

**CITY OF RENO
MAINTENANCE & OPERATIONS DEPARTMENT**

**PROPOSAL, CONTRACTS AND
SPECIAL PROVISIONS
FOR**

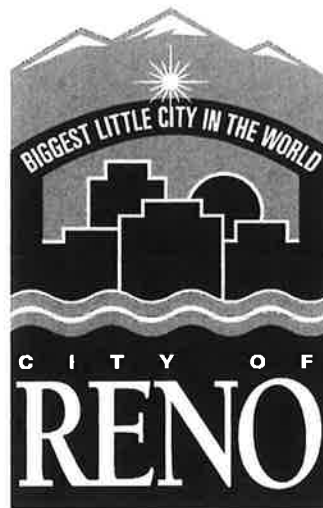
**CALIFORNIA BUILDING HVAC SYSTEM
UPGRADE**

CONTRACT NO. FM980B

PWP WA-2023-208

FEDERALLY FUNDED PROJECT

NOT REPRODUCIBLE



Director of Maintenance & Operations
Travis Truhill

Conformed Copy

TABLE OF CONTENTS

<u>SECTION</u>	<u>SUBJECT</u>	<u>PAGES</u>
010	NOTICE TO CONTRACTORS	010-1 to 010-2
015	INSTRUCTIONS TO BIDDERS	015-1 to 015-3
017	BID SUBMITTAL CHECKLIST	017-1
020	PROPOSAL/BID BOND/SCHEDULE OF PRICES – BASE BID	020-1 to 020-9
025	ADDENDA	025-1
030	PRINCIPAL CONTRACTOR	030-1
035	LIST OF PRIME CONTRACTOR AND SUBCONTRACTORS	035-1 to 035-4
040	AFFIDAVIT OF NON-COLLUSION	040-1
050	AFFIDAVIT CONCERNING CONFINED SPACE ENTRY	050-1
055	LABOR AND EQUIPMENT RATES	055-1
060	ACKNOWLEDGEMENT OF PREVAILING WAGE REQUIREMENTS	060-1
061	AFFIDAVIT REGARDING DEBARMENT	061-1
065	AFFIDAVIT OF CERTIFICATION FOR DRUG/ALCOHOL POLICY	065-1
066	ACKNOWLEDGEMENT OF INSURANCE REQUIREMENTS	066-1
067	NEVADA CONTRACTOR'S LICENSE	067-1
067	CITY OF RENO BUSINESS LICENSE	067-2
068	FEDERAL DOCUMENTS (ARPA)	068-1 to 068-24
070	CONTRACT	070-1 to 070-3
075	PERFORMANCE BOND	075-1 to 075-3
080	LABOR AND MATERIALS BOND	080-1 to 080-3
100	SUPPLEMENTAL GENERAL PROVISIONS	100-1 to 100-26
400	WASHOE COUNTY PREVAILING WAGE RATES	400-1 to 400-64
400	DAVIS BACON WAGE RATES	400-65 to 400-75
LIST OF APPENDICES		
A	TECHNICAL SPECIFICATIONS	A-1 to A-147
B	DESIGN PLANS	B-1 to B-33
C	MECHANICAL COMPLIANCE CERTIFICATE	C-1 to C-16
D	STRUCTURAL CALCULATIONS	D-1 to D-8

SECTION 010 – NOTICE TO CONTRACTORS

**Proposals Requested
By
CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT**

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

Proposals via PlanetBids will be received by the City of Reno until 2:00 P.M. Local Time on May 22, 2023 for Contract Number FM980B.

Said Proposal shall include all labor, tools, implements, machinery, materials, and any incidentals necessary to complete the work in the manner and time prescribed, and in strict conformity with the Contract Documents to the satisfaction of the City Engineer. In general, the major work items include:

1) removal of existing HVAC equipment, which includes, but is not limited to two interior wall mounted heaters, one exterior wall mounted air conditioner, and one boiler), and repair (patch and paint) the walls where equipment is removed; 2) installation of new mechanical HVAC system consisting of new condensers, air handlers, louvers, ductwork, controls, and sensors; 3) installation of new electrical service to support HVAC upgrades; 4) installation of security fencing and concrete equipment pads; and 5) perform any other miscellaneous work as outlined in the plans and specifications.

A mandatory pre-bid walk will be held on Tuesday, May 9, 2023 at 9:00 a.m. Bidders are required to meet at 75 Cowan Drive, Reno, NV 89509.

Minority and Women Business Enterprises will be afforded full opportunity to submit bids in response to this notice, and will not be discriminated against on the grounds of race, color, or national origin in consideration for and award of any contract entered into pursuant to this advertisement. The City of Reno affirms its interest in and encourages the different contracting communities to actively pursue participation and utilization of Minority and Women Business Enterprises on City projects.

The proposed contract is under and subject to Executive Order 11246 of September 24, 1965, and to the Equal Employment Opportunity (EEO) and Labor Standard Provisions. Minimum Wage rates have been determined by the Labor Commissioner of the State of Nevada and are set forth in the contract documents. In no case shall the wage rates be less than prescribed therein. In the event there is a difference between the minimum wage rates as predetermined by the Secretary of Labor and the prevailing wages rates as determined by the State Labor Commissioner for similar classifications of labor, the contractor or and his subcontractor shall not pay less than the wage rate which is the higher of the two. Additionally, if a classification that is being used does not appear in the Davis Bacon Wage decision, a Request for Classification will be required and will be forwarded to the U.S. Department of Labor for approval.

The bidder must supply all the information required by the bid documents and specifications and complete all forms in the Proposal, including, but not limited to the Section 3 Clause, Suspension and Debarment Certificate, Prime Contractors Agreement of Compliance, and Bidders Statement on Previous Contracts Subject to EEO Clause. The EEO requirements, labor provisions, and wage rates are included in the specifications and bid documents.

The Bidders attention is directed to Nevada Revised Statutes 338.01165, enacted by the Nevada Legislature by passage of Senate Bill No. 207, setting forth the requirements for the use of apprentices on public works which requires a contractor or subcontractor to comply with certain requirements relating to the use of apprentices on public works.

Digital copies of the plans, specifications and related documents are available through PlanetBids (Invitation #FM-2023-980B) for downloading from the City of Reno's website <http://reno.gov/business/bids-rfps>. Only those bidders who have registered as a vendor and are included in and appear on the prospective bidders list may submit a bid.

The contact person for this project is Frank Avera, Facilities Manager, with the City of Reno, and may be reached at (775) 399-5599, btsadmin@reno.gov.

Adv. Reno Gazette-Journal – April 7, 2023, April 14, 2023, and April 21, 2023
1 Proof

SECTION 015 – INSTRUCTIONS TO BIDDERS

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
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The contact person for this project is Frank Avera, Facilities Manager, with the City of Reno, and may be reached at (775) 399-5599, btsadmin@reno.gov.

All Proposals shall be subject to, and must be uploaded using the City of Reno Proposal Forms provided in the Contract Documents. Failure to submit the Proposal on the forms or without all forms in the Proposal completed will be grounds for the Proposal being rejected.

Some errors in printing have been observed from contractors printing from Apple or Mac computers. Please check your documents to ensure that documents are displaying correctly prior to submittal.

All bidders shall appear on the official prospective bidders list.

The City reserves the right to reject any or all Proposals.

The attention of Bidders is directed to the State Contractor's License Law (NRS Provision 624.700 as amended to date).

A certified check, cashier's check, bid bond or cash, in the amount of five percent (5%) of the total bid must accompany each Proposal, as a guarantee that if awarded the Contract, the Bidder will execute the Contract, give the two (2) bonds required, and present evidence of the required liability insurance and being licensed under the provisions Chapter 4.04 of the Reno Municipal Code. Said check shall be made payable to the City of Reno, and said bond shall be executed by an approved surety, if used. The provision of any such bond, check, or cash is conditioned to the effect that should the Bidder to whom the Contract is awarded fail to enter into the Contract in accordance with the Proposal, give the two (2) bonds required by said Contract, present sufficient evidence of required liability insurance and being licensed under the provisions of Chapter 4.04 of the Reno Municipal Code within ten (10) calendar days after notice of such award, the surety company shall forthwith pay the City of Reno the sum set forth in the bid bond, and the City shall be entitled to deposit the cash or check as liquidated damages.

The Bidder's attention is especially directed to NRS 338.125, NRS 338.130 and NRS 613.250.

Contractors who appear on the Nevada State Office of the Labor Commissioner's Disqualified Contractor list or the Federal Government General Services Administration (GSA) System for Award Management (SAM) with an exclusion will not be eligible for award of the contract.

Bidders shall hold a valid State of Nevada Contractor's License of a class corresponding to the work to be performed at the time the Proposal is submitted to the City of Reno. Failure to possess the appropriate contractor's license at the time the Proposal is submitted will result in the Proposal being rejected.

The successful Bidder must possess a valid City of Reno Business License prior to the award of any Contract. RMC 4.04.020 applies to subcontractors as to Business License requirements.

NRS 338.072 provides that any subcontractor of the successful bidder who is awarded the contract must also hold a state business license issued pursuant to Chapter 76 of the Nevada Revised Statutes.

Bidders are advised that they must have in place a drug and alcohol policy applicable to workers who will be employed on this project. The policy must be an approved Federal drug and alcohol policy/program which provides, at a minimum, that the use of alcohol, and use, possession, transfer, and sale of illegal drugs, narcotics, or other unlawful substances are prohibited while working on any site in connection with work performed under this contract and assurances that the contractor's subcontractors are required to cooperate with the contractor's policy. Each contractor shall demonstrate compliance by submitting with its bid the certification form found within this document under penalty of perjury that the

policy is in place, that it will be actively enforced and that workers who will be employed on the project will be subject to this policy.

The successful Bidder shall furnish to the City of Reno, the appropriate insurance certificates and bonds as outlined hereinafter, prior to execution of the Contract as set forth in Section 100.14 - Insurance. Bidders must execute the Acknowledgement of Insurance Requirements. Bidders are to submit any requests for information as to insurance requirements prior to submitting a bid.

If the Unit Bid Item prices and/or schedule of values of a prospective bidder's bid are determined by the City to be unbalanced, either in excess or below the reasonable cost analysis values, the Bid may be rejected. A bid may be rejected if the City of Reno determines that the lack of balance poses an unacceptable risk to the City of Reno.

The minimum wages to be paid for labor shall not be less than the prevailing wages scale for Washoe County as determined by the Labor Commissioner of the State of Nevada or Federal Davis Bacon rates, whichever is higher. The provisions of NRS 338.010 through NRS 338.090 shall apply.

The Bidders attention is directed to Nevada Revised Statutes 338.01165, enacted by the Nevada Legislature by passage of Senate Bill No. 207, setting forth the requirements for the use of apprentices on public works which requires a contractor or subcontractor to comply with certain requirements relating to the use of apprentices on public works.

A person who bids on this contract may file a notice of protest regarding the awarding of the contract in accordance with NRS 338.142. The protestant must comply with all requirements set forth in NRS 338.142. Further, the protestant will be required, at the time of filing the protest, to post a bond or submit other security, in a form approved by the City and in the amount as set forth in NRS 338.142(3). The protest must be directed to the attention of the Director of Public Works and must be delivered to the Clerk's Office, One East First Street, Second Floor, Reno, Nevada 89501.

Minority and Women Business Enterprises will be afforded full opportunity to submit bids in response to this notice, and will not be discriminated against on the grounds of race, color, or national origin in consideration for and award of any contract entered into pursuant to this advertisement. The City of Reno affirms its interest in and encourages the different contracting communities to actively pursue participation and utilization of Minority and Women Business Enterprises on City projects.

A bidder may submit to the City of Reno requests for approved equals or clarifications on items that have been included in the specifications or on an addendum to the specifications. Any such request must be received, in writing, not less than seven (7) calendar days before the date of the scheduled bid opening. Any request for substitution must be submitted with technical data, test results, or other information as evidence that the substitute offered is equal to or better than what is specified.



Frank Avera
Facilities Manager

SECTION 017 – BID SUBMITTAL CHECKLIST

BID SUBMITTAL CHECKLIST

The following must be completed and submitted by Contractor at time of bid.

- Proposal
- Bid Bond Certificate 5% bid Bond, Certified Check, or Cashier's Check - (Digital Copy included with PlanetBids/ Hard Copy shall be mailed to City postmarked the date of the bid opening.)
- Schedule of Prices
- Executed Addenda
- Principal Contractor Form
- List of Prime Contractor and First Tier Subcontractors (5% List)
- Affidavit of Non-Collusion
- Affidavit Concerning Confined Space Entry Compliance
- Acknowledgement of Prevailing Wage Requirements
- Affidavit Regarding Debarment
- Affidavit of Certification for Drug and Alcohol Policy
- Acknowledgement of Insurance Requirements
- Nevada Contractor's License
- Prime Contractor's Agreement of Compliance
- Bidder's Statement on Previous Contract Subject to EEO Clause
- The Section 3 Clause
- Certification Regarding Debarment, Suspension, Proposed Debarment and Other Responsibility Matters
- Certification Required by Section 1352 of Title 31 Regarding Restrictions of Lobbying
- Disclosure of Lobbying Activities

The following must be completed and submitted by the three lowest bidders within 2 hours after the completion of the opening of the bids.

- List of Prime Contractor and First Tier Subcontractors (1% List)
- Labor and Equipment Rates

SECTION 020 –PROPOSAL/BID BOND/SCHEDULE OF PRICES

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

PROPOSAL

Proposal of Mt. Rose Heating & Air Conditioning, Inc. to
Company Name

furnish and deliver all materials except those specified to be furnished by the City of Reno and to do and perform all work for:

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
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FEDERALLY FUNDED PROJECT**

together with incidental items necessary to complete the work to be constructed in accordance with these Contract Documents, Improvement Plans and "Standard Specifications for Public Works Construction" and revisions to date.

TO THE HONORABLE MAYOR AND THE CITY COUNCIL OF RENO, NEVADA:

The undersigned as Bidder, proposes and agrees, if this bid is accepted, to enter into an agreement with City of Reno in the form included in the bid documents to perform and furnish all work as specified or indicated in the bid documents for the bid price and within the bid times indicated in this bid and in accordance with the other terms and conditions of the bid documents. Bidder shall provide all necessary machinery, tools, apparatus and other means of construction to perform all work, furnish all materials as specified in the bid documents. Bidder acknowledges the quantities shown herein are approximate only and are subject to increase or decrease, and that they will accept in full payment, the unit prices as reflected in the "Schedule of Prices" .

Bidder accepts all terms and conditions of the "Notice to Contractors" and "Instructions to Bidders," including without limitation those dealing with the disposition of bid security. Bidder will sign and deliver the required number of counterparts of the agreement with the bonds and other documents required by the bid requirements within ten (10) days after the date of City Notice of Award.

Bidder declares that the only persons or parties interested in this Proposal as principals are those named herein; that this Proposal is made without collusion with any other person, firm or corporation; is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any person, firm or corporation to refrain from bidding; Bidder has not sought collusion to obtain for itself any advantage over any other Bidder or over the City of Reno. Bidder declares they have carefully examined all locations of proposed work, is familiar with all Proposal requirements and has examined this Contract Proposal, Improvement Plans, Specifications and Conditions referenced herein.

Bidder declares this bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and in submitting this bid, Bidder represents, as more fully set forth in the agreement,

that Bidder has examined and carefully studied the bidding documents and the following Addenda all of which are hereby acknowledged (list Addenda by addendum number):

ADDENDUM NUMBER	DATE	SIGNATURE
Proc-Bid Q/A	5/9/2020	[Signature]

Bidder declares they have visited and examined all sites, has become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the work. Bidder is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, performance and furnishing of the work. Bidder has carefully studied all Improvement Plans and drawings of in-situ conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities). Bidder acknowledges that such Improvement Plans are not bid documents and may not be complete for Bidder's purposes. Bidder acknowledges that the City of Reno does not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Improvement Plans with respect to underground facilities at or contiguous to the site. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this bid for performance and furnishing of the work in accordance with the times, price and other terms and conditions of the bid documents.

Bidder declares they have correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract documents and all additional examinations, investigations, explorations, tests, studies and data with the bid documents.

Bidder declares they have given the City of Reno written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the bid documents and the written resolution thereof by the City of Reno is acceptable to Bidder, and the bid documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the work for which this bid is submitted.

The Proposal submitted shall remain in effect for ninety (90) calendar days after the opening of bids.

If this proposal shall be accepted and the undersigned fail to contract as aforesaid and to give a Performance Bond in the amount not less than the full contract amount, one-hundred percent (100%), and a Payment Bond of not less than one-hundred percent (100%) of the contract amount with surety satisfactory to the City of Reno and present evidence of required liability insurance and licensed under the provisions of Chapter 4.04 of the Reno Municipal Code within ten (10) calendar days after the bidder has received notice the contract has been awarded, the City of Reno may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and acceptance thereof shall be null and void, and the forfeiture of such security accompanying this proposal and the same shall be the property of the City of Reno.

Accompanying this Proposal is a deposit in the form of

Bid Bond

(Insert words - Certified Check, Cashier's Check, Bid Bond, or Cash)

in the amount of \$

1,300,000 one million three hundred thousand

which amount is not less than five percent (5%) of the total bid.

The undersigned holds valid Nevada State Contractor's License Number 0032146

with Classification(s) C-21 Refrigeration and Air Conditioning

BIDDER

Mt. Rose Heating & Air Conditioning, Inc.

Contractor Name

310 Sunshine Lane

Address

Reno, NV

City, State

89502

Zip Code

775-329-8384

Phone

775-329-8502

Fax

jbingham@mtrosehvac.com


E-Mail

Joe Bingham

Print name of person authorized to sign this bid

Vice President

Title


Contractor Signature

CERTIFIED PAYROLL

Katie Philippi

(Name of Person Submitting Certified Payroll)

kPhilippi@mtrosehvac.com

(Email address)

775-329-8384

(Phone Number + extension)

775-329-8502

(Fax Number)

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

ATTENTION BIDDERS

BID BOND

BIDDER SHALL MAIL THE 5% BID BOND, CERTIFIED CHECK, CASHIER'S CHECK, OR CASH WITH SIGNED BID BOND CERTIFICATE TO THE CITY OF RENO. THE BID BOND/CERTIFICATE SHALL BE POSTMARKED BY THE DATE OF THE BID OPENING

City of Reno
Attn: Maintenance & Operations - BTS Contract Number FM980B
P.O. Box 1900
Reno, NV 89505

A SCANNED COPY OF THE 5% BID BOND, CERTIFIED CHECK, OR CASHIER'S CHECK, WITH SIGNED BID BOND CERTIFICATE, MUST BE INCLUDED IN THE VIRTUAL BID SUBMITTAL

BID BOND CERTIFICATE

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
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KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

Mt. Rose Heating and Air Conditioning, Inc.
hereinafter designated as "Principal" and

Western Surety Company
hereinafter designated as "Surety", are hereby held and firmly bound onto the City of Reno, hereinafter designated "City", in the sum of Five Percent of Total Amount Bid Dollars
(\$ 5% of Total Amount Bid) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

Signed this 18th day of May, 2023. The condition of the above obligation is such that whereas Principal has submitted to the City a Bid Proposal attached hereto and hereby made a part hereof, to enter into a Contract for the above mentioned Contract.

Now, therefore, if said Bid Proposal shall be rejected, or in the alternative, if said Bid Proposal shall be accepted and Principal shall execute and deliver a Contract in the form of Contract attached hereto, and properly completed, and shall furnish a Bond for Principal's faithful performance of said Contract, and a Bond for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid Proposal, then this obligation shall be void.

Otherwise, the same shall remain in force and effect, and the sum herein specified paid over to the City, it being expressly understood and agreed that the liability for Surety for any and all claims hereunder shall, in no event, exceed the amount of this obligation as herein stated.

Surety, for value received, hereby stipulates and agrees that the obligations of surety and its bond shall be in no way impaired or affected by an extension of the time within which City may accept such Bid; and Surety does hereby waive notice of such extension.

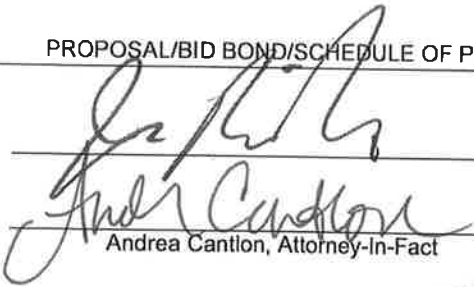
In Witness whereof, Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their officers, the day and year set forth above.

CITY OF RENO
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B

PROPOSAL/BID BOND/SCHEDULE OF PRICES

Principal: Mt. Rose Heating and Air Conditioning, Inc. By: _____

Surety: Western Surety Company By: _____


Andrea Cantlon, Attorney-In-Fact

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

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BID SUBMISSION

The Bidder's Proposal shall be submitted through PlanetBids. Only the unit price will be entered. PlanetBids will calculate the totals for the "Schedule of Prices" based on the provided "unit price". Unit prices for all items, must be included.

In the event the total amount for an individual bid item does not agree with the product of the estimated quantity and unit price bid for that item, unit price stated for the individual item shall govern and the incorrect total amount for that item shall be corrected. In the event the total bid price does not agree with the sum of the total amounts bid for the respective bid items, the total amounts for the respective bid items shall govern and the incorrect total bid price shall be corrected.

The successful bidder will be the lowest responsible and responsive bidder based on the **Base Bid**.

The Contractor shall anticipate the Force Account to range between 5% and 10% of the total base bid price. The Contractor will be responsible for meeting the bonding and insurance amount required for the total bid award amount including the force account.

(THE REMAINDER OF THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK)

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Teri Lynn Wood, Patricia Owens, Nick Rossi, Nina Dedeker, Andrea Cantlon, Peter Kitowski, Carey Morgan, Shelly Demaray, Individually

of Reno, NV, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 27th day of April, 2022.



WESTERN SURETY COMPANY

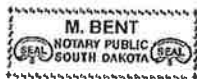
Paul T. Bruflat, Vice President

State of South Dakota }
County of Minnehaha } ss

On this 27th day of April, 2022, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 18th day of May, 2023.



WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

Form F4280-7-2012

Go to www.cnasurety.com > Owner / Obligor Services > Validate Bond Coverage, if you want to verify bond authenticity.

Authorizing By-Law

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

SCHEDULE OF PRICES

Company Name _____					
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE – BASE BID					
BID ITEM	APPROX QUANTITY	UNIT	BID ITEM DESCRIPTION	UNIT PRICE	AMOUNT
1	1	LS	Remove existing HVAC equipment	\$ <u>1</u> Per LS	\$ <u>20,000</u>
2	1	LS	Install new mechanical HVAC system consisting of new condensers, air handlers, louvers, ductwork, controls, and sensors	\$ <u>1</u> Per LS	\$ <u>1059,000</u>
3	1	LS	Install new electrical service to support HVAC upgrades	\$ <u>1</u> Per LS	\$ <u>150,000</u>
4	1	LS	Install security fencing and concrete equipment pads	\$ <u>1</u> Per LS	\$ <u>60,000</u>
5	1	LS	Perform any other miscellaneous work as outlined in the plans and specifications, clean-up, and demobilization	\$ <u>1</u> Per LS	\$ <u>20,000</u>
TOTAL BASE BID					\$ <u>1,309,000</u>

The successful bidder will be the lowest responsible and responsive bidder based on the **Base Bid**.

NOTE: After the bidder is determined to be responsive and responsible, then, the City of Reno may add a Force Account to be recommended as the total bid award amount. The Contractor shall anticipate the Force Account to range between 5% and 10% of the total base bid price. The Contractor will be responsible for meeting the bonding and insurance amount required for the total bid award amount including the force account.

SECTION 020 – Schedule OF PRICES

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

“PROJECT SCHEDULE OF PRICES”

**CITY OF RENO TO ATTACH THE FINAL BID
SCHEDULE OF PRICES FROM PLANETBIDS**

DO NOT WRITE BELOW THIS LINE

TO BE COMPLETED BY THE CITY OF RENO

BASE BID - Upgrade HVAC System	\$ 1,300,000 ⁰⁰
FORCE ACCOUNT	\$ 130,000 ⁰⁰
TOTAL AWARD AMOUNT	\$ 1,430,000 ⁰⁰ TOTAL AMOUNT

The successful bidder will be the lowest responsible and responsive bidder based on the **Base Bid**.

NOTE: After the bidder is determined to be responsive and responsible, then, the City of Reno may add a Force Account to be recommended as the total bid award amount. The Contractor shall anticipate the Force Account to range between 5% and 10% of the total base bid price. The Contractor will be responsible for meeting the bonding and insurance amount required for the total bid award amount including the force account.

SECTION 025 – ADDENDA

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

As a holder of Specifications and Improvement Plans for the above referenced project the Bidder shall acknowledge receipt of any and all Addenda. The bidder shall acknowledge any indicated change(s) that have been incorporated and/or new pages that have been inserted and/or replaced.

**FAILURE TO ACKNOWLEDGE RECEIPT OF ANY/ALL ADDENDA MAY BE
GROUNDS FOR THE PROPOSAL BEING REJECTED**

ATTENTION BIDDERS

**PLEASE AFFIX ALL EXECUTED ADDENDA
TO THIS PAGE**

SECTION 030 – PRINCIPAL CONTRACTOR

Principals:

Name:

Title:

Karen Bingham

/ President

Joe Bingham

/ Vice President

The following principal(s) is/are authorized to enter into contract

For: Mt Rose Heating & Air Conditioning, Inc

(Prime Contractor Company Name)

Principals not listed above:

Name:

Title:

CHECK ONE: ☒ CORPORATION ☐ PARTNERSHIP ☐ INDIVIDUAL-OWNED

I, Joe Bingham, certify that the above list includes all owner and financial partners of the above-mentioned company-corporate structure to the best of my knowledge.


Contractor's Signature

5/22/2023
Date

 TOTAL VALUE OF THE WORK TO BE COMPLETED BY THE PRIME CONTRACTOR
\$ 700,000

MUST BE 50% OR GREATER OF THE TOTAL BASE BID WITHOUT FORCE ACCOUNT.

SECTION 035 – LIST OF PRIME CONTRACTOR AND FIRST TIER SUBCONTRACTORS (5% LIST)

Per NRS Provision 338.141, each bid submitted must include the name of the prime contractor and each first tier subcontractor who will provide labor or a portion of the work on the public work in an amount exceeding five percent (5%) of the Prime Contractor's total bid.

If a Contractor fails to provide a complete list his bid shall be deemed not responsive. Subcontractors must not be on disqualified status with the State Public Works Board.

Any bidder whose proposal is accepted shall not substitute any person or subcontractor who is named in the proposal, nor shall sublet any portion of the work not so indicated in their proposal, without complying with NRS 338.141. Consent to sublet, assign, or otherwise dispose of any portion of the contract shall not be construed to relieve the bidder of their liability under the contract and bonds.

Listed hereinafter is the list of the Prime Contractor and first tier Subcontractors who will be employed and the segregation of the work each will perform if the contract is awarded to the party or parties listed herein.

First tier subcontractor is defined as a contractor who contracts with a prime contractor to provide labor, materials or services for a construction project. NRS 338.141(7)(a).

THE PRIME CONTRACTOR MUST BE LISTED IF THEY WILL PERFORM ANY OF THE WORK IN EXCESS OF 5%.

PRIME CONTRACTOR NAME Mt Rose Heating & Air Conditioning, Inc

Description of the Labor or a portion of the Work To Be Performed By Prime Contractor pursuant to NRS 338.141(3)(a) or a statement pursuant to NRS 338.141(3)(b).

Mt Rose Heating & Air Conditioning, Inc - Dryside HVAC / *prime*


SUBCONTRACTORS (5% LIST)

Work To Be Performed by Subcontractors	Name, Address, & Phone Number	Classification & License Number
Dryslide HVAC	Mt Rose Heating & Air Conditioning, Inc 310 Sunshine Ln Reno NV 89502 775-329-8384	0032146 C-21 Refrigeration/Air Conditioning
Controls	ACS Controls 1750 Longley Ave Suite 104 Reno, NV 89502 926-8808	81710 Low Voltage Controls/PLC
Electrical	Placer Electric 2015 Highway 40 West Verden NV 89437	33942 C-21 Electrical

(ATTACH ADDITIONAL PAGES IF NECESSARY)

Submitted By: Mt Rose Heating & Air Conditioning, Inc
 (Name of Individual, Partnership, or Corporation)

Name and Title: Joe Bingham / Vice President

Signed By:  9/22/2025

SECTION 035 – LIST OF PRIME CONTRACTOR AND FIRST TIER SUBCONTRACTORS (1% LIST)

Within 2 hours of the bid opening, the three lowest bidders must submit a list containing the name of each first tier subcontractor who will provide labor or a portion of the work on the public work to the prime contractor meeting either of the following criteria:

- a) Any first tier subcontractor which will be paid an amount exceeding \$250,000,
- b) Any first tier subcontractor which will be paid one percent (1%) of the prime contractor's total bid or \$50,000, whichever is greater.

If a contractor fails to provide a complete list his bid shall be deemed not responsive. Subcontractors must not be on disqualified status with the State Public Works Board.

Any Bidder whose Proposal is accepted shall not substitute any person or Subcontractor who is named in the Proposal, nor shall sublet any portion of the work not so indicated in their Proposal, without complying with NRS 338.141. Consent to sublet, assign, or otherwise dispose of any portion of the contract shall not be construed to relieve the bidder of their liability under the contract and bonds.

First tier subcontractor is defined as a contractor who contracts with a prime contractor to provide labor, materials or services for a construction project. NRS 338.141(7)(a).

THE PRIME CONTRACTOR MUST BE LISTED IF THEY WILL PERFORM ANY OF THE WORK IN EXCESS OF 1%.

INFORMATION PROVIDED ON THE 5% LISTS SHALL AUTOMATICALLY BE DEEMED INCORPORATED INTO THE 1% LISTS AND NEED NOT BE RE-LISTED BELOW.

PRIME CONTRACTOR NAME Mt. Rose heating

Description of the Labor or a portion of the Work To Be Performed By Prime Contractor pursuant to NRS 338.141(3)(a) or a statement pursuant to NRS 338.141(3)(b).

HVAC/Prime

SUBCONTRACTORS (1% LIST)

Description of the Work To Be Performed by Subcontractors	Name, Address, & Phone Number	Classification & License Number
Controls	BCS Controls 775-826-8998	81710
Electrical	475 Langely Ln. Suite 106 Reno, NV Placer Electric, 2915 Highway 40 West Verdi, NV 89439 775-345-7283	Low Voltage Controls/hvac 33942 C-2 Electrical

(ATTACH ADDITIONAL PAGES IF NECESSARY)

Submitted By: Mt. Rose Heating and Air Conditioning
(Name of Individual, Partnership, or Corporation)

Name and Title: Chase Morrow, Project Estimator

Signed By: 

SECTION 040 - AFFIDAVIT OF NON-COLLUSION

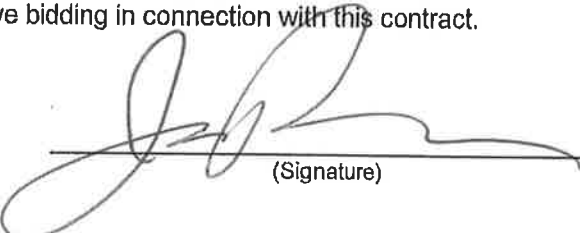
State of Nevada

County of Washoe

I, Joe Bingham Vice President
(Name of party signing this affidavit & Proposal Form) (Title)

being duly sworn do depose and say that Mt Rose Heating & Air Conditioning, Inc
(Name of person, firm, association, or corporation)

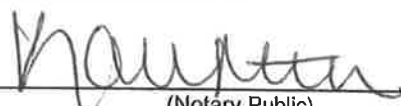
has not, either directly or indirectly, entered into agreement, participated in any collusion, or otherwise
taken any action in restraint of free competitive bidding in connection with this contract.


(Signature)

Joe Bingham
(Printed Name)

Vice President
(Title)

Sworn to before me this 22nd day of May, 2023.


(Notary Public)



SECTION 050 - AFFIDAVIT CONCERNING CONFINED SPACE ENTRY COMPLIANCE

State of Nevada

County of Washoe

I, Joe Bingham Vice President
(Name of party signing this affidavit & Proposal Form) (Title)

being duly sworn do depose and say that Mt Rose Heating & Air Conditioning, Inc
(Name of person, firm, association, or corporation)

have, and shall continue during the course of this Contract, comply with the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, as outlined in the 29 CFR Parts 1910; "Permit-Required Confined Spaces for General Industry; Final Rule".


(Signature)

Joe Bingham
(Printed Name)

Vice President
(Title)

Sworn to before me this 22nd day of May, 2023.


(Notary Public)



(Stamp/Seal)

SECTION 055 – LABOR AND EQUIPMENT RATES

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

ATTENTION BIDDERS

**PLEASE AFFIX LABOR AND EQUIPMENT RATES
SUBMIT WITHIN 2 HOURS OF THE BID OPENING**

Mt. Rose Heating & Air Conditioning Inc.

Standard Rates for Public Works projects

January 1st, 2023 – December 31st 2023

Labor Classification:	ST.	OT.	DT.
Superintendent:	\$115.00		
Foremen:	\$110.00		
Journeymen:	\$106.00		
Delivery Driver:	\$89.00		
Shop Fabrication:	\$106.00		
Project Manager:	\$135.00		
Project Secretary:	\$65.00		
Service Technician:	\$120.0		

Plus 15% overhead & profit.

All labor, materials, major tools, equipment, subcontractors (depending on contract requirements), fuel and rental equipment to be cost plus 15%.

Sean Bingham
Cell – (775) 544 8807
Director of Construction

Gregg Bennett
Phone – (775) 329-8502
Shop Foreman

Mark Taylor
Phone – (775) 329-8384
Chief Estimator

Dan Davis
Phone (775) 329-8384
Facility Director

Ray Auble
Cell – (775) 446-9559
Senior Project Manager

Jay Morris
Phone (775) 329-8384
Project Manager

Joe Morrow
Cell – (775) 443-8075
Superintendent

Chase Morrow
Cell – (775) 997 5008
Project Estimator

Katie Phillippi
Phone – (775) 329-8384
Office Manager

Jeremy Trejo
Phone – (775) 329 8384
VDC Coordinator

310 Sunshine Lane Reno, NV 89502

Phone: (775) 329-8384

NV Lic. #32146 – CA Lic. #770238 – ID Lic. #RCE - 22367

SECTION 060 – ACKNOWLEDGEMENT OF PREVAILING WAGE REQUIREMENTS

ACKNOWLEDGEMENT AND STIPULATION OF BIDDER REGARDING PENALTIES FOR
NONCOMPLIANCE WITH NEVADA PREVAILING WAGE REQUIREMENTS

**CALIFORNIA BUILDING ROOF REPAIR
CONTRACT NUMBER FM988B
PWP WA-2023-207
FEDERALLY FUNDED PROJECT**

The undersigned Bidder acknowledges and stipulates that:

1. This Contract is for a public work as set forth in Nevada Revised Statutes Chapter 338.
2. A contractor engaged on public works shall forfeit, as a penalty to the public body on behalf of which the contract has been made and awarded to the contractor, not less than \$20 nor more than \$50 for each calendar day or portion thereof that each person employed on the public work is paid less than the designated rate for any work done under the contract, by the contractor or any subcontractor under them, unless waived by the Labor Commissioner for good cause shown.
3. A contractor engaged on a public work shall forfeit, as a penalty to the public body on behalf of which the Contract has been made and awarded to the contractor, not less than \$20 nor more than \$50 for each calendar day or portion thereof for each person employed on the public work for which the contractor or subcontractor willfully included inaccurate or incomplete information in the monthly record required to be submitted to the public body pursuant to subsection 5 of NRS 338.070, unless waived by the Labor Commissioner for good cause shown.
4. A contractor engaged on a public work shall forfeit, as a penalty to the public body on behalf of which the contract has been made and awarded to the contractor, not less than \$20 nor more than \$50 for each calendar day or portion thereof that each person employed on the public work is not reported to the public body awarding the contract by the contractor or any of their subcontractors as required pursuant to subsection 5 of NRS 338.070, unless waived by the Labor Commissioner for good cause shown, up to a maximum amount of:
 - a. For the first failure to comply during the term of the contract for public work, \$1,000; and
 - b. For each subsequent failure to comply during the term of the contract for public work, \$5,000.
5. If a violation of more than one provision of subsections 1, 2 and 3 involves the same persons, the contractor shall forfeit the penalty set forth in each subsection that was violated, unless waived by the Labor Commissioner for good cause shown.
6. If a penalty is imposed pursuant to this section, the costs of the proceeding, including investigative costs and attorney's fees, may be recovered by the Labor Commissioner.

Mt Rose Heating & Air Conditioning, Inc
(Name of Company)

Joe Bingham - Vice President
(Name and Title of Authorized Representative)

(Signature)

05/22/2023

(Date)

SECTION 061 – AFFIDAVIT REGARDING DEBARMENT

State of Nevada

County of Washoe

I, Joe Bingham Vice President
(Name of party signing this affidavit & Proposal Form) (Title)

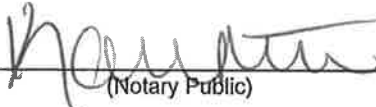
being duly sworn do depose and say that Mt Rose Heating & Air Conditioning, Inc
(Name of person, firm, association, or corporation)

has not, either directly or indirectly, been debarred from receiving contracts from the Federal Government pursuant to 48 CFR §§ 9.400 et seq. (NRS 338.017 (2) & (3)).


(Signature)
Joe Bingham
(Printed Name)

Vice President
(Title)

Sworn to before me this 22nd day of May, 2023.


(Notary Public)



(Stamp/Seal)

SECTION 065 - AFFIDAVIT OF CERTIFICATION FOR DRUG AND ALCOHOL POLICY

State of Nevada

County of Washoe

I, Joe Bingham
(Name of party signing this affidavit & Proposal Form)

Vice President
(Title)

being duly sworn do depose and say that Mt Rose Heating & Air Conditioning, Inc
(Name of person, firm, association, or corporation)

has in place a drug and alcohol policy that will be actively enforced and that all workers who will be employed on the City of Reno Public Works Construction Project will be subject to the policy.

[Signature]
(Signature)
Joseph Bingham
(Printed Name)
V.P.
(Title)

Sworn to before me this 22nd day of May, 2023.

[Signature]
(Notary Public)



(Stamp/Seal)

SECTION 066 - ACKNOWLEDGMENT OF INSURANCE REQUIREMENTS

The undersigned bidder acknowledges and agrees to comply with the insurance requirements set forth in Section 100.14 – Insurance.

The bidder acknowledges that they can acquire the required coverage and that this has been verified by their insurance company prior to submitting a bid.

Any requests for clarification regarding insurance requirements must be made prior to submitting a bid.



(Signature)

Joe Bingham

(Printed Name)

Vice President

(Title)

CITY OF RENO
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B

CONTRACTOR'S LICENSE

SECTION 067 – NEVADA CONTRACTOR'S LICENSE

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

ATTENTION BIDDERS

**PLEASE AFFIX “CONTRACTOR LICENSE”
TO THIS PAGE**

Southern Nevada Office
2310 Corporate Circle, Suite 200
Henderson, Nevada 89074
(702) 486-1100

STATE CONTRACTORS BOARD

Northern Nevada Office
5390 Kietzke Lane, Suite 102
Reno, Nevada 89511
(775) 688-1141

The Nevada State Contractors Board certifies that
MT ROSE HEATING & AIR CONDITIONING INC

Licensed since May 01, 1991

License No. **0032146**

Is duly licensed as a contractor in the following classification(s):

PRINCIPALS:

KAREN BINGHAM, President
JOSEPH BINGHAM, Vice President, QI

C-21 Refrigeration and Air Conditioning

LIMIT: Unlimited
EXPIRES: 05/31/2023


Chair, Nevada State Contractors Board



STATE OF NEVADA CONTRACTORS LICENSE

THIS IS TO CERTIFY THAT THE COMPANY
LISTED BELOW IS LICENSED IN THE STATE OF
NEVADA FOR THE CLASSIFICATION(S) SHOWN:

MT ROSE HEATING & AIR CONDITIONING INC
310 SUNSHINE LN
RENO, NV 89502

LIC. NO.
0032146

EXPIRES:
05/31/2023

LIMIT: Unlimited

Class: C-21

STATE OF NEVADA
STATE CONTRACTORS BOARD
5390 Kietzke Lane, Suite 102, Reno, Nevada 89511
2310 Corporate Circle, Suite 200, Henderson, Nevada 89074

POCKET CARD RE-ORDER FORM

Enclosed is \$_____ to cover the cost of _____ additional
pocket cards at ten dollars (\$10.00) each.

Firm Name _____

License No. _____

Date: _____ By: _____

MT ROSE HEATING & AIR CONDITIONING INC
310 SUNSHINE LN
RENO, NV 89502



NEVADA STATE CONTRACTORS BOARD

5390 KIETZKE LANE, SUITE 102, RENO, NEVADA, 89511 (775) 600-1141 FAX (775) 600-1271
8400 WEST SUNSET ROAD, SUITE 150, LAS VEGAS, NEVADA, 89113, (702) 406-1100 FAX (702) 406-1100

SPECIALTY CONTRACTOR'S RESTRICTED **CERTIFICATE OF ELIGIBILITY** **PER NRS 338.147 and NRS 338.1389**

CERTIFICATE NUMBER: **SBPC-01-04-19-0013**

MT. ROSE HEATING & AIR CONDITIONING, INC. (HEREIN THE
"CONTRACTOR") NEVADA STATE CONTRACTORS' LICENSE NUMBER: **0032146**
ORIGINAL ISSUE DATE: **05/01/1991** BUSINESS TYPE: **CORPORATION**
CLASSIFICATION: **C21-REFRIGERATION & AIR CONDITIONING** MONETARY
LICENSE LIMIT: **UNLIMITED** STATUS: **ACTIVE**, IS HEREBY ISSUED THIS
CERTIFICATE BY THE NEVADA STATE CONTRACTORS' BOARD, BASED UPON THE
INFORMATION CONTAINED IN THE STATEMENT OF COMPLIANCE WITH NEVADA
REVISED STATUTES (NRS) 338.147 AND NRS 338.1389 AND THE AFFIDAVIT OF
CERTIFIED PUBLIC ACCOUNTANT SUBMITTED TO THE NEVADA STATE
CONTRACTORS BOARD AS PROOF OF CONTRACTOR'S COMPLIANCE WITH THE
PROVISIONS OF NRS 338.147 AND NRS 338.1389. IN ACCORDANCE WITH THE
PROVISIONS OF NRS 338.147(3), THE ABOVE-NAMED CONTRACTOR AND A
CERTIFIED PUBLIC ACCOUNTANT HAVE SUBMITTED FULLY EXECUTED AND
NOTARIZED SWORN AFFIDAVITS AS PROOF OF PREFERENTIAL BIDDER STATUS,
UNDER PENALTY OF PERJURY, CERTIFYING THAT THE CONTRACTOR IS
QUALIFIED TO RECEIVE A PREFERENCE IN BIDDING AS SET FORTH IN NRS 338.147
AND NRS 338.1389 AND OTHER MATTERS RELATING THERETO WHEN ACTING AS A
PRIME CONTRACTOR ON THE SPECIFIC PUBLIC WORKS PROJECT FOR WHICH THIS
CERTIFICATE IS SUBMITTED BY THE CONTRACTOR.

THIS CERTIFICATE OF ELIGIBILITY IS ISSUED ON **JUNE 1, 2022** AND EXPIRES ON
MAY 31, 2023, UNLESS SOONER REVOKED OR SUSPENDED BY THE NEVADA
STATE CONTRACTORS BOARD.



NANCY MATHIAS, LICENSING ADMINISTRATOR DATE
FOR MARGI GREIN, EXECUTIVE OFFICER

5/12/2022



The Nevada State Contractors Board assumes no liability or responsibility for the accuracy or validity of the information contained in the Contractors Statement of Compliance or the Affidavit of Certified Public Accountant as Proof of Contractors Compliance with the Provisions of NRS 338.147 and NRS 338.1389. The above-named Contractor shall bear the responsibility to ascertain the accuracy and validity of the affidavits provided to support the issuance of this certificate.

SECTION 067 – BUSINESS LICENSE

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

“CITY OF RENO BUSINESS LICENSE”

**CITY OF RENO BUSINESS LICENSE IS REQUIRED BY DATE OF AWARD,
NOT AT TIME OF BID**

ENTITY INFORMATION

ENTITY INFORMATION

Entity Name:

MT. ROSE HEATING AND AIR CONDITIONING, INC.

Entity Number:

C9008-1990

Entity Type:

Domestic Corporation (78)

Entity Status:

Active

Formation Date:

10/01/1990

NV Business ID:

NV19901038079

Termination Date:

Perpetual

Annual Report Due Date:

10/31/2023

REGISTERED AGENT INFORMATION

Name of Individual or Legal Entity:

DECS

Status:

Active

CRA Agent Entity Type:

Registered Agent Type:

Commercial Registered Agent

NV Business ID:

NV20181208358

Office or Position:

Jurisdiction:

NEVADA

Street Address:

5421 KIETZKE LANE SUITE 100, Reno, NV, 89511, USA

Mailing Address:

Individual with Authority to Act:

BONNIE DRINKWATER

Fictitious Website or Domain Name:

OFFICER INFORMATION

☐ VIEW HISTORICAL DATA

Title	Name	Address	Last Updated	Status
President	KAREN BINGHAM	310 SUNSHINE LANE, Reno, NV, 89502, USA	09/09/2021	Active
Secretary	KAREN BINGHAM	310 SUNSHINE LANE, Reno, NV, 89502, USA	09/09/2021	Active
Treasurer	KAREN BINGHAM	310 SUNSHINE LANE, Reno, NV, 89502, USA	09/09/2021	Active
Director	JOSEPH D BINGHAM	310 SUNSHINE LANE, Reno, NV, 89502, USA	09/09/2021	Active

Page 1 of 1, records 1 to 4 of 4

CURRENT SHARES

Class/Series	Type	Share Number	Value
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No records to view.

Number of No Par Value Shares:

1000

Total Authorized Capital:

1,000

[Filing History](#)

[Name History](#)

[Mergers/Conversions](#)

[Return to Search](#)

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CONTRACT PROVISIONS

Appendix II to Part 200 - Contract Provisions for Non-Federal Entity Contracts Under Federal Awards

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or sub-recipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or sub-recipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or sub-recipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

(G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended - Contracts and sub-grants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Debarment and Suspension (Executive Orders 12549 and 12689) - A contract award (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) - Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

§ 200.323 Procurement of recovered materials.

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

§ 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.

(a) Recipients and sub-recipients are prohibited from obligating or expending loan or grant funds to:

(1) Procure or obtain;

(2) Extend or renew a contract to procure or obtain; or

(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

(b) In implementing the prohibition under Public Law 115-232, section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

(c) See Public Law 115-232, section 889 for additional information.

(d) See also § 200.471.

200.322 Domestic preferences for procurements.

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all sub-awards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.


PRIME CONTRACTOR'S AGREEMENT OF COMPLIANCE

The following prime contractor hereby agrees to comply with all applicable Federal, State and local laws and regulations pertaining to this federally funded project. Particular attention is called to the requirements of the Davis-Bacon Act, the Contract Work Hours Act, the Copeland Anti-Kickback Act, the Federal Water Pollution Control act and the Clean Air Act.

I am familiar with and understand the provisions of the above Acts and I voluntarily agree to comply with the above laws and regulations, including weekly submission of certified and completed payroll forms (for all workmen used on project) from start of work through completion of all contracted work.

As prime contractor, I understand that I am responsible for all my subcontractors on this project. I agree to notify the City of Reno of our intentions prior to making any additions or deletions of subcontractors.

Additionally by signing below I certify that as a non-federal entity I, my principals and any sub-contractors my firm retains for this project have not been suspended or debarred by the Federal Government, and are not listed in the list of parties excluded from the Federal procurement or non-procurement programs issued by the General Services Administration.

Signed and Accepted 

Legal Name of Company Mt Rose Heating & Air Conditioning, Inc

I.R.S. Taxpayer I.D.# 88-0266831

DUNS# 622133965

Date 05/22/2023

1. **SPECIAL CONDITIONS PERTAINING TO HAZARDS SAFETY STANDARDS AND ACCIDENT PREVENTION**

A. Lead-Based Paint Hazards

(Applicable to contracts or rehabilitation of residential structures)

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based paint regulations, 24 CFR Part 35. The Contractor and Subcontractors shall comply with the provisions for the elimination of lead base paint hazards under sub-part B of said regulations. The Owner will be responsible for the inspections and certifications required under Section 35.14 (f) thereof.

B. Use of Explosives

When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe all local, state and Federal laws in purchasing and handling explosives. The Contractor shall take all necessary precautions to protect completed work neighboring property, water lines, or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timber, steel or rope mats.

C. Danger Signals and Safety Devices

The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under these specifications or contract.

2. MINORITY PARTICIPATION, EXECUTIVE ORDER 11625

Executive Order 11625 authorizes the Secretary of Commerce to supervise the implementation of the Minority Business Enterprise Program. This program is designed to extend the opportunity for participation in the U.S. free enterprise system to socially and economically disadvantaged persons. The President has required all departments and agencies receiving Federal Funds to establish goals for improving minority participation efforts in 1980. In order to meet the substance of Executive Order 11625 a 10% level of minority business participation for programs funded with Community Development Block Grant monies has been established. In order for Reno to be in compliance with 11625 all contractors working on projects funded through Community Development must make full and good faith effort to obtain a 10% level of minority participation in contracts and subcontracts for goods and services.

3. CERTIFICATION OF COMPLIANCE WITH AIR AND WATER ACTS

(Applicable to Federally assisted construction contracts and related subcontracts exceeding \$100,000)

Compliance with Air and Water Acts

During the performance of this Contract, the Contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended. In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following:

(1) A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

(2) Agreement by the Contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued there under.

(3) A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract is under consideration to be listed under the EPA List of Violating Facilities.

(4) Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraph (1) through (4) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.

4. BREACH OF FOREGOING FEDERAL LABOR STANDARDS PROVISIONS

In addition to the causes for termination of this Contract as herein elsewhere set forth, the Local Public Agency or Public Body reserves the right to terminate this contract for the contractor or any subcontractor whose subcontract covers any of the work covered by the Contract shall breach any of these Federal Labor Standards Provisions. A breach of these Federal Labor Standards Provisions may also be grounds for debarment as provided by the applicable regulations issued by the Secretary of Labor, United States Department of Labor.

5. WAGE RATES

The Contractor is responsible in keeping informed of current Wage Rates and complying with same.

The following section contains materials from the

United States Department of Labor

Please refer any questions concerning this section to:

Krysti Smith
City of Reno
P.O. Box 1900
Reno, NV 89505
(775) 433-8681
smithk@reno.gov

**BIDDERS STATEMENT
ON
PREVIOUS CONTRACT
SUBJECT TO EEO CLAUSE**

"The Bidder (Proposer) shall complete the following statement by checking the appropriate boxes.

The Bidder (Proposer) has ☐ has not ☐ participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The Bidder (Proposer) has ☐ has not ☐ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontracts.

If the Bidder (Proposer) has participated in a previous contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder (Proposer) shall submit a compliance report on Standard Form 100, 'Employee Information Report EEO-1' prior to the award of contract."

BIDDER: Mt Rose Heating & Air Conditioning, Inc

BY: 

Vice President

Title

DATE: 05/22/2023

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted.
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
 - d. "Minority" includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin.
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race.
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands).
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered

contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally-assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or woman sent by the contractor or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligation.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions, including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.
 - i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
 - j. Encourage present minority and female employees to recruit other minority persons and women and where reasonable, provide after school summer and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60.3.
 - l. Conduct at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in

fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority.

Consequently, the contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or national origin.
11. The contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
12. The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The contractor, in fulfilling its obligations under these specifications shall implement affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

The following Notice shall be included in and shall be a part of all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000 to be performed in geographical areas designated by the Director.

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered areas are as follows:

**GOALS FOR MINORITY
PARTICIPATION IN
EACH TRADE**

8.2%

**GOALS FOR FEMALE
PARTICIPATION IN
EACH TRADE**

6.9%

These goals are applicable to all the contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederal involved construction.

The contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Compliance Officer, U.S. Department of Labor, P.O. Box 40924, Reno, NV 89504, within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for

construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is Washoe County.

THE EQUAL OPPORTUNITY CLAUSE

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal government or borrowed on the credit of the Federal government pursuant to a grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

3. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of

the Secretary of Labor.

5. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6. In the event of the contractor's noncompliance with the discrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 504 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality, or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

(33F.R. 7804, May 28, 1968, as amended at 34 FR 744, Jan. 17, 1969; 40 FR 14083, Mar. 28, 1975)

**Please refer any questions concerning
Davis-Bacon Wage Rates**

TO:

Krysti Smith
City of Reno
P.O. Box 1900
Reno, NV 89505
(775) 433-8681
smithk@reno.gov

To request

A copy of "A Contractor's Guide to Prevailing Wage Requirements for Federally-Assisted Construction Projects" can be obtained by contacting the city of Reno employee listed above.

Effective January 28, 2015

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT
AND OTHER RESPONSIBILITY MATTERS**

This certification needs to be completed by all City of Reno Suppliers who are fulfilling a single procurement where funding is provided by Federal grant funds. Please complete, sign, and submit form to the City Finance Department.

- 1) The undersigned certifies, to the best of his or her knowledge and belief, that:
 - a) The Offeror and/or any of its Principals:
 - i) Are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and
 - ii) Have not within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and
 - iii) Are not presently indicted for, or otherwise criminally or civilly charged by a government entity with, commission of any of the offenses enumerated in (a) and (b) of this provision; and
 - iv) Have not within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.
- 2) "Principals," for the purpose of this certification, means officer; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar position). This Certification concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Section 1001, title 18, United States Code;
- 3) The Offeror shall provide immediate written notice to City of Reno Finance Department if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances;
- 4) A certification that any of the items in this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish

a certification or provide such additional information as requested by City of Reno may render the Offeror non-responsive;

5) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings; and

6) The certification of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the City of Reno may terminate the contract resulting from this solicitation for default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under Section 1001, title 18, United States Code, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Printed Name and Title of Authorized Representative

Joe Bingham - Vice President

Signature of Authorized Representative



Firm Name

Mt Rose Heating & Air Conditioning, Inc

Date

05/22/2023

I am unable to certify to the above statement. My explanation is attached.

Signature _____ Date _____

ANTI- LOBBYING CERTIFICATION

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.
4. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
5. The Contractor, MT Rose Heating & Air Conditioning, Inc, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.



Signature of Contractor's Authorized Official

Joe Blingham - Vice President

Name and Title of Contractor's Authorized Official

05/22/2023

Date

SECTION 070 – CONTRACT

CONTRACT

This agreement, made and entered into this 19th day of July, 2023 in Reno, Nevada, by and between the City of Reno, hereinafter called the City, and MT. ROSE HEATING & AIR CONDITIONING, INC., hereinafter called the Contractor.

Witnesseth, that the Contractor agrees with the City, for the consideration and agreements hereinafter mentioned and contained to be made and performed by the City, and under the conditions expressed in two (2) bonds bearing even date with these presents, approved by the City Attorney and hereunto annexed, that they, the Contractor, shall and will at their own proper cost and expense, do all the work and furnish all the materials, necessary for the substantial construction and completion and to the satisfaction of the City,

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

together with incidental items necessary to complete the work in strict conformity, in every part and particular, with the annexed plans, special provisions and technical specifications which are made a part hereof (Contract Documents), and in full compliance with the terms of this agreement.

And the Contractor hereby further agrees to receive and accept the unit prices set forth in the "Schedule of Prices" forms hereto annexed and hereby made a part of this agreement, as full compensation for furnishing all materials and labor, and the doing of all work, to the satisfaction of the City and in the manner and under the conditions hereinafter specified.

The City hereby promises and agrees with the Contractor, to employ, and does hereby employ, the Contractor to provide the materials and to complete all the work according to the terms and conditions herein contained and referred to, for the prices in the Proposal Schedule of Prices Bid form, and hereby contracts to pay the said Contractor at the time, in the manner, and upon the conditions set forth in the Contract Documents, and the said parties themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to the full performance of the covenants herein contained.

The Contractor further agrees that no monies payable under this contract shall be assigned by power of attorney, or otherwise, except upon written consent of the City.

The Contractor covenants and agrees to conform to and comply with all requirements contained in Wage and Equal Opportunity requirements hereto annexed and hereby made a part of this Agreement. The Contractor further agrees that they shall promptly repair, replace, restore or rebuild, as the City may determine, any finished work in which defects of materials or workmanship may appear or to which damage may occur, because of such defects, during a one-year period subsequent to the date of final acceptance.

It is further expressly agreed, by and between the parties hereto, that should there be any conflict between the Contract Documents and the Proposal of said Contractor, then Contract Documents shall

control and nothing herein shall be considered an acceptance of the said terms of said proposal conflicting therewith.

Furthermore, the components of the Contract Documents shall be assigned the following hierarchy, with the items listed in order of decreasing control as follows:

- Executed Change Orders
- Contract
- Addenda
- Special Provisions or Technical Specifications
- Supplemental General Provisions
- Proposal
- City of Reno Standard Detail Drawings
- Standard Specifications for Public Works Construction

In the event of a conflict between the Specifications and the Drawings, the more restrictive shall prevail.

The Contractor hereby further agrees to receive and accept the Contract Sum of


One Million-Four hundred and thirty thousand Dollars

(\$ 1,430,000.00), as full compensation for furnishing all materials and labor, and the doing of all work, to the satisfaction of the Owner, and in the manner and under the conditions specified in the Contract Documents.

And the said Contractor hereby further agrees that the payment of the final amount due under this Contract shall release the City from any and all claims or liability on account of work performed under this Contract other than such claims, if any, as may be specifically excepted by the Contractor in writing at the time final payment is made.

In witness whereof, the parties to these presents have hereunto set their hands and seals the year and date first above written.

ATTEST:


City Clerk, City of Reno



City of Reno, Nevada


Hillary L. Schieve, Mayor

I hereby certify that I have examined the written contract and find the same to be in accordance with the Reno Municipal Code.

By: 
(Deputy City Attorney)

CONTRACTOR'S SIGNATURE FOLLOWS ON NEXT PAGE

CONTRACTOR'S ACKNOWLEDGEMENT

MT. ROSE HEATING & AIR CONDITIONING, INC.

(Company Name)

(Principal Signature)

JOE BINGHAM

(Principal Printed Name)

CONTRACTOR'S NOTARY:

State of Nevada

County of Washoe

Joseph Bingham

(Name of party signing this affidavit & Proposal Form)

known to me to be the Vice President

(Title)

of

Mt Rose Heating + Air Conditioning, Inc.

(Company Name)

acknowledged to me that he executed the above instrument.

Sworn to before me this 21st day of July, 2023.

[Signature]

(Notary Public)



(Stamp/Seal)

SECTION 075 - PERFORMANCE BOND

BOND NO. 30194397

KNOW ALL MEN BY THESE PRESENTS:

That WHEREAS, the City of Reno in the State of Nevada has awarded to
MT. ROSE HEATING & AIR CONDITIONING, INC.

_____ hereinafter designated as the
"Principal", a Contract for construction of the California Building HVAC System Upgrade, Contract
Number FM980B, and WHEREAS, said Principal is required under the terms of said Contract to furnish
a Bond for the faithful performance of said Contract, which Contract in its entirety by this reference is
made a part hereof;

NOW, therefore, we the Principal and Western Surety Company
as surety, are held and firmly bound unto the City of Reno in the State of Nevada, in the penal sum of
One Million-Four hundred and thirty thousand Dollars

(\$ 1,430,000.00), lawful money of the United States, being not less than one hundred
percent (100%) of the estimated Contract cost of the work for the payment of which sum well and truly
to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally,
firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal, their heirs,
executors, administrators, successors, or assigns, shall in all things abide by, and well and truly keep
and faithfully perform the covenants, conditions and agreements in the said Contract and any alterations
made as therein provided, on his or its part to be kept and performed at the time and in the manner
therein specified, and in all respects according to their true intent and meaning; and shall indemnify and
save harmless the City of Reno in the State of Nevada, its officers and agents, as therein stipulated; then
this obligation shall become null and void. Otherwise, it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of the said contract, the above obligation shall
hold good for a period of one (1) year after the completion and acceptance of the said work, during which
time if the above bounden principal, their heirs, executors, administrators, successors or assigns shall
make full, complete and satisfactory repair and replacements or totally protect the said City of Reno in
the State of Nevada from loss or damage made evident during said period of one (1) year from the date
of acceptance of said works, and resulting from or caused by defective materials or faulty workmanship
in the prosecution of the work done.

Further, the above obligation shall hold good by the above bounden Principal, his heirs, executors,
administrators, successors or assigns during the one (1) year warranty period if any defect is found to
exist and efforts to rectify the defect cannot be executed during the one (1) year warranty period, the
warranty period shall extend until the defect is remedied to the full and complete satisfaction of the City
of Reno in the State of Nevada. If this defect causes additional defects during this extended warranty
period, the additional defects shall also be remedied by the above bounden Principal, his or its heirs,
executors, administrators, successors or assigns to the full and complete satisfaction of the City of Reno
in the State of Nevada. The above obligation shall remain in full force and effect; otherwise the above
obligation shall be void.

And the said surety, for value received hereby stipulates and agrees that no change, extension of
time, alteration or addition to the terms of the Contract, or to the work to be performed hereunder, or

to the specifications accompanying the same, shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration to the terms of the contract, or to the work, or to the specifications.

And the said surety, for value received, stipulates and agrees, if requested to do so by the City of Reno, to perform and fully complete the work in said Contract, pursuant to the terms and conditions therein, if for any cause, the Principal fails or neglects to perform and complete the work; surety further agrees to commence the work within twenty (20) days after notice from the City of Reno, and to fully complete the work with due diligence according to the Contract documents.

The Bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under NRS Chapter 339, so as to give a right of action to them or their assigns in any suit brought upon this Bond.

CONTRACTOR:

MT. ROSE HEATING & AIR CONDITIONING, INC.

(Company Name)

(Principal Signature)

JOE BINGHAM

(Principal Printed Name)

CONTRACTOR NOTARY:

State of Nevada

County of Washoe

Joe Bingham
(Name of party signing this affidavit & Proposal Form)

known to me to be the Vice President of
(Title)

Mt. Rose Heating & Air Conditioning, Inc
(Company Name)

acknowledged to me that he executed the above instrument.

Sworn to before me this 28th day of July, 2023.

Katie Philippi
(Notary Public)

APPROVED AS TO LEGAL FORM:

[Signature]
(Deputy City Attorney)



CITY OF RENO
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B

PERFORMANCE BOND

SURETY:

Western Surety Company
(Surety Company Name)
Andrea Cantlon
(Surety Authorized Signature)
Andrea Cantlon, Attorney-In-Fact
(Surety Printed Name)

SURETY NOTARY:

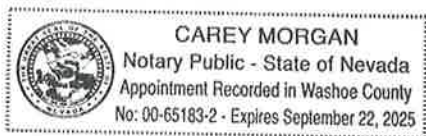
State of NEVADA

County of WASHOE

Andrea Cantlon
(Name of party signing this affidavit & Proposal Form)
known to me to be the Attorney-In-Fact of
(Title)
Western Surety Company
(Company Name)

she
acknowledged to me that ~~he~~ executed the above instrument.

Sworn to before me this 24th day of July, 2023.



Carey Morgan
(Notary Public)

Countersigned by Licensed Agent

Andrea Cantlon
(Signature) Andrea Cantlon, Resident Agent
(Stamp/Seal)

On July 24, 2023 for L/P Insurance Services, LLC
(Date) (Licensed Agent Company Name)

300 East 2nd Street, Suite 1300
(Street Address)

Reno, Nevada 89501
(City, State & Zip Code)

775-336-1987
(Phone Number)

BOND NO. 30194397

CONTRACTOR:

MT. ROSE HEATING & AIR CONDITIONING, INC.

(Company Name)

(Principal Signature)

JOE BINGHAM

(Principal Printed Name)

CONTRACTOR NOTARY:

State of Nevada

County of Washoe

Joe Bingham
(Name of party signing this affidavit & Proposal Form)

known to me to be the Vice President of
(Title)

Mt Rose Heating & Air Conditioning, Inc
(Company Name)

acknowledged to me that he executed the above instrument.

Sworn to before me this 28th day of July, 2023.

Katie Philippi
(Notary Public)



(Stamp/Seal)

APPROVED AS TO LEGAL FORM:

Susan Baer Rethme
(Deputy City Attorney)

CITY OF RENO
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B

LABOR AND MATERIALS BOND

SURETY:

Western Surety Company

(Surety Company Name)

Andrea Cantlon

(Surety Authorized Signature)

Andrea Cantlon, Attorney-In-Fact

(Surety Printed Name)

SURETY NOTARY:

State of NEVADA

County of WASHOE

Andrea Cantlon

(Name of party signing this affidavit & Proposal Form)

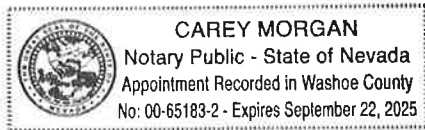
known to me to be the Attorney-In-Fact of
(Title)

Western Surety Company

(Company Name)

she
acknowledged to me that ~~he~~ executed the above instrument.

Sworn to before me this 24th day of July, 2023.



Carey Morgan

(Notary Public)

Countersigned by Licensed Agent

Andrea Cantlon

(Stamp/Seal)

(Signature) Andrea Cantlon, Resident Agent

On July 24, 2023
(Date)

for L/P Insurance Services, LLC
(Licensed Agent Company Name)

300 East 2nd Street, Suite 1300
(Street Address)

Reno, Nevada 89501
(City, State & Zip Code)

775-336-1987
(Phone Number)

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Teri Lynn Wood, Patricia Owens, Nick Rossi, Nina Dedeker, Andrea Cantlon, Peter Kitowski, Carey Morgan, Shelly Demaray, Individually

of Reno, NV, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 27th day of April, 2022.



WESTERN SURETY COMPANY

Paul T. Bruflat

Paul T. Bruflat, Vice President

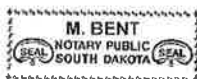
State of South Dakota
County of Minnehaha

} ss

On this 27th day of April, 2022, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent

M. Bent, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 24th day of July, 2023.



WESTERN SURETY COMPANY

L. Nelson

L. Nelson, Assistant Secretary

Authorizing By-Law

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

SECTION 100 – SUPPLEMENTAL GENERAL PROVISIONS

CITY OF RENO – MAINTENANCE & OPERATIONS DEPARTMENT

SUPPLEMENTAL GENERAL PROVISIONS

**CALIFORNIA BUILDING HVAC SYTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

100.00.01 – STANDARD SPECIFICATIONS

All materials furnished and work performed shall be done in accordance with the 2012 edition of "Standard Specifications for Public Works Construction" (Orange Book) and any revisions thereto if not covered by the Supplemental General Provisions and the contract documents. The "Standard Specifications for Public Works Construction" are herein referred to as "Standard Specifications". In the event of conflict, error, ambiguity or discrepancy between provisions of the Supplemental General Provisions and/or the contract documents and the Standard Specifications hereinbefore mentioned, the Supplemental General Provision and the contract documents shall take precedence. The Supplemental General Provisions are additions to the Standard Specifications unless specified as a deletion or replacement.

Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or laws or regulations in effect at the time of opening of bids, except as may be otherwise specifically stated in these contract documents. The contract documents shall take precedence over any provisions of any such laws or regulations applicable to the performance of the work unless the interpretations of the contract document provisions would result in violation of such law or regulation.

100.00.02 – STANDARD DETAILS

The City of Reno "Supplemental Standard Drawing Details" and any revisions thereto, herein referred to as "Standard Details" shall apply to this contract except as modified in the Improvement Plans and/or by these Specifications.

100.00.03 – SCOPE OF WORK

1) removal of existing HVAC equipment, which includes, but is not limited to two interior wall mounted heaters, one exterior wall mounted air conditioner, and one boiler), and repair (patch and paint) the walls where equipment is removed; 2) installation of new mechanical HVAC system consisting of new condensers, air handlers, louvers, ductwork, controls, and sensors; 3) installation of new electrical service to support HVAC upgrades; 4) installation of security fencing and concrete equipment pads; and 5) perform any other miscellaneous work as outlined in the plans and specifications.

Contract prices in the "Schedule of Prices" forms shall be considered full compensation for all labor, materials, tools, equipment, overhead profit, insurance bonding, taxes, and all other incidentals necessary to complete the construction as shown on the Improvement Plans and/or as specified in Contract Documents under this Contract. Actual installed quantities of each item proposed on a unit price basis will be determined during construction in the manner set up for each proposed item in these Specifications. Payment for all items in the "Schedule of Prices" forms will constitute full compensation for all work shown and/or specified to be performed under this project.

100.00.04 – CONTRACTOR COOPERATION

Special Construction phasing/order of work shall be per Section 100.21 of these specifications. The Contractor should note that, in addition to this Contract, there may be other contractors executing construction contracts for other agencies in the area. In the event of concurrent work, it shall be the responsibility of the Contractor to coordinate operations in such manner so that all requirements, restrictions and stipulations specified in these Contract Documents are met.

100.01.11 – CONTRACT TIME

This is a ONE HUNDRED AND TWENTY FIVE (125) calendar day construction schedule. Construction shall start upon confirmation by the contractor that materials have been received. The contractor shall comply with the requirements set forth in Section 100.21 – Phasing, Order of Work and Traffic Control Considerations. The Contract time includes up to three (3) weather days. In the event of additional weather delay exceeding the three (3) allocated, one calendar day will be extended to the contract and the contract end date will extend. Where used within this document, the following definitions shall apply to weather days, the hours, and days of operation:

Normal Working Hours and Days: From 7:00 AM to 5:00 PM, Monday through Friday, excluding holidays. This applies to equipment start up and operation of all equipment.

Night Time Hours: From one-half (1/2) hour after sunset to one-half (1/2) hour before sunrise. This applies to the start-up and operation of all equipment.

Weekend Working Hours: From 7:00 PM Friday to 5:00 AM Monday, excluding Holidays.

Weather Day: A weather day will be defined as delays caused by the effects of rains or other inclement weather conditions, related adverse soil conditions or suspension of operations that prevent the Contractor from productively performing controlling items of work resulting in:

1. The Contractor being unable to work at least 50% of the normal work day on pre-determined controlling work items; or

2. The Contractor must make major repairs to work damaged by weather, provided that the damage is not attributable to the Contractor's failure to perform or neglect; and provided that the Contractor was unable to work at least 50% of the normal workday on pre-determined controlling work items.

If the Contractor intends to seek approval to perform contract work outside normal working hours and/or working days such approval must be obtained from the City's Project Manager at least forty-eight (48) hours prior to commencing such work.

If the Contractor intends to seek approval to perform contract work on Saturday or Sunday, approval must be obtained by the Monday preceding work on the Saturday or Sunday for which work is planned. If the Contractor intends to seek approval to perform work on a legal holiday, they must obtain such approval from the City's Project Manager at least seven (7) days in advance.

The Contractor shall be responsible for any services, costs, overtime, etc., incurred by City for work performed on legal holidays and outside the normal working hours and days.

100.01.17 – HOLIDAYS

Delete Standard Specification section and replace with the following:

No contract work shall be performed on the following legal holidays recognized by the City unless approved by the City's Project Manager:

New Year's Day (January 1)
Martin Luther King Day (3rd Monday in January)
President's Day (3rd Monday in February)
Memorial Day (Last Monday in May)
Juneteenth (June 19)
Independence Day (July 4)
Labor Day (1st Monday in September)
Nevada Day (Last Friday in October)
Veteran's Day (November 11)
Thanksgiving Day (4th Thursday in November)
Day after Thanksgiving Day (4th Friday in November)
Christmas Day (December 25)
Other days declared by the President of the United States, Governor of Nevada

100.05.01 – EXAMINATION OF PLANS AND SITE

Delete Standard Specification section and replace with the following:

Each Bidder shall visit the site of the proposed work and become fully acquainted with conditions relating to construction and labor so that the Bidder may fully understand the vehicle and pedestrian traffic volumes, special access requirements to businesses, existing conditions relating to lateral locations, facilities, difficulties, and restrictions attending the execution of the work under the Contract. Bidder shall thoroughly examine and be familiar with the drawings and Specifications. The failure of any Bidder to receive or examine any form, instrument, addendum or other document or to visit the site and become acquainted with conditions there existing shall in no way relieve any obligations with respect to the Bidder's proposal or to the Contract.

100.11 – AWARD OF CONTRACT OR REJECTION OF PROPOSALS

Delete Standard Specification section and replace with the following:

If the award is made, the City will award the contract to the lowest responsive and responsible bidder who complies with the instructions in these contract documents. The award, if made, will be within ninety (90) calendar days after the opening of the proposal.

The City reserves the right to reject any or all proposals. The competency and responsibility of Bidder as evidenced by the information accompanying the proposal, which will be subject to verification, will be considered in making the award. The proposal may be rejected if the unit prices contained in the proposal are unbalanced, either in excess or below reasonable cost analysis.

The City reserves the right to waive requirements relating to minor irregularities in the proposal documents when it is deemed to be in the best interests of the City to do so.

Before any contract is awarded, the bidder may be required to furnish a complete statement of origin, composition, and manufacture of any or all materials to be used in the construction of the work, together with samples, if required by the Specifications to determine their quality and fitness for the work.

100.12 – CONTRACT, PROJECT CONSTRUCTION COORDINATION

The Bidder to whom award is made shall execute a written Contract with the City of Reno within ten (10) calendar days after the date on which the Contract is awarded.

At the preconstruction meeting, the Contractor shall designate a representative who will be on the job or available for communication at all times during construction. The Contractor's representative shall be available twenty-four (24) hours a day by mobile telephone, home telephone, answering service, pager, or other means acceptable to the City's Project Manager. The representative shall be the contact person representing the Contractor and shall be capable of giving direct field orders as the need arises and addressing property owner concerns. Official job communication shall be conducted between the Contractor's representative and the City's Project Manager. It is the intent of this Contract that the Contractor's representative shall be the same person for the entire duration of the project. A proposed change of the Contractor's representative during the course of the project is subject to approval by the City.

100.13 – CONTRACT SECURITY

The successful bidder shall, at the time of signing the Contract, furnish the following listed bonds of a surety company or companies authorized to do business in the State of Nevada and satisfactory to the City of Reno. The bonds shall be made payable to the City of Reno.

100.13.01 – PERFORMANCE BOND

A bond in an amount equal to 100 percent of the full amount of the Contract, as surety for the faithful performance of the Contract, and for the fulfillment of such other requirements as may be provided by law shall be required. The faithful performance bond shall remain in effect for one (1) year after final payment has been accepted by the Contractor.

100.13.02 – LABOR AND MATERIALS BOND

A bond in an amount equal to 100 percent of the full amount of the Contract as surety for the payment of materials and labor costs for which the Contractor has obligated themselves will be required.

100.14 – INSURANCE

Delete Standard Specification section and replace with the following:

Each insurance policy shall bear at least thirty (30) day written notice of cancellation to the certificate holder for any reason other than non-payment of premium which shall bear at least ten (10) day written notice of cancellation.

If the city is notified prior to completion of this contract, that any required insurance is or will be no longer in effect or is scheduled to be cancelled, the city will issue a notice that if insurance is not reinstated prior to expiration of the policy the work will be suspended. It will be the sole responsibility of the contractor to re-establish any and all insurances no longer in effect and provide a copy of current insurance to the City's Project Manager before contractor is allowed to continue work on the jobsite. The insurance must be the same coverage as the original insurance required by this contract. The contractor is not allowed to do any work until it receives a written notice from the city to resume work. The city will not bear any costs associated with the work stoppage due to the lapse in insurance, nor any costs associated with any mobilization or de-mobilization incurred by the contractor due to the insurance lapse. Working days will remain in effect during this time and will continue to count as if the contractor was still working.

If the insurance is not re-established prior to the cancellation date, the contractor will be considered in breach of contract and the contract will be terminated pursuant to Section 100.28.

100.14.01 – LIABILITY INSURANCE

Delete Standard Specifications section and replace with the following:

At all times during the agreement term, Contractor shall procure and maintain, at its sole expense, the following insurance coverage unless waived in writing:

Commercial General Liability at least as broad as Insurance Services Office Commercial General Liability Coverage "occurrence" form CG 00 01 04 13 or an equivalent form. The Comprehensive General Liability Coverage shall include, but is not limited to, liability coverage arising from premises, operations, independent contractors, products and completed operations, personal and advertising, injury, blanket contractual liability and broad form property damage.

The following coverage shall not be limited, by endorsement or otherwise:

1. Contractual liability coverage, including the definition of "Insured Contract" and the contractual liability exception to the employer's liability exclusion.
2. Completed operations coverage, including the subcontractor exception to the "damage to 'your work'" exclusion.
3. The provisions of Subparts (5) and (6) of the "damage to property" exclusion pertaining to "that particular part..." in ISO form CG 00 01 04 13.

If any underground work will be performed, the policy limits shall be no less than \$2,000,000 per occurrence, \$4,000,000 general aggregate and \$4,000,000 products-completed operations aggregate and shall be endorsed to include electronic data liability coverage form CG 04 37 (or equivalent). The City waives this requirement for this project only

In addition, Explosion, Collapse, Pollution and Underground coverage must be reflected in the insurance certificates and shall be no less than \$2,000,000 per occurrence, \$4,000,000 general aggregate and \$4,000,000 products-completed operations aggregate.

The Contractor shall maintain limits of no less than \$2,000,000 per occurrence, \$4,000,000 general aggregate and \$4,000,000 products-completed operations aggregate, or the amounts customarily carried by the Contractor, whichever are greater. The general aggregate limit shall apply on a per project or location basis.

