Washoe County School District

Project Title:
Heat Pump Replacements
at B.D. Billinghurst Middle School – Phase 1

Bid #:
25-96-B-04-DA

Date:
April 7, 2025

Prepared By:
Purchasing Department
14101 Old Virginia Road, Room 0
Reno, NV 89521
Phone: (775) 850-8025
Fax: (775) 857-3175
E-Mail: solicitations@washoeschools.net

SECTION 00090 - NOTICE TO CONTRACTORS

Sealed bids for the **Heat Pump Replacements at B.D. Billinghurst Middle School – Phase 1** will be received by the Washoe County School District's (WCSD) Purchasing Department located at the Brown Center 14101 Old Virginia Road, Room #0, Reno, NV 89521, **until 2:00 p.m., (Local Time) on May 8, 2025**. The bids will be opened publicly via a TEAMS Meeting at **2:30 pm (local time).**

Join the meeting now
Meeting ID: 241 647 218 087
Passcode: fe7vM9U3

Scope of Work: Phase 1 includes the removal and replacement of twelve (12) heat pumps, the installation of isolation shut-off valves at all heat pump locations, the replacement of access doors, the replacement of two (2) makeup air units, and the installation of a bypass at the central plant for a variable flow of plant. The twelve (12) heat pumps have been purchased by WCSD and the Awarded Contractor shall pick up and deliver the units to B.D. Billinghurst Middle School for installation.

Contractors desiring to bid on this work shall be contractors presently licensed by the Nevada State Contractors Board and shall maintain a valid Contractor's License for the duration of the construction project. In addition, any and all Subcontractors that will be utilized by the Contractor shall also be presently licensed by the Nevada State Contractors Board and shall maintain a valid license for the duration of the construction project. All licensing requirements as specified in Nevada Revised Statutes (NRS) Chapter 624 shall also be strictly adhered to. Contractors shall also carry and provide evidence of required insurance liability coverage as specified in the Liability Insurance Specifications, as identified in Section 00800 – SUPPLEMENTARY GENERAL CONDITIONS.

***NOTE:* The Facilitating Buyer for this solicitation is named below. Interested parties may NOT contact anyone else regarding this solicitation. Any interested Bidder contacting any other individual including, but not limited to, WCSD staff, officials, evaluation committee members, or Board of Trustees may have their Bid submission rejected from evaluation and award consideration.**

Plans and specifications are available to view and download at WCSD's Purchasing Department website at http://solicitations.washoeschools.net/.

There will be a MANDATORY Pre-Bid Meeting held at 2:30 p.m. on April 24, 2025, at B.D. Billinghurst Middle School (Meet in Front of the Office) 6685 Chesterfield Lane, Reno, NV 89523. Due to access and coordination involved in this project we highly recommend that contractors walk the project site that we are making available.

The physical work is to be commenced upon issuance of a "Notice to Proceed". Work shall be completed on or before August 1, 2025.

Bid #: 25-96-B-04-DA
PWP #: WA-2025-301

Facilitating Buyer: Dawn Allshouse
Email: solicitations@washoeschools.net

To be published in the Reno Gazette Journal on April 7, 2025.

Washoe County School District
Purchasing Department
14101 Old Virginia Road, Room #0
Reno, NV 89521

Phone: 775-850-8025
Fax: 775-857-3175

Email: solicitations@washoeschools.net

C O N T E N T S

Heat Pump Replacements at B.D. Billinghurst Middle School – Phase 1

DIVISION 0			PAGES
Section 00100	Instruction to Bidders		7 – 9
	Special Notifications		10 – 12
Section 00400	Sample Bid Bond	PUR-F525	13 – 14
Section 00500	Sample Contract	PUR-F532	15 – 16
Section 00600	Sample Labor and Materials Bond	PUR-F526	17 – 18
Section 00610	Sample Performance Bond	PUR-F527	19 – 20
Section 00700	General Conditions		21
Section 00800	Supplementary General Conditions		22 – 45
Section 00810	Wage Rates and Apprentice Utilization		46
Section 00820	Special Conditions		47 – 66
Section 00830	Technical Specifications		67 – 68
2024 – 2025 Balanced School Calendar		Total Pages	1
2025 – 2026 Balanced School Calendar		Total Pages	1
FORMS REQUIRED AT BID OPENING WITH BID SUBMISSION			
Bid Form	PUR-F523	Total Pages	5
Preferential Bidder Status Affidavit	PUR-F524	Total Pages	2
Public Disclosure Form	PUR-F210	Total Pages	1
Bid Bond	PUR-F525	Total Pages	2
FORMS REQUIRED FROM AWARD CONTRACTOR			
Labor and Materials Bond	PUR-F526	Total Pages	2
Performance Bond	PUR-F527	Total Pages	3
DIVISION 1			
Section 01001	Construction Procedures for Existing School Sites	Total Pages	2

Section 01010	Summary of Work	Total Pages	2
Section 01015	Schedule of Drawings	Total Pages	2
Section 01020	Personnel Safety Check Application	Total Pages	9
Section 01027	Application for Payment	Total Pages	7
Section 01035	Modification Procedures	Total Pages	7
Section 01040	Coordination	Total Pages	6
Section 01041	Project Management Software	Total Pages	5
Section 01045	Cutting and Patching	Total Pages	5
Section 01110	Prevailing Wage Specifications	Total Pages	20
2025 Prevailing Wage Rates (Washoe County, NV)		Total Pages	66
Amendments		Total Pages	1
Section 01200	Project Meeting	Total Pages	6
Section 01300	Submittals	Total Pages	10
Section 01310A	Progress Schedules	Total Pages	8
Section 01400	Quality Control	Total Pages	4
Section 01420	References	Total Pages	6
Section 01600	Materials and Equipment	Total Pages	6
Section 01631	Substitutions	Total Pages	6
Section 01650	Contractor Moving	Total Pages	6
Section 01700	Contract Closeout	Total Pages	7
Section 01710	Final Cleaning	Total Pages	4
TECHNICAL SPECIFICATIONS – AINSWORTH ASSOCIATES AND MECHANICAL ENGINEERS			
Section 07 54 19	Polyvinyl-Chloride (PVC) Roofing	Total Pages	8
Section 08 31 13	Access Doors and Frames	Total Pages	2
Section 09 91 23	Interior Painting	Total Pages	4
Section 21 00 00	Fire Suppression Systems	Total Pages	9
Section 21 05 30	Hangers and Supports for Fire Suppression Systems	Total Pages	3
Section 21 05 40	Seismic Bracing For Fire Suppression Systems	Total Pages	1

Section 23 00 00	Heating, Ventilating, and Air Conditioning	Total Pages	8
Section 23 05 00	Basic Materials and Methods for HVAC Systems	Total Pages	13
Section 23 05 10	Valves for HVAC Systems	Total Pages	4
Section 23 05 20	Operation and Maintenance of HVAC Systems	Total Pages	1
Section 23 05 30	Hangers and Supports for HVAC Systems	Total Pages	13
Section 23 05 40	Seismic Bracing for HVAC Systems	Total Pages	2
Section 23 05 50	Vibration Isolator for HVAC Systems	Total Pages	3
Section 23 07 00	HVAC Systems Insulation	Total Pages	3
Section 23 08 00	Testing, Adjusting, and Balancing of HVAC Systems	Total Pages	5
Section 23 08 10	HVAC Systems Commissioning	Total Pages	6
Section 23 09 00	Temperature Controls	Total Pages	9
Section 23 09 10	Sequence of Operation	Total Pages	2
Section 23 21 00	Hydronic Piping and Accessories	Total Pages	8
Section 23 31 00	HVAC Ductwork	Total Pages	6
Section 23 31 10	HVAC Ductwork Accessories	Total Pages	5
Section 23 35 00	Air Filters	Total Pages	3
Section 23 75 00	Water Source Heat Pumps (6 Tons and Below)	Total Pages	4
Section 23 75 10	Water Source Heat Pumps (7 Tons and Below)	Total Pages	4
Section 23 81 10	Make-Up Air Units (Evaporative Cooling – Gas Heat)	Total Pages	6
Structural Calculations WCSD Billinghurst MS Heat Pump Replacement – Phase 1		Total Pages	7
HAZARDOUS MATERIALS SPECIFICATIONS			
Material, Water & Lead Disturbance Permit(s)		Total Pages	9
FACS Asbestos & Lead Survey Billinghurst Middle School		Total Pages	48
Work Plan for Small-Scale Disturbance of Lead-Containing Paints or Components		Total Pages	6

SECTION 00100 - INSTRUCTION TO BIDDERS

Bids must be submitted in accordance with the following instructions to be considered for review and award.

Bids shall be submitted on the provided Bid Form (PUR-F523) only, and all of the blank spaces shall be completed; numbers shall be stated both in writing and in figures, the signature shall be in longhand; and the completed form shall be without interlineation, alteration or erasure. **Any bid submission will be disqualified and rejected if the bid submission is not signed.**

Washoe County School District only accepts signatures done manually (also known as a wet signature) or electronic digital signatures that are certified. Non-certified electronic digital signatures will NOT be accepted. A typed signature, even in cursive font, DOES NOT meet the requirements of an official digital signature. A digital signature must be accompanied by a certified digital stamp issued through programs like Adobe Acrobat, Docu-Sign or other similar programs that produce a digital stamp certifying the electronic digital signature. Any signatures on required forms that do not meet these requirements will not be accepted and the Contractor's submission will be deemed "Non-Responsive" and will be rejected. If you have any questions about this requirement, please submit your question by the question deadline, so that it can be answered prior to the bid submission deadline.

In the event of a discrepancy on the Bid Form, NRS 104.3114 Contradictory terms of instrument states that, "If an instrument contains contradictory terms, typewritten terms prevail over printed terms, handwritten terms prevail over both, and words prevail over numbers." No additional pages containing inclusions, exclusions or clarifications will be accepted as part of the bid. Any clarifications, additions or exclusions made by the Washoe County School District (WCSD – OWNER) will be considered incorporated into the specifications.

The Contractor is responsible for ensuring he/she has received and reviewed the entire bid package, including all specifications, plans and any/all issued Addendums.

Bids shall be addressed to the WCSD and delivered to the office of the Purchasing Department, located at the Brown Center, 14101 Old Virginia Road, Room #0, Reno, Nevada 89521**, until 2:00 p.m., (Local Time) on May 8, 2025**. Bids shall be delivered sealed in an opaque envelope. The outside of the envelope shall be clearly marked to indicate the bid for the proposed work and directed to the Purchasing Department. The bids will be opened publicly via a TEAMS Meeting at 2:30 pm.

Each individual bid shall be accompanied by a surety company issued Bid Bond or by a Certified or Cashier's Check made payable to the *Washoe County School District*, in the amount of not less than five percent (5%) of the bid, said amount to be forfeited to WCSD, should the Contractor to whom the Contract is awarded fail to enter into the Contract in accordance with the Contractor's bid and any other contract documents and furnish the required bonds within ten (10) days after the delivery of notice of such award. Bid Bonds, upon request, or deposits of the unsuccessful bidders will be returned upon signing of Contract, or within forty-five (45) days from bid date, whichever is earlier.

Contractors desiring to bid on this work shall be Contractors presently licensed by the Nevada State Contractors Board and shall maintain a valid Contractor's license for the duration of the construction project. In addition, any and all Subcontractors that will be utilized by the Contractor shall also be presently licensed by the Nevada State Contractors Board and shall maintain a valid license for the duration of the construction project. All licensing requirements as specified in NRS Chapter 624 shall also be strictly adhered to.

WCSD requires that all Contractors who work on construction projects have in place a Drug and Alcohol Policy and this shall be acknowledged by signature on the Bid Form (PUR-F523).

The physical work is to be commenced upon issuance of a "Notice to Proceed". Work shall be completed on or before August 1, 2025.

Contractor must agree that Owner may retain from the monies due the Contractor Two Thousand Dollars ($2,000) per day (Liquidated Damages) as a direct result of the Contractor's delay or for not completing the project in the required time allowance plus approved time extensions.

The right is reserved by WCSD to reject any and all bids or accept the bid, which is deemed by WCSD to be in the best interest of the school district. WCSD also reserves the right to waive any irregularities and/or informalities in the submitted bids.

Should a Contractor find discrepancies in, or omissions from, the drawings or documents, or should he/she be in doubt as to the meanings of said documents, he/she should immediately notify the Owner in writing via Email to solicitations@washoeschools.net, whereas the Owner will send written instruction via Addendum to all Contractors. The Owner, Architect/Engineer, Project Manager, Assistant Project Manager, or any other WCSD staff member will not be held responsible for any oral instructions provided during the bid submission process.

Before submitting a bid, Contractors shall carefully examine the scope of work outlined in the bid package and the proposed drawings, specifications, and forms and shall be thoroughly familiar with all existing conditions and expectations of a successful project completion.

No increase in cost or extension in performance time will be considered for failure to know the conditions to be encountered as to the character, quality, and quantity of the work to be performed, and materials to be furnished, and as to the requirements of the specifications.

No increase in cost or extension in performance time will be considered for material escalation. Section 01027 – Applications for Payment, Part 1, Subpart 1.3, Schedule of Values; B,5 of the contract documents provides a provision for the storage of materials, off-site if necessary, to help in managing the project costs and to hedge against potential future material price increases.

A 5% list showing all Subcontractors to be used on the project shall be submitted with the bid followed by a 1% list within 2 hours from the completion of the bid opening, as required

by Nevada Revised Statutes. WCSD also requires a Comprehensive Contractor/Subcontractor list showing all remaining subcontractors to be utilized on the project. All subcontractors shall be licensed as required by Nevada Revised Statutes.

Any Addendums issued during the bid solicitation process shall be acknowledged on the Bid Form (PUR-F523) and in the execution of a contract, Addendums will become a part thereof.

All questions shall be submitted in writing directly to WCSD's Solicitations website at http://solicitations.washoeschools.net/ or via e-mail to solicitations@washoeschools.net by **4:30 p.m. (Local Time) on April 30, 2025.** During this active solicitation there shall be no personal contact with any WCSD employees or other parties associated with this project directly. All inquiries shall be done in writing as stated above.

Addendums will be distributed by WCSD accordingly and can also be accessed via the WCSD Public Works website at: **http://solicitations.washoeschools.net/**

Modifications to bids may only be considered if submitted bids by delivery as previously noted have already been received and said modifications are completed prior to the due date and time for the bid submission.

Bids may be withdrawn in a written request received from a Contractor prior to the time fixed for opening of bids.

In cases where the award of the project has not been made, bids submitted and opened may not be withdrawn for a period of forty-five (45) calendar days from the due date and time of the bid.

A person who bids on this work may file a notice of protest regarding the awarding of the contract with the WCSD's Purchasing Department's Director of Procurement and Contracts within five (5) business days after the date the recommendation to award a contract is issued. The notice of protest must be submitted in accordance with NRS Chapter 338.142. Detailed specifications can be found in Section 00820 – Special Conditions, subsection 14.0 – Appeal by Unsuccessful Bidder.

A person filing a notice of protest in accordance with NRS Chapter 338.142 will be required to post a bond or other security in the amount of twenty-five (25%) percent of the value of the total bid or two hundred fifty thousand ($250,000) dollars, whichever is less. If the protest cannot be resolved by the WCSD's Director of Procurement and Contracts, it will be presented to the WCSD Board of Trustees at a regular meeting.

Contractors to be considered as a Preferential Bidder must submit the Certificate of Eligibility for Preferential Status issued by State of Nevada Contractors Board with their bid submission and the Preferential Bidder Status Affidavit must be provided within two (2) hours after the bid opening, although WCSD prefers the affidavit to also be submitted with the bid at the time of opening.

SPECIAL NOTIFICATIONS

Signature Requirements

Any bid submission will be disqualified and rejected if the bid submission is not signed.

Washoe County School District only accepts signatures done manually (also known as a wet signature) or electronic digital signatures that are certified. Non-certified electronic digital signatures will NOT be accepted. A typed signature, even in cursive font, DOES NOT meet the requirements of an official digital signature. A digital signature must be accompanied by a certified digital stamp issued through programs like Adobe Acrobat, Docu-Sign or other similar programs that produce a digital stamp certifying the electronic digital signature. Any signatures on required forms that do not meet these requirements will not be accepted and the Contractor's submission will be deemed "Non-Responsive" and will be rejected. If you have any questions about this requirement, please submit your question by the question deadline, so that it can be answered prior to the bid submission deadline.

Preferential Bidders

Contractors to be considered as a Preferential Bidder must submit the Certificate of Eligibility for Preferential Status issued by State of Nevada Contractors Board with their bid submission and the Preferential Bidder Status Affidavit must be provided within two (2) hours after the bid opening, although WCSD prefers the affidavit to also be submitted with the bid at the time of opening. Preferential Bidder Status shall be considered if the amount of the apparent low bid is $250,000 or greater per NRS Chapter 338.1389.

Specifications/Addendums

Contractor is responsible to ensure that he/she has received and reviewed the entire bid package, including specifications, plans and any/all issued Addendums. Contractors shall acknowledge by signing any issued Addendum(s) and returning the signed Addendums with his/her bid submission.

Technical Specifications

Any conflicts between the Architect and WCSD specification, it will be the responsibility of the Contractor to seek clarification for any conflicts or be responsible for all the requirements. Clarifications and questions must be submitted in writing via email to: solicitations@washoeschools.net

Washoe County School District Structured Cabling Standard – WCSD-SCS-015

The Washoe County School District Structured Cabling Standard – WCSD-SCS-015 dated March 13, 2023 is located on our website. The link to view it is https://www.washoeschools.net/cms/lib/NV01912265/Centricity//Domain/70/ITPC%20Images/WCSD-SCS-015%203-10-23.pdf

Project Completion

The construction contract time allowed for this project is based on a reasonable expectation of how long it will take to do a project of this scope. WCSD recognizes that Contractors often try to finish projects in significantly less time than the construction contract time and, in such cases, develop schedules which are based on everything going smoothly with no delays. While WCSD allows Contractors to submit such accelerated

construction schedules, WCSD reserves the right to deny the Contractor's submission. Acceptance of a submittal with a shortened schedule is not an official agreement between WCSD and the Contractor that the project can be done in less time than the construction contract time specified.

Roof Penetrations

All roof-mounted equipment or penetrations associated with this project are to be flashed by a licensed roofing Contractor. The roofing Contractor shall have experience with the existing roofing membrane. New flashing materials shall be installed to comply with the membrane manufacturer's specifications or details published by the National Roofing Contractors Association Waterproofing Manual. In acceptance of the work, the Owner will make no allowance for lack of skill on the part of the Contractor. The Contractor shall coordinate all aspects of roof work including any penetrations to maintain the building in a totally watertight condition, no exceptions.

Hours

There is a potential that Summer School, Extended School Year (ESY), Intercession School, After School Care, Parent nights, etc. may be held at the project sites. The Contractor will be required to flex schedule and/or work areas to accommodate school needs during this time frame. In addition, the Contractor may have to alter their normal schedule in order to perform any lead and asbestos attachments and penetrations.

Pre-Bid Meeting Attendance

All Pre-Bid Meetings, whether mandatory or not, will require that all attendees sign in on the sign-in sheet provided. It is the Contractor's responsibility to ensure that he/she documents his/her attendance by signing the Pre-Bid Sign-In Sheet. Failure to do so could result in the Contractor's bid not being accepted by the WCSD, especially in the event of a Mandatory Pre-Bid Meeting.

Mandatory Pre-Bid Meetings require attendees, who intend to bid on the project and act as the Prime Contractor, to participate in the entire meeting including site walk. Attendance will be recorded at the beginning and at the conclusion of the site walk on the Pre-Bid Sign-In Sheet and then posted on the Solicitations website. Leaving prior to the conclusion of the site walk risks contractor's attendance being disqualified and struck from the sign-in sheet.

In addition, if a Pre-Bid Meeting is held on-site, especially a school site, it is the Contractor's responsibility to sign in/register presence on grounds with the site's Front Office. A signature on a school's office sign-in sheet will not take the place of signature on the Pre-Bid Sign-In Sheet, which will only be present at the actual meeting and distributed by the staff of the Purchasing Department and Capital Projects Department.

Questions

All questions shall be submitted in writing directly to WCSD's Solicitations website at http://solicitations.washoeschools.net/ or via e-mail to solicitations@washoeschools.net by 4:30 p.m. (Local Time) April 30, 2025.

Force Accounts

When applicable, the force account amount listed on the Bid Form (PUR-F523) shall be used for changes in the work at the Owner's discretion. Any changes shall be approved

by change order and the force account balance shall be reduced to reflect said change. Any remaining force account balance at the completion of the project shall be returned to the Owner by a deductive change order.

Working Hours

When School is **Not in Session**: From 7:00 a.m. until 3:30 p.m. Monday through Friday the project site will be available to the Contractor.

When School is **In Session**: From 3:30 p.m. until 11:00 p.m. Monday through Friday the project site will be available to the Contractor.

Coordination and Location of Pre-Purchased Heat Pumps

The Awarded Contractor shall coordinate with the WCSD Project Manager for pick-up of the pre-purchased heat pumps that are being stored at 380 Edison Way, Reno, NV 89502.

WCSD's Project Management Software (Procore)

The Awarded Contractor will be required to utilize WCSD's Project Management Software (Procore) for workflow of project documents. This will include, but not limited to submissions of RFIs, submittals, schedule and schedule updates, change documents, payment requests, and close out documents. The Awarded Contractor will be required to work with WCSD Project Manager and WCSD Consultants to manage process to meet project schedule needs. See Section 01041 – Project Management Software for details.

SECTION 00400 – SAMPLE BID BOND (PUR-F525)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____, as Principal, and _____ as Surety, are hereby held and firmly bound unto the Board of Trustees, Washoe County School District, as Owner, in the sum of _____ _____Dollars ($_____) for 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 _____day of_____, 20____.

The condition of the above obligation is such that whereas the Principal has submitted to the Board of Trustees, Washoe County School District, a certain bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for: _____.

NOW, THEREFORE, if said bid shall be rejected, or in the alternative, if said bid shall be accepted and the Principal shall execute and deliver a Contract in the form of Contract attached hereto (properly completed in accordance with said bid) and shall furnish a Bond for its 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 contract created by the acceptance of said bid, then this obligation shall be void.

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

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

IN WITNESS WHEREOF, the Principal and the 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 first set forth above.

_____

_____
Principal

(Seal)

By: _____

_____
Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

SECTION 00500 – SAMPLE CONTRACT (PUR-F532)

THIS CONTRACT, made by and between _____ hereinafter called the Contractor, and **WASHOE COUNTY SCHOOL DISTRICT**, hereinafter called the Owner,

WITNESSETH, that the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

Article 1 – Scope of Work. The Contractor shall furnish all of the materials and perform all of the work in conformance with the Contract Documents entitled **_____(Bid #_____).**

Article 2 – Time of Completion. The work to be performed under this Contract shall be commenced on the date set forth in the Notice to Proceed and shall be completed on or before **_____ or in _____ calendar days**. The Contractor agrees that Owner may retain from the monies due the Contractor the actual value of the damages to the Owner as a direct result of the Contractor's delay or for not completing the project in the required time allowance plus approved time extensions.

Article 3 – The Contract Sum. The Owner shall pay the Contractor for the performance of the Contract, subject to additions and deductions provided therein, in current funds the following stipulated sum:
_____($_____).

Article 4 – Progress Payments. The Owner shall make payments and pay interest to the Contractor in accordance with Nevada Revised Statutes, Chapter 338. No monies payable under this Contract shall be assigned by Power of Attorney, or otherwise, except upon written consent of Owner.

Article 5 – Acceptance and Final Payment. Upon written notice to the Owner that the work is one hundred percent (100%) complete, the Owner shall inspect the project. When the project is one hundred percent (100%) acceptable and complete to the Owner, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, interest on retention, and other indebtedness connected with the work have been paid. Once all requirements have been satisfied, the Owner shall issue a fully executed Certificate of Completion which shall constitute the Owner's acceptance of the work in accordance with NRS Chapter 338.

Article 6 – The Contract Documents. The entire bidding documents, including but not limited to the: Notice to Contractors, Instructions to Bidders, Contractor's Bid, General Conditions, Supplementary Conditions, Special Conditions, Technical Specifications, Addenda, and the Drawings (if any), and this document form the Contract, and they are as fully a part of the Contract as if hereto attached.

Article 7 – Lead and Asbestos Certification. The Contractor hereby certifies that no lead/asbestos containing building material will be used for the construction of the project. If a lead/asbestos containing building material is subsequently found to have been included in the construction of the project, the Contractor shall be responsible for and indemnify the Owner against all costs for the proper removal of the lead/asbestos containing building material and the replacement of said material with a non-lead/asbestos containing material substitute. The removal method shall be specifically approved by the Owner and any and all authorities having jurisdiction over such removal.

IN WITNESS WHEREOF, the parties hereto have executed this Contract the day and year written below.

Bid #_____ - _____

WASHOE COUNTY SCHOOL DISTRICT	CONTRACTOR
_____	_____
Signature	Signature
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Date	Date

SECTION 00600 – SAMPLE LABOR AND MATERIALS BOND (PUR-F526)

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the Board of Trustees of Washoe County School District in the State of Nevada has awarded to _____, hereinafter designated as "Principal", a contract dated _____, for _____ _____ _____ a copy of which contract is attached hereto and by reference made a part hereof, and hereinafter referred to as the "Contract."

And WHEREAS, said Principal is required under the terms of said Contract and by law under the provisions of NRS Chapter 339 to furnish a Bond for the Labor and Materials used in said Contract;

NOW, THEREFORE, we, the Principal, and _____, as Surety, are held and firmly bound unto the Board of Trustees of Washoe County School District in the State of Nevada in the sum of _____ Dollars ($_____), 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 will 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, or its heirs, executors, administrators, successors or assigns shall fail to pay for any materials, provisions, supplies implements or machinery used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Compensation Law with respect to such work or labor, as required by the Provisions of NRS Chapter 339, the Surety hereon will pay for the same within thirty (30) calendar days an amount not exceeding the sum specified in this bond, and the above obligation shall then be null and void. Otherwise, it shall remain in full force and virtue.

THE 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 thereunder, 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 or addition to the terms of the Contract or to the work, or to the specifications.

And the said Surety, for value received, further stipulates and agrees that should the Board of Trustees of Washoe County School District, or other obligees, incur attorney's fees or other expenses for the enforcement of the Contract or this bond, the same shall

be paid by the Surety to the contracting body, subcontractors, workmen laborers, mechanics and furnishers of material as their interests may appear.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their seals this_____ day of _____, 20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

_____
Principal

(Seal) By: _____

_____
Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

SECTION 00610 – SAMPLE PERFORMANCE BOND (PUR-F527)

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the Board of Trustees of Washoe County School District in the State of Nevada has awarded to_____, hereinafter designated as "Principal": a contract dated _____, for _____
_____
a copy of which contract is attached hereto and by reference made a part hereof, and hereinafter referred to as the "Contract".

And WHEREAS, said Principal is required under the terms of said Contract and by law under the provisions of NRS Chapter 339 to furnish a Bond for the faithful Performance of said Contract;

NOW, THEREFORE, we, the Principal, and _____, as Surety, are held and firmly bound unto the Board of Trustees of Washoe County School District in the State of Nevada in the sum of _____Dollars ($_____), lawful money of the United States, being no less than one hundred per cent (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, or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by and well and truly keep the faithfully perform the covenants, conditions, and agreements in the Contract and any alterations made as therein provided, on his or its part to be kept and performed at the respects according to their true intent and meaning; and shall indemnify and save harmless the Board of Trustees of Washoe County School District 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 Contract, the above obligation shall hold good for a period of one (1) year after completion and acceptance of the work done, during which time if the above-bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the Board of Trustees of Washoe County School District 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 work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the

work done, the above obligation in the said sum of _____Dollars ($_____) shall remain in full force and virtue; otherwise, the above obligation shall be void.

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

And the said Surety, for value received, further stipulates and agrees that should the Board of Trustees, Washoe County School District, incur attorney's fees or other expenses for the enforcement of the Contract or his/her bond, the same shall be paid by the Surety to the Board of Trustees, Washoe County School District.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

_____
Principal

(Seal) By: _____

_____
Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

SECTION 00700 – GENERAL CONDITIONS

The General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition, Articles 1 through 15, are hereby incorporated by reference as the “General Conditions of this Project.” Copies of General Conditions may be examined or obtained through formal request to the WCSD’s Purchasing Department located at the Brown Center, 14101 Old Virginia Road, Room 0, Reno, Nevada, 89521 or by phone at (775) 850-8025.

The information contained in the Supplementary General Conditions (Section 00800), Special Conditions (Section 00820), Instructions to Bidders (Section 00100), and the Bid Form (PUR-F523) shall become a part of the Contract and shall apply to all Contractors and Subcontractors. The information contained in Supplementary General Conditions (Section 00800) may amend, modify, supersede, void or supplement the Articles of the “General Conditions of the Project.” Where any part of an Article of the “General Conditions of the Project” is amended, modified, superseded or voided by a provision of the Supplementary General Conditions (Section 00800) or other Contract documents, all other provisions of such Article shall remain in effect, and the provisions of the Supplementary General Conditions (Section 00800) or other Contract documents shall be considered as added.

SECTION 00800 – SUPPLEMENTARY GENERAL CONDITIONS

The General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition, Articles 1 through 15, are hereby incorporated by reference as the “General Conditions of this Project.” Copies of General Conditions may be examined or obtained through formal request to the WCSD’s Purchasing Department located at The Brown Center, 14101 Old Virginia Road, Room 0, Reno, Nevada, 89521 or by phone at (775) 850-8025.

The information contained in the Supplementary General Conditions (Section 00800), Special Conditions (Section 00820), Instructions to Bidders (Section 00100), and the Bid Form (PUR-F523) shall become a part of the Contract and shall apply to all Contractors and Subcontractors.

In any instance where no Architect is involved in the project, any and all references contained in this or any other documents to "Architect" shall be deemed to refer to the consulting Engineer, if any, the special project consultant, if any, or, in the event no such individuals are involved, to the Owner.

The following supplements modify, delete and/or add to the “General Conditions of the Project.” Where any Article, Paragraph or Subparagraph in the “General Conditions of the Project” is supplemented by one of the following Paragraphs, the provisions of such Article, Paragraph, or Subparagraph shall remain in effect and the supplemental provisions shall be considered as added. Where any Article, Paragraph, or Subparagraph in the “General Conditions of the Project” is amended, voided or superseded by any of the following paragraphs, the remaining provisions of such Article, Paragraph or Subparagraph not amended, voided, or superseded shall remain in effect.

