, new thermostats throughout the building.

### PREQUALIFIED CONTRACTORS

Only prequalified contractors will be allowed to submit a Bid on this Project. The University has determined that the following contractors have been prequalified to bid on this Project for the Bid Packages and license classifications below:

**Los Angeles Air Conditioning, Inc.**  
**Arrowhead Mechanical, Inc.**  
**RAN Enterprises, Inc.**

The successful Bidder must have the following State of California Contractor's license current and active at the time of submission of the Bid: **C20 – Warm-Air Heating, Ventilating and Air Conditioning Contractor.**

The successful Bidder for each Bid Package must have the specified State of California Contractor's license current and active at the time of submission of the Bid.

**Bidding and Contract Documents** will be made available at **2:00 PM**, on **Tuesday, April 13<sup>th</sup>, 2021** upon request by sending an email to [kara.longtin@ucr.edu](mailto:kara.longtin@ucr.edu). Interested parties must use the following in the subject header:

***950583 Skye Hall HVAC Replacement – Request for Bid Documents***

### PRE-BID CONFERENCE & SITE VISIT

A mandatory Pre-Bid Zoom conference call will take place on **Friday, April 23, 2021** beginning promptly at **2:00 PM**. Only bidders who participate in the Pre-Bid conference will be allowed to bid on the Project as prime contractors. For further information, including the Zoom Meeting ID, interested bidders must contact the Project's Contract Administrator, Kara Longtin via email, at [kara.longtin@ucr.edu](mailto:kara.longtin@ucr.edu) and must use the project's number and name in the subject header to request the Zoom information.

At this time, there are no plans for a site visit, if a bidder would like access to the site, this will be done by appointment only and through the coordination of the Contract Administrator noted above. Do not contact the project manager directly.

**Any bidder who joins the Pre-Bid Conference after 2:05 PM will be precluded from bidding as a prime contractor and may only bid as a subcontractor. Subcontractors are not required to attend; however we encourage their attendance.**

### BID DEADLINE

Bids must be received at or before ~~Thursday, June 3<sup>rd</sup>, 2021~~ **Thursday, May 27, 2021** at **2:00 PM** for furnishing all labor, materials, services, and equipment to complete the Work described below in accordance with the enclosed Bidding Documents. Due to COVID-19 restrictions, all bids will be received electronically only at the email address above; the low bidder must produce the original bid, bid bond, notary acknowledgement and surety notice within 24 hours of making an announcement of who the low bidder is.

Bids are to be submitted to The Regents of the University of California ("University") **via email only** at:

Email: [kara.longtin@ucr.edu](mailto:kara.longtin@ucr.edu)

Immediately following the Bid Deadline, bids will be opened and posted on the University's website. Bids will be made available to be reviewed by bidders shortly after bids have been validated. Efforts will be made to accommodate and observe all typical procedures during COVID-19 restrictions

Bid Security in the amount of 10% of the Lump Sum Base Bid shall accompany each Bid. The Surety issuing the Bid Bond shall be, on the Bid Deadline, an admitted surety insurer (as defined in California Code of Civil Procedure Section 995.120).

Every effort will be made to ensure that all persons have equal access to contracts and other business opportunities with the University within the limits imposed by law or University policy. Each Bidder may be required to show evidence of its equal employment opportunity policy. The successful Bidder and its subcontractors will be required to follow the nondiscrimination requirements set forth in the Bidding Documents and to pay prevailing wage at the location of the work.

The work described in the contract is a public work subject to section 1771 of the California Labor Code.

No contractor or subcontractor may be listed on a Bid for this project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded any portion of this project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

Estimated construction cost: **\$1,030,000.00**

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA  
University of California, Riverside  
04/07/2021 – 04/22/2021

**BID FORM**

FOR: SKYE HALL HVAC REPLACEMENT  
PROJECT NUMBER: 950583  
CONTRACT NUMBER: 950583-LF-2020-100  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
RIVERSIDE, CALIFORNIA

**May 19, 2021** ~~April 13, 2021~~

BID TO:

Planning, Design & Construction  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
1223 University Avenue, Suite 240  
Riverside, CA 92521

(951) 827-2610

BID FROM:

\_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_  
(Contact Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(City, State, Zip Code)

\_\_\_\_\_  
(Telephone Number)

\_\_\_\_\_  
(Facsimile Number)

\_\_\_\_\_  
(E-mail)

\_\_\_\_\_  
(Date Bid Submitted)

Note: All portions of this Bid Form must be completed and the Bid Form must be signed before the Bid is submitted. Failure to do so will result in the Bid being rejected as non-responsive.