In the event that asbestos or other hazardous materials risks are excluded from the Comprehensive General Liability, the Contractor must provide an additional policy insuring asbestos or hazardous materials abatement liability that does not exclude asbestos abatement, asbestos disease, hazardous materials disease or transportation to an EPA approved disposal site, with limits of not less than Two Million Dollars (\$2,000,000) per occurrence. Insurance shall be occurrence based.

The policy shall include the City, including its elected officials, officers, employees, agents and volunteers as additional insureds with respect to liability arising out of the activities performed by or on behalf of the Contractor, including the insured's general supervision of the Contractor, products and completed operations of the Contractor and for premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the additional insureds.

The Additional Insured Endorsements for General Liability shall be at least as broad as the unmodified ISO CG 20 10 04 13 and ISO CG 20 37 04 13 endorsements, or equivalent, including additional insured coverage for the Contractor's premises, operations products and completed operations exposures. The certificate shall confirm Excess Liability is following form.

The Contractor shall obtain and maintain Completed Operations Liability Insurance through the statute of repose after completion of the Project. The limit of Completed Operations Liability Insurance coverage shall be the same as the limit for General Liability.

The Contractor's insurance coverage shall be considered primary insurance. Any insurance or self-insurance maintained by the City shall be excess of the Contractor's insurance and shall not contribute in any way.

The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

Any failure by the Contractor to comply with reporting provisions of the policies shall not affect its obligations to the additional insureds.

The Contractor shall furnish the City a policy or certificate of liability insurance issued by an authorized representative of the insurance carrier including policy forms and endorsements confirming the required coverage. The contract number and name of contract for this project shall be included on the certificate.

This contract includes work that may result in exposure to "hazardous material" as this term is defined by applicable law, including, but not limited to waste, asbestos, fungi, bacterial, and mold.

Automobile Coverage at least as broad as Insurance Services Office Business Auto Coverage form CA 00 01 10 13 or an equivalent form covering Automobile Liability Symbol 1 "Any Auto". In lieu of a separate Business Auto Liability Policy, the City may agree to accept Auto Liability covered in the General Liability Policy, if non owned and hired auto liability are included.

The Contractor shall maintain limits of no less than \$1,000,000 or the amount customarily carried by the contractor, whichever is greater, combined single limit per accident for bodily injury and property damage. No aggregate limit may apply.

The Contractor's policies shall be endorsed to provide a thirty (30) day written notice of cancellation to the certificate holder for any reason other than non-payment of premium which shall bear at least ten (10) day written notice of cancellation.

Certificate Holder: City of Reno
P.O. Box 1900
Reno, NV 89505

Acceptability of Insurers: Insurance is to be placed with an A.M. Best Company, Inc. rating level of **A-** or better, financial size category of **VIII** or better, or otherwise approved by the City in its sole discretion. City reserves the right to require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada, or on the Insurance Commissioner's approved but not admitted lists.

The Contractor shall include all subcontractors as insureds under its policy or it shall require its subcontractors to maintain separate liability coverages and limits as set forth herein.

100.14.01 – PROPERTY INSURANCE

The Contractor shall purchase and maintain property insurance upon the entire work at the site for the full cost of replacement at the time of loss. This insurance shall include the interests of the Owner, the Contractor, subcontractors, and sub-subcontractors in the work. This insurance shall be written as a builder's risk, all-risk, or equivalent form to cover all risks of physical loss except those specifically excluded by the policy and shall insure at least against the perils of fire, theft, vandalism and malicious mischief, lightning, explosion, windstorm, and hail, smoke, aircraft and vehicles, riot and civil commotion, debris removal, flood, earthquake, earth movement, water damage, wind, testing, if applicable, collapse however caused, and damage resulting from defective design, workmanship or material.

This policy shall provide for a waiver of subrogation in favor of the City and Contractor.

The insurance shall remain in effect until final acceptance by the City.

Partial occupancy or use of any building shall not commence until the Contractor has secured the consent of the insurance company or companies providing the coverage required in this paragraph. Prior to commencement of the work, the Contractor shall provide certificates of insurance for the property policy or policies obtained in compliance with this section.

Acceptability of Insurers: Insurance is to be placed with an A.M. Best Company, Inc. rating level of **A-** or better, financial size category **VIII** or better, or otherwise approved by the City in its sole discretion.

City reserves the right to require that Contractor's insurer be a licensed and admitted insurer in the State of Nevada or on the Insurance Commissioner's approved but not admitted lists.

100.14.02 - WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

The Contractor shall purchase and maintain Workers' Compensation and Employer's Liability insurance at least as broad as National Council on Compensation Insurance (NCCI) policy form WC 00 00 00 B 07/11, or equivalent, providing coverage meeting the requirements of the Workers' Compensation law of the State of Nevada.

The policy shall include an endorsement waiving the insurance company's rights of subrogation against the City. This endorsement shall be at least as broad as National Council on Compensation Insurance (NCCI) Waiver of Our Right to Recover from Others Endorsement form WC 00 03 13.

It is understood and agreed that there shall be no Worker's Compensation and Employer's Liability coverage provided for the Contractor or any subcontractor by the City. The Contractor, and any subcontractor(s), shall procure, pay for and maintain required coverage. The Contractor agrees, as a precondition to the performance of any work under this Contract and a precondition to any obligation of the City to make any payment under this Contract, to provide the City with certificates issued by an insurance company that shows compliance with this Contract and Nevada Revised Statutes (NRS) 616B.627 and 617.210, respectively. Should the Contractor be self-funded, the Contractor shall so notify the City in writing prior to the signing of a Contract. The City reserves the right to accept or reject a self-funded Contractor and to approve the amount of any self-insured retentions. The Contractor agrees that the City is entitled to obtain additional documentation, financial or otherwise, for review prior to entering into a contract with the self-funded contractor.

Upon completion of the project, the Contractor shall, if requested by the City, provide the City with a Final Certificate for itself and each subcontractor showing that the Contractor and each subcontractor had maintained the required insurance by paying all premiums due throughout the entire course of the project. If the Contractor or subcontractor is a sole proprietor, coverage for the sole proprietor must be purchased and evidence of coverage must appear on the Certificate of Insurance and Final Certificate.

Worker's Compensation and Employer's Liability: Workers' Compensation coverage shall be provided with statutory limits in the State of Nevada. Employer's Liability limits of \$1,000,000 each accident, \$1,000,000 each employee for disease and \$1,000,000 policy limit for disease.

If the Contractor fails to make payment for the workmen's compensation insurance, the City will immediately make payment and deduct the cost thereof from the payment then or thereafter due the Contractor.

100.14.03 – ACCIDENT PREVENTION AND SAFETY

This Section specifies procedures for complying with applicable laws and regulations related to worker safety and health. It is not the intent of the City to develop, manage, direct, and/or administer the safety and health programs of contractors or in any way assume the responsibility for the safety and health of their employees. It is required that all contractors adhere to applicable federal, state, and local safety and health standards.

The Contractor shall comply with the Federal Contract Work Hours and Safety Standards Act, as set forth in Title 29, CFR. Copies of the regulations may be obtained at www.ecfr.gov.

The Contractor shall comply with the provisions of the State of Nevada Occupational Safety and Health Act and Federal Occupational Safety and Health Act, as amended.

The Contractor shall provide all safeguards, safety devices, and protective equipment and take any other needed actions, on their own responsibility, reasonably necessary to protect the life and the health of employees on the job, the safety of the public, and to protect property in connection with the performance of the work covered by this contract.

It is not the intent of the City to list and identify all applicable safety codes, standards, and/or regulations requiring compliance by the Contractor and their subcontractor groups. Contractors and their subcontractors shall be solely responsible for identifying and determining all safety codes, standards, and regulations which are applicable to the work.

The Contractor shall notify the City's Project Manager immediately of all incidents involving personal injury and/or property damage. Provide a written report known as the Incident Report within 24 hours of any incident. Report for each incident occurrence shall include:

1. Description of event
2. Names of personnel involved
3. Description of injuries and treatment required (short term and long term)
4. Description of property damage
5. Site visits and inspections of other agencies as a result of an incident. Include names of the persons, purpose of the visit, and any other pertinent information.

100.14.03 – DRUG/ALCOHOL PROGRAM REQUIREMENT

In order to be eligible to perform work on a City of Reno Public Works Construction Project, contractors are to have in place a drug and alcohol policy applicable to workers who will be employed on such project. This requirement is a reasonable precaution to ensure a safe and drug-free environment on City of Reno Public Works Construction Projects.

The policy is to be an approved Federal drug and alcohol policy/program which provides, at a minimum, that the use of alcohol, and use, possession, transfer, or sale of illegal drugs, narcotics, or other unlawful substances is prohibited while working on any site in connection with work performed under this Contract and assurance that the Contractor's subcontractors are required to cooperate with the Contractor's policy.

The Contractor shall demonstrate compliance with this provision by submitting an affidavit of certification for drug and alcohol policy with their bid under penalty of perjury that the policy is in place, will be actively enforced, and that workers who will be employed on the project will be subject to the policy.

The City of Reno may review the Contractor's record of its drug and alcohol policy at any time during the period following award of the bid up to and including completion of the project in order to determine whether the policy is in place.

Failure to maintain a policy may result in suspension of the Contract, pending proof of compliance by the Contractor, at no cost to the City of Reno.

The Contractor shall indemnify, defend and hold the City of Reno harmless against any and all claims, demands, suits or liabilities that may arise out of or is in any way related to Contractor's application or non-application of their drug and alcohol policy.

100.14.03. – CONFINED SPACE ENTRY

The Contractor shall be required to comply with U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, as outlined in the 29 CFR Parts 1910; "Permit-Required Confined Spaces for General Industry; Final Rule". The Contractor shall submit, at the pre-construction meeting, a written plan for confined space entry and written documentation that its employees have been trained in confined space entry procedures. The plan shall include emergency rescue operations. The documentation shall include the specific names of the trained employees and their training records. Failure to fully comply with this specification during construction may result in a work stoppage until corrective action has been taken. Any work stoppage shall be at the Contractor's expense. Such suspension time shall count against the Contractor's total number of project calendar days under the Contract.

100.14.04 – INDEMNITY

Delete Standard Specification section and replace with the following:

To the fullest extent permitted by laws and regulations the Contractor shall assume the defense of, indemnify and hold harmless the City and its Officers, Employees, and Consultants from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the said Contractor; any act or omission of Contractor arising from the work performed; or on account of or in consequence of any neglect in safeguarding the work; or the use of unacceptable materials in constructing the work; or because of any claims or amount recovered under the "Workman's Compensation Act", or any other law, ordinance, order, or decree. The money due the said Contractor under and by virtue of this Contract as may be considered necessary by the City's Project Manager for such purpose, may be retained for use of City or in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims for the injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the City's Project Manager; except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.

Reimbursement to the Contractor by the City in whole or in part for costs of protecting traffic shall not serve to relieve the Contractor of their responsibility as set forth in the Standard Specifications and these Special Provisions.

The Contractor guarantees the payment of all just claims for materials, supplies, and labor, and all other just claims against their, or any, subcontractor in connection with this Contract.

100.15.01 – PREVAILING WAGE, CERTIFIED PAYROLL

Delete Standard Specification section and replace with the following:

This project is subject to prevailing wage rates in accordance with Nevada Revised Statutes Chapter 338. The prevailing wage rates for Washoe County, as established by the Nevada State Labor Commission, shall be paid for all classifications of labor. The Contractor is responsible for verifying and adhering to all prevailing wage rates. Pursuant to Chapter 132, Statutes of Nevada 2019, enacted by the Nevada Legislature by passage of Assembly Bill No. 190 (NRS 338.030 (9)), the prevailing rates of wages are the rates in effect at the time of the opening of bids and will be paid as provided in Assembly Bill No. 190 and will be included in the conformed contract documents.

This Project is under and subject to Executive Order 11246 of September 24, 1965, and to the Equal Employment Opportunity (EEO) and Labor Standard Provisions. Minimum Wage rates have been determined by the Labor Commissioner of the State of Nevada and are set forth in the contract documents. In no case shall the wage rates be less than prescribed therein. In the event there is a difference between the minimum wage rates as predetermined by the Secretary of Labor and the prevailing wages rates as determined by the State Labor Commissioner for similar classifications of labor, the contractor or and his subcontractor shall not pay less than the wage rate which is the higher of the two. Additionally, if a classification that is being used does not appear in the Davis Bacon Wage decision, a Request for Classification will be required and will be forwarded to the U.S. Department of Labor for approval.

A forty-hour (40-hour) work week shall be performed over no less than a five (5) day week of work. A contractor or subcontractor may work in excess of forty (40) hours a week; however the contractor or subcontractor must pay overtime wages, in accordance with NRS338.020, for hours worked in excess of eight (8) hours in any given day.

The Contractor's attention is directed to NRS Chapter 338, as it relates to Public Works Projects and, specifically, changes in the requirements for submission of certified payrolls and payment of prevailing wages. The Contractor shall make arrangements for submittals at the preconstruction meeting.

The Contractor shall report in writing to the City the name and address of each subcontractor whom they will engage for work on this project within five (5) calendar days after award of Contract. **THIS SUBMITTAL DOES NOT RELIEVE THE CONTRACTOR OF THE SUBMITTAL REQUIREMENTS IN THESE SPECIFICATIONS.**

The Contractor shall report in writing to the State of Nevada Labor Commissioner the name and address of each subcontractor whom they engage for work on this project within ten (10) calendar days after each subcontractor has commenced work on the project. The Contractor shall submit a copy of this information to the City within the same timeframe.

The Contractor shall submit certified payrolls to the City for all individuals working on this project on a weekly basis. The Contractor and all subcontractors are required to submit certified payroll electronically through the City's LCPTracker program. Progress payment requests submitted by the Contractor will not be accepted unless certified payroll submittals from the Contractor and all subcontractors are current for the project period covered by the pay application.

100.15.04 – FAIR EMPLOYMENT PRACTICES/LABOR DISCRIMINATION

Delete Standard Specification section and replace with the following:

Attention is directed to the following portion of NRS Provision 338.125. Contracts negotiated between Contractors and the State, or any of its political subdivisions, shall contain the following contractual provisions:

In connection with the performance of work under this contract, the contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, sexual orientation, gender identity or expression, or age. Such Contract shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

The Contractor further agrees to insert this provision in all subcontracts hereunder, except subcontracts for standard commercial supplies or raw materials.

Any violation of such provision by a contractor shall constitute a material breach of contract. As used in this article, sexual orientation means having or being perceived as having an orientation for heterosexuality, homosexuality, or bi-sexuality. Sexuality and gender identity or expression means a gender-related identity, appearance, expression, or behavior of a person, regardless of the person's assigned sex at birth. Race includes traits associated with race, including, without limitation, hair texture and protective hairstyles.

100.15.05 – PREFERENTIAL EMPLOYMENT

Delete Standard Specification section and replace with the following:

Pursuant to NRS 338.130, in all cases where persons are employed in the construction of public works, preference must be given, the qualifications of the applicants being equal, first to persons who have been honorably discharged from the Army, Navy, Air Force, Marine Corps or Coast Guard of the United States, a reserve component thereof or the National Guard; and are citizens of the State of Nevada, and second to other citizens of the State of Nevada. If the contractor engaged on the public work is not in compliance with the provisions of this subsection, the contract is void, and any failure or refusal to comply with any of the provisions of this section renders any such contract void.

100.15.06 – AMERICANS WITH DISABILITIES ACT

The Contractor and all subcontractors shall comply with the terms, conditions, and requirements of the Americans with Disabilities Act of 1990 (P.L. 101-136), 42 U.S.C. 12101, as amended and regulations adopted thereunder contained in CFR 26.101-36.999, inclusive, and any relevant program-specific regulations.

100.15.07 – PAYMENT OF SALES AND USE TAXES

The Contractor, subcontractors, or anyone who provides labor, equipment, materials, supplies or services must comply with applicable federal, state, and local laws, including without limitation, any applicable licensing requirements and requirements for the payment of sales and use taxes on equipment, materials and supplies provided for this project.

100.15.08 – STATE OF NEVADA BUSINESS LICENSE

NRS 338.072 provides that any subcontractor of the successful bidder who is awarded the contract must also hold a state business license issued pursuant to Chapter 76 of the Nevada Revised Statutes. RMC 4.04.020 applies to subcontractors as to Business License requirements.

100.15.09 – APPRENTICES

Contractor is to comply with Nevada Revised Statutes 338.01165, enacted by the Nevada Legislature by passage of Senate Bill No. 207, setting forth the requirements for the use of apprentices on public works which requires a contractor or subcontractor to comply with certain requirements relating to the use of apprentices on public works.

100.16.03 – INSPECTION FACILITIES

Quality Control shall be the Contractor's responsibility. All samples shall be furnished by the Contractor without cost to the City. The City's Project Manager may waive sampling and testing if adequate information, properly certified, is available to indicate that materials comply with the terms of specifications. Any retests due to faulty workmanship or materials shall be paid for by the Contractor. Specific testing requirements are contained in the Standard Specifications and as modified herein. Subject to NRS 338.140, the responsibility for ensuring that the work is constructed in strict conformance with the contract documents and specifications resides solely with the Contractor.

No payment shall be made to the Contractor for the cost of delay while waiting for inspection by the City's Project Manager of completed work.

100.17 – MATERIALS AND WORKMANSHIP

The Contractor shall warrant equipment, material, and workmanship to be of first quality and approved by the City's Project Manager and shall guarantee that the quality of material and workmanship used in the job will be satisfactory for a period of one year after final acceptance of the work. Any defects occurring during the guarantee period shall be corrected in a manner satisfactory to the City's Project Manager. In the event repairs cannot be made without undue difficulty, the Contractor or his surety shall be responsible to the City for any damages determined reasonable and consistent with the circumstances and acceptable to the City.

The Contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the work. All materials shall be of good quality and new, except as otherwise provided in the contract documents.

The Contractor acknowledges that any damage to public or private property due to excavation, equipment movement or storage, foot traffic, material storage or any other contractor activity will be replaced in accordance with these Specifications to equal or better than previously existing conditions at the Contractor's expense. Grass will be re-sodded, trees and shrubs replaced in kind, irrigation systems repaired or replaced, fencing restored, and any damaged or removed structures and flatwork repaired or replaced.

100.18 – LOCATION OF WORK, PUBLIC RELATIONS

It shall be the Contractor's responsibility to notify, in writing, all residents and businesses adjacent to this project of the construction working hours and duration of work. Notification shall be provided directly to impacted properties (i.e. properties abutting the work) two (2) calendar days prior to beginning work at that location **excepting** notification for Monday and Tuesday work shall be provided no later than 7:00 PM Thursday. Notification shall be in the form of a "door hanger" or flyer that is hand-delivered by the Contractor to each residence/business. The Contractor shall provide a draft notification for the City's Project Manager's review prior to delivery to impacted properties.

"NO PARKING" signs shall be placed on each street no less than 48 hours in advance of work to be performed. Signs shall have the day or date clearly legible and shall be in good condition.

In the event of delays that require rescheduling of work, the Contractor shall re-notify impacted properties in the same manner as described in the paragraphs above.

100.18 – USE OF PRIVATE AND PUBLIC PROPERTY

The Contractor shall restrict their construction operations to the limits of City right-of-way and/or easements. The use of property for the convenience of the Contractor that is in addition to the right-of-way and easements provided shall be arranged by the Contractor.

The Contractor shall furnish the City, prior to the use of any public or private property by the Contractor in the performance of the work required under these Specifications, a grading permit for stockpiling/processing materials outside the public right-of-way, see Section 100.49 of this document. No construction activities shall commence on any private property until such permit is obtained.

Prior to acceptance of the work by the City, the Contractor shall furnish written evidence acceptable to the City's Project Manager that private or public property used for construction purposes has been restored to an acceptable condition and all the terms of the authorization between the Contractor and the property owner regarding use of said property have been satisfied.

The Contractor shall take all necessary precautions to preserve private and public property in the immediate area of all construction locations. Complete liability shall be assumed by the Contractor for any damage to private and/or public property during the execution of work. Upon completion of the work, all private and public property shall be, at a minimum, restored to the same or better physical condition as that prior to the commencement of work thereon.

100.19 – CONTRACT TIME, TIME OF COMPLETION

Delete Standard Specification section and replace with the following:

The contractor will be allowed ten (10) calendar days after the date on which the contract is awarded, in which to deliver the contract with the contractor's signature affixed thereto, together with the bonds prescribed by law and these specifications to the agency.

The Contractor shall begin construction no earlier than the date set forth in the "Notice to Proceed." Failure to complete the work within the specified time requirement will subject the Contractor to liquidated damages in accordance with Section 100.39 of these Specifications.

Other construction projects and utility work will be in progress throughout the City during the execution of this project. It is the Contractor's responsibility to coordinate this project's schedule such that no seal coats shall be applied adjacent to or within the limits of other construction projects or on streets used for detours in the execution of the other projects until such time as the construction is completed.

100.19 – PHOTOGRAPHS AND VIDEO RECORDS

Contractor shall comply with Section 337 of these specifications for recording pre- and post-construction documentation. The Contractor shall submit all pre-construction documentation to the Engineer for approval prior to proceeding with project work. Contractor shall provide post-construction documentation for approval prior to substantial completion.

100.21 – PROGRESS SCHEDULE

Delete Standard Specification section and replace with the following:

The Contractor shall prepare a project schedule plan for the entire contract work and submit it to the City's Project Manager at least seven (7) days prior to the Pre-Construction Meeting.

In addition to the total project schedule, the Contractor shall provide a detailed three (3) week look-ahead work agenda that describes the work item and time frame in the form of a bar graph, listed-itemized schedule or any other form agreed to by the City's Project Manager. The agenda may be updated by contacting the City's Project Manager no later than 48 hours prior to a change. The Contractor shall deliver the agenda for the following week to the City's Project Manager at each weekly progress meeting or no later than noon Thursday. If a holiday or non-working day falls on Thursday, the agenda shall be delivered at or before noon on the preceding working day. If no work or a continuation of the prior week's work is anticipated for the following week, an agenda indicating this shall be submitted. Each agenda shall be signed and dated by the construction superintendent.

Weekly progress meetings shall be scheduled at a convenient location to discuss the weekly schedule, work progress, construction concerns or other project matters at the City's Project Manager's discretion. The Contractor's representative and appropriate subcontractor representatives requested by the City's Project Manager shall attend.

100.22 – DELAYS

Delete Standard Specification section and replace with the following:

When delays occur due to unforeseen causes beyond the control and without the fault or negligence of the Contractor, including, but not restricted to acts of God, acts of the public enemy, acts of government agency, fires, floods, epidemics, strikes, and freight embargoes, the time for completion shall be extended an amount determined by the City's Project Manager to be equivalent to the delays; provided, however, written request for such an extension of time is made by the Contractor within ten (10) days after the beginning of such delay. No allowance shall be made for delay or suspension of the work due to the fault of the Contractor.

100.23 – PROVISIONS FOR HANDLING EMERGENCIES

Delete Standard Specification section and replace with the following:

In the case of emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City's Project Manager, shall be obligated to act to prevent threatened damage, injury or loss. Contractor shall give City's Project Manager prompt written notice if Contractor believes that any significant changes in the work or variations from the contract documents have been caused thereby.

100.24 – CHANGE ORDERS – FORCE ACCOUNT

The Contractor is to submit a Labor and Material Schedule provided per Section 055 of these Specifications within two hours of the bid opening. The schedule is to contain a list of construction equipment, hourly rates of said equipment, and hourly rates of personnel proposed to be utilized on this contract. At the discretion of the City's Project Manager, the schedule may be used for unanticipated extra work or agreed additional work added to the project.

Extra work shall be authorized by the City of Reno Project Manager and a written Authorization of Contingency (AOC) executed by the City and the Contractor prior to unanticipated extra work being performed.

100.26 – SUSPENSION OF WORK

The City's Project Manager will have the authority to suspend the work entirely or in part due to the failure of the Contractor to correct conditions unsafe for the workmen or the general public; for failure to carry out the provisions of the contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for the prosecution of the work or for any other reason deemed to be in the public interest.

100.27 – FAILURE TO PERFORM PROPERLY

If, in the judgment of the City, the failure of the Contractor to prosecute the work properly places the health and safety of the public at risk, the City may make good such deficiencies immediately and deduct the cost thereof from the payment then or thereafter due the Contractor.

100.28 – DEFAULT AND TERMINATION OF CONTRACT

Delete Standard Specification section and replace with the following:

If the Contractor:

- A. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or
- B. Fails to perform the work with sufficient workmen and equipment or with sufficient materials to assure the prompt completion of said work, or
- C. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable or unsuitable, or

- D. Discontinues the prosecution of work, or
- E. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or
- F. Becomes insolvent or is declared bankrupt or commits any act of bankruptcy or insolvency, or
- G. Allows any final judgment to stand against them unsatisfied for a period of five (5) days, or
- H. Makes an assignment for the benefit of creditors, or
- I. Does not complete at least ninety percent (90%) of the contract work within the contract time, or
- J. For any other cause whatsoever, fails to carry on the work in an acceptable manner, or
- K. If any required insurances are cancelled or terminated during the duration of the contract,

Then the City's Project Manager will give notice in writing to the Contractor and his surety of such delay, neglect, or default.

If the Contractor or surety, within a period of ten (10) days after such notice, shall not proceed in accordance therewith, then the City shall have full power and authority without violating the contract, to take the prosecution of the work out of the hands of the Contractor and the contract shall be deemed terminated. The City's Project Manager may, at his option, call upon the surety to complete the work in accordance with the terms of the contract; or he may take over the work, including any or all materials and equipment on the project as may be suitable and acceptable, and may complete the work by force account, or may enter into a new agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as, in his opinion, may be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the City, together with the cost of completing the work under the contract, shall be deducted from any money due or which may become due said Contractor. In case such expense shall exceed the sum which would have been payable under the contract, then the Contractor and his surety shall be liable and shall pay to the City the amount of said excess.

100.31 – DATA TO BE FURNISHED BY THE CONTRACTOR, SUBMITTALS

Delete Standard Specification section and replace with the following:

Submittals covered by these Specifications shall include manufacturers' information, samples, requests for substitutions, and miscellaneous work-related submittals. Submittals shall also include, but not be limited to, all mechanical, electrical and electronic equipment and systems, materials, reinforcing steel, fabricated items, and piping and conduit details. The Contractor shall furnish all contract documents, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's installation and other instructions as specifically required in the contract documents to demonstrate fully that the materials and equipment to be furnished and the methods of work comply with the Specifications and intent of the contract documents.

The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. The Contractor shall verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment, which are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated. The Contractor shall ensure that there is no conflict with other submittals and notify

the City's Project Manager in each case where the submittal may affect the work of another contractor or the City. The Contractor shall coordinate submittals among their subcontractors and suppliers.

The Contractor shall coordinate submittals so that work will not be delayed. Contractor shall coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals. The Contractor shall not proceed with work related to a submittal until the submittal process is complete.

The Contractor shall certify on each submittal transmittal document that they have reviewed the submittal, verified field conditions, and complied with the contract documents.

If the Contractor proposes to provide material, equipment, or method of work, which deviates from the contract documents, they shall indicate so under "deviations" on the transmittal form accompanying the submittal copies.

When the contract documents require a submittal, the Contractor shall submit four (4) copies of all information plus one reproducible original of all information.

Unless otherwise specified, the City's Project Manager shall have ten (10) calendar days after receipt of submittal to review and comment. The City's Project Manager shall retain the reproducible original.

Subject to NRS 338.140, review of contract documents, methods of work, or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of their responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Project Manager or the City, or by any officer or employee thereof, and the Contractor shall have no claim under the contract on account of the failure, or partial failure, of the method of work, material, or equipment so reviewed.

The cost for third and subsequent submittals shall be borne by the Contractor. The cost of reviews for third and subsequent reviews shall be at a rate of \$150 per hour for the City's Project Manager's time.

Contractor shall comply with these specifications for recording pre- and post-construction documentation. The Contractor shall submit all pre-construction documentation to the City's Project Manager for approval prior to proceeding with project work. Contractor shall provide post-construction documentation for approval prior to substantial completion.

100.33 – PROTECTION OF PROPERTY

The Contractor shall protect against any damage to pipes, conduits, or other structures crossing the trenching or encountered during the execution of work and shall be responsible for any damage done to such pipes, structures or property resulting therefrom. If a utility is affected, the Utility Company shall be notified immediately by the Contractor of any damage. Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring or other work necessary for such protection.

The Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, ditches, embankments, landscaping, or other public or private property, which may be caused by transporting equipment, materials, or workers to or from the work. Contractor shall make satisfactory and acceptable arrangement with the property owner and/or the City over damaged property concerning its repair or replacement and as specified in these Specifications.

The Contractor and their Subcontractors are solely responsible for the security of their work site. Contractor and their Subcontractors shall provide their own security for their work in progress and for the goods, products, material, equipment, systems, construction machinery, tools, devices and other items required, used or to be used in the execution of the work.

100.33 – SPILL CONTROL

A spill is defined as any release of raw sewage, construction water, or other liquids at the site. Spills shall not be permitted at any time throughout the duration of the Contract. Sewage released from the existing sewer system shall be considered a spill. Sewage in contact with the soil on the ground or within pits or excavations shall also be considered a spill.

The Contractor shall be responsible for all consequences and damages caused by a sewage spill due to the Contractor's work activities. Contractor shall give both verbal and written notification to the City's Project Manager immediately in the event of any sewage spill.

100.37 – PROTECTION OF WORK AND CLEANING UP

The Contractor shall keep the work site, staging areas, storage and parking area, and Contractor's facilities clean and free from rubbish and debris. Materials and equipment shall be promptly removed from the site when they are no longer necessary. Upon completion of the work and before final acceptance, the work site shall be cleared of equipment, unused materials, and rubbish to present a clean and neat appearance in conformance with the preconstruction condition of the site. Refer to each section of these Specifications for further requirements.

The Contractor shall not store equipment or materials anywhere other than locations approved by the City's Project Manager. Property surrounding the work site shall be completely free of debris and rubbish at all times.

In the event that waste material, refuse, debris and/or rubbish have not been removed after the Contractor has been directed to do so, the City's Project Manager reserves the right to have this material removed at the Contractor's expense.

The Contractor shall handle paints, solvents, and other construction materials with care to prevent entry of contaminants into storm drains, sewers, surface waters, or soils.

NO SOLID MATERIALS OR SOILS SHALL BE FLUSHED INTO STORM DRAINS OR SEWERS.

Cleaning of these facilities shall be at the Contractor's expense. In the event the Contractor does not clean the facilities to the satisfaction of the City's Project Manager after the Contractor has been directed to do so, the City's Project Manager reserves the right to have the facilities cleaned by others at the Contractor's expense.

The Contractor shall install fences and/or barriers around all excavations and open structures. The barrier shall enclose the area and prevent unauthorized access.

The Contractor shall be responsible for preventing dirt, dust, and sediments from escaping from trucks departing the project site, by covering dusty loads, washing truck tires before leaving the site, or other reasonable methods. The Contractor shall be required to clean said streets as soon as possible, but no later than at the conclusion of each day's operations. Cleaning shall be at the Contractor's expense. Any violation of the requirements shall be sufficient grounds for the City's Project Manager to order the streets

in question cleaned at the Contractor's expense. In the event the Contractor does not clean the streets to the satisfaction of the City's Project Manager after the Contractor has been directed to do so, the City's Project Manager reserves the right to have the streets cleaned by others at the Contractor's expense.

The Contractor is responsible for immediately removing all graffiti from equipment, tools and signs on the worksite.

100.37 – SECURITY FOR WORK IN PROGRESS

The Contractor is solely responsible for the security of the site. Contractor shall provide its own security for its work in progress and for the goods, products, material, equipment, systems, construction machinery, tools, devices and other items required, used or to be used for its scope of the Work.

100.39 – LIQUIDATED DAMAGES/FAILURE TO COMPLETE WORK ON TIME

Time is of the essence of this contract, and in the event the construction of the work is not completed within the time herein specified, it is agreed that from the compensation otherwise to be paid to the contractor, the City may retain the sum of One Thousand Dollars (\$1,000) per day for each contract calendar day thereafter, that the work remains uncompleted and not accepted. This sum is not a penalty, being the stipulated damage City will have sustained in the event of failure by the Contractor to complete the work within the contract time. Liquidated damages shall be cumulative for each portion of the work for which the specified construction completion time(s) is not met by the Contractor.

100.40 – SANITATION AND SAFETY

The Contractor shall comply with provisions of local, state and federal regulations as relates to sanitation and sanitary facilities. Portable sanitary facilities shall be provided at each work site location.

100.41 – PUBLIC SERVICE EQUIPMENT

The Contractor shall contact Underground Service Alert at 811 or 1-800-227-2600 a minimum of two working days prior to the start of construction for street or parking lot patching and adjusting service utilities or survey monuments.

The Contractor shall immediately notify the City's Project Manager of any apparent or potential conflict of which the Contractor becomes aware between existing underground facilities and facilities to be installed or constructed as a part of the work required by these specifications and contract documents. Upon said notice, the City's Project Manager will make a timely investigation of the apparent or potential conflict and, if required, will issue instructions to the Contractor for the adjustment of the existing underground facilities or will revise the design of the facilities to be installed, or both.

In the event damage to any existing underground facility should occur during progress of the work, the Contractor shall immediately notify the Project Manager and the City of the damaged facility. The Contractor shall be responsible for any damage to existing underground facilities which may result from their performance of the work and shall arrange for the timely repair of such damaged facilities at his sole cost and expense. The Contractor shall coordinate the temporary shutdown, support, or relocation

of existing private utilities as determined necessary during construction with the owning utility, allowing adequate time for relocations as required.

100.43 – UTILITY SERVICES

All utilities required by the Contractor shall be furnished at their expense. Construction and drinking water for Contractor and Subcontractors shall be provided by the Contractor. Connection to fire hydrants or private property services for the purpose of obtaining construction water shall not be permitted.

100.44 – TREE AND PLANT PROTECTION

If a tree or any landscaped vegetation is damaged or destroyed by construction, or by any action of the Contractor, the Contractor shall replace the damaged tree or plant with a healthy one of the same or similar species, subject to the approval of the City's Project Manager. The replacement tree or plant shall be of the same size as the damaged tree or plant and will be placed at the existing grade. The Contractor shall bear all expenses required to establish the replacement tree or plant. The replacement tree or plant shall be guaranteed healthy for one (1) year after the final payment made to the Contractor. The Contractor shall be responsible for any tree or plant that the Contractor had replaced that is deemed unhealthy during that year.

100.47 – TRADE NAMES, SUBSTITUTES AND "OR EQUAL" ITEMS

Delete Standard Specification section and replace with the following:

Whenever an item of material or equipment is specified or described in the contract documents by using the name of a proprietary item or the name of a particular supplier, the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains, or is followed by, words reading "no like, equivalent, or-equal item", or "no substitution is permitted", other items of material or equipment of other suppliers may be accepted by the City's Project Manager under the following circumstances and subject to NRS 338.140:

1. **Or equal:** If, in City's Project Manager's sole discretion, an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by City's Project Manager as an "or-equal" item.
2. **Substitute items:** If, in City's Project Manager's sole discretion, an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, it will be considered a proposed substitute item. Contractor shall submit sufficient information to allow the City's Project Manager to determine if the item of material or equipment proposed is essentially equivalent to that named and is an acceptable substitute. Requests for review of proposed substitute items of material or equipment will not be accepted from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall first make written application to City's Project Manager for acceptance thereof, certifying that the proposed substitute will perform adequately and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of substantial completion on time, whether or not acceptance of the substitute for use in the work will require a change in any of the contract documents, to adapt the

design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty.

All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change, all of which will be considered by City's Project Manager in evaluating the proposed substitute. City's Project Manager may require Contractor to furnish additional data about the proposed substitute.

3. **Substitute construction methods or procedures:** If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the contract documents, Contractor may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to City's Project Manager. Contractor shall submit sufficient information to allow City's Project Manager, in Project Manager's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the contract documents. The procedure for review by Project Manager will be similar to that provided in item 2 above.

All support and/or testing data provided by Contractor for any proposed "or-equal" or substitute item shall be at the Contractor's expense. City's Project Manager will be allowed a minimum of five (5) calendar days to evaluate each proposal and/or submittal made. The City's Project Manager shall be sole judge of acceptability. A proposal and/or submittal may be denied by the City's Project Manager without explanation. No "or-equal" or substitute(s) will be ordered, installed or utilized without City's Project Manager's prior written acceptance. The City may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. The time required by City's Project Manager and/or the Project Manager's consultants for evaluating proposed or submitted substitutes shall be at the Contractor's expense. The rate for reimbursement of these services shall be \$150.00 per hour. The charges for the evaluation shall be applied no matter if the proposed or submitted item is accepted or rejected.

100.48 – DISPUTE RESOLUTION

Delete Standard Specification section and replace with the following:

All claims, counterclaims, disputes and other matters in question between the City and the Contractor arising out of, or relating to, this contract or breach of it, unless otherwise settled, must be mediated before initiation of a judicial action.

Unless the parties mutually agree otherwise, mediation will be in accordance with the Construction Industry Mediation Procedures of the American Arbitration Association currently in effect. The American Arbitration Association will not be used to administer or facilitate the process or the selection of the mediators. Instead, the parties will mutually agree to the appointment of one mediator. If the parties cannot agree to one mediator, each party shall select one mediator and the two mediators will appoint a third mediator. The parties agree to split the mediator(s) fees and expenses. Each party shall bear their own attorney's fees and other costs incurred for the mediation.

If the City is the prevailing party in litigation, unless otherwise agreed to in writing, it shall be entitled to an award of reasonable attorney's fees and costs. NRS 338.640(1) applies when appropriate.

100.48.01 – REMEDY AND DAMAGES AVAILABLE TO THE CITY WHICH RESULT FROM CONTRACTOR'S REQUEST TO BE RELEASED FROM PERFORMANCE OF CONTRACT PRIOR TO ISSUANCE OF A NOTICE TO PROCEED

If a Contractor requests to be released from performance of the Contract prior to issuance of a Notice to Proceed, and it is determined by the City that it is in the City's best interest to release the Contractor from performance of the Contract, the Contractor shall pay to the City any and all expenses incurred by the City as a result of the City releasing the Contractor from performance.

100.49 – PERMITS AND LICENSES

The Prime Contractor is responsible for ensuring all subcontractors working on this project hold a current Reno Business License as required by Reno Municipal Code Section 4.04.020. Unless otherwise noted below, the Contractor is responsible for obtaining all certificates, licenses, and permits required to perform the work. This includes current state and local business licenses, certificates, licenses and permits for all on site or off site vehicles, equipment, processes, and activities associated with the work.

100.49 – CITY OF RENO PERMITS

Building Permit - A City of Reno Building Permit is required for this project.

Other permits, including special use permits, associated with staging areas and material processing yards may be required and are the responsibility of the contractor. No payment will be made by the City for permitting of staging areas and processing yards.

100.49 – WASHOE COUNTY DUST CONTROL PERMIT

All construction procedures shall conform to Washoe County Air Quality Standards. Dust Control Permits associated with staging areas and material processing yards may be required and are the responsibility of the contractor. No payment will be made by the City for permitting of staging areas and processing yards.

The Contractor will also be responsible for obtaining a Dust Control Permit for any staging areas outside the City right-of-way used by the Contractor. By law, these areas are the responsibility of the property owner. The Contractor shall ensure that said property owners are aware of their responsibility when negotiating permission to use private property for staging operations.

The requirement of a Dust Control Permit is necessary when more than one (1) acre of bare ground is disturbed by construction operations and/or the grading of more than one (1) acre of aggregate surfaces. This requirement applies to underground work as well as surface operations.

100.49 - NDEP CONSTRUCTION STORMWATER PERMIT

All construction activities shall incorporate Nevada Department of Environmental Protection (NDEP) Best Management Practices for Storm Water Management in accordance with the Federal Clean Water Act.

All construction procedures shall conform to Nevada Department of Environmental Protection (NDEP) Best Management Practices for Storm Water Management. The contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP), keep it on site at all times, and modify it as needed.

100.49 – NOISE CONTROL

The Contractor shall perform all work in compliance with OSHA standards and in no case will noise levels be permitted that are greater than allowed by local laws and regulations. Noise levels shall not exceed 65 decibels (db) at 50 feet from the operating equipment.

All internal combustion engines utilized for any purpose on this project, or associated with work on this project, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without said muffler.

Noisy portable equipment, such as generators, compressors and/or pumps shall be equipped with sound abatement enclosures and devices and shall be located as far away from sensitive noise receptor areas as practicable. (Sensitive noise receptors are defined as occupied buildings with windows or doors facing the site.) Noise barriers shall be constructed around noisy stationary construction equipment such as compressors, generators and pumps that are utilized at locations near (within 100 feet of) sensitive noise receptors as defined above during the daytime working hours and at all sites when construction is being completed at night.

Idling equipment not actively being used for construction purposes shall be shut off.

100.49 - ODOR CONTROL

The Contractor shall employ methods and procedures that mitigate the generation and discharge of objectionable odors to the surface environment during all work, including bypassing of sewage flows.

100.51 – PARTIAL PAYMENTS

For each progress payment, five percent (5%) will be held until fifty percent (50%) of the work has been performed. This amount will be held until one hundred percent (100%) completion and final acceptance of the project.

Except for cause, in accordance with NRS 338.525, no retention will be held from subsequent payments.

100.53 – CONTINGENT ITEMS AND INCREASED OR DECREASED QUANTITIES

Delete Standard Specification section and replace with the following:

Quantities shown on the Schedule of Prices are a calculated estimate and will be used for the purpose of comparing bids. Payment will be made for actual quantities furnished, installed, or constructed. An exception is where a specific item is identified in these specifications as a "Contingent item" in which case the quantity set forth on the Schedule of Prices represents no actual estimate, is nominal only, and may be greatly increased or decreased or reduced to zero.

For major items of work not identified as contingent, a net increase or decrease in excess of 25% in the bid quantity may result in a negotiated change in the bid price for that item.

100.54 – NO WAIVER OF LEGAL RIGHTS

The City shall not be precluded or stopped by any measures, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefore, from showing the true amount and character of the work performed, and materials furnished by the Contractor, nor from showing that any such measurements, estimate, or certificate is untrue or is incorrectly made, nor that the work or materials do not in fact conform to the contract. The City shall not be precluded or stopped, notwithstanding any such measurement, estimate, or certificate, and payment in accordance therewith, from recovering from the Contractor or his sureties, or both, such damages as it may sustain by reason of his failure to comply with the terms of the contract. Neither the acceptance by the City, or any representative of the City, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the City, shall operate as a waiver of any portion of the contract or any power herein reserved, or of any right to damages. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

100.58 - MEASUREMENT AND PAYMENT

The scope of this section defines the items included in each bid item in the Base Bid Schedule of Prices of these specifications. Payment for work performed by the Contractor under these Contract Documents shall be made at the approved contract agreement bid price for each of the principal items as listed in the Base Bid Schedule of Prices. All contract prices included in the Base Bid Schedule of Prices shall be considered full compensation for all labor, materials, tools, equipment, overhead profit, insurance bonding, taxes, and all other incidentals necessary to complete the construction as shown on the Contract documents and/or as specified in the Contract Documents to be performed under this contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in a manner described for each item in these Specifications. Payment of all items listed in the bid schedule will constitute full compensation for all work shown and/or specified to be performed under this project. All incidental and appurtenant work essential to the completion of the project in a workmanlike manner, including cleanup and disposal of waste or surplus material, shall be accomplished by the Contractor without additional cost to the City.

Measurements of the completed work will be made in place, with no allowance for waste. Measurements of distances will be made in a horizontal plane, unless otherwise stated. Measurements of areas will be made in a horizontal plane, unless otherwise stated. Widths of pavement removal areas and trenching will be measured as specified in these Contract Documents.

Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by reason of failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the City's Project Manager; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

Payment shall be made for the actual quantities constructed or installed; said quantities being measured as specified in their respective specification sections. Payment will be made for installed work only.

**CITY OF RENO
CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B**

SUPPLEMENTAL GENERAL PROVISIONS

Payment will not be made for stored, uninstalled materials. Payment will only be made for items of work complete, in place, verified and accepted with the disturbed area fully restored and cleaned. Work items not specifically identified in the Proposal, but shown and specified, shall be considered incidental items. No additional payment will be made for incidental items.

*****END OF SUPPLEMENTAL GENERAL PROVISIONS*****



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

8/1/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER L/P Insurance Services LLC 300 East 2nd Street Suite 1300 Reno NV 89501	CONTACT NAME: Jessica Carroll PHONE (A/C, No, Ext): (775) 996-6000 FAX (A/C, No): (775) 473-9288 E-MAIL ADDRESS: jessica.carroll@lpins.net														
INSURED Mt Rose Heating & Air Conditioning Inc 310 Sunshine Lane Reno NV 89502	<table border="1"><thead><tr><th>INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr></thead><tbody><tr><td>INSURER A: Valley Forge Insurance Co</td><td>20508</td></tr><tr><td>INSURER B: National Fire Insurance Co of Hartford</td><td>20478</td></tr><tr><td>INSURER C: Continental Casualty Co</td><td>20443</td></tr><tr><td>INSURER D: Copperpoint American Ins/Pacific Comp</td><td>13751</td></tr><tr><td>INSURER E: Underwriters at Lloyd's of London</td><td></td></tr><tr><td>INSURER F: Westerchester Surplus Lines Ins Co</td><td>10172</td></tr></tbody></table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Valley Forge Insurance Co	20508	INSURER B: National Fire Insurance Co of Hartford	20478	INSURER C: Continental Casualty Co	20443	INSURER D: Copperpoint American Ins/Pacific Comp	13751	INSURER E: Underwriters at Lloyd's of London		INSURER F: Westerchester Surplus Lines Ins Co	10172
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COVERAGES**CERTIFICATE NUMBER:** CL22122974243**REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS														
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:			7036138468	12/31/2022	12/31/2023	<table border="1"><tr><td>EACH OCCURRENCE</td><td>\$ 1,000,000</td></tr><tr><td>DAMAGE TO RENTED PREMISES (Ea occurrence)</td><td>\$ 100,000</td></tr><tr><td>MED EXP (Any one person)</td><td>\$ 15,000</td></tr><tr><td>PERSONAL & ADV INJURY</td><td>\$ 1,000,000</td></tr><tr><td>GENERAL AGGREGATE</td><td>\$ 2,000,000</td></tr><tr><td>PRODUCTS - COMP/OP AGG</td><td>\$ 2,000,000</td></tr><tr><td></td><td>\$</td></tr></table>	EACH OCCURRENCE	\$ 1,000,000	DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000	MED EXP (Any one person)	\$ 15,000	PERSONAL & ADV INJURY	\$ 1,000,000	GENERAL AGGREGATE	\$ 2,000,000	PRODUCTS - COMP/OP AGG	\$ 2,000,000		\$
EACH OCCURRENCE	\$ 1,000,000																				
DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000																				
MED EXP (Any one person)	\$ 15,000																				
PERSONAL & ADV INJURY	\$ 1,000,000																				
GENERAL AGGREGATE	\$ 2,000,000																				
PRODUCTS - COMP/OP AGG	\$ 2,000,000																				
	\$																				
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			7036138454	12/31/2022	12/31/2023	<table border="1"><tr><td>COMBINED SINGLE LIMIT (Ea accident)</td><td>\$ 1,000,000</td></tr><tr><td>BODILY INJURY (Per person)</td><td>\$</td></tr><tr><td>BODILY INJURY (Per accident)</td><td>\$</td></tr><tr><td>PROPERTY DAMAGE (Per accident)</td><td>\$</td></tr><tr><td></td><td>\$</td></tr></table>	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000	BODILY INJURY (Per person)	\$	BODILY INJURY (Per accident)	\$	PROPERTY DAMAGE (Per accident)	\$		\$				
COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000																				
BODILY INJURY (Per person)	\$																				
BODILY INJURY (Per accident)	\$																				
PROPERTY DAMAGE (Per accident)	\$																				
	\$																				
C	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			7036138440	12/31/2022	12/31/2023	<table border="1"><tr><td>EACH OCCURRENCE</td><td>\$ 5,000,000</td></tr><tr><td>AGGREGATE</td><td>\$ 5,000,000</td></tr><tr><td></td><td>\$</td></tr></table>	EACH OCCURRENCE	\$ 5,000,000	AGGREGATE	\$ 5,000,000		\$								
EACH OCCURRENCE	\$ 5,000,000																				
AGGREGATE	\$ 5,000,000																				
	\$																				
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N <input checked="" type="checkbox"/> N/A			1021465 (NV) 1025758 (CA)	1/1/2023	1/1/2024	<table border="1"><tr><td><input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER</td><td></td></tr><tr><td>E.L. EACH ACCIDENT</td><td>\$ 1,000,000</td></tr><tr><td>E.L. DISEASE - EA EMPLOYEE</td><td>\$ 1,000,000</td></tr><tr><td>E.L. DISEASE - POLICY LIMIT</td><td>\$ 1,000,000</td></tr></table>	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER		E.L. EACH ACCIDENT	\$ 1,000,000	E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000	E.L. DISEASE - POLICY LIMIT	\$ 1,000,000						
<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER																					
E.L. EACH ACCIDENT	\$ 1,000,000																				
E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000																				
E.L. DISEASE - POLICY LIMIT	\$ 1,000,000																				
A	Rented/Leased Equipment			7036138468	12/31/2022	12/31/2023	Limit \$100,000														
E	Professional Liability			B0621PMTRO000223	1/1/2023	1/1/2024	Each Claim / Aggregate \$1Mil / \$1Mil														

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Project: California Building HVAC Systems Upgrade, Contract #: FM980B / Additional Interest Name(s): City of Reno, including its elected officials, officers, employees, agents and volunteers.
See Attached Additional Comments/Remarks page for information regarding additional coverage terms and Additional Insured status. *30 day notice of cancellation applies except 10 days for non-payment.

CERTIFICATE HOLDER**CANCELLATION**

City of Reno
PO Box 1900
Reno, NV 89505

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Jessica Carroll/JESS

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COMMENTS/REMARKS

Contractors Pollution Liability Coverage - Insurer F: Westerchester Surplus Lines Insurance Co, Policy #G71488068005, Eff 1/1/2023-1/1/2024, Limit \$3,000,000 Agg / \$3,000,000 Occ.

Riggers Liability Coverage - Insurer A: CNA Insurance Companies, Policy #7036138468, Eff 4/11/2023 - 12/31/2023, Limit: \$75,000 / \$2,500 Deductible.

Continued from Description of Operations Section:

NAMED INSURED: MT. ROSE HEATING & AIR CONDITIONING, INC.

When Named Insureds operations are performed for Certificate Holder and/or entities listed in Description of Operations on the Acord 25 form pursuant to a valid written contract or agreement executed by Named Insured prior to loss, in accordance with the noted policy(ies): Additional Insured Status is determined by attached GL Forms #CNA74705XX (1-15), CNA75079XX (10-16); Auto Form #CNA63359XX (4-12), Pollution Liability Forms #ENV3250 (12/18), ENV3251 (12/18); Waiver of Subrogation Status is determined by GL Form #CNA74705XX (1-15), Auto Form #CNA63359XX (4-12), Pollution Liability Form #ENV3143 (03/05), Workers Compensation Form #WC000313 04/84; Primary and Non-Contributory Status is determined by GL Forms #CNA74705XX (1-15), CNA75079XX (10-16), Auto Form #CNA63359XX (4-12), Pollution Liability Form #ENV3253 (12/18). OCIP/CCIP Work Off-Premises General Liability Only. Umbrella/Excess Follows Form. Inland Marine Loss Payee Form G-55232 01/97.

**Contractors' General Liability Extension Endorsement**

It is understood and agreed that this endorsement amends the **COMMERCIAL GENERAL LIABILITY COVERAGE PART** as follows. If any other endorsement attached to this policy amends any provision also amended by this endorsement, then that other endorsement controls with respect to such provision, and the changes made by this endorsement with respect to such provision do not apply.

TABLE OF CONTENTS

- | |
|---|
| 1. Additional Insureds |
| 2. Additional Insured - Primary And Non-Contributory To Additional Insured's Insurance |
| 3. Bodily Injury – Expanded Definition |
| 4. Broad Knowledge of Occurrence/ Notice of Occurrence |
| 5. Broad Named Insured |
| 6. Broadened Liability Coverage For Damage To Your Product And Your Work |
| 7. Contractual Liability - Railroads |
| 8. Electronic Data Liability |
| 9. Estates, Legal Representatives and Spouses |
| 10. Expected Or Intended Injury – Exception for Reasonable Force |
| 11. General Aggregate Limits of Insurance – Per Project |
| 12. In Rem Actions |
| 13. Incidental Health Care Malpractice Coverage |
| 14. Joint Ventures/Partnership/Limited Liability Companies |
| 15. Legal Liability – Damage To Premises / Alienated Premises / Property In The Named Insured's Care, Custody or Control |
| 16. Liquor Liability |
| 17. Medical Payments |
| 18. Non-owned Aircraft Coverage |
| 19. Non-owned Watercraft |
| 20. Personal And Advertising Injury – Discrimination or Humiliation |
| 21. Personal And Advertising Injury - Contractual Liability |
| 22. Property Damage - Elevators |
| 23. Supplementary Payments |
| 24. Unintentional Failure To Disclose Hazards |
| 25. Waiver of Subrogation – Blanket |
| 26. Wrap-Up Extension: OCIP CCIP, or Consolidated (Wrap-Up) Insurance Programs |

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CNA74705XX (1-15)

Page 1 of 17

VALLEY FORGE INSURANCE COMPANY

Insured Name: MT ROSE HEATING & AIR CONDITIONING INC

Policy No: 7036138468

Endorsement No: 4

Effective Date: 12/31/2022

Contractors' General Liability Extension Endorsement**1. ADDITIONAL INSURED**

- a. **WHO IS AN INSURED** is amended to include as an **Insured** any person or organization described in paragraphs **A.** through **H.** below whom a **Named Insured** is required to add as an additional insured on this **Coverage Part** under a written contract or written agreement, provided such contract or agreement:

(1) is currently in effect or becomes effective during the term of this **Coverage Part**; and

(2) was executed prior to:

(a) the **bodily injury** or **property damage**; or

(b) the offense that caused the **personal and advertising injury**,

for which such additional insured seeks coverage.

- b. However, subject always to the terms and conditions of this policy, including the limits of insurance, the Insurer will not provide such additional insured with:

(1) a higher limit of insurance than required by such contract or agreement; or

(2) coverage broader than required by such contract or agreement, and in no event broader than that described by the applicable paragraph **A.** through **H.** below.

Any coverage granted by this endorsement shall apply only to the extent permissible by law.

A. Controlling Interest

Any person or organization with a controlling interest in a **Named Insured**, but only with respect to such person or organization's liability for **bodily injury**, **property damage** or **personal and advertising injury** arising out of:

1. such person or organization's financial control of a **Named Insured**; or

2. premises such person or organization owns, maintains or controls while a **Named Insured** leases or occupies such premises;

provided that the coverage granted by this paragraph does not apply to structural alterations, new construction or demolition operations performed by, on behalf of, or for such additional insured.

B. Co-owner of Insured Premises

A co-owner of a premises co-owned by a **Named Insured** and covered under this insurance but only with respect to such co-owner's liability for **bodily injury**, **property damage** or **personal and advertising injury** as co-owner of such premises.

C. Lessor of Equipment

Any person or organization from whom a **Named Insured** leases equipment, but only with respect to liability for **bodily injury**, **property damage** or **personal and advertising injury** caused, in whole or in part, by the **Named Insured's** maintenance, operation or use of such equipment, provided that the **occurrence** giving rise to such **bodily injury**, **property damage** or the offense giving rise to such **personal and advertising injury** takes place prior to the termination of such lease.

D. Lessor of Land

Any person or organization from whom a **Named Insured** leases land but only with respect to liability for **bodily injury**, **property damage** or **personal and advertising injury** arising out of the ownership, maintenance or use of such land, provided that the **occurrence** giving rise to such **bodily injury**, **property damage** or the offense giving rise to such **personal and advertising injury** takes place prior to the termination of such lease. The

Contractors' General Liability Extension Endorsement

coverage granted by this paragraph does not apply to structural alterations, new construction or demolition operations performed by, on behalf of, or for such additional insured.

E. Lessor of Premises

An owner or lessor of premises leased to the **Named Insured**, or such owner or lessor's real estate manager, but only with respect to liability for **bodily injury, property damage or personal and advertising injury** arising out of the ownership, maintenance or use of such part of the premises leased to the **Named Insured**, and provided that the **occurrence** giving rise to such **bodily injury or property damage**, or the offense giving rise to such **personal and advertising injury**, takes place prior to the termination of such lease. The coverage granted by this paragraph does not apply to structural alterations, new construction or demolition operations performed by, on behalf of, or for such additional insured.

F. Mortgagee, Assignee or Receiver

A mortgagee, assignee or receiver of premises but only with respect to such mortgagee, assignee or receiver's liability for **bodily injury, property damage or personal and advertising injury** arising out of the **Named Insured's** ownership, maintenance, or use of a premises by a **Named Insured**.

The coverage granted by this paragraph does not apply to structural alterations, new construction or demolition operations performed by, on behalf of, or for such additional insured.

G. State or Governmental Agency or Subdivision or Political Subdivisions – Permits

A state or governmental agency or subdivision or political subdivision that has issued a permit or authorization but only with respect to such state or governmental agency or subdivision or political subdivision's liability for **bodily injury, property damage or personal and advertising injury** arising out of:

1. the following hazards in connection with premises a **Named Insured** owns, rents, or controls and to which this insurance applies:
 - a. the existence, maintenance, repair, construction, erection, or removal of advertising signs, awnings, canopies, cellar entrances, coal holes, driveways, manholes, marquees, hoistaway openings, sidewalk vaults, street banners, or decorations and similar exposures; or
 - b. the construction, erection, or removal of elevators; or
 - c. the ownership, maintenance or use of any elevators covered by this insurance; or
2. the permitted or authorized operations performed by a **Named Insured** or on a **Named Insured's** behalf.

The coverage granted by this paragraph does not apply to:

- a. **Bodily injury, property damage or personal and advertising injury** arising out of operations performed for the state or governmental agency or subdivision or political subdivision; or
- b. **Bodily injury or property damage** included within the **products-completed operations hazard**.

With respect to this provision's requirement that additional insured status must be requested under a written contract or agreement, the Insurer will treat as a written contract any governmental permit that requires the **Named Insured** to add the governmental entity as an additional insured.

H. Trade Show Event Lessor

1. With respect to a **Named Insured's** participation in a trade show event as an exhibitor, presenter or displayer, any person or organization whom the **Named Insured** is required to include as an additional insured, but only with respect to such person or organization's liability for **bodily injury, property damage or personal and advertising injury** caused by:



Contractors' General Liability Extension Endorsement

- a. the **Named Insured's** acts or omissions; or
 - b. the acts or omissions of those acting on the **Named Insured's** behalf,
in the performance of the **Named Insured's** ongoing operations at the trade show event premises during the trade show event.
2. The coverage granted by this paragraph does not apply to **bodily injury** or **property damage** included within the **products-completed operations hazard**.

2. ADDITIONAL INSURED - PRIMARY AND NON-CONTRIBUTORY TO ADDITIONAL INSURED'S INSURANCE

The **Other Insurance** Condition in the **COMMERCIAL GENERAL LIABILITY CONDITIONS** Section is amended to add the following paragraph:

If the **Named Insured** has agreed in writing in a contract or agreement that this insurance is primary and non-contributory relative to an additional insured's own insurance, then this insurance is primary, and the Insurer will not seek contribution from that other insurance. For the purpose of this Provision 2., the additional insured's own insurance means insurance on which the additional insured is a named insured. Otherwise, and notwithstanding anything to the contrary elsewhere in this Condition, the insurance provided to such person or organization is excess of any other insurance available to such person or organization.

3. BODILY INJURY – EXPANDED DEFINITION

Under **DEFINITIONS**, the definition of **bodily injury** is deleted and replaced by the following:

Bodily injury means physical injury, sickness or disease sustained by a person, including death, humiliation, shock, mental anguish or mental injury sustained by that person at any time which results as a consequence of the physical injury, sickness or disease.

4. BROAD KNOWLEDGE OF OCCURRENCE/ NOTICE OF OCCURRENCE

Under **CONDITIONS**, the condition entitled **Duties in The Event of Occurrence, Offense, Claim or Suit** is amended to add the following provisions:

A. BROAD KNOWLEDGE OF OCCURRENCE

The **Named Insured** must give the Insurer or the Insurer's authorized representative notice of an **occurrence**, offense or **claim** only when the **occurrence**, offense or **claim** is known to a natural person **Named Insured**, to a partner, executive officer, manager or member of a **Named Insured**, or an **employee** designated by any of the above to give such notice.

B. NOTICE OF OCCURRENCE

The **Named Insured's** rights under this **Coverage Part** will not be prejudiced if the **Named Insured** fails to give the Insurer notice of an **occurrence**, offense or **claim** and that failure is solely due to the **Named Insured's** reasonable belief that the **bodily injury** or **property damage** is not covered under this **Coverage Part**. However, the **Named Insured** shall give written notice of such **occurrence**, offense or **claim** to the Insurer as soon as the **Named Insured** is aware that this insurance may apply to such **occurrence**, offense or **claim**.

5. BROAD NAMED INSURED

WHO IS AN INSURED is amended to delete its Paragraph 3. in its entirety and replace it with the following:

3. Pursuant to the limitations described in Paragraph 4. below, any organization in which a **Named Insured** has management control:
 - a. on the effective date of this **Coverage Part**; or

**Contractors' General Liability Extension Endorsement**

b. by reason of a **Named Insured** creating or acquiring the organization during the **policy period**,

qualifies as a **Named Insured**, provided that there is no other similar liability insurance, whether primary, contributory, excess, contingent or otherwise, which provides coverage to such organization, or which would have provided coverage but for the exhaustion of its limit, and without regard to whether its coverage is broader or narrower than that provided by this insurance.

But this **BROAD NAMED INSURED** provision does not apply to:

- (a) any partnership, limited liability company or joint venture; or
- (b) any organization for which coverage is excluded by another endorsement attached to this **Coverage Part**.

For the purpose of this provision, management control means:

- A. owning interests representing more than 50% of the voting, appointment or designation power for the selection of a majority of the Board of Directors of a corporation; or
- B. having the right, pursuant to a written trust agreement, to protect, control the use of, encumber or transfer or sell property held by a trust.

4. With respect to organizations which qualify as **Named Insureds** by virtue of Paragraph 3. above, this insurance does not apply to:

- a. **bodily injury** or **property damage** that first occurred prior to the date of management control, or that first occurs after management control ceases; nor
- b. **personal or advertising injury** caused by an offense that first occurred prior to the date of management control or that first occurs after management control ceases.

5. The insurance provided by this **Coverage Part** applies to **Named Insureds** when trading under their own names or under such other trading names or doing-business-as names (dba) as any **Named Insured** should choose to employ.

6. BROADENED LIABILITY COVERAGE FOR DAMAGE TO YOUR PRODUCT AND YOUR WORK

A. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete exclusions **k.** and **l.** and replace them with the following:

This insurance does not apply to:

k. Damage to Your Product

Property damage to your product arising out of it, or any part of it except when caused by or resulting from:

- (1) fire;
- (2) smoke;
- (3) collapse; or
- (4) explosion.

l. Damage to Your Work

Property damage to your work arising out of it, or any part of it and included in the **products-completed operations hazard**.

This exclusion does not apply:

- (1) If the damaged work, or the work out of which the damage arises, was performed on the **Named Insured's** behalf by a subcontractor; or



Contractors' General Liability Extension Endorsement

(2) If the cause of loss to the damaged work arises as a result of:

- (a) fire;
- (b) smoke;
- (c) collapse; or
- (d) explosion.

B. The following paragraph is added to **LIMITS OF INSURANCE**:

Subject to 5. above, \$100,000 is the most the Insurer will pay under **Coverage A** for the sum of **damages** arising out of any one **occurrence** because of **property damage to your product** and **your work** that is caused by fire, smoke, collapse or explosion and is included within the **product-completed operations hazard**. This sublimit does not apply to **property damage to your work** if the damaged work, or the work out of which the damage arises, was performed on the **Named Insured's** behalf by a subcontractor.

C. This **Broadened Liability Coverage For Damage To Your Product And Your Work** Provision does not apply if an endorsement of the same name is attached to this policy.

7. CONTRACTUAL LIABILITY – RAILROADS

With respect to operations performed within 50 feet of railroad property, the definition of **insured contract** is replaced by the following:

Insured Contract means:

- a. A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for damage by fire to premises while rented to a **Named Insured** or temporarily occupied by a **Named Insured** with permission of the owner is not an **insured contract**;
- b. A sidetrack agreement;
- c. Any easement or license agreement;
- d. An obligation, as required by ordinance, to indemnify a municipality, except in connection with work for a municipality;
- e. An elevator maintenance agreement;
- f. That part of any other contract or agreement pertaining to the **Named Insured's** business (including an indemnification of a municipality in connection with work performed for a municipality) under which the **Named Insured** assumes the tort liability of another party to pay for **bodily injury** or **property damage** to a third person or organization. Tort liability means a liability that would be imposed by law in the absence of any contract or agreement.

Paragraph f. does not include that part of any contract or agreement:

(1) That indemnifies an architect, engineer or surveyor for injury or damage arising out of:

- (a) Preparing, approving or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
- (b) Giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage;

(2) Under which the **Insured**, if an architect, engineer or surveyor, assumes liability for an injury or damage arising out of the insured's rendering or failure to render professional services, including those listed in (1) above and supervisory, inspection, architectural or engineering activities.

8. ELECTRONIC DATA LIABILITY

Contractors' General Liability Extension Endorsement

- A. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete exclusion p. **Electronic Data** and replace it with the following:

This insurance does not apply to:

p. **Access Or Disclosure Of Confidential Or Personal Information And Data-related Liability**

Damages arising out of:

- (1) any access to or disclosure of any person's or organization's confidential or personal information, including patents, trade secrets, processing methods, customer lists, financial information, credit card information, health information or any other type of nonpublic information; or
- (2) the loss of, loss of use of, damage to, corruption of, inability to access, or inability to manipulate **electronic data** that does not result from physical injury to tangible property.

However, unless Paragraph (1) above applies, this exclusion does not apply to **damages** because of **bodily injury**.

This exclusion applies even if damages are claimed for notification costs, credit monitoring expenses, forensic expenses, public relation expenses or any other loss, cost or expense incurred by the **Named Insured** or others arising out of that which is described in Paragraph (1) or (2) above.

- B. The following paragraph is added to **LIMITS OF INSURANCE**:

Subject to 5. above, \$100,000 is the most the Insurer will pay under **Coverage A** for all **damages** arising out of any one **occurrence** because of **property damage** that results from physical injury to tangible property and arises out of **electronic data**.

- C. The following definition is added to **DEFINITIONS**:

Electronic data means information, facts or programs stored as or on, created or used on, or transmitted to or from computer software (including systems and applications software), hard or floppy disks, CD-ROMS, tapes, drives, cells, data processing devices or any other media which are used with electronically controlled equipment.

- D. For the purpose of the coverage provided by this **ELECTRONIC DATA LIABILITY** Provision, the definition of **property damage** in **DEFINITIONS** is replaced by the following:

Property damage means:

- a. Physical injury to tangible property, including all resulting loss of use of that property. All such loss of use shall be deemed to occur at the time of the physical injury that caused it;
- b. Loss of use of tangible property that is not physically injured. All such loss of use shall be deemed to occur at the time of the **occurrence** that caused it; or
- c. Loss of, loss of use of, damage to, corruption of, inability to access, or inability to properly manipulate **electronic data**, resulting from physical injury to tangible property. All such loss of **electronic data** shall be deemed to occur at the time of the **occurrence** that caused it.

For the purposes of this insurance, **electronic data** is not tangible property.

- E. If Electronic Data Liability is provided at a higher limit by another endorsement attached to this policy, then the \$100,000 limit provided by this **ELECTRONIC DATA LIABILITY** Provision is part of, and not in addition to, that higher limit.

9. **ESTATES, LEGAL REPRESENTATIVES, AND SPOUSES**

The estates, heirs, legal representatives and **spouses** of any natural person **Insured** shall also be insured under this policy; provided, however, coverage is afforded to such estates, heirs, legal representatives, and **spouses** only for



Contractors' General Liability Extension Endorsement

claims arising solely out of their capacity or status as such and, in the case of a **spouse**, where such **claim** seeks **damages** from marital community property, jointly held property or property transferred from such natural person **Insured** to such **spouse**. No coverage is provided for any act, error or omission of an estate, heir, legal representative, or **spouse** outside the scope of such person's capacity or status as such, provided however that the **spouse** of a natural person **Named Insured** and the **spouses** of members or partners of joint venture or partnership **Named Insureds** are **Insureds** with respect to such **spouses'** acts, errors or omissions in the conduct of the **Named Insured's** business.

10. EXPECTED OR INTENDED INJURY – EXCEPTION FOR REASONABLE FORCE

Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete the exclusion entitled **Expected or Intended Injury** and replace it with the following:

This insurance does not apply to:

Expected or Intended Injury

Bodily injury or **property damage** expected or intended from the standpoint of the **Insured**. This exclusion does not apply to **bodily injury** or **property damage** resulting from the use of reasonable force to protect persons or property.

11. GENERAL AGGREGATE LIMITS OF INSURANCE - PER PROJECT

A. For each construction project away from premises the **Named Insured** owns or rents, a separate Construction Project General Aggregate Limit, equal to the amount of the General Aggregate Limit shown in the Declarations, is the most the Insurer will pay for the sum of:

1. All **damages** under **Coverage A**, except **damages** because of **bodily injury** or **property damage** included in the **products-completed operations hazard**; and
2. All medical expenses under **Coverage C**,

that arise from **occurrences** or accidents which can be attributed solely to ongoing operations at that construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations, nor the Construction Project General Aggregate Limit of any other construction project.

B. All:

1. **Damages** under **Coverage B**, regardless of the number of locations or construction projects involved;
2. **Damages** under **Coverage A**, caused by **occurrences** which cannot be attributed solely to ongoing operations at a single construction project, except **damages** because of **bodily injury** or **property damage** included in the **products-completed operations hazard**; and
3. Medical expenses under **Coverage C** caused by accidents which cannot be attributed solely to ongoing operations at a single construction project,

will reduce the General Aggregate Limit shown in the Declarations.

- C. The limits shown in the Declarations for Each Occurrence, for Damage To Premises Rented To You and for Medical Expense continue to apply, but will be subject to either the Construction Project General Aggregate Limit or the General Aggregate Limit shown in the Declarations, depending on whether the **occurrence** can be attributed solely to ongoing operations at a particular construction project.
- D. When coverage for liability arising out of the **products-completed operations hazard** is provided, any payments for **damages** because of **bodily injury** or **property damage** included in the **products-completed operations hazard** will reduce the Products-Completed Operations Aggregate Limit shown in the Declarations, regardless of the number of projects involved.

**Contractors' General Liability Extension Endorsement**

- E. If a single construction project away from premises owned by or rented to the **Insured** has been abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.
- F. The provisions of **LIMITS OF INSURANCE** not otherwise modified by this endorsement shall continue to apply as stipulated.

12. IN REM ACTIONS

A quasi in rem action against any vessel owned or operated by or for the **Named Insured**, or chartered by or for the **Named Insured**, will be treated in the same manner as though the action were in personam against the **Named Insured**.

13. INCIDENTAL HEALTH CARE MALPRACTICE COVERAGE

Solely with respect to **bodily injury** that arises out of a **health care incident**:

- A. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Insuring Agreement** is amended to replace Paragraphs 1.b.(1) and 1.b.(2) with the following:
- b. This insurance applies to **bodily injury** provided that the professional health care services are incidental to the **Named Insured's** primary business purpose, and only if:
- (1) such **bodily injury** is caused by an **occurrence** that takes place in the **coverage territory**.
- (2) the **bodily injury** first occurs during the **policy period**. All **bodily injury** arising from an **occurrence** will be deemed to have occurred at the time of the first act, error, or omission that is part of the **occurrence**; and
- B. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to:
- i. add the following to the **Employers Liability** exclusion:
- This exclusion applies only if the **bodily injury** arising from a **health care incident** is covered by other liability insurance available to the **Insured** (or which would have been available but for exhaustion of its limits).
- ii. delete the exclusion entitled **Contractual Liability** and replace it with the following:
- This insurance does not apply to:
- Contractual Liability**
- the **Insured's** actual or alleged liability under any oral or written contract or agreement, including but not limited to express warranties or guarantees.
- iii. add the following additional exclusions:
- This insurance does not apply to:
- Discrimination**
- any actual or alleged discrimination, humiliation or harassment, including but not limited to **claims** based on an individual's race, creed, color, age, gender, national origin, religion, disability, marital status or sexual orientation.
- Dishonesty or Crime**
- Any actual or alleged dishonest, criminal or malicious act, error or omission.
- Medicare/Medicaid Fraud**

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**Contractors' General Liability Extension Endorsement**

any actual or alleged violation of law with respect to Medicare, Medicaid, Tricare or any similar federal, state or local governmental program.

Services Excluded by Endorsement

Any **health care incident** for which coverage is excluded by endorsement.

C. DEFINITIONS is amended to:**i.** add the following definitions:

Health care incident means an act, error or omission by the **Named Insured's employees** or **volunteer workers** in the rendering of:

a. professional health care services on behalf of the **Named Insured** or

b. Good Samaritan services rendered in an emergency and for which no payment is demanded or received.

Professional health care services means any health care services or the related furnishing of food, beverages, medical supplies or appliances by the following providers in their capacity as such but solely to the extent they are duly licensed as required:

a. Physician;

b. Nurse;

c. Nurse practitioner;

d. Emergency medical technician;

e. Paramedic;

f. Dentist;

g. Physical therapist;

h. Psychologist;

i. Speech therapist;

j. Other allied health professional; or

Professional health care services does not include any services rendered in connection with human clinical trials or product testing.

ii. delete the definition of **occurrence** and replace it with the following:

Occurrence means a **health care incident**. All acts, errors or omissions that are logically connected by any common fact, circumstance, situation, transaction, event, advice or decision will be considered to constitute a single **occurrence**;

iii. amend the definition of **Insured** to:**a.** add the following:

the **Named Insured's employees** are **Insureds** with respect to:

(1) **bodily injury** to a co-employee while in the course of the co-employee's employment by the **Named Insured** or while performing duties related to the conduct of the **Named Insured's** business; and

Contractors' General Liability Extension Endorsement

- (2) **bodily injury** to a **volunteer worker** while performing duties related to the conduct of the **Named Insured's** business;

when such **bodily injury** arises out of a **health care incident**.

the **Named Insured's** **volunteer workers** are **Insureds** with respect to:

- (1) **bodily injury** to a **co-volunteer worker** while performing duties related to the conduct of the **Named Insured's** business; and

- (2) **bodily injury** to an **employee** while in the course of the **employee's** employment by the **Named Insured** or while performing duties related to the conduct of the **Named Insured's** business;

when such **bodily injury** arises out of a **health care incident**.

- b. delete Subparagraphs (a), (b), (c) and (d) of Paragraph 2.a.(1) of **WHO IS AN INSURED**.

- D. The **Other Insurance** condition is amended to delete Paragraph b.(1) in its entirety and replace it with the following:

Other Insurance

b. **Excess Insurance**

- (1) To the extent this insurance applies, it is excess over any other insurance, self insurance or risk transfer instrument, whether primary, excess, contingent or on any other basis, except for insurance purchased specifically by the **Named Insured** to be excess of this coverage.

14. JOINT VENTURES / PARTNERSHIP / LIMITED LIABILITY COMPANIES

WHO IS AN INSURED is amended to delete its last paragraph and replace it with the following:

No person or organization is an **Insured** with respect to the conduct of any current or past partnership, joint venture or limited liability company that is not shown as a **Named Insured** in the Declarations, except that if the **Named Insured** was a joint venturer, partner, or member of a limited liability company and such joint venture, partnership or limited liability company terminated prior to or during the **policy period**, such **Named Insured** is an **Insured** with respect to its interest in such joint venture, partnership or limited liability company but only to the extent that:

- a. any offense giving rise to **personal and advertising injury** occurred prior to such termination date, and the **personal and advertising injury** arising out of such offense first occurred after such termination date;
- b. the **bodily injury** or **property damage** first occurred after such termination date; and
- c. there is no other valid and collectible insurance purchased specifically to insure the partnership, joint venture or limited liability company; and

If the joint venture, partnership or limited liability company is or was insured under a **consolidated (wrap-up) insurance program**, then such insurance will always be considered valid and collectible for the purpose of paragraph c. above. But this provision will not serve to exclude **bodily injury**, **property damage** or **personal and advertising injury** that would otherwise be covered under the **Contractors General Liability Extension Endorsement** provision entitled **WRAP-UP EXTENSION: OCIP, CCIP, OR CONSOLIDATED (WRAP-UP) INSURANCE PROGRAMS**. Please see that provision for the definition of **consolidated (wrap-up) insurance program**.

15. LEGAL LIABILITY – DAMAGE TO PREMISES / ALIENATED PREMISES / PROPERTY IN THE NAMED INSURED'S CARE, CUSTODY OR CONTROL

- A. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete exclusion j. **Damage to Property** in its entirety and replace it with the following:

This insurance does not apply to:

Contractors' General Liability Extension Endorsement**j. Damage to Property****Property damage to:**

- (1) Property the **Named Insured** owns, rents, or occupies, including any costs or expenses incurred by you, or any other person, organization or entity, for repair, replacement, enhancement, restoration or maintenance of such property for any reason, including prevention of injury to a person or damage to another's property;
- (2) Premises the **Named Insured** sells, gives away or abandons, if the **property damage** arises out of any part of those premises;
- (3) Property loaned to the **Named Insured**;
- (4) Personal property in the care, custody or control of the **Insured**;
- (5) That particular part of real property on which the **Named Insured** or any contractors or subcontractors working directly or indirectly on the **Named Insured's** behalf are performing operations, if the **property damage** arises out of those operations; or
- (6) That particular part of any property that must be restored, repaired or replaced because **your work** was incorrectly performed on it.