1. LIABILITY INSURANCE SPECIFICATIONS

A. INTRODUCTION

The Owner has established specific indemnification and insurance requirements for its construction contracts to help assure that reasonable insurance coverage is purchased and maintained. Insurance, indemnification and hold harmless clauses are intended to assure that a Contractor accepts and is able to pay for the loss or liability related to its activities.

Contractor’s attention is directed to the insurance requirements below. It is recommended that Contractors confer with their respective insurance carriers or brokers to determine **in advance of Bid submission** the availability of insurance certificates and endorsements as described and provided herein.

B. INDEMNIFICATION AGREEMENT

The Contractor agrees to hold harmless, indemnify and defend the Owner, its officers, agents, employees and volunteers from any loss or liability, financial or otherwise resulting from any claim, demand, suit, action, or cause of action based on bodily injury, including death, or property damage, including damage to the

Contractor's property or injury to the Contractor's employees, caused by any action, either direct or passive, the omission, failure to act or negligence on the part of the Contractor, employees, agents, representatives or Subcontractors arising out of the performance of work under this Contract by the Contractor, or by others under the direction or supervision of the Contractor.

In determining the nature of the claim against the Owner, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against the Owner.

In the event of a lawsuit against the Owner, its officers, agents, employees and volunteers, the Contractor shall reimburse the Owner for costs of the Owner's attorneys' fees and costs, as well as personnel in defending such actions. Reimbursement for the time spent by such personnel shall be at the rate charged for such services by private counsel. The Owner shall not be held liable for any accident, loss or damage to the work prior to its completion and acceptance.

C. GENERAL REQUIREMENTS

The Contractor shall purchase Workers Compensation Insurance, General Liability and Automobile Liability as described below. The cost of such insurance shall be included in the Contractor's bid price.

D. WORKERS COMPENSATION INSURANCE

It is understood and agreed that there shall be no Workers Compensation Insurance coverage provided for the Contractor or any Subcontractor by the Owner. Contractor agrees, as a precondition to the performance of any work under this Contract and a precondition to any obligation of the Owner to make any payment under this Contract, to provide Owner with certificates issued by an insurer that shows compliance with NRS Chapters 616A, 616B, 616C and 616D, inclusive, and Chapter 617.

It is further understood and agreed by and between the Owner and the Contractor that the Contractor shall procure, pay for, and maintain the above-mentioned Workers Compensation Insurance coverage at the Contractor's sole cost and expense.

Should Contractor be self-funded for Workers Compensation Insurance, Contractor shall notify Owner in writing prior to the acceptance of this Contract. Owner reserves the right to approve said retentions and may request additional documentation, financial or otherwise, for review prior to the acceptance of this Contract as provisioned under NRS Chapter 616B.627.

E. MINIMUM SCOPE OF LIABILITY INSURANCE

Coverage shall be at least as broad as:

1. Insurance Services Office (ISO) Commercial General Liability Coverage "Occurrence" form CG 0001 12 04 or substitute form

providing coverage as broad as CG 0001 12 04. The Commercial General Liability Coverage shall include, but is not limited to,
Liability Coverage arising from Operations, Premises, Blanket Contractual Liability, Broad Form Property Damage Liability, Products and Completed Operations, Personal Injury and Advertising Liability, and Stop Gap or Employers Liability. In addition, explosion, collapse, and underground coverage must be included unless Owner waives this requirement in writing prior to execution of Contract.

2. Business Auto Coverage form number ISO CA 0001, CA 00 055, CA00 12, CA 00 20 or an equivalent form covering Automobile Liability Symbol 1 "Any Auto."

F. MINIMUM LIMITS OF INSURANCE

The Contractor shall maintain limits no less than:

1. General Liability: **$1,000,000** minimum or the amount customarily carried by the Contractor, whichever is greater, combined single limit per occurrence (with $2,000,000 Aggregate Limit) for bodily injury, personal injury, and property damage. General Liability coverage shall specifically apply to the acts and/or omissions of Contractor and his/her Subcontractors. The above General Liability coverage shall be maintained in full force and effect for five (5) years from the date of completion of the project. The required limits may be met through a combination of primary and excess liability coverage. Any excess liability coverage shall provide coverage at least as broad as the primary coverage and be subject to all of the requirements herein.

2. Automobile Liability: $1,000,000 minimum or the amount customarily carried by the Contractor, whichever is greater, combined single limit per accident for bodily injury and property damage. No Aggregate Limits may apply. Non-owned and hired automobile liability must be included.

3. Workers Compensation Insurance: $1,000,000 minimum in limits (Employers Liability) and obtain Statutory Limits of Workers Compensation Insurance for employees engaged on or at the site of the project in accordance with NRS Chapters 616A, 616B, 616C and 616D, inclusive, and Chapter 617. If an excess policy is utilized, the policy will provide excess coverage for Employers' Liability.

4. Asbestos Environmental Risk Liability Insurance: N/A

G. ASBESTOS COVERAGE

Not Required For This Project.

H. PROPERTY COVERAGES

Not Required For This Project.

I. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retention must be declared to and approved by the Owner. The Owner reserves the right to request additional documentation, financial or otherwise, prior to giving its approval of the deductibles and self-insured retention's and prior to executing the Contract. Any changes to the deductibles or self-insured retentions made during the term of this Contract or during the term of any policy, must be approved by the Owner prior to the change taking effect. It is also understood that the Contractor is responsible for and shall assume payment of all deductibles and/or self-insured retentions.

J. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages

a. The Owner, its agents, officers, employees and volunteers are to be included as Additional Insureds for damages and defense arising from: 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; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, employees or volunteers.

b. The Contractor's insurance coverage shall be primary insurance with respect to the Owner, its officers, employees and volunteers. Any insurance or self-insurance maintained by the Owner, its officers, employees or volunteers shall be in excess of the Contractor's insurance and shall not contribute to the Contractor's insurance coverage in any way.

c. 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.

d. The insurance companies issuing the policy or policies shall have no recourse against the Owner payment of any premiums, costs or assessments under any form of policy.

e. Failure of the Contractor to take out and/or maintain any required insurance shall not relieve the Contractor from any liabilities under this Contract, nor shall the insurance

requirements be construed to conflict with or otherwise limit the obligations of the Contractor concerning indemnification.

2. All Coverages

a. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled or non-renewed by either the Contractor or by the insurer, reduced in coverage or in limits except after thirty (30) days prior written notice has been given to the Owner, which must be approved, if acceptable, by the Owner in writing.

Furthermore, Contractor shall provide the Owner thirty (30) days prior notice, in writing when the Contractor elects to change carriers, not to renew the policy, or reduce coverage, which must be approved, if acceptable, by the Owner also in writing.

b. The Contractor's insurers shall have no right of recovery or subrogation against the Owner or the design professionals which provide work on the project.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Owner, its officers, employees or volunteers.

d. The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums, costs or assessments under any form of policy.

K. ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with an A.M. Best's rating of no less than A:X. The Owner may accept coverage with carriers that have lower A.M. Best's ratings upon review of financial information concerning Contractor and insurance carrier. The Owner reserves the right to require that the Contractor's insurer(s) be a licensed and admitted insurer(s) in the State of Nevada, or on the Insurance Commissioner's approved, but not admitted, list.

L. VERIFICATION OF COVERAGE

Prior to the commencement of any work on the project, the Contractor shall furnish the Owner with certificates of insurance and with original endorsements affecting coverage required. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements are to be received and approved by the Owner before work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time should it be deemed in the best interest of the Owner.

M. SUBCONTRACTORS

The Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein, except that if any Subcontractors maintain limits of insurance less than required in this Contract, Contractor's insurance shall include coverage for acts or omissions of Subcontractor up to the full limits required in this Contract.

N. MISCELLANEOUS CONDITIONS

1. The Contractor shall be responsible for and remedy all damage or loss to any property, including property of the Owner, caused in whole or in part by the Contractor, any Subcontractor, or any employed, directed or supervised by the Contractor.

2. Nothing herein contained shall be construed as limiting in any way the extent to which the Contractor may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Subcontractor under it.

3. In addition to any other remedies the Owner may have should the Contractor fail to provide or maintain any insurance policies or policy endorsements to the extent and within the time required, the Owner may, at its sole option:

   a. Purchase such insurance to cover any risk for which the Owner may be liable through the operations of the Contractor under this Contract and deduct or retain the amount of the premiums for such insurance from any sums due to the Contractor under the Contract; or

   b. Order the Contractor to cease work under this Contract and/or withhold any payments, which became due the Contractor until the Contractor demonstrates compliance with the requirements hereof; or

   c. Terminate the Contract.

2. GUARANTEE BOND

Not Required For This Project.

3. INTEREST

Article 13.5 is hereby supplemented as follows:

Not Required For This Project.

4. CLEANING UP

Article 3.15 is hereby supplemented as follows:

The Contractor, at all times, shall keep the premises free from accumulation of waste materials or rubbish caused by operations. At the completion of the work, Contractor shall remove all waste materials and rubbish from and about the project as well as all tools, construction equipment, machinery and surplus materials, and shall clean all glass surfaces and leave the work "broom clean" or its equivalent, except as otherwise specified.

5. LIQUIDATED DAMAGES

Add Article 8.2.4 as follows:

It is hereby understood and mutually agreed that the date of beginning, rate of progress, and the time for completion of the work to be done hereunder are essential conditions of this Contract and that the work embraced in this Contract shall be commenced on the date set forth in the Notice to Proceed issued by the Owner.

The Contractor agrees that all work shall be performed regularly, diligently, and uninterruptedly at a rate of progress that will ensure substantial completion within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the work described herein is an acceptable time for the completion of the work. If the Contractor should neglect, fail, or refuse to complete the work within the specified Contract time, that has been extended by the Owner, then the Contractor does hereby agree, as a part of the consideration for receiving the award of this Contract, to pay to the Owner, not as a penalty, but as Liquidated Damages, the amount of money specified in the Contract (Section 00100 – Instruction to Bidders and Bid Form (PUR-F523) per day. If the Owner incurs costs in excess of the Liquidated Damages as a result of the Contractor's inability to complete the work by the specified date the additional cost will be deducted from the Contract amount.

If the Contractor fails to complete or correct the work listed on the comprehensive list of deficiencies ("**Punch-List**") within the specified time for performance, the Contractor does hereby agree to pay the Owner **$500** as Liquidated Damages for each calendar day that the completion or correction of the work extends beyond the 45 days for performance allowed from the date the Contractor receives the Punch List of deficiencies from the Architect and/or his/her consultants and/or the Owner.

6. CHANGE ORDERS

Article 7.2 is hereby modified as follows:

A. The Owner, without invalidating the contract, may order changes in the work consisting of additions, deletions, or other revisions, the contract sum and contract time being adjusted accordingly. All such changes in the work shall be authorized by Change Order issued by the Owner.

B. The cost or credit to the Owner resulting from a change in the work shall be determined by the Architect in one or more of the following ways:

1. By unit prices stated in the Contract documents or subsequently agreed upon.

2. By mutual acceptance of a lump sum proposal, properly itemized by contractor/subcontractor, to include the following:

   a. Labor, including fringe benefits, payroll taxes, and workers' compensation insurance;

   b. Materials entering permanently into the work;

   c. Equipment costs for equipment utilized to perform the Change Order work; and/or

   d. Change Order Mark-Up per Schedule.

3. By the actual cost of properly itemized by contractor/subcontractor, to include the following:

   a. Labor, including fringe benefits, payroll taxes, and workers' compensation insurance;

   b. Materials entering permanently into the work;

   c. Equipment costs for equipment utilized to perform the Change Order work; and/or

   d. Change Order Mark-Up per Schedule.

C. The costs under Paragraph 6(B) 1-3 above may be increased by General/Prime Contractor, Subcontractor (all tiers) to include a fixed fee for Subcontractor profit and overhead, Prime Contractor profit and overhead on Subcontractor work, and profit and overhead on work done by the General/Prime Contractor's own forces. The total of such fixed fee shall not exceed the amount determined from the Change Order Mark-Up Schedule below for a single Change Order item, or for any group of related items, and shall be full compensation for the cost of supervision (to include Project Manager, Project Coordinator, Superintendent, Administrative Staff, etc.), overhead, profit, insurance, general conditions not listed and any BIM updating, Procore updating, or other general expense associated with completing the change in the scope of work. The allowable mark-up fee for contractor bonding shall be in addition to the fee below for the Prime Contractor only and shall not exceed 1% of the change if applicable.

CHANGE ORDER MARK-UP SCHEDULE

1. Additive Changes (for the entity performing the work):	
Total Cost of Change +$0.01 to +$50,000 +$50,000.00 and above	Allowable Fee 15% of the Total Cost 10% of the Total Cost
2. Additive Changes (Contractor Markup) Subcontractors work:	
Total Cost of Change +$0.01 to +$50,000 +$50,000.00 and above	Allowable Fee 10% of the Total Subcontractor Fee 5% of the Total Subcontractor Fee
3. Deductive Changes:	
Total Credit Cost of Change +$0.01 to +$50,000 +$50,000.00 and above	Credit Fee to be Applied 10% of the Total Subcontractor Cost. (*Deductive*) 5% of the Total Subcontractor Fee (Deductive)
Example of Deductive Change: Assume <$5,000.00> to be credited. The Contractor must include a 10% credit for profit and overhead, i.e. $5,000.00 X 0.10 = <$5,500.00> total credit to the Contract.	

D. No fees shall be paid for time extensions.

E. All proposals shall be submitted to the Architect in sufficient detail to complete an analysis of all costs. The Contractor shall submit invoices for materials and equipment utilized in Change Order work. Labor rates shall not exceed the applicable Wage Rates (including Prevailing Wage Rates) as published by the State of Nevada Office of the Labor Commissioner. Fringe benefits shall not exceed the cost of fringe benefits normally paid to such personnel or established by the industry in the Northern Nevada area, whichever is lower. Labor rates or additional rates not identified as part of Prevailing Wage Rates shall be identified and approved by WCSD prior to start of construction.

7. SUBCONTRACTORS

Article 5.2.1 is hereby modified as follows:

A. Per NRS Chapter 338:

1. Except as otherwise provided in Subsection 2, each bid submitted to any officer, department, board or commission for the construction of any public work or improvement must include:

   a. The name of each Subcontractor who will provide labor or a portion of the work or improvement to the Contractor for which he/she will be paid; and

b. A description of the portion of the work or improvement which each Subcontractor named in the bid will complete.

2. The Contractor shall list in the Bid Form (PUR-F523) pursuant to Subsection 1 the name of a Subcontractor for each portion of the project that will be completed by him/her.

3. A Contractor whose bid is accepted, shall not substitute any person for a Subcontractor who is named on the Bid Form (PUR-523), unless:

a. The Owner objects to the Subcontractor, requests in writing a change in the Subcontractor and pays any increase in costs resulting from the change; or

b. The substitution is approved by the Owner and:

1. The Subcontractor, after having a reasonable opportunity, fails or refuses to execute a written contract with the Contractor, which was offered to the Subcontractor with the same terms and conditions that all other Subcontractors on the project were offered; or

2. The named Subcontractor files for bankruptcy or becomes insolvent; or

3. The named Subcontractor fails or refuses to perform subcontract within a reasonable time.

8. MANDATORY DRUG TESTING PROGRAM

A. In order to be eligible to perform work on WCSD construction projects all Contractors who will work on such projects must have a current and valid Drug and Alcohol Policy that is applicable to all workers who will be employed on those projects regardless of tier. This requirement is a reasonable precaution to ensure a safe and drug-free environment on school construction projects that may involve workers being in relatively in close contact with students.

B. The Policy must meet the minimum requirements as outlined in Exhibit 1. Each Contractor shall demonstrate compliance with this provision by signature on the Bid Form that the Policy is in place, that it will be actively enforced, and that all workers who will be employed on WCSD projects will have undergone the pre-placement drug testing required by WCSD. The WCSD and/or the Prime Contractor is empowered to review Contractor records of enforcement of its Drug and Alcohol Policy at any time during the construction period up to and including completion of the project in order to determine whether the policy is in fact being enforced. The Contractor shall forthwith deliver to the WCSD any and all records requested to determine compliance with this Drug and Alcohol Policy requirement. Failure to maintain or rigorously enforce the policy or to timely respond to WCSD demands for production of records relating to the Drug and Alcohol Policy may

result in termination of the project agreement at no cost to the WCSD.

C. Refer to Washoe County School District Mandatory Drug and Testing Program Requirements – EXHIBIT 1.

EXHIBIT 1

WASHOE COUNTY SCHOOL DISTRICT

MANDATORY DRUG AND ALCOHOL TESTING PROGRAM REQUIREMENTS

In order to be eligible to perform work on WCSD construction projects, all Contractors who work on such projects must have a current and valid Drug and Alcohol Policy that meets the following minimum requirements:

1. A statement identifying prohibited conduct regarding employee drug and alcohol use. At a minimum, the policy should address the following areas of prohibited conduct:

    a. Alcohol

    Possession of open containers use or being under the influence of alcohol by any employee during normal business hours including lunch breaks, while performing Contractor business, while operating Contractor vehicles or equipment or while on company premises is prohibited. Failure to pass an alcohol test will be grounds for disciplinary action up to and including termination.

    b. Illegal Drugs

    The unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited. Failure to pass a drug test will be grounds for disciplinary action up to and including termination.

    c. Legal Drugs

    Except as provided below, use or being under the influence of any mood-altering legal drug by any employee while on company premises or while performing company business is prohibited to the extent such use or influence may affect the safety of the employee, co-workers or the public, the employee's job performance or the safe or efficient operation of the Contractor.

    An employee under the influence of a mood-altering legal drug has an obligation to inquire and determine whether the mood-altering legal drug he/she is taking may or will affect his/her ability to safely and efficiently perform his/her job duties. If the employee is using a mood-altering legal drug at the direction of a physician, dentist or other licensed practitioner, the employee is required to inform a designated company official. In compliance with the Americans with Disabilities Act (ADA), this policy does not require the employee, physician, dentist or other licensed practitioner to identify the name of the prescription drug or the medical condition for who it is prescribed. For the safety of all employees, the Contractor

may place persons using such drugs in a less hazardous job assignment or place them on temporary medical leave until released as fit for duty by the prescribing physician, dentist or other licensed practitioner. An employee taking over-the-counter medications contrary to instructions provided by the manufacturer may be subject to disciplinary action up to and including termination.

d. Drug Paraphernalia

Employee possession of drug paraphernalia on the project site is strictly prohibited.

2. A statement requiring, at a minimum, the following types of drug and/or alcohol testing:

a. Pre-Placement Testing

Prior to the start of employment generally, or employment on any WCSD project, the Contractor must assure that any employee assigned to work on a WCSD project has previously completed a pre-placement drug test before the effective date of the project assignment. In the case of a newly hired employee, he/she must pass a pre-placement drug test prior to being allowed to work on a WCSD project.

b. Reasonable Suspicion Testing

Contractor will require a medical examination, breath test, blood test, and/or urinalysis when there is reasonable suspicion to believe that the employee is using drugs and/or alcohol at work or where circumstances or workplace conditions justify it.

c. Post- Accident Testing

Each employee will be tested for prohibited drugs and alcohol use as soon as possible after a reportable accident. Reportable accident is defined as any incident that results in an employee requiring medical treatment that results in the filing of a Workers Compensation claim, or property damage in excess of five hundred dollars ($500.00). An employee shall not be relieved of duty pending the receipt of test results except where there is reasonable evidence that alcohol or illegal drug use was a contributing factor as determined by the treating physician.

d. Return To Duty Testing and Follow-Up Testing

At the Contractor's discretion, employees in violation of the drug and alcohol policy will be subject to a return to duty policy as a condition of continued employment. In essence, this policy states that the Contractor may rehire or retain the employee in return for the employee's promise to remain alcohol and drug free on WCSD project sites, complete an evaluation by a licensed alcohol and drug counselor and follow all professional recommendations, provide a negative drug and/or alcohol test to return to duty and submit to follow-up testing on a random basis to confirm on-going policy compliance. This document will be

kept in a confidential file belonging to the Contractor's agency.

3. A statement describing the procedures the Contractor will use to test for the presence of alcohol and controlled substances, protect the integrity of the testing processes, safeguard the validity of the test results and ensure that those results are attributed to the correct employee. To meet this requirement, the Contractor is encouraged to follow the Federal Substance Abuse and Mental Health Services Administration (SAMHSA) Drug and Alcohol Testing Guidelines (49 CFR Part 40). At a minimum, the employer must test for the following drugs of abuse:

    - Marijuana
    - Cocaine
    - Opiates
    - Amphetamines/Methamphetamines
    - Phencyclidine (PCP)

    a. For the purpose of this policy, a positive drug test means that the employee has ingested a drug(s), which causes the employee's drug threshold level to be above the Federal Substance Abuse and Mental Health Services Administration (SAMHSA) Drug and Alcohol Testing Guidelines (49 CFR Part 40). For the purpose of this policy an employee whose breath/blood alcohol level is .04 or greater is considered to be in violation of the policy. It is recommended that blood alcohol testing only be used when an employee is medically unable to provide a breath alcohol sample.

4. A statement indicating the consequences for employees found to be in violation of the drug and alcohol policy. The Contractor's policy must outline the procedures the Contractor will follow to assure that the employee is fit to return to duty following a policy violation. At a minimum, an employee in violation of the Contractor's drug and alcohol policy must complete an evaluation by a licensed alcohol and drug counselor and follow all professional recommendations, provide a negative drug and/or alcohol test to return to duty and submit to follow-up testing on a random basis to confirm on-going policy compliance.

5. A statement indicating that actions taken under this policy will be confidential within the affected Contractor and employee. At a minimum, the Contractor must inform the employee that test results may be disclosed to another member of management on a need-to-know basis and to the employee upon request. Disclosures, without employee consent may also occur when: (A) the information is compelled by law or judicial or administrative process; (B) the information has been placed at issue in a formal dispute between the employer and the employee or job applicant; (C) the information is used in administering an employee benefit plan or other insurance program; (D) the information is needed by first-aid, safety, or medical personnel for the diagnosis or treatment of an employee who is unable/unwilling to authorize disclosure; (E) for review by the State Worker's Compensation Board or the State Unemployment Security Division in determining a pending claim; or (F) the information is compelled by federal officials investigating compliance with the Americans with Disabilities Act (ADA).

6. A statement indicating that all employees shall participate in a company-sponsored drug/alcohol awareness program. The program shall provide employees with information regarding: (A) the company's drug/alcohol free workplace policy; (B) available counseling, referral agencies and rehabilitation; and (C) the penalties imposed upon employees for violations of this policy.

   Each Contractor shall ensure that all supervisors designated to supervise employees on a WCSD project complete a training course on reasonable suspicion testing. This training shall include information on the physical, behavioral, speech and performance indicators of probable employee alcohol or drug abuse and how to effectively intervene per Contractor policy.

7. A statement indicating that Subcontractors, Sub-tiered Contractors, vendors, and their employees shall be required to cooperate with the Contractor's policy to achieve a drug/alcohol free workplace.

END OF EXHIBIT 1

****

9. ARTICLE 1.1 GENERAL PROVISIONS

Add the following at the end of Subparagraph 1.1.1:

In the event of any conflict among the Contract documents, the documents shall be construed according to the following priorities:

Highest Priority:	Modifications
Second Priority:	Agreement
Third Priority:	Addenda–later date to take precedence
Fourth Priority:	Supplementary General Conditions
Fifth Priority:	General Conditions
Sixth Priority:	Specifications with respect to quality and general performance of the Work
Seventh Priority:	Drawings with respect to quantity of materials and general location of the Work. Detail drawings shall take precedence over small scale drawings.

Add the following at the end of Subparagraph 1.2.1:

All Work mentioned or indicated in the Contract documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract documents that such Work is to be done by others. Should the Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quantity of work unless otherwise directed by written addendum to the Contractor.

Add the following to Subparagraph 1.2.2:

The Contractor and all Subcontractors shall refer to all of the Drawings, including those showing primarily the Work of the mechanical, electrical and other specialized trades, and to all of the Sections of the Specifications, and shall perform all Work reasonably inferable therefrom as being necessary to produce the indicated results.

Add new Subparagraphs 1.2.4 through 1.2.11 as follows:

1.2.4 All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract documents.

1.2.5 Where codes, standards, requirements and publications of public and private bodies are referred to in the Specifications, references shall be understood to be to the latest adopted version used to issue permits, except where otherwise indicated.

1.2.6 Where no explicit quality or standards for materials or workmanship are established for Work, such Work is to be of good quality for the intended use and consistent with the quality of the surrounding Work and of the construction of the Project generally.

1.2.7 All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's written or printed directions and instructions unless otherwise indicated in the Contract documents.

1.2.8 The Mechanical, Electrical and Fire Protection Drawings are diagrammatic only, and are not intended to precisely show the alignment, physical locations or configurations of such Work. Such Work shall be installed without additional cost to the Owner to clear all obstructions, permit proper clearances for the Work of other trades, and present an orderly appearance where exposed. Prior to beginning such Work, the Contractor shall prepare coordination drawings showing the exact alignment, physical location and configuration of the Mechanical, Electrical and Fire Protection installations and demonstrating to the Contractor's satisfaction that the installations will comply with the preceding sentence.

1.2.9 Exact locations of fixtures and outlets shall be obtained from the Architect as provided in Subparagraph 3.2.2 before the Work is roughed in; Work installed without such information from the Architect shall be relocated at the Contractor's expense.

1.2.10 Test boring or soil test information included with the Contract documents or otherwise made available to the Contractor was obtained by the Owner for use by the Architect in the design of the Project or Work. The Owner does not hold out such information to the Contractor as an accurate or approximate indication of subsurface conditions, and no claim for extra cost or extension of time resulting from reliance by the Contractor on such

information shall be allowed except as provided in Subparagraph 3.7.4.

1.2.11 Where the Work is to fit with existing conditions or work to be performed by others, the Contractor shall fully and completely join the Work with such conditions or work, unless otherwise specified.

11. ARTICLE 3.1 CONTRACTOR

Add the following to the end of 3.2.1:

If the Contractor proceeds with the Work without such notice to the Architect, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract documents the Contractor could have discovered such, the Contractor shall bear all costs arising therefrom.

Add the following to the end of 3.2.2:

The Contractor shall give the Architect timely notice of any additional Drawings, Specifications, or instructions required to define the Work in greater detail or to permit the proper progress of the Work. The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract documents but shall request additional Drawings or instructions from the Architect. If the Contractor proceeds with such Work without obtaining further Drawings, Specifications or instructions, then the Contractor shall correct Work incorrectly done at the Contractor's own expense.

Add the following sentence to the end of Subparagraph 3.4.1:

The word "provide" shall mean furnish and install complete, including connections, unless otherwise specified.

Change the first sentence of Subparagraph 3.5.1 and delete the last (2) two sentences to read as follows:

The Contractor warrants that the materials and equipment furnished under the Contract will be new and of recent manufacture unless otherwise specified, and that all Work will be of good quality, free from faults and defects, and in conformance with the Contract documents.

Add new Subparagraphs 3.5.3 through 3.5.9 as follows:

3.5.3 The Contractor shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract documents. The Architect may require the Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the Architect, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract documents. All such data

shall be furnished at the Contractor's expense. This provision shall not require the Contractor to pay for periodic testing of different batches of the same material, unless such testing is specifically required by the Contract documents to be performed at the Contractor's expense.

3.5.4 If the Contractor proposes to use a material which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract documents, the Contractor shall inform the Architect in writing of the nature of such deviations at the time the material is submitted for approval and shall request written approval of the deviation from the requirements of the Contract documents.

3.5.5 In requesting approval of deviations or substitutions, the Contractor shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the Architect, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the Architect may reject such substitution or deviation without further investigation.

3.5.6 The Contract documents are intended to produce a building of consistent character and quality of design. All components of the building including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the building. The Architect shall judge the design and appearance of proposed substitutes based on their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The Architect will not approve as equal to materials specified proposed substitutes which, in the Architect's opinion, would be out of character, obtrusive, or otherwise inconsistent with the character of quality of design of the Project. In order to permit coordinated design of color and finishes the Contractor shall, if required by the Architect, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.

3.5.7 Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Architect, unless such substitution was made at the written request or direction of the Owner or the Architect.

3.5.8 The warranty provided in this Paragraph 3.5 shall be in addition to and not in limitation of any other warranty required by the Contract documents or otherwise prescribed by law.

3.5.9 The Contractor shall procure and deliver to the Architect, no later than the date claimed by the Contractor as the date of Substantial Completion, all special warranties required by the Contract documents. Delivery by the Contractor shall constitute the Contractor's guarantee to the Owner that the warranty will be performed in accordance with its terms and conditions.

Change the title of Paragraph 3.9 to read “Superintendence.”

Change the first sentence of Subparagraph 3.9.1 to read as follows:

> The Contractor shall employ a competent superintendent, reasonably acceptable to the Owner, and necessary assistants who shall be in attendance at the Project site full time during the progress of the Work until the date of Substantial Completion, and for such additional time thereafter as the Architect may determine to be necessary for the expeditious completion of the Work.

Add to end of Subparagraph 3.9.3 as follows:

> The Contractor shall remove the superintendent if requested to do so in writing by the Owner and shall promptly replace him with a competent person reasonably acceptable to the Owner.

Add new Subparagraphs 3.9.4 through 3.9.7 as follows:

3.9.4 The Contractor shall retain a competent Registered Professional Engineer or Registered Land Surveyor, acceptable to the Architect, who shall establish the exterior lines and required elevations of all buildings and structures to be erected on the site and shall establish sufficient lines and grades for the construction of associated Work such as, but not limited to, roads, utilities, and site grading. The Engineer or Land Surveyor shall certify as to the actual location of the constructed facilities in relation to property lines, building lines, easements, and other restrictive boundaries.

3.9.5 The Contractor shall establish the building grades, lines, levels, columns, walls and partition lines required by the various Subcontractors in laying out their Work.

3.9.6 The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of work and the storage of materials.

3.9.7 The Contractor shall arrange for and attend job meetings with the Architect and such other persons as the Architect may from time-to-time wish to have present. The Contractor shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by the Contractor’s own superintendent. An authorized representative of any Subcontractor or Sub-Subcontractor shall attend such meetings if the representative’s presence is requested by the Architect. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, change orders, time schedules, and workforce. Any

notices required under the Contract may be served on such representatives.

Change Subparagraph 3.10.1 to read as follows:

3.10.1 The Contractor shall prepare and submit to the Architect a progress schedule as described in Subparagraphs 8.2.4 through 8.2.10.

Change Subparagraph 3.12.6 to read as follows:

3.12.6 By approving and submitting Shop Drawings, Product Data, Samples, and similar submittals the Contractor thereby represents that the Contractor has determined and verified all dimensions, quantities, field dimensions, relations to existing work, coordination with work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples, or similar submittals and verification of compliance with all the requirements of the Contract documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals the Architect shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

Add the following at the end of Subparagraph 3.12.9:

Unless such written notice has been given, the Architect's approval of a resubmitted Shop Drawing, Product Data, Sample, or similar submittal shall not constitute approval of any changes not requested on the prior submittal.