**BIDDER'S NAME:** \_\_\_\_\_

**1.0 BIDDER'S REPRESENTATIONS**

Bidder, represents that a) Bidder and all Subcontractors, regardless of tier, has the appropriate current and active Contractor's licenses required by the State of California and the Bidding Documents; b) it has carefully read and examined the Bidding Documents for the proposed Work on this Project; c) it has examined the site of the proposed Work and all Information Available to Bidders; d) it has become familiar with all the conditions related to the proposed Work, including the availability of labor, materials, and equipment; e) Bidder and all Subcontractors, regardless of tier, are currently registered with the California Department of Industrial Relations pursuant to California Labor Code Section 1725.5 and 1771.1. Bidder hereby offers to furnish all labor, materials, equipment, tools, transportation, and services necessary to complete the proposed Work on this Project in accordance with the Contract Documents for the sums quoted. Bidder further agrees that it will not withdraw its Bid within **{60}** days after the Bid Deadline, and that, if it is selected as the apparent lowest responsive and responsible Bidder, that it will, within 10 days after receipt of notice of selection, sign and deliver to University the Agreement in triplicate and furnish to University all items required by the Bidding Documents. If awarded the Contract, Bidder agrees to complete the proposed Work within **105** days after the date of commencement specified in the Notice to Proceed.

**2.0 ADDENDA**

Bidder acknowledges that it is Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda from University's Facility at the appropriate address stated on Page 1 of this Bid Form. Bidder therefore agrees to be bound by all Addenda that have been issued for this Bid.

**3.0 NOT USED**

**4.0 LUMP SUM BASE BID**

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(Place figures in appropriate boxes.)

**5.0 SELECTION OF APPARENT LOW BIDDER**

Refer to the Instructions to Bidders for selection of apparent low bidder.

**6.0 UNIT PRICES - NOT USED**

**BIDDER'S NAME:** \_\_\_\_\_

**7.0 DAILY RATE OF COMPENSATION FOR COMPENSABLE DELAYS**

Bidder shall determine and provide below the daily rate of compensation for any Compensable Delay caused by University at any time during the performance of the Work. A Facility may choose a minimum compensable delay in the best interests of the Project. If so, use the language in parentheses { } and in grey highlight:

\$ 

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 X 20 multiplier

(Place figures in appropriate boxes.)

Failure to fill in a dollar figure for the daily rate for Compensable Delay shall render the bid non-responsive. University will perform the extension of the daily rate times the multiplier.

The daily rate shown above will be the total amount of Contractor entitlement for each day of Compensable Delay caused by University at any time during the performance of the Work and shall constitute payment in full for all delay costs, direct or indirect (including, without limitation, compensation for all extended home office overhead and extended general conditions), of the Contractor and all subcontractors, suppliers, persons, and entities under or claiming through Contractor on the Project. The number of days of Compensable Delay shown as a "multiplier" above is not intended as an estimate of the number of days of Compensable Delay anticipated by the University. The University will pay the daily rate of compensation only for the actual number of days of Compensable Delay, as defined in the General Conditions; the actual number of days of Compensable Delay may be greater or lesser than the "multiplier" shown above.

**BIDDER'S NAME:** \_\_\_\_\_

8.0 ALTERNATES- NOT USED

**In order for a Bid to be responsive, Bidder must submit an additive bid, a deductive bid, or a "no change" bid, for each Alternate listed below. The failure to do so shall result in the Bid being rejected as non-responsive. The failure to quote an amount, unless the bidder marks the "no change" box, will result in the bid being rejected as non-responsive.**

**The Contract Time will change by the number of days, if any, specified for each accepted Alternate.**

**Alternate No. 1**

**Deduct, Steel Vibration Equipment bases. Furnish and install steel vibration isolation equipment bases for all units except RTU's #15 & #16 in lieu of concrete curbs, as specified in 01 2300.**

**Bid for Alternate No. 1**

**If "Add" or "Deduct" is intended, indicate by placing figures in the corresponding boxes. If "No Change" is intended, indicate by marking the "No Change" box**