Paragraphs (1), (3) and (4) of this exclusion do not apply to **property damage** (other than damage by fire) to premises rented to the **Named Insured** or temporarily occupied by the **Named Insured** with the permission of the owner, nor to the contents of premises rented to the **Named Insured** for a period of 7 or fewer consecutive days. A separate limit of insurance applies to Damage To Premises Rented To You as described in **LIMITS OF INSURANCE**.

Paragraph (2) of this exclusion does not apply if the premises are **your work**.

Paragraphs (3), (4), (5) and (6) of this exclusion do not apply to liability assumed under a sidetrack agreement.

Paragraph (6) of this exclusion does not apply to **property damage** included in the **products-completed operations hazard**.

Paragraphs (3) and (4) of this exclusion do not apply to **property damage** to:

- i. tools, or equipment the **Named Insured** borrows from others, nor
- ii. other personal property of others in the **Named Insured's** care, custody or control while being used in the **Named Insured's** operations away from any **Named Insured's** premises.

However, the coverage granted by this exception to Paragraphs (3) and (4) does not apply to:

- a. property at a job site awaiting or during such property's installation, fabrication, or erection;
- b. property that is **mobile equipment** leased by an **Insured**;
- c. property that is an **auto**, aircraft or watercraft;
- d. property in transit; or
- e. any portion of **property damage** for which the **Insured** has available other valid and collectible insurance, or would have such insurance but for exhaustion of its limits, or but for application of one of its exclusions.

A separate limit of insurance and deductible apply to such property of others. See **LIMITS OF INSURANCE** as amended below.

**Contractors' General Liability Extension Endorsement**

- B. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete its last paragraph and replace it with the following:

Exclusions c. through n. do not apply to damage by fire to premises while rented to a **Named Insured** or temporarily occupied by a **Named Insured** with permission of the owner, nor to damage to the contents of premises rented to a **Named Insured** for a period of 7 or fewer consecutive days.

A separate limit of insurance applies to this coverage as described in **LIMITS OF INSURANCE**.

- C. The following paragraph is added to **LIMITS OF INSURANCE**:

Subject to 5. above, \$25,000 is the most the Insurer will pay under **Coverage A** for **damages** arising out of any one **occurrence** because of the sum of all **property damage** to borrowed tools or equipment, and to other personal property of others in the **Named Insured's** care, custody or control, while being used in the **Named Insured's** operations away from any **Named Insured's** premises. The Insurer's obligation to pay such **property damage** does not apply until the amount of such **property damage** exceeds \$1,000. The Insurer has the right but not the duty to pay any portion of this \$1,000 in order to effect settlement. If the Insurer exercises that right, the **Named Insured** will promptly reimburse the Insurer for any such amount.

- D. Paragraph 6., Damage To Premises Rented To You Limit, of **LIMITS OF INSURANCE** is deleted and replaced by the following:

6. Subject to Paragraph 5. above, (the Each Occurrence Limit), the Damage To Premises Rented To You Limit is the most the Insurer will pay under **Coverage A** for **damages** because of **property damage** to any one premises while rented to the **Named Insured** or temporarily occupied by the **Named Insured** with the permission of the owner, including contents of such premises rented to the **Named Insured** for a period of 7 or fewer consecutive days. The Damage To Premises Rented To You Limit is the greater of:

- a. \$500,000; or
- b. The Damage To Premises Rented To You Limit shown in the Declarations.

- E. Paragraph 4.b.(1)(a)(ii) of the **Other Insurance** Condition is deleted and replaced by the following:

(ii) That is property insurance for premises rented to the **Named Insured**, for premises temporarily occupied by the **Named Insured** with the permission of the owner; or for personal property of others in the **Named Insured's** care, custody or control;

16. LIQUOR LIABILITY

Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete the exclusion entitled **Liquor Liability**.

This **LIQUOR LIABILITY** provision does not apply to any person or organization who otherwise qualifies as an additional insured on this **Coverage Part**.

17. MEDICAL PAYMENTS

- A. **LIMITS OF INSURANCE** is amended to delete Paragraph 7. (the Medical Expense Limit) and replace it with the following:

7. Subject to Paragraph 5. above (the Each Occurrence Limit), the Medical Expense Limit is the most the Insurer will pay under **Coverage C – Medical Payments** for all medical expenses because of **bodily injury** sustained by any one person. The Medical Expense Limit is the greater of:

- (1) \$15,000 unless a different amount is shown here: \$N,NNN,NNN,NNN; or
- (2) the amount shown in the Declarations for Medical Expense Limit.



**Contractors' General Liability Extension Endorsement**

B. Under **COVERAGES**, the **Insuring Agreement of Coverage C – Medical Payments** is amended to replace Paragraph 1.a.(3)(b) with the following:

(b) The expenses are incurred and reported to the Insurer within three years of the date of the accident; and

18. NON-OWNED AIRCRAFT

Under **COVERAGES**, **Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended as follows:

The exclusion entitled **Aircraft, Auto or Watercraft** is amended to add the following:

This exclusion does not apply to an aircraft not owned by any **Named Insured**, provided that:

1. the pilot in command holds a currently effective certificate issued by the duly constituted authority of the United States of America or Canada, designating that person as a commercial or airline transport pilot;
2. the aircraft is rented with a trained, paid crew to the **Named Insured**; and
3. the aircraft is not being used to carry persons or property for a charge.

19. NON-OWNED WATERCRAFT

Under **COVERAGES**, **Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended to delete subparagraph (2) of the exclusion entitled **Aircraft, Auto or Watercraft**, and replace it with the following.

This exclusion does not apply to:

- (2) a watercraft that is not owned by any **Named Insured**, provided the watercraft is:
- (a) less than 75 feet long; and
 - (b) not being used to carry persons or property for a charge.

20. PERSONAL AND ADVERTISING INJURY –DISCRIMINATION OR HUMILIATION

A. Under **DEFINITIONS**, the definition of **personal and advertising injury** is amended to add the following tort:

Discrimination or humiliation that results in injury to the feelings or reputation of a natural person.

B. Under **COVERAGES**, **Coverage B – Personal and Advertising Injury Liability**, the paragraph entitled **Exclusions** is amended to:

1. delete the Exclusion entitled **Knowing Violation Of Rights Of Another** and replace it with the following:

This insurance does not apply to:

Knowing Violation of Rights of Another

Personal and advertising injury caused by or at the direction of the **Insured** with the knowledge that the act would violate the rights of another and would inflict **personal and advertising injury**. This exclusion shall not apply to discrimination or humiliation that results in injury to the feelings or reputation of a natural person, but only if such discrimination or humiliation is not done intentionally by or at the direction of:

- (a) the **Named Insured**; or
 - (b) any **executive officer**, director, stockholder, partner, member or manager (if the **Named Insured** is a limited liability company) of the **Named Insured**.
2. add the following exclusions:

**Contractors' General Liability Extension Endorsement**

This insurance does not apply to:

Employment Related Discrimination

Discrimination or humiliation directly or indirectly related to the employment, prospective employment, past employment or termination of employment of any person by any **Insured**.

Premises Related Discrimination

discrimination or humiliation arising out of the sale, rental, lease or sub-lease or prospective sale, rental, lease or sub-lease of any room, dwelling or premises by or at the direction of any **Insured**.

Notwithstanding the above, there is no coverage for fines or penalties levied or imposed by a governmental entity because of discrimination.

The coverage provided by this **PERSONAL AND ADVERTISING INJURY –DISCRIMINATION OR HUMILIATION** Provision does not apply to any person or organization whose status as an **Insured** derives solely from

Provision 1. **ADDITIONAL INSURED** of this endorsement; or

attachment of an additional insured endorsement to this **Coverage Part**.

This **PERSONAL AND ADVERTISING INJURY –DISCRIMINATION OR HUMILIATION** Provision does not apply to any person or organization who otherwise qualifies as an additional insured on this **Coverage Part**.

21. PERSONAL AND ADVERTISING INJURY - CONTRACTUAL LIABILITY

A. Under **COVERAGES, Coverage B –Personal and Advertising Injury Liability**, the paragraph entitled **Exclusions** is amended to delete the exclusion entitled **Contractual Liability**.

B. Solely for the purpose of the coverage provided by this **PERSONAL AND ADVERTISING INJURY - CONTRACTUAL LIABILITY** provision, the following changes are made to the section entitled **SUPPLEMENTARY PAYMENTS – COVERAGES A AND B**:

1. Paragraph 2.d. is replaced by the following:

d. The allegations in the **suit** and the information the Insurer knows about the offense alleged in such **suit** are such that no conflict appears to exist between the interests of the **Insured** and the interests of the indemnitee;

2. The first unnumbered paragraph beneath Paragraph 2.f.(2)(b) is deleted and replaced by the following:

So long as the above conditions are met, attorneys fees incurred by the Insurer in the defense of that indemnitee, necessary litigation expenses incurred by the Insurer, and necessary litigation expenses incurred by the indemnitee at the Insurer's request will be paid as **defense costs**. Such payments will not be deemed to be **damages** for **personal and advertising injury** and will not reduce the limits of insurance.

C. This **PERSONAL AND ADVERTISING INJURY - CONTRACTUAL LIABILITY** Provision does not apply if **Coverage B –Personal and Advertising Injury Liability** is excluded by another endorsement attached to this **Coverage Part**.

This **PERSONAL AND ADVERTISING INJURY - CONTRACTUAL LIABILITY** Provision does not apply to any person or organization who otherwise qualifies as an additional insured on this **Coverage Part**.

22. PROPERTY DAMAGE – ELEVATORS

A. Under **COVERAGES, Coverage A – Bodily Injury and Property Damage Liability**, the paragraph entitled **Exclusions** is amended such that the **Damage to Your Product** Exclusion and subparagraphs (3), (4) and (6) of the **Damage to Property** Exclusion do not apply to **property damage** that results from the use of elevators.



**Contractors' General Liability Extension Endorsement**

- B. Solely for the purpose of the coverage provided by this **PROPERTY DAMAGE – ELEVATORS** Provision, the **Other Insurance** conditions is amended to add the following paragraph:

This insurance is excess over any of the other insurance, whether primary, excess, contingent or on any other basis that is Property insurance covering property of others damaged from the use of elevators.

23. SUPPLEMENTARY PAYMENTS

The section entitled **SUPPLEMENTARY PAYMENTS – COVERAGES A AND B** is amended as follows:

- A. Paragraph 1.b. is amended to delete the \$250 limit shown for the cost of bail bonds and replace it with a \$5,000. limit; and
- B. Paragraph 1.d. is amended to delete the limit of \$250 shown for daily loss of earnings and replace it with a \$1,000. limit.

24. UNINTENTIONAL FAILURE TO DISCLOSE HAZARDS

If the **Named Insured** unintentionally fails to disclose all existing hazards at the inception date of the **Named Insured's Coverage Part**, the Insurer will not deny coverage under this **Coverage Part** because of such failure.

25. WAIVER OF SUBROGATION - BLANKET

Under **CONDITIONS**, the condition entitled **Transfer Of Rights Of Recovery Against Others To Us** is amended to add the following:

The Insurer waives any right of recovery the Insurer may have against any person or organization because of payments the Insurer makes for injury or damage arising out of:

1. the **Named Insured's** ongoing operations; or
2. **your work** included in the **products-completed operations hazard**.

However, this waiver applies only when the **Named Insured** has agreed in writing to waive such rights of recovery in a written contract or written agreement, and only if such contract or agreement:

1. is in effect or becomes effective during the term of this **Coverage Part**; and
2. was executed prior to the **bodily injury, property damage or personal and advertising injury** giving rise to the claim.

26. WRAP-UP EXTENSION: OCIP, CCIP, OR CONSOLIDATED (WRAP-UP) INSURANCE PROGRAMS

Note: The following provision does not apply to any public construction project in the state of Oklahoma, nor to any construction project in the state of Alaska, that is not permitted to be insured under a **consolidated (wrap-up) insurance program** by applicable state statute or regulation.

If the endorsement **EXCLUSION – CONSTRUCTION WRAP-UP** is attached to this policy, or another exclusionary endorsement pertaining to Owner Controlled Insurance Programs (O.C.I.P.) or Contractor Controlled Insurance Programs (C.C.I.P.) is attached, then the following changes apply:

- A. The following wording is added to the above-referenced endorsement:

With respect to a **consolidated (wrap-up) insurance program** project in which the **Named Insured** is or was involved, this exclusion does not apply to those sums the **Named Insured** become legally obligated to pay as **damages** because of:

1. **Bodily injury, property damage, or personal or advertising injury** that occurs during the **Named Insured's** ongoing operations at the project, or during such operations of anyone acting on the **Named Insured's** behalf; nor

**Contractors' General Liability Extension Endorsement**

2. **Bodily injury or property damage** included within the **products-completed operations hazard** that arises out of those portions of the project that are not **residential structures**.

B. Condition 4. Other Insurance is amended to add the following subparagraph **4.b.(1)(c)**:

This insurance is excess over:

- (c) Any of the other insurance whether primary, excess, contingent or any other basis that is insurance available to the **Named Insured** as a result of the **Named Insured** being a participant in a **consolidated (wrap-up) insurance program**, but only as respects the **Named Insured's** involvement in that **consolidated (wrap-up) insurance program**.

C. DEFINITIONS is amended to add the following definitions:

Consolidated (wrap-up) insurance program means a construction, erection or demolition project for which the prime contractor/project manager or owner of the construction project has secured general liability insurance covering some or all of the contractors or subcontractors involved in the project, such as an Owner Controlled Insurance Program (O.C.I.P.) or Contractor Controlled Insurance Program (C.C.I.P.).

Residential structure means any structure where 30% or more of the square foot area is used or is intended to be used for human residency, including but not limited to:

1. single or multifamily housing, apartments, condominiums, townhouses, co-operatives or planned unit developments; and
2. the common areas and structures appurtenant to the structures in paragraph 1. (including pools, hot tubs, detached garages, guest houses or any similar structures).

However, when there is no individual ownership of units, **residential structure** does not include military housing, college/university housing or dormitories, long term care facilities, hotels or motels. **Residential structure** also does not include hospitals or prisons.

This **WRAP-UP EXTENSION: OCIP, CCIP, OR CONSOLIDATED (WRAP-UP) INSURANCE PROGRAMS** Provision does not apply to any person or organization who otherwise qualifies as an additional insured on this **Coverage Part**.

All other terms and conditions of the Policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the Policy issued by the designated Insurers, takes effect on the effective date of said Policy at the hour stated in said Policy, unless another effective date is shown below, and expires concurrently with said Policy.

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**Blanket Additional Insured - Owners, Lessees or Contractors - with Products-Completed Operations Coverage Endorsement**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

It is understood and agreed as follows:

- I. WHO IS AN INSURED** is amended to include as an **Insured** any person or organization whom you are required by **written contract** to add as an additional insured on this **coverage part**, but only with respect to liability for **bodily injury, property damage** or **personal and advertising injury** caused in whole or in part by your acts or omissions, or the acts or omissions of those acting on your behalf:
- A.** in the performance of your ongoing operations subject to such **written contract**; or
 - B.** in the performance of **your work** subject to such **written contract**, but only with respect to **bodily injury** or **property damage** included in the **products-completed operations hazard**, and only if:
 - 1. the **written contract** requires you to provide the additional insured such coverage; and
 - 2. this **coverage part** provides such coverage.

II. But if the **written contract** requires:

- A.** additional insured coverage under the 11-85 edition, 10-93 edition, or 10-01 edition of CG2010, or under the 10-01 edition of CG2037; or
- B.** additional insured coverage with "arising out of" language; or
- C.** additional insured coverage to the greatest extent permissible by law;

then paragraph **I.** above is deleted in its entirety and replaced by the following:

WHO IS AN INSURED is amended to include as an **Insured** any person or organization whom you are required by **written contract** to add as an additional insured on this **coverage part**, but only with respect to liability for **bodily injury, property damage** or **personal and advertising injury** arising out of **your work** that is subject to such **written contract**.

III. Subject always to the terms and conditions of this policy, including the limits of insurance, the Insurer will not provide such additional insured with:

- A.** coverage broader than required by the **written contract**; or
- B.** a higher limit of insurance than required by the **written contract**.

IV. The insurance granted by this endorsement to the additional insured does not apply to **bodily injury, property damage**, or **personal and advertising injury** arising out of:

- A.** the rendering of, or the failure to render, any professional architectural, engineering, or surveying services, including:
 - 1. the preparing, approving, or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; and
 - 2. supervisory, inspection, architectural or engineering activities; or
- B.** any premises or work for which the additional insured is specifically listed as an additional insured on another endorsement attached to this **coverage part**.

V. Under **COMMERCIAL GENERAL LIABILITY CONDITIONS**, the Condition entitled **Other Insurance** is amended to add the following, which supersedes any provision to the contrary in this Condition or elsewhere in this **coverage part**:

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Page 1 of 2

VALLEY FORGE INSURANCE COMPANY

Insured Name: MT ROSE HEATING & AIR CONDITIONING INC

Policy No: 7036138468

Endorsement No: 6

Effective Date: 12/31/2022



**Blanket Additional Insured - Owners, Lessees or
Contractors - with Products-Completed
Operations Coverage Endorsement****Primary and Noncontributory Insurance**

With respect to other insurance available to the additional insured under which the additional insured is a named insured, this insurance is primary to and will not seek contribution from such other insurance, provided that a **written contract** requires the insurance provided by this policy to be:

1. primary and non-contributing with other insurance available to the additional insured; or
2. primary and to not seek contribution from any other insurance available to the additional insured.

But except as specified above, this insurance will be excess of all other insurance available to the additional insured.

VI. Solely with respect to the insurance granted by this endorsement, the section entitled **COMMERCIAL GENERAL LIABILITY CONDITIONS is amended as follows:**

The Condition entitled **Duties In The Event of Occurrence, Offense, Claim or Suit** is amended with the addition of the following:

Any additional insured pursuant to this endorsement will as soon as practicable:

1. give the Insurer written notice of any **claim**, or any **occurrence** or offense which may result in a **claim**;
2. send the Insurer copies of all legal papers received, and otherwise cooperate with the Insurer in the investigation, defense, or settlement of the **claim**; and
3. make available any other insurance, and tender the defense and indemnity of any **claim** to any other insurer or self-insurer, whose policy or program applies to a loss that the Insurer covers under this **coverage part**. However, if the **written contract** requires this insurance to be primary and non-contributory, this paragraph 3. does not apply to insurance on which the additional insured is a named insured.

The Insurer has no duty to defend or indemnify an additional insured under this endorsement until the Insurer receives written notice of a **claim** from the additional insured.

VII. Solely with respect to the insurance granted by this endorsement, the section entitled **DEFINITIONS is amended to add the following definition:**

Written contract means a written contract or written agreement that requires you to make a person or organization an additional insured on this **coverage part**, provided the contract or agreement:

- A. is currently in effect or becomes effective during the term of this policy; and
- B. was executed prior to:
 1. the **bodily injury** or **property damage**; or
 2. the offense that caused the **personal and advertising injury**;for which the additional insured seeks coverage.

Any coverage granted by this endorsement shall apply solely to the extent permissible by law.

All other terms and conditions of the Policy remain unchanged.

This endorsement, which forms a part of and is for attachment to the Policy issued by the designated Insurers, takes effect on the effective date of said Policy at the hour stated in said Policy, unless another effective date is shown below, and expires concurrently with said Policy.



CONTRACTORS EXTENDED COVERAGE ENDORSEMENT - BUSINESS AUTO PLUS

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

I. LIABILITY COVERAGE

A. Who Is An Insured

The following is added to **Section II, Paragraph A.1., Who Is An Insured**:

1.
 - a. Any incorporated entity of which the Named Insured owns a majority of the voting stock on the date of inception of this Coverage Form; provided that,
 - b. The insurance afforded by this provision **A.1.** does not apply to any such entity that is an **insured** under any other liability "policy" providing **auto** coverage.
2. Any organization you newly acquire or form, other than a limited liability company, partnership or joint venture, and over which you maintain majority ownership interest.

The insurance afforded by this provision **A.2.**:

- a. Is effective on the acquisition or formation date, and is afforded only until the end of the policy period of this Coverage Form, or the next anniversary of its inception date, whichever is earlier.
 - b. Does not apply to:
 - (1) **Bodily injury** or **property damage** caused by an **accident** that occurred before you acquired or formed the organization; or
 - (2) Any such organization that is an **insured** under any other liability "policy" providing **auto** coverage.
3. Any person or organization that you are required by a written contract to name as an additional insured is an **insured** but only with respect to their legal liability for acts or omissions of a person, who qualifies as an **insured** under **SECTION II – WHO IS AN INSURED** and for whom Liability Coverage is afforded under this policy. If required by written contract, this insurance will be primary and non-contributory to insurance on which the additional insured is a Named Insured.
4. An **employee** of yours is an **insured** while operating an **auto** hired or rented under a contract or agreement in that **employee's** name, with your permission, while performing duties related to the conduct of your business.

"Policy", as used in this provision **A. Who Is An Insured**, includes those policies that were in force on the inception date of this Coverage Form but:

1. Which are no longer in force; or
2. Whose limits have been exhausted.

B. Bail Bonds and Loss of Earnings

Section II, Paragraphs A.2. (2) and A.2. (4) are revised as follows:

1. In **a.(2)**, the limit for the cost of bail bonds is changed from \$2,000 to \$5,000; and
2. In **a.(4)**, the limit for the loss of earnings is changed from \$250 to \$500 a day.

Form No: CNA63359XX (04-2012)

Endorsement Effective Date:

Endorsement Expiration Date:

Endorsement No: 9; Page: 1 of 4

Policy No: BUA 7036138454

Policy Effective Date: 12/31/2022

Policy Page: 59 of 172

Underwriting Company: National Fire Insurance Company of Hartford, 151 N Franklin St, Chicago, IL 60606



C. Fellow Employee

Section II, Paragraph B.5 does not apply.

Such coverage as is afforded by this provision C. is excess over any other collectible insurance.

II. PHYSICAL DAMAGE COVERAGE

A. Glass Breakage – Hitting A Bird Or Animal – Falling Objects Or Missiles

The following is added to **Section III, Paragraph A.3.:**

With respect to any covered **auto**, any deductible shown in the Declarations will not apply to glass breakage if such glass is repaired, in a manner acceptable to us, rather than replaced.

B. Transportation Expenses

Section III, Paragraph A.4.a. is revised, with respect to transportation expense incurred by you, to provide:

- a. \$60 per day, in lieu of \$20; subject to
- b. \$1,800 maximum, in lieu of \$600.

C. Loss of Use Expenses

Section III, Paragraph A.4.b. is revised, with respect to loss of use expenses incurred by you, to provide:

- a. \$1,000 maximum, in lieu of \$600.

D. Hired "Autos"

The following is added to **Section III. Paragraph A.:**

5. Hired "Autos"

If Physical Damage coverage is provided under this policy, and such coverage does not extend to Hired Autos, then Physical Damage coverage is extended to:

- a. Any covered **auto** you lease, hire, rent or borrow without a driver; and
- b. Any covered **auto** hired or rented by your **employee** without a driver, under a contract in that individual **employee's** name, with your permission, while performing duties related to the conduct of your business.
- c. The most we will pay for any one **accident** or **loss** is the actual cash value, cost of repair, cost of replacement or \$75,000, whichever is less, minus a \$500 deductible for each covered auto. No deductible applies to **loss** caused by fire or lightning.
- d. The physical damage coverage as is provided by this provision is equal to the physical damage coverage(s) provided on your owned **autos**.
- e. Such physical damage coverage for hired **autos** will:
 - (1) Include loss of use, provided it is the consequence of an **accident** for which the Named Insured is legally liable, and as a result of which a monetary loss is sustained by the leasing or rental concern.
 - (2) Such coverage as is provided by this provision will be subject to a limit of \$750 per **accident**.

E. Airbag Coverage

The following is added to **Section III, Paragraph B.3.:**

The accidental discharge of an airbag shall not be considered mechanical breakdown.

Form No: CNA63359XX (04-2012)

Endorsement Effective Date:

Endorsement Expiration Date:

Endorsement No: 9; Page: 2 of 4

Policy No: BUA 7036138454

Policy Effective Date: 12/31/2022

Policy Page: 60 of 172

Underwriting Company: National Fire Insurance Company of Hartford, 151 N Franklin St, Chicago, IL 60606



F. Electronic Equipment

Section III, Paragraphs B.4.c and B.4.d. are deleted and replaced by the following:

- c. Physical Damage Coverage on a covered **auto** also applies to **loss** to any permanently installed electronic equipment including its antennas and other accessories
- d. A \$100 per occurrence deductible applies to the coverage provided by this provision.

G. Diminution In Value

The following is added to **Section III, Paragraph B.6.:**

Subject to the following, the **diminution in value** exclusion does not apply to:

- a. Any covered **auto** of the private passenger type you lease, hire, rent or borrow, without a driver for a period of 30 days or less, while performing duties related to the conduct of your business; and
- b. Any covered **auto** of the private passenger type hired or rented by your **employee** without a driver for a period of 30 days or less, under a contract in that individual **employee's** name, with your permission, while performing duties related to the conduct of your business.
- c. Such coverage as is provided by this provision is limited to a **diminution in value** loss arising directly out of accidental damage and not as a result of the failure to make repairs; faulty or incomplete maintenance or repairs; or the installation of substandard parts.
- d. The most we will pay for **loss** to a covered **auto** in any one accident is the lesser of:
 - (1) \$5,000; or
 - (2) 20% of the **auto's** actual cash value (ACV).

III. Drive Other Car Coverage – Executive Officers

The following is added to **Sections II and III:**

- 1. Any **auto** you don't own, hire or borrow is a covered **auto** for Liability Coverage while being used by, and for Physical Damage Coverage while in the care, custody or control of, any of your "executive officers", except:
 - a. An **auto** owned by that "executive officer" or a member of that person's household; or
 - b. An **auto** used by that "executive officer" while working in a business of selling, servicing, repairing or parking **autos**.

Such Liability and/or Physical Damage Coverage as is afforded by this provision.

- (1) Equal to the greatest of those coverages afforded any covered **auto**; and
- (2) Excess over any other collectible insurance.

- 2. For purposes of this provision, "executive officer" means a person holding any of the officer positions created by your charter, constitution, by-laws or any other similar governing document, and, while a resident of the same household, includes that person's spouse.

Such "executive officers" are **insureds** while using a covered **auto** described in this provision.

IV. BUSINESS AUTO CONDITIONS

A. Duties In The Event Of Accident, Claim, Suit Or Loss

The following is added to **Section IV, Paragraph A.2.a.:**

Form No: CNA63359XX (04-2012)

Endorsement Effective Date:

Endorsement Expiration Date:

Endorsement No: 9; Page: 3 of 4

Policy No: BUA 7036138454

Policy Effective Date: 12/31/2022

Policy Page: 61 of 172

Underwriting Company: National Fire Insurance Company of Hartford, 151 N Franklin St, Chicago, IL 60606



- (4) Your **employees** may know of an **accident** or **loss**. This will not mean that you have such knowledge, unless such **accident** or **loss** is known to you or if you are not an individual, to any of your executive officers or partners or your insurance manager.

The following is added to **Section IV, Paragraph A.2.b.:**

- (6) Your **employees** may know of documents received concerning a claim or **suit**. This will not mean that you have such knowledge, unless receipt of such documents is known to you or if you are not an individual, to any of your executive officers or partners or your insurance manager.

B. Transfer Of Rights Of Recovery Against Others To Us

The following is added to **Section IV, Paragraph A.5. Transfer Of Rights Of Recovery Against Others To Us:**

We waive any right of recovery we may have, because of payments we make for injury or damage, against any person or organization for whom or which you are required by written contract or agreement to obtain this waiver from us.

This injury or damage must arise out of your activities under a contract with that person or organization.

You must agree to that requirement prior to an **accident** or **loss**.

C. Concealment, Misrepresentation or Fraud

The following is added to **Section IV, Paragraph B.2.:**

Your failure to disclose all hazards existing on the date of inception of this Coverage Form shall not prejudice you with respect to the coverage afforded provided such failure or omission is not intentional.

D. Other Insurance

The following is added to **Section IV, Paragraph B.5.:**

Regardless of the provisions of Paragraphs **5.a.** and **5.d.** above, the coverage provided by this policy shall be on a primary non-contributory basis. This provision is applicable only when required by a written contract.

That written contract must have been entered into prior to **Accident** or **Loss**.

E. Policy Period, Coverage Territory

Section IV, Paragraph B. 7.(5).(a). is revised to provide:

- a. 45 days of coverage in lieu of 30 days.

V. DEFINITIONS

Section V. paragraph C. is deleted and replaced by the following:

Bodily injury means bodily injury, sickness or disease sustained by a person, including mental anguish, mental injury or death resulting from any of these.

ADDITIONAL INSURED ENDORSEMENT – ONGOING WORK OR OPERATIONS

Named Insured Mt Rose Heating & Air Conditioning Inc			Endorsement Number
Policy Symbol CPW	Policy Number G71488068 005	Policy Period 01/01/2023 to 01/01/2024	Effective Date of Endorsement 01/01/2023
Issued By (Name of Insurance Company) Westchester Surplus Lines Insurance Company			

Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

THIS ENDORSEMENT MODIFIES INSURANCE PROVIDED UNDER THE FOLLOWING:

CONTRACTORS POLLUTION LIABILITY COVERAGE PART

SCHEDULE:

Name of Person(s) or Organization(s): As required by written contract, prior to a loss to which this insurance applies.

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

A. SECTION II - WHO IS AN INSURED is amended to include as an additional insured the persons or organizations shown in the Schedule, but only with respect to liability for injury or damage, to which this insurance applies, caused in ,whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insureds.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following exclusion is added:

Exclusions

This insurance does not apply to injury or damage occurring after:

- a. All work or operations, including materials, parts or equipment furnished in connection with such work or operations, on the project (other than service, maintenance or repairs) to be performed by you or on your behalf at the site of the covered operations has been completed; or
- b. That portion of **your work** out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for the additional insured as a part of the same project.

C. With respect to the insurance afforded to these additional insureds, the following is added to SECTION III – LIMITS OF INSURANCE:

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
 2. Available under the applicable Limits of Insurance shown in the Declarations;
- whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

All other terms and conditions of this policy remain unchanged.

ADDITIONAL INSURED ENDORSEMENT – PRODUCTS-COMPLETED OPERATIONS HAZARD

Named Insured Mt Rose Heating & Air Conditioning Inc			Endorsement Number
Policy Symbol CPW	Policy Number G71488068 005	Policy Period 01/01/2023 to 01/01/2024	Effective Date of Endorsement 01/01/2023
Issued By (Name of Insurance Company) Westchester Surplus Lines Insurance Company			

Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

THIS ENDORSEMENT MODIFIES INSURANCE PROVIDED UNDER THE FOLLOWING:

CONTRACTORS POLLUTION LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization(s): As required by written contract, prior to a loss to which this insurance applies.

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

- A. SECTION II – WHO IS AN INSURED** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for injury or damage, to which this insurance applies, caused by or resulting from **your work** performed for that additional insured and included in the **products-completed operations hazard**, and only to the extent that such injury or damage is caused, in whole or in part, by your negligence or the negligence of those acting on your behalf.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

- B. With respect to the insurance afforded to these additional insureds, the following is added to SECTION III - LIMITS OF INSURANCE:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

All other terms and conditions of this policy remain unchanged.

Named Insured Mt Rose Heating & Air Conditioning Inc			Endorsement Number
Policy Symbol CPW	Policy Number G71488068 005	Policy Period 01/01/2023 to 01/01/2024	Effective Date of Endorsement 01/01/2023
Issued By (Name of Insurance Company) Westchester Surplus Lines Insurance Company			

Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART
CONTRACTORS POLLUTION LIABILITY COVERAGE PART**

SCHEDULE

Name of Person or Organization: As required by written contract, prior to a loss to which this insurance applies.

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

The **TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US Condition** is amended by the addition of the following:

We waive any right of recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or **your work** done under a contract with that person or organization and included in the **products-completed operations hazard**. This waiver applies only to the person or organization shown in the Schedule above.

All other terms and conditions remain the same.

PRIMARY AND NONCONTRIBUTORY – OTHER INSURANCE CONDITION

Named Insured Mt Rose Heating & Air Conditioning Inc			Endorsement Number
Policy Symbol CPW	Policy Number G71488068 005	Policy Period 01/01/2023 to 01/01/2024	Effective Date of Endorsement 01/01/2023
Issued By (Name of Insurance Company) Westchester Surplus Lines Insurance Company			

Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

THIS ENDORSEMENT MODIFIES INSURANCE PROVIDED UNDER THE FOLLOWING:

CONTRACTOR'S POLLUTION LIABILITY COVERAGE PART

The following is added to the **Other Insurance** Condition and supersedes any provision to the contrary:

Primary and Noncontributory Insurance

This policy is primary to, and will not seek contribution from, any other insurance available to an additional insured under this policy, provided that:

- a. The additional insured is a named insured under such other insurance; and
- b. The **named insured** has agreed in a written contract or agreement that this insurance would:
 - (1) act as primary insurance; and
 - (2) would not seek contribution from any other insurance available to the additional insured.

All other terms and conditions of this policy remain unchanged.

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us).

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

	Schedule
State	Blanket/Schedule/State
NV	BLANKET

Blanket Waiver: Anyone for whom you have agreed to provide this Waiver subject to the terms of this endorsement

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.

This document may have been uploaded to the CopperPoint Portal.

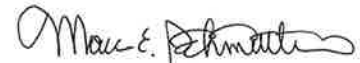
(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement Effective 01/01/2023 Policy No. 1021465
Insured Mt Rose Heating & Air Conditioning Inc

Endorsement No. 9
Premium \$

Insurance Company CopperPoint American Insurance Company

Countersigned by



WC 00 03 13
(Ed. 4-84)

SECTION 070 – CONTRACT

CONTRACT

This agreement, made and entered into this 21st day of July, 2023 in Reno, Nevada, by and between the City of Reno, hereinafter called the City, and MT. ROSE HEATING & AIR CONDITIONING, INC., hereinafter called the Contractor.

Witnesseth, that the Contractor agrees with the City, for the consideration and agreements hereinafter mentioned and contained to be made and performed by the City, and under the conditions expressed in two (2) bonds bearing even date with these presents, approved by the City Attorney and hereunto annexed, that they, the Contractor, shall and will at their own proper cost and expense, do all the work and furnish all the materials, necessary for the substantial construction and completion and to the satisfaction of the City,

**CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
CONTRACT NUMBER FM980B
PWP WA-2023-208
FEDERALLY FUNDED PROJECT**

together with incidental items necessary to complete the work in strict conformity, in every part and particular, with the annexed plans, special provisions and technical specifications which are made a part hereof (Contract Documents), and in full compliance with the terms of this agreement.

And the Contractor hereby further agrees to receive and accept the unit prices set forth in the "Schedule of Prices" forms hereto annexed and hereby made a part of this agreement, as full compensation for furnishing all materials and labor, and the doing of all work, to the satisfaction of the City and in the manner and under the conditions hereinafter specified.

The City hereby promises and agrees with the Contractor, to employ, and does hereby employ, the Contractor to provide the materials and to complete all the work according to the terms and conditions herein contained and referred to, for the prices in the Proposal Schedule of Prices Bid form, and hereby contracts to pay the said Contractor at the time, in the manner, and upon the conditions set forth in the Contract Documents, and the said parties themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to the full performance of the covenants herein contained.

The Contractor further agrees that no monies payable under this contract shall be assigned by power of attorney, or otherwise, except upon written consent of the City.

The Contractor covenants and agrees to conform to and comply with all requirements contained in Wage and Equal Opportunity requirements hereto annexed and hereby made a part of this Agreement. The Contractor further agrees that they shall promptly repair, replace, restore or rebuild, as the City may determine, any finished work in which defects of materials or workmanship may appear or to which damage may occur, because of such defects, during a one-year period subsequent to the date of final acceptance.

It is further expressly agreed, by and between the parties hereto, that should there be any conflict between the Contract Documents and the Proposal of said Contractor, then Contract Documents shall

MT. ROSE HEATING & AIR
CONDITIONING, INC.
310 SUNSHINE LANE
RENO, NV 89502

MT. ROSE HEATING & AIR
CONDITIONING, INC.
310 SUNSHINE LANE
RENO, NV 89502

MT. ROSE HEATING & AIR
CONDITIONING, INC.
310 SUNSHINE LANE
RENO, NV 89502



NEW

Policy Number

**COMMERCIAL LINES POLICY
COMMON DECLARATIONS
COMMERCIAL MARINE**

Coverage is provided in the: HANOVER INSURANCE COMPANY
440 LINCOLN STREET
WORCESTER, MASSACHUSETTS 01653

POLICY NUMBER		POLICY PERIOD		AGENCY CODE
	FROM	TO		
IH4 J501830 00	08/01/2023	08/01/2024	AT 12:01 AM STANDARD TIME AT YOUR MAILING ADDRESS SHOWN ON THE COMMON DECLARATION.	2301486
NAMED INSURED AND MAILING ADDRESS (Street, Town or City, County, State, Zip Code) MT. ROSE HEATING & AIR CONDITIONING, INC. 310 SUNSHINE LANE RENO, NV 89502			AGENT LP INSURANCE SERVICES LLC 300 E 2ND ST STE 1300 RENO, NV 89501	

DESCRIPTION OF BUSINESS

☐ Individual ☐ Corporation ☐ Partnership ☐ Joint Venture ☐ Other:

Business Description: BUILDERS RISK

IN RETURN FOR THE PAYMENT OF THE PREMIUM, AND SUBJECT TO ALL THE TERMS OF THIS POLICY, WE AGREE WITH YOU TO PROVIDE THE INSURANCE AS STATED IN THIS POLICY. THIS POLICY CONSISTS OF THE FOLLOWING COVERAGE PART(S) FOR WHICH A PREMIUM IS INDICATED. THIS PREMIUM MAY BE SUBJECT TO ADJUSTMENT.

	PREMIUM
• Commercial Property Coverage Part	\$ _____
• Commercial Crime Coverage Part	\$ _____
• Commercial Inland Marine Coverage Part	<u>\$1,494.00</u>
• Boiler and Machinery Coverage Part	\$ _____
• Ocean Marine	\$ _____
• Terrorism	<u>\$15.00</u>

PREMIUM <input checked="" type="checkbox"/> The total premium of \$1,509.00 is due at inception <input type="checkbox"/> The total premium includes a deposit premium subject to adjustment	PAYMENT PLAN: Agency Bill/Full Paid
--	---

See list of Form (s) and Endorsement(s) applicable to all Coverage Part(s) and made a part of this policy at time of issue.

Countersigned:

By _____
Authorized Representative

THESE DECLARATIONS TOGETHER WITH THE COMMON POLICY CONDITIONS, COVERAGE PARTS COVERAGE FORM(S) AND FORMS AND ENDORSEMENTS, IF ANY, ISSUED TO FORM A PART THEREOF, COMPLETE THE ABOVE NUMBERED POLICY.

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FORMS AND ENDORSEMENTS APPLICABLE TO ALL COVERAGE PARTS AND MADE A PART OF THIS POLICY AT TIME OF ISSUE

Form Number	Edition Date	Form Name
Common Forms applicable to All Coverages		
IM 201	05-08	Commercial Marine - Reporting Claims
IM441-1644	05-22	Builders Risk Notice To Policyholder
231-0862	12-14	Customer Notice Of Privacy And Producer Compensation Practices Disclosures
IM441-1045	01-12	Minimum Earned Premium
IM441-1635	01-20	Additional Property Not Covered Endorsement - Construction Type
401-1127	01-15	Notice - Acceptance Of Terrorism Coverage and Disclosure Of Premium
401-1374	01-15	Disclosure Pursuant To Terrorism Risk Insurance Act
CL 06 00	01-15	Certified Terrorism Loss
CM 00 01	09-04	Commercial Inland Marine Conditions
IL 00 17	11-98	Common Policy Conditions
IL 01 10	09-07	Nevada Changes- Concealment, Misrepresentation or Fraud
IL 02 51	09-07	Nevada Changes - Cancellation and Nonrenewal
IL 09 35	07-02	Exclusion of Certain Computer-Related Losses
IM441-1636	01-20	Additional Property Not Covered Endorsement - Project Type
401-1337	02-16	Trade Or Economic Sanctions Endorsement
401-1377	06-20	Company Address Listing
SIG 11 00	11-17	Signature Page
Builders Risk Forms		
IM441-1359	08-16	Builders' Risk Schedule of Coverages
IM441-1352	01-20	Builders' Risk Coverage Form
IM441-1381	06-13	Exclusion Of Loss Due To Virus Or Bacteria



Commercial Marine REPORTING CLAIMS

In the event of a claim losses must be reported by the insured or agent immediately through our National Claims Reporting Line @ 1-800-628-0250.

The caller then presses 2. This delivers the call to our Customer Care Team. Our representative will take the loss report and assign an adjuster.

Losses can also be faxed to us @ 1-800-399-4734.

BUILDERS' RISK IMPORTANT NOTICE TO POLICYHOLDERS

THIS DISCLOSURE DOES NOT PROVIDE COVERAGE NOR DOES THIS NOTICE REPLACE ANY PROVISIONS OF YOUR POLICY. YOU SHOULD READ YOUR POLICY AND REVIEW YOUR DECLARATIONS PAGE FOR COMPLETE INFORMATION ON THE COVERAGES YOU ARE PROVIDED. IF THERE IS ANY CONFLICT BETWEEN THE POLICY AND THIS NOTICE, THE PROVISIONS OF THE POLICY SHALL PREVAIL.

This notice is to advise you that your Builders' Risk policy is a set term policy and is not automatically extended. The coverage provided under the Builders' Risk Coverage Form will cease as of the expiration date.

We understand that an extension of coverage may be necessary in order to complete the Builders' Risk project. This may be a result of design changes, permitting, weather delays or problems with suppliers or material deliveries. An extension questionnaire with key questions will be issued and we ask that you work with your agent on answering those questions if an extension is necessary. Upon receipt of the completed questionnaire we will review, evaluate and determine if an extension is granted. If we do not receive the questionnaire we are unable to offer an extension.

Customer Notice of Privacy Policy and Producer Compensation Practices Disclosures

Privacy Policy Disclosure

Collection of Information

We collect personal information so that we may offer quality products and services. This information may include, but is not limited to, name, address, Social Security number, and consumer reports from consumer reporting agencies in connection with your application for insurance or any renewal of insurance. For example, we may access driving records, insurance scores or health information. Our information sources will differ depending on your state and/or the product or service we are providing to you. This information may be collected directly from you and/or from affiliated companies, non-affiliated third parties, consumer reporting agencies, medical providers and third parties such as the Medical Information Bureau.

We, and the third parties we partner with, may track some of the web pages you visit through cookies, pixel tagging or other technologies. We currently do not process or comply with any web browser's "do not track" signals or similar mechanisms that request us to take steps to disable online tracking. For additional information regarding online privacy, please see our online privacy statement, located at www.hanover.com.

Disclosure of Information

We may disclose non-public, personal information you provide, as required to conduct our business and as permitted or required by law. We may share information with our insurance company affiliates or with third parties that assist us in processing and servicing your account. We also may share your information with regulatory or law enforcement agencies, reinsurers and others, as permitted or required by law.

Our insurance companies may share information with their affiliates, but will not share information with non-affiliated third parties who would use the information to market products or services to you.

Our standards for disclosure apply to all of our current and former customers.

Safeguards to Protect Your Personal Information

We recognize the need to prevent unauthorized access to the information we collect, including information held in an electronic format on our computer systems. We maintain physical, electronic and procedural safeguards intended to protect the confidentiality and integrity of all non-public, personal information, including but not limited to social security numbers, driver's license numbers and other personally identifiable information.

Internal Access to Information

Access to personal, non-public information is limited to those people who need the information to provide our customers with products or services. These people are expected to protect this information from inappropriate access, disclosure and modification.

Consumer Reports

In some cases, we may obtain a consumer report in connection with an application for insurance. Depending on the type of policy, a consumer report may include information about you or your business, such as:

- character, general reputation, personal characteristics, mode of living;
- credit history, driving record (including records of any operators who will be insured under the policy); and/or
- an appraisal of your dwelling or place of business that may include photos and comments on its general condition.

Access to Information

Upon written request, we will inform you if we have ordered an investigative consumer report. You have the right to make a written request within a reasonable period for information concerning the nature and scope of the report and to be interviewed as part of its preparation. You may obtain a copy of the report from the reporting agency and, under certain circumstances, you may be entitled to a copy at no cost.

You also may review certain information we have about you or your business in our files. To review information we maintain in our files about you or your business, please write to us, providing your complete name, address and policy number(s), and indicating specifically what you would like to see. If you request actual copies of your file, there may be a nominal charge.

We will tell you to whom we have disclosed the information within the two years prior to your request. If there is not a record indicating that the information was provided to another party, we will tell you to whom such information is normally disclosed.

There is information that we cannot share with you. This may include information collected in order to evaluate a claim under an insurance policy, when the possibility of a lawsuit exists. It may also include medical information that we would have to forward to a licensed medical doctor of your choosing so that it may be properly explained.

Correction of Information

If after reviewing your file you believe information is incorrect, please write to the consumer reporting agency or to us, whichever is applicable, explaining your position. The information in question will be investigated. If appropriate, corrections will be made to your file and the parties to whom the incorrect information was disclosed, if any, will be notified. However, if the investigation substantiates the information in the file, you will be notified of the reasons why the file will not be changed. If you are not satisfied with the evaluation, you have the right to place a statement in the file explaining why you believe the information is incorrect. We also will send a copy of your statement to the parties, if any, to whom we previously disclosed the information and include it in any future disclosures.

Our Commitment to Privacy

In the insurance and financial services business, lasting relationships are built upon mutual respect and trust. With that in mind, we will periodically review and revise our privacy policy and procedures to ensure that we remain compliant with all state and federal requirements. If any provision of our privacy policy is found to be non-compliant, then that provision will be modified to reflect the appropriate state or federal requirement. If any modifications are made, all remaining provisions of this privacy policy will remain in effect. For more detailed information about our customer privacy policy (including any applicable state-specific policies) and our online privacy statement, visit our Web site, located at www.hanover.com.

Further Information

If you have questions about our customer privacy policy (including any applicable state-specific policies) or our online privacy statement, or if you would like to request information we have on file, please write to us at our Privacy Office, N435, The Hanover Insurance Group, Inc., 440 Lincoln Street, Worcester, MA 01653. Please provide your complete name, address and policy number(s). A copy of our Producer Compensation Disclosure is also available upon written request addressed to the attention of the Corporate Secretary, N435, The Hanover Insurance Group, 440 Lincoln Street, Worcester, MA 01653.

Producer Compensation Disclosure

Our products are sold through independent agents and brokers, often referred to as "Producers." We may pay Producers a fixed commission for placing and renewing business with our company. We may also pay additional commission and other forms of compensation and incentives to Producers who place and maintain their business with us. Details of our Producer compensation practices may be found at www.hanover.com.

This notice is being provided on behalf of the following Hanover Companies: The Hanover Insurance Group, Inc. - Allmerica Financial Alliance Insurance Company - Allmerica Financial Benefit Insurance Company - Allmerica Plus Insurance Agency, Inc. - Citizens Insurance Company of America - Citizens Insurance Company of Illinois - Citizens Insurance Company of the Midwest - Citizens Insurance Company of Ohio - Citizens Management, Inc. - AIX Ins. Services of California, Inc.- Campania Insurance Agency Co. Inc. - Campmed Casualty & Indemnity Co. Inc. - Chaucer Syndicates Limited- Educators Insurance Agency, Inc.- Hanover Specialty Insurance Brokers, Inc. - The Hanover American Insurance Company - The Hanover Insurance Company - The Hanover New Jersey Insurance Company - The Hanover National Insurance Company - Hanover Lloyd's Insurance Company - Massachusetts Bay Insurance Company - Opus Investment Management, Inc. - Professionals Direct Insurance Services, Inc. -Professional Underwriters Agency, Inc. - Verlan Fire Insurance Company - Nova Casualty Company - AIX Specialty Insurance Company.

IM441-1045 01 12

This endorsement changes
"your" policy
-- PLEASE READ THIS CAREFULLY --

Minimum Earned Premium

(The entries required to complete this endorsement
will be shown below or on the "schedule of coverages".)

In the event of cancellation of this policy or reduction in coverage by "you" the minimum earned premium is \$500.

Minimum earned premium is the minimum premium "we" will retain regardless of the cancellation or amendment date of "your" policy.

If "your" policy includes reporting conditions the cancellation or amendment of the policy does not waive "your" reporting requirements as stated in "your" policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL PROPERTY NOT COVERED ENDORSEMENT – CONSTRUCTION TYPE

This endorsement modifies insurance under the following:

BUILDERS' RISK COVERAGE FORM

If checked, the following is added to **A. COVERAGE, 2. Property Not Covered:**

- ☒ **Frame** (Construction class 1) – Frame or wood stick construction buildings or structures have exterior roofs, walls and floors of combustible materials. Buildings or structures may have exterior walls of non-combustible construction but floors and roofs are combustible.
- ☒ **Joisted Masonry** (Construction class 2) – Joisted Masonry means buildings or structures with exterior bearing walls of masonry or fire resistive construction with at least one hour fire rating but with combustible roof and floor.
- ☐ **Non-Combustible** (Construction class 3) – Non Combustible means buildings or structures with exterior walls, floors and roofs of non-combustible or slow burning materials. Building supports are made of non-combustible or slow burning materials.
- ☐ **Masonry Non-Combustible** (Construction class 4) – Masonry Non Combustible means buildings or structures with exterior bearing walls of fire resistive construction, not less than 4" thick, with a fire rating of at least one (1) hour. Roofs and floors are constructed of non-combustible or slow burning materials.
- ☐ **Modified Fire Resistive** (Construction class 5) – Modified Fire Resistive construction means buildings or structures with exterior and interior bearing walls or structural supports, floors and roof of masonry materials with a fire rating of less than two (2) hours but not less than one (1) hour. Structural steel will be protected by applied material affording like fire protection. Masonry materials are at least 4 inches thick.
- ☐ **Fire resistive** (Construction class 6) – Fire resistive construction means floors, exterior bearing walls or the exterior structural frame that are either of non-combustible materials with a fire rating on 2 hours or more or are a masonry material meeting the following thickness requirements: solid masonry or reinforced concrete at least 4 inches thick; or, hollow masonry materials at least 12 inches thick. All assembled components will have a fire rating of at least two (2) hours.
- ☒ **Buildings** (Mixed Construction) – Buildings or structures which are of multiple or mixed construction and which, at completion, are composed of 25% or more frame construction, will be classed as Frame – Construction class 1.

ALL OTHER TERMS, CONDITIONS AND EXCLUSIONS REMAIN UNCHANGED

THIS NOTICE IS ATTACHED TO AND MADE PART OF YOUR POLICY IN RESPONSE TO THE DISCLOSURE REQUIREMENTS OF THE TERRORISM RISK INSURANCE ACT, AS AMENDED. THIS NOTICE DOES NOT GRANT ANY COVERAGE OR CHANGE THE TERMS AND CONDITIONS OF ANY COVERAGE UNDER THIS POLICY. IF THERE IS A CONFLICT BETWEEN THIS NOTICE AND THE POLICY, THE PROVISIONS OF THE POLICY SHALL APPLY.

NOTICE – ACCEPTANCE OF TERRORISM COVERAGE AND DISCLOSURE OF PREMIUM

Schedule

Disclosure of Premium:	
Total Terrorism Premium	\$ 15.00
Fire Following Premium	\$ Not Applicable
Other than Fire Following Premium	\$ 15.00

Coverage for “acts of terrorism,” as defined in Section 102(1) of the Terrorism Risk Insurance Act (“Act”) is included in your policy. You are hereby notified that under the Act, as amended in 2015, the definition of “act of terrorism” is:

Any act or acts that are certified by the Secretary of the Treasury, in consultation with the Secretary of Homeland Security and the Attorney General of the United States, to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States government by coercion.

Disclosure of Federal Participation in Payment of Terrorism Losses

The United States government through the Department of the Treasury may pay a share of terrorism losses insured under the federal program under a formula set forth in the Act. Under this formula, the United States government generally reimburses the following percentage of covered terrorism loss which exceeds the statutorily established deductible paid by the insurance company providing the coverage: 85% through 2015; 84% beginning on January 1, 2016; 83% beginning on January 1, 2017; 82% beginning on January 1, 2018; 81% beginning on January 1, 2019; and 80% beginning on January 1, 2020.

Cap on Insurer Participation in Payment of Terrorism Losses

The Act contains a \$100 billion cap that limits the reimbursement by the United States government as well as insurers' liability for losses resulting from certified acts of terrorism. If the aggregate of insured losses attributable to terrorist acts certified under the Terrorism Risk Insurance Act exceed \$100 billion in a calendar year and we have met our insurer deductible under the Act, we will not be liable for the payment of any portion of the amount of such losses that exceeds \$100 billion. In such case, insured losses up to that amount are subject to pro rata allocation in accordance with procedures established by the Secretary of the Treasury.

THIS NOTICE IS PROVIDED IN RESPONSE TO THE DISCLOSURE REQUIREMENTS OF THE TERRORISM RISK INSURANCE ACT. THIS NOTICE DOES NOT GRANT COVERAGE OR CHANGE THE TERMS AND CONDITIONS OF COVERAGE UNDER THE POLICY. IF THERE IS A CONFLICT BETWEEN THIS NOTICE AND THE POLICY, THE PROVISIONS OF THE POLICY SHALL APPLY.

DISCLOSURE PURSUANT TO TERRORISM RISK INSURANCE ACT

Schedule

Disclosure of Premium:	
Total Terrorism Premium	\$ 15.00
Fire Following Premium	\$ Not Applicable
Other than Fire Following Premium	\$ 15.00

Disclosure of Terrorism Coverage Available

You are hereby notified that under the Terrorism Risk Insurance Act, as amended, you have a right to purchase insurance coverage for losses resulting from "acts of terrorism" defined in Section 102(1) of the Act as follows:

Any act or acts that are certified by the Secretary of the Treasury, in consultation with the Secretary of Homeland Security and the Attorney General of the United States, to be an act of terrorism; to be a violent act or an act that is dangerous to human life, property, or infrastructure; to have resulted in damage within the United States, or outside the United States in the case of certain air carriers or vessels or the premises of a United States mission; and to have been committed by an individual or individuals as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States government by coercion.

The premium charged for this coverage is provided in the Schedule above and does not include any charges for the portion of loss that may be covered by the Federal Government as described below.

Your policy may contain other exclusions which could affect your coverage, such as an exclusion for Nuclear Events or Pollution. **Please read your policy carefully.**

Note for Commercial Property or Commercial Inland Marine Policyholders in Standard Fire States:

In your state, a terrorism exclusion makes an exception for (and therefore provides coverage for) fire losses resulting from an act of terrorism. If you reject the offer of terrorism coverage, therefore, that rejection does not apply to fire losses resulting from an act of terrorism. Coverage for such fire losses will be provided in your policy. The additional premium just for such fire coverage is shown in the Schedule above.

Disclosure of Federal Participation in Payment of Terrorism Losses

The United States government through the Department of the Treasury may pay a share of terrorism losses insured under the federal program under a formula set forth in the Act. Under this formula, the United States government generally reimburses the following percentage of covered terrorism loss which exceeds the statutorily established deductible paid by the insurance company providing the coverage: 85% through 2015; 84% beginning on January 1, 2016; 83% beginning on January 1, 2017; 82% beginning on January 1, 2018; 81% beginning on January 1, 2019; and 80% beginning on January 1, 2020.

Cap on Insurer Participation in Payment of Terrorism Losses

The Act contains a \$100 billion cap that limits the reimbursement by the United States government as well as insurers' liability for losses resulting from certified acts of terrorism. If the aggregate of insured losses attributable to terrorist acts certified under the Terrorism Risk Insurance Act exceed \$100 billion in a calendar year and we have met our insurer deductible under the Act, we will not be liable for the payment of any portion of the amount of such losses that exceeds \$100 billion. In such case, insured losses up to that amount are subject to pro rata allocation in accordance with procedures established by the Secretary of the Treasury.

Rejection of Terrorism Insurance Coverage

☐ I decline to purchase terrorism coverage for certified acts of terrorism. I understand that I will have no coverage for losses resulting from certified acts of terrorism.

Applicant/Policyholder Signature

Print Name

Date

Hanover Insurance

Insurance Company

IH4 J501830 00

Quote or Policy Number

BUILDERS' RISK SCHEDULE OF COVERAGES

Description of Covered Property:

The following "Building(s) or Structure(s)" under course of construction are covered:

A 1 STORY NON-COMBUSTIBLE BUILDING(S) UNDER CONSTRUCTION AT 75 COWAN DR, RENO, NV, 89509 TO BE OCCUPIED AS A MUNICIPAL STRUCTURE.

Limits of Insurance

Limit

☐ If checked, see **Multiple Locations Limits Schedule** for applicable limits

Limit for any one "Building or Structure"	<u>\$1,430,000</u>
Limit for All "Buildings or Structures" at Any One Job Site	<u>\$1,430,000</u>
Covered Property in Transit	<u>\$100,000</u>
Covered Property in Temporary Storage or Off Site Fabrication	<u>\$100,000</u>
Trees, Plants, Lawns and Shrubs	<u>\$25,000</u>

Premium:

Annual Premium	<u>\$1,494</u>
Term Premium	<u> </u>

Additional Coverages:

Business Personal Property	<u>\$10,000</u>
Construction Trailers and Contents at Job Site	<u>\$50,000</u>
Contract Penalty Coverage	<u>\$25,000</u>
Debris Removal – Additional Limits	<u>\$50,000</u>
Emergency Removal to Preserve Covered Property	<u>\$10,000</u>
Expediting Expense	<u>\$100,000</u>
Expenses to Re-Erect Undamaged Scaffolding, Fences and Signs	<u>Covered</u>
Fire Suppression Equipment Recharging	<u>\$50,000</u>
Fungus, Wet Rot, Dry Rot and Bacteria	<u>\$100,000</u>

Insufficiency of Limit	10% of Limit of Insurance / \$1,000,000 maximum
Key Coverage	<u>\$2,500</u>
Loss Adjustment Expense	<u>\$5,000</u>
Ordinance or Law Coverage:	
Undamaged portions of the Building or Structure	Included in Building or Structure Limit
Demolition Costs and Increased Cost of Construction	<u>\$1,000,000</u>
Police and Fire Department Service Charge	<u>\$50,000</u>
Pollutant Clean Up and Removal	<u>\$25,000</u>
Reward Payment	<u>\$10,000</u>
Sewer and Drain Back Up	<u>\$50,000</u>
Valuable Papers and Records	<u>\$50,000</u>

Coverage Option -- Equipment Breakdown and Testing

Equipment Breakdown and Testing is not automatically provided. Coverage is only provided when we indicate that coverage is provided below.

☒ **Equipment Breakdown and Testing is covered.**

<input checked="" type="checkbox"/> Property Damage Limits	<u>\$1,430,000</u>
<input type="checkbox"/> Delay in Completion Coverage Limits	<u>NOT COVERED</u>
<input checked="" type="checkbox"/> Equipment Breakdown and Testing Pollutants	<u>\$50,000</u>

Optional Coverages:

The following coverages are only applicable when we indicate that coverage is provided below.

☐ **Delay in Completion Coverage:**

Soft Costs limit	<u>NOT COVERED</u>
Loss of Business Income limit	<u>NOT COVERED</u>
Loss of Rental Income limit	<u>NOT COVERED</u>

Deductibles:

Per Occurrence Deductible

\$5,000 _____

Loss of Business Income / Loss of Rents Waiting Period

_____ # of Days

\$ _____

\$ _____

\$ _____

Other Terms & Conditions**PERMISSION TO OCCUPY:**

When indicated below, Clause **F.3.f** of the Builder's Risk Coverage Form is not applicable.

☒ **Permission to Occupy is granted**

CERTIFIED TERRORISM LOSS

1. The following definitions are added.
 - a. "Certified act of terrorism" means an act that is certified by the Secretary of the Treasury, in consultation with the Secretary of Homeland Security, and the Attorney General of the United States:
 - 1) to be an act of terrorism;
 - 2) to be a violent act or an act that is dangerous to human life, property, or infrastructure;
 - 3) to have resulted in damage:
 - a) within the United States; or
 - b) to an air carrier (as defined in section 40102 of title 49, United States Code); to a United States flag vessel (or a vessel based principally in the United States, on which United States income tax is paid and whose insurance coverage is subject to regulation in the United States), regardless of where the loss occurs; or at the premises of any United States mission;
 - 4) to have been committed by an individual or individuals, as part of an effort to coerce the civilian population of the United States or to influence the policy or affect the conduct of the United States Government by coercion; and
 - 5) to have resulted in insured losses in excess of five million dollars in the aggregate, attributable to all types of insurance subject to the Terrorism Risk Insurance Act, as amended.
 - b. "Certified terrorism loss" means loss that results from a "certified act of terrorism".
2. The "terms" of any terrorism exclusion that is part of or that is attached to this Coverage Part are amended by the following provision:

This exclusion does not apply to "certified terrorism loss".
 3. The following provision is added.

If the Secretary of the Treasury determines that the aggregate amount of "certified terrorism loss" has exceeded one hundred billion dollars in a calendar year (January 1 through December 31), and "we" have met "our" insurer deductible under the Terrorism Risk Insurance Act, as amended, "we" will not pay for any portion of "certified terrorism loss" that exceeds one hundred billion dollars. If the "certified terrorism loss" exceeds one hundred billion dollars in a calendar year (January 1 through December 31), losses up to one hundred billion dollars are subject to pro rata allocation in accordance with procedures established by the Secretary of the Treasury under the Terrorism Risk Insurance Act, as amended.
 4. The following provisions are added.
 - a. Neither the "terms" of this endorsement nor the "terms" of any other terrorism endorsement attached to this Coverage Part provide coverage for any loss that would otherwise be excluded by this Coverage Part under:
 - 1) exclusions that address war, military action, or nuclear hazard; or
 - 2) any other exclusion; and
 - b. the absence of any other terrorism endorsement does not imply coverage for any loss that would otherwise be excluded by this Coverage Part under:
 - 1) exclusions that address war, military action, or nuclear hazard; or
 - 2) any other exclusion.

COMMERCIAL INLAND MARINE CONDITIONS

The following conditions apply in addition to the Common Policy Conditions and applicable Additional Conditions in Commercial Inland Marine Coverage Forms:

LOSS CONDITIONS

A. Abandonment

There can be no abandonment of any property to us.

B. Appraisal

If we and you disagree on the value of the property or the amount of loss, either may make written demand for an appraisal of the loss. In this event, each party will select a competent and impartial appraiser. The two appraisers will select an umpire. If they cannot agree, either may request that selection be made by a judge of a court having jurisdiction. The appraisers will state separately the value of the property and amount of loss. If they fail to agree, they will submit their differences to the umpire. A decision agreed to by any two will be binding. Each party will:

1. Pay its chosen appraiser; and
2. Bear the other expenses of the appraisal and umpire equally.

If there is an appraisal, we will still retain our right to deny the claim.

C. Duties In The Event Of Loss

You must see that the following are done in the event of loss or damage to Covered Property:

1. Notify the police if a law may have been broken.
2. Give us prompt notice of the loss or damage. Include a description of the property involved.
3. As soon as possible, give us a description of how, when and where the loss or damage occurred.
4. Take all reasonable steps to protect the Covered Property from further damage, and keep a record of your expenses necessary to protect the Covered Property, for consideration in the settlement of the claim. This will not increase the Limit of Insurance. However, we will not pay for any subsequent loss or damage resulting from a cause of loss that is not a Covered Cause of Loss. Also, if feasible, set the damaged property aside and in the best possible order for examination.

5. You will not, except at your own cost, voluntarily make a payment, assume any obligation, or incur any expense without our consent.

6. As often as may be reasonably required, permit us to inspect the property proving the loss or damage and examine your books and records.

Also permit us to take samples of damaged and undamaged property for inspection, testing and analysis, and permit us to make copies from your books and records.

7. We may examine any insured under oath, while not in the presence of any other insured and at such times as may be reasonably required, about any matter relating to this insurance or the claim, including an insured's books and records. In the event of an examination, an insured's answers must be signed.

8. Send us a signed, sworn proof of loss containing the information we request to settle the claim. You must do this within 60 days after our request. We will supply you with the necessary forms.

9. Immediately send us copies of any demands, notices, summonses or legal papers received in connection with the claim or suit.

10. Cooperate with us in the investigation or settlement of the claim.

D. Insurance Under Two Or More Coverages

If two or more of this policy's coverages apply to the same loss or damage, we will not pay more than the actual amount of the loss or damage.

E. Loss Payment

1. We will give notice of our intentions within 30 days after we receive the sworn proof of loss.
2. We will not pay you more than your financial interest in the Covered Property.
3. We may adjust losses with the owners of lost or damaged property if other than you. If we pay the owners, such payments will satisfy your claim against us for the owners' property. We will not pay the owners more than their financial interest in the Covered Property.
4. We may elect to defend you against suits arising from claims of owners of property. We will do this at our expense.

5. We will pay for covered loss or damage within 30 days after we receive the sworn proof of loss if you have complied with all the terms of this Coverage Part and:

- a. We have reached agreement with you on the amount of the loss; or
- b. An appraisal award has been made.

6. We will not be liable for any part of a loss that has been paid or made good by others.

F. Other Insurance

1. You may have other insurance subject to the same plan, terms, conditions and provisions as the insurance under this Coverage Part. If you do, we will pay our share of the covered loss or damage. Our share is the proportion that the applicable Limit of Insurance under this Coverage Part bears to the Limits of Insurance of all insurance covering on the same basis.

2. If there is other insurance covering the same loss or damage, other than that described in 1. above, we will pay only for the amount of covered loss or damage in excess of the amount due from that other insurance, whether you can collect on it or not. But we will not pay more than the applicable Limit of Insurance.

G. Pair, Sets Or Parts

1. Pair Or Set

In case of loss or damage to any part of a pair or set we may:

- a. Repair or replace any part to restore the pair or set to its value before the loss or damage; or
- b. Pay the difference between the value of the pair or set before and after the loss or damage.

2. Parts

In case of loss or damage to any part of Covered Property consisting of several parts when complete, we will only pay for the value of the lost or damaged part.

H. Recovered Property

If either you or we recover any property after loss settlement, that party must give the other prompt notice. At your option, the property will be returned to you. You must then return to us the amount we paid to you for the property. We will pay recovery expenses and the expenses to repair the recovered property, subject to the Limit of Insurance.

I. Reinstatement Of Limit After Loss

The Limit of Insurance will not be reduced by the payment of any claim, except for total loss or damage of a scheduled item, in which event we will refund the unearned premium on that item.

J. Transfer Of Rights Of Recovery Against Others To Us

If any person or organization to or for whom we make payment under this Coverage Part has rights to recover damages from another, those rights are transferred to us to the extent of our payment. That person or organization must do everything necessary to secure our rights and must do nothing after loss to impair them. But you may waive your rights against another party in writing:

- 1. Prior to a loss to your Covered Property.
- 2. After a loss to your Covered Property only if, at time of loss, that party is one of the following:
 - a. Someone insured by this insurance; or
 - b. A business firm:
 - (1) Owned or controlled by you; or
 - (2) That owns or controls you.

This will not restrict your insurance.

GENERAL CONDITIONS

A. Concealment, Misrepresentation Or Fraud

This Coverage Part is void in any case of fraud, intentional concealment or misrepresentation of a material fact, by you or any other insured, at any time, concerning:

- 1. This Coverage Part;
- 2. The Covered Property;
- 3. Your interest in the Covered Property; or
- 4. A claim under this Coverage Part.

B. Control Of Property

Any act or neglect of any person other than you beyond your direction or control will not affect this insurance.

The breach of any condition of this Coverage Part at any one or more locations will not affect coverage at any location where, at the time of loss or damage, the breach of condition does not exist.

C. Legal Action Against Us

No one may bring a legal action against us under this Coverage Part unless:

- 1. There has been full compliance with all the terms of this Coverage Part; and
- 2. The action is brought within 2 years after you first have knowledge of the direct loss or damage.

D. No Benefit To Bailee

No person or organization, other than you, having custody of Covered Property will benefit from this insurance.

E. Policy Period, Coverage Territory

We cover loss or damage commencing:

1. During the policy period shown in the Declarations; and
2. Within the coverage territory.

F. Valuation

The value of property will be the least of the following amounts:

1. The actual cash value of that property;

2. The cost of reasonably restoring that property to its condition immediately before loss or damage; or

3. The cost of replacing that property with substantially identical property.

In the event of loss or damage, the value of property will be determined as of the time of loss or damage.

COMMON POLICY CONDITIONS

All Coverage Parts included in this policy are subject to the following conditions.

A. Cancellation

1. The first Named Insured shown in the Declarations may cancel this policy by mailing or delivering to us advance written notice of cancellation.
2. We may cancel this policy by mailing or delivering to the first Named Insured written notice of cancellation at least:
 - a. 10 days before the effective date of cancellation if we cancel for nonpayment of premium; or
 - b. 30 days before the effective date of cancellation if we cancel for any other reason.
3. We will mail or deliver our notice to the first Named Insured's last mailing address known to us.
4. Notice of cancellation will state the effective date of cancellation. The policy period will end on that date.
5. If this policy is cancelled, we will send the first Named Insured any premium refund due. If we cancel, the refund will be pro rata. If the first Named Insured cancels, the refund may be less than pro rata. The cancellation will be effective even if we have not made or offered a refund.
6. If notice is mailed, proof of mailing will be sufficient proof of notice.

B. Changes

This policy contains all the agreements between you and us concerning the insurance afforded. The first Named Insured shown in the Declarations is authorized to make changes in the terms of this policy with our consent. This policy's terms can be amended or waived only by endorsement issued by us and made a part of this policy.

C. Examination Of Your Books And Records

We may examine and audit your books and records as they relate to this policy at any time during the policy period and up to three years afterward.

D. Inspections And Surveys

1. We have the right to:
 - a. Make inspections and surveys at any time;

- b. Give you reports on the conditions we find; and
- c. Recommend changes.

2. We are not obligated to make any inspections, surveys, reports or recommendations and any such actions we do undertake relate only to insurability and the premiums to be charged. We do not make safety inspections. We do not undertake to perform the duty of any person or organization to provide for the health or safety of workers or the public. And we do not warrant that conditions:
 - a. Are safe or healthful; or
 - b. Comply with laws, regulations, codes or standards.

3. Paragraphs 1. and 2. of this condition apply not only to us, but also to any rating, advisory, rate service or similar organization which makes insurance inspections, surveys, reports or recommendations.

4. Paragraph 2. of this condition does not apply to any inspections, surveys, reports or recommendations we may make relative to certification, under state or municipal statutes, ordinances or regulations, of boilers, pressure vessels or elevators.

E. Premiums

The first Named Insured shown in the Declarations:

1. Is responsible for the payment of all premiums; and
2. Will be the payee for any return premiums we pay.

F. Transfer Of Your Rights And Duties Under This Policy

Your rights and duties under this policy may not be transferred without our written consent except in the case of death of an individual named insured.

If you die, your rights and duties will be transferred to your legal representative but only while acting within the scope of duties as your legal representative. Until your legal representative is appointed, anyone having proper temporary custody of your property will have your rights and duties but only with respect to that property.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

NEVADA CHANGES – CONCEALMENT, MISREPRESENTATION OR FRAUD

This endorsement modifies insurance provided under the following:

CAPITAL ASSETS PROGRAM (OUTPUT POLICY) COVERAGE PART
COMMERCIAL AUTOMOBILE COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
CRIME AND FIDELITY COVERAGE PART
EQUIPMENT BREAKDOWN COVERAGE PART
FARM COVERAGE PART – FARM PROPERTY – OTHER FARM PROVISIONS FORM – ADDITIONAL
COVERAGES, CONDITIONS, DEFINITIONS
FARM COVERAGE PART – LIVESTOCK COVERAGE FORM
FARM COVERAGE PART – MOBILE AGRICULTURAL MACHINERY
AND EQUIPMENT COVERAGE FORM
STANDARD PROPERTY POLICY

The **CONCEALMENT, MISREPRESENTATION OR FRAUD** Condition is replaced by the following:

CONCEALMENT, MISREPRESENTATION OR FRAUD

We will not pay for any loss ("loss") or damage in any case of:

1. Concealment or misrepresentation of a material fact; or

2. Fraud;

committed by an insured ("insured") at any time and relating to a claim under this policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

NEVADA CHANGES – CANCELLATION AND NONRENEWAL

This endorsement modifies insurance provided under the following:

CAPITAL ASSETS PROGRAM (OUTPUT POLICY) COVERAGE PART
 COMMERCIAL AUTOMOBILE COVERAGE PART
 COMMERCIAL GENERAL LIABILITY COVERAGE PART
 COMMERCIAL INLAND MARINE COVERAGE PART
 COMMERCIAL LIABILITY UMBRELLA COVERAGE PART
 COMMERCIAL PROPERTY COVERAGE PART
 CRIME AND FIDELITY COVERAGE PART
 EMPLOYMENT-RELATED PRACTICES LIABILITY COVERAGE PART
 EQUIPMENT BREAKDOWN COVERAGE PART
 FARM COVERAGE PART
 FARM UMBRELLA LIABILITY POLICY
 LIQUOR LIABILITY COVERAGE PART
 POLLUTION LIABILITY COVERAGE PART
 PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

A. The following are added to the **Cancellation
Common Policy Condition:**

7.a. Midterm Cancellation

If this policy has been in effect for 70 days or more, or if this policy is a renewal of a policy we issued, we may cancel only for one or more of the following reasons:

- (1) Nonpayment of premium;
- (2) Conviction of the insured of a crime arising out of acts increasing the hazard insured against;
- (3) Discovery of fraud or material misrepresentation in obtaining the policy or in presenting a claim thereunder;
- (4) Discovery of an act or omission or a violation of any condition of the policy which occurred after the first effective date of the current policy, and substantially and materially increases the hazard insured against;
- (5) A material change in the nature or extent of the risk, occurring after the first effective date of the current policy, which causes the risk of loss to be substantially and materially increased beyond that contemplated at the time the policy was issued or last renewed;

(6) A determination by the commissioner that continuation of our present volume of premiums would jeopardize our solvency or be hazardous to the interests of our policyholders, creditors or the public;

(7) A determination by the commissioner that the continuation of the policy would violate, or place us in violation of, any provision of the code.

b. Anniversary Cancellation

If this policy is written for a term longer than one year, we may cancel for any reason at an anniversary, by mailing or delivering written notice of cancellation to the first Named Insured at the last mailing address known to us at least 60 days before the anniversary date.

B. The following is added as an additional Condition and supersedes any other provision to the contrary:

NONRENEWAL

1. If we elect not to renew this policy, we will mail or deliver to the first Named Insured shown in the Declarations a notice of intention not to renew at least 60 days before the agreed expiration date.

If notice is mailed, proof of mailing will be sufficient proof of notice.

2. We need not provide this notice if:
 - a. You have accepted replacement coverage;
 - b. You have requested or agreed to nonrenewal; or
 - c. This policy is expressly designated as nonrenewable.

C. Notices

1. Notice of cancellation or nonrenewal in accordance with **A.** and **B.** above, will be mailed, first class or certified, or delivered to the first Named Insured at the last mailing address known to us and will state the reason for cancellation or nonrenewal.
2. We will also provide a copy of the notice of cancellation, for both policies in effect less than 70 days and policies in effect 70 days or more, to the agent who wrote the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

EXCLUSION OF CERTAIN COMPUTER-RELATED LOSSES

This endorsement modifies insurance provided under the following:

COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
CRIME AND FIDELITY COVERAGE PART
STANDARD PROPERTY POLICY

- A.** We will not pay for loss ("loss") or damage caused directly or indirectly by the following. Such loss ("loss") or damage is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the loss ("loss") or damage.
- 1.** The failure, malfunction or inadequacy of:
 - a.** Any of the following, whether belonging to any insured or to others:
 - (1)** Computer hardware, including microprocessors;
 - (2)** Computer application software;
 - (3)** Computer operating systems and related software;
 - (4)** Computer networks;
 - (5)** Microprocessors (computer chips) not part of any computer system; or
 - (6)** Any other computerized or electronic equipment or components; or
 - b.** Any other products, and any services, data or functions that directly or indirectly use or rely upon, in any manner, any of the items listed in Paragraph **A.1.a.** of this endorsement;

due to the inability to correctly recognize, process, distinguish, interpret or accept one or more dates or times. An example is the inability of computer software to recognize the year 2000.
 - 2.** Any advice, consultation, design, evaluation, inspection, installation, maintenance, repair, replacement or supervision provided or done by you or for you to determine, rectify or test for, any potential or actual problems described in Paragraph **A.1.** of this endorsement.
- B.** If an excluded Cause of Loss as described in Paragraph **A.** of this endorsement results:
- 1.** In a Covered Cause of Loss under the Crime and Fidelity Coverage Part, the Commercial Inland Marine Coverage Part or the Standard Property Policy; or
 - 2.** Under the Commercial Property Coverage Part:
 - a.** In a "Specified Cause of Loss", or in elevator collision resulting from mechanical breakdown, under the Causes of Loss – Special Form; or
 - b.** In a Covered Cause of Loss under the Causes Of Loss – Basic Form or the Causes Of Loss – Broad Form;

we will pay only for the loss ("loss") or damage caused by such "Specified Cause of Loss", elevator collision, or Covered Cause of Loss.
- C.** We will not pay for repair, replacement or modification of any items in Paragraphs **A.1.a.** and **A.1.b.** of this endorsement to correct any deficiencies or change any features.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL PROPERTY NOT COVERED ENDORSEMENT – PROJECT TYPE

This endorsement modifies insurance under the following:

BUILDERS' RISK COVERAGE FORM

The following property is added to **A. COVERAGE, 2. Property Not Covered:**

Bridges, dams, piers, wharves, towers, wind turbines, air supported structures, and utility projects (gas, electric, steam, power generation and electrical distribution), laboratories or clean rooms.