Change Subparagraph 3.13 to read as follows:

The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times with the Owner. The Contractor's right to entry and use thereof arises solely from the permission granted by the Owner under the Contract documents. The Contractor shall confine the Contractor's apparatus, the storage of materials, and the operations of the Contractor's workmen to limits indicated by law, ordinances, the Contract documents and permits and/or directions of the Architect and shall not unreasonably encumber the premises with the Contractor's materials. The Owner shall not be liable to the Contractor, their Subcontractors, their employees or anyone else with respect to the conditions of the premises, except only for a condition caused directly and solely by the negligence of the Owner.

Add the following at the end of Subparagraph 3.15.1:

Immediately prior to the Architect's inspection for Substantial Completion, the Contractor shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned. Woodwork shall be dusted and cleaned. Sash, fixtures, and equipment shall be thoroughly cleaned. Stains, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal

surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the Contractor at the Contractor's expense.

12. ARTICLE 4.1 ADMINISTRATION OF THE CONTRACT

In Subparagraph 4.2.7, add to the end of the first sentence:

"…and only to the extent which the Architect believes desirable to protect the Owner's interest."

13. ARTICLE 8.1 TIME

Added new Subparagraphs 8.1.5 through 8.1.11 as follows:

8.1.5 Within two (2) weeks after award of the Contract, the Contractor shall submit to the Architect a Progress Schedule showing for each class of work included in the Schedule of Values, the percentage completion to be obtained and the total dollar value of work to be completed as of the first of each month until Substantial Completion. All calculations shall be based on the Work in place, and not include the value of materials delivered, but not in place.

8.1.6 The Progress Schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The Progress Schedule will be reviewed by the Architect for compliance with the requirements of this Article and will be accepted by the Architect or returned to the Contractor for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the Progress Schedule has been approved by the Architect.

8.1.7 If in any Application for Payment the total value of the completed Work in place, as certified by the Architect, is less than 90% of the total value of the Work in place estimated in the Progress Schedule, the Owner may, at the Owner's option, require the Contractor to accelerate the progress of the Work without cost to the Owner by increasing the work force of hours of work, or by other reasonable means approved by the Architect.

8.1.8 If each of three (3) successive applications, as certified by the Architect, indicate that the actual Work completed is less than 90% of the values estimated in the Progress Schedule to be completed by the respective dates, the Owner may at the Owner's option, treat the Contractor's delinquency as a default justifying the action permitted under Paragraph 14.2.

8.1.9 If the Architect has determined that the Contractor should be permitted to extend the time for completion as provided in Paragraph 8.3, the calendar

dates in the Progress Schedule shall be adjusted accordingly to retain the same relationship to the adjusted date of Substantial Completion, and the dollar value of Work to be completed as of the first of each month shall be prorated.

8.1.10 If the Contractor fails to submit any Application for Payment in any month, the Architect shall, for the purpose of this evaluation of progress, certify separately to the actual value of the Work in place completed as of the first of the month to the best of the Architect's knowledge.

8.1.11 Nothing herein shall limit the Owner's right to liquidated or other damages for delays by the Contractor or to any other remedy which the Owner may possess under other provisions of the Contract Documents or by law.

Change Subparagraph 8.3.3 and add new Subparagraph 8.3.4 as follows:

8.3.3 No claim for delay shall be allowed on account of failure of the Architect to furnish Drawings, Specifications, or instructions or to return Shop Drawings or Samples until fifteen (15) days after receipt by the Architect by registered or certified mail of written demand for such instructions, Drawings, or Samples, and not then unless such claim be reasonable.

8.3.4 The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the Owner or the Architect on account of any delay in the commencement of the Work and/or any delay or suspension of any portion of the Work, whether such delay is caused by the Owner, the Architect, or otherwise. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time as provided in this Article.

14. ARTICLE 9.1 PAYMENTS AND COMPLETION

Add at the end of the second sentence of Subparagraph 9.2:

"and shall be revised if later found by the Architect to be inaccurate."

Add new Subparagraph 9.3.4 as follows:

9.3.4 Each Application for Payment or periodic estimate requesting payment shall at the Owner's option be accompanied by: (1) a waiver of liens from each Subcontractor; or (2) a certificate from each Subcontractor stating that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the Contractor or else stating the amount not so paid and the reason for the discrepancy. In the event of any such discrepancy, the Contractor shall furnish the Contractor's own written explanation to the Owner through the Architect. Such waiver or certificate shall be in a form acceptable to the Owner.

In Subparagraph 9.5.1, add the new item to the list of .1 through .7 as follows:

.8 failure of mechanical trade or electrical trade Subcontractors to comply with mandatory requirements for maintaining record drawings. The Contractor shall check record drawings each month. Written confirmation that the record drawings are current will be required by the Architect before approval of the Contractor's monthly payment requisition.

Replace the second sentence of Subparagraph 9.10.2 with the following:

If the Contractor fails to furnish such releases or waivers, as the Owner reasonably requires, to satisfy the Owner that there are not outstanding liens, the Owner may require the Contractor, as a condition of final payment and at the Contractor's expense, to furnish a bond satisfactory to the Owner to indemnify the Owner against any such liens.

15. ARTICLE 10.1 PROTECTIONS OF PERSONS AND PROPERTY

At the end of the Subparagraph 10.1, add the following:

"… including compliance with 29 CFR 1910.132, 1910.133, and 1910.134, and for providing a safe workplace and complying with all codes, bylaws, rules and regulations applicable to the construction site."

In Subparagraph 10.2.1.2 delete the word "and" at the end of the Subparagraph.

In Subparagraph 10.2.1.3 add the word "and" to the end of the Subparagraph.

In Subparagraph 10.2.1, add the new item to the list of .1 through .3 as follows:

.4 any other property of the Owner, whether or not forming part of the Work, located at the site or adjacent thereto in areas to which the Contractor has access.

Add new Subparagraphs 10.2.9 through 10.2.12 as follows:

10.2.9 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local Fire Chief or Fire Marshal. The area within the site limits shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.

10.2.10 The Contractor shall, at all times, protect excavations, trenches, buildings and materials, from rainwater, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping, and other equipment necessary to this end.

10.2.11 The Contractor shall remove snow and ice which might result in damage or delay.

10.2.12 During the progress of the Work and at all times prior to the date of Substantial Completion of occupancy of the Work by the Owner, whichever is earlier, the Contractor shall provide temporary heat, ventilation, and enclosure, adequate to permit the Work to proceed in a timely fashion, and to prevent damage to completed Work or Work in progress, or to materials stored on the premises. The permanent heating and ventilation systems may be used for these purposes when available unless otherwise provided in the Contract Documents.

16. ARTICLE 11.3 PROPERTY INSURANCE

Subparagraphs 11.2.2 through 11.5.2 shall be deleted in their entirety.

17. ARTICLE 12.1 UNCOVERING AND CORRECTION OF WORK

Add at the end of Subparagraph 12.2.1:

"…and any cost, loss, or damages to the Owner resulting from such failure or defect."

18. ARTICLE 13.1 MISCELLANEOUS PROVISIONS

Change Subparagraph 13.4.4 to read as follows:

13.5.4 The Contractor shall obtain and deliver promptly to the Architect any occupancy permit and any certificates of final inspection of any part of the Contractor's work and operating permits for any mechanical apparatus, such as elevators, escalators, boilers, air compressors, etc., which may be required by law to permit full use and occupancy of the premises by the Owner. Receipt of such permits or certificates by the Architect shall be a condition precedent to Substantial Completion of the Work.

19. ARTICLE 14.1 TERMINATION OF THE CONTRACT

Delete "or" from end of Subparagraph 14.1.1.2

Delete Subparagraphs 14.1.1.4 in its entirety.

20. ARTICLE 15 CLAIMS AND DISPUTES

Add the following sentence to the end of Subparagraph 15.1.3.1:

Any change or addition to a previously made Claim shall be made by timely written notice in accordance with this Subparagraph 15.1.3.1.

Delete the second sentence of Subparagraph 15.1.6.1 and substitute the following:

The Contractor shall have the burden of demonstrating the effect of the claimed delay on the Contract Time and shall furnish the Architect with such documentation relating thereto as the Architect may reasonably require.

Add the following Subparagraph:

15.1.6.3 Any extension of time for weather delays shall be considered by the Architect and Owner only when a request for such extension is made in writing by the Contractor and provided further that any such request shall be presented to the Architect or Owner within ten (10) days from the commencement of the period of delay.

It is expressly understood and agreed that the Contract Time includes adequate time to allow for usual weather/smoke delays considering the climatic conditions in the area of the Project. No adjustments to the Contract Time will be allowed on account of usual weather or subsequent building/site conditions. The Contractor shall include adequate float or other allowance in the Contractors construction schedule to accommodate weather conditions that may be associated with weather dependent work. Any extension of time for weather will be per specifications 01310(A/B).

Time extension requests for delays caused by additional adverse weather conditions will be evaluated individually. Inclement weather days in which no work is conducted at the project site will be considered by the Owner for full day time extensions. Inclement weather days in which any trade or worker perform work on the project will be considered by the Owner for a maximum of one-half (½) daytime extension.

SECTION 00810 – WAGE RATES AND APPRENTICE UTILIZATION

The Contractor shall comply strictly with the requirements of **NRS Chapter 338** and shall pay, if required by statute, prevailing wage rates for the appropriate labor positions as outlined in 'Washoe County - Prevailing Wage Rates for Public Works, State of Nevada" for projects that are $100,000 or greater. Prevailing wage shall be paid for all work through punch list and issuance of Notice of Completion.

Wage rates as published by the Labor Commissioner of the State of Nevada are available as follows:

Office of Labor Commissioner
1818 College Parkway, Suite 102
Carson City, NV 89706

- Phone: (775) 684-1890
- Email: mail1@Labor.nv.gov
- Website: https://labor.nv.gov/

The Contractor shall comply strictly with the requirements of **NRS Chapter 338 and the Apprentice Utilization Act** as reformed by Senate Bill 82 (SB82) in the 2023 Legislative Session effective January 1, 2024. Please refer to the Labor Commissioner's website specifically for a copy of Senate Bill 82, Presentation Senate Bill 82 dated 12-12-23, Senate Bill 82 OLC Summary dated 12-12-23 and any other posted information.

(https://labor.nv.gov/Apprenticeship_Utilization_Act/Apprenticeship_Utilization_Act/)

A contractor or subcontractor engaged in Public Works construction who employs workers on one or more public works during a calendar year pursuant to NRS 338.040 shall use apprentices for a portion of the total hours of labor worked for each apprenticed craft or type of work to be performed on those public works.

This project is subject to the Apprentice Utilization Act and is categorized as **VERTICAL** work.

It is the Contractor's responsibility to comply, document and report directly to the Labor Commissioner annually if they have performed a certain number of hours or more on Public Works. Failure to comply, document and report could result in financial penalties and disqualification per NRS.

SECTION 00820 - SPECIAL CONDITIONS

1. TIME OF COMPLETION

The physical work is to commence upon issuance of a Notice to Proceed and shall be completed on or before August 1, 2025.

2. EXAMINATION OF SITE

Contractor is requested to visit the project site, compare the Drawings and Specifications with any work in place, and be informed of all conditions, including the work, if any, being performed. Failure to visit the project site will in no way relieve the Contractor from necessity of furnishing any materials or performing any work in accordance with Drawings and Specifications that may be required to complete the work without additional cost to the Owner.

The Contractor shall call the project site and make arrangements for a time to visit. To review the existing premises, contact the Principal and/or Site Facilities Coordinator at the site(s). **Whenever at the site, be sure to check in at the Front Office**.

3. STORAGE

If available as determined by the Capital Projects Department, the Contractor may make arrangements with the Capital Projects Department for an area which the Contractor may use for storage of tools, equipment, and supplies while the project is in progress. Contractor to provide own storage unit for self and any Subcontractors.

4. UTILITIES

If available as determined by the Capital Projects Departments, the Contractor may make arrangements with the Capital Projects Department for the use of all water, electricity, lighting, and other utilities necessary for construction purposes. However, the Contractor shall furnish at his/her own expense any lines or equipment, or extensions necessary to bring utilities to construction areas including any design, permitting, fees, hookup, etc. to execute the use of the utility.

5. TOILETS

If available as determined by the Capital Projects Department, the Contractor may make arrangements with the Capital Projects Department for toilets as necessary for use of workers. Toilets must be kept in sanitary condition and are the responsibility of the Contractor. Additional toilets may be required to be provided by the Contractor if weekend or after hour work is anticipated.

6. BUILDING CODES

All work in this project shall strictly comply with ordinances and laws, state and local, governing such construction in this locality.

Should the Drawings and/or Specifications in any way conflict with these ordinances and laws, the Contractor shall immediately notify the Owner.

7. WAGES

a. Wage Rates – The Contractor shall comply strictly with the requirements of NRS Chapter 338 and shall pay, if required by statute, prevailing wage rates for the appropriate labor positions as outlined in "Washoe County - Prevailing Wage Rates for Public Works, State of Nevada" for projects that are $100,000 or greater.

b. Nondiscrimination - In connection with the performance of the work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, national origin, or sex. Such agreement 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 subcontract for standard commercial supplies or raw materials. Any violation of these provisions by a Contractor or Subcontractor shall constitute a material breach of Contract.

c. Health and Safety in Employment - All applicable provisions of NRS Chapter 618 shall be incorporated in the construction practices for all employees directly engaged in the completion of this project.

Safety: In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for condition of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.

The duty of the Engineer/Architect to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures.

d. Hours - No overtime or weekend work on the project will be performed without the written approval of the Owner or Owner's representative except in cases of emergency where life or property is in imminent danger. The Contractor may submit a request for overtime, weekend or holiday work to the Capital Projects Department for review and approval or denial, a minimum of one (1) week prior to such work. It shall be the Contractor’s responsibility to pay, as a Deductive Change Order, any overtime costs associated with such work for WCSD personnel to open/close site, provide quality assurance and quality control for such work.

WCSD has the right to reject any overtime, holiday or weekend work.

No person shall be employed for more than eight (8) hours in any one day or more than forty (40) hours in any one week without proper overtime compensation being paid.

During occupied periods, the Contractor can only work with the WCSD's permission. During these occupied periods, the Contractor will be responsible for the complete clean-up and weatherproofing of any work each day in order that the space can be utilized for its educational purpose the next day.

The cost of these "off" hours shall be included in the bid.

When School is **Not in Session**: From 7:00 a.m. until 3:30 p.m. Monday through Friday the site will be available to the Contractor.

When School is **In Session**: From 3:30 p.m. until 11:00 p.m. Monday through Friday the site will be available to the Contractor.

e. Employment – Contractors shall comply with NRS Chapter 338.125 and Chapter 338.130 inclusively. The Contractor expressly agrees to comply with the provisions of Chapter 338.130 and further agrees that if those provisions are not complied, or any failure or refusal to comply with the provisions of Chapter 338.130, shall render this Contract VOID.

f. Statutes - All applicable provisions of NRS Chapter 338 shall apply to this project and Contract and all Contractor and Subcontractors shall comply therewith.

g. Workers' Compensation - Workers' Compensation premiums shall be paid as required by law for the duration of the Contract practices delineated under "Occupational Safety and Health" (NRS Chapter 618) and will be adhered to in all phases of construction.

8. PERMITS AND INSPECTIONS

a. Since the project site is within Washoe County, City of Reno or City of Sparks, the Contractor shall secure a building permit and arrange for all inspections through the appropriate jurisdiction. WCSD is not exempt from the requirements of these authorities.

b. Any fees charged by Washoe County, City of Reno, or City of Sparks, for permanent improvements plan checking, permits and water, sewer, electrical hook-up will be paid by WCSD.

c. The Contractor shall give all notices as required and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Specifications and/or Drawings are at variance therewith, the Contractor shall notify the Owner promptly in writing, of any necessary changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the Owner, the Contractor shall

bear all costs arising therefrom.

d. The Contractor shall notify the Owner when ready for final inspection.

e. Final payment shall not be made until the original closed out permit for the work has been turned over to the Owner.

9. EMPLOYEE REGULATIONS

The Contractor shall, at all times, enforce strict discipline and good order among employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

The Contractor shall ensure that each and every kind of work shall be performed by workmen, laborers, or mechanics especially skilled in the class of work (trade) required and that workmanship shall be of the best trade practice, regardless of the quality of materials.

The Contractor shall provide, at all times, sufficient and competent labor to carry on the work properly and ensure completion of each part in accordance with schedule and within the time agreed to.

An employee of the Contractor or Subcontractor, who is deemed incompetent, disorderly, or otherwise objectionable by the Owner, shall be removed promptly by the Contractor, and not reemployed on the work.

10. MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS

Wherever, in these specifications, a particular brand or make of item is specified, the Contractor shall comply strictly with the specifications and recommendations of that manufacturer as to the installation and/or application of that particular item.

11. REFERENCE TO SPECIFICATIONS AND TRADE NAMES

In these Specifications, wherever American Society for Testing Materials or other specifications or standards are mentioned it shall be understood that the materials or methods mentioned therewith shall conform to all requirements of the issue in effect on date of submission of bids. In these specifications whenever the trade name of a product or the name of a product or the name of a manufacturer appears it shall be understood to specify the product so identified or its "Approved Equal." The words "Or Equal" or "Approved Equal" shall mean equal in the opinion of and approved by the Owner or its representative. Refer to requirements outlined in Section 01631 - SUBSTITUTIONS.

12. NOTIFICATION TO CONTRACTOR OF WORK TO BE PERFORMED

After award of the bid, the project shall be initiated by the successful execution of a Contract and a “Notice to Proceed” has been issued by the WCSD’s Purchasing Department.

13. GUARANTEE

The Contractor shall guarantee all work and equipment provided under this Contract to be free from defects of workmanship and material for a period of **one (1) year** or as specified, from the date of final acceptance of the work, which constitutes the issuance of a Notice of Substantial Completion and shall, at Contractor's own expense, repair and replace all defective work and materials.

14. APPEAL BY UNSUCCESSFUL BIDDER

Any unsuccessful Bidder (Appellant) may appeal the results in the solicitation's RECOMMENDATION OF AWARD TABULATION if they believe applicable provisions of the law were violated.

Appellant must submit a notice of protest to the Director of Procurement and Contracts no later than five (5) business days beginning the day after the date of the ROA TABULATION.

The notice of protest must include a written statement setting forth with specificity the reasons the person filing the notice believes the applicable provisions of the law were violated.

Appellant shall submit with the notice of protest a bond (i.e., Protest Bond or Appeal Bond) with a good and solvent surety company, authorized to do business in the State of Nevada or submit other security in a form approved by WCSD, who will hold the bond or other security until a determination is made on the appeal.

The bond shall be in the amount of twenty-five percent (25%) of the total dollar value of the Appellant's bid submission, up to a maximum amount of two hundred fifty thousand dollars ($250,000).

If Appellant is not satisfied with WCSD's Director of Procurement and Contracts' response, Appellant may then appeal to an appeals committee designated by WCSD.

If Appellant is not satisfied with the appeals committee's response, Appellant may then appeal to WCSD's Board of Trustees, who will render the final decision.

WCSD will postpone any award action until after WCSD's Board of Trustees renders a final decision.

Appellant will not seek any type of judicial intervention until WCSD has rendered its final decision on the protest.

If an appeal is granted, the full amount of the posted bond will be returned to Appellant.
If the appeal is denied/not upheld, a claim may be made against the bond by WCSD for expenses suffered by WCSD as a result of the unsuccessful appeal.

WCSD is not liable for any costs, expenses, attorney's fees, loss of income, or other damages sustained by Appellant in an appeal process.

15. QUALITY ASSURANCE

It shall be the Contractor's responsibility to use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

16. OTHER PROJECTS

The Contractor is hereby informed that other projects may be happening at the school/ site at the same time as this project. The Contractor will make every effort to coordinate work with that of other Contractors.

17. EXISTING BUILDING AND CONDITIONS

During construction, it shall be the responsibility of the Contractor to take all reasonable precautions to preserve and protect surrounding buildings and property from damage of all kinds arising from the execution of this Contract. He/she shall repair and/or be responsible for any such damage at no additional cost to the Owner.

It is the Contractor's responsibility to identify and document any building or site damage that exists prior to the start of construction. If undocumented damage is discovered by the Owner that could have been caused as a result of the Contractor's presence it will be the Contractor's responsibility to repair the damage to the Owner's satisfaction without cost to the Owner. If the Contractor does not repair the damage to the Owner's satisfaction, then the Owner has the right after forty-eight (48) hours of written notification to repair the damage and process an Owner's Deductive Change Order for all expenses associated with the repair.

The Contractor shall provide temporary protective fencing or covering over any open trenching or excavation arising from the execution of this Contract, to keep out unauthorized persons, at no additional cost to the Owner.

The Contractor shall notify the Capital Projects Department's representative forty-eight (48) hours prior to any electrical shutdowns at the project site. Failure to do so could cause freezing and other damage due to shut down of the energy management system. The Contractor shall bear all costs for damage resulting from any failure to notify designated parties.

The Contractor shall meet with the representative of the Capital Projects Department to establish limits of work and general ground rules. As school may be in session, all safety precautions will be rigidly enforced.

Contractor shall hire a qualified, properly Licensed Contractor to test all natural gas lines within area of work for leaks prior to the start of the project and at project completion. Note all gas leaks at the start of the project and report it to the Capital

Projects Department's representative IMMEDIATELY. Contractor shall not proceed with work in area of any leaks until directed by the Capital Projects Department's representative. Gas line leaks at project completion shall be the responsibility of the Contractor and be repaired by a qualified, Licensed Contractor at no cost to the Owner. Contractor shall assume that all exposed conduit that exists within the work area is fully functional and operational for all wiring that is within the conduit at the start of the project. If at any time during construction, operations utilizing this wiring fail or are disrupted, the Contractor shall be responsible for repairs to make the operations fully functional by a qualified, Licensed Contractor at no cost to the Owner.

18. MATERIAL DISTURBANCE PERMIT

The Building Material Disturbance Permit (MDP) is a Washoe County School District (WCSD) document that identifies asbestos and lead site specific information, and it is issued by the Environmental, Safety & Assessment (ES&A) Department. A site-specific Material Disturbance Permit is required for each project. Each project and facility require a separate Material Disturbance Permit because each facility has specific information and direction regarding asbestos and lead, as each facility is different in that regard. The Material Disturbance Permit is to be requested by the Project Manager, or appointed District representative, in accordance with current Material Disturbance Permit requirements. No work can be done by a Contractor in WCSD without an MDP.

19. WATER SYSTEM DISTURBANCE

Improper closing of valves and other improperly conducted disruptions to District facilities can result in cross connections and back siphoning of chemicals and other contaminates into the water supply. Since these disturbances are very important, the District has added a water system disturbance section to the Material Disturbance Permit (MDP). Work, as a part of this contract, may involve the disturbance of a facilities water distribution system and, as such, the contractor is required to comply with the Water System Disturbance Permit Appendix section of the Material, Water & Lead Disturbance Permit for any work impacting a facility water system.

The contractor shall carefully comply with all requirements of the Material, Water & Lead Disturbance Permit, and shall be aware of this process prior to bid preparation and any construction. The permit requirements are hereby made a part of this specification and contract to the same extent as if bound herein and shall apply to all contractors and subcontractors.

The contractor shall be responsible for all costs incurred by the Washoe County School District, including the consultant, sampling and testing, clean-up, replacement of effected equipment, materials, etc., and any legal action that may result from an unauthorized disturbance of a water system caused by the contractor or his subcontractors, resulting in a cross connection or backflow incident.

If Contractors have any questions regarding the requirements of the Water System Disturbance Permit, please call the ES&A Department for the Regulated Systems Compliance & Safety Officers at (775) 325-8491.

20. ASBESTOS

The Washoe County School District has approx. 60% of our facilities that contain asbestos-containing materials. Contractors performing disturbances to asbestos-containing materials must be properly licensed and trained per the EPA AHERA regulation, as well as other Federal, State, and Local regulations.

Since so many of the facilities contain asbestos, minor construction activities many times will involve disturbance of materials which contain asbestos. These projects may involve “small scale-short duration” asbestos disturbances also termed “Attachments & Penetrations” to non-friable materials. As a part of this contract, the successful contractor will be required to include Attachments & Penetrations into the scope of their work.

a. Asbestos and the Material Disturbance Permit

The Contractor shall carefully comply with all the items of the Building Material Disturbance Permit (MDP) and shall review the permit and become familiar with its contents prior to bid preparation and any construction.

Once a Material Disturbance Permit Request is received for a specific project, building materials that have been identified as being disturbed during construction, and/or demolition, will have been tested for the presence of asbestos. These materials will be identified as asbestos-containing or non-asbestos-containing on the building Material Disturbance Permit(s) by the District’s AHERA Management Planner. The Material Disturbance Permit must be referred to before any work commences. No outside asbestos sampling of building materials, by the Contractor or a Contractor hired asbestos consultant, is allowed.

All asbestos-containing material must be handled by contractors and/or individuals trained and certified in the removal of asbestos-containing building materials. No asbestos-containing materials shall be disturbed prior to authorization from the owner. If any material is encountered that is not listed on the Material Disturbance Permit, it shall immediately be brought to the attention of the Project Manager before any work continues that might disturb this material. If any building material listed in the disturbance permit as containing asbestos is improperly disturbed, in the opinion of the District, by the Contractor or his sub-contractor/s, the District will immediately hire a third-party asbestos consultant to investigate possible asbestos contamination, and an asbestos Contractor to perform any recommended clean-up.

The Contractor shall be responsible for all costs incurred by the District including the consultant, sampling and testing, clean-up, replacement of affected equipment, materials, etc., and any legal action that may result

from an asbestos fiber release incident caused by the Contractor or his sub-contractors.

b. Asbestos Abatement (The removal of an asbestos material)

Attachments and Penetrations does not include the removal (other than drilling holes) of asbestos containing materials. Any removal of asbestos-containing materials is not an “Attachment and Penetration” activity, but rather an abatement, and any abatement of asbestos materials must be designed by an EPA AHERA certified Asbestos Project Designer. Any abatement project’s design will be the responsibility of the District to design and provide abatement specifications. Asbestos abatement (Removal) must be conducted by an asbestos abatement contractor, which will be supervised by the District and/or a District hired asbestos abatement consultant. The abatement costs will be included into the scope of this project.

c. Asbestos – Attachments & Penetrations

Attachments & Penetrations, for the purpose of this document, is the drilling of holes, installing/removing screws, installing anchors, nails, and staples in non-friable asbestos-containing materials, in which the disturbance may release asbestos fibers. Attachments & Penetrations are minor disturbances that are normal activities such as installing conduits, mounting boxes or brackets, and removing equipment anchors from asbestos containing materials. The Material Disturbance Permit will identify which materials at a specific site can be disturbed, and the minimum requirements to perform an asbestos disturbance.

d. “Small Scale-Short Duration” – WCSD Attachment & Penetration Procedures

The WCSD Attachment & Penetration Procedures that the Contractor must utilize, when identified as being required in the MDP, are available from the Project Manager. The contractor shall submit their WCSD Attachment & Penetration Procedures to the Project Manager. The Project Manager will submit the documents to the ES&A Department for approval.

The contractor can add additional requirements, but nothing required in the MDP and WCSD Attachment & Penetration Procedures may be omitted. The Contractor must submit their Attachment & Penetration Procedure to their Project Manager to get ES&A approval of these documents **prior to any disturbance.** The ES&A Department will notify the contractor upon approval of these documents.

Once the approval of the WCSD Attachment & Penetration Procedure and training certificates is received, the contractor may schedule the disturbance, but must notify the ES&A Department immediately prior to disturbing the asbestos-containing materials. The Contractor shall provide this notice by calling the ES&A Attachment & Penetration hotline at 325-8490, follow the directions, and leave a message. ES&A Department

personnel, Project Managers, Assistant Project Managers/PCI's, and other district personnel may conduct site visits to ensure compliance with the contractor's submitted and approved procedures.

e. Asbestos Training Certificates – Abatement

Abatement of asbestos-containing materials, as allowed and identified in the Material Disturbance Permit, will be done by an Asbestos Abatement Contractor, with workers that have a minimum of 32-hour AHERA asbestos training (Asbestos Worker), and supervised by an abatement supervisor with 40-hour AHERA asbestos training (Contactor/Supervisor). Workers and supervisors must also get an annual refresher certificate if the original training is greater than one year old. Contractor training certificates will be submitted to the Project Manager at least two weeks prior to the start of the project. The ES&A Department will review the submitted training documentation, verify certificates as required, and approve the abatement workers and supervisors, so they can work on the assigned WCSD project. No one that has not been approved by the ES&A Department is authorized to perform any asbestos disturbances within the WCSD.

New workers added after the start of the project will be approved by the ES&A Department within one 8-hour work period of the standard Monday thru Friday work schedule. Certification submittal will be serviced by the ES&A Department on a first come, first served basis. Delays to review the documentation will be anticipated and taken into account on any abatement schedule developed, and asbestos workers and supervisors will not be allowed to work in any way on that project until their documentation has been reviewed and approved.

f. Asbestos Training Certificates – Attachment & Penetration

Contractors performing "Attachment & Penetration" work on non-friable asbestos-containing materials, as allowed, and identified in the Material Disturbance Permit, will be required to have a minimum of 16 hours of AHERA asbestos training (Operations & Maintenance, or O&M), as well as an annual refresher certificate if the original training is greater than one year old. Contractor training certificates will be submitted to the Project Manager at least two weeks prior to the start of the project. The ES&A Department will review the submitted training documentation, verify certificates as required, and approve the Attachment & Penetration technicians, so they can work on the assigned WCSD project. No one that has not been approved by the ES&A Department is authorized to perform any asbestos disturbances within the WCSD.

New workers added after the start of the project will be approved by the ES&A Department within one 8-hour work period of the standard Monday thru Friday work schedule. Certification submittal will be serviced by the ES&A Department on a first come, first served basis. Delays to review the documentation will be anticipated and taken into account on any Attachment & Penetration schedule developed, and Attachment & Penetration

technicians will not be allowed to work in any way on that project until their documentation has been reviewed and approved.

g. Asbestos Air Sampling, Respiratory Protection, and Protective Suits

Asbestos personal air sampling is required during any asbestos disturbance. Asbestos air sampling results will be supplied to the ES&A Department, and the Project Manager, within 48 hours of the completion of a disturbance. Laboratory results will be emailed directly to the ES&A Department from the laboratory providing analysis. Handwritten results will not be allowed. Regardless of air sampling results, Contractors will not be allowed to submit a Negative Exposure Assessment so that they can discontinue the use of respirators and personal protective suits. The District reserves the right to require this requirement, to reduce the long-term exposure liability from Contractors and their workers, which have disturbed this owner's asbestos materials.