<b><u>Add</u></b>	\$		1				1			:		
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<b><u>Deduct</u></b>	\$		1				1			:		
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**No Change: Bidder will perform this Alternate without change to Contract Sum.**

**No extension of time will be granted if this Alternate is accepted.**

**University reserves the right to accept this Alternate within 10 calendar days after the date University signs the Agreement:**



**BIDDER'S NAME:** \_\_\_\_\_

**9.0 LIST OF SUBCONTRACTORS**

Bidder will use Subcontractors for the Work:

- No  Yes

If “yes”, provide in the spaces below (a) the name, the location of the place of business, and the California contractor license number of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the state of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid, (b) the portion of the work which will be done by each subcontractor. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime contractor in its bid.

Portion of the Work Activity (e.g. electrical, mechanical, concrete)	Subcontractor			
	Name of Business	Location of Business (City)	License No.	DIR Registration No.

(Note: Add additional pages if required.)

**BIDDER'S NAME:** \_\_\_\_\_

**10.0 ~~NOT USED~~ LIST OF CHANGES IN SUBCONTRACTORS DUE TO ALTERNATES**

***The information below must be provided for all changes in first-tier Subcontractors if University selects Alternates. List changes in Subcontractors only for those portions of the Work valued in excess of one-half of 1 percent of prime contractor's total bid.***

<b><u>Portion of the Work Activity (e.g. electrical, mechanical, concrete)</u></b>	<b><u>Subcontractor</u></b>			
	<b><u>Name of Business</u></b>	<b><u>Location of Business (City)</u></b>	<b><u>License No.</u></b>	<b><u>DIR Registration No.</u></b>

***(Note: Add additional pages if required.)***

**BIDDER'S NAME:** \_\_\_\_\_

**11.0 BIDDER INFORMATION**

**TYPE OF ORGANIZATION**

\_\_\_\_\_  
(Corporation, Partnership, Individual, Joint Venture, etc.)

**IF A CORPORATION, THE CORPORATION IS ORGANIZED UNDER THE LAWS OF:**

THE STATE OF \_\_\_\_\_  
(State)

**NAME OF PRESIDENT OF THE CORPORATION:**

\_\_\_\_\_  
(Insert Name)

**NAME OF SECRETARY OF THE CORPORATION:**

\_\_\_\_\_  
(Insert Name)

**IF A PARTNERSHIP, NAMES OF ALL GENERAL PARTNERS:**

\_\_\_\_\_  
(Insert Name(s))

**CALIFORNIA CONTRACTORS LICENSE(S):**

\_\_\_\_\_  
(Classification(s))                      (License Number)                      (Expiration Date)

(For Joint Venture, list Joint Venture's license and licenses for all Joint Venture partners.)

**BIDDER'S NAME:** \_\_\_\_\_

**12.0 REQUIRED COMPLETED ATTACHMENTS**

The following documents are submitted with and made a condition of this Bid:

1. Bid Security in the form of \_\_\_\_\_  
(Bid Bond or Certified Check)

**13.0 DECLARATION**

I, \_\_\_\_\_, hereby declare that I am the  
(Printed Name)  
\_\_\_\_\_ of \_\_\_\_\_  
(Title) (Name of Bidder)

submitting this Bid Form; that I am duly authorized to execute this Bid Form on behalf of Bidder; and that all information set forth in this Bid Form and all attachments hereto are, to the best of my knowledge, true, accurate, and complete as of its submission date.

I further declare that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I declare, under penalty of perjury, that the foregoing is true and correct and that this Declaration was executed at:

\_\_\_\_\_, in the State of \_\_\_\_\_,  
(Name of City if within a City, otherwise Name of County) (State)

on \_\_\_\_\_,  
(Date)

\_\_\_\_\_  
(Signature)

## AGREEMENT

This AGREEMENT is made on \_\_\_\_\_, between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ("University"),

whose Facility is: University of California, Riverside

whose address for notices is: UCR Planning, Design & Construction  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
1223 University Avenue, Suite 240  
Riverside, CA 92521

and Contractor: **Name**

whose address for notices is: **Street Address**  
**City, State & Zip**

for the Project: SKYE HALL HVAC REPLACEMENT  
Project Number: 950583  
University of California, Riverside  
County of Riverside  
Riverside, California 92521