ALL OTHER TERMS, CONDITIONS AND EXCLUSIONS REMAIN UNCHANGED

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

TRADE OR ECONOMIC SANCTIONS ENDORSEMENT

This insurance does not apply to the extent that trade or economic sanctions or other laws or regulations prohibit us from providing insurance, including, but not limited to, the payment of claims.

ALL OTHER TERMS, CONDITIONS, AND EXCLUSIONS REMAIN UNCHANGED.

IMPORTANT INFORMATION ABOUT YOUR INSURANCE COMPANY

The Home Office address for the Insurance Company shown on the policy Declarations page is:

Allmerica Financial Alliance Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

The Hanover American Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Allmerica Financial Benefit Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

The Hanover Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Campmed Casualty & Indemnity Company, Inc.

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

The Hanover Casualty Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Citizens Insurance Company of America

(A Stock Company)

808 North Highlander Way
Howell, MI 48843-1070

Massachusetts Bay Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Citizens Insurance Company of Illinois

(A Stock Company)

333 West Pierce Road, Suite 300
Itasca, IL 60143-3114

The Hanover New Jersey Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Citizens Insurance Company of the Midwest

(A Stock Company)

9229 Delegates Row, Suite 100
Indianapolis, IN 46240-3824

Verlan Fire Insurance Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

Citizens Insurance Company of Ohio

(A Stock Company)

4400 Easton Commons Way, Suite 125
Columbus, OH 43219-6223

Nova Casualty Company

(A Stock Company)

440 Lincoln Street
Worcester, MA 01653-0002

BUILDERS' RISK COVERAGE FORM

Various provisions in this policy restrict coverage. Please read this policy carefully to determine rights, duties and to determine what is and what is not covered.

Throughout this policy, the words "you" and "yours" refer to the Named Insured shown on the Declarations. The words "we", "us", and "ours" refer to the Company providing the insurance.

Other words and phrases used in this Coverage Form have special meanings. These words or phrases will be shown within quotation marks. Refer to section **G. DEFINITIONS** to determine these special meanings.

A. COVERAGE

We will pay for direct physical "loss" to Covered Property caused by or resulting from any Covered Causes of Loss unless the "loss" is excluded or subject to limitations.

1. Covered Property

- a. "Buildings or structures" in the course of construction with "construction class" indicated and described on the "schedule of coverages";
- b. Construction materials and supplies that will become a permanent part of the completed "buildings or structures" while located at the described construction site or while;
 - (1) In transit; or
 - (2) While being fabricated or in temporary storage at any location other than the construction site described on the "schedule of coverages";
- c. "Temporary structures"; and
- d. Trees, plants, lawns or shrubs that are, or will become, permanently installed by you at the described construction site. We also cover trees, plants, lawns or shrubs while in transit or in temporary storage.

Covered Property described in section **A. COVERAGE, 1. Covered Property** includes your property and the property of others in your care, custody and control for which you are legally liable.

2. Property Not Covered

Covered Property does not include:

- a. Any "pre-existing structure";
- b. Water or land, including land on which Covered Property is located;
- c. Self-propelled vehicles, aircraft or watercraft; contractors' equipment, construction trailers and their contents;
- d. Accounts, bills, currency, deeds, evidences of debt, manuscripts, money, notes, securities, stamps or tickets;
- e. "Valuable papers and records"; or
- f. Contraband or property in the course of illegal transport or trade.

3. Covered Causes of Loss

Covered Cause of Loss means direct physical "loss" caused by or resulting from any cause except those causes of "loss" listed in section **B. EXCLUSIONS** of this Coverage Form.

4. Additional Coverages

a. Business Personal Property

We will pay for direct physical "loss" to your "business personal property" located at your construction site caused by or resulting from a Covered Cause of Loss. We cover such property only if it will not become a permanent part of the "buildings or structures" in the course of construction. The most that we will pay for "loss" in any one occurrence is \$10,000.

b. Construction Trailers and Contents at Job Site

We will pay for direct physical "loss" to your owned or leased job site construction trailers and your contents within those trailers caused by or resulting from a Covered Cause of Loss but coverage only

applies when such property is located at the construction site described on the "schedule of coverages". The most we pay for "loss" to Construction Trailers and Contents at Job Site in any one occurrence is \$50,000.

This Additional Coverage cannot be combined with Additional Coverage Business Personal Property.

c. Contract Penalty Coverage

We will pay to cover the "contract penalties" that you incur.

We only cover contract penalties that result from direct physical "loss" to Covered Property caused by or resulting from a Covered Cause of Loss.

The most that we will pay for all "loss" for Contract Penalty in any one occurrence or all occurrences at any one construction site is \$25,000.

d. Debris Removal

Following a covered "loss", we will pay your expenses to remove debris of Covered Property covered by this Coverage Form. The "loss" must occur during the policy period. We will pay your debris removal expenses only if they are reported to us in writing within 180 days of the date of the direct physical "loss". The most that we will pay is 25% of the amount that we pay for the direct physical "loss", prior to the application of the policy deductible. Any payment is included within and will not increase the applicable Limit of Insurance.

However, when the debris removal expense is greater than the amount determined above, or when the sum of debris removal expense and the amount we pay for the direct physical "loss" to Covered Property is greater than the applicable Limit of Insurance shown on the "schedule of coverages", we will pay up to an additional \$75,000 for debris removal expense.

This Additional Coverage does not apply to expenses to:

- (1) Extract "pollutants" from land or water; or
- (2) Remove, restore or replace polluted water or land.

e. Emergency Removal to Preserve Covered Property

If it is necessary to move Covered Property that will become a permanent part of the "buildings or structures" from the construction site described on the "schedule of coverages" or from site of fabrication or temporary storage to preserve it from "loss" from a Covered Cause of Loss, we will pay reasonable expenses that you incur to move or store covered property.

The most we will pay in any one occurrence for Emergency Removal to Preserve Covered Property is \$10,000. Subject to this sub limit of insurance, we will provide up to 90 days of storage charges.

No deductible applies to this Additional Coverage.

f. Expediting Expense

In the event of direct physical "loss" to Covered Property by a Covered Cause of Loss, we will pay the reasonable and necessary expenses you incur to expedite the temporary repair and the permanent repair or replacement of that Covered Property including additional overtime wages and express or other rapid means of transportation.

The most that we will pay in any one occurrence for Expediting Expense is \$100,000.

g. Expenses to Re-erect Undamaged Scaffolding, Fences and Signs

We will pay reasonable expenses that you incur to re-erect or re-install undamaged property covered within the scope of Covered Property, Clause **A. COVERAGE, 1. Covered Property**, paragraph **c.** above, that must be re-erected or re-installed as a result of a Covered Cause of Loss.

The most we pay in any one occurrence for Expenses to Re-Erect Undamaged Scaffolding, Fences and Signs is \$10,000.

h. Fire Suppression Equipment Recharging

We will pay reasonable expenses you incur to recharge permanent or temporary "fire protection equipment" located in the covered "buildings or structures" or at the construction site described on the "schedule of coverages". We cover your reasonable costs to recharge fire suppression equipment which discharges as a result of a cause of loss not otherwise covered by this Coverage Form.

Following equipment discharge covered by this Additional Coverage, we will also pay your costs to repair or replace faulty or deficient valves or controls which are part of the permanent fire suppression system located in the covered "buildings or structures".

We do not pay any cost or expense caused by, resulting from, or which is in any way associated with the deliberate discharge of any system or equipment when such discharge occurs solely for the purpose of inspection, testing or maintenance of the fire suppression system or equipment.

The most we pay for "Fire Protection Equipment" Recharge in any one occurrence, or in all occurrences in any one policy period, is \$50,000.

i. Fungus, Wet Rot, Dry Rot and Bacteria – Limited Coverage

The coverage we provide for "fungus", wet rot, dry rot and bacteria is limited. We will pay for:

- (1) Direct physical "loss" to Covered Property caused by "fungus", wet rot, dry rot or bacteria, including the cost of removal of the "fungus", wet rot, dry rot or bacteria, and
- (2) The cost to tear out and replace any part of the building or other covered property as necessary to gain access to the "fungus", wet rot, dry rot or bacteria; and
- (3) The cost of testing performed after removal, repair, replacement or restoration of damaged property is completed.

We only provide the coverage when the "fungus", wet rot, dry rot and bacteria is caused by or results from a "specified cause of loss" other than fire or lightning that occurs during the policy period.

At the time of "loss" and following that occurrence, you must use all reasonable means to save and preserve the property from further damage.

The maximum amount that we will pay under this limited coverage is \$100,000.

The Limit of Insurance applicable to Limited Coverage -- "Fungus", Wet Rot, Dry Rot and Bacteria is the most that we will pay in each 12 month policy period beginning with the inception date of this policy. This is the most that we will pay for the total of all "loss", regardless of the number of claims or the types of coverage that we provide. The limit provided is the most that we will pay for all "loss" caused directly by or resulting from or as a consequence of "fungus", wet rot, dry rot or bacteria, regardless of the limit available under any other coverage provided under this policy, including Delay in Completion Coverages, which may apply as a result of the "fungus", wet rot, dry rot or bacteria.

This limit applies even if the "fungus", wet rot, dry rot or bacteria continues to be present or active, or reoccurs, in a later policy period.

The coverage provided under this limited coverage is included within and will not increase the applicable limit of insurance.

This Additional Coverage does not apply to **A. COVERAGE, 1. Covered Property**, paragraph d.

j. Insufficiency of Limit

In the event of a direct physical "loss" to "buildings or structures" caused by or resulting from a Covered Cause of Loss that results in a total loss and the applicable Limit of Insurance is not adequate for the building to be rebuilt to the identical design and specifications as a result of the increased cost of new construction materials or labor expense, we will pay, up to an additional 10% of the Limit of Insurance applicable to that property incurring the total loss. The most that we will pay in any one occurrence, or in all occurrences in any one policy period, is \$1,000,000.

This coverage does not apply:

- (1) If the "building or structure" is not rebuilt; or
- (2) If the "building or structure" is not rebuilt at the described construction site where the total loss occurred; or
- (3) If the "building or structure" is replaced by one that is not identical to the "building or structure" that sustained the "loss". An identical building or structure, as used by this clause, means a new building of the same specifications, square footage and floor plan and which is built of substantially identical construction materials and which is intended to be used, upon completion, for the same occupancy as the "building or structure" sustaining covered total loss; or

- (4) If the increased cost of construction materials is caused by or contributed to by the use of any construction materials which are antique or historic; unique, handmade or which have "artistic merit"; or which are not readily available even in the absence of "loss".

This coverage does not apply to any "pre-existing structure" even if coverage for any "pre-existing structure" is provided.

k. Key Coverage

We will pay the reasonable and necessary expenses that you incur to replace keys if they are stolen; rekey, reprogram or replace undamaged locks in a covered "building or structure".

The most we pay in any one occurrence or in any one policy period is \$2,500.

l. Loss Adjustment Expense

We will pay those necessary and reasonable expenses that you incur at our direction to determine the amount of covered "loss". We do not cover any loss adjustment expenses that you incur for any of the following:

- (1) Payments to public adjusters or any other outside claims expense;
- (2) Payments to lawyers or any other legal fees;
- (3) Payments to insurance agents or brokers;
- (4) Any expenses incurred for an examination under oath, even if required by us;
- (5) Any expense incurred in accordance with the appraisal section of the Commercial Inland Marine Conditions; or
- (6) Any expense that you incur to prove that a "loss" is covered.

The most we will pay in any one occurrence for Loss Adjustment Expenses is \$5,000.

No deductible will apply to this Additional Coverage.

m. Ordinance or Law Coverage

(1) Coverage Applicable To the Undamaged Portions of the Building or Structure

- (a) In the event of "loss" to Covered Property by a Covered Cause of Loss, we will pay for "loss" to the undamaged portion of the Covered Property as a consequence of enforcement of any ordinance or law that:
 - (i) Requires the demolition of parts of the same property not damaged by a Covered Cause of Loss;
 - (ii) Regulates the construction or repair of the property, or establishes zoning or land use requirements at the construction site; and
 - (iii) Is in force at the time of "loss".
- (b) Coverage for "loss" to the undamaged portion of the Covered Property is included within and is not in addition to the Limit of Insurance applicable to the Covered Property at that construction site.

(2) Demolition Costs

In the event of "loss" to Covered Property by a Covered Cause of Loss, we will pay the cost to demolish and clear the site of the undamaged part of the Covered Property caused by the enforcement of building, zoning or land use ordinance or law.

(3) Increased Cost of Construction

In the event of "loss" to Covered Property by a Covered Cause of Loss, we will pay the increased cost to repair or rebuild damaged parts of the Covered Property as a consequence of the enforcement of building, zoning or land use ordinance or law.

We will only pay if the rebuilt property is intended for the same occupancy.

If an applicable ordinance or law requires relocation to another site, we will pay for the increased cost of construction at that new site.

(4) Limits Applicable to Demolition Costs and Increased Cost of Construction

The most we will pay for Demolition Cost and Increased Cost of Construction, as provided in paragraphs (2) and (3) above, is the least of the following:

- (a) The amount you actually spend to repair or replace Covered Property; or
- (b) The applicable Limit of Insurance shown on the "schedule of coverages".

(5) Other Conditions Applicable to Additional Coverage – Ordinance or Law Coverage

- (a) This coverage does not apply to any "pre-existing structure" even if coverage for any "pre-existing structure" is provided.
- (b) We will not pay under this Additional Coverage any costs incurred as a consequence of any ordinance or law:
 - (i) Which requires any insured or others to test for, monitor, clean up, remove, contain, treat, detoxify or neutralize, or in any way to respond to, or assess the effects of "pollutants", "fungus" wet rot, dry rot or bacteria;
 - (ii) Which requires the demolition, repair, replacement, remodeling or remediation of property due to contamination by "pollutants" or due to the presence, growth, spread, proliferation or any activity of "fungus", wet rot, dry rot or bacteria; or
 - (iii) If, prior to "loss", you failed to comply with any building code or ordinance regulating the construction of any building or structure.

n. Police and Fire Department Service Charge

When the police or fire department is called to save or protect Covered Property from a Covered Cause of Loss, we will pay up to \$50,000 for your liability for police and fire department service charges which are:

- (1) Assumed by contract or agreement prior to loss; or
- (2) Required by local ordinance.

No Deductible applies to this Additional Coverage.

o. Pollutant Clean Up and Removal

We will pay to extract "pollutants" from land or water at the described construction site if the discharge, dispersal, seepage, migration, release or escape of "pollutants" is caused by or results from a Covered Cause of Loss to Covered Property that occurs during the policy period. The expenses to extract "pollutants" will only be paid if they are reported to us in writing within 180 days of the date of the covered "loss".

This Additional Coverage does not apply to costs to test for, monitor or assess the existence, concentration or effects of "pollutants" in land or water. But we will pay for testing which is performed in the course of extracting the "pollutants" from land or water.

The most we will pay under this Additional Coverage in any one policy period is \$50,000.

p. Reward Payment

- (1) When we pay for "loss" caused by theft, vandalism or fire, we will reimburse you for any documented payments that you make to others as reward(s), provided these reward payments cause:
 - (a) The return of your stolen property to the custody of the police or a law enforcement agency; or
 - (b) The arrest and conviction of any person(s) committing the covered theft, vandalism or fire loss.
- (2) We will not cover any reward payment that you make to any of the following:
 - (a) You or any member of your family;
 - (b) Any member of the applicable law enforcement agency; or
 - (c) Any person involved in the crime.

The most we pay in any one policy period is \$10,000. You and we will determine the amount of reward we will pay.

q. Sewer and Drain Back Up

We will pay for direct physical "loss" to Covered Property caused by or resulting from water that backs up or overflows or is otherwise discharged from a sewer, drain, sump, sump pump or related equipment.

Section **B. EXCLUSIONS, 1.e. Flood and Related Water** applies to this coverage. However, paragraph **e. (4)** does not apply to the extent that this Additional Coverage applies.

The most that we will pay in any one occurrence is \$100,000 unless a different Limit of Insurance applicable to Sewer and Drain Back Up is shown on the "schedule of coverages".

r. Valuable Papers and Records

(1) Provided your "valuable papers and records" do not have duplicates, we will pay the reasonable expenses you incur to research, recreate, or restore "valuable papers and records" as a result of direct physical "loss" caused by or resulting from a Covered Cause of Loss that are located on the construction site and which are related to the construction of the "buildings or structures." The "valuable papers and records" covered by this Additional Coverage include "valuable papers and records" in printed, written, electronic or magnetic media format.

(2) If a duplicate of lost or damaged "valuable papers and records" exists, the coverage that we provide is limited. The most that we will pay is the reasonable and necessary cost of blank materials to reproduce property and the labor to transcribe or copy from the undamaged duplicate.

The most we will pay for all "loss" to Valuable Papers and Records in any one occurrence is \$50,000.

5. Coverage Option – Equipment Breakdown and Testing

a. Coverage

(1) When we indicate on the "schedule of coverages" that Equipment Breakdown and Testing is covered, we will pay for "loss" caused by or resulting from an "accident" to "covered equipment" which is part of or will become a permanent part of covered "buildings or structures" including during "testing." This Coverage Option does not increase the Limit of Insurance.

If we do not indicate on the "schedule of coverages" that Equipment Breakdown and Testing is covered, we do not provide the coverage.

If an initial "accident" causes other "accidents", all will be considered one "accident". All "accidents" that are the result of the same event will be considered one "accident".

Section **B. EXCLUSIONS**, paragraphs **2.e., 2.f., 3.a.** and **3.c.** do not apply to the extent that coverage is provided under this coverage option.

(2) "Pollutants"

We will pay for additional cost to repair or replace Covered Property because of contamination by "pollutants" caused by or resulting from an "accident". This includes the additional expenses to clean up or dispose of such property. Additional expenses means those beyond which would have been required had no "pollutants" been involved.

We will also pay for additional loss as described under Delay in Completion Coverage Endorsement caused by contamination by "pollutants".

The most that we will pay for loss, damage or expense under this coverage is \$50,000 if shown as covered under Delay in Completion Coverage on the "schedule of coverages". If a different limit is indicated in the Equipment Breakdown and Testing section of the "schedule of coverages", that limit will apply instead of the limit shown above.

(3) If the Delay in Completion Coverage Endorsement is attached to this Builders' Risk Coverage Form, and Delay in Completion is indicated in the Equipment Breakdown and Testing section of the "schedule of coverage", coverage under this Coverage Option is extended to the Delay in Completion Coverage Endorsement, subject to limits as described below.

If Delay in Completion limits are indicated in the Equipment Breakdown and Testing section of the "schedule of coverage", those Delay in Completion limits are the only limits that apply to a "delay in completion" resulting from an "accident".

Refer to the Delay in Completion Coverage Endorsement for a definition of "delay in completion".

b. Additional Exclusions applicable to Coverage Option – Equipment Breakdown and Testing

We exclude any loss, damage or expense:

- (1) To any property not included within the definition of "covered equipment" but only to the extent of the coverage provided by Equipment Breakdown and Testing;
- (2) Caused by or resulting from collision or upset;
- (3) Caused by or resulting from the following:
 - (a) Error in calibration, misalignment, arrangement, or any condition which can be corrected by adjustment, cleaning, resetting or tightening; or by performance of maintenance;
 - (b) Lack of maintenance; or
 - (c) Defect, programming error, programming limitation, computer virus, malicious code, loss of "data", loss of access, loss of use, loss of functionality or other condition within or involving "data" or "media" of any kind.

But if an "accident" results from (3)(a) through (3)(c) directly above, we will pay for the additional loss or damage caused by that "accident".

- c. If electrical "covered equipment" is damaged by a cause of loss shown in section **B. EXCLUSIONS 1.e. Flood and Related Water**, paragraphs (1) through (6), we will pay the reasonable and necessary expenses to dry out such equipment. However, we will pay no more than \$10,000 in any one occurrence.

The deductible indicated on the "schedule of coverage" applies.

B. EXCLUSIONS

1. We will not pay for "loss" caused directly or indirectly by any of the following. Such "loss" is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the "loss".

a. Governmental Action

Governmental action means any act of seizure, confiscation or destruction by order of any governmental authority.

But we will pay for acts of destruction ordered by governmental action and taken at the time of a fire to prevent its spread if that fire would be covered under this Coverage Form.

b. Nuclear Hazard

Nuclear Hazard or radiation, or radioactive contamination, however caused.

But if nuclear reaction or radiation, or radioactive contamination, results in fire, we will pay for the loss or damage caused by that fire.

c. War and Military Action

- (1) War, including undeclared or civil war;
- (2) Warlike action by a military force, including action in hindering or defending against an actual or expected attack, by any government, sovereign, or other authority using military personnel or other agents; or
- (3) Insurrection, rebellion, revolution, usurped power or action by governmental authority in hindering or defending against any of these.

d. Earth Movement

- (1) Earthquake, including tremors or aftershocks and any earth sinking, rising or shifting relating to such event;
- (2) Landslide, including any earth sinking, rising or shifting related to such event;
- (3) Mine subsidence, meaning subsidence of a man-made mine, whether or not mining activity has ceased;
- (4) Earth sinking, other than "sinkhole collapse", rising or shifting including soil conditions which cause settling, cracking or other disarrangement of foundations or other parts of realty. Soil conditions include contraction, expansion, freezing, thawing, erosion, improperly compacted soil and the action of water under the ground surface.

But if Earth Movement, as described in d.(1) through (4) above, results in fire or explosion, we will pay for the "loss" or damage caused by that fire or explosion.

(5) Volcanic eruption, explosion or effusion.

But if volcanic eruption, explosion or effusion results in fire, building glass breakage or volcanic action, we will pay for the "loss" or damage caused by that fire, building glass breakage or volcanic action.

Volcanic Action means direct physical "loss" or damage resulting from the eruption of a volcano when the loss or damage is caused by:

- (a) Airborne volcanic blast or airborne shock waves;
- (b) Ash, dust or particulate matter; or
- (c) Lava flow.

With respect to Volcanic Action as set forth in paragraphs (5)(a) through (c), all volcanic eruptions that occur within any 168-hour period will constitute a single occurrence.

Volcanic Action does not include the cost to remove ash, dust or particulate matter that does not cause direct physical loss or damage to the described property.

This exclusion applies regardless of whether any of the above, in paragraphs (1) through (5) is caused by an act of nature or is otherwise caused.

This exclusion does not apply to Covered Property in transit.

e. Flood and Related Water

- (1) Flood;
- (2) Surface water, rapid accumulation of run off, waves (including tidal wave and tsunami), tides, tidal water, overflow of any body of water, or spray from any of these, all whether or not driven by wind (including storm surge);
- (3) Mudslide or mudflow;
- (4) Water that backs up or overflows or is otherwise discharged from a sewer, drain, sump, sump pump or related equipment;
- (5) Water under the ground surface pressing on, or flowing or seeping through:
 - (a) Foundations, walls, floors or paved surfaces;
 - (b) Basements, whether paved or not; or
 - (c) Doors, windows or other openings; or
- (6) Waterborne material carried or otherwise moved by any of the water referred to in paragraphs (1), (2), (4) or (5), or material carried or otherwise moved by mudslide or mudflow.

This exclusion applies regardless of whether any of the above, in paragraphs (1) through (6) is caused by an act of nature or is otherwise caused. An example of a situation to which this exclusion applies is the situation where a dam, levee, seawall or other boundary or containment system fails in whole or in part, for any reason, to contain the water.

But if any of the above, in paragraphs (1) through (6) results in fire or explosion, we will pay for the loss or damage caused by that fire or explosion.

This exclusion does not apply to Covered Property in transit.

f. Mold

Mold means "fungus", wet rot, dry rot or bacteria.

But we will pay when "fungus," wet rot, dry rot or bacteria is caused by or results from fire or lightning.

g. Ordinance or Law

- (1) Except to the extent that coverage may otherwise be provided under **A. Coverage, 4. Additional Coverages m. Ordinance or Law Coverage**, the enforcement of any ordinance or law:
 - (a) Regulating the construction, use or repair of any property; or
 - (b) Requiring the tearing down of any property, including the cost of removing its debris.
- (2) This exclusion applies whether the loss or damage results from:

- (a) An ordinance or law that is enforced even if the property has not been damaged; or
 - (b) The increased costs incurred to comply with an ordinance or law in the course of construction, repair, renovation, remodeling or demolition of property, or removal of its debris, following a physical loss or damage to that property.
- 2. We will not pay for "loss" caused by or resulting from any of the following:
 - a. Delay, loss of use, loss of market or any other consequential loss.
 - b. Unexplained disappearance.
 - c. Shortage found upon taking inventory.
 - d. Criminal, fraudulent, or dishonest acts by:
 - (1) You or any of your partners;
 - (2) Your directors or trustees;
 - (3) Your authorized representatives or employees;
 - (4) Anyone else with an interest in the property, or their employees or authorized representatives;
 - (5) Anyone, other than a carrier for hire, to whom you have entrusted the Covered Property, including their employees, for any purpose:
 - (a) Whether acting alone or in collusion with others; and
 - (b) Whether or not occurring during the hours of employment.

This exclusion does not apply to acts of destruction by your employees, but theft by your employees is not covered.

- e. Artificially generated electrical current, including electrical arcing, that disturbs electrical devices, appliances or wires; mechanical or electrical breakdown of any machinery, including rupturing or bursting caused by centrifugal force.

But if artificially generated electric current results in fire, we will pay for the loss or damage caused by that fire.

This exclusion applies except as provided for in the Coverage Option - Equipment Breakdown and Testing.

- f. Explosion of steam boilers, steam pipes, steam engines or steam turbines owned or leased by you, or operated under your control.

But if explosion of steam boilers, steam pipes, steam engines or steam turbines results in fire or combustion explosion, we will pay for the loss or damage caused by that fire or combustion explosion. We will also pay for loss or damage caused by or resulting from the explosion of gases or fuel within the furnace of any fired vessel or within the flues or passages through which the gases of combustion pass.

This exclusion applies except as provided for in the Coverage Option - Equipment Breakdown and Testing.

- g. Discharge, dispersal, seepage, migration, release or escape of "pollutants" unless the discharge, dispersal, seepage, migration, release or escape is itself caused by any of the "specified cause of loss".

But if the discharge, dispersal, seepage, migration, release or escape of "pollutants" results in a "specified cause of loss", we will pay for the damage caused by that "specified cause of loss".

- 3. We will not pay for "loss" caused by or resulting from any of the following. But if "loss" by a Covered Cause of Loss results, we will pay for the loss caused by that Covered Cause of Loss.

- a. Wear and tear, depreciation, or obsolescence.
- b. Settling, cracking, shrinking or expanding.
- c. Rust, corrosion, decay, deterioration, hidden or latent defect, inherent vice, or any quality or fault in the property that causes it to damage or destroy itself.
- d. Faulty, inadequate or defective:
 - (1) Planning, zoning, surveying, siting or development;

- (2) Design, specifications, workmanship, repair, construction, renovation, remodeling, grading, or compaction;
- (3) Materials used in repair, construction, renovation or remodeling; or
- (4) Maintenance of all or part of any covered property at or off the construction site.

But if a "loss" excluded above d. (1) through (4) results in a Covered Cause of Loss, we will pay for the "loss" caused by or resulting from that Covered Cause of Loss.

We will not pay to correct or make good any fault, inadequacy or defect itself, including any expense required to tear out, tear down, repair or replace any property, or any part of any property, to correct or make good the fault, inadequacy or defect.

We will also not pay for any resulting loss to the property that has the fault, inadequacy or defect until such fault, inadequacy or defect is corrected or made good.

- 4. We will not pay for "loss" to Trees, Plants, Lawns or Shrubs caused by or resulting from any of the following:
 - a. Changes in or extremes of temperature or humidity;
 - b. Freezing;
 - c. Lack of water or drought;
 - d. Disease or infestation;
 - e. Animals;
 - f. Weight of ice or snow or sleet; or
 - g. Wind or hail.

C. LIMITS OF INSURANCE

- 1. The most we will pay for loss or damage in any one occurrence is the applicable Limit of Insurance shown on the "schedule of coverages".
- 2. Limits of Insurance for Additional Coverages:
 - a. Apply to any one occurrence; and
 - b. Are additional Limits of Insurance; unless stated otherwise.

D. DEDUCTIBLE

We will not pay for "loss" in any one occurrence until the amount of the covered "loss" exceeds the applicable deductible shown on the "schedule of coverages". We will then pay the amount of the "loss" in excess of the applicable deductible, up to the applicable Limit of Insurance.

Unless otherwise stated, if more than one deductible applies to "loss" in any one occurrence, we will apply only the largest applicable deductible.

The deductible does not apply to Covered Property in transit.

E. VALUATION AND LOSS PAYMENT

The valuation provision found in the Commercial Inland Marine General Conditions (CM 00 01) is replaced by the following:

- 1. In the event of "loss", the value of property will be determined at the time of "loss" in accordance with the following provisions:
 - a. Replacement cost as of the time of "loss", except as may be otherwise provided. Replacement cost means the cost to repair or replace property at the time of loss without any deduction for depreciation.

We will not pay for any "loss" on a Replacement Cost basis:

 - (1) Until the lost or damaged property is actually repaired or replaced; and
 - (2) Unless the repairs or replacement are made as soon as reasonably possibly after the "loss".
 - b. The value of property that is not repaired or replaced will be based on actual cash value.

This provision does not apply to any "loss" that is smaller than \$50,000.

- c. Property of others will be valued at the amount for which you are liable but not more than the replacement cost.
- 2. We will not pay more for "loss" on a replacement cost basis than the least of the following:
 - a. The cost to repair or replace Covered Property at the same construction site with property of comparable material and quality and which is used for the same purpose;
 - b. The amount you actually spend to repair or replace Covered Property; or
 - c. The applicable Limit of Insurance.

If the property is replaced at a location other than the original construction site described on the "schedule of coverages", what we pay will be limited to the cost which would have been incurred had property been rebuilt or replaced at the original construction site.
- 3. The cost to repair or replace does not include any increased cost attributable to the enforcement of any ordinance or law regulating the use, construction or repair of any property except as provided by the provisions of **A. COVERAGE, 4. Additional Coverages, m. Ordinance or Law Coverage**.
- 4. Payment for repair or replacement may include reasonable overhead and profit charges or change fees. However, we will not pay more than the lesser of the percentage of overhead and profit, if applicable, or change fees outlined in any contract or change order related to the construction, change or repair of described construction project shown on the "schedule of coverages".

F. ADDITIONAL CONDITIONS

1. Coverage Territory

We insure the Covered Property only while it is located in:

- a. The United States of America;
- b. Puerto Rico; or
- c. Canada.

Subject to the Covered Property In Transit Limit of Insurance, we also cover property being shipped within and between points in paragraph 1. directly above.

2. Duration of Coverage Clause

This policy is written covering specific "buildings or structures" in the course of construction. The term of this policy reflects information submitted by you. This policy will not be automatically renewed at expiration. If an extension of this policy is necessary, you or your agent must notify us in writing, prior to the expiration of the policy, that the scheduled "buildings or structures" are not yet complete. You must also tell us when, based on standard construction practices, when construction is expected to be completed. We may, at our discretion, offer an extension. If we offer an extension, we will extend the policy for the term and premium that you and we agree upon.

If we agree to an extension, we may amend or modify the original policy terms and conditions that were applicable to your policy. Any changes or modifications must be agreed to by you prior to the extension taking effect. We may also offer the original policy terms and conditions that were applicable to your policy without any change.

3. When Coverage Ends

The coverage provided for Covered Property will end when one of the following first occurs:

- a. This policy expires or is cancelled;
- b. The "building or structure" is accepted by the purchaser or owner under the contract of construction, even if the owner or purchaser is an insured under this policy;
- c. Your interest in the "building or structure" ceases;
- d. You abandon construction with no intent to complete it;
- e. 90 days after construction on the project is complete; or
- f. When the "building or structure":
 - (1) Is occupied in whole or in part; or
 - (2) Is put to its intended use.

4. Unintentional Errors and Omissions

Prior to "loss" you may amend any unintentional error or omission that you make in setting the Limit of Insurance applicable to the "building or structure" provided:

- a. The error or omission is unintentional; and
- b. It is reported to us in writing as soon as it becomes known to you.

If you amend the Limit of Insurance applicable to any "building or structure" after the inception of coverage, we must agree to change the Limit of Insurance. If we agree, we will charge premium back to the inception date that coverage was first provided for the described "building or structure".

We will not, under any circumstance, amend any Limit of Insurance after a "loss" has occurred.

5. Additional Named Insured

Provided you have agreed to add any of the following persons or organizations as Additional Named Insureds, as evidenced by a written contract that you executed prior to "loss", we cover:

- a. Contractors and sub-contractors of every tier; and
- b. Owners.

We only cover such persons or organizations to the extent of their financial interest in Covered Property.

We do not cover any architect or engineer or any organization acting as architect or engineer on the project.

6. Mortgage Holder

- a. The term mortgage holder includes trustees.
- b. We will pay for covered "loss" to buildings or structures to each mortgage holder shown in the Declarations in their order of precedence, as interests may appear.
- c. The mortgage holder has the right to receive "loss" payment even if the mortgage holder has started foreclosure or similar actions on property insured under this policy.
- d. If we deny your claim because of your acts or because you have failed to comply with the terms of this Coverage Form, the mortgage holder will still have the right to receive loss payment if the mortgage holder:
 - (1) Pays the premium due under this Coverage Form at our request if you have failed to do so;
 - (2) Submits a signed, sworn proof of "loss" within 60 days after receiving notice from us of your failure to do so; and
 - (3) Has notified us of any change in ownership, occupancy or substantial change in the risk known to the mortgage holder.

All of the terms of this Coverage Form will then apply directly to the mortgage holder.

- e. If we pay the mortgage holder for any loss or damage and deny payment to you because of your acts or because you have failed to comply with the terms of this Coverage Form:
 - (1) The mortgage holder's rights under the mortgage will be transferred to us to the extent of the amount that we pay; and
 - (2) The mortgage holder's right to recover the full amount of the mortgage holder's claim will not be impaired.

At our option, we may pay to the mortgage holder the whole principal on the mortgage plus any accrued interest. In this event, your mortgage and note will be transferred to us and you must pay your remaining mortgage debt to us.
- f. If we cancel this policy, we will give written notice to the mortgage holder at least:
 - (1) 10 days before the effective date of the cancellation if we cancel for your nonpayment of premium; or
 - (2) 30 days before the effective date of cancellation if we cancel for any other reason.
- g. If we do not renew this policy, we will give written notice to the mortgage holder at least 10 days before the expiration date of this policy.

G. DEFINITIONS

1. "Accident" means direct physical loss or damage to "covered equipment" caused by or resulting from one or more of the following:
 - a. Mechanical breakdown, including rupture or bursting caused by centrifugal force;
 - b. Artificially generated electrical current, including electrical arcing that disturbs electrical devices, appliances or wires;
 - c. Explosion of steam boilers, steam pipes, steam engines or steam turbines owned or leased by you, or operated under your control;
 - d. Loss or damage to steam boilers, steam pipes, steam turbines, steam engines caused by or resulting from any condition or event inside such equipment;
 - e. Loss or damage to hot water boilers or other water heating equipment caused by or resulting from any condition or event inside such boilers or equipment; and
 - f. Any "testing" of "covered equipment".
2. "Artistic merit" means the special value applicable to tangible construction materials primarily because of their historic, rare or unique characteristics. This includes, but is not limited to, stained or art glass windows; antique structural elements incorporated into the new "building or structure" including interior or exterior stone or wood work; antique floors or roof tiles.
3. "Buildings or structures" means structures which are meant to be permanent structures, including grading, excavation, and backfill, foundations, pipes and wiring above or beneath the surface of the ground, machinery, equipment and related property provided such property is, or will become, a permanent part of the completed "building or structure". Also included are appurtenant permanent structures including fences, sidewalks, walkways, driveways, roadways and their related fixtures provided such work is included within the contract of construction and if the values are included within the completed value.
4. "Business personal property" means property that is owned by or leased or rented by you from others, that is used by you in your business including office furniture and supplies, computers, and telephone systems. "Business personal property" does not include "valuable papers and records".
5. "Construction class" means one of the following types of construction developed by Insurance Service Office (ISO):
 - a. Frame – Construction class 1. Frame or wood stick construction buildings or structures have exterior roofs, walls and floors of combustible materials. Buildings or structures may have exterior walls of non-combustible construction but floors and roofs are combustible.
 - b. Joisted Masonry – Construction class 2. Joisted Masonry means buildings or structures with exterior bearing walls of masonry or fire resistive construction with at least one hour fire rating but with combustible roof and floor.
 - c. Non-Combustible – Construction class 3. Non Combustible means buildings or structures with exterior walls, floors and roofs of non-combustible or slow burning materials. Building supports are made of non-combustible or slow burning materials.
 - d. Masonry Non Combustible – Construction class 4. Masonry Non Combustible means buildings or structures with exterior bearing walls of fire resistive construction, not less than 4" thick, with a fire rating of at least one (1) hour. Roofs and floors are constructed of non-combustible or slow burning materials.
 - e. Modified Fire Resistive – Construction class 5. Modified Fire Resistive construction means buildings or structures with exterior and interior bearing walls or structural supports, floors and roof of masonry materials with a fire rating of less than two (2) hours but not less than one (1) hour. Structural steel will be protected by applied material affording like fire protection. Masonry materials are at least 4 inches thick.
 - f. Fire resistive – Construction class 6. Fire resistive construction means floors, exterior bearing walls or the exterior structural frame that are either of non-combustible materials with a fire rating on 2 hours or more or are a masonry material meeting the following thickness requirements: solid masonry or reinforced concrete at least 4 inches thick; or, hollow masonry materials at least 12 inches thick. All assembled components will have a fire rating of at least two (2) hours.

- g. Buildings – Mixed Construction. Buildings or structures which are of multiple or mixed construction and which, at completion, are composed of 25% or more frame construction, will be classed as Frame – Construction class 1.
- 6. "Contract penalties" means those fees or penalties that you, acting as a general contractor, agree to pay as a result of your failure to complete the construction of "buildings or structures" within the timeframe provided by a written contract of construction executed by you in advance of "loss".
- 7. "Covered equipment" means:
 - a. Electrical or mechanical equipment that transmits or uses energy;
 - b. Electrical or mechanical equipment that operates under internal pressure or vacuum, other than weight of its contents;"Covered equipment" must be located at the construction site described on the "schedule of coverages".
"Covered equipment" does not mean any of the following:
 - c. Structure, foundation, cabinet, or compartment, including those that cover, hold or support "covered equipment";
 - d. Sewer piping, buried vessels or piping, or piping forming a part of a sprinkler or fire extinguishing or suppression system;
 - e. Insulating or refractory material;
 - f. Water piping, other than boiler feedwater piping, boiler condensate return piping or water piping forming part of a refrigerating or air conditioning system.
 - g. "Vehicle" or any equipment mounted on a "vehicle";
 - h. Satellite, spacecraft or any equipment mounted on a satellite or spacecraft; or
 - i. Dragline, excavation or construction equipment.
- 8. "Data" means information or instructions stored in digital code capable of being processed by machinery.
- 9. "Fire protection equipment" means equipment that manually or automatically discharges water, inert gas, or chemicals for the purpose of stopping or controlling a fire. The equipment referred to by this definition may be hand-held fire extinguishing equipment, owned by you or owned by others; permanently installed automatic fire extinguishing system such as an operating automatic sprinkler system within the covered "building or structure".
- 10. "Fungus" means any type or form of "fungus", mold or mildew, and any mycotoxins, spores, scents or by-products produced or released by fungus; any type or form of algae or lichens.
- 11. "Loss" means accidental loss or damage.
- 12. "Media" means material on which "data" is recorded, such as magnetic tapes, hard disks, optical disks, or floppy disks.
- 13. "Pollutants" means any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes acids, alkalis, chemicals, asbestos, and waste. Waste includes materials to be recycled, reconditioned or reclaimed.
- 14. "Pre-existing structure" means any "building or structure", or any part of any "building or structure", which existed at the construction site prior to the inception of this policy. This includes any building or structure in course of construction, alteration, renovation or rehabilitation.
- 15. "Schedule of coverages" means the pages labeled "schedule of coverages" or other declarations or schedules that apply to this coverage.
- 16. "Sinkhole collapse" means the sudden sinking or collapse of land into underground empty spaces created by the action of water on limestone or dolomite and similar rock formations. This cause of loss does not include the cost of filling sinkholes (except to the extent that such filling is required to repair Covered Property following a Covered Cause of Loss), or sinking or collapse of land into manmade underground cavities.
- 17. "Specified causes of loss" means any of the following:

Fire, lightning, explosion, windstorm or hail, smoke, aircraft or vehicles, riot or civil commotion, vandalism, leakage from fire extinguishing equipment, "sinkhole collapse", volcanic action, falling objects, and weight of snow, ice or sleet.

18. "Temporary structures" means false-work, cribbing, construction forms, scaffolding, temporary fences and signs, and similar property built or erected at the construction site shown on the "schedule of coverages" which are used in conjunction with the construction of "buildings and structures".
19. "Testing" means the testing of building systems and components at the construction site, including:
 - a. Electrical;
 - b. Pneumatic;
 - c. Hydrostatic; or
 - d. Mechanical testing.
20. "Valuable papers and records" means blueprints, designs, records and other specifications in written, printed, electronic or magnetic media format.
21. "Vehicle" means, as respects to Equipment Breakdown and Testing Coverage only, any machinery or apparatus that is used for transportation or moves under its own power. "Vehicle" includes, but is not limited to: car, truck, bus, trailer, train, aircraft, watercraft, forklift, bulldozer, tractor or harvester. However, any property that is stationary, permanently installed at a covered location and that receives electrical power from an external power source will not be considered a "vehicle".

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.


EXCLUSION OF LOSS DUE TO VIRUS OR BACTERIA

This endorsement modifies the Builders' Risk Coverage Form

- A.** The exclusion set forth in Paragraph **B.** applies to all coverage under all Forms and Endorsements that comprise this Policy.
- B.** We will not pay for loss or damage caused by or resulting from any virus, bacterium or other microorganism that induces or is capable of inducing physical distress, illness or disease.
However, this exclusion does not apply to loss or damage caused by or resulting from "fungus", wet rot or dry rot. Such loss or damage is addressed in a separate exclusion in the above Coverage Form.
- C.** With respect to any loss or damage subject to the exclusion in Paragraph **B.**, such exclusion supersedes any exclusion relating to "pollutants".
- D.** The following provisions in the above Coverage Form are hereby amended to remove reference to bacteria:
 - 1. Exclusion of "Fungus", Wet Rot, Dry Rot And Bacteria; and
 - 2. Additional Coverage – Limited Coverage for "Fungus", Wet Rot, Dry Rot And Bacteria, or any endorsement increasing the scope or amount of coverage.
- E.** The terms of the exclusion in Paragraph **B.**, or the inapplicability of this exclusion to a particular loss, do not serve to create coverage for any loss that would otherwise be excluded under this Coverage Part or Policy.

THE ONLY SIGNATURES APPLICABLE TO THIS POLICY ARE THOSE REPRESENTING THE COMPANY NAMED ON THE FIRST PAGE OF THE DECLARATIONS.

In Witness Whereof, this company has caused this policy to be signed by its President and Secretary and countersigned on the declarations page, where required, by a duly authorized agent of the company.

A handwritten signature in cursive script, appearing to read "John C. Roche".

John C. Roche
President

A handwritten signature in cursive script, appearing to read "Charles F. Cronin".

Charles Frederick Cronin
Secretary



EVIDENCE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY)

07/31/2023

THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE ADDITIONAL INTEREST NAMED BELOW. THIS EVIDENCE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS EVIDENCE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE ADDITIONAL INTEREST.

AGENCY L/P Insurance Services LLC 300 East 2nd Street Suite 1300 Reno NV 89501		PHONE (A/C, No, Ext): (775) 996-6000	COMPANY Hanover Insurance Company	
FAX (A/C, No): (775) 473-9288		E-MAIL ADDRESS: jessica.carroll@lpins.net		
CODE: 5701486		SUB CODE:		
AGENCY CUSTOMER ID #: 00000680				
INSURED Mt Rose Heating & Air Conditioning Inc 310 Sunshine Lane Reno NV 89502		LOAN NUMBER		POLICY NUMBER IH4J50183000
		EFFECTIVE DATE 08/01/2023	EXPIRATION DATE 08/01/2024	<input type="checkbox"/> CONTINUED UNTIL TERMINATED IF CHECKED
THIS REPLACES PRIOR EVIDENCE DATED:				

PROPERTY INFORMATION

LOCATION/DESCRIPTION 75 Cowan Dr (California Building HVAC System Upgrade) Reno Loc# 00001/Bldg# 00001		Contract #: FM980B NV 89509
THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS EVIDENCE OF PROPERTY INSURANCE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.		

COVERAGE INFORMATION

PERILS INSURED

BASIC

BROAD

SPECIAL

☒

COVERAGE / PERILS / FORMS	AMOUNT OF INSURANCE	DEDUCTIBLE
Builders Risk, Replacement Cost	1,430,000	5,000

REMARKS (Including Special Conditions)

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CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

ADDITIONAL INTEREST

NAME AND ADDRESS City of Reno PO Box 1900 Reno NV 89505	<input type="checkbox"/> ADDITIONAL INSURED	<input type="checkbox"/> LENDER'S LOSS PAYABLE	<input type="checkbox"/> LOSS PAYEE
	<input type="checkbox"/> MORTGAGEE		
	LOAN #		
AUTHORIZED REPRESENTATIVE Jessica L. Carroll			

STATE OF NEVADA

STEVE SISOLAK
GOVERNOR

TERRY REYNOLDS
DIRECTOR

BRETT K. HARRIS
LABOR COMMISSIONER



OFFICE OF THE LABOR COMMISSIONER
3300 WEST SAHARA AVENUE, SUITE 225
LAS VEGAS, NEVADA 89102
PHONE: (702) 486-2650
FAX (702) 486-2660

OFFICE OF THE LABOR COMMISSIONER
1818 COLLEGE PARKWAY, SUITE 102
CARSON CITY, NV 89706
PHONE: (775) 684-1890
FAX (775) 687-6409

2023 PREVAILING WAGE RATES WASHOE COUNTY

DATE OF DETERMINATION: October 1, 2022

**APPLICABLE FOR PUBLIC WORKS PROJECTS OVER \$100,000 BID/AWARDED
OCTOBER 1, 2022 THROUGH SEPTEMBER 30, 2023**

Pursuant to Nevada Revised Statutes (NRS) section 338.030(9)(a), "If the contract for a public work: (a) Is to be awarded pursuant to a competitive bidding process, the prevailing wages in effect at the time of the opening of the bids for a contract for a public work must be paid until the completion or termination of the contract or for the 36 months immediately following the date on which the bids were opened, whichever is earlier." For contracts not awarded pursuant to competitive bidding, please see NRS section 338.030(9)(b). However, if a project exceeds 36 months new wage rates may apply pursuant to NRS section 338.030(9)(10). Prevailing Wage Rates may be adjusted based on Collective Bargaining Agreements (CBA's) and adjustments to those agreements. (See NRS 338.030)

PREVAILING WAGE DETERMINATIONS - NRS 338.030 subsection 7, the wages so determined must be:

- (a) Issued by the Labor Commissioner on October 1 of the odd-numbered year in which the survey was conducted and, except as otherwise provided in subsection 8, remain effective for 2 years after that date; and
- (b) Made available by the Labor Commissioner to any public body which awards a contract for any public work.

Senate Bill 243 passed during the 80th Nevada Legislative Session (2019) and set forth in NRS section 338.025, now requires the Labor Commissioner to calculate the Prevailing Wage Rates by region. NRS section 338.025 Prevailing wage regions. For the purpose of determining the prevailing rate of wages pursuant to NRS section 338.030, four prevailing wage regions are hereby established in this State as follows:

1. The Washoe Prevailing Wage Region consisting of Washoe County;
2. The Northern Rural Prevailing Wage Region consisting of Carson City and the counties of Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Storey, Pershing and White Pine;
3. The Clark Prevailing Wage Region consisting of Clark County; and
4. The Southern Rural Prevailing Wage Region consisting of the counties of Esmeralda, Lincoln and Nye.

OBJECTIONS TO PREVAILING WAGE DETERMINATIONS – NRS section 338.030 subsection 2. Objections to the Prevailing Wage Determinations must be submitted within 30 days after the Prevailing Wage Determinations are issued.

Pursuant to NRS section 338.030 subsection 8, the Labor Commissioner will review the prevailing wage rates in each even-numbered year to determine if adjustments should be made.

As Amendments/Revisions are made to the wage rates, they will be posted on the website for each respective Region. Please review regularly for any Amendments/Revisions that are posted or contact our offices directly for further assistance.

Air Balance Technician	4
Alarm Installer	5
Boilermaker	6
Bricklayer	7
Carpenter	8
Cement Mason	9
Electrician – Communication Technician	10
Electrician - Lineman	12
Electrician – Neon Sign	14
Electrician - Wireman	15
Elevator Constructor	16
Fence Erector	18
Flagperson	19
Floorcoverer	20
Glazier	21
Highway Striper	22
Hod Carrier-Brick Mason	23
Hod Carrier – Plasterer Tender	24
Ironworker	26
Laborer	29
Lubrication And Service Engineer (Mobile And Grease Rack)	46
Mechanical Insulator	31
Millwright	32
Operating Engineer	34
Operating Engineer – Steel Fabricator & Erector	34
Operating Engineer – Piledriver	35
Painter	37
Piledriver (Non-Equipment)	39
Plasterer	40
Plumber/Pipefitter	41
Refrigeration	42
Roofer	43
Sheet Metal Worker	45
Soils and Material Tester	46
Sprinkler Fitter	46
Surveyor	46
Taper	47
Tile/Terrazzo Worker/Marble Mason Finisher	49
Tile/Terrazzo Worker/Marble Mason	49
Traffic Barrier Erector	51
Truck Driver	52
Well Driller	54
Group Classifications	
Labor Group Classifications	55
Operating Engineers	59

NRS section 338.010 subsection (25) "Wages" means:

- a) The basic hourly rate of pay; and
- b) The amount of pension, health and welfare, vacation and holiday pay, the cost of apprenticeship training or other similar programs or other bona fide fringe benefits which are a benefit to the worker.

NRS section 338.035 Bona Fide Fringe Benefits - Discharge of part of obligation of contractor or subcontractor engaged on public work to pay wages by making certain contributions in name of workman. "Bona fide fringe benefit" means a benefit in the form of a contribution that is made not less frequently than monthly to an independent third party pursuant to a fund, plan or program: (a) Which is established for the sole and exclusive benefit of a worker and his or her family and dependents; and (b) For which none of the assets will revert to, or otherwise be credited to, any contributing employer or sponsor of the fund, plan or program. The term includes, without limitation, benefits for a worker that are determined pursuant to a collective bargaining agreement and included in the determination of the prevailing wage by the Labor Commissioner pursuant to NRS section 338.030.

Please see NRS sections 338.010, 338.020, and 338.035 and Nevada Administrative Code (NAC) sections 338.0097 and 338.092 through 338.100 for further details on "Bona fide fringe benefits" and reporting requirements and exceptions.

Job Descriptions for Recognized Classes of Workers

Regarding job descriptions for public works projects, please take notice of the following:

1. The job description links have been redacted to include ONLY the scope of work for the craft.
2. Pursuant to NAC section 338.0095(1)(a) - A worker employed on a public work must be paid the applicable prevailing rate of wage for the type of work that the worker actually performs on the public work and in accordance with the recognized class of the worker.
3. The work description for a particular class is not intended to be jurisdictional in scope.
4. Any person who believes that a type of work is not classified, or who otherwise needs clarification pertaining to the recognized classes or job descriptions, shall contact the Labor Commissioner in writing for a determination of the applicable classification and pay rate for a particular type of work.
5. The job descriptions set forth or referenced herein supersede any, and all descriptions previously agreed upon by the Labor Commissioner in any settlement agreements or stipulations arising out of contested matters.
6. The following specific provisions, where applicable, shall prevail over any general provisions of the job descriptions:
 - Amendments to the prevailing wage determinations.
 - Group Classifications and/or descriptions recognized by the Labor Commissioner and included with wage determinations for a particular type of work in a particular county.

Zone Rates

The zone rate has been added to each applicable craft.

Premium Pay Premium pay for hours worked in excess of a shift of 8 hours or 12 hours, or such other time increment set forth in the Collective Bargaining Agreement or on a weekend or holiday.

Craft: AIR BALANCE TECHNICIAN (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Air Balance Technician Journeyman.....	71.50
Air Balance Technician-Foreman.....	75.71
Air Balance Technician-General Foreman.....	79.93

ADD ZONE RATE

In addition to AIR BALANCE rates add the applicable amounts per hour, calculated based on a road from the courthouse in Reno, Nevada:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 100 miles	\$5.00
Zone 3	Over 100 miles	\$10.00 the employee shall be provided reasonable lodging and meal expenses.

ADD PREMIUM PAY

All hourly rates are subject to Over Time (One and one half 1 ½) of the Regular rate:

1. For all hours worked over Eight (8) Hours in one day or shift.
2. For the first Eight (8) Hours work on Saturday.

All hourly rates are subject to Double Time of the Regular Rate:

1. For all hours worked over Ten (10) Hours in one day or shift.
2. For all hours worked over Eight (8) Hours on Saturday.
3. For all hours worked on Sunday, New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day.

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day

JOB DESCRIPTION: Excerpt from Sheet Metal Local 26 Collective Bargaining Agreement

(a) manufacture, fabrication, assembling, handling, erection, installation, dismantling, conditioning, adjustment, alteration, repairing and servicing of all ferrous or nonferrous metal work and all other materials used in lieu thereof and of all HVAC systems, air veyor systems, exhaust systems, and air-handling systems regardless of material used including the setting of all equipment and all reinforcements in connection therewith; (b) all lagging over insulation and all duct lining; (c) testing and balancing of all air-handling equipment and duct work; (d) the preparation of all shop and field sketches whether manually drawn or computer assisted used in fabrication and erection, including those taken from original architectural and engineering drawings or sketches; (e) metal roofing; and (f) all other work included in the jurisdictional claims of International Association of Sheet Metal, Air, Rail and Transportation Workers.

Craft: ALARM INSTALLER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Alarm Installer.....33.79

JOB DESCRIPTION:

Includes but is not limited to:

1. Installing or testing electrical protective signaling systems used to provide notification of fire, burglary or other irregularities on the premises of the subscriber of the system;
2. Installing of wiring and signaling units;
3. Repairing electrical protective signaling systems
4. Starting up, programming and documenting systems;

Craft: BOILERMAKER (Union Rate)
Prevailing wage rates include the base rate as well as all applicable fringes

Boilermaker.....	65.94
Boilermaker Foreman.....	65.94
Boilermaker General.....	65.94

ADD PREMIUM PAY

Premium pay for hours worked in excess of a shift of 8 hours or 12 hours or such other time increment set forth in the Collective Bargaining Agreement or on a weekend or holiday.

JOB DESCRIPTION:

Includes but is not limited to:

1. Constructing, assembling, maintaining and repairing stationary steam boilers and boiler house auxiliaries;
2. Aligning structures or plate sections to assemble boiler frame tanks or vats;
3. Assisting in the testing of assembled vessels, directing cleaning of boilers and boiler furnaces;
4. Inspecting and repairing boiler fittings, including, without limitation, safety valves, regulators, automatic-control mechanisms, water columns and auxiliary machines.

Craft: BRICKLAYER (Union Rate)
Prevailing wage rates include the base rate as well as all applicable fringes

Bricklayer Journeyman.....48.71
Bricklayer Foreman.....49.96

Add Zone pay

Zone	75 miles and Over	\$8.13
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ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.

New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day,
Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between No. NV Masonry Contractors and LIUNA
Local 169

This shall apply to and cover the work of Brick/Block Masonry, Stone Masonry, Artificial Masonry
Marble Masonry.

Craft: CARPENTER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Carpenter Journeyman.....	54.91
Carpenter Foreman.....	58.27
Carpenter General Foreman.....	62.03

ADD ZONE RATE

(Building and Heavy Highway and Dam Construction)

In addition to CARPENTER rates add the applicable amounts per hour, calculated from the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00 (Road miles from the Washoe County Courthouse)
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	Over 300 miles	\$6.00

ADD PREMIUM PAY

Any work performed over eight (8) hours per day and on Saturdays shall be compensated at time and one-half (1-1/2x) the appropriate hourly rate. All work performed on Sundays, holidays and over twelve (12) hours in one (1) day shall be compensated at two times (2x) the appropriate hourly rate. In the event a day's work is lost because of severe weather conditions or major mechanical breakdown, work may be performed on a voluntary basis on a Saturday at the straight time hourly rate for eight (8) hours provided the straight time hours worked in one (1) week do not exceed forty (40) hours.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, 4th of July, Labor Day, Admission's Day, Thanksgiving Day, the Friday after Thanksgiving, Christmas Day.

JOB DESCRIPTION Excerpt from Southwest Regional Council of Carpenters and Affiliated Local Unions Master Labor Agreement

(1) All building construction, including but not limited to the construction, erection, alteration, repair, modification, demolition, addition, or improvement in whole or in part of any building structure. All rigging of Carpenters', and Piledrivers' materials.

(2) All heavy, highway and engineering construction, including but not limited to the construction, improvement, modification and demolition of all or any part of the streets, highways, bridges, viaducts, railroads, tunnels, airports, water supply, irrigation, flood control and draining systems, sewers and sanitation projects, dams, power houses, refineries, aqueducts, canals, river and harbor projects, wharves, docks, breakwaters, jetties, quarrying of breakwaters or rip rap stone or operations incidental to such heavy construction work and whether such work is above or below the water line level.

(3) The character of such work covered by this Agreement shall include but not be limited to all carpenter, concrete form work, shoring, drywall, metal stud, drywall finishing, plaster, scaffold, modular furniture, trade show work, insulation, acoustical, and lathing work on such construction

(4) All interior and/or exterior wall finish work, including EIFS and other wet wall finish work.

Craft: CEMENT MASON (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Cement Mason - Journeyman.....	48.92
Cement Mason - Foreman.....	52.55

ADD ZONE RATE

In addition to CEMENT MASON rates add the applicable amounts per hour, calculated from the Reno Post Office, 50 So. Virginia St., Reno, Nevada:

Zone 1	0 to 90 miles	\$0.00
Zone 2	over 90 miles	\$6.00

ADD PREMIUM PAY

OVERTIME – Any worked performed over eight (8) hours per day shall be compensated at time and one half the hourly rate. All work performed after twelve (12) consecutive hours shall be paid at double the hourly rate. All worked performed on Saturdays shall be compensated at time and one half the hourly rate. All Sunday and Holiday work shall be paid for at double time.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Independence Day, Labor Day, Admissions Day, Thanksgiving Day and the following Friday following Thanksgiving Day, and Christmas

JOB DESCRIPTIONS

1. All building construction, including but not limited to the construction, erection, alteration, repair, modification, demolition, addition, or improvement in whole or in part of any building structure.
2. All heavy, highway and engineering construction, including but not limited to construction, improvement, modification, demolition, of all or any part of streets and highways (including sidewalks, curbs and gutters), bridges, viaducts, rail roads, tunnels, airports, water supply, irrigation, flood control and drainage systems, sewers and sanitation projects, dams, power houses, refineries, aqueducts, canals, river and harbor projects, wharves, docks, breakwaters, jetties, quarrying of breakwater or rip-rap stone, or operation incidental to such heavy construction work.
3. The work to be performed by Cement Masons shall include but not be limited to the following, when tools of the Cement Masons trade are used or required:

Setting screeds, screed pins, curb forms and curb and gutter forms, rodding, spreading and tamping concrete, hand application of curing compounds, applying topping (wet or dry) colors or grits; using Darby and push floats, hand troweling or hand floating; marking edging, brooming or brushing, using base cove or step tools; chipping, and stoning, patching or sacking; dry packing; spreading and finishing gypsum, operating mechanical finishers (concrete) such as Clary, Jackson, Bidwell Bridge Deck Paver or similar types; grinding machines; troweling machines, floating machines powered concrete saws; finishing of epoxy and resin materials, bush hammering and exposed finishes for architectural work.

Operation of skill saw, chain saw, Laser Screed, Laser Level, Curb and Slipform machines, Epoxy Type Injection pumps, stamps or other means of texturing, any new devices, which are beneficial to the construction of or with concrete or related products.

Craft: ELECTRICIAN COMMUNICATION TECHNICIAN (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Communication Installer.....	44.79
Communication Technician.....	49.66
Senior Technician	52.91

ADD ZONE RATE

In addition to Electrician Communication Tech rates add the applicable amounts per hour, calculated from the Washoe County Courthouse:

Zone 1	0 to 70 miles	\$0.00
Zone 2	70 to 90 miles	\$8.00
Zone 3	90 miles and over	\$10.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For the first eight (8) hours worked on Saturday

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over eight (10) hours in one day or shift.
2. For any hours worked on Sunday
3. For any hours worked on Holidays

Shift Rates

1. Swing shift to be paid at seventeen-point three (17.3) percent the regular straight time rate for hours between 4:30 p.m. and 1:00 a.m.
2. Graveyard shift to be paid at thirty-one-point four (33.4) percent the regular straight time rate for hours between 12:30 a.m. and 9:00 a.m.
3. Shifts are established for at least five (5) consecutive days or double the regular straight time rate shall be paid.

****Note – Double the straight time rate is the max rate paid. (No pyramiding of overtime rates)**

JOB DESCRIPTION:

The work covered by this Agreement shall include the installation testing, service and maintenance, of the following systems which utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms and low voltage master clock systems.

A. SOUND AND VOICE TRANSMISSION/TRANSFERENCE SYSTEMS 1. Background-foreground music 2. Intercom and telephone interconnect systems 3. Telephone systems 4. Nurse call systems 5. Radio page systems 6. School intercom and sound systems 7. Burglar alarm systems 8. Low-voltage

master clock systems 9. Multi-media/multiplex systems 10. Sound and musical entertainment systems 11. RF Systems 12. Antennas and Wave Guide

B. FIRE ALARM SYSTEMS * 1. Installation, wire pulling and testing

C. Television and Video Systems 1. Television monitoring and surveillance systems 2. Video security systems 3. Video entertainment systems 4. Video educational systems 5. Microwave transmission systems 6. CATV and CCTV

D. Security Systems 1. Perimeter security systems 2. Vibration sensor systems 3. Card access systems 4. Access control systems 5. Sonar/Infrared monitoring equipment

E. COMMUNICATION SYSTEMS THAT TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED SYSTEMS (IN THE SCOPE)
1. SCADA (Supervisory Control and Data Acquisition) 2. PCM (Pulse Code Modulation) 3. Inventory Control Systems 4. Digital Data Systems 5. Broadband and Baseband and Carriers 6. Point of Sale Systems 4 7. VSAT Data Systems 8. Data Communication Systems 9. RF and Remote-Control Systems 10. Fiber Optic Data Systems

Craft: ELECTRICIAN LINEMAN/GROUNDMAN/HEAVY EQUIPMENT OPERATOR
(Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Electrician-Groundman.....	56.09
Lineman-Journeyman.....	81.13
Lineman-Foreman.....	87.80
Lineman-General Foreman.....	94.54
Lineman-Equipment Man.....	67.81

ADD PREMIUM PAY

Premium pay for hours worked in excess of a shift of 8 hours or 12 hours or such other time increment set forth in the Collective Bargaining Agreement or on a weekend or holiday.

RECOGNIZED HOLIDAYS

New Year's Day, Martin Luther King Holiday, President's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION:

Outside, overhead and underground construction and maintenance work on electrical transmission lines, switch yards, substations and distribution systems which shall include:

1. Pole line work (whether built of wood, metal or other material): the digging and back-filling of holes for poles or anchors (by hand or mechanical equipment); the loading or unloading, handling, sorting and moving of materials; the assembly or erection of all materials including the guying, stringing of conductors and fiber optics or other work necessary on through to the ultimate completion of such pole work.

2. Steel or metal structures used for the purpose of carrying electrical wire, conductors, or equipment (this includes transmission towers, outdoor substations, switch racks, or similar electrical structures); the moving of men, tools or equipment; the loading or unloading, handling, sorting and moving of materials; the assembly and erection of all materials used on the job site, including the assembly of the grillage and foundations, on through to the ultimate completion of such structures. Work covered shall include the grounding of all such structures except the bonding of stub-angle to rebar cage; the stringing and installation of wires, cables and insulators or other electrical equipment suspended from structure; also the handling and placing of transformers or O.C.B.'s and other related electrical equipment.

The moving of men, tools or equipment; the loading or unloading, handling, sorting and moving of materials; the assembly of all electrical materials on race-ways such as ducts, shall be performed by workmen under the Agreement. This shall also include CIC (cable in conduit), CC (coilable conduit), the placing of fish wire, the pulling of cables or wires through such race-ways, installing and making up of termination and the splicing of such conductors.

Street lighting systems where such work properly comes under the outside jurisdiction shall be handled in the same manner as pole line construction.

Installing and maintaining the catenary and trolley work and bonding of rails shall be handled in the same manner as pole line, and steel construction.

In connection with all of the above items, it is understood the scope of this Agreement shall include not only new installation work but shall also govern the repair, maintenance or dismantling of such structures, lines or equipment; the handling and operating of all equipment used to transport men, tools and/or materials on the job site as well as the equipment used to move, raise or place materials used in the Outside Branch of the Electrical Industry shall be performed by workmen under this Agreement unless otherwise excluded herein.

Craft: ELECTRICIAN – NEON SIGN
(Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Electrician Neon Sign Journeyman.....37.06

ELECTRICIAN-NEON SIGN, includes but is not limited to:

- 1. Installing, servicing and repairing plastic, neon and illuminated signs;
- 2. Ascending ladders or operating hydraulic or electric hoist to install, service, or examine sign to determine cause of malfunction;
- 3. Wiring, rewiring or removing defective parts and installing new parts using electrician's tools;
- 4. Removing sign or part of sign for repairs, such as structural fabrication, scroll repair, or transformer repair;

Craft: ELECTRICIAN WIREMAN (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Wireman.....	69.61
Wireman-Cable Splicer.....	75.41
Wireman Foreman.....	75.41
Wireman General Foreman.....	81.21

ADD ZONE RATE

In addition to ELECTRICIAN-Wireman, rates, add the applicable amounts per hour, calculated from Washoe County Courthouse, Reno Nevada:

Zone 1	0 to 70 miles	\$0.00
Zone 2	70 to 90 miles	\$8.00
Zone 3	90 miles and over	\$10.00

ADD PREMIUM PAY

Premium pay for hours worked in excess of a shift of 8 hours or 12 hours or such other time increment One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For the first eight (8) hours worked on Saturday

Double the regular straight time hourly rate shall be paid for all time:

3. For all hours worked over ten (10) hours in one day or shift.
4. For any hours worked on Sunday
5. For any hours worked on Holidays

Shift Rates

1. Swing shift to be paid at seventeen-point three (17.3) percent the regular straight time rate for hours between 4:30 p.m. and 1:00 a.m.
2. Graveyard shift to be paid at thirty-one-point four (33.4) percent the regular straight time rate for hours between 12:30 a.m. and 9:00 a.m.
3. Shifts are established for at least five (5) consecutive days or double the regular straight time rate shall be paid.

****Note – Double the straight time rate is the max rate paid. (No pyramiding of overtime rates)**

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Independence Day, Labor Day, Admission Day, Veteran's Day, Thanksgiving Day, Friday following Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between NECA and Local Union 401, IBEW

All electrical construction, installation, or erection work including fabrication or prefabrication of boxes, brackets, bends and nipples and all electrical maintenance thereon including the final running tests. This shall include the installation and maintenance of temporary wiring and the installation of all electrical lighting, heat and power equipment, installation of all raceway systems, including underground conduits and all supports, underground utility conduits, photovoltaic power generation systems, wind power generation systems and geothermal power generating systems. Further all salvage of electrical work shall be included.

Craft: ELEVATOR CONSTRUCTOR (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Elevator Constructor-Journeyman Mechanic.....	117.95
Elevator Constructor-Journeyman Mechanic In Charge.....	128.06

ADD PREMIUM PAY

Work performed on Construction Work on Saturdays, Sundays and before and after 30 the regular working day on Monday to Friday, inclusive, shall be classed as overtime, and paid for at double the rate of single time.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement of International Union of Elevator Constructors

The handling and unloading of all equipment coming under the jurisdiction of the Elevator Constructor, from the time such equipment arrives at or near the building site, shall be handled and unloaded by the Elevator Constructors. Mechanical equipment such as a forklift or truck mounted swing boom may be used by the Elevator Constructors. A derrick, crane or material hoist can be used under the supervision of Elevator Constructors to handle and unload the heavy material described in Par. 5(a). Where unusual conditions are expected to exist prior to delivery of equipment at or near the building site in regard to handling and unloading of equipment in the primary or secondary jurisdiction of the local union, the Company shall contact the Local's Business Representative to make appropriate arrangements for the handling and unloading of such equipment. In areas outside the jurisdiction of the local union, the Company shall contact the Regional Director.

(b) The erecting and assembling of all elevator equipment to wit: electric, hydraulic, steam, belt, dumbwaiters, residence elevators, parking garage elevators (such as Bowser, Pigeon Hole, or similar types of elevators), shuttles, compressed air and handpower, automatic people movers, monorails, airport shuttles and like-named devices used in the transportation of people for short distances of travel (less than 5 miles), as well as vertical reciprocating conveyor systems.

(c) It is understood and agreed that the preassembly of all escalators, moving stairways and link belt carriers that may be done in the factory shall include the following:

1. Truss or truss sections with tracks, drive units, machines, handrail drive sheaves, drive chains, skirts on the incline sections but not curved sections, step chains and steps installed and permanently aligned.
2. Balustrade brackets may be shipped attached but not aligned.
3. Setting of all controllers and all wiring and conduit from the controller.

All other work on escalators, moving stairways and link belt carriers shall be performed in the field before or after the truss or truss sections are joined and/or hoisted and placed in permanent position. This includes any and all work not done in the factory. The erecting and assembly of all theater stage and curtain elevator equipment and guides and rigging thereto, organ consoles and orchestra elevators

- (d) All wiring, conduit, and raceways from main line feeder terminals on the controller to other elevator apparatus and operating circuits. Controllers are not to be shipped from the factory with extended wiring attached thereto.
- (e) The erecting of all guide rails.
- (f) The installation of all grating under the control of the Company. The installation of all counterweight screens, overhead work, either wood or iron, and all material used for mounting of elevator apparatus in machine room, overhead or below.
- (g) The drilling of overhead beams for attaching machines, sheaves, kick angles, and all other elevator equipment.
- (h) The setting of all templates.
- (i) All foundations, either of wood or metal, that should take the place of masonry.
- (j) The assembly of all cabs complete.
- (k) The installation of all indicators.
- (l) The erecting of all electrical or mechanical automatic or semi-automatic gates complete.
- (m) The hanging of all automatic or semi-automatic elevator hoistway doors, together with the installation of hangers and tracks.
- (n) The installation of all devices for opening and closing and locking of elevator car and hoistway doors and gates.
- (o) The drilling of doors for mounting of closing devices.
- (p) The drilling of angle supports for mounting of closing devices except one template hole.
- (q) The drilling of sills for sill trips.
- (r) The operating of temporary cars.
- (s) The setting of all elevator pressure open or pit tanks.
- (t) The setting of hydraulic power units (power units include: motor, pump, drive valve system, internal piping, muffler, internal wiring, controller and tank). Where power units arrive in parts, they shall be assembled at the job site. The wiring and piping to and between multiple hydraulic power units shall be performed at the job site.
- (u) All air cushions with the exception of those built of brick or those put together with hot rivets.
- (v) Landing door entrances.

Craft: FENCE ERECTOR (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Fence Erector.....45.78

ADD ZONE RATE

In addition to FENCE ERECTOR rates add the applicable amounts per hour, calculated based on a road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles or over	\$6.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.
New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day,
Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION:

Includes but is not limited to:

1. Erecting or repairing chain link, wooden, tortoise, wire/wire mesh, or temporary fencing;
2. Mixing and pouring concrete around bases of posts and tamping soil into post hole to embed post;
3. Digging post holes with a spade, post hole digger or power-driven auger;
4. Aligning posts through the use of lines or by sighting;
5. Verifying vertical alignment of posts with a plumb bob or spirit level;

Craft: FLAG PERSON (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Flag Person.....42.66

ADD ZONE RATE

In addition to FLAG PERSON add the applicable amounts per hour, calculated based on a road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles or over	\$6.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midn ight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday. New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION

FLAG PERSON, includes but is not limited to:

1. Directing movement of vehicular traffic through construction projects;
2. Distributing traffic control signs and markers along site in designated pattern;
3. Informing drivers of detour routes through construction sites;

Craft: FLOOR COVERER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Floor Coverer Journeyman.....	50.69
Floor Coverer Foreman.....	54.12

ADD PREMIUM PAY

Shift work

1. \$2.00 per hour will be added to the taxable net wage to shift schedule of hours worked between 6:00 p.m. and 6:00 a.m.

One and one half (1 ½) time -shall be calculated using one (1) hour of the taxable net wage and one half (1/2) the base wage, to be paid for all time:

1. For all hours worked over ten (10) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight

Double time -shall be calculated using one (1) hour of the taxable net wage and one (1) of the base wage, to be paid for all time:

1. For any hours worked on Sunday from midnight to midnight
2. For any hours worked on holidays from midnight to midnight

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Independence Day, Labor Day, Admissions Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between Painters and Allied Trades DC 16 and Independent Flooring Contractors of No Nevada

Measuring, cutting, fabricating, fitting, installing to be cemented, tacked or otherwise applied to its base wherever it may be, all materials whether used either as a decorative covering or as an acoustical appliance such as carpets of all types and designs, wall carpets, sheet rubber, sheet vinyl, cork carpet, rubber tile, asphalt tile, tile, cork tile, linoleum tile, mastic in sheets or the tile from vinyl tile, interlocking tile, laminate flooring, engineered wood, hardwood, composition in sheet or tile form and all derivatives of above; the fittings of all devices for the attachment of the above materials and the fitting of all decorative or protective trim to and adjoining the above materials which shall include the drilling and plugging of holes and attaching of strips, slats, nosing, etc. on any base where the above materials are to be installed, or applied, such as drilling, plugging, slating, and slating for installing or fastening of carpet, the installing of all nosing, cap strips, corner beads and edging of any material and the preparatory work of the craft for all of the aforesaid. Also, the cleaning of rugs, carpets, and drapery hanging, make-up and the installation of drapes, the spraying and/or rolling of adhesives as required for double stick installation and carpet tiles.

Craft: GLAZIER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Glazier Journeyman.....25.25

JOB DESCRIPTION:

Includes but is not limited to:

- 1. Installing, setting, cutting, preparing, or removal of glass, or materials used in lieu thereof, including, without limitation, in windows, doorways, showers, bathtubs, skylights and display cases;
- 2. Installing glass on surfaces, including, without limitation, fronts of buildings, interior walls and ceilings;
- 3. Installing pre-assembled framework for windows and doors designed to be fitted with glass panels, including stained glass windows by using hand tools;
- 4. Loading and arranging of glass on trucks at the site of the public work;

Craft: Highway Striper (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Highway Striper.....	48.28
Highway Striper Foreman.....	48.78

ADD ZONE RATE

In addition to HIGHWAY STRIPER rates add the applicable amounts per hour, calculated based on a road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles or over	\$6.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.

New Year's Day, Memorial Day, 4th of July, Labor Day, Admission Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION:

Includes but is not limited to:

1. Painting highways, streets and parking surfaces by using manually propelled or mechanically propelled machines, brushes, rollers or spray guns;
2. Installing any device or application of any material used in lieu of paint for traffic direction, including, without limitation, buttons, tapes, plastics, rumble bars and other similar materials;

Craft: Hod Carrier-Brick Mason Tender (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Brick Mason Journeyman.....	46.03
Brick Mason Foreman.....	46.43

ADD ZONE RATE

In addition to Hod Carrier Brick Mason Tender rates add the applicable amounts per hour, calculated based on road miles from the Washoe County Courthouse:

Zone	75 miles and Over	\$8.13
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ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.

New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between No. NV Masonry Contractors and LIUNA Local 169

Conveying of all materials used by the Brick and Stone Masons from the first point of delivery to the Mechanic whether done manually or by a piece of machinery or equipment devised to replace the wheelbarrow or buggy, including but not limited to the forklift. The handling of Bricks, Blocks, mortar, or any other material to serve the bricklayer in any capacity building and dismantling scaffolds of any kind or type used by Bricklayers for masonry work including but not limited to tower scaffolds, access scaffolds, or other specialty scaffolds, mixing and tempering mortar by hand and/or machine, mixing grout and cleaning up after the bricklayer, the repairing and maintenance of all equipment, either on the job or in the yard.

Craft: Hod Carrier-Plasterer Tender (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Plasterer Tender-Journeyman.....	46.37
Plasterer Tender- Gun Tender.....	47.37
Plasterer Tender-Foreman.....	47.73

ADD ZONE RATE

In addition to: HOD CARRIER-PLASTERER TENDER rates add the applicable amounts per hour, calculated based on road miles from So. Virginia St., Reno, Nevada:

Zone 1	0 to 70 miles	\$0.00
Zone 2	70 miles and Over	\$8.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midnight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.
New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day,
Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between Plasterers Contractors and LIUNA Local Union 169

Any Employee within the scope of this division tending or serving any other worker performing plasterers work, any plasterer, plasterers, or apprentices in any capacity performing plasterers work including but not limited to, handling and conveying of all materials after delivery used by plasters, including but not limited to, inside finish coat, outside finish coat, brown coat, scratch coat, sprayed or trowled on fireproofing, EIFS systems, and other materials or systems for the same or similar purpose whether done manually or by a piece of machinery or equipment devised to replace the wheelbarrow or buggy, including but not limited to the forklift, tusk hoist, and rigging and signaling for cranes to the point or points of application or installation, making mixing and preparing after delivery all materials used by plasters, whether by hand or machine including but not limited to mixers, pumps for plaster or fire proofing, plaster, finish coats, fireproofing, including Monocoat, Caico or other materials for the same or similar use, moving any rolling scaffolding, building and handling all necessary trestle, scaffolding and planking of scaffolding for plasterers and lathers, building mortar boxes, mortar boards and stands, and the repairing and maintenance of all equipment either on the job or in the yard, the spreading of all temporary protective drop cloths, building paper or plastic covers and taping of same (in a composite crew with the plasterers when necessary), the cleaning of all floors, and debris, behind the plasterers or any other worker performing plasterers work in connection with the work performed all work necessary for cold weather protection and cure including but not limited to handling installing or tending to blankets, visqueen, and space heaters, and running putty.