If training certificates are issued for a class, those training certificates need to be submitted. Wallet cards will not be accepted as a training certificate unless no training certificate is provided by the training provider. In order for a wallet card to be accepted, the contractor will supply a letter from the training provider stating that no training certificate was provided, and only wallet cards were supplied to attendees. Wallet cards are less desirable due to their small size and mitigate the ability to clearly read and verify all the information on the card. Contractors are encouraged to request a full size 8 ½" x 11" training certificate from their training providers.

21. LEAD PAINTS, COATINGS, CERAMIC TILE, AND LEAD-CONTAINING MATERIALS IN WCSD FACILITIES

a. Lead-containing paints, coatings, ceramic tile, and lead materials are present in WCSD facilities.

Bidders/Contractors that disturb lead-containing or potentially lead-containing paints, coatings, ceramic tile, and lead-containing materials, by law, are required to know all applicable regulations, and comply with all state and federal regulations that apply to the disturbances to lead-containing paints, coatings, ceramic tile, and lead-containing materials they are conducting. The regulations that are recommended by the District for a contractor to be properly trained and knowledgeable related to lead disturbances, includes, but is not limited to, the following:

OSHA Regulation CFR 1926.62 – Lead & Appendix A, B, C, & D – Lead Construction Standard.
OSHA Regulation CFR 1910. 1025 - Lead & Appendix A, B, C, & D – General Industry Standard.
EPA, 40 CFR Part 745 – Lead; Renovation, Repair, and Painting Regulation.

b. Lead and the Material Disturbance Permit

The Contractor shall carefully comply with all items of the Building Material Disturbance Permit (MDP) and shall review the permit and become familiar with its contents prior to bid preparation and any construction.

Once a Material Disturbance Permit request is received for a specific project, building materials that have been identified as being disturbed during construction, and/or demolition, will have been tested for the presence of lead. These materials will be identified as lead-containing or not lead-containing on the building Material Disturbance Permit(s) by the District's ES&A Staff. The Material Disturbance Permit must be referred to before any work commences. **No outside lead sampling of building materials, by the Contractor or a Contractor hired lead consultant, is allowed.**

All lead-containing materials must be handled by contractors and/or individuals trained and certified to perform lead disturbances. No lead-containing materials shall be disturbed prior to authorization from the owner. If any building material listed in the disturbance permit as lead-containing are improperly disturbed, in the opinion of the District, by the Contractor or his sub-contractor, the District will immediately hire a third-party lead consultant to investigate possible lead contamination, and a lead removal Contractor to perform any recommended clean-up.

The Contractor shall be responsible for all costs incurred by the District, including the consultant, sampling and testing, clean-up, replacement of the affected equipment, materials, etc., and any legal action that may result from a lead contamination incident caused by the Contractor or his sub-contractors.

Bidders/Contractors accept and acknowledge, by signing the Material Disturbance Permit, the existence of lead related regulations, and accept all liability related to the disturbance of lead-containing materials, citations resulting from, or any other costs the District may incur by the action of all parties of the bidders' company or companies hired by the successful bidder to complete this project.

c. Construction Age of Buildings in the District

At the conception of adding lead information to MDP's, it was thought that lead-containing paints, coatings, and ceramic tile were much more likely to be present on more surfaces in the District's older facilities. However, recent sampling has shown lead containing paints, coatings and ceramic tiles DO routinely exist, even in our newest facilities. Due to that finding, the age of buildings is not as important as was originally thought. We are still providing construction date information in MDP's because lead-based paint >5000 ppm is much less likely in facilities built after 1978.

d. Pre – 1978 WCSD Buildings

Paint and coating sampling have shown that paints and coatings contain some levels of lead in the Districts' Pre-1978 facilities. Therefore, all persons performing **any** disturbance to coatings or paints in our Pre-1978 constructed facilities must utilize lead safe work practices. In addition, any person performing **any** disturbance to paints, coatings, ceramic tile, and lead-containing materials must have taken an OSHA lead action level training class from a WCSD ES&A Department approved training provider. If identified as lead-containing, the Contractor will be required to perform all disturbances as per the MDP, WCSD provided lead specification, and all local, state, and federal regulations.

e. Post – 1978 WCSD Buildings

While it was originally thought that paints and coatings on materials other than metal surfaces and ceramic tile typically did not contain lead in WCSD post – 1978 constructed facilities, sampling has shown that is not the case. The MDP will provide specific historical sampling that has been conducted in the District facilities. If past sampling has shown the presence of lead-containing paints and coatings in the facility, the Contractor will be required to treat all painted and coated surfaces as lead-containing. If identified as lead-containing, the Contractor will be required to perform all disturbances as per the MDP, WCSD provided lead specification, and all local, state, and federal regulations.

The MDP will state all buildings identified above were constructed after 1978. While it was originally thought that paints, coatings and ceramic wall tile are less likely to contain lead in newer WCSD facilities, recent sampling has shown lead-containing paints, coatings, and ceramic tiles DO routinely exist, even in our newest facilities. Due to that finding, Contractors must treat all paints, coatings, and ceramic tile as lead-containing unless WCSD project sampling has proven otherwise, and it will be deemed negative within the MDP and the project scope. **The Bidder/Contractor must comply with all lead-containing or assumed lead-containing paint and coating disturbance instructions and requirements listed in the MDP, District provided lead specifications, and all local, state, and federal regulations, unless the material has been proven, to the satisfaction of the District, that said materials do not contain lead.**

f. Lead Removal (The removal of a lead-containing material)

Attachments and Penetrations does not include any removal, demo, welding, sanding, abrading, sandblasting, cutting, grinding, heating, and torch cutting of lead-containing materials, and is not an "Attachment and Penetration" disturbance. These activities must be designed by an EPA Certified Lead Consultant. The project's design for the above-listed activities will be the responsibility of the District to design and provide the specs as a part of this bid package. Lead activities listed above must be conducted by a lead removal contractor, which will be supervised by the

District and/or District hired EPA Certified Lead Consultant. The lead activities costs will be included into the scope of each project.

g. Lead Attachments & Penetrations

Attachments & penetrations, for the purpose of this document, is the drilling of holes, installing/removing screws, installing anchors, nails, and staples, in which the disturbance may release lead dust. Attachments and Penetrations are minor disturbances that are normal activities such as installing conduits, mounting boxes or brackets, and removing equipment anchors from lead-containing materials. The Material Disturbance Permit will identify which materials at a specific site can be disturbed, and the minimum requirements to perform a lead disturbance.

h. Lead Safe Work Practices – WCSD Attachment & Penetration Procedures

The WCSD Attachment & Penetration Procedures that the Contractor must utilize, when identified as being required in the MDP, are available from the Project Manager. The contractor shall submit their WCSD Attachment & Penetration Procedures to the Project Manager. The Project Manager will submit the documents to the ES&A Department for approval.

The contractor can add additional requirements, but nothing required in the MDP and WCSD Attachment & Penetration Procedures may be omitted. The Contractor must submit their Attachment & Penetration Procedure to their Project Manager to get ES&A approval of these documents **prior to any disturbance.** The ES&A Department will notify the contractor upon approval of these documents.

Once the approval of the WCSD Attachment & Penetration Procedure and training certificates is received, the contractor may schedule the disturbance, but must notify the ES&A Department immediately prior to disturbing the lead-containing materials. The Contractor shall provide this notice by calling the ES&A Attachment & Penetration hotline at 325-8490, follow the directions, and leave a message. ES&A Department personnel, Project Managers, Assistant Project Managers/PCI's, and other district personnel may conduct site visits to ensure compliance with the contractor's submitted and approved procedures.

i. Lead Training Certificates – Removal and Attachments & Penetrations

The health and safety of all occupants of the WCSD facilities is the number one priority of the District. To that end, technicians performing disturbances to lead-containing materials must have adequate training. Contractors performing lead disturbances, as allowed and identified in the Material Disturbance Permit, will be required to have a minimum of "OSHA Lead Action Level" training, as well as an annual OSHA Lead Action Level training certificate if the original training is greater than one year old, before being approved to perform lead disturbances. OSHA Lead Action Level training will be conducted in accordance with OSHA 1926.62(l)(2)(i) thru

(viii) and all required topics identified in this standard will be completed to include:

- 1926.62(l)(2)(i) The content of this standard and its appendices;
- 1926.62(l)(2)(ii) The specific nature of the operations which could result in exposure to lead above the action level;
- 1926.62(l)(2)(iii) The purpose, proper selection, fitting, use, and limitations of respirators;
- 1926.62(l)(2)(iv) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);
- 1926.62(l)(2)(v) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in Appendix B of this section;
- 1926.62(l)(2)(vi) The contents of any compliance plan in effect;
- 1926.62(l)(2)(vii) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and
- 1926.62(l)(2)(viii) The employee's right of access to records under 29 CFR 1910.20.

Certificates of Training showing that technicians have successfully completed an OSHA Lead Action Level course and are required to be properly submitted and approved by the District's ES&A Department prior to any Contractor's technician performing any disturbances to lead-containing or assumed lead-containing paints or coatings, or any other lead-containing materials. The training certificate must have "OSHA Lead Action Level Training" clearly identified on the training certificate and should have a sentence that states that the training topics covered in the class meet or exceed the training topics of OSHA 1926.62(l)(2)(i) thru (viii).

If training certificates are issued for a class, those training certificates need to be submitted. Wallet cards will not be accepted as training certificates unless no training certificate is provided by the training provider. In order for a wallet card to be accepted, the contractor will supply a letter from the training provider stating that no training certificate was provided, and only wallet cards were supplied to attendees. Wallet cards are less desirable due to their small size and mitigate the ability to clearly read and verify all the information on the card. Contractors are encouraged to request a full size 8 ½" x 11" training certificate from their training providers.
It is important that Contractor's planning on doing the lead work within the District become familiar with the lead training requirements, and spend the

time confirming that the lead classes being taken are truly an OSHA Lead Action Level course, and not a lead awareness course as identified above. Many training providers have differing training class titles on their lead classes, but only training certificates that are noted as above will be accepted to fulfill the listed District's training requirements. Contractors requiring training are responsible in providing the training providers a clear understanding of what training is required.

Full Lead worker initial and annual training certificates that comply with adjacent state requirements for lead worker certification, will be accepted in lieu of the OSHA Lead Action Level training certificate, as long as they are titled "Lead Worker" and then accompanied with a letter from the training provider certifying that the topics identified in OSHA 1926.62(I)(2)(i) thru (viii) were covered in that class. Contractors are responsible with ensuring and verifying training certificates meet the above-listed requirements. Training certificates that do not have "OSHA Lead Action Level or Lead Worker" will not be accepted or submitted.

Contractor training certificates will be submitted to the Project Manager at least two weeks prior to the start of the project. The ES&A Department will review the submitted training documentation and must pre-approve workers so they can work on the assigned WCSD project. No one that has not been approved by the ES&A Department is authorized to perform any lead disturbances.

New workers added after the start of the project will be approved by the ES&A Department within one 8-hour work period of the standard Monday thru Friday work schedule. Certification submittal will be serviced by the ES&A Department on a first come, first served basis. Delays to review the documentation will be anticipated and taken into account on any Removal or Attachment & Penetration schedule developed, and Removal and/or Attachment & Penetration technicians will not be allowed to work in any way on that project until their documentation has been reviewed and approved.

j. Renovation, Repair & Painting Regulations (RR&P) - 40 CFR Part 745.81

Effective April 22, 2010, contractors will be required to be trained and registered with the EPA to conduct regulation applicable renovations, repairs and painting (RR&P) in all **elementary schools or child occupied District facilities constructed prior to 1978 when lead-based paints and coatings are being disturbed**. Contractors are reminded that there are some childcare facilities in middle and high school locations, and the RR&P would apply at those locations as outlined in the RR&P regulation requirements. http://www.epa.gov/lead/pubs/steps.pdf

In general, all firms that disturb 6 square feet of **lead-based** painted surface per room on the interior, or 20 square feet on the exterior, within a 30 day period in **this** facility, must comply with the EPA's Renovation, Repair and Painting (RR&P) regulation **and** must be registered with the federal EPA. Per the Regulation, the area of disturbance is calculated by adding up the entire

surface areas being removed/disturbed, which then determines the amount of painted surface area disturbed. Work that involves window replacement or demolition of a painted surface, the EPA RR&P regulation applies regardless of size if lead-based paint is present.

The District requires all workers in RR&P projects involving lead disturbances to have, at a minimum, OSHA lead action level training. This regulation also requires that the contractor must assign an EPA RR&P certified renovator that is responsible for ensuring and documenting all work is conducted in compliance with the EPA RR&P regulation. There are extensive record keeping and notification requirements that the Contractor must perform. All workers with the minimum OSHA lead action level training, but are not EPA RR&P certified renovator trained, must be trained and supervised by the EPA RR&P certified renovator.

On a RR&P project, Contractors must have a minimum of one EPA RR&P certified renovator on-site that has successfully attended and passed a 8-hour EPA accredited renovator training course before working in any elementary schools or child occupied District facilities constructed prior to 1978. The renovator's training certification must remain current. Recertification requirements through the attendance of refresher courses are a requirement of this regulation. The renovator must be on-site throughout the project. The certified renovator is responsible for ensuring that lead safe work practices are utilized per this EPA RR&P regulation, as well as per all District lead requirements and policies that may be more stringent than the EPA and OSHA regulations.

The EPA RR&P regulation requires that personnel disturbing lead containing materials utilize lead safe work practices as identified in the EPA guidance document titled **"steps to lead safe renovation, repair and painting", pages 12 through 23**. This document is available electronically at http://www.epa.gov/lead/pubs/steps.pdf. The contractor shall submit lead safe work practice procedures, and all RR&P and OSHA lead action level training certificates to the Project Manager at least two weeks prior to the start of the project. The ES&A Department will review the submitted training documentation and must pre-approve workers so they can work on the assigned WCSD project. No one that has not been approved by the ES&A Department is authorized to perform any lead disturbances.

New workers added after the start of the project will be approved by the ES&A Department within one 8-hour work period of the standard Monday thru Friday work schedule. Certification submittal will be serviced by the ES&A Department on a first come, first served basis. Delays to review the documentation will be anticipated and taken into account on any RR&P project schedule developed, and EPA RR&P certified renovators and workers will not be allowed to work in any way on that project until their documentation has been reviewed and approved.

This is a general overview of the regulation and the contractor must refer to the regulation for additional requirements and information. Fines are

expensive and are levied toward the Contractor not the owner, so compliance with this regulation is very important, and it is important that Bidders/Contractors are well versed in this regulation.

k. Lead Air Sampling, Respiratory Protection and Protective Suits

Lead personal air sampling is required during any lead disturbance. Lead air sampling results will be supplied to the ES&A Department, and the Project Manager, within 48 hours of the completion of a disturbance. Laboratory results will be emailed directly to the ES&A Department from the laboratory providing analysis. Handwritten results will not be allowed. Regardless of air sampling results, Contractors will not be allowed to submit a Negative Exposure Assessment so that they can discontinue the use of respirators and personal protective suits. The District reserves the right to require this requirement, to reduce the long-term exposure liability from Contractors and their workers, which have disturbed this owner's lead materials.

22. INDOOR ENVIRONMENTAL QUALITY

Preventative job site practices will reduce the potential for residual problems with indoor air quality in completed buildings and reduce undue health risks for all workers. The following are the minimum standards required by the WCSD for on-site construction in the district.

a. Existing HVAC System:
When feasible, the HVAC system for the project area will be shut down for the duration of the project. If occupied spaces will be adversely affected by the shut-down of the system, construction area return registers should be sealed with polyethylene sheeting and secured as an alternative. Registers must be sealed prior to the start of work.

b. Separating Occupied Spaces From Non-Occupied:
Keep work areas separate from occupied spaces with polyethylene sheeting (or similar) if there are no other natural barriers in place OR in spaces where air exchange will occur around the barriers.

c. Ventilation:
During the installation of carpet, paints, furnishings and any other VOC emitting products, provide "spot" ventilation during application/installation and for at least 24 hours after the work is completed. In most cases, opening windows and doors will not be enough to effectively exhaust contaminants. It is recommended that an exhaust fan be used to pull polluted air out of the building. This can be accomplished by placing a fan in a window or door and temporarily sealing any opening around the fan with plastic. Additionally, a door or window at the opposite end of the room should be opened to allow fresh, outdoor air to flow across the work area and sweep polluted air out through the exhaust fan. As long as odors are present, the temporary exhaust ventilation must continue to operate. This may include nights and weekends, as necessary. Ventilation should continue for a minimum of 24 hours after the

completion of the project or until there are no more noticeable odors.

d. Construction Dust:
Minimize the amount of dust in the air and on surfaces. Examples include the use of vacuum assisted drywall sanding equipment and the use of vacuums instead of brooms to clean construction dust from floors.

e. After Hours Scheduling:
Schedule high dust generating operations or extreme noise generating activities for after normal working hours. (i.e. saw cutting, jack hammering) and install temporary barriers to confine dust, as necessary.

f. Gasoline/Diesel Powered Equipment:
Electric powered equipment must be used in lieu of diesel or gasoline powered equipment. Gas and diesel equipment may not be used inside a WCSD building or near an outdoor fresh air building intake.

g. Material Safety Data Sheets (MSDS):
MSDS must be made be maintained onsite and made available upon request as required by federal law.

h. Construction Completion:
Prior to the occupancy of the building but after the installation of new furniture, carpet, etc., the building should be flushed with 100% outside air for one to three days.

i. Air Filters:
Replace all filtration media immediately at the conclusion of the job.

j. Monitoring Air Quality:
Indoor air quality monitoring will be conducted randomly throughout the project. Results and any recommendations will be communicated through the building inspector to construction management.

k. Pre-Construction Work Area Inspection:
Any overhead work including roof, the Contractor shall conduct a pre room condition walk through with WCSD Project Manager to determine the level of cleanliness that will be expected at completion of project. Contractor shall be responsible for cleaning all exposed surfaces within the facility beneath the work area. At the completion of the project, the Contractor shall clean all exposed surfaces within the facility beneath the aforementioned work area including but not limited to all shelving, duct, lighting, flooring, furniture, etc.

23. LOCK OUT TAG OUT (LOTO) PROCEDURE

Contractor will be responsible for the isolation and termination of all building systems that may be impacted by the scope of work within this bid. Contractor will coordinate all shut-down processes with the construction manager prior to any shutdowns up to and including Lock Out Tag Out procedures 24 hours prior to any shutdowns. WCSD will make the final determination of which systems and location shall be isolated. All Lock Out Tag Out will be performed at main service panel.

SECTION 00830 - TECHNICAL SPECIFICATIONS

I. SUMMARY OF THE WORK:

The work shall include the furnishing of all labor, tools, equipment, material, transportation and the performance of all operations required for the **Heat Pump Replacements at B.D. Billinghurst Middle School – Phase 1** at the site(s) and associated work as specified herein and shall include the cleanup and removal from the site(s) of all debris resulting from the operations performed. It shall also be the Contractor's responsibility to take all necessary safety precautions and to furnish barricades and/or other safety measures as required.

All work shall be performed in strict accordance with the requirements of these specifications and any and all appropriate state, county and local ordinances.

II. LOCATION OF THE WORK:

The location(s) of the work and contact person(s) are:

B.D. Billinghurst Middle School
6685 Chesterfield Lane
Reno, NV 89523
Phone #: 775-746-5870
Principal: Kevin Arnold
Site Facilities Coordinator: Edgar Arias

The Contractor is urged to examine the site(s) and compare the existing conditions with that of the work outlined. No extra payment will be considered for work additional to that shown or noted if such work would have been apparent in an inspection of the premises.

To review the existing premises, contact the Principal and/or Site Facilities Coordinator at the site(s). **Whenever at the site, be sure to check in at the front office**.

At the above-named site(s), school classes and other construction projects may or may not be taking place during the construction phase. It will require coordination between the school site(s), other vendors, and the WCSD's Capital Projects Department.

III. QUESTIONS & CLARIFICATIONS:

For questions and clarifications regarding the Technical Specifications, Drawings, General Conditions, Special Conditions, Bidding and Contract Information contact the Purchasing Department at solicitations@washoeschools.net. **All questions shall be submitted in writing directly to WCSD's Solicitations website at http://solicitations.washoeschools.net/ or via e-mail to solicitations@washoeschools.net by 4:30 p.m. (Local Time) on April 30, 2025.**

IV. MANUFACTURERS:

Manufacturers, types, model numbers and execution as detailed on the drawings.

V. ASBESTOS ASSESSMENT:

The Material, Water & Lead Disturbance Permit(s) are included in the Special Conditions section of the Specifications.

2024-2025 Balanced Calendar

July 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 0
	1	2	3	4	5	6	
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	31				

August 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 15
				1	2	3	August 6 - 8 - Teacher Professional Dev. Days
4	5	6	7	8	9	10	August 9 - Teacher Work Day
11	12	13	14	15	16	17	August 12 - First Day of School for Students
18	19	20	21	22	23	24	August 12 - 16 - Kindergarten Testing Week
25	26	27	28	29	30	31	August 19 - First Day of Kindergarten

September 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 20
1	2	3	4	5	6	7	September 2 - Labor Day
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	
29	30						

October 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 17
		1	2	3	4	5	
6	7	8	9	10	11	12	October 7 - 11 - Fall Break
13	14	15	16	17	18	19	October 18 - End of Grading Period
20	21	22	23	24	25	26	October 18, 21 - 24 - Conference Week
27	28	29	30	31			October 25 - Nevada Day Observance

November 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 17
					1	2	
3	4	5*	6	7	8	9	November 5 - Election Day (See * below)
10	11	12	13	14	15	16	November 11 - Veterans Day
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	November 27 - 29 - Thanksgiving Break

December 2024							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 14
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	December 19 - End of Grading Period
15	16	17	18	19	20	21	December 20 - Teacher Work Day
22	23	24	25	26	27	28	December 23 - January 3 - Winter Break
29	30	31					

January 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 19
			1	2	3	4	January 1 - 3 - Winter Break
5	6	7	8	9	10	11	January 6 - School Resumes
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	January 20 - Martin Luther King, Jr. Day
26	27	28	29	30	31		

February 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 19
						1	
2	3	4	5	6	7	8	
9	10	11	12	13	14	15	
16	17	18	19	20	21	22	February 17 - President's Day
23	24	25	26	27	28		* February 24 - 28 - Spring Conference Week for some elementary schools. Please check with your school for details.

March 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 11
						1	
2	3	4	5	6	7	8	March 4 - College and Career Readiness Assessment for high schools only. Awaiting confirmation from NDE.
9	10	11	12	13	14	15	March 14 - End of Grading Period
16	17	18	19	20	21	22	March 17 - 28 - Spring Break
23	24	25	26	27	28	29	
30	31						

April 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 22
		1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30				

May 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 21
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	31	May 26 - Memorial Day

June 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 5
1	2	3	4	5	6	7	June 6 - End of Grading Period
8	9	10	11	12	13	14	June 6 - Last Day of School
15	16	17	18	19	20	21	June 9, 10, 11 - Contingency Days
22	23	24	25	26	27	28	June 19 - Juneteenth
29	30						

*November 5, 2024 is a non-student day used for professional development but counted as a day in session per NAC 387.140 (2a).

Number of Days Per Quarter	44	39	48	49	180
Number of Days Per Semester	83		97		180
Contingency Days: June 9, 10, 11					

Teacher Work Days: August 6 - 9, December 20

Teacher Professional Dev Day. November 5

2025-2026 BALANCED CALENDAR

July 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 0
		1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

August 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 15
					1	2	
3	4	5	6	7	8	9	August 5 - 7 Teacher Professional Dev. Days
10	11	12	13	14	15	16	August 8 - Teacher Work Day
17	18	19	20	21	22	23	August 11 - First Day of School for Students
24	25	26	27	28	29	30	August 11 - 15 - Kindergarten Testing Week
							August 18 - First Day for Kindergarten Students

September 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 21
	1	2	3	4	5	6	September 1 - Labor Day
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30					

October 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 17
			1	2	3	4	October 6 - 10 - Fall Break
5	6	7	8	9	10	11	October 13 - Teacher Professional Dev. Day
12	13*	14	15	16	17	18	October 17 - End of Grading Period
19	20	21	22	23	24	25	October 24, 27 - 30 - Conference Week
26	27	28	29	30	31		October 31 - Nevada Day

November 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 16
						1	
2	3	4	5	6	7	8	
9	10	11	12	13	14	15	November 11 - Veterans Day
16	17	18	19	20	21	22	
23	24	25	26	27	28	29	November 26 - 28 - Thanksgiving Break

December 2025							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 14
	1	2	3	4	5	6	
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	December 18 - End of Grading Period
21	22	23	24	25	26	27	December 19 - Teacher Work Day
28	29	30	31				December 22 - January 2 - Winter Break

January 2026							No School on Shaded Days
J	M	T	W	TH	F	S	# of School Days = 19
				1	2	3	January 1 - 2 - Winter Break
4	5*	6	7	8	9	10	January 5 - Teacher Professional Dev. Day
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	January 19 - Martin Luther King, Jr. Day
25	26	27	28	29	30	31	

February 2026							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 19
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	February 16 - President's Day
22	23	24	25	26	27	28	

March 2026							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 15
1	2	3	4	5	6	7	March 3 - College and Career Readiness Assessment for high schools only. Awaiting confirmation from NDE.
8	9	10	11	12	13	14	March 13 - End of Grading Period
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	March 23 - April 3- Spring Break
29	30	31					

April 2026							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 19
			1	2	3	4	March 23 - April 3- Spring Break
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	
26	27	28	29	30			

May 2026							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 20
					1	2	
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	May 25 - Memorial Day

June 2026							No School on Shaded Days
S	M	T	W	TH	F	S	# of School Days = 5
	1	2	3	4	5	6	June 5 - End of Grading Period
7	8	9	10	11	12	13	June 5 - Last Day of School
14	15	16	17	18	19	20	June 9 - Primary Election Day
21	22	23	24	25	26	27	June 8, 9, 10 - Contingency Days
28	29	30					June 19 - Juneteenth

* October 13, 2025 & January 5, 2026 is a non-student day used for professional development but counted as a day in session per NAC 387.120 (4)

Number of Days per Quarter	44	39	48	49	180
Number of Days per Semester	83		97		180
Contingency Days: June 8, 9, 10					

Teacher Work Days: August 5 - 8, December 19

Teacher Professional Dev Days: October 13, 2025 & January 5, 2026

BID FORM

Washoe County School District - Purchasing Department
14101 Old Virginia Road - Reno, Nevada 89521
Phone: 775-850-8025 Email: solicitations@washoeschools.net

Bid #: 25-96-B-04-DA
PWP # WA-2025-301

Having carefully examined all of the Bid Specifications entitled **Heat Pump Replacements at B.D. Billinghurst Middle School – Phase 1,** dated April 7, 2025; and the Drawings dated April 1, 2025; the addenda numbered _____; as well as the premises and the conditions affecting the work, the undersigned proposes to furnish for the stipulated sum of:

ITEM	DESCRIPTION	AMOUNT
A.	BASE BID 1	$
B.	FORCE ACCOUNT	$165,000.00
C.	**TOTAL – BASE BID 1 AND FORCE ACCOUNT (The Sum of Box A + Box B)**: All labor and materials for the **HEAT PUMP REPLACEMENTS AT B.D. BILLINGHURST MIDDLE SCHOOL – PHASE 1** as drawn and specified, the sum of _____ _____Dollars ($_____).	

If there is a mathematical error between the Base Bid amount and the Force Account amount and the total of those two items added together, WCSD will make the correction which may revise the Total Amount.

Any bid submission will be disqualified and rejected if the bid submission is not signed.

Bids shall be submitted on the provided Bid Form (PUR-F523) only, and all of the blank spaces shall be completed; numbers shall be stated both in writing and in figures, the signature shall be in longhand; and the completed form shall be without interlineation, alteration or erasure. Washoe County School District only accepts signatures done manually (also known as a wet signature) or electronic digital signatures that are certified. Non-certified electronic digital signatures will NOT be accepted. A typed signature, even in cursive font, DOES NOT meet the requirements of an official digital signature. A digital signature must be accompanied by a certified digital stamp issued through programs like Adobe Acrobat, Docu-Sign or other similar programs that produce a digital stamp certifying the electronic digital signature. Any signatures on required forms that do not meet these requirements will not be accepted and the Contractor's submission will be deemed "Non-Responsive" and will be rejected. If you have any questions about this requirement, please submit your question by the question deadline, so that it can be answered prior to quote submission deadline. In the event of a discrepancy on the Bid Form, NRS 104.3114 Contradictory terms of instrument states that, "If an instrument contains contradictory terms, typewritten terms prevail over printed terms, handwritten terms prevail over both, and WORDS PREVAIL OVER NUMBERS." **WCSD will record the bid amount stated in WORDS**

in Box C. Only bids on the form(s) provided will be accepted. No additional pages containing inclusions, exclusions or clarifications will be accepted as part of the bid. Any clarifications, additions or exclusions made by the Washoe County School District (WCSD/ OWNER) will be considered incorporated into the specifications.

Bidder shall proofread his/her bid carefully for errors.

WCSD reserves the right to award the bid for the best proposal for each individual item or to award on the best total proposal, whichever is deemed by the Owner to be in their best interests. WCSD also reserves the right to reject any or all bids and to waive irregularities or informalities in any bid for any reason whatsoever.

If they be notified of the acceptance of this proposal within forty-five (45) days of the time set for opening of bids, Contractor agrees to execute a contract for the above work for the above-stated compensation in the form of the contract attached within these bid specifications and to commence the physical work no fewer than ten (10) days after the execution thereof.

The undersigned agrees, if awarded the contract, work is to be commenced upon issuance of a Notice to Proceed and shall be completed on or before August 1, 2025. The commencement date for the physical work shall be coordinated by the Capital Projects Department upon the receipt of said Notice to Proceed. The undersigned further agrees that the Owner may retain from the monies due the Contractor Two Thousand Dollars ($2,000) per day as a direct result of the Contractor's delay for not completing the project in the required time allowance plus approved time extensions.

The undersigned agrees, if awarded the contract, to execute and deliver to the Owner, within ten (10) calendar days after delivery of notice of award of contract, an executed contract, satisfactory insurance, a performance bond for each awarded contract, and a labor & materials bond for each awarded contract in accordance with the specifications.

Enclosed is a bid bond or other surety in the amount of five percent (5%) of each total proposal (must be provided for each individual base bid item), as required in the Instructions to Bidders.