University's Responsible Administrator: Blythe R. Wilson, Architect  
Director of Project Management  
Planning, Design & Construction

University's Representative is: **Tameesha Hayes**  
Project Manager  
Planning, Design & Construction

whose address for notices is: UCR Planning, Design & Construction  
UNIVERSITY OF CALIFORNIA, RIVERSIDE  
1223 University Avenue, Suite 240  
Riverside, CA 92521

Contract Documents for the  
Work Prepared by: Nick Ubrun  
Goss Engineering  
255 E. Main Street, Suite 301  
Corona, CA. 92879  
Tel: 951-363-4797

University and Contractor hereby agree as follows:

## ARTICLE 1 WORK

Contractor shall provide all work required by the Contract Documents (the "Work"). Contractor agrees to do additional Work arising from changes ordered by the University pursuant to Article 7 of the General Conditions. Contractor shall (1) pay all sales, consumer and other taxes and (2) obtain and pay for any governmental licenses and permits necessary for the work, other than building and utility permits.

## ARTICLE 2 CONTRACT DOCUMENTS

"Contract Documents" means the Advertisement For Bids from Prequalified Contractors, Instructions To Bidders, Supplementary Instructions to Bidders, Bid Form, this Agreement, General Conditions, Supplementary Conditions, Exhibits, Specifications, List of Drawings, Drawings, Addenda, Notice to Proceed, Change Orders, Notice of Completion, and all other documents identified in this Agreement that together form the contract between University and Contractor for the Work (the "Contract"). The Contract constitutes the complete agreement between University and Contractor and supersedes any previous agreements or understandings.

## ARTICLE 3 CONTRACT SUM

Subject to the provisions of the Contract Documents University shall pay to Contractor, for the performance of the Work, \$\_\_\_\_\_, the "Contract Sum".

**The Contract Sum includes the following Alternates accepted by University:**

**List Alternates Accepted by University at Time of Award**

**University reserves the right to accept the following Alternates within {INSERT NUMBER FROM BID FORM} days after the date of this Agreement:**

**List Alternates Not Accepted by University at Time of Award**

## ARTICLE 4 CONTRACT TIME

Contractor shall commence the Work on the date specified in the Notice to Proceed and fully complete the work within **105 calendar** days, the "Contract Time".

By signing this agreement, Contractor represents to University that the Contract Time is reasonable for completion of the work and that Contractor will complete the Work within the Contract Time. Time limits stated in the Contract Documents are of the essence of the Contract.

**ARTICLE 5 LIQUIDATED DAMAGES**

If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to University, as liquidated damages and not as a penalty, the sum of **\$500.00** for each day after the expiration of the Contract Time that the Work remains incomplete. After Substantial Completion, the rate for liquidated damages shall be reduced to the sum of **\$250.00** per day. University and Contractor agree that if the Work is not completed within the Contract Time, University's damages would be extremely difficult or impracticable to determine and that the aforesaid amounts are reasonable estimates of and reasonable sums for such damages. University may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of University in the event of any other default of Contractor other than failing to complete the Work within the Contract Time.

**ARTICLE 6 COMPENSABLE DELAY**

If Contractor is entitled to an increase in the Contract Sum as a result of a Compensable Delay, determined pursuant to Articles 7 and 8 of the General Conditions, the Contract Sum will be increased by the sum of \$\_\_\_\_\_ per day for each day for which such compensation is payable.

**ARTICLE 7 DUE AUTHORIZATION**

The person or persons signing this Agreement on behalf of Contractor hereby represent and warrant to University that this Agreement is duly authorized, signed, and delivered by Contractor.

THIS AGREEMENT is entered into by University and Contractor as of the date set forth above.