Tending to plasterers or any other worker performing plasterers work on EFIS system work shall include all work after the wallboard is installed including but not limited to any preparatory sealing or leveling, placing foam, mesh, and plaster including any rough, finish, and color coats.

For sprayed on fire proofing work only, including Monocoat, Cafco or other materials for the same or similar use an Employer signatory to this Agreement and the Local 169, Laborers Master Agreement may employ Laborers at the Group 1 wage rate to perform overspray protection, the spreading of all temporary protective drop cloths, building paper or plastic covers and taping of same, the cleaning of all floors, and debris, cold weather protection and cure including but not limited to handling installing or tending to blankets, visqueen, and space heaters and moving rolling scaffolding.

Craft: Ironworker (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Ironworker-Journeyman.....	78.74
Ironworker - Foreman.....	83.21
Ironworker -General Foreman.....	88.13

ADD ZONE RATE

In addition to Iron Worker rates add the applicable amounts per day, calculated based on a road mile from the Reno City Hall.

Zone 1	60 to 75 miles	\$20.00
Zone 2	75 to 100 miles	\$25.00
Zone 3	100 miles and over	\$75.00

ADD PREMIUM PAY

One and one half (1X) the regular straight time hourly rate shall be paid:

1. For the first two (2) hours worked in excess of eight (8) on a regular workday Monday-Friday
2. For the first eight (8) hours on Saturday

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over ten (10) hours in one day or shift.
2. For any hours worked on Sunday.
3. For all hours worked over eight (8) on Saturday
4. For all hours worked on Holidays

Shift Pay

1. 2nd shift add 6% of hourly wage
2. 3rd shift add 13% of hourly wage
3. Dedicated shift add 6% of hourly wage

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB CLASSIFICATION: Excerpt from Agreement between NV AGC and DC of Ironworkers

Field fabrication and/or erection or deconstruction of structural, ornamental and reinforcing steel, including but not limited to the fabrication, rigging and signaling, erection and construction of all iron and steel, ornamental lead, bronze, brass, copper and aluminum, plastics and all other substitute materials, including, but not limited to, composites, carbon fiber and fiberglass, all barrier railings, handrail, aluminum, steel, glass and plastic, reinforced concrete structures or parts thereof; bridges, viaducts, inclines, dams, docks, dredges, vessels, locks, gates, guides, aqueducts, reservoirs, spillways, flumes, caissons, cofferdams, subways, tunnels, cableways, tramways, monorails, blast furnaces, stoves, kilns, coolers, crushers, agitators, pulverizers, mixers, concentrators, ovens, cupolas, roof decking such as but not limited to "Cofar", "Trusdeck", Mahon "M"; smoke conveyors, penstocks, flag poles, drums, shafting, shoring, fur and storage rooms, fans and hot rooms, stacks, bunkers, conveyors, dumpers, elevators, vats, tanks, enamel tanks, enamel vats, towers, pans, hoppers, plates, anchors, caps, corbels, lintels, Howe and combination trusses, grillage and foundation work, grating, bucks, partitions, hanging ceilings, hangers, clips, brackets, flooring, floor construction and domes, rolling shutters, curtains, frames; aluminum, rolling fire, won and iron doors, including supports; cast

tiling, air ducts, duct and trench frames and plates; wire work, railings, wire cable including pipe, guards, fencing, grill work, sidewalk and vault lights, skylights, roofs, canopies, light steel framing, marquees, awnings and other related equipment elevator and dumb waiter enclosures, elevator cars, tracks, fascias, aprons, operating devices, steel and aluminum sash, hardware and screens, frames, fronts, lockers, racks, book stacks, tables, shelving, metal furniture, seats, chutes, escalators, stairways including pre-engineered stairs, ventilators, boxes, fire escapes, signs, jail and cell work, safes, vaults, vault doors, safe deposit boxes, corrugated sheets when attached to steel frames, including insulation; frames in support of boilers; materials altered in field such as framing, cutting, bending, drilling, burning and welding including by acetylene gas and electric machines; metal forms and false work pertaining to concrete construction; seismic isolation systems and dampening systems including base isolators, sectional water tube and tubular boilers and stokers; traveling sheaves, vertical hydraulic elevators, bulkheads, skip hoists, making and installation of articles made of wire and fibrous rope, rigging in connection with pumps, compressors, forced and induced draft fans, air meters, Bailey meters, agitators, oxygen converters, cinder machines, pelletizing machines, reactor vessels, reactor spheres, completed tanks and assembled sections of completed tanks, scroll cases, refineries, hydroelectric power houses and steam plants, cogeneration plants, vessels and government departments; false work, travelers, scaffolding, pile drivers, sheet piling, derricks and powered derrick swinger including the erection, installation, handling and operating. Cranes erection, installation, handling and operating of same on all forms and types of construction work. The operation of Valla and Spider type battery and/or propane powered portable floor cranes having no operator seat utilized to install ironworker scope of work and the same on all forms and types of construction work. Crane work at the ports, including hammer-head cranes, container cranes and rubber tire cranes. Offloading, relocations, and commissioning of all burning and removal of sea bracing track layout; erection of apex boom extensions, back reach extensions, and rail replacement. Includes all welding, containment and structural modifications of the aforementioned items; railroad bridge work including maintenance thereof; moving, hoisting and lowering of machinery, modules, skid modules and placing of same on foundation, including bridges, cranes, intermittent use forklifts, derricks, buildings, piers and vessels; loading, unloading, necessary maintenance, erection, installation, removal, wrecking and dismantling of all of the above and all reinforcing work and submarine diving in connection with or about same; erection of steel towers, chutes and spouts for concrete where attached to towers and handling and fastening of cables and guys for same; unloading, racking, sorting, cutting, bending, hoisting, placing and tying including the use of any and all mechanical tying devices, burning and welding including stud welding of all iron, steel and metal in reinforced concrete construction including mesh for floor arches and the making of hoops and stirrups, metal forms and metal supports thereof; jacking of slip forms, installation of all wire, cable, parabolic cans, steel and all other materials, including, but not limited to, composites, carbon fiber and fiberglass, used for the purposes of prestressing including grouting of ducts, post stressing concrete girders, beams, columns, etc.; loading, unloading, hoisting, handling, signaling, placing and erection of all prestressed, post stressed, precast materials, G.F.R.C., Dryvit System, including the securing by bolting and/or welding and the installation of steeltex and wire mesh of any type when used for reinforced concrete construction; erection of all curtain wall; glass handrail; stay in place deck; automated and/or mechanical parking structures; offloading, staging, hoisting and setting of modular structures and micro-units; curtain wall systems and associated sealants. Window wall and entrances, panels, insulated and non-insulated, factory and field assembled, porcelain enameled panels, ceramic, laminated spandrelite, louvers and sunscreens; application of thiokol, neoprene and other sealants used to seal materials installed by Iron Workers; installation and handling of phenolic panels, including but not limited to, Trespa products and all similarly related materials and/or systems; installation of metal window stools and sills; installation of aluminum, bronze and steel thresholds; erection and dismantling of all types of cranes and changing of booms; erection of rock, sand and gravel plants, dismantling and loading out conveyors, aggregate plants, batch plants, ableways, refrigeration plants, etc.; erection and dismantling of Monigan walking dragline, launchhammer bucket wheel excavator and other trenching equipment; signaling on highlines, whirley cranes and derricks, buck hoists, man hoists, fork lifts, material towers and scanning antennae; metal

and steel supports of all types; fabrication, assembling and erection of offshore drilling platforms or similar installations; dust collectors, precipitators, multi-plate, specialty welding processes, unloading, loading, hoisting, handling and rigging of all building materials delivered to the job site; hanging ceilings, tees, channels, beams, acoustical elements, sound barriers, computer floors, etc.; installation of stage rigging (including counterweights), curtains, draperies, traverse rods, tracks, cables, window cleaning equipment, powered work platforms, including and loading and unloading, erection installation and removal of powered chassis mounted elevating mast climbing work platforms, rigging in connection with display shows; ski lifts, etc.; wrecking of bridges, viaducts, elevated roads and structural steel and iron in buildings; all steel frames for openings, all porches, verandas, canopies and balconies; all overhead travelers, duo rails, tram rails; erection, setting, repairing of guard or collision rails on bridges and approaches, road ways or any other structures; handling and setting of all types of steel and metal joists, including metal box joists for truss lab and preformed keystone shaped metal joists; erection of steel and metal houses and packaged buildings; all translucent and plastic material on steel frame construction; the erection of solar energy systems, including but not limited to, photo voltaic, heliostat and parabolic systems, energy producing windmill type towers, wind turbine erection to included, but not limited to, prep work, boltup, tensioning or torque of bolts on base and all tower section turbine and blade assemblies; nuclear reactors, electromagnetic shielding plates and atomic vessels including all component parts; the plumbing, aligning and leveling of all materials and equipment through the use of optical instruments, LASER beams, etc., and the use of instruments to establish layout, installation and disposition of ironworker installed scope of work; the unloading, distributing, stockpiling and handling of all materials coming under the jurisdictional claims of the UNION such as to rail heads, storage yards, loading and unloading, hoisting, handling, signaling of all fabricated material and equipment at the jobsite (except FOB deliveries) related to the Iron Workers jurisdiction that is within the individual employers' contractual scope of work including from and to barge and ships to a lay down yard or construction project, etc., shall be done by the Iron Workers.

All reinforcing work in connection with field fabrication, including but not limited to the pre-assembly of reinforcing cages, loading and unloading, handling, racking, sorting, cutting, bending, hoisting, intermittent use of forklifts, placing, burning, welding and tying of all material including the use of any and all mechanical tying devices, or substitute materials, including but not limited to, composites, carbon fiber and fiberglass, stainless steel, used to reinforce concrete construction shall be done by Iron Workers within the individual employers' scope of work at the jobsite, excluding FOB deliveries. A working Iron Worker shall be employed for maintenance on jobs of substantial size while concrete is being poured on reinforcing steel, wire mesh and paper back steeltex but will not be required as a stand-by man. All work in connection with the installation, alignment, repair & modification of panelized roofing systems, pre-engineered fabric structures, aluminum clarifier coverings, carports, ministorages, and dock planks. All work in connection with the installation, alignment, repair and modification of bleachers, planking and stadium seating. All work in connection of installation of amusement rides including, but not limited to, the erection and alignment of all track, machinery and related components.

Craft: Laborer (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Landscaper	40.37
Furniture Mover	41.87
Group 1.....	45.53
Group 1A.....	42.66
Group 2.....	45.63
Group 3.....	45.78
Group 3A.....	48.21
Group 4.....	46.03
Group 4A.....	48.53
Group 5.....	46.33
Group 6	
Nozzlemen, Rodmen.....	45.33
Gunmen, Materialmen.....	46.03
Reboundmen.....	45.68
Gunite Foreman.....	46.73

ADD ZONE RATE

In addition to LABORER rates add the applicable amounts per hour, calculated based on a road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles or over	\$6.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midn ight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday. New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Admission Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between AGC and LIUNA Local 169

The construction, erection, alteration, repair, modification, demolition, addition, improvement of all building, heavy and highway, utility, industrial and all other type(s) of construction.

SEE GROUP CLASSIFICATIONS

Craft: LUBRICATION AND SERVICE ENGINEER (MOBILE AND GREASE RACK) (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Lubrication and Service Engineer (mobile and grease rack).....65.08

ADD ZONE RATE

In addition to: **LUBRICATION AND SERVICE ENGINEER (MOBILE AND GREASE RACK)** rates add the applicable amounts per hour calculated based on a road miles from the Carson City Courthouse or Washoe County Courthouse.

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles and over	\$6.00

ADD PREMIUM PAY

1. One and one-half (1-1/2) times the applicable straight-time rate for the day, shift, work, equipment and classification shall be paid for all work (including repair work and field survey work) performed on Saturday and before a shift begins and after it ends, except when operating equipment servicing a craft that is receiving double time on commercial building construction, in which case double time shall be paid.

2. Overtime. The following rates shall apply on Sundays and holidays and all work before a shift begins and after it ends:

RECOGNIZED HOLIDAYS

Holidays. Double the applicable straight-time rate shall be paid for all work (including repair, maintenance and field survey work) performed on Sundays and the following holidays: New Year's Day (January 1); Memorial Day (last Monday in May); Independence Day (July 4); Labor Day (1st Monday in September); Nevada Admission Day (last Friday in October); Thanksgiving Day (4th Thursday in November); the day after Thanksgiving Day; and Christmas Day (December 25). Holidays falling on Sunday shall be observed on the following Monday. Holiday hours shall be reckoned on the same basis as Sunday hours.

Saturday Shift Period. On any shift, Saturday shall be the twenty-four-hour period commencing at 12:00 midnight Friday.

Sunday Shift Period. On any shift, Sunday shall be the twenty-four-hour period commencing at 12:00 midnight Saturday.

3. For hours worked in excess of 12) on any such workday, an Employee shall be paid two (2) times the regular straight-time rate of pay for each hour so worked.

Craft: Mechanical Insulator (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Mechanical Insulator-Mechanic.....	72.11
Mechanical Insulator-Foreman.....	76.11
Mechanical Insulator-General Foreman	78.11

ADD ZONE RATE

In addition to MECHANICAL INSULATOR rates add the applicable amounts per DAY, calculated based on a radius figured from Reno City Hall:

Zone 1	0 to 20 miles	\$11.00
Zone 2	21 to 40 miles	\$21.00
Zone 3	41 to 60 miles	\$31.00
Zone 4	Over 60 miles	\$85.00

ADD PREMIUM PAY

One and one half times the minimum hourly wage rate shall be paid for the first two (2) hours of overtime work, directly following eight (8) hours Monday through Friday, and for the first ten (10) hours worked on Saturdays. Double the minimum hourly wage rate shall be paid for all other overtime worked Monday through Friday and in excess of ten (10) hours on Saturdays.

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from the Int'l Assoc. of Heat and Frost Insulators and Allied Workers Local 16 and the No. CA Chapter. Western Insulation Contractors Assoc.

65. Lining of all mechanical room surfaces and air handling shafts.
66. The filling and damming of fire stops and penetrations including, but not limited to, electrical and mechanical systems.
67. All foam applications for the purpose of thermal, acoustical, or fire protective purposes, including RTV foams or equivalents, applied to mechanical or electrical systems.
68. All duct lining, and duct wrapping, done on the job site, direct application and installation of fire protection of grease ducts, exhaust systems, or any other ductwork for acoustical or thermal purposes.
69. The insulation of all field joints on pre-insulated underground piping, and the pouring of Gilsilite or its equivalent.
70. Any finish material which is contiguous to the thermal or acoustical application.
71. The preparation, distribution of materials on job sites, assembling, molding, spraying, pouring, mixing, hanging, adjusting, repairing, dismantling, reconditioning, maintaining, finishing, and weather proofing of hot or cold thermal or acoustical insulation with such materials as may be specified.
72. The application of any material, including metal and PVC jacketing, Alumaguard or equivalent, on piping, fittings, valves, flanges, boilers, ducts, plenums, flues, tanks, vats, equipment and any other hot or cold surface for the purpose of thermal control.
73. The Agreement shall cover all other work of a specialty nature.

Craft: Millwright (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Millwright Journeyman.....	71.01
Millwright Welder.....	72.01
Millwright Foreman.....	75.30
Millwright General Foreman.....	80.02

ADD ZONE RATE

In addition to MILLWRIGHT rates, add the applicable amounts per hour, calculated on road miles from the Washoe County Courthouse:

Zone 1	0 to 15 Miles	\$0.00
Zone 2	15 to 35 Miles	\$2.50
Zone 3	Over 35 Miles	\$4.25

ADD PREMIUM PAY

First two (2) hours outside the regular constituted shift shall be at the rate of time and one-half (1½X).

Saturdays up to the first ten (10) hours shall be at the rate of time and one-half (1½X). All additional hours and Sundays and holidays shall be the rate of double time (2X). When working on Sundays and holidays, there will be one dollar and fifty cents (\$1.50) per hour additional paid to Pension Annuity. Admission Day is a recognized holiday in lieu of Veterans' Day.

RECOGNIZED HOLIDAYS

New Year's Day, Washington's Birthday (President's Day), Memorial Day, 4th of July, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving, Christmas Day.

JOB DESCRIPTION Excerpt from Southwest Regional Council of Carpenters and Affiliated Local Unions Master Labor Agreement

5006.18

The work of the millwrights, as spelled out in the Jurisdictional Claims Handbook referenced in Paragraph 5006.17 above, is as follows: The term "MILLWRIGHTS AND MACHINE ERECTORS" shall mean the, unloading, hoisting, rigging, skidding, moving, dismantling, aligning, erecting, assembling, repairing, maintaining and adjusting of all machinery and equipment installed either in buildings, factories, structures, or processing areas, either undercover, underground or elsewhere required to process material, handle, manufacture or service, be it powered or receiving power manually, by steam, gas, electric, gasoline, diesel, nuclear, solar, water, air or chemically; and in industries such as and including but not limited to the following (which are identified for the purpose of description: woodworking plants, canning industries, steel, coffee roasting plants, paper and pulp, cellophane, stone crushing, gravel and sand washing and handling, refineries, grain storage and handling, asphalt plants, sewage disposal and water plants, laundry, bakery, mixing plants, can, bottle and bag packing plants, textile mills, paint mills, breweries and milk processing plants, power plants, aluminum processing or manufacturing plants, and the amusement or entertainment field.

5006.19

Also included are installation of mechanical equipment in atomic energy plants, installation of reactors in power plants, installation of control rods and equipment in reactors, installation of mechanical

equipment in rocket missile bases, launchers, launching gantry, floating bases, hydraulic escape doors and any and all component parts thereto either assembled, semi-assembled or disassembled.

5006.20

Further included is the installation of, but not limited to the following: setting of all engines, motors, generators, air compressors and fans, pumps, scales, hoppers, conveyors of all types and sizes and their supports, escalators, man lifts, moving machinery, mechanical operator and/or automatic doors, roll-up doors, mechanical stage equipment, amusement devices, mechanical pin setters and spotters in bowling alleys, refrigeration equipment and installation of all types of equipment necessary and required to process material either in manufacturing or servicing, the handling and installation of pulleys, gears, sheaves, fly wheels, air and vacuum drives, worm drives and gear drives directly or indirectly coupled to motors, belts, chains, screws, legs, boots, guards, boot tanks, all bin valves, turn heads and indicators, shafting, bearing, cable sprockets, cutting all key seats in new and old work, troughs, chippers, filters, calendars, rolls, winders, reminders, slitters, cutters and wrapping machines; blowers, forging machines, rams, hydraulic or otherwise, planing, extruder, ball, dust collectors, equipment in meat packing plants and splicing of ropes and cables.

5006.21

Additionally included are the laying out, fabrication and installation of protection equipment, including machinery guards, the making and setting of templates for machinery, fabrication of bolts, nuts, pins and drilling of holes for any equipment which the millwrights install regardless of materials; all welding and burning regardless of type; fabrication of all lines, hose or tubing used in lubricating machinery installed by millwrights; grinding, cleaning, servicing and machine work necessary for any part of any equipment installed by the millwrights; and the breaking in and trial run, of any equipment or machinery installed by the millwrights

5006.22

When requested in writing by the Millwright Union, individual Employers who are parties to this Agreement shall furnish signed letters promptly on a date mutually agreed upon by both parties, but in no case more than thirty (30) days, on the letterhead of the individual Employer stating he is employing or had employed millwrights on a specific type of work and a specific job and paid the negotiated scale of wages and fringe benefits for such work.

5006.23

The individual Employer and the Local Union will cooperate promptly in attempting to resolve jurisdictional disputes that may arise on any job or project.

Craft: OPERATING ENGINEER (Union Rate)
Prevailing wage rates include the base rate as well as all applicable fringes

Operating Engineers	(SEE GROUP CLASSIFICATIONS)
Group 1.....	63.11
Group 1A.....	65.82
Group 2.....	66.35
Group 3.....	66.62
Group 4.....	67.36
Group 5.....	67.66
Group 6.....	67.86
Group 7.....	68.08
Group 8.....	68.67
Group 9.....	68.99
Group 10.....	69.34
Group 10A.....	69.53
Group 11.....	69.77
Group 11A.....	71.41
Group 11B.....	72.22
Foreman.....	68.80
Add \$12.5% to base rate for "Special" Shift	

Add Operating Engineers Zone Pay
Add Premium Pay

Craft: OPERATING ENGINEER (Union Rate)
STEEL FABRICATOR & ERECTOR

Prevailing wage rates include the base rate as well as all applicable fringes

Operating Engineers	(SEE GROUP CLASSIFICATIONS)
Group 1.....	78.36
Group 1 Truck Crane Oiler.....	72.19
Group 1 Oiler.....	70.23
Group 2.....	76.85
Group 2 Truck Crane Oiler.....	71.94
Group 2 Oiler.....	70.02
Group 3.....	75.61
Group 3 Truck Crane Oiler.....	71.72
Group 3 Oiler.....	69.80
Group 3 Hydraulic.....	71.39
Group 4.....	73.88
Group 5.....	72.78
Add \$12.5% to base rate for "Special" Shift.....	

Add Operating Engineers Zone Pay
Add Premium Pay

Craft: OPERATING ENGINEER (Union Rate)
PILEDRIIVER

Prevailing wage rates include the base rate as well as all applicable fringes

Operating Engineers	(SEE GROUP CLASSIFICATIONS)
Group 1.....	77.88
Group 1 Truck Crane Oiler.....	72.37
Group 1 Oiler.....	70.45
Group 2.....	76.29
Group 2 Truck Crane Oiler.....	72.16
Group 2 Oiler.....	70.25
Group 3.....	72.03
Group 3 Truck Crane Oiler.....	74.84
Group 3 Oiler.....	71.94
Group 4.....	73.33
Group 5.....	72.22
Group 6.....	68.94
Group 7.....	70.15
Group 8.....	69.19
Add \$12.5% to base rate for "Special" Shift.....	

ADD ZONE RATE

In addition to: **OPERATING ENGINEER, STEEL FABRICATOR & ERECTOR, and OPERATING ENGINEER PILEDRIIVER**, rates add the applicable amounts per hour calculated based on a road miles from the Carson City Courthouse or Washoe County Courthouse

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$5.00
Zone 3	150 to 300 miles	\$6.00
Zone 4	300 miles over	\$7.00

ADD PREMIUM PAY

1. One and one-half (1-1/2) times the applicable straight-time rate for the day, shift, work, equipment and classification shall be paid for all work (including repair work and field survey work) performed on Saturday and before a shift begins and after it ends, except when operating equipment servicing a craft that is receiving double time on commercial building construction, in which case double time shall be paid.

2. Overtime. The following rates shall apply on Sundays and holidays and all work before a shift begins and after it ends:

RECOGNIZED HOLIDAYS

Holidays. Double the applicable straight-time rate shall be paid for all work (including repair, maintenance and field survey work) performed on Sundays and the following holidays: New Year's Day (January 1); Memorial Day (last Monday in May); Independence Day (July 4); Labor Day (1st Monday in September); Nevada Admission Day (last Friday in October); Thanksgiving Day (4th Thursday in November); the day after Thanksgiving Day; and Christmas Day (December 25). Holidays falling on Sunday shall be observed on the following Monday. Holiday hours shall be reckoned on the same basis as Sunday hours.

Saturday Shift Period. On any shift, Saturday shall be the twenty-four-hour period commencing at 12:00 midnight Friday.

Sunday Shift Period. On any shift, Sunday shall be the twenty-four-hour period commencing at 12:00 midnight Saturday.

3. For hours worked in excess of 12) on any such workday, an Employee shall be paid two (2) times the regular straight-time rate of pay for each hour so worked.

JOB DESCRIPTION, includes but is not limited to:

Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement.

Craft: PAINTER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Brush/Roller Painter.....	47.34
Spray Painter/Paperhanger.....	49.00
Sandblaster.....	49.05
Structural Steel & Steeplejack.....	49.05
Swing Stage.....	49.34
Special Coating Application-Brush.....	49.39
Special Coating Application-Spray.....	49.39
Special Coating Application-Spray Steel.....	49.39
Foreman.....	\$1.00 above highest Journeyman

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift unless the Union is notified when four (4) tens (10's) are instituted.
2. For any hours worked on Saturday from midnight to midnight
3. For any work performed in excess of the regular work week of forty (40) hours.

Double the regular straight time hourly rate shall be paid for all time:

1. For any hours worked on Sunday from midnight to midnight
2. For any hours worked on holidays from midnight to midnight

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between Painters and Allied Trades DC 16 and Independent Flooring Contractors of No Nevada

a. All painting of residences, buildings, structures, industrial plants, tanks, vats, pipes, vessels, bridges, light poles, high tension poles, traffic and parking lines on highways, parking lots, playgrounds, factories, and air line strips; all sign, pictorial, coach, car automobile, carriage, aircraft machinery, ship and railroad equipment, mural and scenic painting; spackling of all surfaces where adhesive materials are used; and all drywall pointing, taping and finishing.

b. All decorators, paperhangers, hard wood finishers, grainers, glaziers, varnishers, enamellers

1. Paperhangers work shall be all material of whatever kind or quality applied to walls or ceilings with paste or adhesive; all tacking on the muslin or other materials which is used as wall or ceiling coverings or covered with material pasted on.

2. The scraping off of old paper, preparing of walls, etc., for paper hangers work.

3. The application of relief, stucco, plaster or decorative work shall not be considered paperhanger's work exclusively.

(c) All men engaged in applying or removing paints, pigments, extenders, metal primers and metal pigments, clear pigments, binders, thinners and dryers, primers and sealers, oil paints and enamels,

water colors and emulsions, clear coatings, waxes, stains, mastics, cement enamels and other special coatings, plastics, adhesives, coatings and sheet rubber and other linings, oils, varnishes, water colors, wall paper, wall coverings or other materials used in the various branches of the trade, and the cleaning and bleaching of all interior and exterior walls and surfaces with liquid, steam, sandblast or any other process and all work incidental thereto.

Craft: PILEDRIVER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Piledriver-Journeyman.....	55.41
Piledriver-Welder.....	56.41
Piledriver-Foreman.....	58.87
Piledriver-General Foreman.....	62.68
Tender.....	58.87
Stand-By Diver.....	59.87
Diver-Diving (Wet Pay).....	98.96

ADD ZONE RATE

In addition to PILEDRIVER rates add the applicable amounts per hour, calculated from the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	Over 300 miles	\$6.00

ADD PREMIUM PAY

First two (2) hours outside the regular constituted shift shall be at the rate of time and one-half (1½X).

Saturdays up to the first ten (10) hours shall be at the rate of time and one-half (1½X). All additional hours and Sundays and holidays shall be the rate of double time (2X). When working on Sundays and holidays, there will be one dollar and fifty cents (\$1.50) per hour additional paid to Pension Annuity.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, 4th of July, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving, Christmas Day.

JOB DESCRIPTION

In addition, the operation of the power pack and vibratory hammer controls when driving or pulling, sheet pile, pile, soldier beams, caissons or casing.

(1) In the construction of waterfront and marine facilities, such as docks, piers, wharves, bulkheads, jetties, and similar structures, the pile driver classification should continue to apply, up to and including the decking thereof.

(2) On all pile driving and caisson work on both land and water, the Pile Driver classification should apply.

(3) In the construction of wooden bridges whether over land or over water, when composed of heavy timber, the Pile Driver classification should apply.

(4) In the construction of concrete or steel bridges over land, the Pile Driver classification shall apply to the driving of piles and/or caisson work including the forms required for the capping of the piles or caissons immediately top of the piles or caissons. The capping of the piles is herein interpreted as being that concrete, wood, or other material resting on the top of the piles where driven or placed and does not include any further form work above the capping. In many instances it has been found that the capping is called the girder. The above shall apply on such concrete or steel bridges constructed over land, highways, railroads, overpasses and include cloverleaves, interchanges, etc.

(5) In the construction of concrete or steel bridges over water, the Pile Driver classification shall apply up to and including all of the form work to the top of the column, piers, or abutments supporting the steel and/or any other superstructures.

(6) In the erection of false work, when necessary for the support of work under the Pile Driver classification, then such false work shall fall within their classification. False work necessary for the support of work under the Carpenter classification shall be done within such Carpenter classification, with the exception that where pile driving or power equipment is used for heavy timber false work, then such work shall come under the Pile Driver classification. This would include all rigging, signaling and tagging incidental to the placing of the heavy timber.

(7) In the construction of open-cut sewers, the Pile Driver classification shall apply on all piling including wood, steel or concrete sheet piling, all bracing timber and form work incidental to the construction thereof.

Craft: PLASTERER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Plasterer-Journeyman.....	48.82
Plasterer-Foreman.....	52.13

ADD ZONE RATE

In addition to PLASTERER rates add the applicable amounts per hour, calculated from the South Virginia and Mill Street, Reno, Nevada:

Zone 1	0 to 70 miles	\$0.00
Zone 2	70 miles and over	\$8.00

ADD PREMIUM PAY

OVERTIME Eight (8) consecutive hours (exclusive of a meal period) shall constitute a day's work at straight time. Five (5) consecutive days of eight (8) consecutive hours (exclusive of a meal period), Monday through Friday, shall constitute a week's work. One and one half (1 ½) the regular straight time hourly rate shall be paid for all work over eight (8) hours. Sunday will be paid at double the regular straight time rate.

RECOGNIZED HOLIDAYS

All work performed on the following holidays shall be paid for at double the regular straight time rate: New Year's Day, Memorial Day, Fourth of July, Labor Day, Admissions Day, Thanksgiving Day and the Friday after Thanksgiving and also Christmas Day.

If any of the above holidays fall on Sunday, the Monday following shall be considered a holiday.

No work shall be permitted on the Fourth of July or Labor Day, regardless of compensation or donation, except in case of emergency or to protect life and property. Permission to work shall be granted by the representative of the Union or its officer.

JOB DESCRIPTION: Excerpt from Agreement No NV. Plasterers Master Labor Agreement

This includes but is not limited to:

1. All building construction, including but not limited to the construction, erection, alteration, repair, modification, demolition, addition, or improvement in whole or in part of any building structures,
2. All interior or exterior plastering construction, restoration, repair and inspection of cement, stucco, stone imitation or any patent material when ornamental molded plaster, and the setting of same. All specialty finishes such as veneer, venetian, marmoreno and grasello. All custom and specialty finishes, including but not limited to custom rock, carved plaster, brick and block veneer, stone and wood. Smooth and finish surfaces of full system E.I.F.S. including sticking and shaping of foam pieces or surfaces by adhesive or mechanical installation. All spray or troweled on fireproofing, including cementitious and intumescent products. All plaster acoustical finish systems including, but not limited to, BASWA Phon and Fellert.
3. All work processes which represent technological change, replacement, modification or substitution for the work described above. In addition, all work and use of new materials or *2020-2024 Reno Plasterers Master Labor Agreement* 4 techniques involved in plaster construction including but not limited to what is known as green or sustainable construction technology.

Craft: PLUMBER/PIPEFITTER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Plumber/Pipefitter-Journeyman.....	66.95
Plumber/Pipefitter-Foreman.....	71.48
Plumber/Pipefitter-General Foreman.....	76.01

ADD ZONE RATE

In addition to PLUMBER/PIPEFITTER rates add the applicable amounts per statute air mile radius from the Nevada freeway interchange of Interstate 80 and 580.

Zone 1	0 to 75	\$0.00
Zone 2	Over 75 miles	\$8.00

A separate free zone will be established for employees permanently residing and working within a seventy-five (75) statute air mile radius of the Elko, Nevada Post Office.

Zone 1	0 to 75	\$0.00
Zone 2	Over 75 miles	\$8.00

ADD PREMIUM PAY

Premium pay for hours worked in excess of a shift of 8 hours or 12 hours or such other time increment set forth in the Collective Bargaining Agreement or on a weekend or holiday.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Fourth of July, Labor Day, Nevada Admission Day, Thanksgiving Day, the Friday after Thanksgiving Day, Day Before Christmas and Christmas Day and any Friday preceding a Holiday falling on a Saturday, if worked, holidays shall be compensated at the double time rate.

JOB DESCRIPTION Excerpt from Agreement between LU 350 of United Assoc. of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of United States and Canada

Installation of all heating and refrigeration systems and competent parts thereof, including fabrication, assembling, erection installation, dismantling, repairing, reconditioning, adjusting, altering servicing, handling, distributing, and tying on all piping materials appurtenances and equipment by method, including all hangars and supports of every description, all other work including the the trade relevant to oil burner and all other types of heating and refrigeration equipment including low voltage controls.

Craft: REFRIGERATION MECHANIC (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Refrigeration-Journeyman.....	59.34
Refrigeration -Foreman.....	62.81
Refrigeration -General Foreman	66.27

ADD PREMIUM PAY

Premium pay for hours worked in excess of a shift of 8 hours or 12 hours or such other time increment set forth in the Collective Bargaining Agreement or on a weekend or holiday.

RECOGNIZED HOLIDAYS

New Year's Day, Memorial Day, Fourth of July, Labor Day, Nevada Admission Day, Thanksgiving Day, the Friday after Thanksgiving Day, Day Before Christmas and Christmas Day and any Friday preceding a Holiday falling on a Saturday, if worked, holidays shall be compensated at the double time rate.

JOB DESCRIPTION Excerpt from Agreement between LU 350 of United Assoc. of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of United States and Canada

Installation of all heating and refrigeration systems and competent parts thereof, including fabrication, assembling, erection installation, dismantling, repairing, reconditioning, adjusting, altering servicing, handling, distributing, and tying on all piping materials appurtenances and equipment by method, including all hangars and supports of every description, all other work including the trade relevant to oil burner and all other types of heating and refrigeration equipment including low voltage controls.

Craft: ROOFER (Non-Union Rate)
(Does not include sheet metal roofs)

Prevailing wage rates include the base rate as well as all applicable fringes

Roofer-Journeyman.....33.64

ROOFER

Includes but is not limited to:

1. Installing and covering roofs and structures with slate, asphalt, wood and other related materials, other than sheet metal, by using brushes, knives, punches, hammers and other tools;
2. Spraying roofs, sidings and walls with material to bind, seal, insulate or soundproof sections of a structure;
3. Installation of all plastic, slate, slag, gravel, asphalt and composition roofing, and rock asphalt mastic when used for damp and waterproofing;
4. Installation of all damp resisting preparations when applied on roofs with mop, three-knot brush, roller, swab or spray system;
5. All types of preformed panels used in waterproofing;
6. Handling, hoisting and storing of all roofing, damp and waterproofing materials;
7. The tear-off and/or removal of roofing and roofing materials;

Craft: SHEET METAL WORKERS (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Sheet Metal Worker Journeyman.....	71.50
Sheet Metal Worker -Foreman.....	75.71
Sheet Metal Worker -General Foreman.....	79.93

ADD ZONE RATE

In addition to SHEET METAL rates add the applicable amounts per hour, calculated based on a road from the courthouse in Reno, Nevada:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 100 miles	\$5.00
Zone 3	Over 100 miles	\$10.00 the employee shall be provided reasonable lodging and meal expenses.

ADD PREMIUM PAY

All hourly rates are subject to Over Time (One and one half 1 ½) of the Regular rate:

1. For all hours worked over Eight (8) Hours in one day or shift.
2. For the first Eight (8) Hours work on Saturday.

All hourly rates are subject to Double Time of the Regular Rate:

1. For all hours worked over Ten (10) Hours in one day or shift.
2. For all hours worked over Eight (8) Hours on Saturday.
3. For all hours worked on Sunday, New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day.

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day

JOB DESCRIPTION: Excerpt from Sheet Metal Local 26 Collective Bargaining Agreement

(a) manufacture, fabrication, assembling, handling, erection, installation, dismantling, conditioning, adjustment, alteration, repairing and servicing of all ferrous or nonferrous metal work and all other materials used in lieu thereof and of all HVAC systems, air veyor systems, exhaust systems, and air-handling systems regardless of material used including the setting of all equipment and all reinforcements in connection therewith; (b) all lagging over insulation and all duct lining; (c) testing and balancing of all air-handling equipment and duct work; (d) the preparation of all shop and field sketches whether manually drawn or computer assisted used in fabrication and erection, including those taken from original architectural and engineering drawings or sketches; (e) metal roofing; and (f) all other work included in the jurisdictional claims of International Association of Sheet Metal, Air, Rail and Transportation Workers.

Craft: SPRINKLER FITTER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Sprinkler Fitter-Journeyman.....27.08

JOB DESCRIPTION

Installing, dismantling, maintenance, repairs, adjustments and corrections of all fire protection and fire control systems Including the unloading, handling by hand, power equipment and installation of all piping or tubing, appurtenances and equipment pertaining thereto, including both overhead and underground water mains, fire hydrants and hydrant mains, standpipes, and hose connections to sprinkler systems, sprinkler tank heaters, air lines and thermal systems used in connection with sprinkler and alarms systems, also all tanks and pumps connected thereto. Also including shall be CO2 and Cardox Systems, Dry Chemical Systems, Foam Systems and all other fire protection systems, but excluding steam fire protection systems.

Craft: SOILS and MATERIAL TESTER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Soil Tester (Certified).....44.17
Soils and Materials Tester.....44.17

Craft: SURVEYOR (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Surveyor.....38.81

SURVEYOR, includes but is not limited to:

1. Planning ground surveys designed to establish base lines, elevation and other geodetic measurements;
2. Compiling data relevant to the shape, contour, gravitation, location, elevation and dimension of land and land features on or near the surface of the Earth for engineering, map making, mining, land evaluation, construction and other purposes;
3. Surveying bodies of water to determine navigable channels and to secure data for construction of breakwaters, piers and other marine structures;
4. Computing data necessary for driving and connecting underground passages, underground storage and volume of underground deposits.

Craft: TAPER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Taper-Journeyman.....	53.86
Taper-Foreman.....	57.75

ADD ZONE RATE

In addition to: TAPER rates add the applicable amounts per hour Zone Pay shall commence from Maryland Parkway and Charleston Boulevard and shall be paid as follows:

Zone 1	0 to 40 miles	\$0.00
Zone 2	40 to 60 miles	\$2.50
Zone 3	over 60 miles	\$4.25

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

ADD PREMIUM PAY

All overtime, except Sundays and holidays, will be time and one-half (1 1/2).

Sundays and holidays will be paid double time (2X). Any and all work performed in excess of the regular workday of eight (8) hours, or ten (10) hours if mutually agreed to, and the regular workweek of forty (40) hours shall be considered overtime and shall be paid for at one and one-half (1 1/2) times the regular hourly rate.

JOB DESCRIPTION: Excerpt from Agreement between DC 16 and the independent Drywall Contractors of Northern Nevada

SECTION 1 -- The scope of work covered by this Agreement shall include (but not be limited to) all work operations, including distribution to the point of application, as follows:

(a) Work or services pertaining to the preparation, spotting, pointing, detailing, flushing, sanding and finishing of interior and/or exterior gypsum, drywall, thin wall, concrete, steel, wood and plaster surfaces, spackling of all surfaces where adhesive materials are used; and all drywall pointing, taping and finishing.

(b) Work or services pertaining to the application of all finish or flushing materials regardless of method of application or type of surface on which materials are applied, including but not limited to texture and simulated acoustic materials of all types and the application of radiant heat fill and steel fireproofing materials.

(c) Work or services pertaining to the installation of protective coverings and masking prior to the application of finish materials.

(d) The operation and care of all taping tools and texturing equipment used in the finishing and texturing of drywall and other surfaces including brushes, rollers, spray texturing equipment, miscellaneous hand, mechanical, and power tools, and the operation and maintenance of compressors required in the finishing and texturing of such surfaces.

(e) No limitation shall be placed on the work covered by this Agreement by reason of the surface, type of material or purpose for which the materials used are designed or intended.

(f) The cleanup of all materials and debris occasioned by any job operation at the site of construction, alteration, or repair undertaken whether such operation occurs on the interior or exterior of a building structure.

Craft: TILE SETTER/TERRAZZO WORKER/MARBLE MASON FINISHER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Tile Setter/Terrazzo Worker/Marble Mason- Finisher.....	37.82
Tile Setter/Terrazzo Worker/Marble Mason- Finisher Foreman.....	39.07
Tile Setter/Terrazzo Worker/Marble Mason Finisher- General Foremen.....	40.82

ADD PREMIUM PAY

All work in excess of forty (40) hours during the established work week shall be paid at the rate of one and one-half (1-1/2) times the hourly base wage rate in effect.

Employees shall be paid one and one-half (1-1/2) times the hourly wage rate for all hours worked over eight (8) in a single day and double time after ten (10) hours in a single day, Monday through Friday, except recognized holidays.

Daily Overtime Saturdays the first ten (10) hours performed on Saturday shall be paid at one and one-half (1-1/2) times the straight time wage rate.

Daily Overtime Sunday- Employees shall be paid double time on Sundays if forty (40) straight time hours have been worked during the proceeding work week.

Holidays shall be paid double time for hours owed on recognized holidays.

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day. Any holiday falling on a Sunday will be observed on Monday.

JOB DESCRIPTION: Excerpt from Agreement between BAC 13 Nevada of the Mountain West Administrative District Council Master Labor Agreement

FINISHER'S WORK:

Finisher's work shall consist of assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments. required to complete the proper installation of the work covered by Sections 5, 7 and 8 of this Code.

Craft: TILE SETTER/TERRAZZO WORKER/MARBLE MASON (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Tile Setter Journeyman.....	47.87
Tile Setter Foreman.....	49.12
Tile Setter General Foreman.....	50.87
Terrazzo/Marble Mason-Journeyman	49.37
Terrazzo/Marble Mason-Foreman	50.62
Terrazzo/Marble Mason-General Foreman.....	52.37

ADD ZONE RATE

In addition to TILE SETTER/TERRAZZO WORKER/MARBLE MASON rates add the applicable amounts per hour, calculated based on a road miles of over fifty (50) miles from the Washoe County Courthouse in Reno, Nevada:

Zone 1	0 to 50 miles	\$0.00
Zone 2	50 to 75 miles	\$3.75
Zone 3	Over 70 miles	\$8.13

ADD PREMIUM PAY

All work in excess of forty (40) hours during the established work week shall be paid at the rate of one and one-half (1-1/2) times the hourly base wage rate in effect.

Employees shall be paid one and one-half (1-1/2) times the hourly wage rate for all hours worked over eight (8) in a single day and double time after ten (10) hours in a single day, Monday through Friday, except recognized holidays.

Daily Overtime Saturdays the first ten (10) hours performed on Saturday shall be paid at one and one-half (1-1/2) times the straight time wage rate.

Daily Overtime Sunday- Employees shall be paid double time on Sundays if forty (40) straight time hours have been worked during the proceeding work week.

Holidays shall be paid double time for hours owed on recognized holidays.

RECOGNIZED HOLIDAYS

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day. Any holiday falling on a Sunday will be observed on Monday.

JOB DESCRIPTION: Excerpt from Agreement between BAC 13 Nevada of the Mountain West Administrative District Council Master Labor Agreement

TILE LAYERS' WORK:

Tile laying shall consist of, but not be limited to, the following work procedures and installation of the following materials:

A. The laying, cutting or setting of all tile where used for floors, walls, ceilings, walks, promenade roofs, stair treads, stair risers, facings, hearths, fireplaces, and decorative inserts, together with any marble plinths, thresholds or window stools used in connection with any tile work; also, preparing and setting all concrete, cement, brickwork, or other foundation or materials that may be required to properly set and complete such work; setting or bedding all tiling, stone, marble, composition, glass, mosaic, or other materials forming the facing, hearth or fireplace of a mantel, or the mantel complete, together with setting of all cement, brickwork, or other materials required in connection with the above work; also the slabbing and fabrication of tile mantels, counters and tile panels of every description, and the erection and installation of same; the building, shaping, forming, construction or repairing of all fireplace work, whether in connection with a mantel hearth facing or not, and the setting and preparing of all material, such as cement, plaster, mortar, brickwork, iron work or other materials necessary for the proper and safe construction and completion of such work, except that a mantel made exclusively of brick, marble or stone, shall be conceded to be bricklayers', marble setters' or stonemasons' work, respectively.

B. It will be understood that the word "tile" refers to all burned clay products, as used in the tile industry, either glazed or unglazed, and to all composition materials made in single units up to 15"x20"x2", except quarry tiles larger than 9"x9"x1 1/4", also to mixtures in tile form of cement, plastics and metals that are made for and intended for use as a finished floor surface, whether upon interior or exterior floors, stair treads, promenade roofs, garden walks, interior walls, ceilings, swimming pools, and all places where tile may be used to form a finished surface for practical use, sanitary finish or decorative purposes, for setting all accessories in connection therewith, or for decorative inserts in other materials.

C. All terra cotta called unit tile in sizes of 6"x12" or under, regardless of method of installation, quarry tile 9"x9"x1 1/4" or less; split brick or quarry tile or similar material where the bed is floated or screeded and the joints grouted. Where the work is installed by tile layers, the grouting and cleaning shall be supervised by the mechanic. The bedding, jointing, and pointing of the above materials shall be the work of the craft installing the same. All clay products known as terra cotta tile, unit tile, ceramic veneer and machine-made terra cotta, and like materials in sizes 6"x12" and less regardless of the method of installation. Where the preponderance of materials to be installed comes within the provisions of this Section and when there is also some material in excess of the sizes provided for in this Section, the tile setter shall install all such materials.

D. The preparation, setup, calibration, operation, cleaning, and routine maintenance of any mechanical devices or robotics used to install tile and related materials, or that otherwise assist the tile layer in performing any of the work described in Article II and Code 1 of the IU Constitution, as well as the preparation and ongoing maintenance of the work area to allow proper installation of tile and related materials.

Craft: TRAFFIC BARRIER ERECTOR (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Traffic Barrier Erector.....45.53

ADD ZONE RATE

In addition to LABORER rates add the applicable amounts per hour, calculated based on a road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone 1	0 to 75 miles	\$0.00
Zone 2	75 to 150 miles	\$4.00
Zone 3	150 to 300 miles	\$5.00
Zone 4	300 miles and over	\$6.00

ADD PREMIUM PAY

One and one half (1 ½) the regular straight time hourly rate shall be paid:

1. For all hours worked over eight (8) hours in one day or shift.
2. For any hours worked on Saturday from midn ight to midnight.

Double the regular straight time hourly rate shall be paid for all time:

1. For all hours worked over twelve (12) hours in one day or shift.
2. For any hours worked on Sunday from midnight to midnight.
3. For any hours worked on holidays from midnight to midnight.

RECOGNIZED HOLIDAYS

If any of these holidays fall on Sunday, the Monday following shall be considered a Holiday.

New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Agreement between AGC and LIUNA Local 169

1. Distributing traffic control signs and markers along site in designated pattern;
2. Informing drivers of detour routes through construction sites;

Craft: Truck Driver (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Dump Trucks (Single or Multiple Units Including Semi's & Double Transfer Units), Dumpcrites and Bulk Cement Spreader

Under 4 yds. (water level).....	28.72
4 yds. & under 8 yds. (water level).....	28.72
8 yds. & under 18 yds. (water level).....	28.72
18 yds. & under 25 yds. (water level)	28.72
25 yds. & under 60 yds. (water level).....	28.72
60 yds. & under 75 yds. (water level)).....	28.72
75 yds. & under 100 yds. (water level)).....	28.72
100 yds. & under 150 yds. (water level)).....	28.72
150 yds. & under 250 yds. (water level)).....	28.72
250 yds. & under 350 yds. (water level)).....	28.72
350 yds. & over (water level).....	28.72

Transit Mix

Under 8 yds.....	28.72
Under 8 yds & including 12 yds.....	28.72
Over 12 yds.....	28.72

Transit Mix (Using Boom)

Transit mix with boom shall receive 16 cents per hour above the appropriate yardage classification rate of pay when such boom is used.....	28.72
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Water & Jetting Trucks

Up to 2,500 gallons.....	28.72
Up to 2,500 gallons & over.....	28.72
DW 20's & 21's & other similar Cat type, Terry Cobra LeTourneau pulls, Tournerocker, Euclid, & similar type equipment when pulling Aqua/Pak, Water Tank Trailers, & Fuel, and/or Grease Tank Trailer, or other miscellaneous Trailers, (except as defined under "Dump Trucks")	
Heavy Duty Transport (High Bed).....	28.72
Heavy Duty Transport(Gooseneck low bed).....	28.72
Tiltbed or Flatbed Pull Trailers.. ..	28.72
Bootman, Comb. Bootman & Road Oiler.....	28.72
Flat Rack (2 or 3 axle unit).....	28.72

Bus & Manhaul Drivers

Up to 18,000 lbs. (single unit).....	28.72
18,000 lbs. and over	28.72
Warehousemen Spotter	28.72

Winch Truck & "A" Frame Drivers

Up to 18,000 lbs.	28.72
18,000 lbs. and over.....	28.72
Warehousemen Spotter.....	28.72
Warehouse Clerk.....	28.72
Tire Repairmen.....	28.72
Truck Repairmen.....	28.72
Pick Up Truck & Pilot Cars (Jobsite)	28.72
Pick Up Truck & Pilot Cars (Over the road)	28.72
Truck Oil Greaser.....	28.72
Fuel Truck Driver.....	28.72
Fuel Man & Fuel Island Man.....	28.72
Oil Tanker.....	28.72

Oil Tanker with Pup.....	28.72
Foreman.....	28.72

TRUCK DRIVER

Includes but is not limited to:

Driving a tractor trailer combination or a truck to transport goods or materials at the site of a public work or between sites of a public work. (Also, see descriptions listed with Truck Driver rates, if any.)

Craft: WELL DRILLER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Well Driller.....31.29

JOB DESCRIPTIONS

1. Setting, operating or tending to portable drilling rig machinery and related equipment to drill wells;
2. Extending stabilizing jackscrews to support and level a drilling rig;
3. Installing water well pumps;
4. Drillings wells for industrial water supplies, irrigation water supplies or water supplies for any other purpose; dewatering or other similar purposes; exploration; hole drilling for geologic and hydrologic information; and core drilling for geologic information.

GROUP CLASSIFICATIONS

LABORER, includes but is not limited to:

Group 1

- All cleanup work of debris, grounds, and building including windows and tile
- Dumpmen or Spotter (other than asphalt)
- Handling and Servicing of Flares, Watchmen
- General Laborer
- Guideposts and Highway Signs
- Guardrail Erection and Dismantling
- Limber, Brushloader and Piler
- Pavement Marking and Highway Striping
- Traffic Barrier Erector
- Tending to portable space heaters
- Profilograph work all types manual, self propelled or carts
- Gabion basket, building, handling, installation and rigging
- Dry set paver work
- Traffic Barrier Erector

Group 2

- Choker setter or Rigger (clearing work only) Pittsburgh
- Chipper and similar type brush shredders
- Concrete worker (wet or dry) all concrete work not listed in Group 3 included but not limited to: concrete forms stripping, handling, cleaning, oiling and moving to the next point of installation.
- Crusher or Grizzly Tender
- Greasing Dowels
- Guinea Chaser (Stakemen)
- Panel Forms (wood or metal) handling, cleaning and stripping of Loading and unloading, (Carrying and handling of all rods and material for use in reinforcing concrete
- Railroad Trackmen (maintenance, repair or builders)
- Sloper
- Semi-Skilled Wrecker (salvaging of building materials other than those listed in Group 3)
- Waterproofing work
- Epoxy rebar/dowels and anchoring dowel baskets
- Placement pouring of concrete including any epoxy resin or similar materials, rodding, spreading and tamping concrete, brooming or brushing, hand application of curing compounds, applying topping (wet or dry) colors or grits, and exposed finishes for architectural work
- Concrete patching, dry packing, chipping, stoning, and grouting
- Concrete cold weather/rain protection and curing
- Placement /anchoring of all earth stabilization/filters fabrics,
- Mechanically stabilized Earth (MSE) and Keystone type retaining walls rigging, placing , aligning, backfilling and installation of dead men and any stabilization components

Group 3

- Asphalt Workers (Ironers, Shovelers, Cutting Machine)
- Buggymobile

- Chainsaw, Faller, Logloader and Bucker
- Compactor (all types)
- Concrete Mixer under 1/2 yard
- Concrete Pan Work (Breadpan type), handling, cleaning\stripping
- Concrete Saw, Chipping, Grinding, Sanding, Vibrator
- Cribbing, Shoring, Lagging, Trench Jacking, Hand-Guided Lagging Hammer
- Curbing or Divider machine
- Curb Setter (precast or cut)
- Ditching Machine (hand-guided)
- Drillers Helper, Chuck Tender
- Fence erector including safety, chain link, turtle, field and barbe wire.fencing
- Form Raiser, Slip Forms
- Grouting of Concrete Walls, Windows and Door Jams
- Headerboardmen
- Jackhammer, Pavement Breaker, Air Spade
- Mastic Worker (wet or dry)
- Pipewrapper, Kettlemen, Potmen, and men applying asphalt, creosote and similar type materials
- All Power Tools (air, gas, or electric), Post Driver
- Riprap-Stonepaver and RockSlinger, including placing of sack concrete wet or dry Rototiller
- Rigging and Signaling in connection with Laborers' work
- Sandblaster, Potmen, Gunmen or Nozzlemen water blasting not covered in group 5A
- Vibra-screed
- All demolition and wrecking work including but not limited t any torch work cutting, burning, plasma are, dust control, and salvaging (removing and salvaging of all materials, windows, doors, plumbing, and electrical fixtures) and use of customary tools and equipment for demolition and wrecking
- All underpinning foundation work, digging and underpinning pits, removal of debris with tuggers or other methods, cutting, handling and installing all shoring boards and lagging boards used for underpinning and foundation work, placement and tying of steel reinforcing for underpinning piers, all tiebacks and soil nail work drilling and grouting, all soldier beam work and us of customary tools and equipment for underpinning foundation work

Group 3A

- Concrete Specialist
- Setting screeds
- Screed pins
- Curb forms and curb and gutter forms,
- Using Darby and push floats,
- Hand trowels or hand floating
- Marking edging
- Using base cove or step tools
- Spreading and finishing gypsum
- Concrete grinding machines (the terms does not include Rotomill machines for highway overlay grinding)
- Troweling machines,
- Floating machines
- Finishing of epoxy or resin materials,
- Operation of skill saw

- Laser Screed
- Laser Level
- Curb and Slipform machines,
- Stamps or other means or texturing,
- Any new devices which are beneficial to the construction of or with concrete or related products.

Group 4

- Burning and Welding in connection with Laborers' work
- Joy Drill Model TWM-2A, Gardner Denver Model DN143 and similar type drills (in accordance with Memorandum of Understanding between Laborers and Operating Engineers dated at Miami, Florida, Feb. 3, 1954) and Track Drillers, Diamond Core Drillers, Wagon Drillers, Mechanical Drillers on Multiple Units
- High scalers including but not limited to laying, anchoring, pinning, cabling and stretching of any rock fall netting, mesh or wire fabric and use of customary tools and equipment for high scaling
- Concrete pump operator
- Heavy Duty Vibrator with Stinger 5" diameter or over
- Pipelayer, Caulker and Bander
- Pipelayer-waterline, Sewerline, Gasoline, Conduit and all other types of composition for any purpose buried under ground outside of building including, stringing, trench shoring, backfilling sanding, caution taping, all walk behind equipment and spotting
- Laborer work in connection with micro tunneling, directional drilling and pipe-jacking
- Cathodic protection, grounding for pipe work
- Cleaning of Utility Lines
- Slip Lining of Utility Lines (including operation of Equipment)
- TV Monitoring and Grouting of Utility Lines
- Asphalt Rakers and Asphalt dump Man
- All mechanical and pressurized pipe work, including the installation of pipe above and below ground, cathodic protection, bolt up, and support installation in connection to water conveyance, c

Group 4A

- Foreman

Group 5

- Construction Specialists
- Blasters and Powdermen, all work of loading, placing, and blasting of all powder and explosives of any type, regardless of method used for such loading and placing
Asbestos removal
- Lead abatement
- Hazardous waste
- Material removal

Group 5A

- Pavement Marking and Highway Striping
- Pavement Marking and Highway Striping Foreman
- Pavement Marking and Highway Striping work includes but is not limited to: All work by any method preformed in connection with the permanent or temporary application and installation of pavement marking of any kind, brand, type or style on parking lots, airfields, highways,

streets and other such surfaces and all work performed in connection with removal of pavement.

Group 6

- Guniting Foremen, Nozzlemen, Rodmen, Gunmen, Materialmen, Reboundmen
 - Tunnel and shaft workers/miners and use of customary tools and equipment for tunnel and mine work All work performed in a compressed air tunnel shaft or chamber including the use of hand, power tools or equipment as necessary in connection with compressed air work
-

OPERATING ENGINEER, includes but is not limited to:

Group 1

- Engineer Assistant

Group 1A

- Oiler (Construction)
- Partsman

Group 2

- Compressor Operator
- Material Loader and/or Conveyor Operator (handling building materials)
- Pump Operator

Group 3

- Bobcat or similar loader, 1/4 cu. yd. or less
- Concrete Curing Machines (streets, highways, airports, canals)
- Conveyor Belt Operator (tunnel)
- Forklift (under 20)
- Engineer Generating Plant (500 K.W.)
- Mixer Box Operator (concrete plant)
- Motorman
- Rodman/Chainman
- Rotomist Operator
- Oiler (truck crane)

Group 4

- Concrete Mixer Operator, Skip type
- Dinky Operator
- Forklift (20' or over) or Lumber Stacker
- Ross Carrier
- Skip Loader Operator (under one (1) cu. yd.)
- Tie Spacer

Group 5

- Concrete Mixers (over one (1) cu. yd.)
- Concrete Pumps or Pumpcrete Guns
- Elevator and Material Hoist (one (1) drum)
- Groundman for Asphalt Milling and similar

Group 6

- Auger type drilling equipment up to and including 30 ft. depth digging capacity M.R.C.
- Boom Truck or Dual-Purpose a-Frame Truck
- B.L.H. Lima Road Pactor or similar
- Chip Box Spreader (Flaherty type or similar)
- Concrete Batch Plant (wet or dry)
- Concrete Saws (highways, streets, airports, canals)
- Locomotives (over thirty (30) tons)
- Maginnis International Full Slab Vibrator (airports, highways, canals and warehouses)
- Mechanical Finishers (concrete) (Clary, Johnson, Bidwell Bridge Deck or similar types)

- Mechanical Burn, Curb and/or Curb and Gutter Machine (concrete or asphalt)
- Pavement Breaker, Truck Mounted, with compressor combination
- Pavement Breaker or Tamper (with or without compressor combination)
- Power Jumbo Operator (setting slip-forms, etc., in tunnels)
- Roller Operator (except asphalt)
- Self-Propelled Tape Machine
- Self-Propelled Compactor (single engine)
- Self-Propelled Power Sweeper Operator
- Slip-Form Pump (power-driven by hydraulic, electric, air, gas, etc. lifting device for concrete forms)
- Small Rubber-Tired Tractors
- Snooper Crane, Paxton-Mitchell or similar
- Stationary Pipe Wrapping, Cleaning and Bending Machine Operator

Group 7

- Auger type drilling equipment over 30 ft. depth digging capacity M.R.C.
- Compressor (over 2)
- Concrete Conveyor or Concrete Pump, truck or equipment mounted (any assistance required shall be performed by an Assistant to Engineer) Boom length to apply Concrete Conveyor, Building Site
- Drilling and Boring Machine, vertical and horizontal (not to apply to waterliners, wagon drills or jack hammers)
- Crusher Plant Engineer
- Generators
- Instrument Man
- Kolman Loader
- Material Hoist (two (2) or more drums)
- Mine or Shaft Hoist
- Pipe Bending Machines (pipeline only)
- Pipe Cleaning Machines (tractor-propelled and supported)
- Pipe Wrapping Machines (tractor-propelled and supported)
- Portable Crushing and Screening Plants
- Post Driller And/or Driver
- Pumps (over 2)
- Screedman (except asphaltic or concrete paving)
- Self-Propelled Boom-Type Lifting Device (center mount) (on ten (10) ton capacity or less)
- Slusher Operator
- Soil Tester (Certified)
- Soils and Materials Tester
- Surface Heater and Planer Operator
- Trenching Machine (maximum digging capacity three (3) ft. depth) (Any assistance in the operation, if needed, shall be performed by an Assistant to Engineer)
- Truck-Type Loader
- Welding Machines (gasoline or diesel)

Group 8

- Articulated on-Site Dump Trucks
- Asphalt Plant Engineer
- Asphalt Milling Machine

- Cast-In-Place Pipe-Laying Machine
- Combination Slusher and Motor Operator
- Concrete Batch Plant (multiple units)
- Dozer Operator
- Drill Doctor
- Elevating Grader Operator
- Stiff Frame Off Road Haul Trucks
- Grooving and Grinding Machine (highways)
- Ken Seal Operator
- Marination Plant
- Loader (up to and including two and one-half (2 1/2) cu. yds)
- Mechanical Finishers or Spreader Machine (asphalt, Barber-Greene or similar)
- Shuttle Buggy
- Mechanical Trench Shield
- Mixermobile
- Push Cats
- Road Oil Mixing Machine Operator Wood-Mixer (and other similar Pugmill equipment)
- Roller Operator (asphalt)
- Rubber-Tired Earthmoving Equipment (up to and including thirty-five (35) cu. yds. "struck " M.R.C., Euclids, T-Pulls, DW10, 20, 21 and similar)
- Water Pull
- Screedman (Barber-Greene and similar) (asphaltic or concrete paving)
- Self-Propelled Compactors with Dozer; Hyster 450, Cat 825 or similar
- Sheepfoot
- Small Tractor (with boom)
- Soil Stabilizer (P & H or equal)
- Timber Skidder (rubber-tired) or similar equipment
- Track Loader
- Tractor-Drawn Scraper
- Tractor Operator
- Tractor-Mounted Compressor Drill Combination
- Trenching Machine Operator (over three (3) feet depth)
- Tri-Batch Paver
- Tunnel Badger or Tunnel Boring Machine Operator
- Tunnel Mole Boring Machine
- Vermeer T-600b Rock Cutter
- Vacuum Truck(excludes trailer mounted vaccums)

Group 9

- Chicago Boom
- Combination Backhoe and Loader (up to and including 3/8 cu. yd.)
- Combination Mixer and Compressor (gunite)
- Heavy Duty Repairman and/or Welder
- Lull Hi-Lift (twenty (20) feet or over)
- Mucking Machine
- Sub-Grader (Gurries or other types)
- Tractor (with Boom) (D6 or larger)
- Track-Laying-Type Earthmoving Machine (single engine with tandem scrapers)

Group 10

- Boom-Type Backfilling Machine
- Bridge Crane
- Cargy-Lift or similar
- Chemical Grouting Machine
- Chief of Party
- Derricks (two (2) Group 10 Operators required when swing engine remote from hoist)
- Derrick Barges (except excavation work)
- Euclid Loader and similar types
- Heavy Duty Repairman
- Heavy Duty Rotary Drill Rigs
- Lift-Slab (Vagtborg and similar types)
- Loader (over two and one-half (2 1/2 cu. yds. up to and including four (4) cu. yds.)
- Locomotive (over one hundred (100) tons, single or multiple units)
- Multiple-Engine Earthmoving Machines (Euclid Dozers, etc.)
- Pre-Stress Wire Wrapping Machine
- Rubber-Tired Scraper, Self-Loading
- Single-Engine Scraper (over thirty-five (35) cu. yds.)
- Shuttle Car (Reclaim Station)
- Train Loading Station
- Trenching Machine multi-engine with sloping attachments (Jefco or similar)
- Vacuum Cooling Plant
- Whirley Crane (up to and including twenty-five (25) tons)

Group 10A

- Backhoe-Hydraulic (up to and including one (1) cu. yd.)
- Backhoe (up to and including one (1) cu. yd.) (Cable)
- CMI Dual Lane Auto-Grader SP30 or similar type
- Cranes (not over twenty-five (25) tons) (hammerhead and gantry)
- Finish Blade
- Gradalls (up to and including one (1) cu. yd.)
- Motor Patrol Operator
- Power Shovels, Clamshells, Draglines, Cranes (up to and including one (1) cu. yd.)
- Rubber-Tired Scraper, Self-Loading (twin engine)
- Self-Propelled Boom-Type Lifting Device, center mount (over 10 tons up to and including 25 tons)

Group 11

- Automatic Asphalt or Concrete Slip-Form Paver
- Automatic Railroad Car Dumper
- Canal Trimmer
- Cargy Lift, Campbell or similar type
- Cranes (over twenty-five (25) tons)
- Euclid Loader when controlled from the Pullcat
- Finish Blade
- Gradesetter, Grade Checker
- Highline Cableway Operator
- Loader (over four (4) cu. yds. up to and including twelve (12) cu. yds.)

- Multi-Engine Earthmoving Equipment (up to and including seventy-five (75) cu. yds. struck m.r.c.)
- Multi-Engine Scrapers (when used to Push Pull)
- Power Shovels, Clamshells, Draglines, Backhoes Gradalls (over one (1) cu. yd. and up to and including seven (7) cu. yds. m.r.c.)
- Self-Propelled Boom-Type Lifting Device (center mount) (over 25 tons m.r.c.)
- Self-Propelled Compactor (with multiple-propulsion power units)
- Single-Engine Rubber-Tired Earthmoving Machine, with Tandem Scraper
- Slip-Form Paver (concrete or asphalt)
- Tandem Cats and Scraper
- Tower Crane Mobile (including Rail Mount)
- Truck Mounted Hydraulic Crane when remote control equipped (over 10 tons up to and including 25 tons)
- Universal Liebherr and Tower Cranes (and similar types)
- Wheel Excavator (up to and including seven hundred fifty (750) cu. yds. per hour)
- Whirley Cranes (over twenty-five (25) tons)

Group 11A

- Band Wagons (in conjunction with Wheel Excavators)
- Operator of Helicopter (when used in construction work)
- Loader (over twelve (12) cu. yds.)
- Multi-Engine Earthmoving Equipment (over seventy-five (75) cu. yds. "struck" m.r.c.)
- Power Shovels, Clamshells, Draglines, Backhoes, and Gradalls (over seven (7) cu. yds. m.r.c.)
- Remote-Controlled Earth Moving Equipment
- Wheel Excavator (over seven hundred fifty (750) cu. yds. per hour)

Group 11B

- Holland Loader or similar or Loader (over 18 cu. yds.)
-

OPERATING ENGINEERS - Steel Fabricator & Erector

Group 1

- Cranes over 100 tons
- Derrick over 100 tons
- Self-Propelled Boom Type Lifting Devices over 100 tons

Group 2

- Cranes over 45 tons up to and including 100 tons
- Derrick, 100 tons and under
- Self-Propelled Boom Type Lifting Device, over 45 tons
- Tower Crane

Group 3

- Cranes, 45 tons and under
- Self-Propelled Boom Type Lifting Device, 45 tons and under

Group 4

- Chicago Boom
- Forklift, 10 tons and over

- Heavy Duty Repairman/Welder

Group 5

- Boom Cat
-

OPERATING ENGINEER -PILEDRIIVER

Group 1

- Derrick Barge Pedestal mounted over 100 tons
- Clamshells over 7 cu. yds.
- Self-Propelled Boom Type Lifting Device, over 100 tons
- Truck Crane or Crawler, land or barge mounted over 100 tons

Group 2

- Derrick Barge Pedestal mounted 45 tons up to and including 100 tons
- Clamshells up to and including 7 cu. yds.
- Self-Propelled Boom Type Lifting Device over 45 tons
- Truck Crane or Crawler, land or barge mounted, over 45 tons up to and including 100 tons

Group 3

- Derrick Barge Pedestal mounted under 45 tons
- Self-Propelled Boom Type Lifting Device 45 tons and under
- Skid/Scow Piledriver, any tonnage
- Truck Crane or Crawler, land or barge mounted 45 tons and under

Group 4

- Assistant Operator in lieu of Assistant to Engineer
- Forklift, 10 tons and over
- Heavy Duty Repairman/Welder

Group 5

No current classification

Group 6

- Deck Engineer

Group 7

No current classification

Group 8

- Deckhand
 - Fireman
-

DAVIS BACON WAGE RATES

"General Decision Number: NV20230040 03/10/2023

Superseded General Decision Number: NV20220040

State: Nevada

Construction Type: Building

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

County: Washoe County in Nevada.

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
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If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.
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The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date

0	01/06/2023
1	01/27/2023
2	03/03/2023
3	03/10/2023

ASBE0016-011 08/01/2021

Rates Fringes

ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 35.61	33.49
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BRNV0013-002 07/01/2020

Rates Fringes

BRICKLAYER.....	\$ 43.23	16.60
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BRNV0013-008 03/01/2020

Rates Fringes

TILE FINISHER.....	\$ 30.69	10.80
TILE SETTER.....	\$ 27.43	6.05

CARP0971-008 07/01/2022

Rates Fringes

CARPENTER (Includes Acoustical Ceiling Installation, Drywall Hanging, and Metal Stud Installation).....	\$ 34.13	19.53
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ELEC0401-010 01/01/2022

	Rates	Fringes
ELECTRICIAN.....	\$ 42.50	20.95

ELEV0008-002 01/01/2023

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 77.61	37.335+a+b

FOOTNOTE:

- a. PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.
- b. PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

ENGI0003-012 07/01/2021

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Loader)		
GROUP 08.....	\$ 44.03	25.02
GROUP 10.....	\$ 44.70	25.02
GROUP 11.....	\$ 45.13	25.02
GROUP 11A.....	\$ 46.77	25.02

GROUP 08: Up to and including 2.5 cy
GROUP 10: Over 2.5 cy, up to and including 4 cy
GROUP 11: Over 4 cy, up to and including 12 cy
GROUP 11A: Over 12 cy

ENGI0012-017 10/01/2016

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 01.....	\$ 41.39	22.60
GROUP 02.....	\$ 42.34	22.60
GROUP 03.....	\$ 42.63	22.60
GROUP 04.....	\$ 44.12	22.60

GROUP 06.....	\$ 44.34	22.60
GROUP 08.....	\$ 44.45	22.60
GROUP 10.....	\$ 44.57	22.60
GROUP 12.....	\$ 44.74	22.60
GROUP 16.....	\$ 45.07	22.60

GROUP 01: Forklift - less than 5 tons

GROUP 02: Forklift - 5 tons or more

GROUP 03: Bobcat

GROUP 04: Backhoe/Trackhoe - under 3/4 cy; Excavator - under 21,000 lbs.

GROUP 06: Roller

GROUP 08: Paver - Asphalt, Aggregate, and Concrete; Mechanic; Excavator - 21,000 lbs. to 100,000 lbs.; Backhoe/Trackhoe - 3/4 cy to 5 cy

GROUP 10: Backhoe/Trackhoe - 5 cy to 7 cy

GROUP 12: Excavator - 100,000 lbs. to 200,000 lbs.; Grader/Blade; Backhoe/Trackhoe - over 7 cy

GROUP 16: Excavator - over 200,000 lbs.

ENGI0012-022 10/01/2016

Rates Fringes

POWER EQUIPMENT OPERATOR

GROUP 04.....	\$ 44.45	22.60
GROUP 05.....	\$ 44.57	22.60
GROUP 06.....	\$ 44.74	22.60
GROUP 07.....	\$ 44.91	22.60
GROUP 08.....	\$ 45.07	22.60
GROUP 09.....	\$ 45.75	22.60
GROUP 10.....	\$ 45.91	22.60
GROUP 12.....	\$ 46.54	22.60
GROUP 13.....	\$ 46.91	22.60
GROUP 15.....	\$ 47.91	22.60
GROUP 16.....	\$ 47.96	22.60
GROUP 17.....	\$ 48.46	22.60
GROUP 18.....	\$ 48.91	22.60
GROUP 19.....	\$ 50.49	22.60

GROUP 20.....	\$ 51.10	22.60
GROUP 21.....	\$ 51.71	22.60
GROUP 22.....	\$ 52.47	22.60
GROUP 23.....	\$ 52.93	22.60

GROUP 04: Hoist - Chicago Boom or Similar; Bridge Crane;
Creator Crane; Polar Gantry Crane

GROUP 05: Pedestal Crane

GROUP 06: Hoist - Stiff Legs, Guy Derrick, or similar, 25
tons or less

GROUP 07: Hoist - Stiff Legs, Guy Derrick, or similar, 25
tons to 50 tons; K-Crane; Polar Crane; Self-erecting Tower
Crane - 10 tons or less

GROUP 08: Oiler - 40 tons to 200 tons

GROUP 09: Oiler - Over 200 tons

GROUP 10: Hoist - Stiff Legs, Guy Derrick, or similar, 50
tons to 100 tons

GROUP 12: Crane - 40 tons or less

GROUP 13: Hoist - Stiff Legs, Guy Derrick, or similar, 100
tons to 200 tons

GROUP 15: Hoist - Stiff Legs, Guy Derrick, or similar, 200
tons to 300 tons

GROUP 16: Crane - 40 tons to 79 tons

GROUP 17: Crane - 80 tons to 150 tons

GROUP 18: Tower Crane; Hoist - Stiff Legs, Guy Derrick, or
similar, greater than 300 tons

GROUP 19: Crane - 150 tons to 200 tons

GROUP 20: Crane - 200 tons to 250 tons

GROUP 21: Crane - 250 tons to 300 tons

GROUP 22: Crane - 300 tons to 350 tons

GROUP 23: Crane - Over 350 tons

IRON0118-008 07/01/2021

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 48.12	25.45

IRON0416-003 01/01/2023

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 46.20	21.26

IRON0433-003 10/01/2022

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 42.71	36.13

LABO0169-033 10/01/2022

	Rates	Fringes
LABORER		
(1) Common or General.....	\$ 30.05	15.02
(3) Concrete Saw (Hand Held/Walk Behind), Mason Tender - Brick, Mason Tender - Cement/Concrete....	\$ 30.30	15.02
(4) Pipelayer.....	\$ 30.55	15.02

PAIN0159-006 07/01/2022

	Rates	Fringes
PAINTER (Spray).....	\$ 45.39	21.28

* PAIN0567-016 01/01/2023

	Rates	Fringes
PAINTER		
Brush and Roller Only.....	\$ 33.10	14.34
Drywall Finishing/Taping....	\$ 38.87	15.04

PLAS0797-008 07/01/2022

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 45.87	17.61

 PLUM0350-005 08/01/2022

	Rates	Fringes
PIPEFITTER.....	\$ 49.54	18.06

 ROOF0162-004 08/01/2022

	Rates	Fringes
ROOFER.....	\$ 34.21	10.47

 SHEE0026-004 09/01/2021

	Rates	Fringes
SHEET METAL WORKER (Includes HVAC Duct and Unit Installation).....	\$ 37.70	28.06

 TEAM0631-001 07/01/2021

	Rates	Fringes
TRUCK DRIVER (Dump Truck).....	\$ 39.99	23.58

 SUNV2014-012 09/08/2016

	Rates	Fringes
PLUMBER.....	\$ 26.34	0.00

 WELDERS - Receive rate prescribed for craft performing
 operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours

they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate

changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

CR ENGINEERING

Mechanical Engineering Consultant
5434 Longley Lane
Reno, Nevada 89511
Phone: 775.826.1919
www.cr-eng.com



PROJECT MANUAL

FOR

CITY OF RENO MAINTENANCE AND OPERATIONS CALIFORNIA BUILDING HVAC REPLACEMENT

75 Cowan Drive
Reno, Nevada 89509

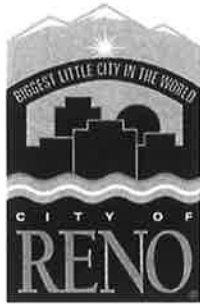
March 30, 2023

FOR

CITY OF RENO MAINTENANCE AND OPERATIONS

1640 Commercial Row
Reno, Nevada 89512





PROJECT MANUAL
CITY OF RENO MAINTENANCE AND OPERATIONS
CALIFORNIA BUILDING
HVAC REPLACEMENT

PROJECT LOCATION
CALIFORNIA BUILDING
75 Cowan Drive
Reno, Nevada 89509

OWNER
CITY OF RENO MAINTENANCE AND OPERATIONS
1640 Commercial Row
Reno, Nevada 89512
Contact: Kyle West, PE
Project Manager
Phone: (775) 399-2473

MECHANICAL ENGINEER
CR ENGINEERING
MECHANICAL ENGINEERING CONSULTANT
5434 Longley Lane
Reno, Nevada 89511
Contact: Chun Lee, P.E.
Project Manager
Phone: (775) 826-1919

STRUCTURAL ENGINEER
CFBR STRUCTURAL GROUP
STRUCTURAL ENGINEERING CONSULTANT
5425 Louie Lane, Suite 2C
Reno, Nevada 89511
Contact: Chris Roper, P.E.
Principal Engineer
Phone: (775) 525-1113

ELECTRICAL ENGINEER
JENSEN ENGINEERING
ELECTRICAL ENGINEERING CONSULTANT
9655 Gateway Drive, Suite A
Reno, Nevada 89521
Contact: Gerald Jensen, P.E.
Principal Engineer
Phone: (775) 852-2288

City of Reno Maintenance and Operations
California Building HVAC Replacement

Table of Contents

DIVISION 01 GENERAL REQUIREMENTS

01 31 00	PROJECT MANAGEMENT AND COORDINATION
01 33 00	SUBMITTAL PROCEDURES
01 40 00	QUALITY REQUIREMENTS
01 60 00	PRODUCT REQUIREMENTS
01 63 01	SUBSTITUTIONS
01 73 00	EXECUTION
01 73 29	CUTTING AND PATCHING
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 23	OPERATION AND MAINTENANCE DATA
01 78 39	PROJECT RECORD DOCUMENTS
01 79 00	DEMONSTRATION AND TRAINING

DIVISION 22 PLUMBING

22 05 00	COMMON WORK RESULTS FOR PLUMBING SYSTEMS
22 05 18	ESCUTCHEONS FOR PLUMBING PIPING
22 05 29	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 48	VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 05 93	TESTING, ADJUSTING AND BALANCING FOR PLUMBING
22 11 17	DRAIN PIPING
22 15 13	FACILITY NATURAL GAS PIPING

DIVISION 23 HEATING VENTILATING AND AIR CONDITIONING

23 00 00	COMMON WORK RESULTS FOR HVAC SYSTEMS
23 05 13	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
23 05 48	VIBRATION AND SEISMIC CONTROLS FOR HVAC
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 07 13	DUCT INSULATION
23 07 19	HVAC PIPING INSULATION
23 09 00	DIRECT DIGITAL CONTROL SYSTEMS
23 23 00	REFRIGERANT PIPING
23 31 13	METAL DUCTS
23 33 00	AIR DUCT ACCESSORIES
23 33 46	FLEXIBLE DUCT

23 37 13	DIFFUSER, REGISTERS, AND GRILLES
23 74 16.11	PACKAGED ROOFTOP AIR-CONDITIONING UNITS
23 81 29	VARIABLE REFRIGERANT FLOW HVAC SYSTEMS

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Project meetings.
 - 2. Requests for Interpretation (RFIs).
- B. See Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.3 SUBMITTALS

- A. No construction is to commence prior to approval of all submittals.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Delivery and processing of submittals.
 - 3. Progress meetings.
 - 4. Preinstallation conferences.
 - 5. Project closeout activities.
 - 6. Startup and adjustment of systems.
 - 7. Project closeout activities.