Enclosed, on the attached form, is a complete listing of the names of each subcontractor who will provide labor or a portion of the work or improvement to the prime contractor for which the subcontractor will be paid equal to or exceeding 5 percent of the prime contractor's total bid. The prime Contractor shall also add his/her name if they are performing any portion of work, including supervision, equal to or exceeding 5 percent of the total bid.

Within two (2) hours after the completion of the opening of the bids, the contractors who submitted the three lowest bids must submit on the form attached a list of each subcontractor who will provide labor or a portion of the work or improvement to the prime contractor for which they will be paid an amount equal to or exceeding 1 percent of the prime contractor's total bid or $50,000, whichever is greater, and the number of the license issued to the subcontractor pursuant to chapter 624 NRS. If a prime contractor fails to submit such a list within the required time, their bid shall be deemed not responsive.

I have read and acknowledge that our company is in compliance with all WCSD Drug & Alcohol Requirements specified in Section 00800 – Supplementary General Conditions.

NOTE: Any bid submission will be disqualified and rejected if the bid submission is not signed. Washoe County School District only accepts signatures done manually (also known as a wet signature) or electronic digital signatures that are certified. Non-certified electronic digital signatures will NOT be accepted. A typed signature, even in cursive font, DOES NOT meet the requirements of an official digital signature. A digital signature must be accompanied by a certified digital stamp issued through programs like Adobe Acrobat, Docu-Sign or other similar programs that produce a digital stamp certifying the electronic digital signature. Any signatures on required forms that do not meet these requirements will not be accepted and the Contractor's submission will be deemed "Non-Responsive" and will be rejected. If you have any questions about this requirement, please submit your question by the question deadline, so that it can be answered prior to bid submission deadline.

Interested parties may NOT contact anyone else regarding this solicitation. Any interested Bidder contacting any other individual including, but not limited to, WCSD staff, officials, evaluation committee members, or Board of Trustees may have their Bid submission rejected from evaluation and award consideration.

BID #: 25-96-B-04-DA

FIRM NAME:	NEVADA LICENSE #:
NAME OF AUTHORIZED REPRESENTATIVE:	
ADDRESS:	
PHONE #:	FAX #:
EMAIL ADDRESS:	DATE:
SIGNATURE:	

5% LIST

To be submitted with the bid in accordance with Article 5.2.1 of the General Conditions as modified and Chapter 338.141 of NRS. **If the Prime Contractor is performing any work, including Supervision, that is 5% or greater they must list themselves per NRS 338.**

PROJECT NAME: **HEAT PUMP REPLACEMENTS AT B.D. BILLINGHURST MIDDLE SCHOOL – PHASE 1**

BID #: **25-96-B-04-DA**

DESCRIPTION OF WORK	SUBCONTRACTOR	LICENSE #

Signature: _____
Authorized Firm Representative

Title: _____ Date: _____

1% LIST

To be submitted within two (2) hours after bid opening in accordance with Chapter 338.141 of NRS. Since all Subcontractors listed on the Bidder's 5% List are over 1% of the Bid amount, those Subcontractors shall automatically be deemed incorporated into this 1% List and need not be re-listed below. **If there are no further Subcontractors to list, please write "NONE or "N/A" and sign document.**

PROJECT NAME: **HEAT PUMP REPLACEMENTS AT B.D. BILLINGHURST MIDDLE SCHOOL – PHASE 1**

BID #: **25-96-B-04-DA**

DESCRIPTION OF WORK	SUBCONTRACTOR	LICENSE #

Signature: _____
Authorized Firm Representative

Title: _____ Date: _____

PREFERENTIAL BIDDER STATUS AFFIDAVIT FOR BIDS SUBMITTED IN ACCORDANCE WITH NRS 338.0117 VALUED $250,000 OR MORE

Although Washoe County School District prefers this form is submitted with the bid response, this form may be submitted within two (2) hours of the bid opening.

Note: The Certificate of Eligibility for Preferential Bidder Status issued by the State Contractor's Board must be submitted with the bid response.

I, _____ ("Affiant"), on behalf of _____ ("Contractor"), swear and affirm that in order to be in compliance with NRS 338.0117, and be eligible to receive a preference in bidding for Project No._____, Project Name _____ ("Project"), certify that for the duration of the project, collectively, and not on any specific day:

(a) At least 50 percent of the workers employed on the public work, including, without limitation, any employees of the contractor, applicant or design-build team and of any subcontractor engaged on the public work, will hold a valid driver's license or identification card issued by the Department of Motor Vehicles of the State of Nevada;

(b) All vehicles used primarily for the public work will be:

(1) Registered and partially apportioned to Nevada pursuant to the International Registration Plan, as adopted by the Department of Motor Vehicles pursuant to NRS 706.826; or

(2) Registered in this State;

(c) If applying to receive a preference in bidding pursuant to subsection 3 of NRS 338.1727 or subsection 2 of NRS 408.3886, at least 50 percent of the design professionals working on the public work, including, without limitation, employees of the design-build team and of any subcontractor or consultant engaged in the design of the public work, will have a valid driver's license or identification card issued by the Department of Motor Vehicles of the State of Nevada; and

(d) The contractor, applicant or design-build team and any subcontractor engaged on the public work will maintain and make available for inspection within this State his or her records concerning payroll relating to the public work.

If the contractor fails to comply with any requirements of this Affidavit, a public body may recover, by civil action against the party responsible for a failure to comply with a requirement of this affidavit, a penalty as described below for a failure to comply with a requirement of this affidavit. If a public body recovers a penalty pursuant to this subsection, the public body shall report to the State Contractors' Board the date of the failure to comply, the name of each entity which failed to comply and the cost of the contract to which the entity that failed to comply was a party. The Board shall maintain this information for not less than 6 years. Upon request, the Board shall provide this information to any public body or its authorized representative.

If a contractor, applicant or design-build team submits this affidavit, receives a preference in bidding described in this affidavit and is awarded the contract as a result of that preference, the contract between the contractor, applicant or design-build team and the public body, each contract between the contractor, applicant or design-build team and a subcontractor and each contract between a subcontractor and a lower tier subcontractor must provide that:

a) If a party to the contract causes the contractor, applicant or design-build team to fail to comply with a requirement of this affidavit, the party is liable to the public body for a penalty in the amount of 1 percent of the cost of the largest contract to which he or she is a party;

b) The right to recover the amount determined pursuant to paragraph (a) by the public body pursuant to this affidavit may be enforced by the public body directly against the party that caused the failure to comply with a requirement of this affidavit; and

c) No other party to the contract is liable to the public body for a penalty.

By:_____ Title:_____
(Print Name of Affiant)

Signature of Affiant: _____ Date: _____

Signed and sworn to (or affirmed) before me on this _____ day of _____, 20_____, by_____ (name of Affiant).

State of _____)
)ss.
County of _____)

_____
Notary Signature
STAMP & SEAL

Proof of Authorization to Sign Affidavit

The person must establish his/her actual authority to act on behalf of the business organization. The individual must be the person indicated in the table below and provide written documentation clearly indicating the person's position within that business organization. If the individual signing the Affidavit is an employee of the business organization, written documentation, on organization letterhead, clearly indicating the person's authority to act on behalf of the business organization must be provided. The written documentation must be signed by the authorized person identified on the table.

If the individual making application for the business organization is not one of the persons identified in the table or an authorized employee, a valid power of attorney executed by an authorized person on behalf of the business organization must be provided. The power of attorney must be made not more than 90 days before the Affidavit is signed.

BUSINESS ENTITY	PERSON WHO HAS AUTHORITY TO COMPLETE AFFIDAVIT
Sole Proprietorship	Sole Proprietor
Partnership	A Partner
Corporation	1. Director, if Authorized 2. Executive Officer as indicated in the Article of Incorporation
Limited Liability Company	1. Member, if Member-Managed LLC 2. Manager, if Manager-Managed LLC

WASHOE COUNTY SCHOOL DISTRICT PUBLIC DISCLOSURE FORM

VENDOR/CONTRACTOR

THIS IS A REQUIRED FORM TO BE COMPLETED, SIGNED, AND SUBMITTED BY THE VENDOR/CONTRACTOR

VENDOR/CONTRACTOR (EMPLOYEE) FIRST/LAST NAME: _____

VENDOR/CONTRACTOR NAME: _____

I understand that per NRS 281A.020, a public office is a public trust and shall be held for the sole benefit of the people, and a public officer or employee must commit themself to avoid conflicts between the private interests of the public officer or employee and those of the general public whom the public officer or employee serves.

Furthermore, I understand that pursuant to Washoe County School District (WCSD) Board of Trustees Policy 4505 and per NRS 281A.400, WCSD employees (as public officers) shall not seek and/or accept any gift, work/service, favor, employment, engagement, emolument, and/or economic opportunity, including, but not limited to, unlawful compensation, salary, retainer, augmentation, expense allowance, commission, personal profit, pecuniary interest in the course of performing WCSD duties. In addition, WCSD employees (as public officers) shall not use their positions to secure and/or grant unwarranted privileges, preferences, exemptions, and/or advantages for the public officer or employee with any business entity.

By signing this form, I certify and acknowledge that I am a duly authorized agent of the VENDOR/CONTRACTOR named above and that failure to disclose all facts relative to a conflict and/or potential conflict of interest (ethical standards) with regard to the specific solicitation, project, and/or contract to which the VENDOR/CONTRACTOR named above is submitting to WCSD may result in a rejection of said solicitation, project, and/or submission and/or termination of any resulting contract should the above-named VENDOR/CONTRACTOR be selected and/or awarded. Furthermore, I also certify that I have completed the following and have provided true and accurate information to the best of my knowledge:

A. I certify that, to the best of my knowledge, **NO** current or former WCSD employees, officers, or trustees have a private pecuniary interest in the VENDOR/CONTRACTOR. ☐ **AGREE** ☐ **DISAGREE**

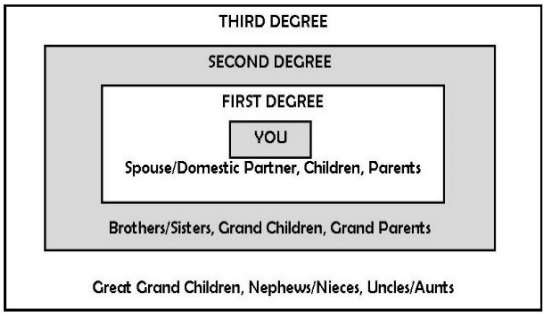
If you DISAGREE and cannot certify, then please explain:

_____
_____
_____

B. To the third degree of consanguinity (refer to the chart below), I have listed all of my and the principal(s) and key personnel of my organization's personal relationships, partnerships, correlations, and relatives (by blood and/or marriage) between WCSD, Officers of WCSD, key employees of WCSD, current and former WCSD Board of Trustees members and any other current and former WCSD personnel. ☐ **AGREE** ☐ **DISAGREE**

If you DISAGREE and cannot certify, then please explain:

_____
_____
_____



SIGNATURE: _____ **DATE**: _____

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____, as Principal, and _____ as Surety, are hereby held and firmly bound unto the Board of Trustees, Washoe County School District, as Owner, in the sum of _____ _____ Dollars ($_____) for 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 _____ day of _____, 20____.

The condition of the above obligation is such that whereas the Principal has submitted to the Board of Trustees, Washoe County School District, a certain bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for: _____ _____.

NOW, THEREFORE, if said bid shall be rejected, or in the alternative, if said bid shall be accepted and the Principal shall execute and deliver a Contract in the form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a Bond for its 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 contract created by the acceptance of said Bid, then this obligation shall be void.

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

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within

which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the 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 first set forth above.

_____

_____

Principal

(Seal) By: _____

_____

Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

LABOR AND MATERIALS BOND

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the Board of Trustees, Washoe County School District in the State of Nevada has awarded to_____, hereinafter designated as “Principal”, a contract dated _____, for _____ _____ a copy of which contract is attached hereto and by reference made a part hereof, and hereinafter referred to as the “Contract”.

And WHEREAS, said Principal is required under the terms of said Contract and by law under the provisions of N.R.S. 339 to furnish a Bond for the labor and materials used in said Contract;

NOW, THEREFORE, we, the Principal, and _____ _____, as Surety, are held and firmly bound unto the Board of Trustees, Washoe County School District in the State of Nevada in the sum of _____ Dollars ($_____), 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 will 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, or its heirs, executors, administrators, successors or assigns shall fail to pay for any materials, provisions, supplies implements or machinery used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Compensation Law with respect to such work or labor, as required by the Provisions of N.R.S. 339, the Surety hereon will pay for the same within thirty (30) calendar days an amount not exceeding the sum specified in this bond, and the above obligation shall then be null and void. Otherwise, it shall remain in full force and virtue.

THE 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 thereunder, 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 or addition to the terms of the Contract or to the work, or to the specifications.

And the said Surety, for value received, further stipulates and agrees that should the Board of Trustees, Washoe County School District, or other obligees, incur attorney's fees or other expenses for the enforcement of the Contract or this bond, the same shall be paid by the Surety to the contracting body, subcontractors, workmen laborers, mechanics and furnishers of material as their interests may appear.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their seals this_____ day of _____, 20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

_____
Principal

(Seal) By: _____

_____
Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the Board of Trustees, Washoe County School District in the State of Nevada has awarded to _____,
Hereinafter designated as “Principal”: a contract dated _____,
for _____
_____
a copy of which contract is attached hereto and by reference made a part hereof, and hereinafter referred to as the “Contract”.

And WHEREAS, said Principal is required under the terms of said Contract and by law under the provisions of N.R.S. 339 to furnish a Bond for the faithful performance of said Contract;

NOW, THEREFORE, we, the Principal, and _____
_____, as Surety, are held and firmly bound unto the Board of Trustees, Washoe County School District in the State of Nevada in the sum of
_____
Dollars ($_____), lawful money of the United States, being no less than one hundred per cent (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, or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by and well and truly keep the faithfully perform the covenants, conditions, and agreements in the Contract and any alterations made as therein provided, on his or its part to be kept and performed at the respects according to their true intent and meaning; and shall indemnify and save harmless the Board of Trustees, Washoe County School District 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 Contract, the above obligation shall hold good for a period of one (1) year after completion and acceptance of the work done, during which time if the above-bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the Board of Trustees, Washoe County School District 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 work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum of _____ Dollars ($_____) shall remain in full force and virtue; otherwise, the above obligation shall be void.

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

And the said Surety, for value received, further stipulates and agrees that should the Board of Trustees, Washoe County School District, incur attorney's fees or other expenses for the enforcement of the Contract or his/her bond, the same shall be paid by the Surety to the Board of Trustees, Washoe County School District.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

_____

Principal

(Seal)

By: _____

_____

Surety

By: _____

Address:

(Seal)

_____

_____

_____

Phone: _____

SECTION 01001 – CONSTRUCTION PROCEDURES FOR EXISTING SCHOOL SITES

PART 1 – GENERAL

1.1 DESCRIPTION

A. All work activities under this contract shall be coordinated with the requirements of the Washoe County School District's (WCSD) Facilities Management Department. WCSD shall be contacted prior to any service shutdown and advised when such shutdown shall be commenced. All materials and equipment shall be stored in spaces assigned by WCSD. The Contractor will be required to maintain a neat and orderly operation and to limit or keep noise and nuisance to a minimum.

B. WCSD reserves the right to remove any person from the property for the safety and security of the facility

1.2 GENERAL REQUIREMENTS FOR WORK INSIDE THE EXISTING PERIMETER AND EXISTING BUILDINGS

A. It is a felony to transport any alcoholic beverages, drugs, weapons or ammunition of any kind on WCSD property

B. Any contact or conversation with students is prohibited.

C. Smoking is prohibited on all WCSD property.

D. Working hours inside the existing perimeter and existing building will be coordinated with WCSD.

E. Storage of materials inside the existing perimeter and buildings will be coordinated with WCSD Facilities Management Department.

F. Construction operations shall be confined to the areas permitted under the contract. Areas beyond indicated work areas are not to be disturbed. Conform to site rules and regulations affecting the work.

G. Keep driveways and entrances serving the premises clear and available at all times. Do not use these areas for parking or storage of materials.

H. Passenger cars, trucks and motorized construction equipment, when parked and unattended, shall be locked and the ignition key removed. Do not leave any such vehicle with the motor running.

I. Limitations on site usage, as well as specific requirements that impact site utilization are indicated on the drawings and any other contract documents. Allocate available space equitably among sub-contractors needing both access and space so as to produce the best overall efficiency. Schedule deliveries to minimize space and time requirements for storage of materials and equipment.

J. All refuse will be removed daily.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01001

SECTION 01010 - SUMMARY OF WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project shall apply to this section.

1.2 PROJECT DESCRIPTION

A. Project to entail work as described in scope of work.

B. The project shall consist of all on and off-site improvements, as shown in the contract documents.

1.3 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises (construction area) for construction operations. The Contractor's use of the premises (construction area) is limited only by the Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of project.

B. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment site.

1.4 OWNER OCCUPANCY

A. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to substantial completion provided that such occupancy does not interfere with completion of the work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total work.

1.5 OWNER FURNISHED ITEMS

A. The Owner will provide certain pieces of equipment and accessories that are to be installed and connected by the Contractor.

1. The Owner will arrange and pay for delivery of Owner furnished items in accordance with the Contractor's construction schedule, and will inspect deliveries for damage.

2. If Owner furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field

services and the delivery of manufacturer's warranties and bonds to the Contractor.

3. The Contractor is responsible for designating the delivery dates of Owner furnished items in the Contractor's construction schedule and for receiving, unloading and handling Owner furnished items at the site. The Contractor is responsible for protecting Owner furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of the Contractor's operations.

4. Owner furnished and Contractor installed and connected equipment shall be as indicated in the contract documents.

END OF SECTION 01010

SECTION 01015 – SCHEDULE OF DRAWINGS

General

T0.1 TITLE SHEET

Mechanical

1-M0.1 MECHANICAL LEGENDS & NOTES
1-M0.2 MECHANICAL SCHEDULES & CALCULATIONS
1-M1.0 OVERALL BUILDING PLAN
1-M1.2 OVERALL MECHANICAL PLAN
1-M2.1 ENLARGED MECH PLANS ATTICS 1, 2, 3, 4, 5 & 8
1-M2.2 ENLARGED MECH PLANS ATTICS 9, 10, 11, 12 & 13
1-M2.3 ENLARGED MECH PLANS ATTICS 14, 15, 16 & 17
1-M2.4 ENLARGED MECH PLANS ATTICS 18, 19, 20, 21, 22 & 23
1-M2.5 ENLARGED MECH PLANS ATTICS 24, 25, 26, 27 & 28
1-M2.6 ENLARGED MECH PLANS ATTICS 29, 30 & 31
1-M2.7 ENLARGED MECHA PLANS ATTICS 32, 33, 34, 35 & 36
1-M2.8 ENLARGED MECH PLANS ATTICS 37, 41, 43, 44, 45 & 46
1-M2.9 ENLARGED MECH PLANS ATTICS 47 & 48
1-M2.10 ENLARGED MECH PLANS ATTICS 6 & 7
1-M2.11 ENLARGED MECH PLANS ATTICS 38 & 39
1-M2.12 ENLARGED NECH PLANS ATTICS 40 & 42
1-M2.13 ENLARGED MECH KITCHEN ROOF PLAN
1-M3.1 MECHANICAL DETAILS
1-M4.1 MECHANICAL PIPING DIAGRAM
1-M5.1 MECHANICAL CONTROLS DIAGRAMS

Fire Protection

1-FP1.1 OVERALL FIRE PROTECTION PLAN

Electrical

1-E0.01 ELECTRICAL LEGEND & DRAWING SCHEDULE
1-E0.02 ELECTRICAL SPECIFICATIONS
1-E0.03 ONELINE DIAGRAM
1-E0.04 PANEL SCHEDULES
1-E1.01 OVERALL FIRST FLOOR ELECTRICAL PLAN
1-E1.02 OVERALL ATTIC ELECTRICAL PLAN
1-E1.03 OVERALL ROOF ELECTRICAL PLAN
1-E2.01 ATTIC 6 & 7 ELECTRICAL PLANS
1-E2.02 ATTIC 38 & 39 ELECTRICAL PLANS
1-E2.03 ATTIC 40 & 42 ELECTRICAL PLANS
1-E2.04 ROOF ELECTRICAL PLANS

Structural

1-S0.1	STRUCTURAL NOTES
1-S1.0	OVERALL FLOOR PLAN
1-S2.1	STRUCTURAL PLAN AND DETAILS

Architectural

1-A101	OVERALL FLOOR PLAN, INTERIOR ELEVATIONS, AND DOOR DETAILS
A-A110	PARTIAL ROOF PLANS AND DETAILS

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

A. 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 submittals required for performance of the work for all entities/individuals including, but not limited to, the following:

1. General Contractor
2. Sub-Contractor
3. Sub-Contractor of Sub-Contractor
4. Quality Control Personnel
5. Special Inspection Personnel
6. Security Personnel
7. Consultant Personnel

B. Administrative Submittals: Refer to other Division 1 sections and other Contract Documents for requirements for administrative submittals.

1.3 SUBMITTAL PROCEDURES

A. Required Submittals

1. Each company, engaged on a project, shall report to the Washoe County School District all required certifications for every employee who will be on a Washoe County School District site. This includes all personnel whom the Contractor engages for work on the project site as defined in 1.2 (A). This information must be submitted within twenty-one (21) calendar days prior to commencement of work by the Contractor, and any sub-contractor, regardless of tier. Such submittals required include:

a. Certification by Company Regarding Personnel Safety Check Application.

PART 2- PRODUCTS (Not Applicable)

PART 3- EXECUTION (Not Applicable)

CERTIFICATION BY COMPANY REGARDING PERSONNEL SAFETY CHECK APPLICATION

Washoe County School District – Capital Improvement Projects

I certify on behalf of the company/firm named below that adequate background check procedures have been or will be performed for all employees that will work on Washoe County School District project _____ (Project Name) regarding _____ (Company/Firm Name) to determine that their employees meet the qualifications required by the Washoe County School District.

With this certification, I confirm that:

- All employees working on a Washoe County School District project shall not have been arrested, convicted, pled guilty, or pled nolo contender for any offenses related to:
  - Sexual assault or sexual activities with a minor
  - Child abuse
  - Felony drug possession
  - Felony weapons possession
- All employees working on a Washoe County School District project shall not:
  - Have any active Wants/Warrants
  - Is a Registered Sex Offender
  - Is on a Terrorist list.

I understand that the Washoe County School District maintains the right to remove any individuals from the project who do not comply with the above requirements.

I certify the information provided on this application is true, complete, and correct to the best of my knowledge and belief and is provided in good faith. I understand that a knowing and willful false statement on this application can be an automatic disqualification.

I hereby release, discharge, exonerate and hold harmless the Washoe County School District, its agents and representatives and persons furnishing information from any and all liability arising out of the disseminating and inspection of my records.

_____

Company/Firm Name

_____ _____

Name of Executive Officer Title

_____ _____

Signature Date

SECTION 01027 – APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

B. Related Sections: The following sections contain requirements that relate to this section.

1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in SECTION 01300 - SUBMITTALS.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

a. Contractor's Construction Schedule
b. Application for Payment forms, including continuation sheets
c. List of all tier Sub-Contractors
d. List of products
e. List of principal suppliers and fabricators
f. Schedule of Submittals
g. Schedule of Allowances
h. Schedule of Alternates

2. Submit the Schedule of Values to the Architect at the earliest possible date but no later than seven (7) calendar days before the date scheduled for submittal of the initial Application for Payment.

3. Sub-schedules: Where Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for

each Specification Section by site improvements, by each individual building new or addition construction, and by each individual building remodel or revitalization.

1. Arrange Schedule with subtotals for the following:
    a. General Conditions
    b. Fee including overhead, proffit, all insurances
    c. Site Improvements
    d. Each individual building new or addition;
    e. Each individual building remodel or revitilization

2. Identification: Include the following Project identification on the Schedule of Values:

    a. Project name and location
    b. Name of the Architect
    c. Project Number
    d. Contractor's name and address
    e. Date of submittal

3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division including general conditions broken down catagorically.
    b. Description of Work
    c. Name of Sub-Contractor
    d. Name of manufacturer or fabricator
    e. Generic Name of supplier
    f. Change Orders (numbers) that affect value
    g. Dollar value

        1. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Application for Payment and progress reports. Coordinate with the Project Manual Table of Contents. Break principal subcontract amounts down into several line items. Include a line item for Force Accounts and unit price items, as applicable.

5. The total shall equal the Contract Sum.

6. For each part of the work where an Application for Payment may include materials or equipment, purchased or fabricated and stored on or off-site, provide separate line items on the Schedule of Values for cost of those materials.

a. If the Contractor is requesting payment for materials or equipment that are stored off-site, those materials must be stored in a bonded and insured third party warehouse, and they must be segregated from other stored materials and they shall be identified according to project name, material and/or equipment description, and quatity. These materials must be observed in their stored condition by either the Architect or the Owner's representative prior to approval of the Application for Payment. In lieu of bond for stored materials offsite the contractor/subcontractor may provide an appropriate insurance policy approved by the owner to provide for the full replacement cost coverage for all materials stored. Any coverage for materials or equipment stored off-site shall include Owner as loss payee with respect to its interests. These materials must be observed in their stored condition by either the Architect or the Owner's representatives prior to approval of the Application for Payment.

b. All stored material payment requests shall include material supplier invoicing and shall not include labor or delivery costs.

7. Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the Schedule of Values

a. General Conditions shall be broken down by major cost items and catagories including breakout of labor and material.

b. General Conditions performed by subcontract work shall be broken down to individual catagories on the schedule of values. No internal changes to subcontracts shall be allowed without formal Change Order Documentation and reflected on the schedule of values.

8. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and Owner's representative and paid for by the Owner.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements

C. Each application for payment shall include sufficient documentation to substantiate completed work including but not limited to: subcontractor invoicing, all tiers; general conditions cost breakdown, etc.

C. Payment Application Times: The date for each progress payment is as indicated in the Contract. The period covered by each Application for Payment is the period indicated in the Contract.

D. Payment Application Forms: Use Washoe County School District Certificate for Payment form only. This form is available in both hard copy format or electronic format.

E. Application Preparation: Complete every entry on the form. The execution of this form shall be by a person authorized to sign legal documents on behalf of the Contractor. The Owner will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

F. Pre-Approval of Application: Percentages of completed work are to be verified by the Owner's Representative and Architect prior to transmittal to the Architect.

1. It shall be established at the Pre-Construction meeting the protocols that are acceptable to each party for the review of payment application percentages.

G. Record Drawings and Record Specifications: Prior to transmittal of the Application for Payment, Record Drawings and Record Specifications must be reviewed and approved by the Owner's Representative and Architect.

1. It shall be established at the Pre-Construction meeting the protocols that are acceptable to each party for the review of Record Drawings and Specifications.

H. Transmittal: Submit one (1) signed original copy of each Application for Payment to the Architect by a method ensuring receipt within twenty-four (24) hours. The submitted copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect.

2. Obtain Owner's Representative's initials as established during the Pre-Construction meeting and in sub-section 1.4, items E & F above.

I. Waivers of Mechanic's Lien: With each Application for Payment, submit conditional waivers of mechanic's lien from every entity who is lawfully entitled to file a

mechanic's lien arising out of the Contract and related to the work covered by the payment.

1. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

J. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:

1. List of Sub-Contractors (all tiers)
2. List of principal suppliers and fabricators
3. Schedule of Values
4. Contractor's Construction Schedule
5. Schedule of principal products
6. Submittal Schedule
7. List of Contractor's staff assignments
8. List of Contractor's principal consultants
9. Copies of Building Permits
10. Copies of authorizations and licenses from governing authorities for performance of the work
11. Initial Progress Report
12. Report of Pre-Construction meeting
13. Data needed to acquire the Owner's insurance
14. Initial settlement survey and damage report, if required, (existing faclity condition)
15. Record Drawings *
16. Record Specifications*

* Record Drawings and Specifications must be reviewed and approved by the Owner's Representative prior to the Application for Payment.

K. Continuing Application for Payments: Administrative actions and submittals, that must precede or coincide with submittal of the Application for Payment, include the following:

1. Updated Contractor's Construction Schedule

2. Progress report

3. Record Drawings*

4. Record Specifications*

*Record Drawings and Specifications must be reviewed and approved by the Owner's Representative prior to the Application for Payment.

L. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the work.

2. Administrative actions and submittals that shall precede or coincide with this application include:

a. Occupancy permits and similar approvals
b. Changeover information related to Owner's occupancy, use, operation, and maintenance
c. Final cleaning
d. Application for reduction of retainage and consent of surety
e. Advice on shifting insurance coverages
f. List of incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion
g. Record Drawings*
h. Record Specifications*
i. Meter Readings
j. Change of door locks to Owner's access

*Record Drawings and Specifications must be reviewed and approved by the Owner's Representative prior to the Application for Payment.

M. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

1. Completion of project closeout requirements

2. Completion of items specified for completion after Substantial Completion

3. Ensure that unsettled claims will be settled
4. Ensure that incomplete work is not accepted and will be completed without undue delay
5. Completion and final reporting of all prevailing wage and apprentice utilization including unsettled prevailing wage and apprentice utilization claims
6. Transmittal of required project construction records to the Owner
7. Proof that taxes, fees, and similar obligations were paid
8. Removal of temporary facilities and services
9. Removal of surplus materials, rubbish, and similar elements
10. Certified property survey
11. Warranties (Guarantees) and Maintenance Agreements
12. Test/adjust/balance records
13. Operation and Maintenance Manuals
14. Startup performance reports
15. Final progress photographs

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

SECTION 01035 - MODIFICATION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for handling and processing contract modifications.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 1 SECTION 01300 – SUBMITTALS for requirements for the Contractor's Construction Schedule.

2. Division 1 SECTION 01027 – APPLICATIONS FOR PAYMENT for administrative procedures governing Applications for Payment.

3. Division 1 SECTION 01631 – SUBSTITUTIONS for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. The Architect will issue supplemental instructions authorizing minor changes in the work, not involving adjustment to the contract sum or contract time, as an Architect's Supplemental Instruction.

1.4 CHANGE ORDER PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the work that will require adjustment to the contract sum or contract time. If necessary, the description will include supplemental or revised drawings and specifications.

1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.

2. Within fourteen (14) working days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.

a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.

c. Include a statement indicating the effect the proposed change in the work will have on the contract time.

d. Include all subcontractor and contractor overhead and profit per contract documents.

B. Contractor-Initiated Proposals: When latent or unforseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.

1. Include a statement outlining the reasons for the change and the effect of the change on the work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the contract sum and contract time.

2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Comply with requirements in SECTION 01631 – SUBSTITUTIONS if the proposed change requires substitution of one product or system for a product or system specified.