**CONTRACTOR:**

_____ (Name of Company)	California Contractor's License(s):
a _____ (Type of Organization)	_____ (Name of Licensee)
By: _____ (Signature)	_____ (Classification and License Number)
_____ (Print Name)	_____ (Expiration Date)
_____ (Title)	_____ (Employer Identification Number)

**Recommended:**

By University's Representative:

**Funds Sufficient:**

By Financial Administrative Officer:

\_\_\_\_\_  
 (Signature & Date)

\_\_\_\_\_  
 (Signature & Date)

Tameesha Hayes  
Project Manager  
Planning, Design & Construction  
\_\_\_\_\_  
(Print Name & Title)

Susan McFadden  
Senior Financial Analyst  
Planning, Design & Construction  
\_\_\_\_\_  
(Print Name & Title)

**UNIVERSITY:**

By The Regents of the University of California:

\_\_\_\_\_  
(Signature & Date)  
Blythe R. Wilson, Architect  
Director of Project Management  
Planning, Design & Construction  
\_\_\_\_\_  
(Print Name & Title)

Account No.: \_\_\_\_\_ Activity Code: \_\_\_\_\_  
Fund: \_\_\_\_\_ Function: \_\_\_\_\_  
Cost Center: \_\_\_\_\_ Project Code: \_\_\_\_\_

Attach notary acknowledgement for all signatures of Contractor. If signed by other than the sole proprietor, a general partner, or corporate officer, attach original notarized Power of Attorney or Corporate Resolution.



## SPECIFICATIONS

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#### Division 01 – General Requirements

<u>Initial Issue</u>	<u>Revision</u>	<u>Section #</u>	<u>Title</u>
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<u>May 19, 2021</u>		<u>01 2300</u>	<u>Alternates</u>
		01 2500	Product Options, Requirements & Substitution Procedures
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<u>Initial Issue</u>	<u>Revision</u>	<u>Section #</u>	<u>Title</u>
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		<b>01 6000</b>	<b>Product Requirements</b>
		<b>01 7100</b>	<b>Examination and Preparation</b>
		<b>01 7123</b>	<b>Field Engineering</b>
		<b>01 7329</b>	<b>Cutting and Patching</b>
		<b>01 7400</b>	<b>Cleaning and Waste Management</b>
		<b>01 7700</b>	<b>Contract Closeout</b>
		<b>01 7839</b>	<b>As-Built Documents</b>
		<b>01 8113</b>	<b>Sustainable Design Requirements</b>
		<b>01 9113</b>	<b>General Commissioning Requirements</b>

**SECTION 01 2300**  
**ALTERNATES**

**PART 1 – GENERAL**

**1.1. SUMMARY**

**A. This Section includes:**

- 1. Procedures**
- 2. Alternate Descriptions**

**B. This Section identifies each Alternate and describes basic changes to the Work only when that Alternate is made a part of the Work by specific provision in the Agreement.**

**C. Definition: Refer to the Instructions to Bidders, 1.2 for the term “Alternate.”**

**1.2. PROCEDURES**

**A. The Lump Sum Base Bid and Alternates shall include the costs of all supporting elements required, so that the combination of the Lump Sum Base Bid and any Alternates shall be complete. The scope of Work for all Alternates shall be in accordance with applicable Drawings and Specifications.**

**B. Except as otherwise specifically provided by University, the Work described in Alternates shall be completed with no increase in Contract Time.**

**C. This Section includes only the non-technical descriptions of the Alternates. Refer to the specific Sections of Divisions 23 0548 of the Specifications for technical descriptions of the Alternates.**

**D. Coordinate related Work and modify surrounding Work as required to properly and completely integrate the Alternates into the Work.**

**1.3. ALTERNATE DESCRIPTIONS**

**A. Alternate No. 1: Deduct, Steel Vibration Isolation Equipment Bases**

**Furnish & Install steel vibration isolation equipment bases for all units except RTUs #15 & #16 in lieu of concrete curbs**

**No extension of the Contract Time will be granted if this Alternate is accepted.**

**University reserves the right to accept this Alternate within 10 calendar days after the commencement date per the Notice to Proceed.**

**PART 2 – PRODUCTS (Not Applicable)**

**PART 3 – EXECUTION (Not Applicable)**

**END OF SECTION**

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**SECTION 23 0548**

**VIBRATION AND SEISMIC CONTROLS FOR HVAC**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes the following:
  - 1. Steel and inertia, vibration isolation equipment bases.