1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of Record Documents.
 - l. Use of the premises.
 - m. Work restrictions.
 - n. Owner's occupancy requirements.
 - o. Construction waste management and recycling.
 - p. Parking availability.
 - q. Office, work, and storage areas.
 - r. Equipment deliveries and priorities.
 - s. Progress cleaning.
 - t. Working hours.
 3. Minutes: Record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Work hours.
 - 9) Hazards and risks.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) RFIs.
 - 15) Pending changes.
3. Minutes: Record the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
- a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.6 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Project name.
 2. Date.
 3. Name of Contractor.
 4. Name of Engineer and Construction Manager.
 5. RFI number, numbered sequentially.
 6. Specification Section number and title and related paragraphs, as appropriate.
 7. Drawing number and detail references, as appropriate.
 8. Field dimensions and conditions, as appropriate.
 9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 10. Contractor's signature.
 11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
- C. Hard-Copy RFIs: CSI Form 13.2A.
1. Identify each page of attachments with the RFI number and sequential page number.
- D. Engineer's Action: Engineer will review each RFI, determine action required, and return it. Allow seven working days for Engineer's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Engineer's actions on submittals.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- f. Incomplete RFIs or RFIs with numerous errors.
- 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again.
- E. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Construction

- A. Anytime a sub contractor is present at job site, the prime contractor shall be on site.

END OF SECTION 01 31 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. See Division 01 Section "Closeout Procedures" for submitting warranties.
- C. See Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 COMMENCEMENT

- A. No construction shall start prior to approval of all submittals.

1.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Electronic submittals shall be in Adobe PDF format.
- C. Substituted items shall be submitted with manufacturer's descriptive data and must show equality to item specified. Information on substituted items must be complete, including, but not limited to: design, construction materials, and construction quality. Engineer will not research information required to compare equipment. Engineer reserves the right to require specified item.
- D. Contractor has two chances (one submittal and one resubmittal) to substitute a piece of equipment from specified equipment. If piece of equipment is still unacceptable to engineer, contractor to provide specified equipment.
- E. Submit manufacturer's descriptive data within ten (10) working days after award of the contract. Materials and fixtures shall not be ordered prior to submittal approval. Allow ten (10) working days after receipt of submittals in the engineer's office before reviewed submittals will be returned.
- F. Upon completion of the project, and prior to final acceptance payment, submit one (1) set of as-built drawings and three sets of operating and maintenance instructions (bound in 3-ring binders).
- G. Resubmittal Review: Allow 10 working days for review of each resubmittal.
- H. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 - 3. Include the following information on label for processing and recording action taken:

City of Reno Maintenance and Operations
California Building HVAC Replacement

- a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- I. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- J. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- 1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
- K. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
- 1. Transmittal Form: Use AIA Document G810.
- L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
- M. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with specified referenced standards.
 - i. Testing by recognized testing agency.

City of Reno Maintenance and Operations
California Building HVAC Replacement

4. Number of Copies: Submit one electronic copy of Product Data. Engineer will mark up and return one electronic copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 - k. Relationship to adjoining construction clearly indicated.
 - l. Seal and signature of professional engineer if specified.
 - m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit electronic copy of each submittal. Engineer will return one copy.
- D. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.
 1. Number of Copies: Submit electronic copy of product schedule or list.
- E. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.
 1. Number of Copies: Submit electronic copy of subcontractor list.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
- C. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 40 00 – QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. Tolerances.
- C. Manufacturers' field services and reports.
- D. Testing and inspections.

1.2 RELATED SECTIONS

- A. Section 01 33 00 - Submittals.
- B. Individual Specification Sections.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step-in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 40 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. See Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
- C. See Division 23 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.3 SUBMITTALS

- A. Substitution Requests: Submit electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - b. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Comparable Product Requests: Submit electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 10 working days of receipt of request, or 7 working days of receipt of additional information or documentation, whichever is later.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store materials in a manner that will not endanger Project structure.
 - 2. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 3. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 4. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within 10 working days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution does not require extensive revisions to the Contract Documents.
 2. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 3. Substitution request is fully documented and properly submitted.
 4. Requested substitution will not adversely affect Contractor's Construction Schedule.
 5. Requested substitution is compatible with other portions of the Work.
 6. Requested substitution has been coordinated with other portions of the Work.
 7. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

- A. Conditions: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 63 01 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the contract.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "References" specifies the applicability of industry standards to products specified.
 - 2. Division 1 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.

1.3 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to the Contract Documents requested by the Owner or Engineer.
 - 3. Specified options of products and construction methods included in the Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

- 1.4 Contractor has 2 chances (initial submittals and 1 revised submittal) for a substitution. If submittals are not to the satisfaction of the Engineer, Contractor to provide specified material at no additional cost to Owner.

1.5 SUBMITTALS

- A. Substitution Request Submittal: The Engineer will consider requests for substitution if received within 30 days after commencement of the Work. Requests received more than 30 days after commencement of the Work may be considered or rejected at the discretion of the Engineer.
 - 1. Submit electronic copy of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
 - 2. Identify the product or the fabrication for installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
 - 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
 - h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Engineer's Action: If necessary, the Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Engineer will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.
- a. Use the product specified if the Engineer cannot make a decision on the use of a proposed substitute within the time allocated.
5. Any changes to the electrical, mechanical, structural, or architectural will be the burden of the Contractor.
- B. Contractor shall submit shop drawings to Engineer of all these changes during submittal process.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Engineer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Engineer. If the following conditions are not satisfied, the Engineer will return the requests without action except to record noncompliance with these requirements.
1. Extensive revisions to the Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 3. The request is timely, fully documented, and properly submitted.
 4. The specified product or method of construction cannot be provided with the Contract Time. The Engineer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
 6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
 7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. The Contractor's submittal and the Engineer's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.
- C. Listed manufacturers are subject to compliance to the specified product on the drawings. Electrical, dimensions, weights and options shall not require re-engineering by the design team.
- D. Substituted product shall not increase cost to owner or design team

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 63 01

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. General installation of products.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
 - 6. Correction of the Work.
- B. See Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
- C. No construction shall start prior to approval of all submittals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other

City of Reno Maintenance and Operations
California Building HVAC Replacement

construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Site: Maintain Project site free of waste materials and debris.
 - C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
 - F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
 - H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.5 STARTING AND ADJUSTING
- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
 - B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
 - C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."
- 3.6 PROTECTION OF INSTALLED CONSTRUCTION
- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
 - B. Comply with manufacturer's written instructions for temperature and relative humidity.
- 3.7 CORRECTION OF THE WORK
- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
 - B. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- D. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 23 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- C. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering, and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 4. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements of the existing building.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
- E. Roof patching: Contractor is responsible for keeping existing foam roof weather tight. Contractor to patch and repair any damages to roof caused by construction of this project. Patch and repair shall be per roofing manufacturer's instructions.

END OF SECTION 01 73 29

City of Reno Maintenance and Operations
California Building HVAC Replacement

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 All existing equipment and control sensors and equipment shall be offered to the owner and shall be delivered to owner on site. All equipment becomes property of the contractor and shall be removed from site.

3.2 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

3.3 DISPOSAL OF WASTE

- A. General: Remove waste materials from Project site and legally dispose of them in a landfill acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. See Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
- C. See Divisions 23 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 4. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
 - 5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 6. Complete startup testing of systems.
 - 7. Submit test/adjust/balance records.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 10. Complete final cleaning requirements, including touchup painting.
 - 11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 3. Submit pest-control final inspection report and warranty.

City of Reno Maintenance and Operations
California Building HVAC Replacement

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)
- A. Preparation: Submit electronic copy of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
- 1.5 WARRANTIES
- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
 - B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - C. Provide additional copies of each warranty to include in operation and maintenance manuals.
- 1.6 FINAL APPROVED SUBMITTALS
- A. Provide the owner with one (1) 3-ring binder and a USB thumb drive of the final approved submittals. Submittals shall be organized by specification section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Sweep concrete floors broom clean in unoccupied spaces.
 - g. Remove labels that are not permanent.
 - h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - i. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - j. Replace parts subject to unusual operating conditions.
 - k. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation manuals for systems, subsystems, and equipment.
 - 2. Maintenance manuals for the care and maintenance of systems and equipment.
- B. See Divisions 23 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 SUBMITTALS

- A. Manual: Submit one copy of each manual in final form at least 10 days before final inspection. Engineer will return copy with comments within 10 days after final inspection.
 - 1. Correct or modify each manual to comply with Engineer's comments. Submit 3 copies of each corrected manual within 10 days of receipt of Engineer's comments.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name, address, and telephone number of Contractor.
 - 6. Name and address of Engineer.
 - 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
 - 1. One (1) Binder: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
 - 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - 5. Also provide a USB thumb drive with PDFs of the manual, book marked for each section.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- a. If oversized drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- b. If drawings are too large to be used as foldouts, fold, and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

2.3 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name, and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name, and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions that detail essential maintenance procedures:
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 TEST AND BALANCE REPORT

- A. Include final copy of Test and Balance Report.

2.6 MANUFACTURER'S START UP REPORT

- A. Include all manufacturer's start up report.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. See Divisions 23 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up Record Prints.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
 - 5. If any substitutions are made from scheduled products, Contractor is to mark schedules to reflect what was installed.
 - 6. Mark to be in Red pen.
 - 7. Submit Record Drawings to Engineer.

2.2 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. See Divisions 23 Sections for specific requirements for demonstration and training for products in those Sections.

1.2 SUBMITTALS

- A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1.3 QUALITY ASSURANCE

- A. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Engineer.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include system and equipment descriptions, operating standards, regulatory requirements, equipment function, operating characteristics, limiting conditions, and performance curves.
 - 2. Documentation: Review emergency, operations, and maintenance manuals; Project Record Documents; identification systems; warranties and bonds; and maintenance service agreements.
 - 3. Emergencies: Include instructions on stopping; shutdown instructions; operating instructions for conditions outside normal operating limits; instructions on meaning of warnings, trouble indications, and error messages; and required sequences for electric or electronic systems.
 - 4. Operations: Include startup, break-in, control, and safety procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; operating procedures for emergencies and equipment failure; and required sequences for electric or electronic systems.
 - 5. Adjustments: Include alignments and checking, noise, vibration, economy, and efficiency adjustments.
 - 6. Troubleshooting: Include diagnostic instructions and test and inspection procedures.
 - 7. Maintenance: Include inspection procedures, types of cleaning agents, methods of cleaning, procedures for preventive and routine maintenance, and instruction on use of special tools.
 - 8. Repairs: Include diagnosis, repair, and disassembly instructions; instructions for identifying parts; and review of spare parts needed for operation and maintenance.

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 3 - EXECUTION

3.1 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish an instructor to describe Owner's operational philosophy.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least seven days advance notice.

END OF SECTION 01 79 00

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Dielectric fittings.
 - 3. Equipment installation requirements common to equipment sections.

1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

- A. Welding certificates.
- B. Company welding procedures.
- C. See section 01 30 00 for submittal requirements.

1.4 QUALITY ASSURANCE

- A. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.
- B. Reference Building Codes and Standards:
 - 1. IBC – 2018 International Building Code
 - 2. UMC – 2018 Uniform Mechanical Code
 - 3. UPC – 2018 Uniform Plumbing Code
 - 4. IFC – 2018 International Fire Code
 - 5. NFPA – National Fire Protection Association
 - 6. NEC – National Electrical Code
 - 7. Nevada State Regulatory Agencies
 - 8. ANSI – American National Standards Institute
 - 9. SMACNA – Sheet Metal and Air Conditioning Contractors National Association
 - 10. ASME – American Society of Mechanical Engineers
 - 11. UL – Underwriters Laboratory
 - 12. 2018 – International Energy Conservation Code

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel, and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

END OF SECTION 22 05 00

SECTION 22 05 18- ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type.
 - j. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
 - k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type.
- C. Seal Escutcheons to wall with silicone suitable for use for kitchen and bathroom. Color of silicone used to be selected by architect.

3.2 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 22 05 18

SECTION 22 05 29-HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal pipe hangers and supports.
 - 2. Trapeze pipe hangers.
 - 3. Thermal-hanger shield inserts.
 - 4. Fastener systems.
 - 5. Pipe positioning systems.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified State of Nevada Professional Engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Signed and sealed by a qualified State of Nevada Professional Engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
 - 1. Trapeze pipe hangers.
 - 2. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
 - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.

City of Reno Maintenance and Operations
California Building HVAC Replacement

5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
 - B. Stainless-Steel Pipe Hangers and Supports:
 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.
 - C. Copper Pipe Hangers:
 1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.
- 2.2 TRAPEZE PIPE HANGERS
- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.
- 2.3 THERMAL-HANGER SHIELD INSERTS
- A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.
 - B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength.
 - C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
 - D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
 - E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.
- 2.4 FASTENER SYSTEMS
- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- 2.5 PIPE POSITIONING SYSTEMS
- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.
- 2.6 MISCELLANEOUS MATERIALS
- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
 - B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- D. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.
- F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- M. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
- 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
- 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.3 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 3/4 inches.

3.4 PAINTING

- A. Retain first paragraph below if Section 09 91 13 "Exterior Painting" or Section 09 91 23 "Interior Painting" is not in Project Manual.
- B. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 09 91 13 "Exterior Painting", Section 09 91 23 "Interior Painting", and Section 09 96 00 "High-Performance Coatings". Retain first paragraph below if Section 09 91 13 "Exterior Painting" or Section 09 91 23 "Interior Painting" is in Project Manual. Revise reference if Section 09 96 00 "High-Performance Coatings" applies instead.
- D. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.5 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- F. Use stainless-steel pipe hangers and stainless-steel attachments for stainless-steel piping and tubing.
- G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
 - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
 - 4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 - 5. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 - 6. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 - 7. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 - 8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
 - 9. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 - 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 - 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 - 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 - 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 - 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 - 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 - 6. C-Clamps (MSS Type 23): For structural shapes.
 - 7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 - 8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- 9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 - 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 - 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 - 2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 - 3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
- P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- Q. Use powder-actuated fasteners instead of building attachments where required in concrete construction.
- R. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION 22 05 29

SECTION 22 05 48-VIBRATION AND SEISMIC CONTROLS FOR PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Seismic bracing for plumbing systems (equipment, piping, and conduit) and mechanical systems (flue, combustion air, ducting, and equipment) shall comply with all applicable requirements of the 2018 International Building Code (IBC) including all applicable provisions of the American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures (ASCE Standard 7-16). Basic seismic design criteria for each project shall be as listed on the structural drawings for that project.
- B. Compliance with the applicable seismic bracing requirements shall be accomplished utilizing the most current version of one of the following design manuals (no exceptions):
 - 1. International Seismic Application Technology (ISAT) Design Manual
 - 2. Mason Industries Seismic Restraint Design Manual
 - 3. Kinetics Noise Control Seismic Design Manual
 - 4. Vibro-Acoustics Seismic Design Manual
- C. A complete bound copy of the applicable design manual shall be provided to the Owner at the beginning of the construction period for use/reference during the course of the project.
- D. Component Importance Factors (Ip) for all plumbing equipment, piping, and conduit shall be determined and assigned in accordance with ASCE Standard 7-16 Section 13.1.3.

1.2 SUBMITTALS

- A. The Contractor shall provide the required number of seismic shop drawing submittal sets for review and approval by the Owner. Submittals shall include a comprehensive set of shop drawings clearly depicting the seismic bracing requirements for all plumbing equipment, piping, and conduit. Any equipment that does not require seismic bracing shall be specifically identified in the submittal, and the reason for exemption shall be provided.
- B. Submittals shall be fully coordinated with the structural drawings and shall include all applicable structural attachment details. Seismic bracing shop drawings shall include all vertical support anchorage loads and all seismic bracing anchorage loads. Each specific load shall be indicated and the structural element that the support is attached to shall be clearly depicted/identified. Seismic bracing submittals shall be stamped and signed by a mechanical, structural, or civil engineer licensed in the State of Nevada.
- C. Seismic shop drawing submittals will be reviewed by both the mechanical engineer and the structural engineer.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. An authorized representative of the seismic bracing system manufacturer shall visit the job site during the construction period to confirm that the seismic bracing installation complies with the shop drawings, with all applicable code requirements, and with the seismic bracing system manufacturer's written

City of Reno Maintenance and Operations
California Building HVAC Replacement

installation requirements and associated details. A minimum of three site visits shall be provided, with the first visit scheduled just prior to installation of the first seismic braces, the second visit at the approximate midpoint of construction, and the third visit when the seismic bracing installation is complete (and prior to installation of ceilings).

- D. A written report shall be issued within one week of each site visit summarizing the observations made during the site visit and listing all required corrective actions and/or deficiencies.
- E. Site visits shall be coordinated with the Owner and shall be scheduled in writing a minimum of two weeks prior to the proposed site visit date.
- F. After all equipment installation is complete and all seismic bracing has been verified, the authorized representative that conducted the field verification shall issue a letter certifying that the installation is complete and that the installation complies with the specified requirements.

1.5 SPECIAL INSPECTION

- A. Special inspections will be arranged and paid for by the Owner when and if required by 2018 IBC Section 1704. When special inspection is required for a system or item of equipment the Contractor shall be available on site during each special inspection to facilitate the on-site review process.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Wind-Restraint Loading:
 - 1. Basic Wind Speed: 140 mph.
 - 2. Building Classification Category: III.
 - 3. Minimum 10 lb./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:
 - 1. Site Class as Defined in the IBC: D.
 - 2. Assigned Seismic Risk as Defined in the IBC: III.
 - a. Component Importance Factor: 1.0.
 - b. Component Response Modification Factor: 6.0 for air-side units and ducts of sheet metal; wet-side components: 2.5.
 - c. Component Amplification Factor: 2.5 for air-side components and 1.0 for wet-side components.
 - 3. Design Spectral Response Acceleration Parameter at Short Periods (0.2 Second): 1.577g.
 - 4. Design Spectral Response Acceleration Parameter at 1-Second Period: 0.841g.

2.2 SEISMIC RESTRAINTS

- A. Compliance with the applicable seismic bracing requirements shall be accomplished utilizing the most current version of one of the following design manuals (no exceptions):
 - 1. International Seismic Application Technology (ISAT) Design Manual
 - 2. Mason Industries Seismic Restraint Design Manual
 - 3. Kinetics Noise Control Seismic Design Manual
 - 4. Vibro-Acoustics Seismic Design Manual

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.2 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Installation of vibration isolators must not cause any change of position of equipment, piping resulting in stresses or misalignment.
- B. Equipment Restraints:
 - 1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
- C. Piping Restraints:
 - 1. Comply with requirements in MSS SP-127.
 - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
 - 3. Brace a change of direction longer than 12 feet.
- D. Install cables so they do not bend across edges of adjacent equipment or building structure.
- E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
- F. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- G. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- H. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- I. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 23 21 13 "Hydronic Piping" for piping flexible connections.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

City of Reno Maintenance and Operations
California Building HVAC Replacement

B. Perform tests and inspections.

C. Tests and Inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test to 90 percent of rated proof load of device.
5. Measure isolator restraint clearance.
6. Measure isolator deflection.
7. Verify snubber minimum clearances.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. 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.

END OF SECTION 22 05 48

City of Reno Maintenance and Operations
California Building HVAC Replacement

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Warning signs and labels.
 - 2. Valve Tags
 - 3. Pipe labels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brimar Industries, Inc.
 - 2. Craftmark Pipe Markers.
 - 3. LEM Products Inc.
 - 4. Marking Services Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8-inch-thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Red.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel rivets.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.2 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brimar Industries, Inc.
 - 2. Craftmark Pipe Markers.
 - 3. LEM Products Inc.
 - 4. Marking Services Inc.
- B. Material and Thickness: 2-inch diameter, 1/8-inch-thick brass, and having predrilled hole.
- C. Top row shall indicate system connected to
- D. Bottom row shall be a unique number
- E. Provide owner with a schedule of valve numbers and locations of valves.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Brimar Industries, Inc.
 - 2. Craftmark Pipe Markers.
 - 3. LEM Products Inc.
 - 4. Marking Services Inc.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: Size letters according to ASME A13.1 for piping.

PART 3 - EXECUTION

3.1 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.2 PIPE LABEL INSTALLATION

- A. Piping Color Coding: Painting of piping is specified in Section 09 91 23 "Interior Painting."
- B. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Pipe Label Color Schedule:
 - 1. Natural gas: Black letters on safety-yellow background.

END OF SECTION 22 05 53

SECTION 22 11 17 - DRAIN PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes equipment drain pipes, tubes, and fittings inside buildings.

1.2 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type M water tube, drawn temper.
- B. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
- C. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.

2.3 PIPING JOINING MATERIALS

- A. Solder Filler Metals: ASTM B 32, lead-free alloys.
- B. Flux: ASTM B 813, water flushable.
- C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- E. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- I. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 22 05 17 "Sleeves and Sleeve Seals for Plumbing Piping."
- J. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 22 05 17 "Sleeves and Sleeve Seals for Plumbing Piping."
- K. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 22 05 18 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

3.3 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 22 05 48 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- B. Comply with requirements for pipe hanger, support products, and installation in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.
- G. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Piping Inspections:

- a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
- b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
- c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections, and arrange for reinspection.
- d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

2. Piping Tests:

- a. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
- b. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
- c. Prepare reports for tests and for corrective action required.

B. Prepare test and inspection reports.

3.6 CLEANING

- A. Clean and flush piping of all debris, use a filter at the end of discharge so debris do not go into drains.

3.7 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Equipment drain for mechanical equipment shall have a trap per manufacturer's instructions and be the following:
 - 1. Hard copper tube, ASTM B 88, Type M; wrought copper, solder-joint fittings, and soldered joints.

END OF SECTION 22 11 17

SECTION 22 15 13 - FACILITY NATURAL-GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipes, tubes, and fittings.
 - 2. Piping specialties.
 - 3. Piping and tubing joining materials.
 - 4. Valves.

1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
 - 1. Piping and Valves: 100 psig minimum unless otherwise indicated.
- B. Natural-Gas System Pressure within Buildings: More than 0.5 psig but not more than 2 psig.
- C. Delegated Design: Design restraints and anchors for natural-gas piping and equipment, including comprehensive engineering analysis by a qualified State of Nevada Professional engineer, using performance requirements and design criteria indicated.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For facility natural-gas piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
- C. Delegated-Design Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Detail fabrication and assembly of seismic restraints.
 - 2. Design Calculations: Calculate requirements for selecting seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.6 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
 - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
 - 2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
 - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
 - 4. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.
 - a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.

2.2 PIPING SPECIALTIES

- A. Flexible Hose Connectors:
 - 1. Flexible hose connector to accommodate any thermal expansion, contraction, or seismic movement of the connected equipment.
 - 2. Capable of compensating for lateral movement and vibration.
 - 3. Manufactured complete with section of corrugated metal hose, compatible braid, with inlet and outlet connections as required.
 - 4. CSA / AGA certified.
 - 5. Products:
 - a. Twin City Hose.
 - b. Flex Tite
 - c. Mason Industries.
 - d. Or approved equal.
 - 6. Corrugated Hose:
 - a. Type 304 stainless steel.
 - 7. Braid:
 - a. Type 304 stainless steel.
 - 8. Fittings Materials of construction and end fitting type shall be consistent with pipe material and equipment/ pipe connection fittings. Copper fittings shall not be attached to stainless steel hose.
 - 9. Flexible hose connector shall be rated with a 150-psi minimum operating pressure.
- B. Appliance Flexible Connectors:
 - 1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
 - 2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
 - 3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
 - 4. Corrugated stainless-steel tubing with polymer coating.
 - 5. Operating-Pressure Rating: 0.5 psig.
 - 6. End Fittings: Zinc-coated steel.
 - 7. Threaded Ends: Comply with ASME B1.20.1.
 - 8. Maximum Length: 72 inches
- C. Quick-Disconnect Devices: Comply with ANSI Z21.41.
 - 1. Copper-alloy convenience outlet and matching plug connector.
 - 2. Nitrile seals.
 - 3. Hand operated with automatic shutoff when disconnected.
 - 4. For indoor or outdoor applications.
 - 5. Adjustable, retractable restraining cable.
- D. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

2.3 JOINING MATERIALS

- A. Joint Compound and Tape: Suitable for natural gas.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- 2.4 MANUAL GAS SHUTOFF VALVES
- A. See "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.
- B. General Requirements for Metallic Valves, NPS 2 and Smaller: Comply with ASME B16.33.
1. CWP Rating: 125 psig.
 2. Threaded Ends: Comply with ASME B1.20.1.
 3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
 4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
 6. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.
- C. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BrassCraft Manufacturing Co.; a Masco company.
 - b. Conbraco Industries, Inc.
 - c. Nibco
 2. Body: Bronze, complying with ASTM B 584.
 3. Ball: Chrome-plated bronze.
 4. Stem: Bronze; blowout proof.
 5. Seats: Reinforced TFE; blowout proof.
 6. Packing: Threaded-body packnut design with adjustable-stem packing.
 7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 8. CWP Rating: 600 psig.
 9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.
- D. Bronze Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.Y. McDonald Mfg. Co.
 - b. Lee Brass Company.
 2. Body: Bronze, complying with ASTM B 584.
 3. Plug: Bronze.
 4. Ends: Threaded, socket, as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 5. Operator: Square head or lug type with tamperproof feature where indicated.
 6. Pressure Class: 125 psig.
 7. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 8. Service: Suitable for natural-gas service with "WOG" indicated on valve body.
- E. Solenoid Shut Off Valve:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ASCO
 - b. OR Approved Equal
 2. Body: Aluminum.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3. Plug: 430F stainless steel.
4. Ends: Threaded, socket,
5. Pressure Class: 125 psig.
6. Listing: FM approved to Class 7400 "Liquid and Gas Safety Shutoff Valves".
7. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

2.5 LABELING AND IDENTIFYING

- A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

PART 3 - EXECUTION

3.1 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of natural-gas piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install natural-gas piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Verify final equipment locations for roughing-in.
- L. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- M. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- N. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- O. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- P. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- Q. Connect branch piping from top or side of horizontal piping.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- R. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment.
- S. Do not use natural-gas piping as grounding electrode.
- T. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- U. Install pressure gage downstream from each line regulator. Pressure gages are specified in Section 23 05 19 "Meters and Gages for HVAC Piping."
- V. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 23 05 17 "Sleeves and Sleeve Seals for HVAC Piping."
- W. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 23 05 17 "Sleeves and Sleeve Seals for HVAC Piping."
- X. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 23 05 18 "Escutcheons for HVAC Piping."

3.2 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing or copper connector.
- B. Install underground valves with valve boxes.
- C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- D. Install earthquake valves aboveground outside buildings according to listing.
- E. Install anode for metallic valves in underground PE piping.

3.3 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
 - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
 - 2. Cut threads full and clean using sharp dies.
 - 3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
 - 4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
 - 5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. Welded Joints:
 - 1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
 - 2. Bevel plain ends of steel pipe.
 - 3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 23 05 48 "Vibration and Seismic Controls for HVAC."
- B. Comply with requirements for pipe hangers and supports specified in Section 23 05 29 "Hangers and Supports for HVAC Piping and Equipment."
- C. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.
 2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
 3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
- D. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:
1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
 2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
 3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch.
- 3.5 CONNECTIONS
- A. Connect to utility's gas main according to utility's procedures and requirements.
 - B. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
 - C. Install piping adjacent to appliances to allow service and maintenance of appliances.
 - D. Connect piping to kitchen appliances using manual gas shutoff valves, unions, and appliance connectors. Install valve within 72 inches of each gas-fired appliance. Install union between valve and appliances.
 - E. Connect piping to equipment (boilers, water heaters, unit heaters, etc.) using manual gas shutoff valves, unions, and flexible connectors. Install valve within 72 inches of each gas-fired equipment. Install union between valve and equipment.
 - F. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.
- 3.6 LABELING AND IDENTIFYING
- A. Comply with requirements in Section 23 05 53 "Identification for HVAC Piping and Equipment" for piping and valve identification.
 - B. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- 3.7 FIELD QUALITY CONTROL
- A. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.
 - B. Natural-gas piping will be considered defective if it does not pass tests and inspections.
 - C. Prepare test and inspection reports.
- 3.8 INDOOR PIPING SCHEDULE
- A. Aboveground, branch piping NPS 2 and smaller shall be the following:
 1. Steel pipe with malleable-iron fittings and threaded joints.
 - B. Above ground piping greater than NPS2, shall be the following.
 1. Steel pip with welded fittings.
 - C. Aboveground, distribution piping shall be the following:
 1. Steel pipe with malleable-iron fittings and threaded joints.
 2. Steel pipe with wrought-steel fittings and welded joints.
 - D. Piping in main ball room to be painted green to match existing green structure paint.
- 3.9 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE
- A. Valves for pipe sizes NPS 2 and smaller at service entrance shall be the following:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Bronze plug valve.
 - B. Distribution piping valves for pipe sizes NPS 2 and smaller shall be the following:
 1. Two-piece, full-port, bronze ball valves with bronze trim.
 2. Bronze plug valve.
 - C. Valves in branch piping for single appliance shall be the following:
 1. Two-piece, full-port, bronze ball valves with bronze trim.
- 3.10 OUTDOOR PIPING SCHEDULE
- A. Aboveground, branch piping NPS 2 and smaller shall be the following:
 1. Steel pipe with malleable-iron fittings and threaded joints.
 - B. Above ground piping greater than NPS2, shall be the following.
 1. Steel pip with welded fittings.
 - C. Aboveground, distribution piping shall be the following:
 1. Steel pipe with malleable-iron fittings and threaded joints.
 2. Steel pipe with wrought-steel fittings and welded joints.
 - D. All outdoor piping to be painted with UV resistance exterior paint to match existing building.

END OF SECTION 22 15 13

SECTION 23 00 00-COMMON WORK RESULTS FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Mechanical demolition.
 - 3. Equipment installation requirements common to equipment sections.
- B. The information indicated on the drawings as existing is based upon information taken from as-built drawings, field investigation, and information obtained from submittal data, etc. The plans do not guarantee accuracy but are only an indication of existing conditions. It is the contractor's responsibility to field verify exact conditions such as equipment placement, ductwork (size, routing, and elevation), piping (size, routing, and elevation), etc. The drawings are intended to provide the contractor an indication of the system installed in the facility to date. It will be the contractor's responsibility to make adjustments to the drawing information as required to match existing field conditions.
- C. The contractor shall install the new equipment, ductwork, and piping around all existing obstacles including: electrical conduit, domestic water piping, waste and vent piping, chilled and heating water piping, and fire sprinkler piping. Provide offsets to avoid relocation of other utilities. Relocate utilities if they are in conflict with the mechanical system installation, cause deviations in the design intent, unsatisfactory operation, noisy conditions, or interfere with maintenance. It is the mechanical contractor's responsibility to coordinate any utility relocation with the appropriate subcontractor.
- D. Provide all necessary labor, materials, equipment, services, and insurances to complete the heating, ventilating, and air conditioning work within the full intent of the drawings and specifications contained hereon and to the entire satisfaction of the engineer.
- E. All dimensions and measurements shall be verified at the jobsite before fabrication and/or installation of the equipment.
- F. Contractor shall visit the site and become familiar with the project before bidding.

1.2 DEFINITIONS

- A. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- B. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

1.3 SUBMITTALS

- A. See specification section 00 13 30, "Submittal Procedures".
- B. Welding certificates.

1.4 WORKMANSHIP

- A. All work to be performed by qualified personnel normally engaged in the respective line of work.
- B. Perform all work in a manner not to disturb the normal operation of the building.
- C. Coordinate all work with the owner's representative.
- D. The mechanical contractor is responsible for performing all work acceptable to the owner's representative.

City of Reno Maintenance and Operations
California Building HVAC Replacement

1.5 PROJECT/SITE CONDITIONS

- A. Examine the site, verify dimensions and locations against the drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.
- B. Information shown relative to existing locations is based upon available records and data but shall be regarded as approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost.
- C. Install work in locations shown on drawings, unless prevented by project conditions.
- D. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of Owner/Engineer before proceeding.

1.6 QUALITY ASSURANCE

- A. Steel Pipe Welding: Qualify processes and operators shall be in accordance with the following:
 - 1. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- B. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.
- C. Reference Building Codes and Standards:
 - 1. IBC – 2018 International Building Code
 - 2. UMC – 2018 Uniform Mechanical Code
 - 3. UPC – 2018 Uniform Plumbing Code
 - 4. IFC – 2018 International Fire Code
 - 5. IECC – 2018 International Energy Conservation Code
 - 6. NFPA – National Fire Protection Association
 - 7. NEC – National Electrical Code
 - 8. Nevada State Regulatory Agencies
 - 9. ANSI – American National Standards Institute
 - 10. SMACNA – Sheet Metal and Air Conditioning Contractors National Association
 - 11. ASME – American Society of Mechanical Engineers
 - 12. UL – Underwriters Laboratory
 - 13. ASHRAE Handbooks
 - 14. ASHRAE Standards
 - 15. SMACNA Duct Construction Standards
 - 16. ASPE Data Books

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 MECHANICAL DEMOLITION

- A. coordinate with the owner prior to the beginning of demolition work of equipment and material that the owner will salvage.
- B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- 4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.
- 3.2 PRODUCT HANDLING
- A. Protection: use all means necessary to protect the materials of this section before, during, and after installation and to protect the materials and work of the other trades.
 - B. Replacements: in the event of damage, immediately make all repairs and replacements necessary to the approval of the engineer and at no additional cost to the owner.
- 3.3 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS
- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
 - B. Install equipment level and plumb, parallel, and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
 - C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
 - D. Install equipment to allow right of way for piping installed at required slope.
- 3.4 CARE AND CLEANING
- A. Replace broken, damaged, or otherwise defective parts, materials, and work. Leave the entire work in a condition satisfactory to the architect and owner. At completion, carefully clean and adjust equipment, fixtures, and trim which are installed as part of this work. Leave systems and equipment in satisfactory operating condition.
 - B. Drain and flush piping to remove grease and foreign matter.
 - C. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.

END OF SECTION 23 00 00

SECTION 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small, and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.2 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
 - 1. Motor controllers.
 - 2. Torque, speed, and horsepower requirements of the load.
 - 3. Ratings and characteristics of supply circuit and required control sequence.
 - 4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.

2.2 MOTOR CHARACTERISTICS

- A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 4,500 feet above sea level.
- B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Efficiency: Energy efficient, as defined in NEMA MG 1.
- C. Service Factor: 1.15.
- D. Multispeed Motors: Variable torque.
 - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
 - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.
- E. Rotor: Random-wound, squirrel cage.
- F. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- G. Temperature Rise: Match insulation rating.
- H. Insulation: Class F.
- I. Code Letter Designation:
 - 1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
 - 2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.
- J. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
 - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
 - 2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

2.5 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
 - 1. Permanent-split capacitor.
 - 2. Split phase.
 - 3. Capacitor start, inductor run.
 - 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.6 ELECTRONICALLY COMMUTATED MOTORS (ECM)

- A. Electronically commutated motors (ECM), shall be permanently lubricated with heavy-duty ball bearings to match load.
- B. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor.
- C. Motor shall be speed controllable down to 20% full speed.
- D. Motor speed shall be controlled by either a potentiometer dial mounted on the motor or by a 0-10 VDC signal
- E. Motor shall be a minimum of 85% efficient at all speeds.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 23 05 13

SECTION 23 05 48 - VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. Seismic bracing for mechanical systems (equipment, ductwork, piping, and conduit) shall comply with all applicable requirements of the 2018 International Building Code (IBC) including all applicable provisions of the American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures (ASCE Standard 7-16). Basic seismic design criteria for each project shall be as listed on the structural drawings for that project.
- B. Compliance with the applicable seismic bracing requirements shall be accomplished utilizing the most current version of one of the following design manuals (no exceptions):
 - 1. International Seismic Application Technology (ISAT) Design Manual
 - 2. Mason Industries Seismic Restraint Design Manual
 - 3. Kinetics Noise Control Seismic Design Manual
 - 4. Vibro-Acoustics Seismic Design Manual
- C. A complete bound copy of the applicable design manual shall be provided to the Owner at the beginning of the construction period for use/reference during the course of the project.
- D. Component Importance Factors (Ip) for all mechanical equipment, ductwork, piping, and conduit shall be determined and assigned in accordance with ASCE Standard 7-16 Section 13.1.3.

1.2 SUBMITTALS

- A. The Contractor shall provide the required number of seismic shop drawing submittal sets for review and approval by the Owner. Submittals shall include a comprehensive set of shop drawings clearly depicting the seismic bracing requirements for all mechanical equipment, ductwork, piping, and conduit. Any equipment that does not require seismic bracing shall be specifically identified in the submittal, and the reason for exemption shall be provided.
- B. Submittals shall be fully coordinated with the structural drawings and shall include all applicable structural attachment details. Seismic bracing shop drawings shall include all vertical support anchorage loads and all seismic bracing anchorage loads. Each specific load shall be indicated and the structural element that the support is attached to shall be clearly depicted/identified. Seismic bracing submittals shall be stamped and signed by a structural or civil engineer licensed in the State of Nevada.
- C. Seismic shop drawing submittals will be reviewed by both the mechanical engineer and the structural engineer.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. An authorized representative of the seismic bracing system manufacturer shall visit the job site during the construction period to confirm that the seismic bracing installation complies with the shop drawings, with all applicable code requirements, and with the seismic bracing system manufacturer's written installation requirements and associated details. A minimum of three site visits shall be provided, with

City of Reno Maintenance and Operations
California Building HVAC Replacement

the first visit scheduled just prior to installation of the first seismic braces, the second visit at the approximate midpoint of construction, and the third visit when the seismic bracing installation is complete (and prior to installation of ceilings).

- D. A written report shall be issued within one week of each site visit summarizing the observations made during the site visit and listing all required corrective actions and/or deficiencies.
- E. Site visits shall be coordinated with the Owner and shall be scheduled in writing a minimum of two weeks prior to the proposed site visit date.
- F. After all equipment installation is complete and all seismic bracing has been verified, the authorized representative that conducted the field verification shall issue a letter certifying that the installation is complete and that the installation complies with the specified requirements.

1.5 SPECIAL INSPECTION

- A. Special inspections will be arranged and paid for by the Owner when and if required by 2018 IBC Section 1704. When special inspection is required for a particular system or item of equipment the Contractor shall be available on site during each special inspection to facilitate the on-site review process.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Wind-Restraint Loading:
 - 1. Basic Wind Speed: 140 mph.
 - 2. Building Classification Category: III.
 - 3. Minimum 10 lb./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:
 - 1. Site Class as Defined in the IBC: D.
 - 2. Assigned Seismic Risk as Defined in the IBC: III.
 - a. Component Importance Factor: 1.0.
 - b. Component Response Modification Factor: 6.0 for air-side units and ducts of sheet metal; wet-side components: 2.5.
 - c. Component Amplification Factor: 2.5 for air-side components and 1.0 for wet-side components.
 - 3. Design Spectral Response Acceleration Parameter at Short Periods (0.2 Second): 1.610g.
 - 4. Design Spectral Response Acceleration Parameter at 1-Second Period: 0.565g.

2.2 SEISMIC RESTRAINTS

- A. Compliance with the applicable seismic bracing requirements shall be accomplished utilizing the most current version of one of the following design manuals (no exceptions):
 - 1. International Seismic Application Technology (ISAT) Design Manual
 - 2. Mason Industries Seismic Restraint Design Manual
 - 3. Kinetics Noise Control Seismic Design Manual
 - 4. Vibro-Acoustics Seismic Design Manual

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.2 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- B. Comply with requirements in Section 07 22 00 "Roof Accessories" for installation of roof curbs, equipment supports, and roof penetrations.
- C. Equipment Restraints:
 - 1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
 - 4. All equipment shall be anchored to concrete bases.
- D. Piping Restraints:
 - 1. Comply with requirements in MSS SP-127.
 - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
 - 3. Brace a change of direction longer than 12 feet.
- E. Install cables so they do not bend across edges of adjacent equipment or building structure.
- F. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
- G. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- H. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- I. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- J. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 23 21 13 "Hydronic Piping" for piping flexible connections.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.
 - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 - 4. Test to 90 percent of rated proof load of device.
 - 5. Measure isolator restraint clearance.
 - 6. Measure isolator deflection.
 - 7. Verify snubber minimum clearances.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. 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.

END OF SECTION 23 05 48

SECTION 23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
 2. Warning signs and labels.
 3. Pipe labels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment (Outdoor Equipment Only):
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Craftmark Pipe Markers.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 2. Material and Thickness: anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 7. Fasteners: Stainless-steel rivets.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment (Indoor equipment only):
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brimar Industries, Inc.
 - b. Craftmark Pipe Markers.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8-inch-thick and having predrilled holes for attachment hardware.
 3. Letter Color: White.
 4. Background Color: Black.
 5. Maximum Temperature: Able to withstand temperatures up to 160 deg F
 6. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch
 7. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 8. Fasteners: Stainless-steel rivets.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Adhesive Labels for labeling VAV terminal unit and Fan Coil locations in ceiling grid below
 1. 1 inch high by 4-inch-long printed adhesive label in blue color with black writing.
- D. Label Content: Include equipment's Drawing designation or unique equipment number, drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- E. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper, Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brimar Industries, Inc.
 2. Craftmark Pipe Markers.
 3. LEM Products Inc.
 4. Marking Services, Inc.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8-inch-thick, and having predrilled holes for attachment hardware.
- C. Letter Color: White.
- D. Background Color: Red.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch
- G. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- H. Fasteners: Stainless-steel rivets.
- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Brimar Industries, Inc.
 2. Craftmark Pipe Markers.
 3. LEM Products Inc.
 4. Marking Services Inc.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
- C. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- D. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- E. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 2. Lettering Size: Size letters according to ASME A13.1 for piping.

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surface of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.
- C. Equipment label Schedule:
 - 1. Outdoor equipment: Metal Tags
 - 2. Indoor Equipment: Plastic Tags

3.3 PIPE LABEL INSTALLATION

- A. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- B. Pipe Label Color Schedule:
 - 1. Refrigerant Piping: White letters on a blue background.

END OF SECTION 23 05 53

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Balancing Air Systems:
 - a. Constant-volume air systems.
- B. Test & Balance to be conducted by Raglen System Balance or a member of the associated air balance council.
 - 1. TAB listed office on AABC website shall be within 60 miles of job site.
- C. Test & Balance of plumbing systems such as circulation pumps, balance valves, and tempering stations are to be included. The Test & Balance contractor shall review the plumbing drawings to determine systems that fall under the procedures identified in this section.

1.2 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. TAB: Testing, adjusting, and balancing.
- C. TAB Specialist: An independent entity, meeting qualifications to perform TAB work.
- D. TDH: Total dynamic head.

1.3 INFORMATIONAL SUBMITTALS

- A. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- B. Certified TAB reports.

1.4 QUALITY ASSURANCE

- A. TAB Specialists Qualifications: Certified by AABC.
 - 1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC.
 - 2. TAB Technician: Employee of the TAB specialist and certified by AABC as a TAB technician.
- B. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."
- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
- B. Examine installed systems for balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.
- F. Examine equipment performance data including fan and pump curves.
 - 1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
 - 2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- H. Examine test reports specified in individual system and equipment Sections.
- I. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, filters are clean, and equipment with functioning controls is ready for operation.
- J. Examine heat pumps and verify that they are accessible and their controls are connected and functioning.
- K. Examine strainers. Verify that startup screens have been replaced by permanent screens with indicated perforations.
- L. Examine control valves for proper installation for their intended function of throttling, diverting, or mixing fluid flows.
- M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
- N. Examine system pumps to ensure absence of entrained air in the suction piping.
- O. Examine operating safety interlocks and controls on HVAC equipment.
- P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

- A. Prepare a TAB plan that includes strategies and step-by-step procedures for balancing the systems.
- B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
 - 1. Airside:
 - a. Duct systems are complete with terminals installed.
 - b. Volume, smoke, and fire dampers are open and functional.
 - c. Clean filters are installed.
 - d. Fans are operating, free of vibration, and rotating in correct direction.
 - e. Variable-frequency controllers' startup is complete and safeties are verified.
 - f. Automatic temperature-control systems are operational.
 - g. Ceilings are installed.
 - h. Windows and doors are installed.
 - i. Suitable access to balancing devices and equipment is provided.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and in this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 - 1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
 - 2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 23 33 00 "Air Duct Accessories."
 - 3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 23 07 13 "Duct Insulation," and Section 23 07 16 "HVAC Equipment Insulation."
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- G. Verify that motor starters are equipped with properly sized thermal protection.
- H. Check dampers for proper position to achieve desired airflow path.
- I. Check for airflow blockages.
- J. Check condensate drains for proper connections and functioning.
- K. Check for proper sealing of air-handling-unit components.
- L. Verify that air duct system is sealed as specified in Section 23 31 13 "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
 - 1. Measure total airflow.
 - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- b. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
 - c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
 - d. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.
 - 2. Measure fan static pressures as follows:
 - a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure static pressure directly at the fan inlet or through the flexible connection.
 - c. Measure static pressure across each component that makes up the air-handling system.
 - d. Report artificial loading of filters at the time static pressures are measured.
 - 3. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
 - 4. Obtain approval from commissioning authority for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
 - 5. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.
- 1. Measure airflow of submain and branch ducts.
 - 2. Adjust submain and branch duct volume dampers for specified airflow.
 - 3. Re-measure each submain and branch duct after all have been adjusted.
- C. Adjust air inlets and outlets for each space to indicated airflows.
- 1. Set airflow patterns of adjustable outlets for proper distribution without drafts.
 - 2. Measure inlets and outlets airflow.
 - 3. Adjust each inlet and outlet for specified airflow.
 - 4. Re-measure each inlet and outlet after they have been adjusted.
- 3.6 PROCEDURES FOR MOTORS
- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
- 1. Manufacturer's name, model number, and serial number.
 - 2. Motor horsepower rating.
 - 3. Motor rpm.
 - 4. Efficiency rating.
 - 5. Nameplate and measured voltage, each phase.
 - 6. Nameplate and measured amperage, each phase.
 - 7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.
- 3.7 PROCEDURES FOR ROOFTOP UNITS AND FAN COIL UNITS
- A. Measure, adjust, and record the following data for each refrigerant coil:
- 1. Dry-bulb temperature of entering and leaving air.
 - 2. Wet-bulb temperature of entering and leaving air.
 - 3. Airflow.
 - 4. Air pressure drop.
 - 5. Refrigerant suction pressure and temperature.

City of Reno Maintenance and Operations
California Building HVAC Replacement

B. Measure, adjust, and record the following data for each gas heat:

1. Dry-bulb temperature of entering and leaving air.
2. Airflow.
3. Air pressure drop.
4. Gas pressure.
5. Gas Valve adjustment.

3.8 TOLERANCES

A. Set HVAC system's airflow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus, or minus 10 percent.
2. Air Outlets and Inlets: Plus, or minus 10 percent.
3. Heating-Water Flow Rate: Plus, or minus 10 percent.
4. Heat Pump - Water Flow Rate: Plus, or minus 10 percent.

B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.9 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.
3. Certify validity and accuracy of field data.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and Product Data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB specialist.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
 - a. Indicated versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
 - a. Settings for outdoor-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- e. Fan drive settings including settings and percentage of maximum pitch diameter.
 - f. Inlet vane settings for variable-air-volume systems.
 - g. Settings for supply-air, static-pressure controller.
 - h. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
- 1. Quantities of outdoor, supply, return, and exhaust airflows.
 - 2. Water and steam flow rates.
 - 3. Duct, outlet, and inlet sizes.
 - 4. Pipe and valve sizes and locations.
 - 5. Terminal units.
 - 6. Balancing stations.
 - 7. Position of balancing devices.
- E. Fan Test Reports: For supply, return, and exhaust fans, include the following:
- 1. Fan Data:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Center-to-center dimensions of sheave and amount of adjustments in inches.
 - 2. Motor Data:
 - a. Motor make and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
 - g. Number, make, and size of belts.
 - 3. Test Data (Indicated and Actual Values):
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.
- F. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
- 1. Report Data:
 - a. System and air-handling-unit number.
 - b. Location and zone.
 - c. Traverse air temperature in deg F.
 - d. Duct static pressure in inches wg.
 - e. Duct size in inches.
 - f. Duct area in sq. ft.
 - g. Indicated airflow rate in cfm.
 - h. Indicated velocity in fpm.
 - i. Actual airflow rate in cfm.
 - j. Actual average velocity in fpm.
 - k. Barometric pressure in psig.
- G. Air-Terminal-Device Reports:
- 1. Unit Data:
 - a. System and air-handling unit identification.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- b. Location and zone.
 - c. Apparatus used for test.
 - d. Area served.
 - e. Make.
 - f. Number from system diagram.
 - g. Type and model number.
 - h. Size.
 - i. Effective area in sq. ft.
 - 2. Test Data (Indicated and Actual Values):
 - a. Airflow rate in cfm.
 - b. Air velocity in fpm.
 - c. Preliminary airflow rate as needed in cfm.
 - d. Preliminary velocity as needed in fpm.
 - e. Final airflow rate in cfm.
 - f. Final velocity in fpm.
 - g. Space temperature in deg F.
 - H. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:
 - 1. Unit Data:
 - a. System and air-handling-unit identification.
 - b. Location and zone.
 - c. Room or riser served.
 - d. Coil make and size.
 - e. Flowmeter type.
 - 2. Test Data (Indicated and Actual Values):
 - a. Airflow rate in cfm.
 - b. Entering-water temperature in deg F.
 - c. Leaving-water temperature in deg F.
 - d. Water pressure drop in feet of head or psig.
 - e. Entering-air temperature in deg F.
 - f. Leaving-air temperature in deg F.
 - I. Instrument Calibration Reports:
 - 1. Report Data:
 - a. Instrument type and make.
 - b. Serial number.
 - c. Application.
 - d. Dates of use.
 - e. Dates of calibration.
- 3.10 VERIFICATION OF TAB REPORT
- A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Construction Manager and commissioning authority.
 - B. Commissioning authority shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
 - C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
 - D. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.
 - E. If TAB work fails, proceed as follows:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.

F. Prepare test and inspection reports.

END OF SECTION 23 05 93

SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes insulating the following duct services:
 - 1. Indoor, concealed supply and outdoor air.
 - 2. Indoor, exposed supply and outdoor air.
- B. Related Sections:
 - 1. Section 23 07 19 "HVAC Piping Insulation."
 - 2. Section 23 31 13 "Metal Ducts" for duct liners.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail insulation application at elbows, fittings, dampers, specialties, and flanges for each type of insulation.
 - 3. Detail application of field-applied jackets.
 - 4. Detail application at linkages of control devices.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Fiberglass Blanket Insulation: Glass fibers bonded with a thermosetting resin. Comply with

City of Reno Maintenance and Operations
California Building HVAC Replacement

ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Knauf Insulation.
 - d. Owens Corning.

2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Fiberglass Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
 - d. Knauf Insulation.
 2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: 60 percent by volume and 66 percent by weight.
 5. Color: White.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.4 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Eagle Bridges - Marathon Industries.
 - c. Foster Brand; H. B. Fuller Construction Products.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, use sealants that have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.5 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.6 TAPES

A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Compac Corporation.
 - b. Knauf Insulation.
 - c. Venture Tape.
2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.7 SECUREMENTS

A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.

B. Insulation Pins and Hangers:

1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) AGM Industries, Inc.
 - 2) Gemco.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- 3) Midwest Fasteners, Inc.
 - b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - c. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
 - d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) AGM Industries, Inc.
 - 2) Gemco.
 - 3) Hardcast, Inc.
 - 4) Midwest Fasteners, Inc.
 - 5) Nelson Stud Welding.
 - b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.
- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel, or Monel.
- D. Wire: 0.080-inch nickel-copper alloy.
- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. C & F Wire.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.
- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal

City of Reno Maintenance and Operations
California Building HVAC Replacement

- ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
 - a. For below ambient services, apply vapor-barrier mastic over staples.
 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- 3.3 PENETRATIONS
- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- 3.4 INSTALLATION OF FIBERGLASS INSULATION
- A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
 - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
 - b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
 - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
 - d. Do not over compress insulation during installation.
 - e. Impale insulation over pins and attach speed washers.
 - f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
 - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
 - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.5 FIELD-APPLIED JACKET INSTALLATION

- A. Where FSK jackets are indicated, install as follows:
 1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Secure jacket to insulation with manufacturer's recommended adhesive.
 4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

3.6 FINISHES

- A. Do not field paint aluminum or stainless-steel jackets.

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation

City of Reno Maintenance and Operations
California Building HVAC Replacement

in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.8 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed supply and outdoor air.
2. Indoor, exposed supply and outdoor air.
3. Indoor, concealed return located in unconditioned space.
4. Indoor, exposed return located in unconditioned space.
5. Indoor, concealed, Type I, commercial, kitchen hood exhaust.
6. Indoor, exposed, Type I, commercial, kitchen hood exhaust.
7. Indoor, concealed oven exhaust.
8. Indoor, exposed oven exhaust.
9. Indoor, concealed exhaust between isolation damper and penetration of building exterior.
10. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
11. Outdoor, concealed supply and return.
12. Outdoor, exposed supply and return.

B. Items Not Insulated:

1. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
2. Exposed ducts located within the room they are serving.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.9 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, Supply-Air Duct and Plenum Insulation: Fiberglass blanket, 2 inches thick and 0.75-lb/cu. ft. nominal density.
- B. Concealed, Return-Air Duct and Plenum Insulation: Fiberglass blanket, 2 inches thick and 0.75-lb/cu. ft. nominal density.

END OF SECTION 23 07 13

SECTION 23 07 19 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes insulation for HVAC piping systems.
 - 1. Refrigerant suction and discharge piping, indoors and outdoors.

1.2 RELATED SECTIONS:

- A. Section 23 07 14 – Duct insulation.

1.3 ACTION SUBMITTALS

- A. See Section 01 33 00 for submittal requirements.
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail attachment and covering of heat tracing inside insulation.
 - 3. Detail insulation application at pipe expansion joints for each type of insulation.
 - 4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 5. Detail removable insulation at piping specialties.
 - 6. Detail application of field-applied jackets.
 - 7. Detail application at linkages of control devices.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Surface Burning Characteristic: For insulation and related materials, as determined by testing identical products according to ASTM E84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation installed indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation installed Outdoors: Flame-spread index of 75 or less and smoke developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- B. Products that come into contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.
- C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable in accordance with ASTM C795.
- D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- E. Flexible Elastomeric: Closed-cell, or expanded-rubber materials; Comply with ASTM C534/C534M, Type I for tubular materials.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC.
 - c. K-Flex USA.

2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aeroflex USA, Inc.
 - b. Armacell LLC
 - c. K-Flex USA
 - 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"
- C. Fiberglass Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - 2. For indoor applications, adhesive shall have a VOC content shall content of 80 g/L or less when calculated according to 40 CFR, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"
- D. ASJ Adhesive and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A, for bonding insulation jacket lap seams and joints.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - 2. For indoor applications, adhesive shall have a VOC content shall content of 50 g/L or less when calculated according to 40 CFR, Subpart D (EPA Method 24).
 - 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"
- E. PVC Jacket Adhesive: Compatible with PVC jacket.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. Johns Manville; a Berkshire Hathaway Company
 - c. P.I.C Plastics, Inc.
 - d. Speedline Corporation.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2. For indoor applications, adhesive shall have a VOC content shall content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"

2.3 MASTICS

- A. For indoor applications, use mastics that have a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 - d. Knauf Insulation.
 2. Water-Vapor Permeance: ASTM F1249, 1.8 perms at 0.0625-inch dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: 60 percent y volume and 66 percent by weight.
 5. Color: White.

2.4 SEALANTS

- A. Joint Sealants:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 2. Materials shall be compatible with insulation materials, jackets, and substrates.
 3. Permanently flexible, elastomeric sealant.
 - a. Service Temperature Range: Minus 100 to plus 300 deg F
 - b. Color: White or gray.
 - c. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - d. Sealants shall comply with the testing and product re product requirements of the California Department of Health Services "Standard Practice of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"
- B. FSK and Metal Jacket Flashing Sealants:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
 - b. Eagle Bridges – Marathon Industries.
 - c. Foster Brand; H.B. Fuller Construction Products.
 2. Materials shall be compatible with insulation materials, jackets, and substrates.
 3. Fire- and water-resistant, flexible, elastomeric sealant.
 4. Service Temperature Range: Minus 40 to plus 250 deg F.
 5. Color: Aluminum.
 6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 7. Sealants shall comply with the testing and product requirements of the California Department of Health Services "Standard Proactive of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers".
- C. ASJ Flashing Sealants and PVDC and PVC Jacket Flashing Sealants:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants shall comply with the testing and product requirements of the California Department of Health Services "Standard Proactive of the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers".

2.5 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C921, Type I, unless otherwise indicated.
- B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway Company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
 2. Adhesive: As recommended by jacket material manufacturer.
 3. Color: White.
 4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
 - a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.
- C. Aluminum Jacket: Comply with ASTM B209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Childers Brand; H.B. Fuller Construction Products
 - b. ITW Insulation Systems, Illinois Tool Works, Inc.
 - c. RPR Products, Inc.
 2. Sheet and roll stock ready for shop or field sizing.
 3. Finish and thickness are indicated in field-applied jacket schedules.
 4. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
 5. Factory-Fabricated Fitting Covers:
 - a. Same material, finish, and thickness as jacket.
 - 1) Preformed two-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 2) Tee covers.
 - 3) Flange and union covers.
 - 4) End caps.
 - 5) Beveled collars.
 - 6) Valve covers.
 - 7) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

2.6 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work included, but not limited to the following:

City of Reno Maintenance and Operations
California Building HVAC Replacement

- a. Avery Dennison Corporation, Specialty Tapes Division.
 - b. Compac Corporation.
 - c. Ideal Tape Co., Inc. an American Biltrite Company.
 - d. Knauf Insulation.
 - e. Venture Tape.
 - f. P.I.C. Plastics,
2. Width: 3 inches.
 3. Thickness: 11.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work included, but not limited to the following:
 - a. Compac Corporation.
 - b. Ideal Tape Co., Inc. an American Biltrite Company.
 - c. Venture Tape.

2.7 SECUREMENTS

- A. Aluminum Bands: Aluminum: ASTM B209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch with wing seal or closed seal.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ITW Insulation Systems, Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
- B. Staples: Outward-clinching insulation staples, nominal 3/4 inch-wide, stainless steel or Monel.
- C. Wire: 0.080-inch nickel-copper alloy.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work included, but not limited to the following:
 - a. C & F Wire.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends attached to structure with vapor-barrier mastic.
 - 3. Install insert materials and insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at 2-inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its normal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.
- P. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.
 - 4. Manholes.
 - 5. Handholes.
 - 6. Cleanouts.

3.3 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Section 07 84 00 "Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078400 "Firestopping."
- 3.4 GENERAL PIPE INSULATION INSTALLATION
- A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles below.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as that of adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 3. Insulate tee fittings with preformed fitting insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than two (2) times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers, so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and

City of Reno Maintenance and Operations
California Building HVAC Replacement

- jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation to fit. Overlap adjoining pipe insulation by not less than two (2) times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket, except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing, using PVC tape.
 9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as that of adjoining pipe insulation.
 2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union at least 2 times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless steel or aluminum bands. Select band material compatible with insulation and jacket.
 3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.
- 3.5 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION
- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
1. Install pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as that of pipe insulation.
 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

City of Reno Maintenance and Operations
California Building HVAC Replacement

D. Insulation Installation on Valves and Pipe Specialties:

1. Install prefabricated valve covers manufactured of same material as that of pipe insulation when available.
2. When prefabricated valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 INSTALLATION OF FIELD-APPLIED JACKETS

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive. directly over bare insulation or insulation with factory-applied jackets.

1. Apply two continuous beads of adhesive to seams and joints, one bead under the lap and the finish bead along seam and joint edge.
2. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by the insulation manufacturer. Secure jacket with stainless steel bands 12 inches o.c. and at end joints.

3.7 FINISHES

- A. Pipe insulation with ASJ or other paintable Jacket Materials: Paint jacket with paint system identified below and as specified in Section 099000 "Painting and Coating".
- B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.
- D. Do not field paint aluminum or stainless-steel jackets.

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and inspections.
1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.
- C. All insulation applications will be considered defective work if sample inspection reveals noncompliance with requirements.

3.9 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Drainage piping located in crawl spaces.
 2. Underground piping.
 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.10 INDOOR PIPING INSULATION SCHEDULE

- A. Refrigerant Suction and discharge piping: Flexible elastomeric, 1" thick.

3.11 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Refrigerant Suction and Liquid Piping insulation shall be the following:
 - 1. Flexible Elastomeric: 2" thick with embossed aluminum jacket.

3.12 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Jacket shall be the following for all insulated outdoor piping:
 - 1. Aluminum, Stucco Embossed: 0.020 inch thick.

END OF SECTION 23 07 19

SECTION 23 09 00 DIRECT DIGITAL CONTROL SYSTEMS

PART 1 - OWNER'S GENERAL REQUIREMENTS

1.1 GENERAL

- A. The control system shall provide direct digital control (DDC) with Windows based user interface. The manufacturer and/or his authorized representative shall be responsible for all work under this section of the specifications. Only pre-approved manufacturers and contractors will be allowed. All control system equipment is to be Alerton, who shall be recognized by Alerton as an approved "Associate Dealer" and shall be as follows:
 - 1. Alerton by: Building Control Services, Inc. (775) 826-8998
 - 2. No Exceptions.
- B. Furnish and install microprocessor-based energy management and control system (EMCS) as an extension to the existing Alerton EMCS System at the Douglas County School District Plant Operations.

1.2 HARDWARE

- A. Controllers:
 - 1. BACnet MS/TP LAN must be software-configured from 9.6 to 115.4Kbps.
 - a. Each BACnet MS/TP LAN shall support 64 BACnet devices at a minimum.
 - b. All property object types, if used in the system, shall be thoroughly documented, and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.
 - c. All controllers (except application-specific for heat pumps) shall be furnished with a minimum of 10 percent spare capacity to allow for addition of both analog and digital inputs and outputs.

1.3 SUBMITTALS AND AS-BUILT DOCUMENTATION

- A. The submittals shall include complete written control sequences for each item of equipment requiring control. The sequences shall include all set points, dead bands, etc. required for successful operation of the specified equipment. The submitted sequences shall include all necessary sequencing details; whether or not those details are furnished as part of the Mechanical Engineer's written control sequences (such details are commonly omitted from the Mechanical Engineer's written control sequences and shall be provided by the Temperature Control Contractor at no additional cost to the Owner.) The written control sequences, initial set points and dead-bands shall all be reviewed and confirmed with the Engineer.
- B. After all temperature control sequences have been finalized and have been approved by the Engineer (and after the HVAC systems commissioning process has been completed) the Contractor shall provide as-built documentation which shall include written control sequences. Written control sequences shall be provided both in hard copy and on diskette.

1.4 WARRANTY PERIOD SERVICES

- A. The Contractor shall provide full service for the temperature control system for a period of one-year after the date of Substantial Completion. Service shall include, but not be limited to, calibration of all sensors and other devices, adjustment to set points and modifications to control sequences or programming as required/desired to fine-tune and/or finalize all control sequences.

1.5 TRAINING

- A. Upon completion of work, the Temperature Control Contractor shall instruct the Owner's designated personnel on the operation of all control system software features shall provide a complete explanation of the control sequences for each item of equipment and shall provide instructions on the

City of Reno Maintenance and Operations
California Building HVAC Replacement

operation and maintenance of all control devices. Training time shall be a minimum of twelve total hours (consisting of three separate 4- hours sessions.)

1.6 EMCS SOFTWARE AND PROGRAMMING REQUIREMENTS

- A. Provide a security/password system with two passwords systems with two passwords of up to four characters each. The security/password system shall access based on four levels of security as follows:
1. Level 1 viewing only.
 2. Level 2 Room temperature adjustment.
 3. Level 3 Adjustment of all set points.
 4. Level 4 full access to all set points and programming.
- B. No set points related to the equipment control sequences or programming shall be accessible by anyone other than the Temperature Control Contractor during the commissioning and warranty period.
- C. The Temperature Control Contractor shall program the eleven School District Holidays into the EMCS software for the three years following the date of installation. The eleven School District Holidays each year are as follows:
- | | |
|--------------------------------------|-------------------------------|
| 1. New Year's Day | January 1 |
| 2. Martin Luther King, Jr's Birthday | Third Monday in January |
| 3. President's Day | Third Monday in February |
| 4. Memorial Day | Last Monday in May |
| 5. Independence Day | July 4 th |
| 6. Labor Day | First Monday in September |
| 7. Nevada Day | Last Friday in October |
| 8. Veteran's Day | November 11 |
| 9. Thanksgiving Day | Fourth Thursday in November |
| 10. Family Day | Friday following Thanksgiving |
| 11. Christmas Day | December 25 th |

When January 1, July 4, November 11 or December 25 falls on a Saturday, the preceding Friday is the observed holiday. If these days fall on Sunday, the following Monday is the observed holiday.

- D. Equipment schedules – A separate occupied/unoccupied schedule shall be provided for each heat pump, air handling unit, fan coil or other individual air handling systems. A graphic display shall be provided to allow for access to each of the schedules from the display screen.

1.7 GRAPHIC DISPLAYS

- A. All temperature set points and all other set points identified as adjustable shall be adjustable from the appropriate graphic displays. Set points given in the control sequences are for initial set-up and trial of system operations. Control system shop drawing shall utilize the same (or similar) written sequences with all set points, throttling ranges and differentials identified. As-built drawing shall include this same information with actual set points following start-up, testing, and adjustment.
- B. Monitored points and alarms for each system shall be shown on the displays with full color graphics and real time data as listed below. Where indicated, graphic shall be dynamic (animated). All graphic displays shall be submitted to the Engineer for review and approval prior to commencing any programming for the temperature controls. Graphic displays shall be developed for a screen resolution of 800 x 600 unless otherwise agreed upon in writing.
- C. All temperatures shall be displayed with zero decimal places.
- D. All valves and damper positions shall be displayed as percent open and shall be displayed with zero decimal places.
- E. All set points which are identified as "adjustable" in written control sequences shall be adjustable via the associated graphic displays (including dead band between and cooling room set point.)

City of Reno Maintenance and Operations
California Building HVAC Replacement

- F. All occupied mode and unoccupied mode room temperature set points shall have an adjustable dead band (adjustable from the associated graphic display).
- G. All displays specified to be dynamic shall depict motion (as a minimum dynamic display shall include rotating fan wheels and rotating pump impellers.)
- H. All set points adjustable from the graphic displays shall be programmed with the dead band on one side of the set point (not split evenly across the set point - unless otherwise specified.)
- I. Zone Temperature Summary – Provide a summary screen which indicates the current room temperature set point and current room temperature for each zone. The screen shall have a global room temperature set point capability that will override the current/individual set point for all zones. Each zone shall be capable of being set to either the global set point or to a separate individual set point. By selecting any of the zones on the screen there shall be the capability to transfer to the selected zones' equipment control screen and back. The zone summary screen shall also include additional information such as discharge air temperature, valve position, fan status, etc. (these requirements shall be coordinated with the Owner prior to developing graphic displays.)
- J. Floor Plans – Provide a display showing the building floor plans, all space temperature sensors, and the equipment associated with each zone (with the zone borders depicted on the floor plan.) The necessary AutoCAD drawing file will be furnished to the Temperature Control Contractor by the Mechanical Engineer upon request.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved manufacturers subject to compliance with requirements: (See Part 3-Execution, General, 01)
 - 1. Alerton Technologies to match existing school district systems, no exceptions.

2.2 MATERIALS AND EQUIPMENT

- A. General:
 - 1. Provide a distribution processing system complete with Direct Digital Control (DDC) software. The system shall be a fully integrated package of control and instrumentation to control all heat pumps, valves, fans, pumps, etc., directly without intervening conventional controls. Control system components shall be manufacturer's standard as indicated through published product information, designed, and constructed as recommended by the manufacturer.
- B. System Architecture
 - 1. The system shall be a complete stand-alone energy management and control system consisting of state-of-the-art menu-driven technology, dynamic graphics, and simple user-friendly operation, completely programmable and highly modular in construction.
 - 2. The basic elements shall be built up of standard components kept in inventory by the EMCS supplier. Components shall not require customizing other than setting jumpers and switches, adding firmware modules or software programming to perform required functions.
 - 3. The system shall be a true distributed processing system with all software control functions to be performed by the remote field panels. Control software shall be in nonvolatile memory. System shall provide "on-line" programming by both "local" and "remote" computer terminals allowing any and all data to be changed, added, deleted, etc., from either terminal. Remote field computers shall communicate with the central processor and the terminal unit control panels.
- C. Global Controller.
 - 1. BACnet Conformance
 - a. Building Controller shall be approved by the BTL as meeting BACnet Building Controller requirements.
 - b. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the

City of Reno Maintenance and Operations
California Building HVAC Replacement

functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented, and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information

2. Building controller shall be of scalable design such that the number of trunks and protocols may be selected to fit the specific requirements of a given project.
3. The controller shall be capable of panel-mounted on DIN rail and/or mounting screws.
4. The controller shall be capable of providing global control strategies for the system based on information from any objects in the system, regardless if the object is directly monitored by the building controller module or by another controller.
5. The controller shall be capable of running up to six (6) independent control strategies simultaneously. The modification of one control strategy does not interrupt the function or runtime of others.
6. The software program implementing the DDC strategies shall be completely flexible and user-definable. All software tools necessary for programming shall be provided as part of the project software. Any systems utilizing factory pre-programmed global strategies that cannot be modified by field personnel on-site, using a wide area network (WAN) or downloaded through remote communications are not acceptable. Changing global strategies using firmware changes are also unacceptable.
7. Programming shall be object oriented using control function blocks and support DDC functions. All flowcharts shall be generated and automatically downloaded to controller. Programming tool shall be supplied and be resident on workstation. The same tool shall be used for all controllers.
8. The programming tool shall provide means to graphically view inputs and outputs to each program block in real-time as program is executing. This function may be performed using the operator's workstation or field computer.
9. Controller shall have 6,000 Analog Values and 6,000 Binary Values.
10. Controller IP configuration can be done via a direct USB connect with an operator's workstation or field computer.
11. Controller shall have at a minimum a Quad Core 996Ghz processor to ensure fast processing speeds.
12. Global control algorithms and automated control functions shall execute using a 64-bit processor.
13. Controller shall have a minimum of GB of DDR3 SDRAM on a 533Mhz bus to ensure high speed data recording, large data storage capacity and reliability.
14. Controller shall support two (2) on-board EIA-485 ports capable of supporting various EIA-485 protocols including, but not limited to BACnet MS/TP and Modbus.
 - a. Ports are capable of supporting various EIA-485 protocols including, but not limited to BACnet MS/TP and Modbus.
15. Controller shall support two (2) ports-each of gigabit speed- Ethernet (10/100/1000) ports.
 - a. Ports are capable of supporting various Ethernet protocols including, but not limited to BACnet IP, FOX, and Modbus.
16. All ports shall be capable of having protocol(s) assigned to utilize the port's physical connection.
17. The controller shall have at a minimum four (4) on-board inputs, two (2) universal inputs and two (2) binary inputs.
18. Schedules.
 - a. Building controller modules shall provide normal seven-day scheduling, holiday scheduling and event scheduling.
 - b. Each building controller shall support a minimum of 380 BACnet Schedule Objects and 380 BACnet Calendar Objects.
19. Logging Capabilities.
 - a. Each building controller shall log as minimum 2,000 objects at 15-minute intervals. Any object in the system (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's workstation.
 - b. Logs may be viewed both on-site or off-site using WAN or remote communication.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- c. Building controller shall periodically upload trended data to network operator's workstation for long term archiving of desired.
 - d. Archived data stored in database format shall be available for use in third-party spreadsheet or database programs.
- 20. Alarm Generation
 - a. Alarms may be generated within the system for any object change of value or state (either real or calculated). This includes things such as analog object value changes, binary object state changes, and various controller communication failures.
 - b. Each alarm may be dialed out as noted elsewhere.
 - c. Alarm log shall be provided for alarm viewing. Log may be viewed on-site at the operator's terminal or off-site using remote communications.
 - d. Controller must be able to handle up to 2,000 alarm setups stored as BACnet event enrollment objects, with system destination and actions individually configurable.
- 21. DDC Terminal Unit Controller
 - a. Each controller shall be microprocessor based and communicate with its respective GC and also be stand-alone maintaining its own control strategy in the event of communication failure with the GC or remote computer terminals. Each controller shall contain RAM and ROM and be capable of controlling heat pumps, boilers, cooling towers, pumps etc., as specified in control sequence. Inputs shall be either analog or digital. Momentary type switch closure allows an input to be both analog and digital. Outputs shall be analog or digital with LED's provided to indicate status. Each controller is linked serially by a pair of wires and communicates to its respective GC at 4800 baud. Controllers default to last programmed temperature or to fixed operator selectable control whenever communication to GC is lost. Default mode shall be field changeable. All operating modes (except default) and set points shall be modified at the computer terminals. Each unit shall allow complete calibration of all temperatures.
 - b. System shall be capable of accomplishing any controller to controller command within a maximum of 1 second.
- D. OA Temperature Sensor:
 - 1. Sensor shall be pre-calibrated Thermistor type resistance element complete with terminal housing and sensor shield.
- E. Immersion Temperature Sensor
 - 1. Sensor shall be similar to OA sensor, except a stainless steel well shall be included providing sensor with fluid contact and capability for sensor removal without draining system.
- F. Current Sensors shall be as follows
 - 1. Current sensors shall be digital type and shall have the capability to transmit the actual system reading.
- G. Duct Temperature Sensor
 - 1. Sensor shall be similar to OA sensor where used in ducts not to exceed 36 inches.
- H. Duct Temperature Sensor
 - 1. Sensor shall be similar to (I); except the sensor shall be averaging type with mechanical support across the duct section when used in ducts over 36" wide.
- I. Room Temperature Sensor
 - 1. Sensor shall contain temperature sensing element. Controller shall allow occupants to raise and lower set point and to activate heat pump for override use within limits programmed by building operator. Controller shall allow service technician access following a password entry to view and change any data relative to service, maintenance, and operation of the heat pump control. Provide service tool to check data for each individual heat pump from its thermostat Mount at +4'-6" AFF.
- J. Relays
 - 1. Relays shall be plug-in type complete with sockets for panel mounting. Poles shall be required and contact rated for intended use.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- K. Damper Actuator
 - 1. Actuator shall be by Belimo with permanently lubricated gear-train sealed in duct tight enclosure. Actuator shall be sized to handle intended load plus 10%. Heat motors will not be acceptable.
- L. Control Dampers
 - 1. Control dampers shall be low leakage type with extruded bladed seals and flexible metal jamb seals. Leakage rating when tested in accordance with AMCA standard shall not exceed 10 cfm/ft² at 4.0" H₂O pressure.
 - 2. Control dampers are to be provided and installed by Mechanical Contractor, control damper actuators to be provided and installed by Temperature Control Contractor.
- M. Gas Monitors
 - 1. Gas monitor for CO₂ and combustibles shall be stand along type utilizing an electrochemical cell (for toxic gas monitoring) or a catalytic combustion cell (for explosive gas monitoring.) Gas monitor shall have an analog output for input to EMCS system. Gas monitor shall also have two (2) alarm relays. Monitor shall be Honeywell Analytics Model E3SM with appropriate Sensor Cartridge for all gases except CO₂ which shall be Honeywell Analytics IAQPoint2.
- N. Software
 - 1. The Energy Management and Control System (EMCS) application program shall be written to communicate specifically utilizing BACnet protocols. Software functions delivered on this project shall include password protection, scheduling (including optimum start), alarming, logging of historical data, full graphics including animation, after-hours billing program, demand limiting, and a full suite of field engineering tools including graphical programming and applications. Systems using operating systems other than that described above are strictly prohibited. All software required to program application specific controller and all field level devices and controllers will be left with the owner. All software passwords required to program and make future changes to the system will also become the property of the owner. All software required to make any program changes anywhere in the system, along with scheduling and trending applications, will be left with the owner. All software passwords required to program and make future changes to scheduled, trends and related program changes will also become the property of the owner. All software required for all field engineering tools including graphical programming and applications will be left with the owner. All software passwords required to program and make future changed to field engineering tools, including graphical programming and applications will be left with the owner.