5. Include a list of all associated cost that would be incurred, including subcontractor and contractor overhead and profit per contract documents.

C. The Contractor shall prepare his response in accordance with the requirements set forth in the General Conditions.

D. Proposal Request Form: Use AIA Document G709-2001 for Change Order Proposal Requests or Change Order Request Form (CP-F107).

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Owner and Architect may issue a Construction

Change Directive.The Construction Change Directive instructs the Contractor to proceed with a change in the work, for subsequent inclusion in a Change Order. The Construction Change Directive will be approved upon email confirmation from the Owner.

1. The Construction Change Directive contains a complete description of the change in the work. It also designates the method to be followed to determine change in the contract sum or contract time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

C. Notification: Contractor shall notify Owner prior to any “Not to Exceed” items being over run. Additional Construction Change Directive may be required for over run work.

1.6 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Architect will issue a Change Order for signatures of the Owner and the Contractor on AIA Form G701-2000/2001 or WCSD’s Change Order Form (CP-F107).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01035

ARCHITECT / OWNER

SAMPLE PRICE REQUEST

Date: _____Price Request #_____

Contractor: _____

Bid/Quote #: _____

Project: _____

Please submit a Price Quotation for the following changes being considered. Quote the change within fourteen (14) calendar days - ADD or DEDUCT - in the Contract Sum and any change in the Contract Time. Also, please state how long the price quoted is effective before job conditions warrant an increase in price. This is NOT authorization to proceed with this work.

REFERENCE: _____
_____
_____
_____

CHANGE: _____
_____
_____
_____

REQUESTED BY: _____

REASON: _____
_____
_____

CONTRACTOR / OWNER

SAMPLE CHANGE ORDER REQUEST

Date: _____Price Request #_____

Contractor: _____

Bid/Quote #: _____

Project: _____

Please submit a Price Quotation for the following changes being considered. Quote the change within five (14) calendar days - ADD or DEDUCT - in the Contract Sum and any change in the Contract Time. Also, please state how long the price quoted is effective before job conditions warrant an increase in price. This is NOT authorization to proceed with this work.

REFERENCE: _____
_____
_____
_____

CHANGE: _____
_____
_____
_____

REQUESTED BY: _____

REASON: _____
_____
_____
_____

SAMPLE CLARIFICATION

DATE: _____

TO: _____

FROM: _____

SUBJECT: _____

REFERENCE: _____
_____
_____
_____
_____

CLARIFICATION: _____
_____
_____
_____
_____

THIS INFORMATION IS PROVIDED FOR CLARIFICATION ONLY AND DOES NOT INVOLVE ANY CHANGE IN CONTRACT PRICE OR TIME.

SIGNATURE: _____

TITLE: _____

DATE: _____CLAR. NO.: _____

SAMPLE REQUEST FOR INFORMATION

DATE: _____

TO: _____

FROM: _____

SUBJECT: _____

REFERENCE:
Specification Section: _____ Paragraph: _____
Drawing Number: _____Details: _____

INFORMATION REQUIRED: _____
_____
_____
_____

SIGNATURE: _____

TITLE: _____

DATE: _____

REPLY TO ABOVE RFI: _____
_____
_____
_____

THIS INFORMATION IS PROVIDED FOR CLARIFICATION ONLY AND DOES NOT INVOLVE ANY CHANGE IN CONTRACT PRICE OR TIME.

SIGNATURE: _____

TITLE: _____

DATE: _____CLAR. NO.: _____

SECTION 01040 – COORDINATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures

2. Conservation

3. Coordination Drawings

4. Administrative and supervisory personnel

5. Cleaning and protection

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 1 Section 01050 – FIELD ENGINEERING specifies procedures for field engineering services, including establishment of benchmarks and control points.

2. Division 1 Section 01200 – PROJECT MEETING for progress meetings, coordination meetings, and pre-installation conferences.

3. Division 1 Section 01300 – SUBMITTALS for preparing and submitting the Contractor's construction schedule.

4. Division 1 Section 01600 – MATERIALS AND EQUIPMENT for coordinating general installation.

5. Division 1 Section 01700 – CONTRACT CLOSEOUT for coordinating contract closeout.

1.3 COORDINATION

A. Coordinate construction operations included in various sections of these Specifications to assure efficient and orderly installation of each part of the work.

Coordinate construction operations included under different sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the 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 to assure maximum accessibility for required maintenance, service, and repair.

3. Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination, include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules

2. Installation and removal of temporary facilities

3. Delivery and processing of submittals

4. Progress meetings

5. Project closeout activities

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the work.

E. Coordinate the installation of all motor starters. General Contractor is responsible for costs associated with supplying and installing <u>all</u> required motor starters.

F. Dimensions: The Structural drawings are to be used in conjunction with the Architectural, Mechanical and Electrical drawings. Primary structural elements are dimensioned on the structural plans and details. Not all secondary dimensions are shown, such as exact door and window locations, wall configurations, slab slopes, depressions, curbs, etc. Coordination of the structure of the dimensions as shown on the drawings and architectural items to be embedded into, or attached to the structure, is the responsibility of the Contractor. Any dimensions discrepancies between the Architectural, Civil Structural, Mechanical and Electrical drawings shall be reported to the Owner's Representative and Architect before proceeding with the work.

G. Intent of Drawings:

1. The work of the Contractor and subcontractor shall conform to the intent of the architectural and coordination drawings as reviewed by the Architect. Drawings are partly diagrammatic and do not intend to show in details all features of work. The Contractor shall carefully review the work to be performed by other trades, compare related drawings and shall thoroughly understand the building conditions affecting their work.

2. All changes required in the work caused by failure to do so shall be at no expense to the Owner.

H. Interfaces and Right-of-Way:

1. Make proper provisions to avoid interfaces.

2. Where conflicts occur, architectural and structural has right-of-way over mechanical and electrical work; concealed mechanical work has right-of-way over concealed electrical work; exposed electrical fixtures have right-of-way over mechanical fixtures.

3. Submit conflicts which cannot be resolved by right-of-way to the Owner for direction.

4. Submit reflected ceiling coordination plans showing work by all applicable trades for review and approval by the Architect.

I. Masonry Wall Coordination Drawings:

1. Contractor shall be responsible for providing masonry wall coordination drawings for all concrete masonry unit walls. Drawings shall consist of wall elevations drawn to scale at not less than ¼" = 1'0".

2. Wall elevations shall include dimensioned sizes and locations for all door, window and mechanical openings and penetrations, beam and joist

bearing pockets, ledger angles, embedded plate connections, and anchor bolts. All miscellaneous steel to be embedded in the masonry unit wall shall be referenced by show drawing mark number or structural detail number.

3. Masonry wall coordination drawings shall be reviewed and approved by interfacing trades prior to submittal to the Architect. Shop drawings for masonry reinforcement shall be an 'overlay' of the masonry wall coordination drawings. Detail, fabricate and place per ACI 315. Reinforcing shop drawings elevations shall show all vertical and horizontal reinforcing layouts; special reinforcement at lintels and jams at doors, windows, mechanical openings and as called out on Structural drawings.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space of efficient installation of different components.

1. Show the relationship of components shown on separate Shop drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section 01300 - SUBMITTALS.

B. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the project site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.

1. Post copies of the list in the Project Meeting Room, the temporary field office and each temporary telephone.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. 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. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading
2. Excessive internal or external pressures
3. Excessively high or low temperatures
4. Thermal shock
5. Excessively high or low humidity
6. Air contamination or pollution
7. Water or ice
8. Solvents
9. Chemicals
10. Light
11. Radiation
12. Puncture
13. Abrasion
14. Heavy traffic
15. Soiling, staining and corrosion
16. Bacteria
17. Rodent and insect infestation
18. Combustion
19. Electrical current
20. High-speed operation
21. Improper lubrication
22. Unusual wear or other misuse
23. Contact between incompatible materials
24. Destructive testing
25. Misalignment
26. Excessive weathering
27. Unprotected storage

28. Improper shipping or handling
29. Theft
30. Vandalism

END OF SECTION 01040

SECTION 01041 – PROJECT MANAGEMENT SOFTWARE

1. SUMMARY

    a. Web based construction project management collaboration software to submit, track, distribute and collaborate on project documentation and action items.

    b. The intent of utilizing a web-based construction management application is to reduce cost and schedule risk, improve quality and safety, and maintain a healthy team dynamic by improving information flow, reducing non-productive activities, reducing rework and decreasing turnaround times.

    c. WCSD to work with Contractor to ensure directory for project is current and to be responsible for establishing and managing necessary permissions for users through duration of project.

    d. WCSD will hold a kickoff meeting with the Contractor and applicable consultants at the beginning of the project to discuss how the software will be used, routing & naming protocols, permissions & restrictions, roles & responsibilities, etc.

2. SOFTWARE CAPABILITIES (including but not limited to)

    a. Daily Log
        i. Provides daily log entry from web and mobile with automatic capture of daily weather conditions.
        ii. Provides ability to attach photographs to entries directly from mobile.
        iii. Provides reporting capabilities to easily report on man-hours and activities for a certain time frame and contractor.

    b. Dashboards
        i. Provides a dashboard that shows the status of all currently assigned items with drill down capability to see the subject, assignee and due date of each item.

    c. Deficiency Tracking
        i. Provides a means for recording, assigning and confirming completion of any deficiency or observation noted during the course of construction.

    d. Directory
        i. Provides a directory of all team member’s contact information that is accessible from web and mobile.

    e. Documents
        i. Provides a storage location for miscellaneous project documents with the ability to have a folder hierarchy and privacy settings on folders.

ii. No storage limit.
iii. Provides download tracking.

f. Drawings
   i. Provides access to a system maintained current set of drawings on web and mobile, with access to all previous revisions as well.
   ii. Provides automatic hyperlinking capability for detail callouts.
   iii. Provides drawing markup capabilities on web and mobile.
   iv. Provides ability to link RFIs, Submittals, Punchlist Items, Photos and Project Documents to the drawings.
   v. Drawing Markups can be carried forward when new revisions are uploaded.
   vi. Markups and linked documentation are able to be public or private.

g. Financial Management
   i. Provides ability to manage contracts, payment applications and change orders.
   ii. Provides ability to view contracts and change orders from web and mobile.

h. Inspections
   i. Provides ability to create inspections from web and mobile.
   ii. Provides ability to create a deficiency item from an inspection that can be assigned and tracked to completion.

i. Meetings
   i. Provides ability to create, edit and view meeting minutes from web and mobile.
   ii. Provides ability to create action items with assignees and due dates from a meeting item.

j. Mobile Accessibility
   i. Provide native mobile applications for iOS and Android phones at a minimum that provide access to relevant project documentation, including as-built versions of Drawings and Specifications, even when there is no internet access.

k. Photos
   i. Provides ability to upload and view photos from web and mobile.
   ii. Provides ability to markup photos from mobile to clarify anything important in the photo.
   iii. Provides ability to link photos to specific locations on drawings.

l. Punchlist
   i. Provides ability to create punchlist items from web and mobile and link them to specific locations on the drawings.

ii. Provides ability to distribute punchlist items to all contractors, for contractors to mark them as resolved with photographic proof of resolution via mobile, and for the items to be marked as complete via mobile or web.

m. Requests for Information (RFIs)
   i. Provides ability to create RFIs with assignees, due dates and attachments.
   ii. Provides ability for assignees to respond to RFIs both via the software and by responding to the system generated email.
   iii. Provides an auto-generated log of all RFIs.

n. Schedule
   i. Provides ability to display schedules from typical scheduling software.

o. Specifications
   i. Provides ability to upload project specifications and manage them at the individual specification level.
   ii. Provides ability to view and search specifications on web and mobile.
   iii. Provides ability to upload revisions to individual specifications and maintain all revision history.
   iv. Provides an auto-generated current specification log that provides access to the current version of each specification.
   v. Provides ability to link specifications to submittals and view the specification from the submittal.

p. Submittals
   i. Provides ability to upload a submittal register of all expected submittals.
   ii. Provides ability to create multi-step approval workflows for submittals, with reminder notifications for the current assignee.
   iii. Provides the ability to upload any file type without size restrictions.
   iv. Provides an auto-generated submittal log.

3. TECHNOLOGY

a. Fully web based with mobile apps for Windows, iOS and Android phones.

b. Accessible without logging in through a virtual private network (VPN).

c. Works on the current version of Internet Explorer, Google Chrome, Mozilla firefox and Apple Safari browsers.

d. Can generate emails automatically, and all attachments are included in the emails via download links to avoid emails not being delivered due to size.

e. PDF output of forms such as RFIs, Submittals, Meetings, Change Orders, etc. are available and customizable.

4. TRAINING AND SUPPORT

   a. Procore has learning portal certifications and support available online.

5. PROCEDURES

   a. RFIs and Submittals
      i. The Contractor will be responsible for submitting all RFIs and Submittals through the software and assigning them to the appropriate parties.
      ii. WCSD / Architects / Engineers / Consultants etc. are responsible for posting all responses to these items via the software, including all relevant attachments.
      iii. The Contractor will distribute responses to all affected subcontractors and confirm agreement with the response by closing the item.

   b. Construction Documentation
      i. The Contractor will manage Drawings, Specifications and Documents in the software to ensure that the current version of all applicable construction documentation is available to the entire team via web and mobile.
      ii. The Contractor will ensure that all RFIs which modify the current drawings are posted to the drawings and available via web and mobile within 24 hours of the RFI being responded to.

   c. Contractor will record and distribute action items via the software.

   d. Contractor will take daily site photos and make them publicly available.

   e. Punchlist
      i. All punch list items will be managed through the software.
      ii. Punchlist items will be created by the Contractor while walking with the Owner and applicable consultants.

6. PRICING

   a. The cost of Procore Technologies services (software fee) has been paid in full by WCSD, but the contractor's bid shall include any costs the Contractor deems necessary to execute the use of Procore as identified above.

END OF SECTION 01041

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for cutting and patching.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 SECTION 01040 - COORDINATION for procedures for coordinating cutting and patching with other construction activities.

2. Division 2 SELECTIVE DEMOLITION for demolition of selected portions of the building for alterations.

3. Refer to other sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.

    a. Requirements of this section apply to mechanical and electrical installations. Refer to Division 15 and 16 sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform work.

4. Indicate dates when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction
b. Bearing and retaining walls
c. Structural steel
d. Lintels
e. Miscellaneous structural metals
f. Piping, ductwork, vessels, and equipment

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Primary operational systems and equipment
b. Air or smoke barriers
c. Water, moisture or vapor barriers
d. Membranes and flashings
e. Fire protection systems
f. Noise and vibration control elements and systems
g. Control systems
h. Communication systems
i. Electrical wiring systems
j. Operating systems of special construction in Division 13 sections

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1. If possible, retain the original installer or fabricator to cut and patch the exposed work. If it is impossible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.

1.5 WARRANTY

A. Existing Warranties: Replace, patch and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties, required or existing.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

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 existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or 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. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or a diamond-core drill.
4. Comply with requirements of applicable Division 2 sections where cutting and patching requires excavating and backfilling.

5. Where services are required to be removed, relocated or abandoned, bypass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. 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. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

   a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.

4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty and similar items. Thoroughly clean piping, conduit and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01110 – PREVAILING WAGE AND APPRENTICESHIP UTILIZATION SPECIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents, addendums and all NRS 338 Prevailing Wage and Apprenticeship Utilization Act requirements associated with this project shall apply to this section. Various forms and information can be found on the Office of the Labor Commisioner's website https://labor.nv.gov/

1.2 SUMMARY

A. This section includes administrative and procedural requirements for submittals required for performance of the work, including the following:

1. Contractor/Subcontractor Notification
2. Completion Notification
3. Weekly Wage and Hour Report of Public Works Contractors.
4. Weekly Wage and Hour Report submittal log.
5. Certification of bidder regarding penalties for noncompliance
6. Certification of bidder, proposed contractor or subcontractor regarding debarment, suspension, ineligibility of voluntary exclusion.

B. Related Sections: The following section(s) may contain requirements that relate to this section if included:

1. SECTION - 01027 APPLICATIONS FOR PAYMENT
2. SECTION – 01300 SUBMITTALS

1.3 SUBMITTAL PROCEDURES

A. Compensation:

1. No extension of contract time, overhead, or profit will be authorized because of failure to transmit any required submittals or payroll report submittals to the Owner sufficiently in advance of progress payment submittals.

2. No extension of contract time will be authorized because of failure to transmit or report of any forms.

B. Required Submittals

1. CONTRACTOR/SUBCONTRACTOR NOTIFICATION

a. The Apparent Low Bidder is requested to submit the information on the Comprehensive Contractor/Subcontractor List for the Prime Bidder and all named (used) Subcontractors whom they engage for work within two (2) business days after Recommendation of Award, which will be supplied by the Purchasing Department.

b. It shall be the Contractor's responsibility to comply and submit any required forms directly to the Office of the Labor Commissioner’s as required by NRS 338.

2. COMPLETION NOTIFICATION

The contractor shall notify Washoe County School District when completion of all work performed under the contract is complete.

3. WEEKLY WAGE AND HOUR REPORTING OF PUBLIC WORKS CONTRACTORS

a. The contractor and all subcontractors are required to submit Certified Weekly Wage and Hour Reports of Public Work Contractors for each weekly payroll to Washoe County School District through the use of LCP Tracker, a paperless online system for filling certified payroll. The first weekly report will begin on the Notice to Proceed date and conclude on the following Saturday. If the Notice to Proceed date falls on a Saturday, the first report will only include reporting for that day. All successive reports will begin on the following Sunday and conclude on the following Saturday. All subcontractor report numbers shall coincide with the General Contractors report numbers. If the contractor or subcontractors do not work during any weekly reporting period they still must submit a report

indicating no public work project hours were performed for that weekly period. When contract scope of work is completed including punch list work, the last report is to be clearly marked “FINAL REPORT.”

b. Weekly Wage and Hour Report of Public Works Contractors and Weekly Wage and Hour Report submittal log must be submitted into Washoe County School District LCP Tracker system within fifteen (15) calendar days following the end of the month being reported.

c. The Prime contractor is required to designate an individual as Prime Approver for the project. The Prime Approver will oversee the reporting for all subcontractors of all tiers on the project. WCSD will set up the Prime Approver Account for the project. Thereafter, the Prime Approver will have the responsibility to use the Account to approve all payroll on the project.

d. The prime contractor is required to assign subcontractors within the LCP Tracker system to the project and to ensure that all subcontractors are aware of the necessity to file payrolls electronically, are set up within the system and all required payrolls are filed by subcontractors of all tiers.

.

1.4 OWNER'S ACTION

A. The owner will review each submittal, mark to indicate action taken, and provide review and acceptance.

1. Compliance with submittal requirements is the Contractor’s responsibility.

1.5 POSTINGS/SIGNAGE

A. Each contractor engaged on a public work must post the applicable prevailing rate of wages for the project on the site of the public work in a generally visible place to workmen.

B. Each contractor engaged in a public work must provide a sign with a white background and 6" black lettering stating, "Posted prevailing wages apply to this public works project". This sign must be posted on the site of the public work in a generally visible place to workmen. This will be maintained by the Contractor throughout the construction phase from the Notice to Proceed date through completion of the project.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01110

WASHOE COUNTY SCHOOL DISTRICT

WEEKLY WAGE AND HOUR REPORT SUBMITTAL LOG

Report Number	Contractor	Week Ending Date	Date Submitted

Washoe County School District

WEEKLY WAGE AND HOUR REPORT OF PUBLIC WORK CONTRACTORS FOR THE PAYROLL PERIOD ENDING _____, _____

Month and Day Year

Pursuant to Chapter 338 of NRS and NAC, respectively, the contractor and each subcontractor shall keep or cause to be kept an accurate record showing the name and the actual per diem, wages and benefits paid to each workman employed by him in connection with the public work. The contractor or subcontractor shall ensure that a copy of the record for each calendar month is received by the public body awarding the contract no later than 15 days after the end of the month.

Report # ☐ Regular Weekly Report ☐ . Final Report Bid/Project # PWP-

Project Title Public Body Awarding Contract **Washoe County School District**

Prime Contractor Name & Address License #

Subcontractor Name & Address License #

Employee Name & State/Jurisdiction that Issued Identification	Work Classification		Hours Worked By Day							Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

Employee Name & State/Jurisdiction that Issued Identification	Work Classification		Hours Worked By Day							Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
			1/0	1/0	1/0	1/0	1/0	1/0	1/0									
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

Employee Name & State/Jurisdiction that Issued Identification	Work Classification	Hours Worked By Day								Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
			1/0	1/0	1/0	1/0	1/0	1/0	1/0									
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

Employee Name & State/Jurisdiction that Issued Identification	Work Classification	Hours Worked By Day								Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
			1/0	1/0	1/0	1/0	1/0	1/0	1/0									
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

Employee Name & State/Jurisdiction that Issued Identification	Work Classification	Hours Worked By Day								Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
			1/0	1/0	1/0	1/0	1/0	1/0	1/0									
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

Employee Name & State/Jurisdiction that Issued Identification	Work Classification	Hours Worked By Day								Total Hours For Week	Hourly Rate Of Pay including fringe	Hourly Fringe Benefit Contribution					Gross Amount Earned For Week	Net Wage Paid For Week
			S	M	T	W	T	F	S			H & W	Pen.	Vac.	App. Trg	Other		
			1/0	1/0	1/0	1/0	1/0	1/0	1/0									
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								
		S								0								
		O								0								

Report Hours For Above Referenced Public Works Project Only

STATE OF NEVADA
Office of the Labor Commissioner
STATEMENT OF COMPLIANCE

In compliance with the provisions of Chapters 338 of NRS and NAC, respectively, I, as an officer, owner or director of the undersigned contractor, hereby certify that this report is a true and accurate statement of worker's earnings employed on this Public Works contract by the undersigned contractor for the following payroll period:

_____ , _____ to _____ , _____ .
Month and Day Year Month and Day Year

I further certify:

1. That no deductions have been made from the wages earned by any person so listed other than those permissible or required by law.
2. That any apprentice listed herein is registered in a bona fide apprenticeship program.
3. Check all that apply:

☐ The contractor is signatory to a collective bargaining agreement with some or all of its employees.
☐ Each employee listed has been paid the required applicable wages plus the amount of fringe benefits listed in their contract.
☐ Each employee listed has been paid the required applicable wages per hour with no fringe benefit contributions paid by the contractor.

☐ Prime Contractor
☐ Subcontractor

Contractor Name:	Address:
Telephone:	Fax:

_____ _____ _____
Printed Name / Title Signature Date

NRS 338.070:

4. The contractor and each subcontractor shall keep or cause to be kept an accurate record showing the name and the actual per diem, wages and benefits paid to each workman employed by him in connection with the public work.

5. The record must be open at all reasonable hours to the inspection of the public body awarding the contract, and its officers and agents. The contractor or subcontractor shall ensure that a copy of the record for each calendar month is received by the public body awarding the contract no later than 15 days after the end of the month. The copy must be open to public inspection as provided in NRS 239.010. The record in the possession of the public body awarding the contract may be discarded by the public body 2 years after final payment is made by the public body for the public work.

6. Any contractor or subcontractor, or agent or representative thereof, performing work for a public work who neglects to comply with the provisions of this section is guilty of a misdemeanor.

Washoe County School District

NON-PERFORMANCE PAYROLL REPORT FOR PUBLIC WORKS PROJECTS

Pursuant to Chapter 338 of NRS and NAC, respectively, the contractor and each subcontractor shall keep or cause to be kept an accurate record showing the name and the actual per diem, wages and benefits paid to each workman employed by him in connection with the public work. The contractor or subcontractor shall ensure that a copy of the record for each calendar month is received by the public body awarding the contract no later than 15 days after the end of the month.

Report # _____ ☐ Regular Weekly Report ☐ . Final Report Bid/Project # _____ PWP- _____

Project Title _____ Public Body Awarding Contract **WASHOE COUNTY SCHOOL DISTRICT**

Prime Contractor Name & Address _____ License # _____

Subcontractor Name & Address _____ License # _____

Payroll period _____, _____ to _____ _____

Month and Day Year Month and Day Year

I hereby certify that no employees or owner/operators were used on the construction of this Public Works project during the payroll period above.

_____ _____ _____

Name & Title (please print) Signature Date

STATE OF NEVADA

JOE LOMBARDO
GOVERNOR

DR. KRISTOPHER SANCHEZ
DIRECTOR

BRETT K. HARRIS, ESQ.
LABOR COMMISSIONER

OFFICE OF THE LABOR COMMISSIONER
1818 COLLEGE PARKWAY, SUITE 102
CARSON CITY, NV 89706
PHONE: (775) 684-1890
FAX (775) 687-6409
OFFICE OF THE LABOR COMMISSIONER
3340 WEST SAHARA AVENUE
LAS VEGAS, NV 89102
PHONE: (702) 486-2650
FAX (702) 486-2660
EMAIL: PUBLICWORKS@LABOR.NV.GOV

2025 PREVAILING WAGE RATES
WASHOE COUNTY REGION

DATE OF DETERMINATION: October 1, 2024

APPLICABLE FOR PUBLIC WORKS PROJECTS OVER $100,000 BID/AWARDED OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025

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 11
Electrician – Neon Sign 13
Electrician - Wireman 14
Elevator Constructor 15
Fence Erector 17
Flagperson 18
Floor Coverer 19
Glazier 20
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) 30
Mechanical Insulator 31
Millwright 32
Operating Engineer 35
Operating Engineer – Steel Fabricator & Erector 35
Operating Engineer – Piledriver 36
Painter 38
Piledriver (Non-Equipment) 40
Plasterer 42
Plumber/Pipefitter 43
Refrigeration 44
Roofer 45
Sheet Metal Worker 46
Soils and Material Tester 47
Sprinkler Fitter 47
Surveyor 48
Taper 49
Tile/Terrazzo Worker/Marble Mason Finisher 50
Tile/Terrazzo Worker/Marble Mason 51
Traffic Barrier Erector 53
Truck Driver 54
Well Driller 56

Group Classifications

Labor Group Classifications 57
Operating Engineers 61

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……77.37
Air Balance Technician-Foreman…….....82.06
Air Balance Technician-General Foreman……86.75

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, Memorial Day, Independence Day, Friday before Labor Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day.

RECOGNIZED HOLIDAYS
New Year's Day, Memorial Day, Independence Day, Friday before Labor 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 exterior wall systems, 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……..……39.90

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……74.61
Boilermaker Foreman……78.59

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.

PER DIEM payments and TRAVEL pay shall be paid as follows:
The Contractor shall pay the employee Per Diem in the amount of seventy-five dollars ($75 .00) per day worked where the job site is 70 miles or more but Jess than 120 miles from the dispatch point.
For mileage of 120 miles or more, the daily Per Diem amount shall be ninety dollars ($90.00) per day worked.
Where the job site is over 120 miles or more from the dispatch point, employees shall receive the I.R.S. maximum allowable per mile for transportation between the dispatch point and the job site at the beginning and conclusion of their employment.
Where a job is located two hundred and forty (240) miles or more from the dispatch point, the employee will receive one additional day's Per Diem at the beginning of employment and one additional day's Per Diem at the conclusion of employment.

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……..……..……53.96
Bricklayer Foreman……..……55.21

ADD ZONE PAY in addition to BRICKLAYER rates add the applicable amounts per hour, calculated based on road miles of over thirty-five (35) miles from the Washoe County Courthouse in Reno, Nevada:

Zone 1	0 to 35 miles	$0.00
Zone 2	35 to 75 miles	$2.50
Zone 3	Over 75 miles	$8.12

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..……..……61.42
Carpenter Foreman..……..……..……65.26
Carpenter General Foreman…….……..……69.48

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	Within 75 road miles	$0.00
Zone 2	Between 75 to 150 road miles	$6.00
Zone 3	Between 150 to 300 road miles	$7.00
Zone 4	In excess of 300 road miles	$8.00

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, including but not limited to plastics and such work in connection with new methods of construction or use of materials.

(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……..…….54.42
Cement Mason - Foreman……..……58.92

ADD ZONE RATE
In addition to CEMENT MASON 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	$6.00
Zone 3	150 to 300 miles	$7.00
Zone 4	More than 300 miles	$8.00

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 (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Communication Technician..…….....41.13

JOB DESCRIPTION:

ELECTRONIC COMMUNICATION TECHNICIAN, includes but is not limited to:
1. Pulling cable, installing and trimming devices, terminating loops, circuits, or other data gathering points;
2. Termination of main control panels, racks, or other head end equipment, as well as testing of all circuits from the field devices to the main control panels and/or equipment; 2016-2017 Prevailing Wage Rates – Washoe County 13
3. Utilizing test equipment for the purpose of troubleshooting and verifying the integrity of the circuits in question;
4. Using hand tools to assemble and install data communication lines and equipment computer systems, antennas and towers;
5. Disassembling equipment to adjust, repair or replace parts using hand tools;
6. Starting up, programming and documenting systems;
7. Measuring, cutting, splicing, connecting, soldering and installing wire and cable associated with communication 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……..……39.57
Lineman-Journeyman…..……..…….....67.30
Lineman-Foreman……..……73.99
Lineman-General Foreman……..……...80.76
Lineman-Equipment Man……..……..51.75

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, President's Day, Memorial Day, Fourth of July, Labor Day, Nevada Day, Thanksgiving Day and the Friday following, 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 (coiliable 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 (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Electrician Neon Sign Journeyman……..…….63.15
Electrician Neon Sign Foreman..……..…….65.15
Electrician Neon Sign Truck Foreman supervising (4) or more...…….67.65

ADD PREMIUM PAY
One and one half (1 ½X) the regular straight time hourly rate shall be paid:
1. For all hours worked over eight (8) hours in one day or shift, either before or after the shift.
2. For up to 8 hours worked on Saturday from midnight to midnight.
Double (2X) the regular straight time hourly rate shall be paid for all time:
1. For all hours worked over eleven (11) hours in one day or shift, Monday thru Friday.
2. For all hours worked in excess of 8 hours on Saturday, Sundays or Holidays.

SHIFT DIFFERENTIAL
Second Shift (Swing) will be an additional $1.25 cents per hour.
Third Shift (Graveyard) will be an additional $1.50 per hour.
HIGH TIME (Working at heights)
1. All employees working at height of 65 feet and subject to a direct fall shall be paid an additional $2.75 per hour in addition to their normal rate for a minimum of 2 hours.
2. All employees working at height of 125 feet or when repelling below 65 feet shall be paid an additional $4.00 per hour in addition to their normal rate for a minimum of 4 hours.

FOREMAN/TRUCK FOREMAN
1. First employee on the job (TRUCK FOREMAN) must have a CDL and Welder certification and shall be paid $2.00 per hour
in addition to their normal rate of pay.
2. When the first employee on the job (FOREMAN) is supervising (4) or more workers, he or she shall be paid an additional $2.50 per hour. In addition to their normal rate of pay.
3. When the first employee on the job (TRUCK FOREMAN and FOREMAN) has a CDL and Welder certification and is supervising (4) or more workers, he or she shall be paid an additional $4.50 per hour. In addition to their normal rate of pay.