**1.02 PERFORMANCE REQUIREMENTS**

- A. Wind-Restraint Loading:
  - 1. Basic Wind Speed: minimum 110 mph.
  - 2. Building Classification Category: II.
  - 3. Minimum 10 lb per sq. ft. multiplied by maximum area of HVAC component projected on vertical plane normal to wind direction, and 45 degrees either side of normal.
- B. Seismic-Restraint Loading: (to be confirmed for each building)
  - 1. Site Class as Defined in the CBC: D.
  - 2. Assigned Seismic Use Group or Building Category as Defined in the CBC: II.
    - a. Component Importance Factor: 1.0.
    - b. Component Response Modification Factor: 2.5.
    - c. Component Amplification Factor: 2.5.
  - 3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 1.057 g.
  - 4. Design Spectral Response Acceleration at 1.0-Second Period: 0.579 g.
- C. Sound and Vibration Performance: The Design-Build Team shall retain a licensed professional acoustical engineer for acoustic and vibration analysis and design. Systems shall be reviewed by the acoustical engineer for compliance with acoustics and vibration control contract document requirements. Provide acoustic and vibration design solutions, including system modifications, equipment modifications, additional sound treatment devices, materials and devices, and labor per the acoustical engineer’s design solution reports, and recommendations.
- D. Rotating and reciprocating equipment shall be statically and dynamically balanced to meet the following vibration limits under design operating conditions and under specified vibration isolation:

Equipment Type	Vibration Limit (inches/sec, RMS)
Direct Drive Fans	0.05
Belt-Driven Fans	0.1

Equipment Type	Vibration Limit (inches/sec, RMS)
Other Equipment	0.1

1. These vibration limits apply either on the bearings or the equipment support structure, whichever applicable.
  2. The vibration limits shall include the effects of inertia mass or inertia bases, where applicable.
  3. Equipment with variable frequency drives shall meet these limits throughout the entire frequency range that the equipment will operate.
- E. Vibration Isolated Equipment with Variable Frequency Drives (VFD) shall not be operated below the following rotational speeds:

Specified Isolation Minimum Static Deflection	Minimum Allowed Equipment Rotational Speed (rpm)
Less than 1 inch	600
1 inch	500
2 inches	400
3 inches	350
4 inches	300
5 or more inches	250

**1.03 SUBMITTALS**

- A. Product Data: Include load deflection curves for each vibration isolation device.
1. Manufacturer's model number for each vibration isolator, the equipment or ductwork or pipeline to which it is to be attached, and the number of isolators to be furnished for each installed system.
  2. An itemized list of isolated equipment with detailed schedules showing isolators proposed for each piece of equipment, referencing materials and drawings.
- B. Shop Drawings: Signed and sealed by a qualified California registered professional engineer. Include the following:
1. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
  2. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.
    - a. Show base construction for equipment; include dimensions, structural member sizes and support point locations.
    - b. Dimensional and weight data for concrete inertia bases, steel and rail bases, and details of isolator attachment.

3. Seismic-Restraint Details: Detail fabrication and attachment of seismic restraints. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors.
  4. Submittals for Interlocking Snubbers: Include load deflection curves up to 1/2-inch deflection in x, y, and z planes.
  5. Layout Drawings showing locations and sizes of braces for suspended piping and ductwork.
- C. Manufacturer's Certification: Upon completion of installation, submit written certification from equipment manufacturer that vibration isolation and seismic control devices are installed correctly and properly adjusted.

#### **1.04 QUALITY ASSURANCE**

- A. Seismic-restraint devices shall have horizontal and vertical load testing and analysis performed according to CBC or shall bear anchorage preapproval "OPA" number, from OSHPD or another agency acceptable to University's Representative, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified California registered professional engineer. Testing and calculations must include both shear and tensile loads and 1 test or analysis at 45 degrees to the weakest mode.
- B. Seismic Engineering: Seismic bracing and support design, mounting hardware and equipment, support systems, restraint systems, anchorage systems, and installation shall conform to the CBC requirements. Submit calculations, plans, and documents stamped by a qualified California registered engineer.
- C. Structural Review: Seismic engineering submittal documents, seismic loads, anchorage and support loads, and vertical loads applied to building structures and structural components shall be reviewed, analyzed, and approved by the project structural engineer of record.

#### **1.05 COORDINATION**

- A. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crystal Distribution Inc.
  2. California Dynamics Corp.
  3. Kinetics Noise Control, Inc.
  4. Vibrex
  5. Thybar
  6. Or equal.