PART 3 - INSTALLATION

3.1 GENERAL

- A. By "Alerton Technologies" by Building Control Services, Inc. no exceptions.
- B. Interlock and Control Wiring
 - 1. Installation shall be in a neat and workman like manner with all runs parallel to or perpendicular to building lines.
 - 2. All wiring walls shall be in EMT. In ceiling areas above finished ceilings, exposed "plenum rated cabling" without raceways shall be permissible, where code permits. Cabling shall be supported above finished ceiling as high as permissible in a neat and workmanship like manner. Cabling shall not lie on top of finished ceiling.
 - 3. "Plenum Rated" cabling shall be identified as follows:
 - a. "EMS Communication" cabling shall be "raspberry" in color and identified on cabling jacket every three (3) feet-minimum.
 - b. "EMS Sensor" cabling shall be "blue" in color and identified on cabling jacket every three (3) feet-minimum.
 - c. Installation shall be in accordance with manufacturers written instructions and with recognized industry standards.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- d. All wiring shall be in conformance with all local and national code requirements.
- e. Verify all room sensor locations in the field prior to installation and relocate as required at no cost to the owner.

C. Control Panels

- 1. Mount controllers, relays, and switches, etc. for equipment located in equipment rooms in enclosed control panels with hinged doors. Control devices for equipment located in exposed areas subject to outside weather conditions shall be mounted inside weatherproof enclosures. Location of each panel shall be convenient for adjustment service. Provide plastic nameplates at each panel-mounted control device describing function of device.
- 2. Prewire electrical devices within the panel to number interdevice within panel completed prior to installation. Terminal numbers to match terminals shown on control diagram.
- 3. Coordinate with Division 23 and 26, including power distribution and mechanical and electrical equipment, as necessary to properly interface installation.
- 4. Adjust and validate all thermostats, sensors, controllers, relays, etc., provided, and complete system validation forms attached in conjunction with DCSD Personnel.
- 5. Validation forms shall be completed and furnished to test and balance contractor for inclusion in final report prior to final inspection and be provided to commissioning agent.

3.2 ADJUSTMENT

- A. Adjust and validate all thermostats, sensors, controllers, relays, etc., provided, and complete system validation forms attached in conjunction with Owner's representative. Provide complete 24 hour printed logs to owner for all equipment operations and system functions as part of acceptance. Thirty days prior to first year warranty anniversary date, provide a duplicate series of validation logs in cooperation with owner's representative. Initial validation complete with all logs shall be included with "Operation and Maintenance Manuals." Copies of all additional logs shall be furnished to Engineer at same time they are furnished to Owner.
 - 1. Items to be logged include:
 - a. Heat pump loop supply water.
 - b. Heat pumps; operating temperatures.
 - 2. Specific problem areas requested by Building Operations Engineer.
 - 3. Copies of each log complete with analysis shall be furnished to commissioning agency.

3.3 INSTRUCTION

- A. Furnish instruction manuals covering functions and operation of control systems for use by Owner's operating personnel. A field instruction period lasting not less than two (2) 8-hour days shall be provided followed by one (1) 8-hour day approximately 30 days later.
- B. Provide control diagrams, reduce as required, diagrams shall equipment, controls, etc., marked to correspond to identification on equipment.
- C. Control Contractor shall maintain terminal and printer in his office to communicate with jobsite and for system troubleshooting, fine tubing system set points and assistance to owner on-site personnel.
- D. Provide vandal proof type sensors or covers on all devices exposed to public.

3.4 COMMISSIONING

- A. Control Contractor shall meet all requirements outlined by Commissioning agent as described in specification.

PART 4 - WARRANTY

4.1 GENERAL

- A. Provide one-year unconditional warranty on all material, software and labor furnished and installed under this contract from date of substantial completion.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Provide and install any software updates and software changes for the site required by owner occurring during warranty period without charge.

END OF SECTION 23 09 00

SECTION 23 23 00 – REFRIGERANT PIPING

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-410:
 - 1. Suction Lines for Air-Conditioning Applications: 200 psig
 - 2. Liquid Lines for Air-Conditioning Applications: 535 psig

1.2 SUBMITTALS

- A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.
- B. See section 01 30 00 for submittal requirements.

1.3 QUALITY ASSURANCE

- A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."
- B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.4 PRODUCT STORAGE AND HANDLING

- A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 PIPING APPLICATIONS

- A. Copper and tube fittings
 - 1. Drawn-Temper Copper Tube: ASTM B 280, Type ACR, clean, dry, and capped.
 - 2. Annealed-Temper Copper Tube: ASTM B 280, Type ACR, clean, dry, and capped. Annealed copper tubing shall not be used for piping larger than 0.625 O.D.
 - 3. Wrought-Copper Fittings: ASME B16.22.
 - 4. Wrought-Copper Unions: ASME B16.22.
 - 5. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.
 - 6. Brazing Filler Metals: AWS A5.8.

2.2 VALVES AND SPECIALTIES

- A. Moisture/Liquid Indicators:
 - 1. Body: Forged brass.
 - 2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
 - 3. Indicator: Color coded to show moisture content in ppm.
 - 4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
 - 5. End Connections: Socket or flare.
 - 6. Working Pressure Rating: 500 psig.
 - 7. Maximum Operating Temperature: 240 deg F.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Permanent Filter Dryers: Comply with ARI 730.
 - 1. Body and Cover: Painted-steel shell.
 - 2. Filter Media: 10 micron-pleated with integral end rings; stainless-steel support.
 - 3. Desiccant Media: Activated alumina
 - 4. End Connections: Socket.
 - 5. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
 - 6. Maximum Pressure Loss: 2 psig
 - 7. Working Pressure Rating: 500 psig
 - 8. Maximum Operating Temperature: 240 deg F

2.3 REFRIGERANTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Atofina Chemicals, Inc.
 - 2. DuPont Company; Fluorochemicals Div.
 - 3. Honeywell, Inc.; Genetron Refrigerants.
 - 4. INEOS Fluor Americas LLC.
 - 5. Or approved equal.

2.4 INSULATION

- A. For indoor refrigerant piping, the suction piping shall be insulated with Rubatex R-180 FS or approved equal 1/2" thick closed cell foam insulation meeting all NFPA requirements for smoke density and flame spread.
- B. All outdoor section of the refrigerant suction and liquid piping shall be insulated with Rubatex R-180 FS or approved equal 1/2" thick closed cell foam insulation meeting all NFPA requirements for smoke density and flame spread and covered with embossed aluminum jacket.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Suction and Liquid Lines NPS 1-1/2 for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed joints.

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.
- B. Install refrigerant piping according to ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping adjacent to machines to allow service and maintenance.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels if valves or equipment requiring maintenance is concealed behind finished surfaces.
- L. Install refrigerant piping in rigid conduit in locations where exposed to mechanical injury.
- M. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- N. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- O. Identify refrigerant piping and valves according to Division 23 Section "Identification for HVAC Piping and Equipment."
- P. Install sleeves for piping penetrations of walls, ceilings, and floors.
- Q. Install sleeve seals for piping penetrations of concrete walls and slabs.
- R. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.3 PIPE JOINT CONSTRUCTION

- A. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
 - 1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.

3.4 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet long.
 - 2. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
 - 1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4 inch.
 - 2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch.
 - 3. NPS 1: Maximum span, 72 inches; minimum rod size, 1/4 inch.
 - 4. NPS 1-1/4: Maximum span, 96 inches; minimum rod size, 3/8 inch.
- D. Support multifloor vertical runs at least at each floor.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping and specialties. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
 - a. Fill system with nitrogen to the required test pressure.
 - b. System shall maintain test pressure at the manifold gage throughout duration of test.
 - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
 - d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.6 SYSTEM CHARGING

- A. Charge system using the following procedures:
 1. Install core in filter dryers after leak test but before evacuation.
 2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
 3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.

Charge system with a new filter-dryer core in charging line.

3.7 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning controllers to the system design temperature.

END OF SECTION 23 23 00

SECTION 23 31 13 – METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rectangular ducts and fittings.
 - 2. Sheet metal materials.
 - 3. Sealants and gaskets.
 - 4. Hangers and supports.
 - 5. Seismic-restraint devices.
 - 6. Duct Liner
- B. Related Sections:
 - 1. Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
 - 2. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports and seismic restraints shall withstand the effects of gravity, wind loads, snow loads, and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"
 - 1. See section 23 05 48 for seismic performance requirements.
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2010.

1.3 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
 - 3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCT AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Duct connectors: Ductmate 25, or approved equal, rectangular duct connector.

2.2 ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Ductwork connected to dehumidification unit is to be 316 stainless steel with stainless steel screws, stainless steel flanges and stainless-steel fittings and support.

2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Galvanized Steel Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Water-Based Joint and Seam Sealant:
 - 1. Application Method: Brush on.
 - 2. Solids Content: Minimum 65 percent.
 - 3. Shore A Hardness: Minimum 20.

City of Reno Maintenance and Operations
California Building HVAC Replacement

4. Water resistant.
 5. Mold and mildew resistant.
 6. VOC: Maximum 75 g/L (less water).
 7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
 8. Service: Indoor or outdoor.
 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
- C. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
- D. Round Duct Joint O-Ring Seals:
1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch and shall be rated for 10-inch wg static-pressure class, positive or negative.
 2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
 3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.
- 2.5 HANGERS AND SUPPORTS
- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Pool Room: See non-metallic hangers and supports specification.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- F. Trapeze and Riser Supports:
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
- 2.6 INSULATION
- A. Rigid sheet insulation: Polyisocyanurate (RMax) insulation compliant with ASTM C1289, having minimum thermal resistance of 0.167 per degree F/BTUH/inch at 75-degrees F mean temperature.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Johns Manville AP foil face or comparable product by one of the following:
 - a. Approved equal.
- 2.7 DUCT LINER
- A. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
1. Basis-of-Design Product: Subject to compliance with requirements, provide Johns Manville Linacoustic RC or comparable product by one of the following:
 - a. CertainTeed Corporation; Insulation Group.
 - b. Knauf Insulation.
 - c. Owens Corning.
 2. Duct liner shall be a minimum of 1-1/2" thick with a minimum installed R-value of R-6.
 3. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
 4. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- a. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Insulation Pins and Washers:
 - 1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
 - 2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch thick galvanized steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
- C. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-19, "Flexible Duct Liner Installation."
 - 1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
 - 2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
 - 3. Butt transverse joints without gaps, and coat joint with adhesive.
 - 4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
 - 5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
 - 6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm.
 - 7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
 - 8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
 - a. Fan discharges.
 - b. Intervals of lined duct preceding unlined duct.
 - c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.
 - 9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.
 - a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.

2.8 SEISMIC-RESTRAINT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.
 - 2. Ductmate Industries, Inc.
 - 3. Hilti Corp.
 - 4. Unistrut Corporation.
- B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an evaluation service member of the ICC Evaluation Service.
- C. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.
- D. Restraint Cables: ASTM A 603, galvanized-steel cables with end connections made of cadmium-plated steel assemblies with brackets, swivel, and bolts designed for restraining cable service; and with an automatic-locking and clamping device or double-cable clips.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- E. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements where used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Round duct joint seals: o-ring.
- C. Maintain consistency, symmetry, and uniformity in arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- D. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 2. Outdoor, Supply-Air Ducts: Seal Class A.
 - 3. Outdoor, Return-Air Ducts: Seal Class A.
 - 4. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg Seal Class B.
 - 5. Conditioned Space, Exhaust Ducts: Seal Class B.

City of Reno Maintenance and Operations
California Building HVAC Replacement

6. Conditioned Space, Return-Air Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."
- B. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- C. Hangers Exposed to View: Threaded rod and angle or channel supports.
- D. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum interval of 16 feet.
- E. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 SEISMIC-RESTRAINT-DEVICE INSTALLATION

- A. Install ducts with hangers and braces designed to support the duct and to restrain against seismic forces required by applicable building codes.
- B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.
- C. Install seismic-restraint devices using methods approved by an evaluation service member of the ICC Evaluation Service.
- D. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.

3.6 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 START UP

- A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

3.8 DUCT SCHEDULE

- A. Duct Liner:
 - 1. Indoor Rectangular Supply Ducts and Fittings: Fibrous glass, 1-1/2 inch thick
 - 2. Indoor Rectangular Return Ducts and Fittings: Fibrous glass, 1-1/2 inch thick
 - 3. Adjust duct size to accommodate liner and give net dimensions shown on drawings.
- B. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
- C. Supply Ducts:
 - 1. Ducts Connected to Fan Coil Units and Heat Pumps:
 - a. Pressure Class: Positive 2-inch wg.
 - b. Minimum SMACNA Seal Class: B.
 - c. SMACNA Leakage Class for Rectangular: 3.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- d. SMACNA Leakage Class for Round and Flat Oval: 3.
 - 2. Ducts Connected to Ducts Connected to Rooftop Units:
 - a. Pressure Class: Positive 3-inch wg.
 - b. Minimum SMACNA Seal Class: B.
 - c. SMACNA Leakage Class for Rectangular: 3.
 - d. SMACNA Leakage Class for Round and Flat Oval: 3.
- D. Return Ducts:
 - 1. Ducts Connected to Fan Coil Units and Heat Pumps:
 - a. Pressure Class: Positive 2-inch wg.
 - b. Minimum SMACNA Seal Class: B.
 - c. SMACNA Leakage Class for Rectangular: 6.
 - d. SMACNA Leakage Class for Round and Flat Oval: 6.
 - 2. Ducts Connected to Rooftop Units:
 - a. Pressure Class: Positive or negative 3-inch wg.
 - b. Minimum SMACNA Seal Class: B.
 - c. SMACNA Leakage Class for Rectangular: 6.
 - d. SMACNA Leakage Class for Round and Flat Oval: 6.
- E. Outdoor Supply and Return Ducts:
 - 1. Inner Ducts Connected to Rooftop Units:
 - a. Ductmate joint connector
 - b. Pressure Class: Positive or negative 4-inch wg.
 - c. Minimum SMACNA Seal Class: A.
 - d. SMACNA Leakage Class for Rectangular: 3.
 - e. SMACNA Leakage Class for Round and Flat Oval: 3.
 - 2. Duct Insulation: 2" rigid polyisocyanurate (R-max) board adhered to duct.
 - 3. Outer Duct Jacket Connected to Rooftop Units:
 - a. Ductmate joint connector. Use full length cleat to prevent water from collecting on the gasket.
 - b. Pressure Class: Positive or negative 4-inch wg.
 - c. Minimum SMACNA Seal Class: A.
 - d. SMACNA Leakage Class for Rectangular: 3.
 - e. SMACNA Leakage Class for Round and Flat Oval: 3.
 - 4. Paint to match building exterior color.
- F. Intermediate Reinforcement:
 - 1. Galvanized-Steel Ducts: Galvanized steel.
- G. Elbow Configuration:
 - 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Velocity 1000 fpm or Lower:
 - 1 Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
 - 2 Mitered Type RE 4 without vanes.
 - b. Velocity 1000 to 1500 fpm:
 - 1 Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
 - 2 Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
 - 3 Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 - c. Velocity 1500 fpm or Higher:
 - 1 Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - 2 Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - 3 Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

City of Reno Maintenance and Operations
California Building HVAC Replacement

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
 - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
 - 1 Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
 - 2 Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
 - 3 Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
 - 4 Radius-to Diameter Ratio: 1.5.
 - b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
 - c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.
- H. Branch Configuration:
1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
 - a. Rectangular Main to Rectangular Branch: 45-degree entry.
 - b. Rectangular Main to Round Branch: Spin in.
 2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
 - a. Velocity 1000 fpm or Lower: 90-degree tap.
 - b. Velocity 1000 to 1500 fpm: Conical tap.
 - c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 23 31 13

SECTION 23 33 00 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual volume dampers.
 - 2. Flange connectors.
 - 3. Turning vanes.
 - 4. Duct-mounted access doors.
 - 5. Flexible connectors.
 - 6. Duct accessory hardware.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Manual volume damper installations.
 - c. Control-damper installations.
 - d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
 - e. Wiring Diagrams: For power, signal, and control wiring.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:

City of Reno Maintenance and Operations
California Building HVAC Replacement

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - a. Greenheck Fan Corporation.
 - b. Nailor Industries Inc.
 - c. Air Balance Inc.
 - d. Ruskin.
 - e. Vent Products Co., Inc.
 2. Standard leakage rating, with linkage outside airstream.
 3. Suitable for horizontal or vertical applications.
 4. Frames:
 - a. Frame: Hat-shaped, 22 gauge-thick, galvanized sheet steel.
 - b. Mitered and welded corners.
 - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
 5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized-steel, 20 gauge thick.
 6. Blade Axles: Galvanized steel.
 7. Bearings:
 - a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 8. Tie Bars and Brackets: Galvanized steel.
- B. Jackshaft:
1. Size: 0.5-inch diameter.
 2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
 3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.
- C. Damper Hardware:
1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
 2. Include center hole to suit damper operating-rod size.
 3. Include elevated platform for insulated duct mounting.
- 2.4 FLANGE CONNECTORS
- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. CL WARD & Family Inc.
 2. Ductmate Industries, Inc.
 3. Hardcast, Inc.
 4. Ward Industries, Inc.
- B. Description: Add-on or roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
- C. Material: Galvanized steel.
- D. Gage and Shape: Match connecting ductwork.
- 2.5 TURNING VANES
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CL WARD & Family Inc.
 2. Ductmate Industries, Inc.
 3. Duro Dyne Inc.

City of Reno Maintenance and Operations
California Building HVAC Replacement

4. Hardcast, Inc.
 5. METALAIRE, Inc.
 6. Ward Industries, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- E. Vane Construction: Single wall.
- 2.6 FLEXIBLE CONNECTORS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ductmate Industries, Inc.
 2. Duro Dyne Inc.
 3. Hardcast, Inc.
 4. Ventfabrics, Inc.
 5. Ward Industries, Inc.
- B. Materials: Flame-retardant or noncombustible fabrics.
- C. Coatings and Adhesives: Comply with UL 181, Class 1.
- D. Metal-Edged Connectors: Factory fabricated with a fabric strip 5-3/4 inches wide attached to two strips of 2-3/4-inch-de, 0.028-inch-ick, galvanized sheet steel or 0.032-inch-ick aluminum sheets. Provide metal compatible with connected ducts.
- E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd.
 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 3. Service Temperature: Minus 40 to plus 200 deg F
- 2.7 DUCT ACCESSORY HARDWARE
- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness. Test holes shall be finished with a Ventlock instrument test hole assembly, Ventlock model 699.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 - 1. Install steel volume dampers in steel ducts.
 - 2. Install aluminum volume dampers in aluminum ducts.
- D. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Install test holes at fan inlets and outlets and elsewhere as indicated.
- F. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
 - 1. On both sides of duct coils.
 - 2. Upstream and downstream from duct filters.
 - 3. At outdoor-air intakes and mixed-air plenums.
 - 4. At drain pans and seals.
 - 5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
 - 6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
 - 7. At each change in direction and at maximum 50-foot spacing.
 - 8. Upstream and downstream from turning vanes.
 - 9. Upstream or downstream from duct silencers.
 - 10. Control devices requiring inspection.
 - 11. Elsewhere as indicated.
- G. Install access doors with swing against duct static pressure.
- H. Install flexible connectors to connect ducts to all equipment with a fan.
- I. Connect diffusers or light troffer boots to ducts with maximum 60-inch lengths of flexible duct clamped or strapped in place.
- J. Connect flexible ducts to metal ducts with draw bands.
- K. Install duct test holes where required for testing and balancing purposes.

3.2 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Operate dampers to verify full range of movement.
 - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
 - 3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
 - 4. Inspect turning vanes for proper and secure installation.

END OF SECTION 23 33 00

SECTION 23 33 46 - FLEXIBLE DUCTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Insulated flexible ducts.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- C. Comply with the Air Diffusion Council's "ADC Flexible Air Duct Test Code FD 72-R1."
- D. Comply with ASTM E96/E96M, "Test Methods for Water Vapor Transmission of Materials."

2.2 INSULATED FLEXIBLE DUCTS

- A. Provide product by one of the following manufacturers:
 - 1. ATCO
 - 2. Thermaflex
 - 3. Hart & Cosley
 - 4. Or approved equal
- B. Insulated, Flexible Duct: UL 181, Class 1, two-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.
 - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - 2. Maximum Air Velocity: 4000 fpm.
 - 3. Temperature Range: Minus 10 to plus 160 deg F.
 - 4. Insulation R-Value: R6.

2.3 FLEXIBLE DUCT CONNECTORS

- A. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install flexible ducts according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install in indoor applications only. Flexible ductwork should not be exposed to UV lighting.
- C. Connect diffusers or ceiling return grilles to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.
- D. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.
- E. Install duct test holes where required for testing and balancing purposes.
- F. Installation:
 - 1. Install ducts fully extended.
 - 2. Do not bend ducts across sharp corners.
 - 3. Bends of flexible ducting shall not exceed a minimum of one duct diameter.
 - 4. Avoid contact with metal fixtures, water lines, pipes, or conduits.
 - 5. Install flexible ducts in a direct line, without sags, twists, or turns.
- G. Supporting Flexible Ducts:
 - 1. Suspend flexible ducts with bands 1-1/2 inches wide or wider and spaced a maximum of 48 inches apart. Maximum centerline sag between supports shall not exceed 1/2 inch per 12 inches.
 - 2. Install extra supports at bends placed approximately one duct diameter from center line of the bend.

END OF SECTION 23 33 46

SECTION 23 37 13 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rectangular and square ceiling diffusers.
 - 2. Duct mounted supply and exhaust grilles.
 - 3. Return and Exhaust Grilles

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.
- B. See section 01 30 00 for submittal requirements.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

- A. Rectangular and Square Ceiling Diffusers:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Krueger.
 - b. Price Industries.
 - c. Titus.
 - 2. Material: Aluminum.
 - 3. Finish: Baked enamel, white.

2.2 DUCT MOUNTED SUPPLY AND EXHAUST GRILLES

- A. Rectangular and Square return and exhaust grilles:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Air Concepts.
 - b. Krueger.
 - c. Price Industries.
 - d. Titus.
 - 2. Material: Aluminum.
 - 3. Finish: Baked enamel, white.

2.3 RETURN AND EXHAUST GRILLES

- A. Rectangular and Square return and exhaust grilles:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Krueger.
 - b. Price Industries.
 - c. Titus.
 - 2. Material: Aluminum.
 - 3. Finish: Baked enamel, white.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.4 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.2 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

SECTION 23 74 16.11 - PACKAGED ROOFTOP AIR-CONDITIONING UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes packaged rooftop air-conditioning units (RTUs) with the following components and accessories:
 - 1. Casings.
 - 2. Fans.
 - 3. Motors.
 - 4. Coils.
 - 5. Refrigerant circuit components.
 - 6. Air filtration.
 - 7. Gas furnaces.
 - 8. Dampers.
 - 9. Electrical power connections.
 - 10. Controls.
 - 11. Accessories.
 - 12. Roof curbs.

1.2 PHYSICAL DIMENSIONS AND CLEARANCES

- A. Units are located in small fenced enclosures that cannot be increased. Unit size, service clearance, and clearance for recommended airflow must be maintained.

1.3 ACTION SUBMITTALS

- A. Product Data: For each RTU.
- B. Delegated-Design Submittal: For RTU supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans and other details, drawn to scale and coordinated with each other, using input from installers of the items involved.
- B. Product Certificates: Submit certification that specified equipment will withstand wind forces identified in "Performance Requirements" Article and in Section 23 0548 "Vibration and Seismic Controls for HVAC."
- C. Field quality-control reports.
- D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.6 WARRANTY

- A. Special Warranty: Manufacturer/Contractor agrees to repair or replace components of RTUs that fail in materials or workmanship for a period of 1 year and compressors for 5 years; non-prorated.

City of Reno Maintenance and Operations
California Building HVAC Replacement

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. AHRI Compliance:
 - 1. Comply with AHRI 210/240 for testing and rating energy efficiencies for RTUs.
 - 2. Comply with AHRI 340/360 for testing and rating energy efficiencies for RTUs.
 - 3. Comply with AHRI 270 for testing and rating sound performance for RTUs.
 - 4. Comply with AHRI 1060 for testing and rating performance for air-to-air exchanger.
- B. AMCA Compliance:
 - 1. Comply with AMCA 11 and bear the AMCA-Certified Ratings Seal for air and sound performance according to AMCA 211 and AMCA 311.
 - 2. Damper leakage tested according to AMCA 500-D.
 - 3. Operating Limits: Classify according to AMCA 99.
- C. ASHRAE Compliance:
 - 1. Comply with ASHRAE 15 for refrigeration system safety.
 - 2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.
 - 3. Comply with applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- D. ASHRAE/IES Compliance: Comply with applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- E. NFPA Compliance: Comply with NFPA 90A or NFPA 90B.
- F. UL Compliance: Comply with UL 1995.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, provide product indicated on drawings or comparable product by one of the following:
 - 1. Lennox.
 - 2. Daikin.
 - 3. Trane.
 - 4. JCI
 - 5. Carrier
 - 6. Valent
 - 7. Or Approved Equal.

2.3 PHYSICAL DIMENSIONS AND CLEARANCES

- A. Units are located in a small fenced area

2.4 CAPACITIES AND CHARACTERISTICS

- A. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's access door.
- B. See drawings for capacities and characteristics.

2.5 CASINGS

- A. General Fabrication Requirements for Casings: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Exterior Casing Material: Galvanized steel with factory-painted finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.
 - C. Casing Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.
 - 1. Materials: ASTM C 1071, Type I.
 - 2. Thickness: 1/2 inch.
 - 3. Liner materials shall have airstream surface coated with erosion- and temperature-resistant coating or faced with a plain or coated fibrous mat or fabric.
 - 4. Liner Adhesive: Comply with ASTM C 916, Type I.
 - D. Condensate Drain Pans: Fabricated using stainless-steel sheet 0.025-inch-thick, a minimum of 2 inches deep, and complying with ASHRAE 62.1 for design and construction of drain pans.
 - 1. Double-Wall Construction: Fill space between walls with foam insulation and seal moisture tight.
 - 2. Drain Connections: Threaded nipple.
 - E. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- 2.6 FANS
- A. Supply-Air Fans: Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.
 - 1. Direct-Driven Supply-Air Fans: Motor shall be resiliently mounted in the fan inlet.
 - B. Fans to have internal vibration isolation on fan with a maximum of 1-inch of deflection.
- 2.7 MOTORS
- A. Comply with Section 23 05 13 "Common Motor Requirements for HVAC Equipment" and the requirements of this Article.
 - B. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - C. Bearings: Regreasable shielded, antifriction ball bearings suitable for radial and thrust loading.
 - D. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements.
 - E. Motors for 3-phase motors shall be NEMA Premium Efficient.
- 2.8 COILS
- A. Coils shall be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and galvanized steel end casings. Fin design shall be sine wave rippled.
 - B. Coils shall be standard capacity.
 - C. Coils shall be hydrogen leak tested.
 - D. Coils shall be furnished with factory installed expansion valves.
- 2.9 REFRIGERANT CIRCUIT COMPONENTS
- A. Compressors shall be scroll type with thermal overload protection and carry a 5-year non-prorated warranty, from the date of original equipment shipment from the factory.
 - B. Compressors shall be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam injected panels to prevent the transmission of noise outside the cabinet.
 - C. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- D. Each refrigeration circuit shall be equipped with expansion valve type refrigerant flow control.
 - E. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low-pressure sides and a factory installed liquid line filter driers
 - F. Unit shall be a 2-stage compressor.
 - G. Each refrigeration circuit shall be equipped with suction and discharge compressor isolation valves.
 - H. First capacity stage shall be provided with adjustable on/off condenser fan cycling and an adjustable compressor lockout to allow cooling operation down to 35°F.
 - I. Refrigeration Specialties:
 - 1. Refrigerant: R-410A.
 - 2. Expansion valve with replaceable thermostatic element.
 - 3. Manual-reset high-pressure safety switch.
 - 4. Automatic-reset low-pressure safety switch.
 - 5. Minimum off-time relay.
 - 6. Automatic-reset compressor motor thermal overload.
- 2.10 AIR FILTRATION
- A. Minimum arrestance and MERV according to ASHRAE 52.2.
 - B. Pleated Panel Filters:
 - 1. Description: Factory-fabricated, self-supported, extended-surface, pleated, panel-type, disposable air filters with holding frames.
 - 2. Unit shall include 2-inch thick, pleated panel filters with an efficiency of MERV rating of 13, upstream of the cooling coil.
 - 3. Filter Unit Class: UL 900, Class 2.
 - 4. Media: Interlaced glass or synthetic fibers coated with nonflammable adhesive.
 - a. Adhesive: As recommended by air-filter manufacturer and with a VOC content of 80 g/L or less.
 - b. Adhesive: As recommended by air-filter manufacturer and that complies with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - c. Media shall be coated with an antimicrobial agent.
 - d. Separators shall be bonded to the media to maintain pleat configuration.
 - e. Welded-wire grid shall be on downstream side to maintain pleat.
 - f. Media shall be bonded to frame to prevent air bypass.
 - g. Support members on upstream and downstream sides to maintain pleat spacing.
- 2.11 GAS FURNACE
- A. Description: Factory assembled, piped, and wired; complying with ANSI Z21.47/CSA 2.3 and NFPA 54.
 - 1. CSA Approval: Designed and certified by and bearing label of CSA.
 - B. Burners: Galvanized Steel, Stainless steel (where indicated).
 - 1. Fuel: Natural gas.
 - 2. Ignition: Electronically controlled electric spark or hot-surface igniter with flame sensor.
 - C. Heat-Exchanger and Drain Pan: See Drawings heat exchanger characteristics.
 - D. Venting: Gravity vented with vertical extension.
 - E. Power Vent: Integral, motorized centrifugal fan interlocked with gas valve with vertical extension.
 - F. Gas Valve Train: Single-body, regulated, redundant, 24-V ac gas valve assembly containing pilot solenoid valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff.
 - 1. Gas valve shall be 2-stage.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.12 DAMPERS

- A. Leakage Rate: Comply with ASHRAE/IES 90.1.
- B. Damper Motor: Modulating with adjustable minimum position.

2.13 ELECTRICAL POWER CONNECTIONS

- A. RTU shall have a single connection of power to unit with unit-mounted disconnect switch accessible from outside unit and control-circuit transformer with built-in overcurrent protection.

2.14 CONTROLS

- A. Manufacturer's terminal strip for connection to Building HVAC Control System.

2.15 ACCESSORIES

- A. See drawings for roof top unit accessories.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Roof Curb: Install on existing curb or manufacturer's curb adapter (where indicated), level and secure, according to AHRI Guideline B or to manufacturer's instructions. Install RTUs on curbs and coordinate roof penetrations and flashing with roof construction specified in Section 07 71 00 "Roof Accessories." Secure RTUs to upper curb rail, and secure curb base to roof framing with anchor bolts.
- B. Unit Support: Install unit level on structural curbs. Coordinate wall penetrations and flashing with wall construction. Secure RTUs to structural support with anchor bolts.

3.2 CONNECTIONS

- A. Comply with duct installation requirements specified in other HVAC Sections. Drawings indicate general arrangement of ducts. The following are specific connection requirements:
 - 1. Install ducts to termination at top of roof curb.
 - 2. Remove roof decking only as required for passage of ducts. Do not cut out decking under entire roof curb.
 - 3. Connect supply ducts to RTUs with flexible duct connectors specified in Section 23 33 00 "Air Duct Accessories."
 - 4. Install return-air duct continuously through roof structure.
 - 5. Install normal-weight, 3000-psi, compressive strength (28-day) concrete mix inside roof curb, 4 inches thick. Concrete, formwork, and reinforcement are specified with concrete.
- B. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.
- C. Where installing piping adjacent to RTUs, allow space for service and maintenance.
 - 1. Gas Piping: Comply with applicable requirements in Section 23 11 23 "Facility Natural-Gas Piping." Connect gas piping to burner, full size of gas train inlet, and connect with union and shutoff valve with sufficient clearance for burner removal and service.
- D. Connect electrical wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- E. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."
- F. Install nameplate for each electrical connection indicating electrical equipment designation and circuit number feeding connection.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections with the assistance of a factory-authorized service representative.
- B. Tests and Inspections:
 - 1. After installing RTUs and after electrical circuitry has been energized, test units for compliance with requirements.
 - 2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. RTU will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.4 CLEANING AND ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
- B. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new filters.

3.5 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain RTUs by manufacturer's authorized representative.

END OF SECTION 23 74 16.11

SECTION 23 81 29 - VARIABLE-REFRIGERANT-FLOW HVAC SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes complete VRF HVAC system(s) including, but not limited to the following components to make a complete operating system(s) according to requirements indicated:
 - 1. Indoor, floor mounted units.
 - 2. Outdoor, air-source, heat pump units.
 - 3. Heat recovery control units.
 - 4. System controls.
 - 5. System refrigerant and oil.
 - 6. System condensate drain piping.
 - 7. System refrigerant piping.
 - 8. Metal hangers and supports.
 - 9. Metal framing systems.
 - 10. Miscellaneous support materials.
 - 11. Piping and tubing insulation.

1.2 DEFINITIONS

- A. Air-Conditioning System Operation: System capable of operation with all zones in cooling only.
- B. Heat-Pump System Operation: System capable of operation with all zones in either heating or cooling, but not with simultaneous heating and cooling zones that transfer heat between zones.
- C. Heat Recovery System Operation: System capable of operation with simultaneous heating and cooling zones that transfer heat between zones.
- D. HRCU: Heat Recovery Control Unit. HRCUs are used in heat recovery VRF HVAC systems to manage and control refrigerant between indoor units to provide simultaneous heating and cooling zones. "Heat Recovery Control Unit" is the term used by ASHRAE for what different manufacturers term as branch circuit controller, branch selector box, changeover box, flow selector unit, mode change unit, and other such terms.
- E. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
- F. Plenum: A space forming part of the air distribution system to which one or more air ducts are connected. An air duct is a passageway, other than a plenum, for transporting air to or from heating, ventilating, or air-conditioning equipment.
- G. Two-Pipe System Design: One refrigerant vapor line and one refrigerant liquid line connect a single outdoor unit or multiple manifold outdoor units in a single system to associated system HRCUs. One refrigerant liquid line and refrigerant vapor line connect HRCUs to associated indoor units. HRCUs used in two pipe systems act as an intermediate heat exchanger and include diverting valves and gas/liquid separators to move high, and low-pressure refrigerant between indoor units.
- H. VRF: Variable refrigerant flow.

1.3 ACTION SUBMITTALS

- A. Product data.
- B. Shop Drawings: For VRF HVAC systems.
 - 1. Include diagrams and details of refrigerant piping and tubing showing installation requirements for manufacturer-furnished divided flow fittings.
 - 2. Include diagrams for power, signal, and control wiring.

City of Reno Maintenance and Operations
California Building HVAC Replacement

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
1. For Installer, certification that installer has been trained for the installed manufacturer's system.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.
- B. Software and Firmware Operational Documentation:
1. Software operating and upgrade manuals.
 2. Program Software Backup: On CD or DVD, USB media, or approved cloud storage platform, complete with data files.
 3. Device address list.
 4. Printout of software application and graphic screens.

1.6 QUALITY ASSURANCE

- A. Factory-Authorized Service Representative Qualifications:
1. Authorized representative of, and trained by, VRF HVAC system manufacturer.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by VRF HVAC system manufacturer.
1. Each employee shall be certified by manufacturer for proper installation of systems, including, but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.
 2. Installer certification shall be valid and current for duration of Project.
 3. Retain copies of Installer certificates on-site and make available on request.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace equipment and components that fail(s) in materials or workmanship within specified warranty period.
1. Warranty Period:
 - a. For Compressor: 10 year(s) from date of Substantial Completion.
 - b. For Parts, Including Controls: 10 year(s) from date of Substantial Completion.
 - c. For Labor: 10 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design product, subject to compliance to the specified product on the drawings. Provide a product by one of the following manufacturers:
1. Mitsubishi
 2. Trane
 3. LG
 4. Daikin
 5. Samsung
 6. Or approved equal.

2.2 SYSTEM DESCRIPTION

- A. Direct-expansion (DX) VRF HVAC system(s) with variable capacity in response to varying cooling and heating loads. System shall consist of multiple indoor units, HRCUs, outdoor unit(s), piping, controls, and electrical power to make complete operating system(s) complying with requirements indicated.
1. Two-pipe system design.
 2. System(s) operation, heat pump as indicated on Drawings.
 3. Each system with one refrigerant circuit shared by all indoor units connected to system.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. AHRI Compliance: System and equipment performance certified according to AHRI 1230.
- D. ASHRAE Compliance:
 - 1. ASHRAE 15: For safety code for mechanical refrigeration.
 - 2. ASHRAE 135: For control network protocol with remote communication.
 - 3. ASHRAE/IES 90.1 Compliance: For system and component energy efficiency.
- E. UL Compliance: Comply with UL 1995.

2.3 PERFORMANCE REQUIREMENTS

- A. Service Access:
 - 1. Provide and document service access requirements.
 - 2. Locate equipment, system isolation valves, and other system components that require service and inspection in easily accessible locations. Avoid locations that are difficult to access if possible.
 - 3. Where serviceable components are installed behind walls and above inaccessible ceilings, provide finished assembly with access doors or panels to gain access. Properly size the openings to allow for service, removal, and replacement.
 - 4. If less than full and unrestricted access is provided, locate components within an 18-inch reach of the finished assembly.
 - 5. Where ladder access is required to service elevated components, provide an installation that provides for sufficient access within ladder manufacturer's written instructions for use.
 - 6. Comply with OSHA regulations.
- B. System Installation Requirements:
 - 1. Install systems indicated according to manufacturer's recommendations and written instructions.
 - 2. Where manufacturer's requirements differ from requirements indicated, contact Engineer for direction. The most stringent requirements should apply unless otherwise directed in writing by Engineer.
- C. Isolation of Equipment: Provide isolation valves to isolate each HRCU, indoor unit and outdoor unit for service, removal, and replacement without interrupting system operation.
- D. System Capacity Ratio: The sum of connected capacity of all indoor units shall be within the following range of outdoor-unit rated capacity:
 - 1. Not less than 60 percent.
 - 2. Not more than 130 percent.
 - 3. Range acceptable to manufacturer.
- E. System Turndown: Stable operation down to 20 percent of outdoor-unit capacity.
- F. System Auto Refrigerant Charge: Each system shall have an automatic refrigerant charge function to ensure the proper amount of refrigerant is installed in system.
- G. Outdoor Conditions:
 - 1. Suitable for outdoor ambient conditions encountered.
 - a. Design equipment and supports to withstand wind loads of governing code
 - 2. Maximum System Operating Outdoor Temperature: See Drawings.
 - 3. Minimum System Operating Outdoor Temperature: See Drawings.
 - 4. See specification section 23 05 48 for vibration and seismic requirements.
- H. Capacities and Characteristics: As indicated on Drawings.

2.4 INDOOR, FLOOR-MOUNTED UNITS FOR DUCTING

- A. Description: Factory-assembled, complete unit with components, piping, wiring, and controls required for mating to ductwork, piping, power, and controls field connections.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- B. Cabinet:
 - 1. Material: Painted steel.
 - 2. Insulation: Manufacturer's standard internal insulation, to provide thermal resistance and prevent condensation.
 - 3. Duct Connections: Extended collar or flange, or designated exterior cabinet surface, designed for attaching field-installed ductwork.
 - 4. Mounting: Manufacturer-designed provisions for field installation.
 - 5. Internal Access: Removable panels or hinged doors of adequate size for field access to internal components for inspection, cleaning, service, and replacement.
- C. DX Coil Assembly:
 - 1. Coil Casing: Aluminum, galvanized, or stainless steel.
 - 2. Coil Fins: Aluminum, mechanically bonded to tubes, with arrangement required by performance.
 - 3. Coil Tubes: Copper, of diameter and thickness required by performance.
 - 4. Expansion Valve: Electronic modulating type with linear or proportional characteristics.
 - 5. Unit Internal Tubing: Copper tubing with brazed joints.
 - 6. Unit Internal Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
 - 7. Field Piping Connections: Manufacturer's standard.
 - 8. Factory Charge: Dehydrated air or nitrogen.
 - 9. Testing: Factory pressure tested and verified to be without leaks.
- D. Drain Assembly:
 - 1. Pan: Non-ferrous material, with bottom sloped to low point drain connection.
 - 2. Condensate Removal: Unit-mounted pump or other integral lifting mechanism, capable of lifting drain water to an elevation above top of cabinet.
 - 3. Field Piping Connection: Non-ferrous material.
- E. Fan and Motor Assembly:
 - 1. Fan(s):
 - a. Direct-drive arrangement.
 - b. Single or multiple fans connected to a common motor shaft and driven by a single motor.
 - c. Materials: Non-ferrous components or ferrous components with corrosion resistant finish.
 - d. Statically and dynamically balanced.
 - 2. Motor: Brushless dc or electronically commutated with permanently lubricated bearings.
 - 3. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.
 - 4. Speed Settings and Control: Two (low, high), three (low, medium, high), or more than three speed settings or variable speed with a speed range of least 50 percent.
 - 5. Vibration Control: Integral isolation to dampen vibration transmission.
- F. Filter Assembly:
 - 1. Access: Bottom, side, or rear to accommodate field installation without removing ductwork and to accommodate filter replacement without need for tools.
 - 2. Efficiency: ASHRAE 52.2, MERV 7.
- G. Unit Controls:
 - 1. Enclosure: Metal, suitable for indoor locations.
 - 2. Factory-Installed Controller: Configurable digital control.
 - 3. Factory-Installed Sensors:
 - a. Unit inlet air temperature.
 - b. Coil entering refrigerant temperature.
 - c. Coil leaving refrigerant temperature.
 - 4. Features and Functions:
 - a. Self-diagnostics.
 - b. Time delay, auto-restart.
 - c. External static pressure control.
 - d. Auto operation mode.
 - e. Manual operation mode.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- f. Filter service notification.
 - g. Power consumption display.
 - h. Drain assembly high water level safety shutdown and notification.
 - i. Run test switch.
 - 5. Communication: Network communication with other indoor units and outdoor unit(s).
 - 6. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - 7. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - H. Unit Electrical:
 - 1. Enclosure: Metal, similar to enclosure, and suitable for indoor locations.
 - 2. Field Connection: Single point connection to power unit and integral controls.
 - 3. Disconnecting Means: Factory-mounted circuit breaker or switch.
 - 4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
 - 5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - 6. Raceways: Enclose line voltage wiring in raceways, matching color of walls.
- 2.5 OUTDOOR, AIR-SOURCE HEAT-PUMP UNITS
- A. Description: Factory-assembled and -tested complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.
 - 1. Specially designed for use in systems with either all heating or all cooling demands, but not for use in systems with simultaneous heating and cooling.
 - 2. Systems shall consist of one unit, or multiple unit modules that are designed by variable refrigerant system manufacturer for field interconnection to make a single refrigeration circuit that connects multiple indoor units.
 - 3. All units installed shall be from the same product development generation.
 - B. Cabinet:
 - 1. Galvanized steel and coated with a corrosion-resistant finish.
 - 2. Mounting: Manufacturer-designed provisions for field installation.
 - 3. Internal Access: Removable panels or hinged doors of adequate size for field access to internal components for inspection, cleaning, service, and replacement.
 - C. Compressor and Motor Assembly:
 - 1. One or more positive-displacement, direct-drive and hermetically sealed scroll compressor(s) with inverter drive and turndown to 15 percent of rated capacity.
 - 2. Protection: Integral protection against the following:
 - a. High refrigerant pressure.
 - b. Low oil level.
 - c. High oil temperature.
 - d. Thermal and overload.
 - e. Voltage fluctuations.
 - f. Phase failure and phase reversal.
 - g. Short cycling.
 - 3. Speed Control: Variable to automatically maintain refrigerant suction and condensing pressures while varying refrigerant flow to satisfy system cooling and heating loads.
 - 4. Vibration Control: Integral isolation to dampen vibration transmission.
 - 5. Oil management system to ensure safe and proper lubrication over entire operating range.
 - 6. Crankcase heaters with integral control to maintain safe operating temperature.
 - 7. Fusible plug.
 - D. Condenser Coil Assembly:
 - 1. Plate Fin Coils:
 - a. Casing: Aluminum, galvanized, or stainless steel.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- b. Fins: Aluminum or copper, mechanically bonded to tubes, with arrangement required by performance.
 - c. Tubes: Copper, of diameter and thickness required by performance.
 - 2. Aluminum Microchannel Coils:
 - a. Series of flat tubes containing a series of multiple, parallel-flow microchannels layered between refrigerant header manifolds.
 - b. Single- or multiple-pass arrangement.
 - c. Construct fins, tubes, and header manifolds of aluminum alloy.
 - 3. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.
- E. Condenser Fan and Motor Assembly:
 - 1. Fan(s): Propeller type.
 - a. Direct-drive arrangement.
 - b. Fabricated from non-ferrous components or ferrous components with corrosion protection finish to match performance indicated for condenser coil.
 - c. Dynamically balanced.
 - 2. Fan Guards: Removable safety guards complying with OSHA regulations. If using metal materials, coat with corrosion-resistant coating to match performance indicated for condenser coil.
 - 3. Motor(s): Brushless dc or electronically commutated with permanently lubricated bearings and rated for outdoor duty.
 - 4. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.
 - 5. Speed Settings and Control: Variable speed with a speed range of least 75 percent.
 - 6. Vibration Control: Integral isolation to dampen vibration transmission.
- F. Drain Pan: If required by manufacturer's design, provide unit with non-ferrous drain pan with bottom sloped to a low point drain connection.
- G. Unit Controls:
 - 1. Enclosure: Manufacturer's standard, and suitable for unprotected outdoor locations.
 - 2. Factory-Installed Controller: Configurable digital control.
 - 3. Factory-Installed Sensors:
 - a. Refrigerant suction temperature.
 - b. Refrigerant discharge temperature.
 - c. Outdoor air temperature.
 - d. Refrigerant high pressure.
 - e. Refrigerant low pressure.
 - f. Oil level.
 - 4. Features and Functions: Self-diagnostics, time delay, auto-restart, fuse protection, auto operation mode, manual operation mode, night setback control, power consumption display.
 - 5. Communication: Network communication with indoor units and other outdoor unit(s).
 - 6. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - 7. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
- H. Unit Electrical:
 - 1. Enclosure: Metal, similar to enclosure, and suitable for unprotected outdoor locations.
 - 2. Field Connection: Single point connection to power entire unit and integral controls.
 - 3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
 - 4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.
 - 5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - 6. Raceways: Enclose line voltage wiring in metal raceways to comply with NFPA 70.

City of Reno Maintenance and Operations
California Building HVAC Replacement

- I. Unit Hardware: Zinc-plated steel, or stainless steel. Coat exposed surfaces with additional corrosion-resistant coating if required to prevent corrosion when exposed to salt spray test for 1000 hours according to ASTM B117.
 - J. Unit Piping:
 - 1. Unit Tubing: Copper tubing with brazed joints.
 - 2. Unit Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
 - 3. Field Piping Connections: Manufacturer's standard.
 - 4. Factory Charge: Dehydrated air or nitrogen.
 - 5. Testing: Factory pressure tested and verified to be without leaks.
- 2.6 HEAT RECOVERY CONTROL UNITS (HRCUs)
- A. Description: Factory-assembled and -tested complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.
 - 1. Specially designed for use in systems with simultaneous heating and cooling.
 - 2. Systems shall consist of one unit, or multiple unit that are designed by variable refrigerant system manufacturer for field interconnection to make a single refrigeration circuit that connects multiple indoor units.
 - B. Cabinet:
 - 1. Galvanized-steel construction.
 - 2. Insulation: Manufacturer's standard internal insulation to provide thermal resistance and prevent condensation.
 - 3. Mounting: Manufacturer-designed provisions for field installation.
 - 4. Internal Access: Removable panels or hinged doors of adequate size for field access to internal components for inspection, cleaning, service, and replacement.
 - C. Drain Pan: If required by manufacturer's design, provide unit with non-ferrous drain pan with bottom sloped to a low point drain connection.
 - D. Refrigeration Assemblies and Specialties:
 - 1. Specially designed by manufacturer for type of VRF HVAC system being installed, either two or three pipe.
 - 2. Each refrigerant branch circuit shall have refrigerant control valve(s) to control refrigerant flow.
 - 3. Spares: Each heat recovery control unit shall include at least one branch circuit port(s) for future use.
 - 4. Each system piping connection upstream of heat recovery unit shall be fitted with an isolation valve to allow for service to any heat recovery control unit in the system without interrupting operation of the system.
 - 5. Each branch circuit connection shall be fitted with an isolation valve and capped service port to allow for service to any individual branch circuit without interrupting operation of the system.
 - a. If not available as an integral part of the heat recovery control unit, isolation valves shall be field installed adjacent to the unit pipe connection.
 - E. Unit Controls:
 - 1. Enclosure: Manufacturer's standard, and suitable for indoor locations.
 - 2. Factory-Installed Controller: Configurable digital control.
 - 3. Communication: Network communication with indoor units and outdoor unit(s).
 - 4. Cable and Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - 5. Field Connection: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
 - F. Unit Electrical:
 - 1. Enclosure: Metal, similar to enclosure, and suitable for indoor locations.
 - 2. Field Connection: Single point connection to power entire unit and integral controls.
 - 3. Disconnecting Means: Factory-mounted circuit breaker or switch, complying with NFPA 70.
 - 4. Control Transformer: Manufacturer's standard. Coordinate requirements with field power supply.

City of Reno Maintenance and Operations
California Building HVAC Replacement

5. Wiring: Manufacturer's standard with each connection labeled and corresponding to a unit-mounted wiring diagram.
6. Raceways: Enclose line voltage wiring in metal raceways to comply with NFPA 70.

G. Unit Piping:

1. Unit Tubing: Copper tubing with brazed joints.
2. Unit Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
3. Field Piping Connections: Manufacturer's standard.
4. Factory Charge: Dehydrated air or nitrogen.
5. Testing: Factory pressure tested and verified to be without leaks.

2.7 SYSTEM CONTROLS

A. General Requirements:

1. Network: Indoor units, and outdoor units shall include integral controls and connect through a TIA-485A control network.
2. Network Communication Protocol: Manufacturer proprietary or open control communication between interconnected units.
3. Integration with Building Automation System: ASHRAE 135, BACnet IP and certified by BACnet Testing Lab (BTL), including the following:
 - a. Ethernet connection via RJ-45 connectors and port with transmission at 100 Mbps or higher.
4. Operator Interface:
 - a. Operators shall interface with system and unit controls through the following:
 - 1) Operator interfaces integral to controllers.
 - 2) Web interface through web browser software.
 - 3) Integration with Building Automation System.
 - b. Users shall be capable of interface with controllers for control of indoor units to extent privileges are enabled. Control features available to users shall include the following:
 - 1) On/off control.
 - 2) Temperature set-point adjustment.

B. Central Controllers:

1. Centralized control for all indoor and outdoor units from a single central controller location.
 - a. Include multiple interconnected controllers as required.
2. Controls operation mode of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units. Operation modes available through central controller shall match those operation modes of controllers for indoor units.
3. Schedule operation of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units.
 - a. Sets schedule for daily, weekly, and annual events.
 - b. Schedule options available through central controller shall at least include the schedule options of controllers for indoor units.
4. Changes operating set points of indoor units as individual units, by selected groups of indoor units, or as collection of all indoor units.
5. Optimized start feature to start indoor units before scheduled time to reach temperature set-point at scheduled time based on operating history.
6. Night setback feature to operate indoor units at energy-conserving heating and cooling temperature set-points during unoccupied periods.
7. Service diagnostics tool.
8. Able to disable and enable operation of individual controllers for indoor units.
9. Information displayed on individual controllers shall also be available for display through central controller.
10. Information displayed for outdoor units, including refrigerant high and low pressures percent capacity.
11. Multiple RJ-45 ports for direct connection to a local PC and an Ethernet network switch.

City of Reno Maintenance and Operations
California Building HVAC Replacement

12. Operator interface through a backlit, high-resolution color display touch panel and web accessible through standard web browser software.

C. Wired Controllers for Indoor Units:

1. Single controller capable of controlling multiple indoor units as group.
2. Auto Timeout Touch Screen LCD: Timeout duration shall be adjustable.
3. Temperature Units: Fahrenheit and Celsius.
4. On/Off: Turns indoor unit on or off.
5. Hold: Hold operation settings until hold is released.
6. Operation Mode: Cool, Heat, Auto, Dehumidification, Fan Only, and Setback.
7. Temperature Display: 1-degree increments.
8. Temperature Set-Point: Separate set points for Cooling, Heating, and Setback. Adjustable in 1-degree increments between.
9. Relative Humidity Display: 1 percent increments.
10. Relative Humidity Set-Point: Adjustable in 1 percent increments between.
11. Fan Speed Setting: Select between available options furnished with the unit.
12. Airflow Direction Setting: If applicable to unit, select between available options furnished with the unit.
13. Seven-day programmable operating schedule with up to five events per day. Operations shall include On/Off, Operation Mode, and Temperature Set-Point.
14. Auto Off Timer: Operates unit for an adjustable time duration and then turns unit off.
15. Occupancy detection.
16. Service Notification Display: "Filter".
17. Service Run Tests: Limit use by service personnel to troubleshoot operation.
18. Error Code Notification Display: Used by service personnel to troubleshoot abnormal operation and equipment failure.
19. User and Service Passwords: Capable of preventing adjustments by unauthorized users.
20. Setting stored in nonvolatile memory to ensure that settings are not lost if power is lost. Battery backup for date and time only.
21. Low-voltage power required for controller shall be powered through non-polar connections to indoor unit.

2.8 SYSTEM REFRIGERANT AND OIL

A. Refrigerant:

1. As required by VRF HVAC system manufacturer for system to comply with performance requirements indicated.
2. ASHRAE 34, Class A1 refrigerant classification.
3. R-410a.

B. Oil:

1. As required by VRF HVAC system manufacturer and to comply with performance requirements indicated.

2.9 SYSTEM CONDENSATE DRAIN PIPING

A. If more than one material is listed, material selection is Contractor's option.

B. Copper Tubing:

1. Drawn-Temper Tubing: According to ASTM B88, Type M.
2. Wrought-Copper Fittings: ASME B16.22.
3. Wrought-Copper Unions: ASME B16.22.
4. Solder Filler Metals: ASTM B32, lead-free alloys, and water-flushable flux according to ASTM B813.

2.10 SYSTEM REFRIGERANT PIPING

A. Comply with requirements in Section 23 23 00 "Refrigerant Piping" for system piping requirements.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2.11 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded, zinc-coated steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
 - 1. Indoor Applications: Zinc-coated steel.
 - 2. Outdoor Applications: Stainless steel.

2.12 PIPING AND TUBING INSULATION

- A. Comply with requirements in Section 23 07 19 "HVAC Piping Insulation" for system piping insulation requirements.

2.13 MATERIALS

- A. Steel:
 - 1. ASTM A36/A36M for carbon structural steel.
 - 2. ASTM A568/A568M for steel sheet.
- B. Stainless Steel:
 - 1. Manufacturer's standard grade for casing.
 - 2. Manufacturer's standard type, ASTM A240/A240M for bare steel exposed to airstream or moisture.
- C. Galvanized Steel: ASTM A653/A653M.
- D. Aluminum: ASTM B209.

2.14 SOURCE QUALITY CONTROL

- A. Factory Tests: Test and inspect factory-assembled equipment.
- B. Equipment will be considered defective if it does not pass tests and inspections.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Clearance:
 - 1. Maintain manufacturer's recommended clearances for service and maintenance.
 - 2. Maintain clearances required by governing code.
- B. Loose Components: Install components, devices, and accessories furnished by manufacturer, with equipment, that are not factory mounted.
- C. Equipment Restraint Installation: Install equipment with seismic-restraint device. Comply with requirements for seismic-restraint devices specified in Section 23 05 48 "Vibration and Seismic Controls for HVAC."
- D. Outdoor Unit Installations:
 - 1. Install units to be level and plumb while providing a neat and finished appearance.
 - 2. Pad-Mounted Installations: Install outdoor units on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations.
 - a. Attachment: Install anchor bolts to elevations required for proper attachment to supported equipment.
 - b. Grouting: Place grout under equipment supports and make bearing surface smooth.

City of Reno Maintenance and Operations
California Building HVAC Replacement

3.2 GENERAL REQUIREMENTS FOR PIPING AND TUBING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping and tubing systems. Install piping and tubing as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping and tubing in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping and tubing at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping and tubing above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping and tubing to permit valve servicing.
- F. Install piping and tubing at indicated slopes.
- G. Install piping and tubing free of sags.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping and tubing to allow application of insulation.
- J. Install groups of pipes and tubing parallel to each other, spaced to permit applying insulation with service access between insulated piping and tubing.
- K. Install sleeves for piping and tubing penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 23 05 17 "Sleeves and Sleeve Seals for HVAC Piping."
- L. Install escutcheons for piping and tubing penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 23 05 18 "Escutcheons for HVAC Piping."

3.3 CONDENSATE DRAIN PIPE AND TUBING INSTALLATION

- A. General Requirements for Drain Piping and Tubing:
 - 1. Install a union in piping at each threaded unit connection.
 - 2. Install an adjustable stainless steel hose clamp with adjustable gear operator on unit hose connections. Tighten clamp to provide a leak-free installation.
 - 3. If required for unit installation, provide a trap assembly in drain piping to prevent air circulated through unit from passing through drain piping. Comply with more stringent of the following:
 - a. Details indicated on Drawings.
 - b. Manufacturer's requirements.
 - c. Governing codes.
 - d. In the absence of requirements, comply with requirements of ASHRAE handbooks.
 - 4. Extend drain piping from units with drain connections to drain receptors as indicated on Drawings. If not indicated on Drawings, terminate drain connection at nearest accessible location that is not exposed to view by occupants.
 - 5. Provide each 90-degree change in direction with a Y- or T-fitting. Install a threaded plug connection in the dormant side of fitting or future use as a service cleanout.
- B. Gravity Drains:
 - 1. Slope piping from unit connection toward drain termination at a constant slope of not less than one percent.
- C. Pumped Drains:
 - 1. If unit condensate pump or lift mechanism is not included with an integral check valve, install a full-size check valve in each branch pipe near unit connection to prevent backflow into unit.

3.4 REFRIGERANT PIPING AND TUBING INSTALLATION

- A. Refrigerant Tubing Kits:
 - 1. Unroll and straighten tubing to suit installation. Deviations in straightness of exposed tubing shall be unnoticeable to observer.

City of Reno Maintenance and Operations
California Building HVAC Replacement

2. Support tubing using hangers and supports indicated at intervals not to exceed 5 feet. Minimum rod size, 1/4 inch.
 3. Prepare tubing ends and make mating connections to provide a pressure tight and leak-free installation.
- B. Install refrigerant piping according to ASHRAE 15 and governing codes.
- C. Select system components with pressure rating equal to or greater than system operating pressure.
- D. Install piping as short and direct as possible, with a minimum number of joints and fittings.
- E. Install refrigerant piping and tubing in protective conduit where installed belowground.
- F. Install refrigerant piping and tubing in rigid or flexible conduit in locations where exposed to mechanical damage.
- G. Unless otherwise required by VRF HVAC system manufacturer, slope refrigerant piping and tubing as follows:
1. Install horizontal hot-gas discharge piping and tubing with a uniform slope downward away from compressor.
 2. Install horizontal suction lines with a uniform slope downward to compressor.
 3. Install traps to entrain oil in vertical runs.
 4. Liquid lines may be installed level.
- H. When brazing, remove or protect components that could be damaged by heat.
- I. Before installation, clean piping, tubing, and fittings to cleanliness level required by VRF HVAC system manufacturer.
- J. Joint Construction:
1. Ream ends of tubes and remove burrs.
 2. Remove scale, slag, dirt, and debris from inside and outside of tube and fittings before assembly.
 3. Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.
 - a. Use Type BCuP (copper-phosphorus) alloy for joining copper fittings with copper tubing.
 - b. Use Type BA9 (cadmium-free silver) alloy for joining copper with bronze.
- 3.5 PIPE AND TUBING INSULATION INSTALLATION
- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated. Installation to maintain a continuous vapor barrier.
- B. Insulation Installation on Pipe Fittings and Elbows:
1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 2. When preformed valve covers are unavailable, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.
1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.
- E. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant

City of Reno Maintenance and Operations
California Building HVAC Replacement

recommended by insulation manufacturer. Secure jacket with stainless steel bands 12 inches o.c. and at end joints.

3.6 DUCT, ACCESSORIES, AND AIR OUTLETS INSTALLATION

- A. Where installing ductwork adjacent to equipment, allow space for service and maintenance.
- B. Comply with requirements for metal ducts specified in Section 23 31 13 "Metal Ducts."
- C. Comply with requirements for nonmetal ducts specified in Section 23 31 16 "Nonmetal Ducts."
- D. Comply with requirements for air duct accessories specified in Section 23 33 00 "Air Duct Accessories."
- E. Comply with requirements for flexible ducts specified in Section 23 33 46 "Flexible Ducts."
- F. Comply with requirements for air diffusers specified in Section 23 37 13.13 "Air Diffusers."
- G. Comply with requirements for registers and grilles specified in Section 23 37 13.23 "Registers and Grilles."

3.7 SOFTWARE

- 1. Hardware:
 - a. Coordinate location and access requirements with IT department.
 - b. Enable highest level of wireless encryption that is compatible with Owner's ICT network.
 - c. Disable dual network connections.

3.8 FIRESTOPPING

- A. Comply with requirements in Section 07 84 13 "Penetration Firestopping."
- B. Comply with TIA-569-D, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping" Chapter.

3.9 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of manufacturer's service representative:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Refrigerant Tubing Positive Pressure Testing:
 - 1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
 - 2. After completion of tubing installation, pressurize tubing systems to a test pressure of not less than 1.2 times VRF HVAC system operating pressure, but not less than 600 psig, using dry nitrogen.
 - 3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of 24 hours. Allowance for pressure changes attributed to changes in ambient temperature are acceptable.
 - 4. Prepare test report to record the following information for each test:
 - a. Name of person starting test, company name, phone number, and e-mail address.
 - b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
 - c. Detailed description of extent of tubing tested.
 - d. Date and time at start of test.

City of Reno Maintenance and Operations
California Building HVAC Replacement

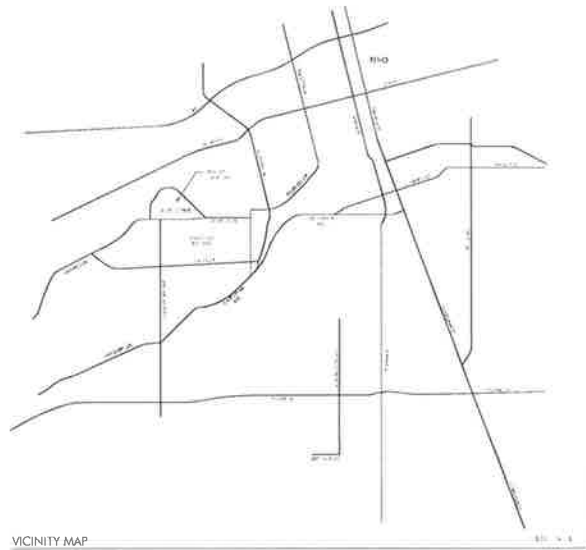
- e. Test pressure at start of test.
 - f. Outdoor temperature at start of test.
 - g. Name of person ending test, company name, phone number, and e-mail address.
 - h. Date and time at end of test.
 - i. Test pressure at end of test.
 - j. Outdoor temperature at end of test.
 - k. Remarks:
 - 5. Submit test reports for Project record.
- C. Refrigerant Tubing Evacuation Testing:
- 1. Comply with more stringent of VRF HVAC system manufacturer's requirements and requirements indicated.
 - 2. After completion of tubing positive-pressure testing, evacuate tubing systems to a pressure of 500 microns.
 - 3. Successful testing shall maintain a test pressure for a continuous and uninterrupted period of one hour with no change.
 - 4. Prepare test report to record the following information for each test:
 - a. Name of person starting test, company name, phone number, and e-mail address.
 - b. Name of manufacturer's service representative witnessing test, company name, phone number, and e-mail address.
 - c. Detailed description of extent of tubing tested.
 - d. Date and time at start of test.
 - e. Test pressure at start of test.
 - f. Outdoor temperature at start of test.
 - g. Name of person ending test, company name, phone number, and e-mail address.
 - h. Date and time at end of test.
 - i. Test pressure at end of test.
 - j. Outdoor temperature at end of test.
 - k. Remarks:
 - 5. Submit test reports for Project record.
 - 6. Upon successful completion of evacuation testing, system shall be charged with refrigerant.
- D. System Refrigerant Charge:
- 1. Using information collected from the refrigerant tubing evacuation testing, system Installer shall consult variable refrigerant system manufacturer to determine the correct system refrigerant charge.
 - 2. Installer shall charge system following VRF HVAC system manufacturer's written instructions.
 - 3. System refrigerant charging shall be witnessed by system manufacturer's representative.
 - 4. Total refrigerant charge shall be recorded and permanently displayed at the system's outdoor unit.
- E. Products will be considered defective if they do not pass tests and inspections.
- F. Prepare test and inspection reports.
- 3.10 STARTUP SERVICE
- A. Engage a VRF HVAC system manufacturer's service representative to perform system(s) startup service.
- 1. Service representative shall be a factory-trained and authorized service representative] of VRF HVAC system manufacturer.
 - 2. Complete startup service of each separate system.
 - 3. Complete system startup service according to manufacturer's written instructions.
- B. Startup checks shall include, but not be limited to, the following:
- 1. Check control communications of equipment and each operating component in system(s).

City of Reno Maintenance and Operations
California Building HVAC Replacement

2. Check each indoor unit's response to demand for cooling and heating.
 3. Check each indoor unit's response to changes in airflow settings.
 4. Check each indoor unit, and outdoor unit for proper condensate removal.
 5. Check sound levels of each outdoor unit.
- C. Installer shall accompany manufacturer's service representative during startup service and provide manufacturer's service representative with requested documentation and technical support during startup service.
1. Installer shall correct deficiencies found during startup service for reverification.
- D. System Operation Report:
1. After completion of startup service, manufacturer shall issue a report for each separate system.
 2. Report shall include complete documentation describing each startup check, the result, and any corrective action required.
 3. Manufacturer shall electronically record not less than two hours of continuous operation of each system and submit with report for historical reference.
 - a. All available system operating parameters shall be included in the information submitted.
- 3.11 ADJUSTING
- A. Adjust equipment and components to function smoothly, and lubricate as recommended by manufacturer.
 - B. Adjust initial temperature and humidity set points. Adjust initial airflow settings and discharge airflow patterns.
 - C. Set field-adjustable switches and circuit-breaker trip ranges according to VRF HVAC system manufacturer's written instructions, and as indicated.
- 3.12 SOFTWARE SERVICE AGREEMENT
- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
 - B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.
- 3.13 DEMONSTRATION
- A. Engage a VRF HVAC system manufacturer's factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain entire system.

END OF SECTION 23 81 29

CALIFORNIA BUILDING HVAC SYSTEM UPGRADE
PWP No. PWP-WA-2023-208

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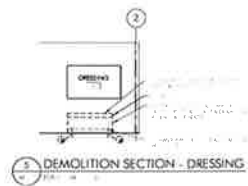
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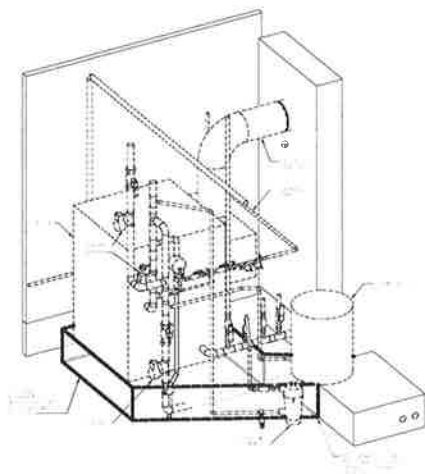
1. 下列各句，没有语病的一项是（3分）
A. 在“中国好声音”的舞台上，评委们通过选手们的演唱，来评判他们是否具备成为歌手的天赋。
B. 随着“中国好声音”的播出，使越来越多的人开始关注并喜爱上了这个节目。
C. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
D. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
2. 下列各句，没有语病的一项是（3分）
A. 随着“中国好声音”的播出，使越来越多的人开始关注并喜爱上了这个节目。
B. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
C. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
D. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
3. 下列各句，没有语病的一项是（3分）
A. 随着“中国好声音”的播出，使越来越多的人开始关注并喜爱上了这个节目。
B. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
C. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
D. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
4. 下列各句，没有语病的一项是（3分）
A. 随着“中国好声音”的播出，使越来越多的人开始关注并喜爱上了这个节目。
B. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
C. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。
D. 中国好声音的评委们，在选手们的演唱中，发现了许多有潜力的歌手。



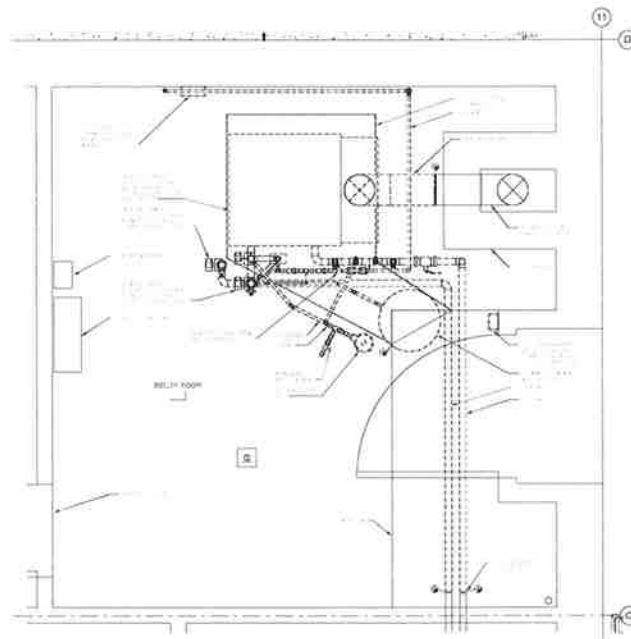
13268 JIJI

TO.1





BOILER ROOM DEMOLITION ISOMETRIC



MECHANICAL BOILER ROOM DEMOLITION FLOOR PLAN

PROJECT NOTES:



CR
ENGINEERING
INC.
1400 10TH AVENUE
SUITE 100
DENVER, CO 80202
303.733.7000



10/10/10

CALIFORNIA BUILDING HVAC
SYSTEMS
REPAIR, MAINTENANCE
AND MODIFICATION
ENGINEER

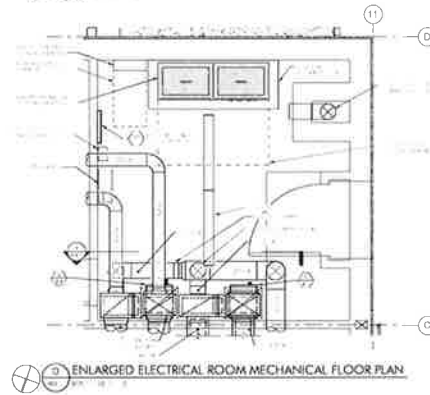
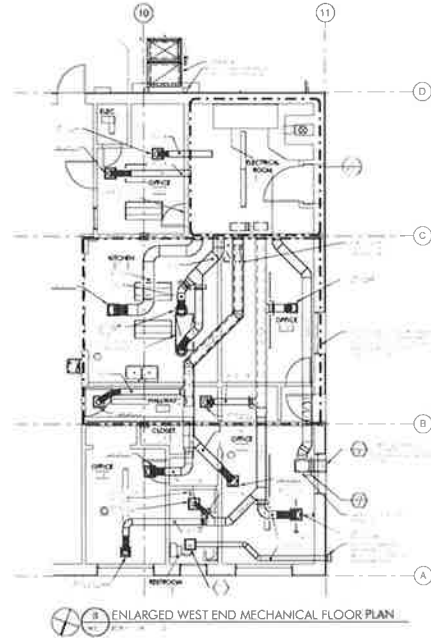
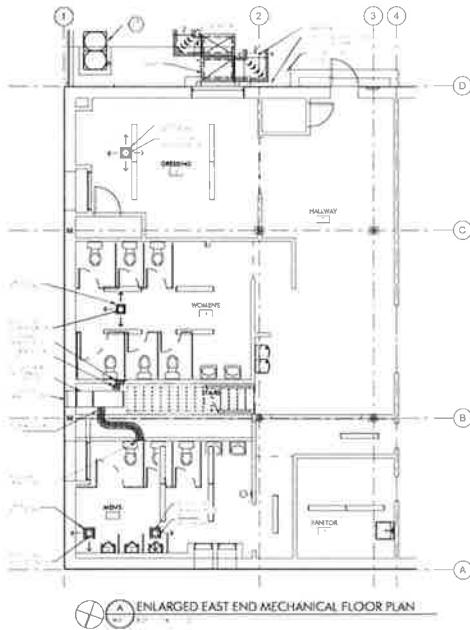
MECHANICAL BOILER ROOM DEMOLITION FLOOR PLAN

REVISIONS

NO. DESCRIPTION

DATE: 10/10/10
BY: A.A.V. 2010
CHECKED: C.A.V. 2010
APPROVED: A.A.V. 2010

M1.2



PROJECT NOTES:

1. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA MECHANICAL CODE (CMC).

2. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA ELECTRICAL CODE (CEC).

3. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA PLUMBING CODE (CPC).

4. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA GAS CODE (CGC).

5. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA FIRE CODE (CFC).

6. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA BUILDING CODE (CBC).

7. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA MECHANICAL CODE (CMC).

8. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA ELECTRICAL CODE (CEC).

9. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA PLUMBING CODE (CPC).

10. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA GAS CODE (CGC).

11. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA FIRE CODE (CFC).

12. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA BUILDING CODE (CBC).

13. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA MECHANICAL CODE (CMC).

14. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA ELECTRICAL CODE (CEC).

15. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 CALIFORNIA PLUMBING CODE (CPC).



CR
ENGINEERING
10000 WILSON AVENUE
SUITE 100
DUBLIN, CA 94568
(916) 231-1000
WWW.CR-ENGINEERING.COM

PROJECT NO. 15-0000
SHEET NO. 15-0000-01

DATE: 01/15/2015
BY: [Signature]
CHECKED: [Signature]

PROJECT: CALIFORNIA BUILDING HVAC
15000 WILSON AVENUE
SUITE 100
DUBLIN, CA 94568

MECHANICAL ENGINEER PLANS

REVISION
NO. DESCRIPTION
1. 01/15/2015
2. 01/15/2015

DATE: 01/15/2015
BY: [Signature]
CHECKED: [Signature]

PROJECT: CALIFORNIA BUILDING HVAC
15000 WILSON AVENUE
SUITE 100
DUBLIN, CA 94568

MECHANICAL ENGINEER PLANS

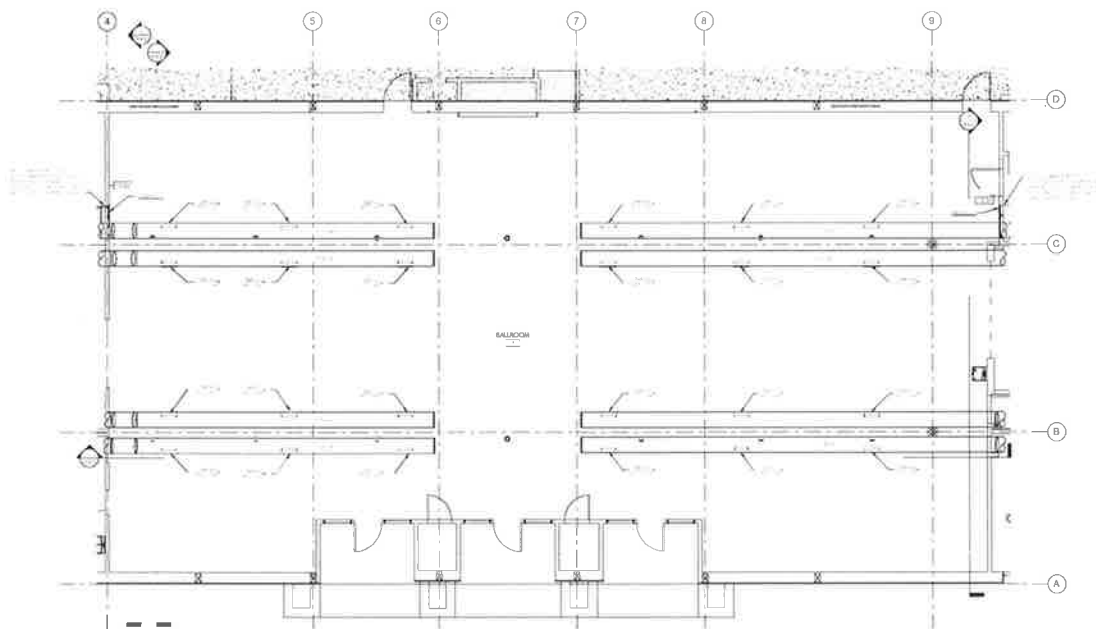
REVISION
NO. DESCRIPTION
1. 01/15/2015
2. 01/15/2015

DATE: 01/15/2015
BY: [Signature]
CHECKED: [Signature]

PROJECT: CALIFORNIA BUILDING HVAC
15000 WILSON AVENUE
SUITE 100
DUBLIN, CA 94568

MECHANICAL ENGINEER PLANS

M3.1



ENLARGED BALLROOM MECHANICAL FLOOR PLAN

PROJECT NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE MECHANICAL CODES AND STANDARDS.