RECOGNIZED HOLIDAYS
New Year's Day, Martin Luther King Day, President's Day unpaid holiday; double time for any hours worked, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Eve ½ day (4 hours) unpaid holiday; straight time for first four hours worked and double time for hours worked after four hours, Christmas Day.

JOB DESCRIPTION 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……..……...……..73.88
Wireman-Cable Splicer…...……....78.33
Wireman Forman…..……..……79.95
Wireman General Foreman…..……..……86.02

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 (31.4) 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..……126.41
Elevator Constructor-Journeyman Mechanic In Charge…….....137.32

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 Local 8.

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.
(1) 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……..……..……51.03

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	$6.00
Zone 3	150 to 300 miles	$7.00
Zone 4	300 miles or over	$8.00

No remote area pay shall be paid within ten (10) miles of employee's permanent place of residence in the State of Nevada.

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……48.91

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	$6.00
Zone 3	150 to 300 miles	$7.00
Zone 4	300 miles or over	$8.00

No remote area pay shall be paid within ten (10) miles of employee's permanent place of residence in the State of Nevada.

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

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…….60.65
Floor Coverer Foreman…..…….64.49

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, Independence Day, Labor Day, Admissions Day, Thanksgiving Day, Day after Thanksgiving Day, Christmas Day.

JOB DESCRIPTION: Excerpt from Southwest Mountain States Regional Council of Carpenters.

All work in connection with the installation of floor coverings (with the exception of wood floors which are covered by the Master Labor Agreement) such as measuring, cutting, installing, or removal and other preparation for installation of all types of floor covering. All types of floor covering regardless of material (except wood flooring), including but not limited to all types of carpeting, linoleum, vinyl, cork, laminate floors; glue down wood floor applications; rubber, cork, asphalt, linoleum or other types of tile; artificial turf and sports surfaces; any type of resilient flooring such as epoxy, polyurethane or similar materials regardless of how applied; and ceramic tile and stone. Included in the work covered is the application or installation of any type of moisture barrier and any type of underlayment or subfloor in connection with a flooring installation.

Craft: GLAZIER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Glazier Journeyman……33.96
Glazier Foreman…..…….36.41
Glazier Superintendent..……..…….37.63

ADD PREMIUM PAY
One and one half (1 ½) the regular straight time hourly rate shall be paid:
1. For first two (2) hours worked over eight (8) on a regular five (5) day week.
2. For all hours worked on Saturday. Employees shall not work less than four (4) hours.

Double the regular straight time hourly rate shall be paid for all time:
1. For all hours worked beyond ten (10) hours shall be paid at two (2 X) times the straight time rate.
2. For all hours worked on Saturday beyond 8 hours (2 X) times the straight time rate.
3. For hours worked Sunday and Recognized Holidays. Employees shall not be employed for less than four (4) hours.

*Also, if there is less than 10 hours between shifts, the 2nd shift becomes an extension of the 1st shift.

*Shift Differential: To be paid for all work performed between the hours of 5:30 pm to 5 am and it will be compensated at 10% differential for all hours worked including overtime. Overtime that falls between these hours will still be paid at the appropriate overtime rate.

20.1 High Pay – work that is thirty (30) or more feet in height above grade on an elevated, mechanically operated platform (including but not limited to: swing stage, boatswain chair, crane basket, heck lift, boom lift), rappelling work, work at slab edge outside the perimeter safety cable or work at slab edge inside the perimeter safety cable if the work being performed puts the employee in a free fall situation because the perimeter safety cable is no longer at or near waist level shall be paid at the rate of one dollar ($1.00) per hour above the straight time rate for actual hours worked. High time shall be paid in addition to all other premiums involved.

25.2 Foremen:
a) The selection of the individual to act as foreman shall be at the discretion of the Employer. On outside jobs lasting three (3) days or more and which four (4) workers or more are employed, one (1) foreman will be designated and he shall be paid ten percent (10%) per hour over the highest journeyman Glazier supervised. Inside foreman shall receive ten percent (10%) per hour above the journeyman's wage scale.

b) When a glazier is requested to perform welding on the job site, he/she will be compensated one dollar ($1.00) over his regular rate of pay. All equipment, including hoods, leather and gloves, will be supplied by the Employer.

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 DC 16 and Glazing Contractors Associations of NV and Independent Contractors

General Glazing shall include the layout and setting by hand or with machines, cutting, preparing handling or removal of the following and incidental and supplemental to such work: setter of art glass, prism glass,

beveled glass, leaded glass, automobile glass, window glass, mirrors of all types, wire glass, ribbed glass, ground glass, colored glass, figured glass, vitrolite glass, carrara glass, and all other types of opaque glass; glass chalk boards, structural glass, tempered and laminated glass, thiokal, neoprene and all other types of glass cements, all types of insulating glass units, solar heat collectors containing glass or glass substitutes, glass hand rail, electric glass, bathroom fixtures, all plastics when used in place of glass, all other similar materials when used in place of moldings, tubber, lead and all types of mastic in wood, iron, aluminum or sheet metal, sash skylights, doors, frames, stone, wall cases, show cases, books cases, sideboards, partitions, automatic doors, automatic sliding doors, revolving doors, luminous ceilings, gaskets, and plastic mirrors, the installation of the above materials, temporary or permanent, on or for any building in the course of repair, remodel, construction or alteration.

The installation of all glass framing or support systems for the same such as extruded, rolled or fabricated metals or any materials that replace the same, such as plastics, metal tubes, mullions, metal facing materials, muttins, facia trim moldings, porcelain panels, skylights, showcase doors and relative materials, including those in any or all of the buildings related to the store front and window wall, curtain wall, stop wall, skylight and dome construction. Glazing and installation of door and window frames, such as patio sliding or fixed doors, vented or fixed windows, shower doors, bath tub enclosures, screens storm stash where the glass becomes an integral part of the finished products, the tinting and coating of glass for the reflecting of heat and light, showcase tops, glass shelving of all types and table tops. In addition, such caulking, glass to glass, glass to metal, metal to concrete and panel to panels.

Production, maintenance, including all incidental and supplemental to, but not limited to Employees, and Employees who are engages int eh cutting, preparing, handling and selecting of glass and /or mirror, bevellers, silverers, blockers, scratch polishers, sand-blasters, flat glass wheel cutters, miters cutters, engraver, hole-drilling machine operations, belt sanding, automatic beveling, multi-grove edging machines, semi- and automatic-cutting machines, grinding, polishing unpacking ad racking or glass, glass packing, glass and mirror cleaning, mirror stripping, all operations in the manufacturing, framing and fabrication and assembling of all insulating units, assembling of all glass insulated solar heat collectors containing glass or glass substitutes, molding or mirrors, manufactured and assembly of sliding glass or mirror doors, the operating of all machines and equipment for these operations, oven operations, glass hangers, glass benders and operators, safety glass fabricators, inspectors, janitors, maintenance mechanics, loading and unloading or truck and railroad cars.

Craft: Highway Striper (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Highway Striper……53.53
Highway Striper Foreman……54.03

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	$6.00
Zone 3	150 to 300 miles	$7.00
Zone 4	300 miles or over	$8.00

No remote area pay shall be paid within ten (10) miles of employee's permanent place of residence in the State of Nevada.

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……..51.28
Brick Mason Foreman……51.68

ADD ZONE RATE
In addition to Hod Carrier Brick Mason Tender rates add the applicable amounts per hour, calculated based on road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone Rate	75 miles and over	$8.13

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..……..51.62
Plasterer Tender- Gun Tender..……..52.62
Plasterer Tender-Foreman…….……52.98

ADD ZONE RATE
In addition to: HOD CARRIER-PLASTERER TENDER rates add the applicable amounts per hour, calculated based on road miles from either the Carson City Courthouse or the Washoe County Courthouse:

Zone Rate	75 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 trawled 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, tusky 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, Cafco 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

SEE AMENDMENT 1

Ironworker - Journeyman…..……82.86
Ironworker - Foreman…..……..……87.61

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 or Las Vegas 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, Admission (Nevada) Day, Veterans 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, cindering 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 ……..…….45.62
Furniture Mover ……47.12
Group 1……..…….50.78
Group 1A……..…….48.91
Group 2……..…….50.88
Group 3……..…….51.03
Group 3A……..……..54.46
Group 4……..…….51.28
Group 4A……..……..53.78
Group 5……..…….51.58
Group 5A……..…….53.53
Group 5A Foreman…….. 54.03
Group 6
Nozzlemen, Rodmen……...…….50.58
Gunmen, Materialmen…….…….50.58
Reboundmen..…….50.93
Gunite Foreman..…….51.98

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	$6.00
Zone 3	150 to 300 miles	$7.00
Zone 4	300 miles or over	$8.00

No remote area pay shall be paid within ten (10) miles of employee's permanent place of residence in the State of Nevada.

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 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)…….74.93

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	$5.00
Zone 3	150 to 300 miles	$6.00
Zone 4	300 miles and 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.

Craft: Mechanical Insulator (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Mechanical Insulator-Mechanic…….....……..78.46
Mechanical Insulator-Foreman….. ...……82.46
Mechanical Insulator-General Foreman ..……84.46

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	$15.00
Zone 2	21 to 40 miles	$25.00
Zone 3	41 to 60 miles	$35.00
Zone 4	Over 60 miles	$100.00
Zone 4: Up to $140.00 per day with receipts		

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…..……..……77.22
Millwright Welder…..……..……80.22
Millwright Foreman.……..……81.90
Millwright General Foreman..……..……87.04

ADD ZONE RATE

In addition to MILLWRIGHT rates add the applicable amounts per hour, calculated from Reno, Nevada City Hall. The Employer agrees to provide each employee zone pay as established below if the project is further than forty-five (45) miles calculated via the "shortest route" filter using Google Maps from the address of city hall of respective dispatch points.

Zone 1	Up to 45 Miles	$0.00
Zone 2	More than 45 miles but less than 101 Miles	$4.00
Zone 3	101 or more Miles	$6.00

ADD PREMIUM PAY

Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight-time work shall be paid at one and one half (1½) times the straight-time rate of pay. All additional overtime will be paid at two (2) times the straight-time rate of pay.
All work performed on Sunday and Holidays shall be paid at two (2) times the straight-time rate of pay.
Any work performed on Labor Day shall be paid at triple (3x) the regular straight time hourly wage rate.

Lodging: If the project is further than forty-five (45) miles calculated via the "shortest route" filter using Google Maps from the address of city hall of the respective dispatch points listed above, the Employer agrees to furnish acceptable single occupancy lodging to each employee. Employers are encouraged to use commercial facilities and lodges, however, when such facilities are not available, per diem in lieu of room and lodging shall be paid at the rate of one hundred ten dollars ($110.00) per day, or part thereof, from the date of hire for the project to the date of termination of employment on the project.

RECOGNIZED HOLIDAYS

New Year's Day, Washington's Birthday (President's Day), Memorial Day, 4th of July, Labor Day, Veteran's Day, Thanksgiving Day, Friday after Thanksgiving, Christmas Day.

JOB DESCRIPTION Excerpt from Southwest Regional Council of Carpenters' Millwright Regional Master Construction Agreement.

Section 1.4 Millwright Jurisdiction.
The machinery, equipment, processes and associated components listed below which are identified for the purpose of description only, falls within the jurisdiction of the United Brotherhood of Carpenters and Joiners of America (Millwrights). Although some components of machinery and/or equipment may be described in one application or location and not in another, it shall not be excluded from our craft jurisdiction when, to avoid repetition, it is not described in other applications, and such jurisdiction shall be applied to the initial commissioning, maintenance, decommissioning, and recommissioning of all associated machinery and/or equipment.

Section 1.4.1
Millwright craft jurisdiction shall include the loading, unloading, hoisting, rigging by any means, transferring, moving, cleaning, disassembling, assembling, moving and setting and removal of skids, welding, burning, erecting, calibrating, precision grouting, supporting, aligning, starting-up and testing, adjusting, repairing, and the maintaining of all machinery and equipment, be it powered by, or receiving power from, steam, gas, gasoline, diesel, biodiesel,

hydrogen, jet, electric, pneumatic, magnetism, adiabatics, diabatics, isothermics, water, hydropnuematics, solar, thermal, mineral, atomic, rocket, nuclear, chemical, wind, waste product of any kind or any other source, regardless of whether or not such machinery or equipment is temporarily or permanently installed or located.

Section 1.4.2
Millwright craft jurisdiction shall include all activities necessary to: set all engines, motors, dynamos, generators, diesel generators, motor restraints and supports; install, measure and align with optical and/or electronic instruments when necessary the reactors, control, push and shut-down rods, rod pressure housing, drives, guide sleeves and other related equipment in reactors, turbines, castings, combustion chambers and all its related components; the attachment and final connection of the inlet manifolds and exhaust ducts, cylinders, diaphragms, gaskets, containment barriers, rotors, blade rings, blade or bucket assemblies, hydrogen coolers, blower assembles, packing joints on hydrogen coolers, exciter or Alterex and all others, turning gear, extension box, welding of extension box, lagging, stretching of coupling bolts or others; perform oil flush; install turbine lube oil tank, pumps and related component skids, filters, thrust bearings, magnetic bearings, the sweating on and shrinking of bearings, couplings, shafts and others, sole plates and machine bases; perform all precision grouting using the following materials: epoxy, wet, non-shrink, dripacking or other types; perform demineralizing and hydromation; install mechanical dust systems, sensors, air compressors, super charges, coolers, boiler controls and linkage, thermal management systems, Bailey Meters or similar devices and their linkages; installation, maintenance and removal of all instrumentation, gauges, antennae and other communication devices, fluid drives, power drive trains, embedded guides for traveling screens, traveling screens, roller, slide, knife, lock and sluice gates, limit torques on mechanical valves, gates and others, tainter valves, limit switches, trips, triggers or switches, including the brackets that are attached to, stop logs, dam rollers, transfer cars and gear head motors.

Section 1.4.3
The setting of variable drives, fans, coal cranes, truck cranes or other types, including servicing and the adjusting and aligning of mechanical equipment within the cranes, crane rails and all other types of rails which would carry mechanically activated equipment, including their alignment, installation, removal, servicing, and alignment of hydraulic and pneumatic lifts and passenger boarding bridges, monorail (all sizes), magnetic propulsion systems, trolleys, pumps and their associated components, packaging equipment, refrigerating equipment, chillers, and related equipment, lantern rings, packing glands, packing for pumps, pollution equipment, carbon absorbers and filtration, heat exchanges, grain, ball, hammer, roller mills, pulverizers and others, crushers and beaters, hoppers, bins, chutes and spouts, turn tables, shears, casing machines, robots, air-veyors, conveyors of all sizes, types, and styles regardless of the materials they are constructed with, or mechanically powered conveyances of any type, including their supports, people movers, x-ray and imaging & scanning machines, elevator and platform lifts, dock levelers and locks, roll-up and sectional doors, operable partitions, retractable roofs, magnetic separators, hoists, feeding machinery, Z-loaders, S-loaders, palletizers, Triax equipment, mechanical equipment in scrubbers, pack towers, precipitators, cooling towers and air cooled condensers.

Section 1.4.4
Sewage, Brackish, Desalination, Water Treatment and Mineral Extraction Plants — the disassembly, fabricating, rigging, erecting and aligning of skimmers, rake mechanisms, feed wells, baffles, scum troughs, de-gritting equipment, bar screens, communitors, mixers, pumps, aeration systems, blowers, membrane filtration systems, sequencing batch reaction systems, including related, filter presses, sand filtration systems, ultra violet rack systems, mechanical drive assemblies, conveyors, lines, piping, flanges, brackets, supports, mono rails, gates and setting odor control and detection equipment, (excluding heating, ventilating and air conditioning work). The setting of thru-clean bar, straight line bar, trash, tritor drum, and disc screens, straight line grit, circuline grit, circuline sludge, and circuline mixer collectors, straight line, flash, horizontal slow, vertical slow, and vibra flow feeder machines, pre-aeration and settling tanks, covers for tanks, bowls and basins including stationary or mechanical covers regardless of materials, thickeners, rotoline distributors, sludge bed and settling pond cleaners, digestion systems, heaters, dyna-grind sewage screening grinders, screw pumps, spiral classifer, agitators, junk remover, hydro pulper, cooling fans, lube systems, selectifier screens, hydrosensors, fuel blowers, grizzly screens, trommels, table feeders, dryers, optical sorters, high tension separators, grip dewatering screens, flash mixer, horizontal slow mixer, vertical slow mixer, filter, cone and rotary presses, comminutors, barminutors, degreasers, rotometers, dehumidifiers, benches, pressure cleaning systems & devices, washers for cars, trucks, buses, trains, planes unmanned and autonomous vehicles and other types, hydraulic, servo and pneumatic units, shroud boxes, silencers, scales, load cells, eddy current clutches, disintegrators, dehairing machines, grain handling devices, laboratory equipment, machine shop equipment, ladle cars, stunning pens and doors and gates, activation equipment, racks, material handling platforms, access & egress platforms, catwalks,

transition pieces, the handling and installation, of pulleys, gears, fluid couplings, sheaves and fly wheels, air vacuum, worm, belt, friction, rope, magnetic, chain and gear drives that are directly or indirectly coupled to motors, belts, chains, shafts, or screws, installation of legs, boots, guards and boot tanks, all bin and diverter valves, turn hands and indicators, shafting, bearing cable sprockets, cutting of all key seats in old and new work, troughs, chippers, calenders, rolls, winders, rewinders, slitters, cutters, wrapping machines, blowers, forging machines, pneumatic, electric and hydraulic rams, servo actuators, extractors, expellers and extruders, ball and dust collectors, splicing of ropes and cables.

Millwright craft jurisdiction on energy generation facilities shall include all loading, unloading, movement, hoisting, preparation, uncrating, preparation of nacelle units prior to installation or removal, installation, setting, removal, alignment, and final torquing and tensioning of any mechanical component used in the generation of power, including any incidental wiring or piping. This shall include all aspects of power trains, drive and tracking systems, elevation and azimuth drives, energy collection optimization systems, all rams, dampers and other stabilization devices, antennae, bearing housing assemblies and units, actuators, pulleys, gears, access points, rotational connections, mounting and alignment of tracks, axles, bearings, rotational joints, or any other device which allows for the automated or manual movement of equipment post-installation, all turbines, and wind, wave and tidal analysis equipment. It shall also include all work associated with energy collection and storage facilities, including the loading, unloading, movement, hoisting, preparation, installation, setting, and alignment of racking systems, torque tubes, modules, batteries, energy storage systems, cooling or control systems, inertia systems or other equipment or machinery, and all incidental wiring or piping thereof.

Section 1.4.5
The laying out, fabrication and installation of protecting equipment including: machinery guards; the making and setting of templates for machinery; the fabrication of bolts, nuts, pans; the drilling or creating of holes in machinery for any equipment which the Millwrights install, remove, service or inspect, regardless of material; installation of all methods of access and egress and safety devices whether temporary or permanent; all welding and burning regardless of type; the fabrication of all lines, hose or tubing used in the lubrication, operation, cooling or heating of machinery, including the installation of all fluids used to operate, lubricate, cool or heat equipment installed by Millwrights; the cleaning or pressure cleaning of machinery; the machining, grinding, milling, broaching, boring, threading, lapping, field machining, technical bolting and keying that may be necessary for any part of equipment, including the starting up, breaking in, trial running and operational or functional testing of any equipment or machinery installed or handled by the Millwrights, the initial programing of robotics for startup, and the incidental connection and disconnection of machinery and equipment from piping and electrical systems.

Section 1.4.6
Rock, sand and gravel plants, mineral processing plants and batch or aggregate plants: Installation, removal and maintenance of all recycling equipment, separators, centrifuges, classifiers, grates, crushers, conveyors, chutes or piping from one piece of mechanical equipment into another piece of mechanical equipment, or from a vessel into a conveyor, or into other places or mechanical equipment or other mechanical equipment used (for the purpose of description only) to excavate material from one area to another from highways, roadways, waterways or elsewhere.

Section 1.4.7
When optical instruments such as total stations or similar devices, automatic levels, builder’s transits, precision jig transits, tilting levels, theodolites or other precision tools and instruments are used to locate, set, scan-to-BIM or as-Built measure and verify machines, these tools are considered a tool of the Millwright trade and are to be used by Millwrights to set the equipment or machinery.

Section 1.4.8
Incidental asbestos removal on equipment in which Millwrights normally remove during maintenance and repair work.

Section 1.4.9
Any new equipment or technology designed to replace any of the equipment described above shall remain in the craft jurisdiction of the Millwrights.

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	69.91
Group 1A	72.67
Group 2	73.20
Group 3	73.47
Group 4	74.21
Group 5	74.51
Group 6	74.68
Group 7	74.93
Group 8	75.52
Group 9	75.84
Group 10	76.19
Group 10A	76.38
Group 11	76.62
Group 11A	78.26
Group 11B	79.07
Foreman	78.26

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	85.21
Group 1 Truck Crane Oiler	79.04
Group 1 Oiler	77.08
Group 2	83.70
Group 2 Truck Crane Oiler	78.79
Group 2 Oiler	76.87
Group 3	82.46
Group 3 Truck Crane Oiler	78.57
Group 3 Oiler	76.65
Group 3 Hydraulic	78.24
Group 4	80.73
Group 5	79.63

Add 12.5% to base rate for “Special” Shift

Add Operating Engineers Zone Pay
Add Premium Pay

Craft: OPERATING ENGINEER (Union Rate)
PILEDRIVER

Prevailing wage rates include the base rate as well as all applicable fringes

Operating Engineers	(SEE GROUP CLASSIFICATIONS)
Group 1	84.68
Group 1 Truck Crane Oiler	79.22
Group 1 Oiler	77.30
Group 2	83.14
Group 2 Truck Crane Oiler	79.01
Group 2 Oiler	77.10
Group 3	81.69
Group 3 Truck Crane Oiler	78.79
Group 3 Oiler	76.87
Group 4	80.18
Group 5	79.07
Group 6	75.79
Group 7	77.00
Group 8	76.04

Add 12.5% to base rate for “Special” Shift

ADD ZONE RATE

In addition to: **OPERATING ENGINEER, STEEL FABRICATOR & ERECTOR, and OPERATING ENGINEER PILEDRIVER,** 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……..……..53.14
Spray Painter/Paperhanger……..……55.72
Sandblaster..……..……55.14
Structural Steel & Steeplejack……..……55.14
Swing Stage……..……..……55.64
Special Coating Application-Brush……..……55.14
Special Coating Application-Spray……..……55.14
Special Coating Application-Spray Steel..……...……..55.14
Foreman..……$2.50 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 Painting 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……..…….61.92
Piledriver-Welder……..……..……62.92
Piledriver-Foreman…..……...…….65.81
Piledriver-General Foreman……...……70.09
Tender……...……...…… 65.81
Stand-By Diver……..……...…….66.81
Diver-Diving (Wet Pay)……..…….. 110.58

ADD ZONE RATE
In addition to PILEDRIVER rates add the applicable amounts per hour, calculated from the Washoe County Courthouse:

Zone 1	Within 75 miles	$0.00
Zone 2	Between 75 to 150 road miles	$6.00
Zone 3	Between 150 to 300 road miles	$7.00
Zone 4	In excess of 300 road miles	$8.00

Workmen performing outside of the free zones shall receive the appropriate remote area allowance for not less than eight (8) hours per day. Remote area differential shall be considered part of the basic wage rate for the purpose of computing overtime hourly wage rates.

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 twelve (12) 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). No work shall be performed on Labor Day, except to preserve life and property.

RECOGNIZED HOLIDAYS
New Year's Day, Memorial Day, 4th of July, Labor Day, Admission Day, Thanksgiving Day, the Friday after Thanksgiving, Christmas Day.

JOB DESCRIPTION
104.1 The Carpenters claim the layout, rigging, tagging, signaling, cutting, burning, welding, chain sawing, driving, setting and pulling of all soldier piles and soldier beams together with all necessary waling, shoring, underpinning, struts, bracing, capping and lagging necessary for construction of subterranean structures of all types to include, but not limited to subways, subway stations, buildings, storm drains, sewers, pipelines and all open cut and cover construction projects. The Carpenters further claim construction of all covers and access mats to include all necessary rigging for setting and removing, whether intermittently or regularly and installation and removal of timber decking.
(a) In addition to the work identified in Article I, the Pile Divers claim the operation of the following types of equipment when the operation of same is incidental to that work which falls under the jurisdiction of the United Brotherhood of Carpenters and Joiners of America or Pile Drivers Local Union No. 2375; mechanical forklifts of all types, boom trucks and any other mobile equipment as assigned by the employer necessary to complete the work. In addition, the operation of the power pack and vibratory hammer controls when driving or pulling, sheet pile, pile, soldier beams, cassinos or casing. . The work includes work on cast & drill holes and operation of the ABI machine.
(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 cloverleafs, 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……..……...……55.62
Plasterer-Foreman……..……...……59.57

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 the first two (2) hours worked over eight (8) hours Monday through Friday. Double the regular straight time rate shall be paid for all hours worked over ten (10) hours Monday through Friday. One and one half (1 ½) the regular straight time rate shall be paid for the first ten (10) hours on Saturday. Double the regular straight time rate shall be paid for all hours worked over ten (10) hours on Saturday. All hours worked on Sunday shall 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 toweled 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..……...……..76.10
Plumber/Pipefitter-Foreman.……...……81.19
Plumber/Pipefitter-General Foreman.……...……86.28

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 hearing 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…….……..…… 67.14
Refrigeration -Foreman…….……..…….67.64

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 hearing 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

JOB DESCRIPTION

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……..……77.37
Sheet Metal Worker -Foreman…….....82.06
Sheet Metal Worker -General Foreman……..…….…86.75

ADD ZONE RATE
A separate free zone will be established for employees permanently residing and working within a seventy-five (75) mile radius of the Elko, Nevada Post Office. 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, Memorial Day, Independence Day, Friday before Labor Day, Labor Day, Nevada Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas, and Christmas Day.

RECOGNIZED HOLIDAYS
New Year's Day, Memorial Day, Independence Day, Friday before Labor 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 exterior wall systems, metal roofing; and (f) all other work included in the jurisdictional claims of International Association of Sheet Metal, Air, Rail and Transportation Workers.

Craft: SOILS and MATERIAL TESTER (Non-Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Soil Tester (Certified)……..…….46.81
Soils and Materials Tester..……..46.81

Craft: SPRINKLER FITTER (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes

Sprinkler Fitter-Journeyman……..…….65.31
Sprinkler Fitter Foreman……..……...68.31
Sprinkler Fitter General Foreman…….70.56

ADD ZONE RATE
In addition to SPRINKLER FITTER rates add the applicable amounts per hour, calculated based on a road from the courthouse in Reno, Nevada:

Zone 1	0 to 60 miles	$0.00
Zone 2	60 to 80 miles	$23.00
Zone 3	80 to 100 miles	$33.00
Zone 4	Over 100 miles	$125.00

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: SURVEYOR (Union Rate)

Prevailing wage rates include the base rate as well as all applicable fringes.

..

Rodman/Chainman ……..……...……...72.97
Instrumentman……..……..……...……..74.43
Chief of Party Surveyor……..……..……..75.69

ADD ZONE RATE

In addition to: **OPERATING ENGINEER, STEEL FABRICATOR & ERECTOR, and OPERATING ENGINEER PILEDRIVER,** rates add the applicable amounts per hour calculated based on a road mile 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:

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.

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.

JOB DESCRIPTION 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……..……..59.26
Taper-Foreman…..……..……..63.54

ADD ZONE RATE
In addition to: TAPER rates add the applicable amounts per hour Zone Pay shall commence from the Washoe County Courthouse in Reno, Nevada, 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. When holiday falls on a Sunday, the Monday following shall be observed as the holiday; holidays falling on Saturday shall be observed on the prior Friday.

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..……42.32
Tile Setter/Terrazzo Worker/Marble Mason - Finisher Foreman……..……44.32
Tile Setter/Terrazzo Worker/Marble Mason Finisher- General Foremen…….……68.32

ADD ZONE RATE
In addition to TILE/TERRAZZO WORKER/MARBLE MASON FINISHER wage rates, employees shall receive the following hourly zone pay for all jobs located more than forty (40) miles from the Washoe County Courthouse in Reno, Nevada:

Zone 1	0 to 40 miles	$0.00
Zone 2	40 to 50 miles	$3.75
Zone 3	50 to 70 miles	$5.00
Zone 4	Over 70 miles	$10.00

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 al 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……...……....52.37
Tile Setter - Foreman…….……...……..54.37
Tile Setter - General Foreman…. ……...……..58.37

Terrazzo/Marble Mason - Journeyman ……...……....53.87
Terrazzo/Marble Mason - Foreman ……...…….……55.87
Terrazzo/Marble Mason - General Foreman..……...…….59.87

ADD ZONE RATE
In addition to TILE SETTER/TERRAZZO/MARBLE MASON wage rates, employees shall receive the following hourly zone pay for all jobs located more than forty (40) miles from the Washoe County Courthouse in Reno, Nevada:

Zone 1	0 to 40 miles	$0.00
Zone 2	40 to 50 miles	$3.75
Zone 3	50 to 70 miles	$5.00
Zone 4	Over 70 miles	$10.00

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…….50.78

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	$5.00
Zone 3	150 to 300 miles	$6.00
Zone 4	300 miles and over	$7.00

No remote area pay shall be paid within ten (10) miles of employee's permanent place of residence in the State of Nevada.