## **2.02 RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS**

- A. Roof-Curb Rails: Shall only be used with prior approval of University.
- B. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment and to withstand 125-mph wind impinging laterally against side of equipment.
- C. Lower Support Assembly: Sheet-metal "Z" section containing adjustable and removable steel springs that support upper floating frame. Upper frame shall provide continuous support for equipment and shall be captive to resiliently resist wind and seismic forces. Lower support assembly shall have a means for attaching to building structure and a wood nailer for attaching roof materials, and shall be insulated with a minimum of 2 inches of rigid, glass-fiber insulation on inside of assembly.
- D. Spring Isolators: Adjustable, restrained spring isolators shall have access ports, for level adjustment, with removable waterproof covers at isolator locations. Isolators shall be located so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof. Isolator adjustment mechanism shall be a rigid lift platform to minimize side sway.
  - 1. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.
    - a. Housing: Steel with resilient vertical-limit stops and adjustable equipment mounting and leveling bolt.
    - b. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
    - c. Minimum Additional Travel: 50 percent of the required deflection at rated load.
    - d. Lateral Stiffness: More than 80 percent of the rated vertical stiffness.
    - e. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
- E. Water Seal: Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counter-flashed over roof materials.

## **2.03 SEISMIC-RESTRAINT DEVICES**

- A. Anchor Bolts: Seismic-rated, drill-in, and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488/E 488M.

## **2.04 FACTORY FINISHES**

- A. Manufacturer's standard galvanized steel coating.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements, installation tolerances, and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- B. Install steel angles or channel, sized to prevent buckling, clamped with ductile-iron clamps to hanger rods for trapeze and individual pipe hangers. At trapeze anchor locations, shackle piping to trapeze. Requirements apply equally to hanging equipment. Do not weld angles to rods.
- C. Install resilient bolt isolation washers on equipment anchor bolts.
- D. Seismic restraint systems shall be installed in strict accordance with the manufacturer's seismic restraint guidelines manual and certified submittal data.
- E. Branch lines may not be used to restrain main lines.
- F. Piping crossing building seismic or expansion joints, passing from building to building, or supported from different portions of the building shall be installed to allow differential support displacements without damaging the pipe, equipment connections, or support connections. Pipe offsets, loops, anchors, and guides shall be installed as required to provide specified motion capability and limit motion of adjacent piping.
- G. Do not brace a system to two independent structures such as ceiling and wall.
- H. Provide appropriately sized openings in walls, floors, and ceilings for anticipated seismic movement. Provide fire seal systems in fire-rated walls.
- I. Installation of seismic restraints shall not cause any change in position of equipment or piping, resulting in stresses or misalignment.
- J. No rigid connections between equipment and the building structure shall be made that degrade the noise and vibration-isolation system specified.
- K. Additional Seismic devices, mounts, and equipment bases shall be installed, type of device shall be selected by licensed structural engineer, or licensed acoustical engineer as required to meet project requirements.
- L. Ductwork shall be installed with vibration isolation devices required to meet sound criteria.

- M. Provide seismic joints in piping and ductwork crossing building seismic joints.

### **3.03 EQUIPMENT ISOLATION**

- A. Install duct, piping and electrical flexible connections to externally vibration-isolated equipment.
- B. Flexible duct connections shall result in a loose and resilient connection and maintain a minimum clearance of 4" between the two sides that they connect.
- C. Flexible connectors shall be used to connect piping to isolated equipment, except equipment for which flexible connectors are not permitted by code.
- D. Flexible pipe equipment connectors for externally isolated equipment shall be as follows:
  - 1. Spherical rubber expansion joints.
  - 2. Flexible hose joints.
  - 3. Locate isolation device downstream of shut-off valves.
- E. Equipment Isolators: For equipment larger than 0.5 horsepower, use spring isolation device.

### **3.04 FIELD QUALITY CONTROL**

- A. Testing: Perform the following field quality-control testing:
  - 1. Isolator seismic-restraint clearance.
  - 2. Isolator deflection.
  - 3. Snubber minimum clearances.

### **3.05 ADJUSTING**

- A. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- B. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop.
- C. Adjust active height of spring isolators.
- D. Adjust seismic restraints to permit free movement of equipment within normal mode of operation.
- E. Torque anchor bolts according to equipment manufacturer's written recommendations to resist seismic forces.

### **3.06 CLEANING**

- A. After completing equipment installation, inspect vibration isolation and seismic-control devices. Remove paint splatters and other spots, dirt, and debris.

**END OF SECTION**