ENGINEERING
R. J. ANDERSON
N.E. 100000000000000
N.E. 100000000000000
N.E. 100000000000000

DATE: 10/1/2010



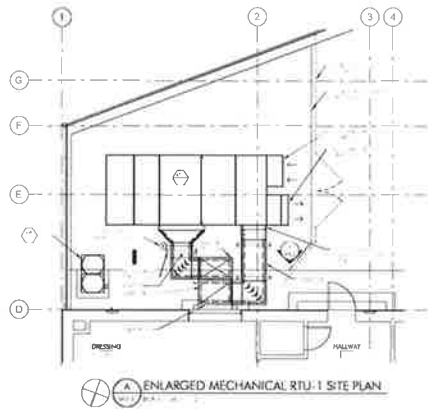
DATE: 10/1/2010

CALIFORNIA BUILDING HVAC
SYSTEM UPGRADE
RENOVATION
MECHANICAL ENLARGED PLAN

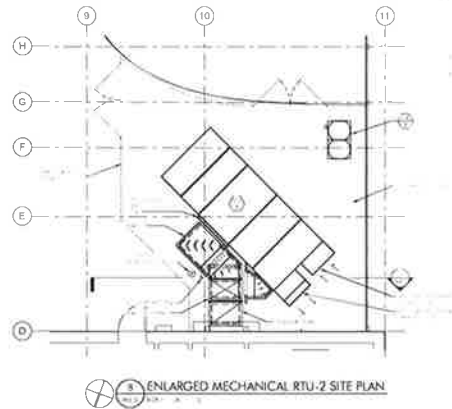
DATE: 10/1/2010

DATE: 10/1/2010

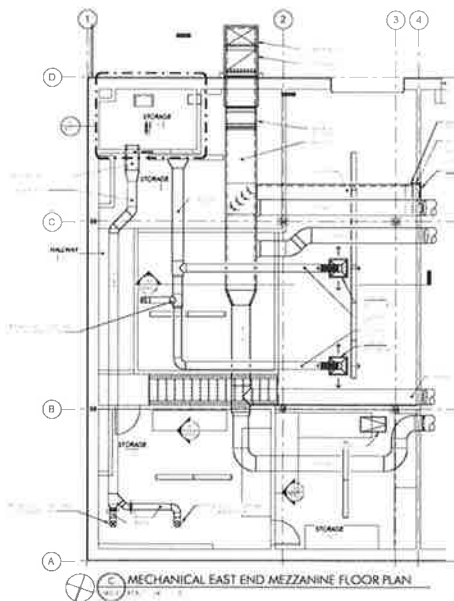
M3.2



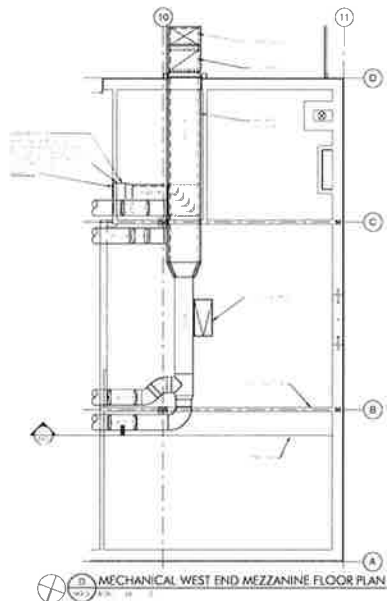
ENLARGED MECHANICAL RTU-1 SITE PLAN



ENLARGED MECHANICAL RTU-2 SITE PLAN



MECHANICAL EAST END MEZZANINE FLOOR PLAN



MECHANICAL WEST END MEZZANINE FLOOR PLAN

PROJECT NOTES

1. SEE SHEET M3.3 FOR MECHANICAL EQUIPMENT SCHEDULES AND NOTES.

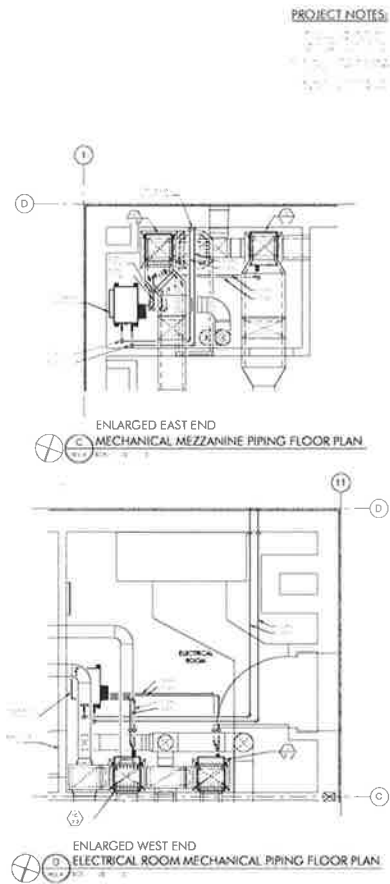
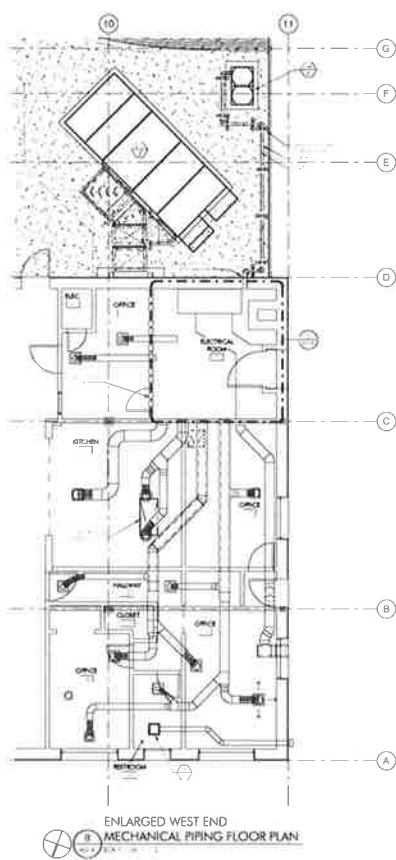
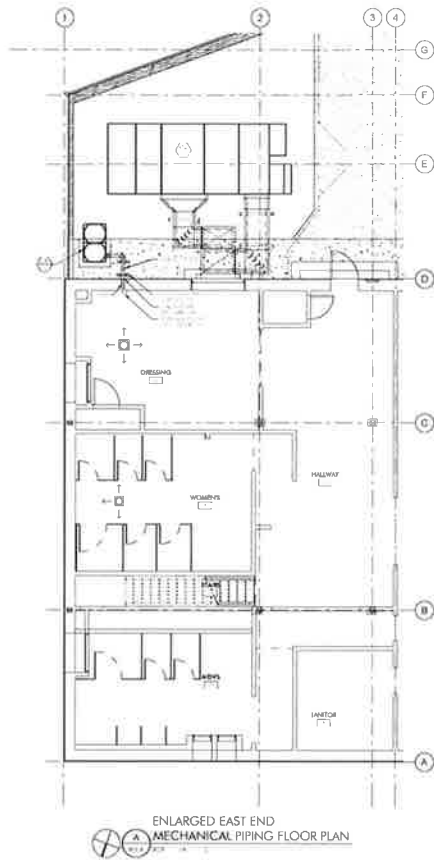


CALIFORNIA BUILDING HVAC
JASON D. COWAN, P.E.
REGISTERED PROFESSIONAL ENGINEER
NO. 100000
EXPIRATION DATE 12/31/2020

AVIATION

2020.01.01
2020.01.01
2020.01.01
2020.01.01
2020.01.01

M3.3

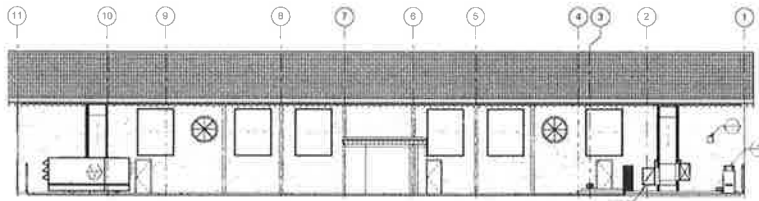


CALIFORNIA BUILDING HVAC
5555 DOWNEY BLVD
DOWNEY, CA 90244
RENC. NEWADA 89509

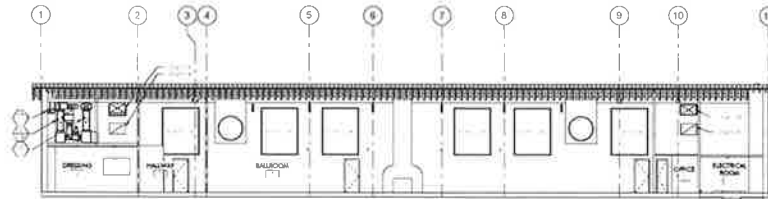
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DATE	10/10/10
BY	10/10/10
CHECKED BY	10/10/10
APPROVED BY	10/10/10
DATE	10/10/10
BY	10/10/10
CHECKED BY	10/10/10
APPROVED BY	10/10/10
DATE	10/10/10
BY	10/10/10
CHECKED BY	10/10/10
APPROVED BY	10/10/10

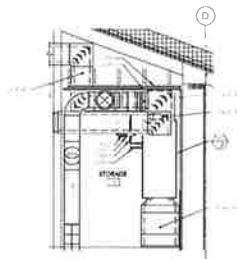
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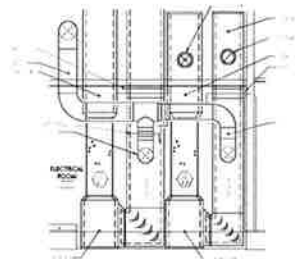
1 MECHANICAL SECTION - BACK OF BUILDING



2 MECHANICAL SECTION - BACK OF BUILDING INTERIOR



3 FC-1-2 SECTION



4 FC-2-1 & 2-2 SECTION



REGISTERED PROFESSIONAL ENGINEER
EXPIRATION DATE 12/31/2014



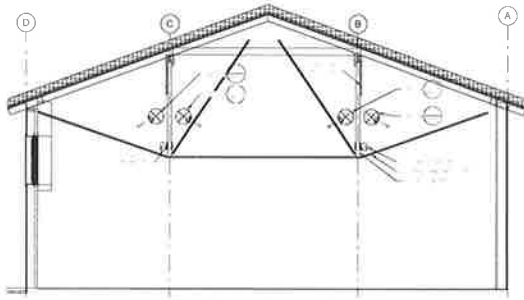
REGISTERED PROFESSIONAL ENGINEER
EXPIRATION DATE 12/31/2014

CALIFORNIA BUILDING - VAC
1555 CALIFORNIA
BENIC, NEWARK 95509
MECHANICAL SECTIONS

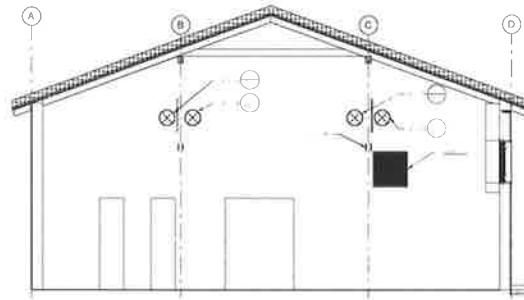
SYSTEMS
DATE: 10/10/14

100% VAC
100% VAC
100% VAC
100% VAC
100% VAC

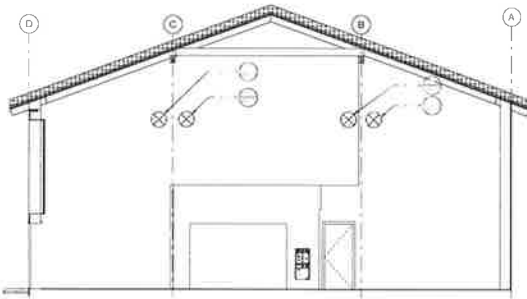
M4.1



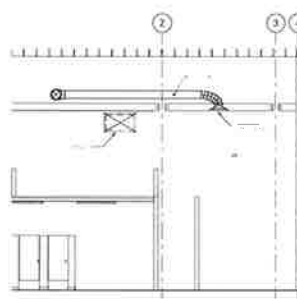
1 BALLROOM DUCT SECTION 1
REV. 10-11-11



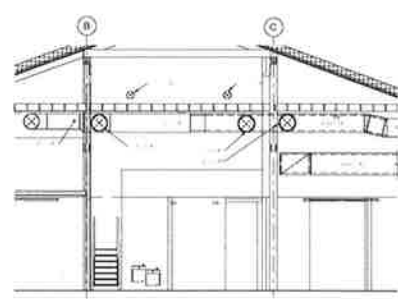
2 BALLROOM DUCT SECTION 2
REV. 10-11-11



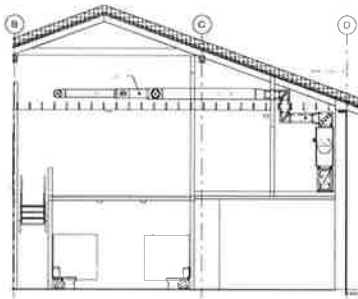
3 BALLROOM DUCT SECTION 3
REV. 10-11-11



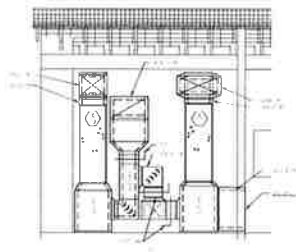
4 MECHANICAL MEZZANINE SECTION 1
REV. 10-11-11



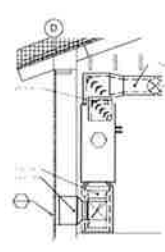
5 MECHANICAL MEZZANINE SECTION 2
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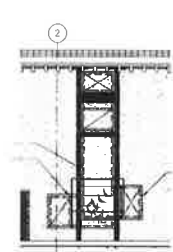
6 MECHANICAL MEZZANINE SECTION 3
REV. 10-11-11



7 MECHANICAL MEZZANINE COIL SECTION
REV. 10-11-11



8 MECHANICAL MEZZANINE FC-1 SECTION
REV. 10-11-11



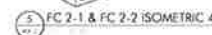
9 RTU-1 EXTERIOR DUCT SECTION
REV. 10-11-11



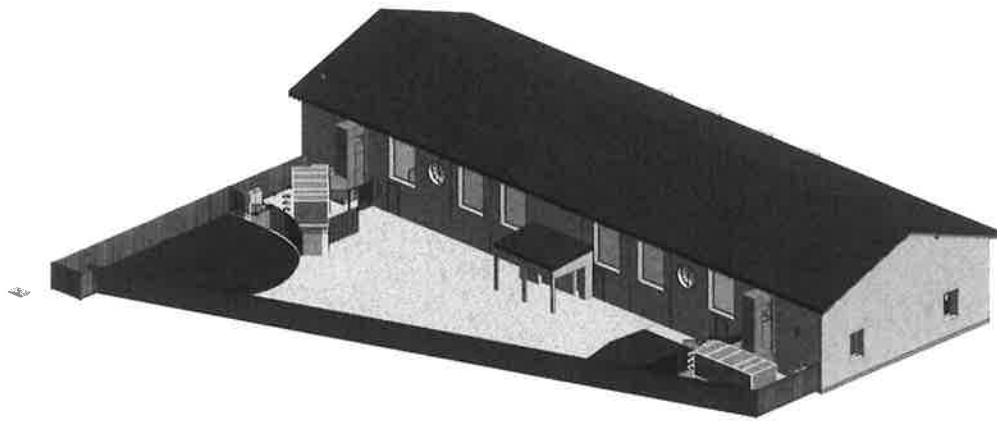
CALIFORNIA BUILDING HVAC
SYSTEMS ENGINEER
RENE NEVADA B5569
MECHANICAL SECTIONS

DATE	10-11-11
BY	RENE NEVADA
CHECKED BY	
DATE	
APPROVED BY	
DATE	

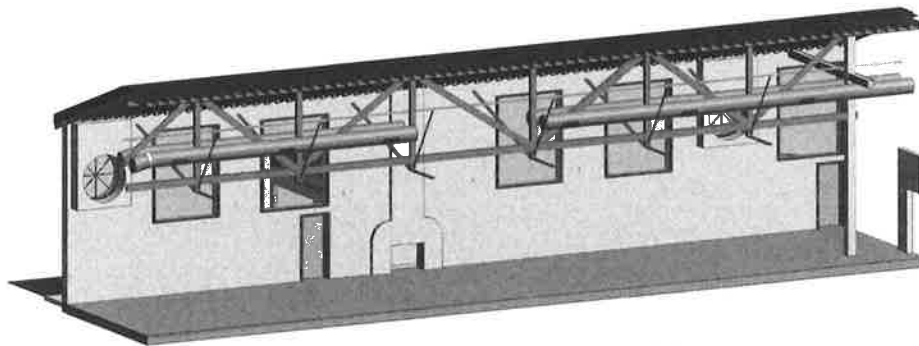
M4.2



M4.3



MECHANICAL BACKYARD ISOMETRIC



MECHANICAL BALLROOM WALL ISOMETRIC



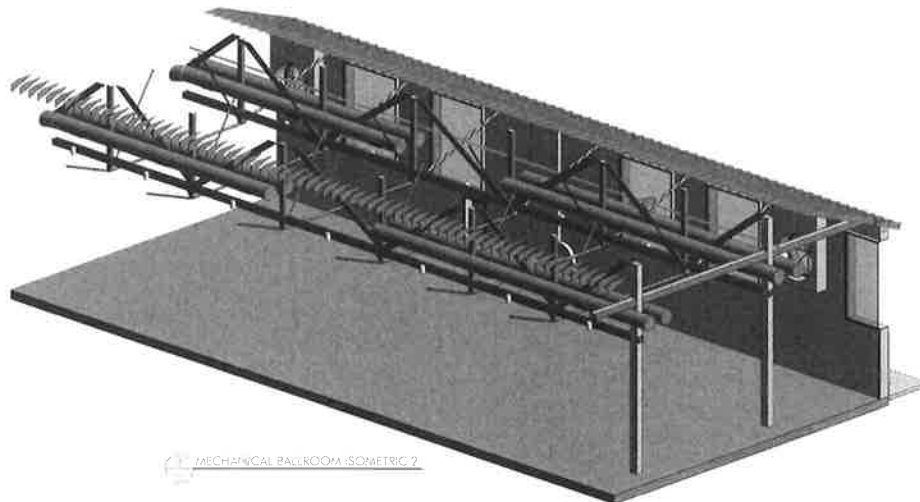
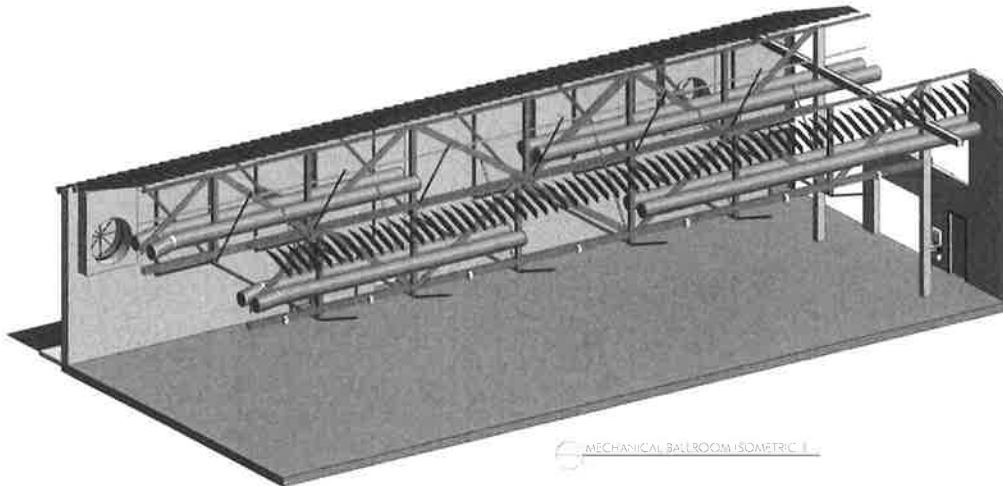
CR
ENGINEERING

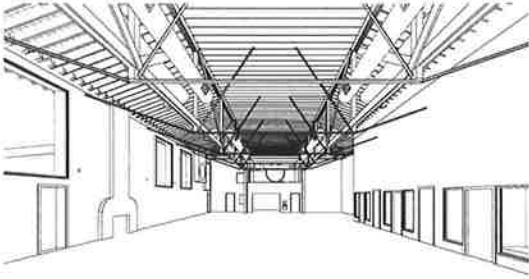


CALIFORNIA BUILDING FINAL
DESIGN
30 JUNE 2014
KING - NEMCA 10000
MECHANICAL ISOMETRIC

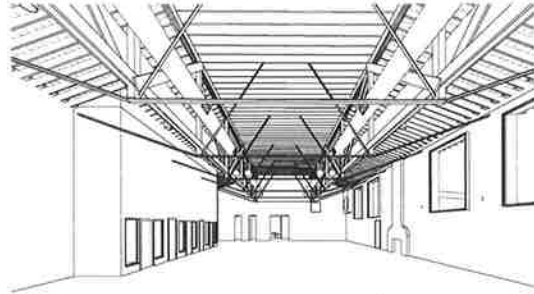
DATE	30 JUNE 2014
BY	KING
CHECKED BY	
APPROVED BY	
DATE	30 JUNE 2014

M4.4

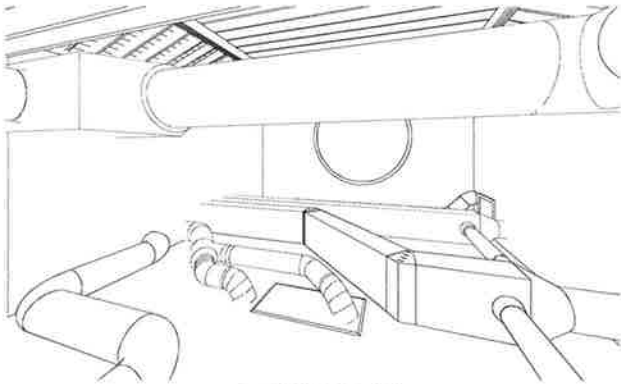




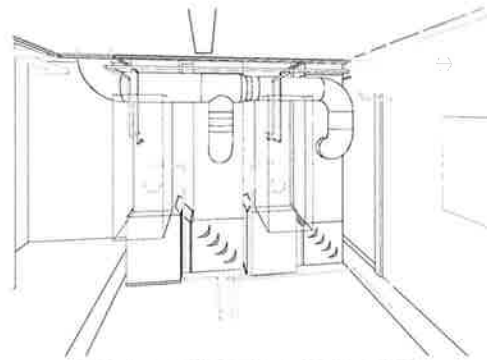
1 BALLROOM ISOMETRIC 1
DATE: 1/1/11



2 BALLROOM ISOMETRIC 2



3 MEZZANINE ISOMETRIC



4 ELECTRICAL ROOM MECHANICAL EQUIPMENT ISOMETRIC



CR
ENGINEERING
TEAM: 1/1/11 11:00 AM
REV: 1/1/11 11:00 AM
FILE: 1/1/11 11:00 AM



00000000

CALIFORNIA BUILDING HVAC
MECHANICAL
RENC, NEVADA 89509
MECHANICAL 3D ISOMETRIC

1/1/11 11:00 AM

1/1/11 11:00 AM

1/1/11 11:00 AM

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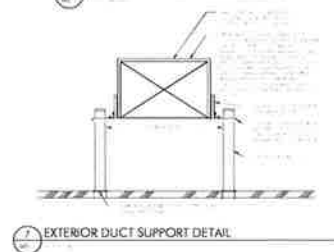
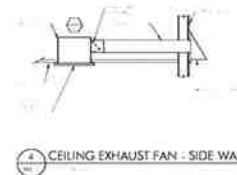
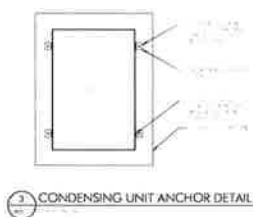
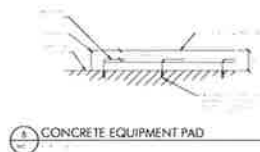
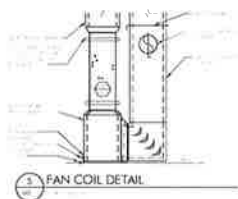
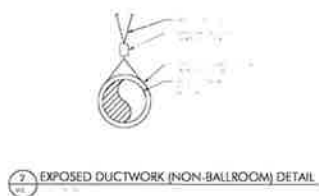
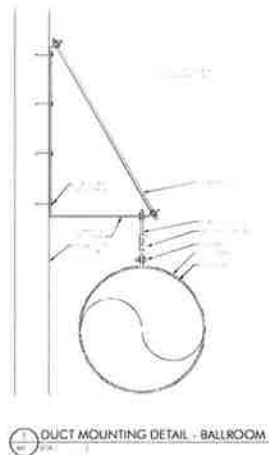
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1/1/11 11:00 AM

1/1/11 11:00 AM

1/1/11 11:00 AM

M4.6



CALIFORNIA BUILDING HVAC
725 COMMERCIAL
RENEE, NE (ARCHITECT)
MECHANICAL, ET AL.

REVISION			
NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMIT	01/15/2016	RENEE
2	REVISION		
3	REVISION		
4	REVISION		
5	REVISION		
6	REVISION		
7	REVISION		
8	REVISION		
9	REVISION		
10	REVISION		

M5.1



CONTROLS SYMBOL LEGEND

[illegible]

CONTROLS ABBREVIATIONS

[illegible]

CONTROL NOTES

1. $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$ (using the squeeze theorem)
 2. $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x} = 0$ (using L'Hôpital's rule)
 3. $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$ (using L'Hôpital's rule)
 4. $\lim_{x \rightarrow 0} \frac{\ln(1+x)}{x} = 1$ (using L'Hôpital's rule)
 5. $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$ (using L'Hôpital's rule)
 6. $\lim_{x \rightarrow 0} \frac{x - \sin x}{x^3} = \frac{1}{6}$ (using L'Hôpital's rule)
 7. $\lim_{x \rightarrow 0} \frac{\tan x - x}{x^3} = \frac{1}{3}$ (using L'Hôpital's rule)
 8. $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$ (using L'Hôpital's rule)

HEAT PUMP (HP-1 AND HP-2) SEQUENCE OF OPERATION

[illegible]

ENGINEERING
S431.04G.Y AN
C431.04G.Y AN
C431.04G.Y AN
W431.04G.Y AN



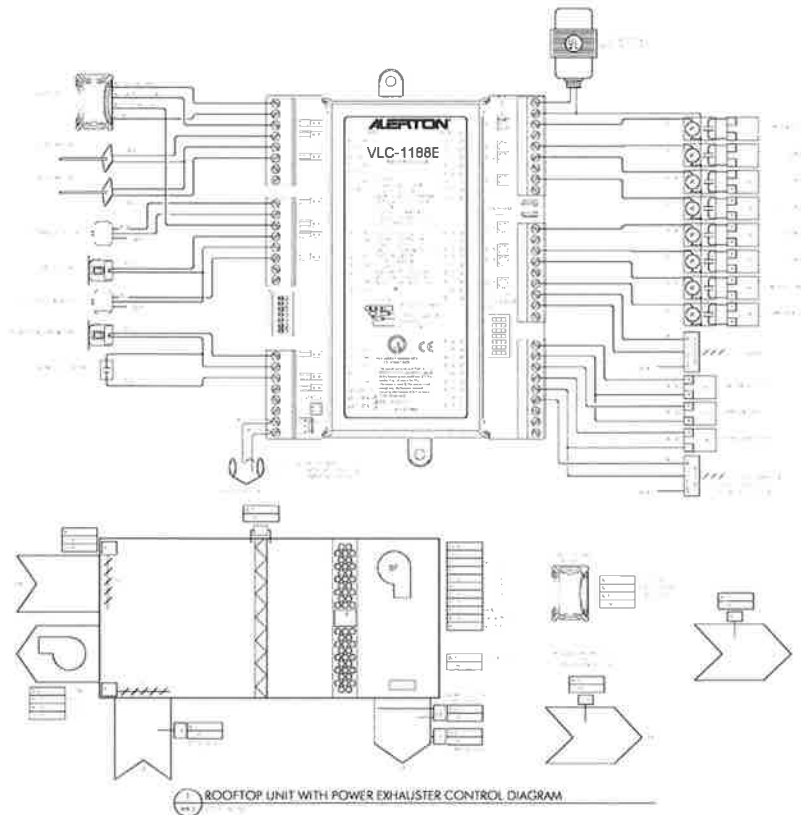
CODE 1000

CALIFORNIA BILLING INC.
SYSTEM SPECIALTIES
13 COWAN DR.
BENIC, NY 14015-8501

REVIEWS

24WV ST
1824 1/2
C-106 3 FF
2-106 1/2
2A'
10/12/10

M6.1



ROOFTOP UNIT WITH POWER EXHAUSTER SEQUENCE OF OPERATION

1	When the unit is powered on, the control unit will check the status of the exhaust fan and the rooftop unit.
2	If the exhaust fan is not running, the control unit will start the exhaust fan and the rooftop unit.
3	If the rooftop unit is not running, the control unit will start the rooftop unit.
4	If the exhaust fan is running and the rooftop unit is not running, the control unit will start the rooftop unit.
5	If the rooftop unit is running and the exhaust fan is not running, the control unit will start the exhaust fan.
6	If both the exhaust fan and the rooftop unit are running, the control unit will continue to monitor their status.
7	If either the exhaust fan or the rooftop unit stops running, the control unit will start the unit that stopped.
8	If the control unit receives a signal from the building management system to stop the units, it will stop both the exhaust fan and the rooftop unit.
9	If the control unit receives a signal from the building management system to start the units, it will start both the exhaust fan and the rooftop unit.
10	If the control unit receives a signal from the building management system to stop the units, it will stop both the exhaust fan and the rooftop unit.

EXISTING RESTROOM SEQUENCE OF OPERATION

1	When the unit is powered on, the control unit will check the status of the exhaust fan and the rooftop unit.
2	If the exhaust fan is not running, the control unit will start the exhaust fan and the rooftop unit.
3	If the rooftop unit is not running, the control unit will start the rooftop unit.
4	If the exhaust fan is running and the rooftop unit is not running, the control unit will start the rooftop unit.
5	If the rooftop unit is running and the exhaust fan is not running, the control unit will start the exhaust fan.
6	If both the exhaust fan and the rooftop unit are running, the control unit will continue to monitor their status.
7	If either the exhaust fan or the rooftop unit stops running, the control unit will start the unit that stopped.
8	If the control unit receives a signal from the building management system to stop the units, it will stop both the exhaust fan and the rooftop unit.
9	If the control unit receives a signal from the building management system to start the units, it will start both the exhaust fan and the rooftop unit.
10	If the control unit receives a signal from the building management system to stop the units, it will stop both the exhaust fan and the rooftop unit.



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CALIFORNIA BUILDING HVAC
SYSTEM UPGRADE
RENO, NV/CA 89509
MECHANICAL CONTROL DIAGRAMS AND SEQUENCE OF OPERATION

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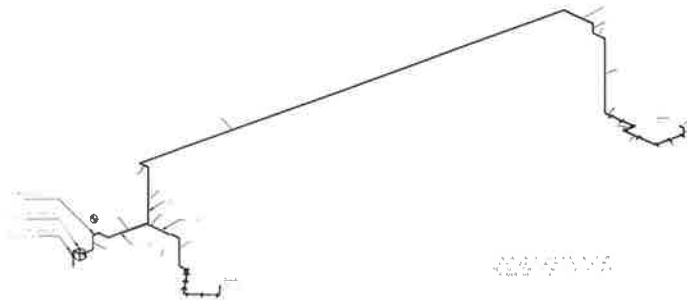
1000 S. 10TH AVE. SUITE 100
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TEL: 303.733.1111
WWW.RENG.COM

1000 S. 10TH AVE. SUITE 100
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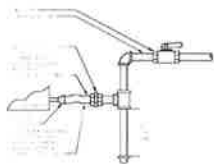
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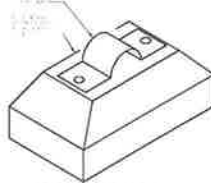
1000 S. 10TH AVE. SUITE 100
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1 GAS ISOMETRIC



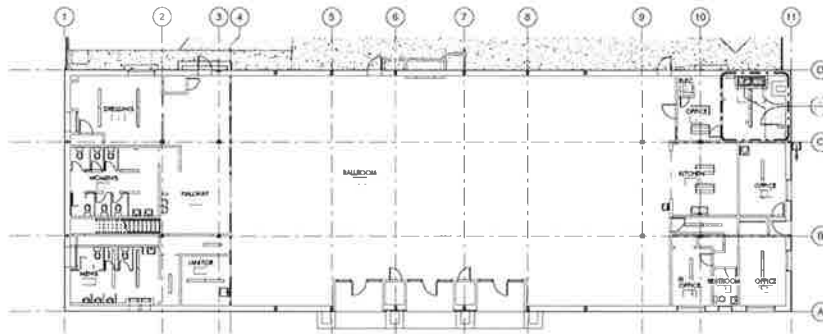
2 GAS CONNECTION DETAIL



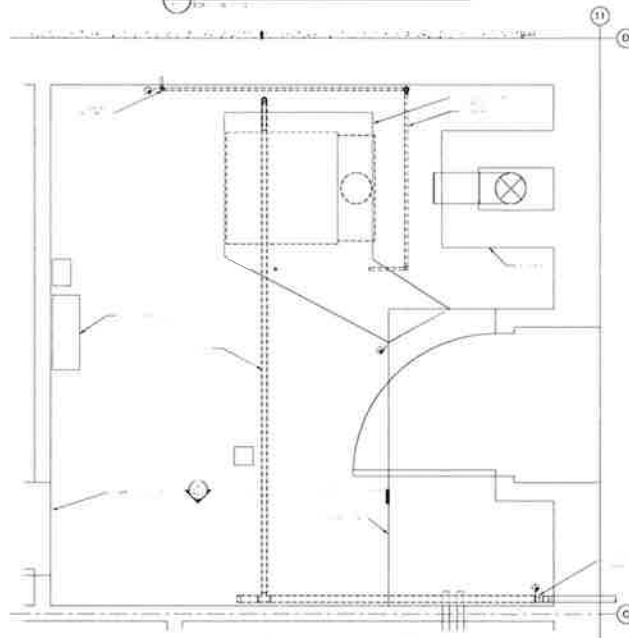
3 PIPE SUPPORT DETAIL

PLUMBING ABBREVIATIONS

1	1/2"	1/2" NPT
2	1/4"	1/4" NPT
3	3/8"	3/8" NPT
4	1/2"	1/2" NPT
5	3/4"	3/4" NPT
6	1"	1" NPT
7	1 1/2"	1 1/2" NPT
8	2"	2" NPT
9	2 1/2"	2 1/2" NPT
10	3"	3" NPT
11	3 1/2"	3 1/2" NPT
12	4"	4" NPT
13	4 1/2"	4 1/2" NPT
14	5"	5" NPT
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16	6"	6" NPT
17	6 1/2"	6 1/2" NPT
18	7"	7" NPT
19	7 1/2"	7 1/2" NPT
20	8"	8" NPT
21	8 1/2"	8 1/2" NPT
22	9"	9" NPT
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24	10"	10" NPT
25	10 1/2"	10 1/2" NPT
26	11"	11" NPT
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28	12"	12" NPT
29	12 1/2"	12 1/2" NPT
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346	171"	171" NPT
347	171 1/2"	171 1/2" NPT
348	172"	172" NPT
349		



OVERALL PLUMBING DEMOLITION FLOOR PLAN



PLUMBING BOILER ROOM DEMOLITION FLOOR PLAN



CR
ENGINEERING
NEW YORK, NY
10001
TEL: 212-696-1100
FAX: 212-696-1101
WWW: WWW.CR-ENG.COM



DATE: 04/11/11

CALIFORNIA BUILDING HVAC
MECHANICAL
735 EDWARDS ST.
MENLO PARK, CA 94025

OVERALL PLUMBING DEMOLITION FLOOR PLAN

REVISIONS

NO. DESCRIPTION

DATE BY

DATE BY

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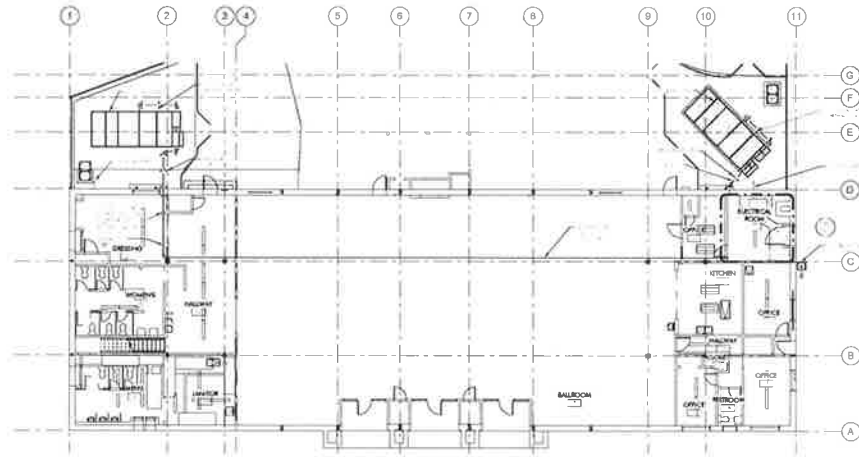
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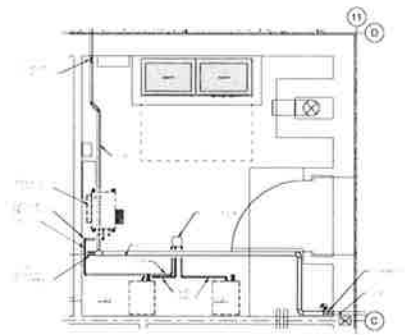
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⊗ A OVERALL PLUMBING FLOOR PLAN



⊗ B PLUMBING NEW ELECTRICAL ROOM FLOOR PLAN



ENGINEERING
 1400 W. 10TH ST. SUITE 100
 DENVER, CO 80202
 303.733.1111
 WWW.CR-ENG.COM

ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE INTERNATIONAL MECHANICAL AND ELECTRICAL CODES (IMC AND NEC) AND THE CALIFORNIA MECHANICAL AND ELECTRICAL CODES (CMC AND CEC).

DATE: 01/11/2011



00000 10000

CALIFORNIA BUILDING HVAC
 SYSTEMS ENGINEER
 725 COWARD DRIVE
 RENO, NEVADA 89509
 OVERALL PLUMBING FLOOR PLAN

REVISION

NO. DESCRIPTION

1. 01/11/2011

2. 01/11/2011

3. 01/11/2011

4. 01/11/2011

5. 01/11/2011

6. 01/11/2011

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35. 01/11/2011

[illegible]

#	DESCRIPTION	DATE	TIME	LOC	ENGR	COMPL	W/RE	W/RE	W/RE	NOTES
1	MANIPULATE IN-PAV. CONC. SAFETY PATCH	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
2	NEWLY REPAVED IN-PAV. CONC. SAFETY PATCH	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
3	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
4	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
5	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
6	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
7	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
8	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
9	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
10	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
11	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
12	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
13	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
14	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
15	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
16	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
17	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
18	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
19	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
20	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
21	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
22	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
23	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
24	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
25	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
26	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
27	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
28	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
29	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
30	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
31	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
32	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
33	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
34	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
35	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
36	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
37	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
38	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER
39	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	NOTE
40	2 PAVE. MANIP. RATED SPEED	1987-11-23	132	70-1-1	1	1	1	1	1	BRAND CONVEALER

1. CONTRACTOR SHALL DISCOVER AND FIELD VERIFY THE SERVING PANEL & BRANCH CIRCUIT AND UPDATE PANEL DIRECTORIES.
2. SEE MECHANICAL PLANS FOR EXISTING LOCATION OF MECHANICAL EQUIPMENT.
3. ALL BRANCH CIRCUIT WIRING SHALL BE PROVIDED WITH PRINTED PERMANENT WIRE MARKERS EACH CLEARLY IDENTIFY THE SERVING PANEL & CIRCUIT BREAKER.
4. SEE NEW PUMP CONTROL DISCUSS ON SHEET TWO FOR DETAILS.

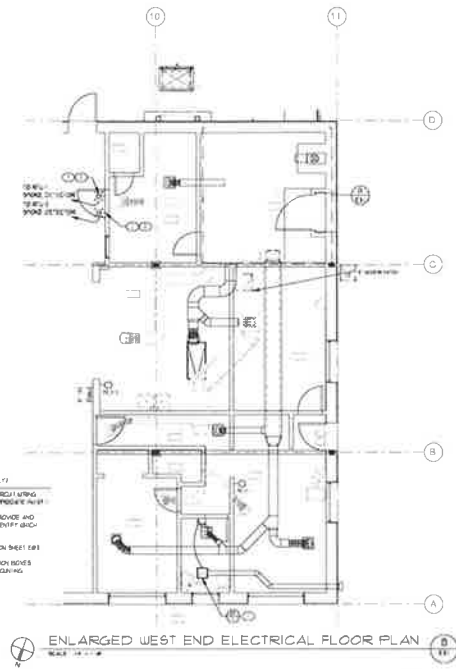
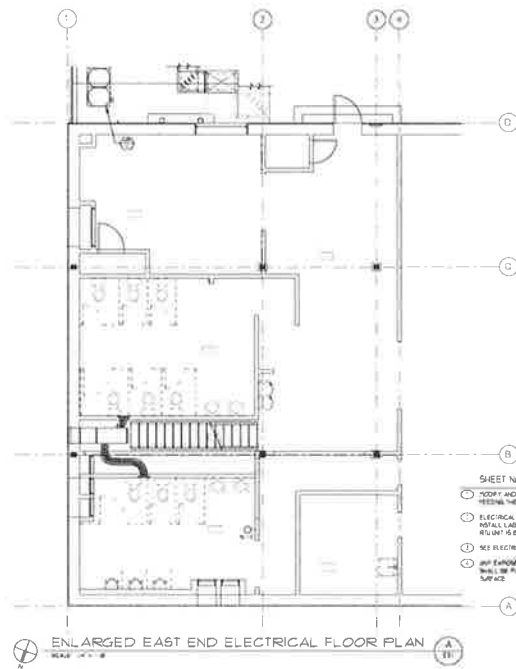
LUMINAIRE SCHEDULE									
FACILITY SYMBOL	FACILITY TYPE	FACILITY NAME		FACILITY WATTAGE	POUNCE HEIGHT	POUNCE STYLE	LAMP TYPE	REMARKS	VOLTAGE
		NAME	CLASS CODE						
000000	A	ACQUITTANCE	CLERK'S OFFICE	100	1000	1000	1000	1000	1000

[illegible]

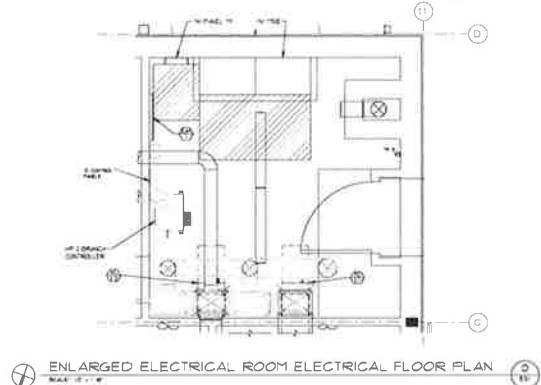
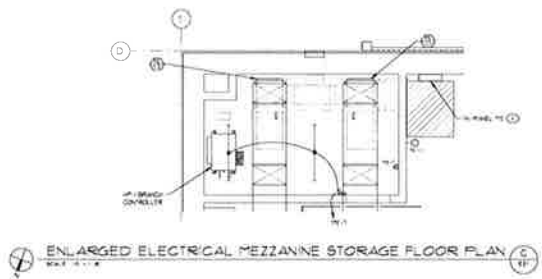




- ⑤ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) EVAPORATIVE COOL
- ⑥ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) HEISTOP EXHAUST FAN
- ⑦ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) ELECTRIC JANI HEATER
- ⑧ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) ELECTRIC HEATER
- ⑨ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) DETECTOR PANEL
- ⑩ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) BUBBLER
- ⑪ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) PUMP
- ⑫ REMOVE AND RETIRE (E) CONDUT AND CONDUCTIONS TO (E) BOILER EMERGENCY SHUTDOWN SWITCH



- SHEET NOTES (THIS SHEET ONLY)**
- 1. VERIFY AND EXTEND TO BRANCH CIRCUIT WITHIN ROOMS THE RELOCATING TO ACCOMMODATE NEW
 - 2. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL LAMPING AT THOSE TO IDENTIFY AND UNIT IS BEING SERVED
 - 3. SEE ELECTRICAL SPECIFICATION ON SHEET 201
 - 4. ALL EXPOSED CONDUITS AND JUNCTION BOXES SHALL BE FINISHED TO MATCH THE FINISHING SURFACE



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JENSEN ENGINEERING
1000 S. GARDEN AVENUE
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DANA POINT, CA 92629
TEL: 949.349.1000
WWW.JENSEN-ENG.COM

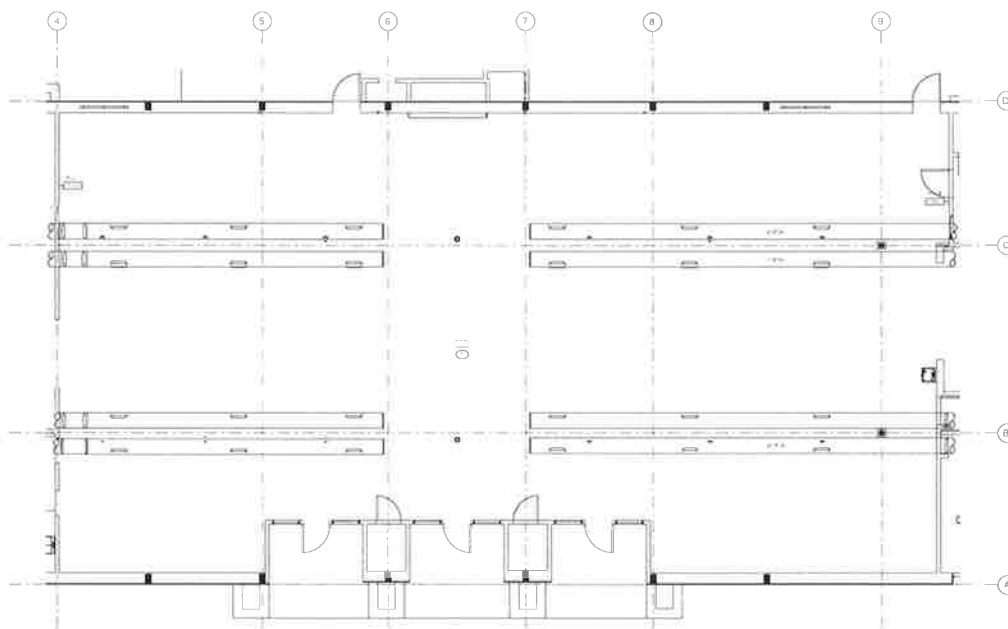


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CALIFORNIA BUILDING
INDUSTRY BOARD
FOR THE STATE OF
CALIFORNIA
ELECTRICAL ENGINEER
ELECTRICAL ENGINEER
ELECTRICAL ENGINEER

PROJECT NO.	100-000000
DATE	01/01/2010
DESIGNED BY	01
CHECKED BY	01
IN CHARGE BY	01
DATE	01/01/2010
BY	01
DATE	01/01/2010

E3.1



ENLARGED BALLROOM ELECTRICAL FLOOR PLAN

SHEET NOTES (THE SHEET ONLY)
 ○ ALL CONDUITS AND SWITCHES AND PANEL BOXES TO BE SET IN BALLROOM ARE TO BE HIDDEN ABOVE THE CEILING AND PAINTED TO MATCH THE CEILING.



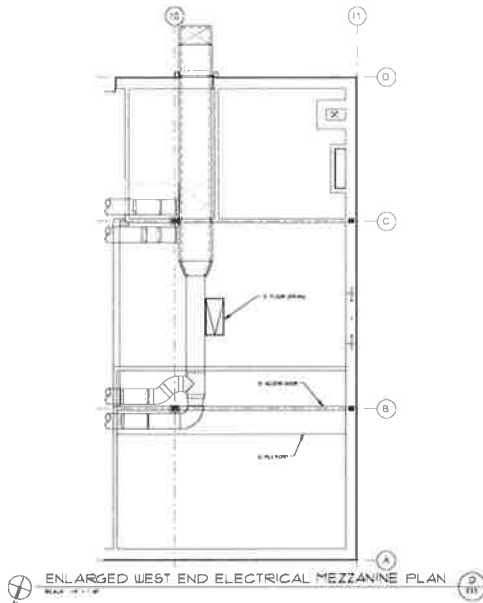
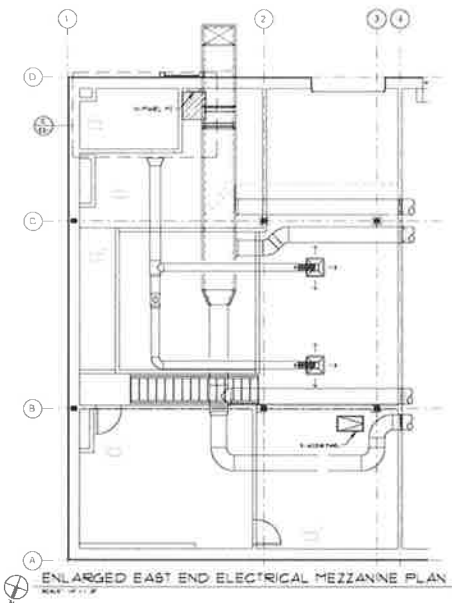
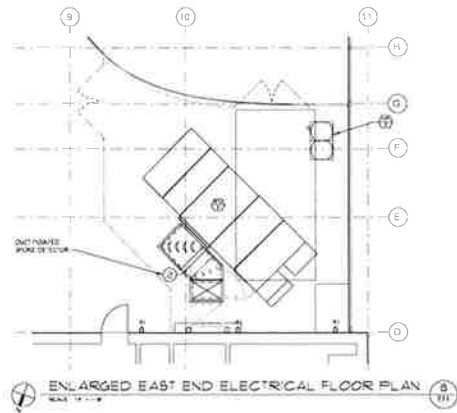
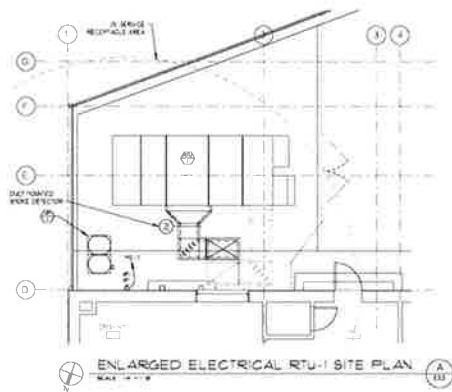
Jensen and Engineering, Inc.
 Electrical Engineering
 10000 S. 100TH AVE. SUITE 100
 SHERMAN, WY 82401
 TEL: 307-761-1234 FAX: 307-761-1235
 WWW: WWW.JE-ENG.COM

CALIFORNIA BUILDING
 PROFESSIONAL SEAL
 J. JENSEN
 ELECTRICAL ENGINEER

REVISIONS

DATE	BY
10/1/11	JE
10/1/11	JE
10/1/11	JE
10/1/11	JE
10/1/11	JE

E3.2



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ELECTRICAL ENLARGED PLANS

REVISION	DATE	BY	CHKD

E3.3



CR
ENGINEERING
3630 UNIVERSITY BLVD
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FAX: 775.851.2074



EXP. 12/31/2015

CONSULTANT
CR ENGINEERING
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735 COWARD
RENO, NEVADA 89509

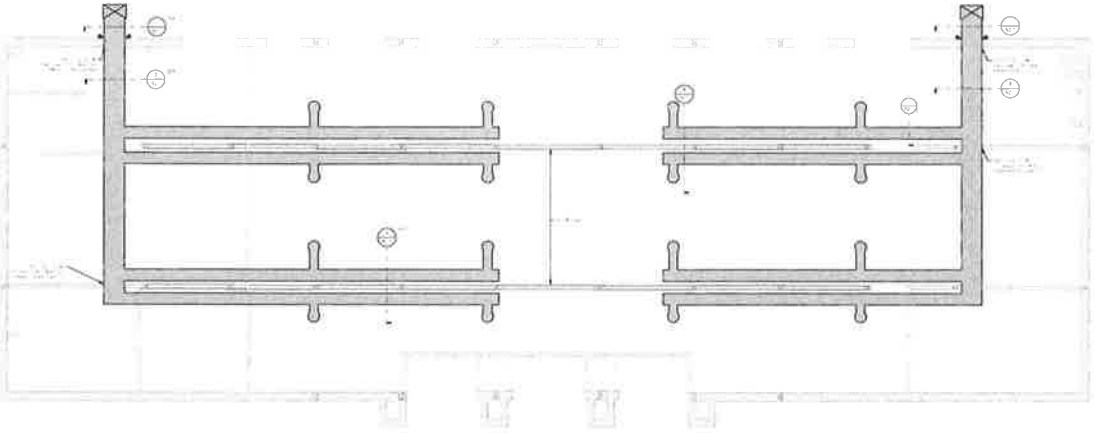
STRUCTURAL IMPROVEMENTS FRAMING PLAN

REVISION	DATE
1	12/15/14

DRAWN BY: LWA
DESIGNED BY: LWA
CHECKED BY: LWA
APPROVED BY: LWA
DATE: 12/15/14
PROJECT NO: 12-248

SHEET NUMBER

S1.2



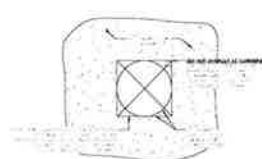
1 Structural Improvements Framing Plan
3/16 • 1-2



6. TYP. FULL PENETRATION THRU PLATE
1/4" x 1/2"



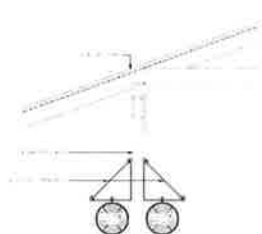
7. TYP. FULL PENETRATION THRU PLATE
1/4" x 1/2"



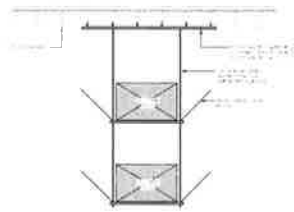
8. TYP. Round Opening
1/4" x 1/2"



9. TYP. Transverse Fillet
1/4" x 1/2"



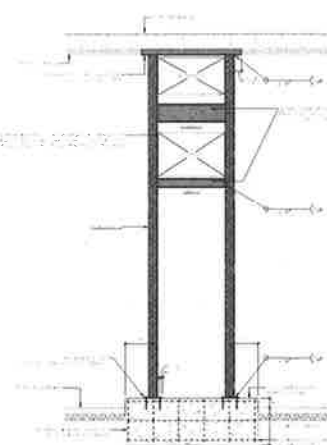
4. TYPICAL HIGH TRANSVERSE SUPPORT DETAIL
1/4" x 1/2"



5. TYPICAL HIGH TRANSVERSE SUPPORT DETAIL
1/4" x 1/2"



2. STRENGTH CHECK FRAME SECTION
1/4" x 1/2"



3. STRENGTH CHECK FRAME ELEV.
1/4" x 1/2"



CR ENGINEERING

3000 GULFVIEW BLVD.
SUITE 100
DALLAS, TEXAS 75246
TEL: 214-343-1111
FAX: 214-343-1112

SEAL

EMP. LICENSE NO. 00001
CONSULTANT
CR ENGINEERING

CALIFORNIA BUILDING
OFFICIAL SEAL
PAUL J. COVATTA, P.E.
RENO, NEVADA 89509

STRUCTURAL SECTIONS AND TYPICAL DETAILS

REVISION

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	11/10/01
2	ISSUED FOR PERMIT	11/10/01
3	ISSUED FOR PERMIT	11/10/01
4	ISSUED FOR PERMIT	11/10/01
5	ISSUED FOR PERMIT	11/10/01
6	ISSUED FOR PERMIT	11/10/01
7	ISSUED FOR PERMIT	11/10/01
8	ISSUED FOR PERMIT	11/10/01
9	ISSUED FOR PERMIT	11/10/01
10	ISSUED FOR PERMIT	11/10/01

DRAWN BY: JCB
DESIGNED BY: JCB
CHECKED BY: JCB
APPROVED BY: JCB
DATE: 11/10/01
PROJECT NO: 01-001
SHEET NUMBER: 10

S2.1



Mechanical Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: California Building HVAC System Upgrade
Location: Reno, Nevada
Climate Zone: 5b
Project Type: Alteration

Construction Site:
75 Cowan Drive
Reno, NV 89509

Owner/Agent:
City of Reno Maintenance and
Operation
1640 Commercial Row
Reno, NV 89512

Designer/Contractor:
Chris Rounds, PE
CR Engineering
5434 Longley Lane
Reno, NV 89511

Mechanical Systems List

Quantity System Type & Description

- 1 RTU-1 (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 500 kBtu/h
Proposed Efficiency = 81.00% Et, Required Efficiency: 80.00 % Et
Cooling: 1 each - Single Package DX Unit, Capacity = 288 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.40 EER, Required Efficiency: 9.80 EER + 11.4 IEER
Fan System: RTU Supply Fan | Ballroom -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 8000 CFM, 10.0 motor nameplate hp, 5.8 design brake hp (7.5 max. BHP), 70.0 fan efficiency grade
- 1 RTU-2 (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 500 kBtu/h
Proposed Efficiency = 81.00% Et, Required Efficiency: 80.00 % Et
Cooling: 1 each - Single Package DX Unit, Capacity = 288 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.40 EER, Required Efficiency: 9.80 EER + 11.4 IEER
Fan System: RTU Supply Fan | Ballroom -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 8000 CFM, 10.0 motor nameplate hp, 5.8 design brake hp (7.5 max. BHP), 70.0 fan efficiency grade
- 1 HP-1 (Single Zone):
VRF Condensing Unit, Air Cooled w/ Heat Recovery Heat Pump
Heating Mode: Capacity = 67 kBtu/h,
No minimum efficiency requirement applies
Cooling Mode: Capacity = 48 kBtu/h,
No minimum efficiency requirement applies
Fan System: None
- 2 HP-1 Fan Coils (Single Zone):
Cooling: 2 each - VRF Zone Fan Unit, Capacity = 24 kBtu/h, No Economizer, Economizer exception: Heat Recovery System
No minimum efficiency requirement applies
Fan System: Fan Coil Supply Fan | Offices -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 2 Supply, Constant Volume, 950 CFM, 0.5 motor nameplate hp, 70.0 fan efficiency grade
- 1 HP-2 (Single Zone):
VRF Condensing Unit, Air Cooled w/ Heat Recovery Heat Pump
Heating Mode: Capacity = 67 kBtu/h,

Quantity System Type & Description

No minimum efficiency requirement applies
Cooling Mode: Capacity = 48 kBtu/h,
No minimum efficiency requirement applies
Fan System: None

- 2 HP-2 Fan Coils (Single Zone):
Cooling: 2 each - VRF Zone Fan Unit, Capacity = 24 kBtu/h, No Economizer, Economizer exception: Heat Recovery System
No minimum efficiency requirement applies
Fan System: Fan Coil Supply Fan | Offices -- Compliance (Motor nameplate HP method) : Passes

Fans:

FAN 2 Supply, Constant Volume, 950 CFM, 0.5 motor nameplate hp, 70.0 fan efficiency grade

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

CHRIS ROUNDS, P.E.

Name - Title



Signature

3/29/31

Date



COMcheck Software Version 4.1.5.5

Inspection Checklist

Energy Code: 2018 IECC

Requirements: 0.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.12.2 , C403.12.3 [FO9] ³	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature and outdoor temperature. future connection to controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

☐ 1 High Impact (Tier 1)
 ☐ 2 Medium Impact (Tier 2)
 ☐ 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.7 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41] ³	Thermally ineffective panel surfaces of sensible heating panels have insulation $\geq R-3.5$.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.3 [ME61] ²	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.3 [ME61] ²	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.3 [ME61] ²	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.3 [ME61] ²	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.1 [ME65] ³	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.8.1 [ME65] ³	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.8.1 [ME65] ³	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.8.1 [ME65] ³	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.8.2 [ME21] ²	HVAC fan motors not oversized beyond allowable limits.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.2 [ME21] ²	HVAC fan motors not oversized beyond allowable limits.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have efficiency grade (FEG) ≥ 67 . The total efficiency of the fan at the design point of operation $\leq 15\%$ of maximum total efficiency of the fan.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

☐ 1 High Impact (Tier 1)
 ☐ 2 Medium Impact (Tier 2)
 ☐ 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.8.3 [ME117] ²	Fans have efficiency grade (FEG) \geq 67. The total efficiency of the fan at the design point of operation \leq 15% of maximum total efficiency of the fan.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have efficiency grade (FEG) \geq 67. The total efficiency of the fan at the design point of operation \leq 15% of maximum total efficiency of the fan.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have efficiency grade (FEG) \geq 67. The total efficiency of the fan at the design point of operation \leq 15% of maximum total efficiency of the fan.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.4 [ME142] ²	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.4 [ME142] ²	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.4 [ME142] ²	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.4 [ME142] ²	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.5 [ME143] ²	Each DX cooling system $>$ 65 kBtu and chiller water/evaporative cooling system with fans $>$ 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.5 [ME143] ²	Each DX cooling system $>$ 65 kBtu and chiller water/evaporative cooling system with fans $>$ 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.5 [ME143] ²	Each DX cooling system $>$ 65 kBtu and chiller water/evaporative cooling system with fans $>$ 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.5 [ME143] ²	Each DX cooling system $>$ 65 kBtu and chiller water/evaporative cooling system with fans $>$ 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

☐ 1 High Impact (Tier 1)
 ☐ 2 Medium Impact (Tier 2)
 ☐ 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.12.1 [ME71] ²	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.3 [ME55] ²	HVAC equipment efficiency verified.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.5.5 [ME113] ²	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.5 [ME113] ²	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.2 [ME59] ¹	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.1 [ME59] ¹	Demand control ventilation provided for spaces >500 ft ² and >25 people/1000 ft ² occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.2 [ME115] ³	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.6 [ME141] ³	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.4 [ME57] ¹	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.5 [ME116] ³	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.1, C403.11.2 [ME60] ²	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5, C403.5.1, C403.5.2 [ME62] ¹	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME62] ¹	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.3 [ME124] ¹	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.3 [ME124] ¹	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.4 [ME125] ¹	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.4 [ME125] ¹	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.5 [ME126] ¹	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3.5 [ME126] ¹	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.3.3.2 [ME121] ³	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.3.3.2 [ME121] ³	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.1.4 [ME63] ²	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3.3 [ME35] ¹	Hot gas bypass limited to: <=240 kBtu/h - 50% >240 kBtu/h - 25%	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3.3 [ME35] ¹	Hot gas bypass limited to: <=240 kBtu/h - 50% >240 kBtu/h - 25%	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.2.1 [ME53] ³	Air outlets and zone terminal devices have means for air balancing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5, C403.5.1, C403.5.2 [ME123] ³	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8] ³	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.2 [FI27] ³	HVAC systems and equipment capacity does not exceed calculated loads.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.1.2 [FI38] ³	Thermostatic controls have a 5 °F deadband.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.1.3 [FI20] ³	Temperature controls have setpoint overlap restrictions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.2 [FI39] ³	Each zone equipped with setback controls using automatic time clock or programmable control system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.2.1, C403.2.4.2.2 [FI40] ³	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.2.3 [FI41] ³	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.2.3 [FI41] ³	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.2.3 [FI41] ³	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.4.2.3 [FI41] ³	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.1 [FI28] ¹	Commissioning plan developed by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.1 [FI31] ¹	HVAC equipment has been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.2 [FI10] ¹	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.3 [FI32] ¹	Economizers have been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.4 [FI29] ¹	Preliminary commissioning report completed and certified by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5.1 [FI7] ³	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5.3 [FI43] ¹	An air and/or hydronic system balancing report is provided for HVAC systems.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

☐ 1 High Impact (Tier 1)
 ☐ 2 Medium Impact (Tier 2)
 ☐ 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.5, 4 [FI30] ¹	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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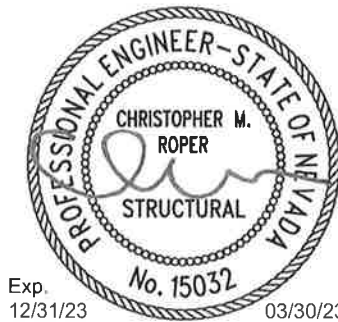
CFBR STRUCTURAL GROUP, LLC

STRUCTURAL CALCULATIONS

CALIFORNIA BUILDING HVAC IMPROVEMENTS

75 Cowan Drive
Reno, NV 89509

CFBR #22_089



DESIGN CRITERIA

CODE

2018 IBC / ASCE 7-16

RISK CATEGORY

II

LIVE LOADS

Roof Live Load, L _r	20	psf
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SNOW LOADS

Project Elevation	4500	ft
Roof Snow Load, S	20	psf (assumed per original design)

WIND LOADS

Basic Wind Speed, V	120	mph
Exposure	C	

SEISMIC LOADS

S _s	1.64
S ₁	0.58
Site Class	D
S _{ds}	1.31
I _e , I _p	1.00
Seismic Design Category	D

SOILS

2018 IBC Table 1806.2	Class 4 materials assumed
Maximum Allowable Soil Bearing	1500 psf



ASCE 7 Hazards Report

Address:
75 Cowan Dr
Reno, Nevada
89509

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see
Section 11.4.3)

Latitude: 39.521977
Longitude: -119.834454
Elevation: 4524.92 ft (NAVD 88)



Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.635	S_{D1} :	N/A
S_1 :	0.58	T_L :	6
F_a :	1.2	PGA :	0.702
F_v :	N/A	PGA_M :	0.842
S_{MS} :	1.961	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.308	C_v :	1.427

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Fri Feb 24 2023

Date Source: [USGS Seismic Design Maps](#)

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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EQUIPMENT**CU-SYSTEM**

W = 1324 lb
H unit = 6 ft
H base = 0 ft
H tot = 6.00 ft

Note: Center of seismic mass is assumed at mid-point of H unit
Assume base solid for wind? y y or n
H center of wind = 3.00 ft

Projected Width B1 (for wind) = 8.4 ft, long side 1 Af1 = 50 sf, long side 1 wind area
Base Anchor Spacing in B1 direction = 8.4 ft, short side to short side
Projected Width B2 (for wind) = 2.5 ft, short side 2 Af2 = 15 sf, short side 2 wind area
Base Anchor Spacing in B2 direction = 2.5 ft, long side to long side

WIND

Basic Wind Speed, V = 120 mph, per local requirements
Exposure = C per local requirements
Kz = 0.85 exposure coefficient
Kzt = 1 topographic factor
Kd = 0.85 directionality factor
Ke = 1 elevation factor
 $qz = 0.00256(Kz)(Kzt)(Kd)(Ke)(V^2) = 26.6$ psf - LRFD
0.6 qz = 16.0 psf - ASD
G = 0.85 gust factor
h/D = 2.4 max
Cf (or Cr) = 1.4 force coefficient

ASD Loading Normal to Long Side 1

F1 = 0.6(qz)(G)(Cf)(Af1) = 958 lb
OTM1 = 2875 ft-lb
0.6MR1 = 993 ft-lb
Max. Uplift @ B1 = -753 lb

LRFD Loading Normal to Long Side 1

F1 = (qz)(G)(Cf)(Af1) = 1597 lb
OTM1 = 4792 ft-lb
0.9MR1 = 1490 ft-lb
Max. Uplift @ B1 = -1321 lb

ASD Loading Normal to Short Side 2

F2 = 0.6(qz)(G)(Cf)(Af2) = 285 lb
OTM2 = 856 ft-lb
0.6MR2 = 3336 ft-lb
Max. Uplift @ B2 = 0 lb

LRFD Loading Normal to Short Side 2

F2 = (qz)(G)(Cf)(Af2) = 475 lb
OTM2 = 1426 ft-lb
0.9MR2 = 5005 ft-lb
Max. Uplift @ B2 = 0 lb

SEISMIC (NON-STRUCTURAL COMPONENT)

Sds = 1.31
Ip = 1.00
ap = 2.5
Rp = 6
z = 0 ft, point of attachment ht.
h = 20 ft, roof ht.
 $Fp = 0.4(ap)(Sds)(Ip)(Wp)/Rp (1+2z/h) = 289$ lb
Fp min = 0.3(Sds)(Ip)(Wp) = 520 lb
Fp max = 1.6(Sds)(Ip)(Wp) = 2775 lb
Fp final = 520 lb

ASD Loading Normal to Long Side 1

F1 = 0.7Fp = 364 lb
OTM1 = 1093 ft-lb
0.6MR1 = 993 ft-lb
Max. Uplift @ B1 = -40 lb

LRFD Loading Normal to Long Side 1

F1 = Fp = 520 lb
OTM1 = 1561 ft-lb
0.9MR1 = 1490 ft-lb
Max. Uplift @ B1 = -29 lb

ASD Loading Normal to Short Side 2

F2 = 0.7Fp = 364 lb
OTM2 = 1093 ft-lb
0.6MR2 = 3336 ft-lb
Max. Uplift @ B2 = 0 lb

LRFD Loading Normal to Short Side 2

F2 = Fp = 520 lb
OTM2 = 1561 ft-lb
0.9MR2 = 5005 ft-lb
Max. Uplift @ B2 = 0 lb

CONTROLLING LOADS**ASD Loading Normal to Long Side 1**

F1 = 958 lb, Wind
OTM1 = 2875 ft-lb, Wind
Max. Uplift @ B1 = -753 lb, Wind

LRFD Loading Normal to Long Side 1

F1 = 1597 lb, Wind
OTM1 = 4792 ft-lb, Wind
Max. Uplift @ B1 = -1321 lb, Wind

ASD Loading Normal to Short Side 2

F2 = 364 lb, Seismic
OTM2 = 1093 ft-lb, Seismic
Max. Uplift @ B2 = 0 lb, Seismic

LRFD Loading Normal to Short Side 2

F2 = 520 lb, Seismic
OTM2 = 1561 ft-lb, Seismic
Max. Uplift @ B2 = 0 lb, Seismic

EQUIPMENT

	RTU	
W =	5500	lb
H unit =	5.83	ft
H base =	0	ft
H tot =	5.83	ft

Note: Center of seismic mass is assumed at mid-point of H unit
 Assume base solid for wind? y y or n
 H center of wind = 2.92 ft

Projected Width B1 (for wind) =	17.3	ft, long side 1	Af1 =	101	sf, long side 1 wind area
Base Anchor Spacing in B1 direction =	17.3	ft, short side to short side			
Projected Width B2 (for wind) =	7.5	ft, short side 2	Af2 =	44	sf, short side 2 wind area
Base Anchor Spacing in B2 direction =	7.5	ft, long side to long side			

WIND

Basic Wind Speed, V =	120	mph, per local requirements
Exposure =	C	per local requirements
Kz =	0.85	exposure coefficient
Kzt =	1	topographic factor
Kd =	0.85	directionality factor
Ke =	1	elevation factor
qz = 0.00256(Kz)(Kzt)(Kd)(Ke)(V ²) =	26.6	psf - LRFD
0.6 qz =	16.0	psf - ASD
G =	0.85	gust factor
h/D =	0.8	max
Cf (or Cr) =	1.4	force coefficient

ASD Loading Normal to Long Side 1

F1=0.6(qz)(G)(Cf)(Af1) =	1918	lb
OTM1 =	5591	ft-lb
0.6MR1 =	12375	ft-lb
Max. Uplift @ B1 =	0	lb

ASD Loading Normal to Short Side 2

F2=0.6(qz)(G)(Cf)(Af2) =	832	lb
OTM2 =	2424	ft-lb
0.6MR2 =	28545	ft-lb
Max. Uplift @ B2 =	0	lb

LRFD Loading Normal to Long Side 1

F1=(qz)(G)(Cf)(Af1) =	3197	lb
OTM1 =	9318	ft-lb
0.9MR1 =	18563	ft-lb
Max. Uplift @ B1 =	0	lb

LRFD Loading Normal to Short Side 2

F2=(qz)(G)(Cf)(Af2) =	1386	lb
OTM2 =	4040	ft-lb
0.9MR2 =	42818	ft-lb
Max. Uplift @ B2 =	0	lb

SEISMIC (NON-STRUCTURAL COMPONENT)

Sds =	1.31	
Ip =	1.00	
ap =	2.5	
Rp =	6	
z =	0	ft, point of attachment ht.
h =	20	ft, roof ht.
Fp = 0.4(ap)(Sds)(Ip)(Wp)/Rp (1+2z/h) =	1201	lb
Fp min = 0.3(Sds)(Ip)(Wp) =	2162	lb
Fp max = 1.6(Sds)(Ip)(Wp) =	11528	lb
Fp final =	2162	lb

ASD Loading Normal to Long Side 1

F1 = 0.7Fp =	1513	lb
OTM1 =	4411	ft-lb
0.6MR1 =	12375	ft-lb
Max. Uplift @ B1 =	0	lb

ASD Loading Normal to Short Side 2

F2 = 0.7Fp =	1513	lb
OTM2 =	4411	ft-lb
0.6MR2 =	28545	ft-lb
Max. Uplift @ B2 =	0	lb

LRFD Loading Normal to Long Side 1

F1 = Fp =	2162	lb
OTM1 =	6301	ft-lb
0.9MR1 =	18563	ft-lb
Max. Uplift @ B1 =	0	lb

LRFD Loading Normal to Short Side 2

F2 = Fp =	2162	lb
OTM2 =	6301	ft-lb
0.9MR2 =	42818	ft-lb
Max. Uplift @ B2 =	0	lb

CONTROLLING LOADSASD Loading Normal to Long Side 1

F1 =	1918	lb, Wind
OTM1 =	5591	ft-lb, Wind
Max. Uplift @ B1 =	0	lb, Seismic

ASD Loading Normal to Short Side 2

F2 =	1513	lb, Seismic
OTM2 =	4411	ft-lb, Seismic
Max. Uplift @ B2 =	0	lb, Seismic

LRFD Loading Normal to Long Side 1

F1 =	3197	lb, Wind
OTM1 =	9318	ft-lb, Wind
Max. Uplift @ B1 =	0	lb, Seismic

LRFD Loading Normal to Short Side 2

F2 =	2162	lb, Seismic
OTM2 =	6301	ft-lb, Seismic
Max. Uplift @ B2 =	0	lb, Seismic

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Steel Beam

Project File: StrongBack Calc.ec6

LIC#: KW-06013933, Build:20.22.12.28

CFBR STRUCTURAL GROUP, LLC

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DESCRIPTION: --None--

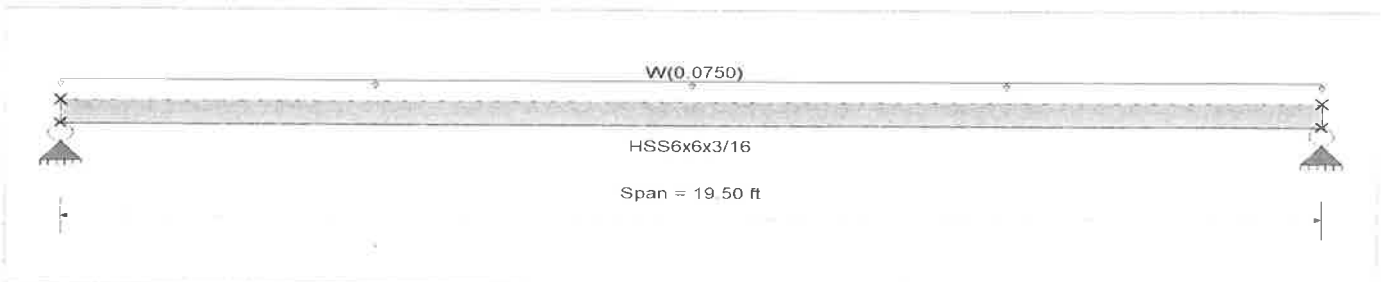
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : IBC 2018

Material Properties

Analysis Method Load Resistance Factor Design
 Beam Bracing : Completely Unbraced
 Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
 E: Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
 Uniform Load : W = 0.030 ksf, Tributary Width = 2.50 ft, (Wind)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.122 : 1	Maximum Shear Stress Ratio =	0.014 : 1
Section used for this span	HSS6x6x3/16	Section used for this span	HSS6x6x3/16
Mu : Applied	3.565 k-ft	Vu : Applied	0.7313 k
Mn * Phi : Allowable	29.337 k-ft	Vn * Phi : Allowable	51.471 k
Load Combination	W Only	Load Combination	W Only
Span # where maximum occurs	Span # 1	Location of maximum on span	0.000 ft
		Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.379 in Ratio = 617		>=600.
Max Upward Transient Deflection	0.000 in Ratio = 0		<600.0
Max Downward Total Deflection	0.227 in Ratio = 1029		>=480.
Max Upward Total Deflection	0.000 in Ratio = 0		<480.0

Maximum Forces & Stresses for Load Combinations

Load Combination			Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
Segment Length	Span #		M	V	max Mu +	max Mu -	Mu Max	Mnx	Phi*Mnx	Cb	Rm	VuMax	Vnx	Phi*Vnx
Dsgn. L = 19.50 ft	1			0.000				32.60	29.34	1.00	1.00	-0.00	57.19	51.47
+0.50W														
Dsgn. L = 19.50 ft	1		0.061	0.007	1.78		1.78	32.60	29.34	1.14	1.00	0.37	57.19	51.47
W Only														
Dsgn. L = 19.50 ft	1		0.122	0.014	3.56		3.56	32.60	29.34	1.14	1.00	0.73	57.19	51.47

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.3790	9.806		0.0000	0.000

Vertical Reactions

Support notation : Far left is #

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.731	0.731
Max Upward from Load Combinations	0.439	0.439
Max Upward from Load Cases	0.731	0.731
+0.60W	0.439	0.439
+0.450W	0.329	0.329
W Only	0.731	0.731