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, 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), Dumpcretes and Bulk Cement Spreader)

Under 4 yds. (water level)……32.25
4 yds. & under 8 yds. (water level)……32.25
8 yds. & under 18 yds. (water level)……32.25
18 yds. & under 25 yds. (water level))……32.25
25 yds. & under 60 yds. (water level)……32.25
60 yds. & under 75 yds. (water level))……32.25
75 yds. & under 100 yds. (water level))……32.25
100 yds. & under 150 yds. (water level))……32.25
150 yds. & under 250 yds. (water level))……32.25
250 yds. & under 350 yds. (water level))……32.25
350 yds. & over (water level)……32.25

Transit Mix

Under 8 yrds……32.25
Under 8 yrds & including 12 yrds……32.25
Over 12 yrds……32.25

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……32.25

Water & Jetting Trucks

Up to 2,500 gallons……32.25
Up to 2,500 gallons & over……32.25
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)……32.25
Heavy Duty Transport(Gooseneck low bed)……32.25
Tiltbed or Flatbed Pull Trailers.. ……32.25
Bootman, Comb. Bootman & Road Oiler……32.25
Flat Rack (2 or 3 axle unit)……32.25

Bus & Manhaul Drivers

Up to 18,000 lbs. (single unit)……32.25
18,000 lbs. and over ……32.25
Warehousemen Spotter ……32.25

Winch Truck & "A" Frame Drivers

Up to 18,000 lbs. ……32.25
18,000 lbs. and over……32.25
Warehousemen Spotter……32.25
Warehouse Clerk……32.25
Tire Repairmen……32.25
Truck Repairmen……32.25
Pick Up Truck & Pilot Cars (Jobsite) ……32.25
Pick Up Truck & Pilot Cars (Over the road) ……32.25
Truck Oil Greaser……32.25
Fuel Truck Driver……32.25
Fuel Man & Fuel Island Man……32.25
Oil Tanker……32.25

Oil Tanker with Pup…….…….32.25
Foreman……..……...32.25

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……..……60.78

JOB DESCRIPTION

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 whether/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 stablilization compenents

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

- Gunite Foremen, Nozzlemen, Rodmen, Gunmen, Materialmen, Reboundmen

- Tunnel and shaft workers/miners and use of customary tools and equipment for tunnel and mine work All worked 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
- Cary-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
- Cary 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 Liebher 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
- 59
- Heavy Duty Repairman/Welder

Group 5

- Boom Cat

OPERATING ENGINEER -PILEDRIVER

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

STATE OF NEVADA

JOE LOMBARDO
Governor

DR. KRISTOPHER SANCHEZ
Director

BRETT K. HARRIS, ESQ.
Labor Commissioner

DEPARTMENT OF BUSINESS AND INDUSTRY
OFFICE OF THE LABOR COMMISSIONER

2024-2025 Prevailing Wage

Amendment 1

- **AMENDMENT 1**
- **Classification – Ironworker**
- **County – All Regions**
- **Effective – January 1, 2025**

The following represents the amended wage rates

Prevailing wage rates include the base rate as well as all applicable fringes

Ironworker-Journeyman……86.36
Ironworker -Foreman……...91.46

Carson City: 1818 E. College Parkway, Suite 102 Carson City, Nevada 89706 - Telephone (775) 684-1890 - Fax (775) 687-6409

Las Vegas: 3340 West Sahara Avenue, Las Vegas, Nevada 89102 - Telephone (702) 486-2650 - Fax (702) 486-2660
www.labor.nv.gov

SECTION 01200 - PROJECT MEETINGS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for project meetings including, but not limited, to the following:

1. Pre-Construction Conference

2. Pre-Installation Conferences

3. Coordination Meetings

4. Progress Meetings

5. Start-up / Training

6. Service, maintenance, warranty review.

B. Construction Schedules are specified in Division 1 SECTION 01310-A – PROGRESS SCHEDULES.

1.3 PRE-CONSTRUCTION CONFERENCE

A. The Contractor shall schedule a pre-construction conference and organizational meeting at the project site or other convenient location no later than fifteen (15) days after execution of the Contract and prior to commencement of any construction activities. The Contractor shall conduct the meeting to review scope, responsibilities, personnel assignments, Permits, submittals, safety, emergency action plans, contacts, schedule, etc.

B. Attendees: Owner; Architect, and their consultants; Contractor and their Superintendent and major sub-contractors; and manufacturers, suppliers and other concerned appropriate parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:

1. Construction schedule

2. Critical work sequencing

3. Designation of responsible personnel

4. Procedures for processing field decisions and change orders

5. Procedures for processing Applications for Payment

6. Submittal of Shop Drawings, product data and samples

7. Preparation of Record Documents

8. Use of the premises

9. Office, work and storage areas

10. Equipment deliveries and priorities

11. Safety and Security, emergency procedures

12. Housekeeping

13. Working hours

1.4 PRE-INSTALLATION CONFERENCES

A. Conduct a pre-installation conference at the site before each major construction activity that requires coordination with other construction. The installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination of integration with other materials and installations that have preceded or will follow, shall attend the meeting. The Contractor shall advise the Architect of scheduled meeting dates.

B. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:

1. Contract Documents

2. Options

3. Related Change Orders

4. Purchases

5. Deliveries

6. Shop Drawings, products data and quality control samples
7. Possible conflicts
8. Compatibility problems
9. Time schedules
10. Weather limitations
11. Manufacturer's recommendations
12. Compatibility of materials
13. Acceptability of substrates
14. Temporary facilities
15. Space and access limitations
16. Governing regulations
17. Inspection and testing requirements
18. Required performance results
19. Recording requirements
20. Protections

C. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the minutes of the meeting to everyone concerned, promptly, including the Owner and the Architect.

D. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.5 PROGRESS MEETINGS

A. Conduct a weekly progress meeting at the project site at regularly scheduled intervals. Coordinate with the Owner and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request, Change Order request, mockup reviews, etc.

B. Attendees: In addition to representatives of the Owner, Architect, Construction Manager each sub-contractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future work shall be represented at these meetings by persons familiar with the project and authorized to conclude matters relating to progress.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's construction schedule, whether on time or ahead or behind schedule. Determine how construction that is behind schedule will be expedited; and 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 allotted contract time.

2. Review the present and future needs of each entity present, including such items as:

    a. Interface requirements
    b. Time
    c. Sequence
    d. Deliveries
    e. Off-site fabrication problems
    f. Access
    g. Site utilization
    h. Temporary facilities
    i. Hours of work
    j. Hazards of work
    k. Housekeeping
    l. Quality and work standards
    m. Change Orders
    n. Documentation of information for payment requests

D. Reporting: No later than three (3) days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1. Schedule Updating: update the construction progress schedule after each progress meeting where modifications to the schedule have been made or recognized. Issue the updated schedule concurrently with the report of each meeting.

1.6 GUARANTEE/WARRANTIES; BONDS; AND SERVICE AND MAINTENANCE CONTRACTS REVIEW MEETING:

A. Eleven (11) months following the date of Substantial Completion of the work, hold a meeting for the purpose of review of guarantees/warranties; bonds; and service and maintenance contracts for materials and equipment.

B. Meeting location shall be at a mutually agreed upon site, as convenient as possible for all parties.

C. Attending shall be representatives of the following:

1. Owner

2. Architect

3. Owner's and Architect's Consultants, as appropriate to the agenda

4. Construction Manager

5. Commissioning Agent

6. Contractor

7 Sub-contractors, as appropriate to the agenda

8. Suppliers, as appropriate to the agenda

9. Others, as appropriate to the agenda

D. Owner will prepare an agenda for the meeting and distribute it to the attendees a minimum of seven (7) calendar days in advance of the scheduled meeting date.

E. The Contractor shall take action as appropriate to implement repair or replacement of defective items and to extend service and maintenance contracts.

F. Owner or Owners Representative shall take meeting notes and distribute them to all attendees. Attendees taking exception to anything in the meeting notes shall state in writing to the Owner within five (5) working days, following receipt of meeting notes.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01200

SECTION 01300 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for submittals required for performance of the work, including the following:

1. Submittal Schedule
2. Daily Construction Reports
3. Shop Drawings
4. Product Data
5. Samples
6. Quality Assurance Submittals
7. Record Drawings
8. Record Specifications

B. Administrative Submittals: Refer to other Division 1 Sections and other contract documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. Applications for Payment
3. Performance and Labor & Material Bonds
4. Insurance Certificates
5. List of Sub-Contractors

C. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 SECTION 01027 – APPLICATION FOR PAYMENT specifies requirements for submittal of the Schedule of Values.

2. Division 1 SECTION 01040 - COORDINATION specifies requirements governing preparation and submittal of required coordination drawings.

3. Division 1 SECTION 01200 – PROJECT MEETING specifies requirements for submittal and distribution of meeting and conference minutes.

4. Division 1 SECTION 01400 – QUALITY CONTROL specifies requirements for submittal of inspection and test reports.

5. Division 1 SECTION 01700 – CONTRACT CLOSEOUT specifies requirements for submittal of project Record Documents and warranties at project closeout.

1.3 DEFINITIONS

A. Coordination drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.

1. Preparation of coordination drawings is specified in Division 1 SECTION 01040 - COORDINATION and may include components previously shown in detail on Shop Drawings or Product Data.

B. Field samples are full size physical examples erected onsite to illustrate finishes, coatings or finish materials. Field samples are used to establish the standard by which the work will be judged.

C. Mockups are full size assemblies for review of construction, coordination, testing or operation; they are not samples.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

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 elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

   a. Allow three (3) weeks for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals, or needs additional information to complete review.
   b. If an intermediate submittal is necessary, process the same as the initial submittal.
   c. Allow two (2) weeks for reprocessing each submittal.
   d. No extension of contract time, overhead or profit will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the work to permit processing.
   e. Allow four (4) weeks for initial review of any submittal requiring review by Authority Having Jurisdiction (AHJ). A listing of these known submittals is indicated on the contract drawings, but this is not necessarily exhaustive.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4” x 5” (100 x 125 mm) on the label or beside the title block on the Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken:

   a. Project Name
   b. Date
   c. Name and Address of the Architect
   d. Name and Address of the Contractor
   e. Name and Address of Sub-Contractor
   f. Name and Address of Supplier
   g. Name of the Manufacturer
   h. Number and Title of appropriate specification section
   i. Drawing Number and detail references, as appropriate

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from contract document requirements, including variations and limitations. Include Contractor's certification that information complies with contract document requirements.

2. Transmittal Form: Use AIA Document G810.

1.5 SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within ten (10) days of the date required for submittal of the Contractor's construction schedule.

1. Coordinate submittal schedule with the list of sub-contracts, schedule of values and the list of products as well as the Contractor's construction schedule.

2. Prepare the schedule in chronological order. Provide the following information:

a. Scheduled date for the first submittal
b. Related section number
c. Submittal category (Shop Drawings, Product Data or Samples)
d. Name of the Sub-Contractor
e. Description of the part of the work covered
f. Scheduled date for resubmittal
g. Scheduled date for the Architect's final release or approval

B. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, Sub-Contractors and other appropriate parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report recording the following information concerning events at the site and submit duplicate copies to the Architect and Owner daily:

1. List of sub-contractors at the site
2. Exact count of personnel at the site from each contractor or sub-contractor
3. Time spent by each person working on site vs off the job site
4. High and low temperatures, general weather conditions
5. Accidents and unusual events
6. Meetings and significant decisions
7. Stoppages, delays, shortages and losses
8. Emergency procedures
9. Orders and requests of governing authorities
10. Change Orders received, implemented
11. Services connected, disconnected
12. Equipment or system tests and startups
13. Partial Completions, occupancies
14. Substantial Completions authorized
15. Record Drawing identified changes
16. Record Specification identified changes

1.7 SHOP DRAWINGS

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle or otherwise indicate deviations from the contract documents. Do not reproduce contract documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions

2. Identification of products and materials included by sheet and detail number

3. Compliance with specified standards

4. Notation of coordination requirements

5. Notation of dimensions established by field measurement

6. Sheet Size: Except for templates, patterns and similar full size drawings, submit Shop Drawings on sheets at least 8½" x 11" but, no larger than 30" x 42".

7. Submit in the quantity the Contractor requires to be returned, together with four (4) additional copies each of brochures, catalog cuts and similar material for mechanical, electrical, hardware and elevator items; and three (3) additional copies for all others.

8. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.8 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing in diagrams and templates, standard wiring diagrams and performance curves.

1. Mark each copy to show applicable choices and options. Where printed, Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:

   a. Manufacturer's printed recommendations
   b. Compliance with trade association standards
   c. Compliance with recognized testing agency standards
   d. Application of testing agency labels and seals
   e. Notation of dimensions verified by field measurement
   f. Notation of coordination requirements

2. Do not submit Product Data until compliance with requirements of the contract documents has been confirmed.

3. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.

4. Submittals: Submit three (3) copies of each required submittal; submit four (4) copies where required for maintenance manuals. The Architect will retain one and will return one (1) marked with action taken and corrections or modifications required. One (1) copy with review comments will be supplied to the Owner.

    a. Unless non-compliance with contract document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, sub-contractors, suppliers, manufacturers, fabricators and others required for performance of construction activities. Show distribution on transmittal forms.

    a. Do not proceed with installation until a copy of Product Data is in the installer's possession.
    b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

A. Submit full size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets and swatches showing color, texture and pattern.

1. Mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Architect's sample. Include the following:

    a. Specification section number and reference
    b. Generic description of the sample
    c. Sample source
    d. Product name or name of the manufacturer
    e. Compliance with recognized standards
    f. Availability and delivery time

2. Submit samples for review of size, kind, color, pattern, texture, and lead content testing for all paints and painted materials. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

    a. Where variation in color, pattern, texture or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
c. Refer to other sections for samples to be returned to the Contractor for incorporation in the work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.
d. Samples not incorporated into the work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.
e. Samples that are tested by WCSD to have any lead content shall be rejected.

3. Preliminary Submittals: Submit a full set of choices where samples are submitted for selection of color, pattern, texture or similar characteristics from a range of standard choices.

   a. The Architect will review and return preliminary submittals with the Architect's notation, indicating selection and other action.

4. Submittals: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three (3) sets. The Architect will return one set marked with the action taken.

5. Maintain sets of samples, as returned, at the project site, for quality comparisons throughout the course of construction.

   a. Unless non-compliance with contract document provisions is observed, the submittal may serve as the final submittal.
   b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to sub-contractors, manufacturers, fabricators, suppliers, installers and others as required for performance of the work. Show distribution on transmittal forms.

1. Field samples are full size examples erected on site to illustrate finishes, coatings or finish materials and to establish the project standard.

   a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 QUALITY ASSURANCE SUBMITTALS

A. Submit quality control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports and other quality control submittals as required under other sections of the specifications.

B. Certifications: Where other sections of the specifications require certification that a product, material or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 SECTION 01400 – QUALITY CONTROL.

1.11 ARCHITECT'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When the Architect marks a submittal "No Exceptions Taken," the work covered by the submittal may proceed provided it complies with requirements of the contract documents. Final payment depends on that compliance.

2. Final-But-Restricted Release: When the Architect marks a submittal "Implement Exception Noted," the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the contract documents. Final payment depends on that compliance.

3. Returned for Resubmittal: When the Architect marks a submittal "Not Approved, Revise and Resubmit," do not proceed with work covered by the submittal, including purchasing, fabrication, delivery or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

a. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the project site or elsewhere where work is in progress.
b. When the submittal review action stamp is marked “Rejected”, do not proceed with that portion of the work covered by the submittal including, but not limited to, purchasing, fabrication, delivery or other activity. Make a new submittal in accordance with the review notations on the submittal and resubmit without delay in the same manner and number as for the original submittal. Resubmit as often as necessary as required to obtain an unrestricted or restricted release action. “Rejected” review action stamp notation shall not be construed by the Contractor as a valid reason for an increase in contract time.

4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "Action Not Required."

C. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01300

SECTION 01310A – PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 THIS SECTION INCLUDES:

A. Schedule Submittal Requirements

B. Schedule Submittal Format

C. CPM Schedule Structural Requirements

D. Updating Schedules

E. Schedule Revisions

F. Time Extensions

G. Three (3) Week Projection Schedule

1.2 RELATED SECTIONS

A. Division 1 SECTION 01010 – SUMMARY OF WORK

B. Schedule of Values

C. Division 1 SECTION 01027 – APPLICATION FOR PAYMENT

D. Change Order Procedures

E. Division 1 SECTION 01300 – SUBMITTALS

1.3 SCHEDULE SUBMITTAL REQUIREMENTS

A. Submit, in duplicate, as described in Part 1.5 A., to the Owner and the Architect at the Pre-Construction Conference the following preliminary documents defining planned operations:

1. Baseline Schedule

B. The Architect and the Owner will review schedule submittals; such review shall not constitute an approval or acceptance of the Contractor's construction means, methods, sequencing or its ability to complete the work in a timely manner.

C. The preliminary documents will illustrate, at a minimum, a detailed baseline schedule for those activities commencing within the first ten (10) calendar days after the Notice to Proceed is issued by the Owner.

D. The Contractor shall submit the completed Baseline documents to the Architect within thirty (30) calendar days from the Notice of Award. The schedules shall integrate the activities of the preliminary schedules, and include all activities required for contract completion.

1. Within fifteen (15) calendar days after receipt of the complete Baseline Schedule, the Owner and Architect will communicate in writing their comments and concerns to the Contractor. Within five (5) working days, the Contractor shall adjust the schedule and progress curve to incorporate comments from the Owner and Architect and resubmit.

2. Upon Owner and Architect receipt and acknowledgment of revisions to the Baseline Schedule, it shall become part of the contract documents. Payment to the Contractor shall be withheld until such schedule, satisfactory in form and substance to the Owner and Architect, has been received.

E. Changes in logic and/or durations shall not be made without first noticing on the need to change with the Owner and Architect. Changes will be accepted where they are reasonable. Changes will be accepted or denied without liability. Changes to simply accommodate a perception of still being on schedule will not be accepted. At the discretion of the Architect and the Owner, the Baseline Schedule no longer represents the actual prosecution and progress of the work, the Architect and Owner will require a Recovery Schedule.

F. Failure to provide the required schedule information at the required times will result in denial of the relative portion of progress payments until such time that the schedule information is submitted in the correct format at the sole option of the Owner.

1.4 SCHEDULE SUBMITTAL FORMAT

A. Follow the guidelines below when submitting a baseline, update, or projection schedule.

1. Required Diagrams:

a. Gantt/Bar Chart or Time Scaled Logic Diagram; sheet size to be a maximum of 30 x 42 inches, organized by building and/or area, sorted by early start and early finish dates.

b. The formatting of the (hard copy submission) Baseline Schedule, schedule updates and three (3) week projection schedules shall include the following information (order and content of columns):

i. Activity Description
ii. Original Duration

iii. Remaining Duration
iv. Percent Complete
v. Total Float
vi. Target Early Start (except on Baseline Schedule)
vii. Target Early Finish (except on Baseline Schedule)
viii. On all updates and projections, show Baseline Schedule as Target (with Target Early Start and Target Early Finish dates)
ix. Format title block to include (at a minimum) the Contractor's name, school name, project number, file name, data date and run date.

c. The Contractor will be responsible for planning, scheduling, managing, and reporting the progress of the work in accordance with all of the specific methods and submittals described in this section.

d. The construction schedule shall be prepared by a competent scheduler, and used by the Contractor to plan, prosecute and coordinate the work in an orderly and expeditious manner. The schedule will be used by the Owner and the Architect to evaluate progress and status at the various stages of the project, allocate funds, determine the impact of any changes to the Contract and establish the basis for progress payments.

1.5 CPM SCHEDULE STRUCTURAL REQUIREMENTS

A. The following requirements have been defined in an effort to create consistency across all project schedules for purpose of analysis.

1. Structure of Schedule:

a. The schedule should be broken down into logical areas of work. We suggest separate areas of the building and that sitework be divided into appropriate areas. We expect to see, at a minimum, the following areas (where applicable):

i. Milestones
ii. Prepare & Issue Submittals
iii. Review Submittals
iv. Material Procurement & Delivery
v. On Site Work
vi. Off Site Work
vii. Area A
viii. Area B
ix. Area C
x. Area D
xi. Plant

xii. Etc.

b. Tasks related to the submittal/procurement of material or equipment shall be included as separate activities in the project schedule. Examples of procurement activities include, but are not limited to:

i. Material/Equipment submittal preparation
ii. Submittal and approval of material/equipment
iii. Delivery of O&M manuals
iv. Material/equipment fabrication and delivery
v. Delivery of extra parts/extra stock/special tools
vi. Notification of Owner furnished materials/equipment delivery requirements
vii. Contractor's original network diagram submittal shall become the Baseline Schedule, once it is found acceptable by the Owner. The Baseline Schedule shall be duplicated and utilized as the Current Schedule and shown graphically over the Baseline.

c. Construction activities shall include at a minimum, but are not limited to:

i. Tasks corresponding to each specification section covered in the Specification Index in Divisions 2 through 16
ii. Tasks related to mobilization / demobilization
iii. Tasks related to Owner; Owner provide materials, FFE delivery and setup, Move in prior to substantial and final completion
iii. The installation of temporary or permanent work by tradesman
iv. Testing and inspections of installed work by technicians, inspectors, or engineers
v. System utility outages and tie ins
vi. Start up and testing of equipment, commissioning of building and related systems
vii. Scheduling of specified manufacturer's representatives
viii. Final clean up
ix. Training to be provided
x. Punch list completion
xi. Maintenance period
xii. Administrative tasks necessary to start, proceed with, accomplish or finalize the contract

1.6 UPDATING SCHEDULES

A. Updated Schedules shall accompany the monthly Application for Payment, reflecting progress since previous month's submittal.

B. The schedule update shall show the status of all activities, including those in progress, completed or not started, indicated by start and finish dates, whether forecasted or actual, completion percentages based on time, original and remaining durations, any changes in network logic or activity durations and any other relevant information. Refer to Part 1.8 for revisions to the Schedule.

C. Identify activities modified since previous submittal, major changes in work, changes associated with approved Change Orders and any other identifiable changes.

D. Actual start and finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual start and actual finish dates on the CPM schedule shall match the dates of actual work accomplished in the field and not on projected completion dates. Out of sequence progress (if applicable) shall be handled through Retained Logic, not the option of Progress override.

E. With each updated schedule submission, the Contractor shall submit a brief narrative report, including descriptions of schedule revisions such as changes in network logic, planned activity start dates, duration or in the critical path. The report will include a description of the amount of progress during the last month, a description of any problem areas, current or anticipated delays and their estimated schedule impacts. In the narrative report, the Contractor shall provide explanation for any slippage in contractual completion or other milestone dates. Additionally, the Contractor shall propose remedial measures necessary to recover any lost time, whether actual or forecasted. Contractor shall take such additional steps as are necessary in order to effectively eliminate or minimize such delays and to comply with the contract schedule.

1.7 SCHEDULE REVISIONS

A. Updating the schedule to reflect actual progress made up to the data date of a schedule update shall not be considered revisions to the Baseline Schedule.

B. If, as a result of a schedule update, it appears the baseline schedule no longer represents the actual prosecution and progress of the work, the Architect or Owner shall request a revised schedule from the Contractor. The revision shall address the Contractor’s current construction plan for completing the work without impacting contract time and cost. Approved

revisions to the schedule shall be incorporated into the Baseline Schedule at the next schedule update submission.

C. If the Architect or Owner recognizes at any time, regardless of, reason that the work has fallen behind the scheduled contract time, milestone, phase dates or for work activity on the latest schedule that indicates more than a critical five (5) day delay to

the project, the Contractor shall submit a written and documented Recovery Schedule within seven (7) calendar days of the Architect's/Owner's written request. The Contractor will document in the Recovery Schedule and narrative, all additional resources, including materials equipment and labor and modifications of operations which will be provided so as to meet the schedule. The Contractor will provide all such additional resources and modifications of operations without additional cost to the Owner. Such additional resources and modifications shall include but not be limited to:

1. Required overtime for the Contractor's personnel

2. Increased construction manpower in such quantities as will substantially eliminate the backlog of work and put the project back on schedule

3. Increase numbers of shifts per working day, working days per week or the amount of construction equipment or any combination of the foregoing which will put the project back on schedule

4. Reschedule activities to achieve the maximum practical concurrence of accomplishment of activities to put the project back on schedule

5. Supplemental progress schedules detailing the specific operation changes instituted to regain the contract schedule

The Contractor will implement the Recovery Schedule without additional cost to the Owner and provide for completion of the work in accordance with the remaining milestone dates without a time extension. Should the logic and/or durations of the Recovery Schedule not receive acceptance of the Architect and the Owner, the Contractor is responsible to use concurrent operations, additional manpower, additional shifts, overtime, etc., including 24 hour production work day, seven (7) day work week operation, as required to put the project back on schedule at no additional cost to the Owner.

D. The Contractor may also request revisions to the Baseline Schedule in the event the Contractor's planning for the work is revised. If the Contractor desires to make changes in the Baseline Schedule to reflect revisions in its method of operating and scheduling of the work, the Contractor shall notify the Architect and Owner in writing stating the reason for the proposed revisions and accompanied by a copy of the Contractor's electronic CPM Schedule. The revision shall address the Contractor's current construction plan for completing the work without impacting contract time and cost. Accepted revisions to the schedule shall be incorporated into the Baseline Schedule at the next schedule update submission.

E. If changes in the method of operation and scheduling are desired, the Owner and/or Architect shall be notified in writing stating the reasons for the change. If the Owner and/or Architect considers these changes to be of a major nature, the Contractor

may be required to revise and submit for acceptance, without additional cost to the Owner, the network diagrams and required sorts. A change may be considered of a major nature if the estimated time required or actually used for an activity or the network logic is varied from the original plan to a degree that there is a reasonable doubt as to the effect on the contract completion date(s) (or phase completion dates). Changes that affect activities with adequate float time shall be considered a major change when their cumulative effect could extend the contract completion dates.

F. Use of float suppression techniques, such as:

1. Preferential sequencing (arranging critical path through activities more susceptible to Owner and/or Architect caused delay);

2. Special lead/lag logic restraints;

3. Zero total or fee float constraints;

4. Extended activity times, or imposing constraint dates other than as required by the contract;

shall be cause for rejection of the project schedule or its updates. The use of resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

G. Definitions of Float or Slack

1. Free float is the length of time the start of an activity can be delayed without delaying the start of a successor activity.

2. Total float is the length of time along a given network path that the actual start and finish of activity(ies) can be delayed without delaying the project completion date.

3. Project float is the length of time between the Contractor's early completion (or Substantial Completion) and the contract completion date.

4. Project float is for the benefit of the project and for the mutual use of the Owner and the Contractor.
5. Contractor's non-work weather days bank of time activity shall not be defined as "Float or Slack" for this project. It is Contractor time identified in item 1.9.G which follows.

H. Negative float will not be a basis for requesting time extensions. Any extension of time will be addressed in accordance with item 1.9 Time Extensions. Scheduled

completion dates(s) that extend beyond the contract (or phase) completion date(s) (evidenced by negative float) may be used in computation for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

1.8 TIME EXTENSIONS

A. Extensions of time to the Contract may be granted only for delays to activities on the critical path that actually delay the project completion beyond the date of Substantial Completion or for delays to activities that transform that activity onto the critical path, and, as a result, delay completion beyond the contract Substantial Completion date.

B. Seasonal weather conditions and resulting impacts shall be included in the planning and scheduling of all work influenced by wind, cold or warm weather, smoke, snow, and/or precipitation to ensure completion of all work within the Contract time.

If all the work, or the portion(s) of the work which are the currently controlling operation(s), are suspended for weather so as not to prosecute the work, a time extension at the Owners discretion, **may be awarded if the following conditions are satisfied**

a. The weather shall actually be the delay to the Substantial Completion Date of the project and the delay must be beyond the control and without the fault or negligence of Contractor; weather will be evaluated based on the original baseline schedule without revision if revision is the result of contractor performance; **and**

b. The weather recorded by NOAA / NWS (WS Form: F6) website: (www.weather.gov/climate/index), Reno location or owner approved location of work during the Contract period shall be found to occur more frequently than the weather normally recorded by NOAA / NWS to be anticipated is documented more frequently occurring than 5 Year NOAA / NWS (WS Form: F6) Averages for all project locations; or

c. Owner/Architect orders the stoppage or suspension of the work in the interest of public safety or health or due to specification requirements.

Weather is defined for the purposes of this Contract to be compared to current recorded National Oceanic and Atmospheric Administration (NOAA) / National Weather Service Preliminary Local Climatological Data (WS FORM: F-6) for Station: Reno, Nevada, or for owner approved alternate project location, as follows:

- **PRECIPITATION** water equivalent of greater than or equal to 0.1 inch

recorded for the 24-hour period, of the date, and /or

- **AVERAGE** wind speed of greater than or equal to 20 miles per hour recorded for the 24-hour period for the date of occurrence. **NOT** 2 Minute Sustained or Gusts as recorded in (WS FORM:F6).

The schedule of anticipated weather delays is based on current National Oceanic and Atmospheric Administration (NOAA) / National Weather Service (NWS) records kept as Preliminary Local Climatological Data (WS FORM: F-6) for Station: Reno, Nevada, (e.g. 5 Year NOAA / NWS (WS Form: F6) Averages) for all project locations **and will constitute the baseline for the total Contract Time weather delay evaluations.** Contractor's CPM schedule shall be understood to include as a minimum, the amount of weather delay days lost in all Contractors' weather dependent activities occurring during the activity.

1.9 THREE (3) WEEK PROJECTION SCHEDULE

A. As deemed necessary by the Owner or Architect, the Contractor shall provide a three (3) week detailed short interval schedule for each building story, and area of the work, at regularly scheduled progress meetings. The format shall be satisfactory to the Owner and Architect. Short interval schedules shall be based upon the most current precedence Network Diagram and will indicate the actual progress achieved the previous week as well as the detailed activities scheduled for the next two (2) weeks and will show anticipated durations, start and completion dates for activities, and how the schedule tracks to the baseline schedule. All projection schedules shall be derived from the baseline schedule.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01310A

SECTION 01400 – QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for quality control services.

B. Quality control services include inspections, tests and related actions, including reports performed by the Contractor, by independent agencies and by governing authorities. They do not include contract enforcement activities performed by the Architect.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with contract document requirements.

D. Requirements of this section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality control requirements for individual construction activities are specified in the sections that specify those activities. Requirements in those sections may also cover production of standard products.

2. Specified inspections, tests and related actions do not limit the Contractor's quality control procedures that facilitate compliance with contract document requirements.

3. Requirements for the Contractor to provide quality control services required by the Architect, Owner or Authorities Having Jurisdiction (AHJ) are not limited by provisions of this section.

E. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 SECTION 01045 – CUTTING AND PATCHING specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.

2. Division 1 SECTION 01300 – SUBMITTALS specifies requirements for development of a schedule of required tests and inspections.

1.3 RESPONSIBILITIES

A. Owners Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, the Owner or Owners representatives/agents, project managers, QA/QC inspectors, coordinators etc. shall provide inspections, tests and other quality control services specified elsewhere in the contract documents and required by AHJ.

1. Where individual sections specifically indicate that certain inspections, tests and other quality control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality control services. Costs for these services are included in the contract sum.

2. Where individual sections specifically indicate that certain inspections, tests and other quality control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services.

    a. Where the Owner has engaged a testing agency for testing and inspecting part of the work and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless agreed to in writing by the Owner.

B. Retesting: The Contractor is responsible for retesting where results of inspections, tests or other quality control services prove unsatisfactory and indicate non-compliance with contract document requirements, regardless of whether the original test was the Contractor's responsibility.

1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated non-compliance with contract document requirements.

C. Associated Services: Cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the work.

2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.

3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.

4. Provide facilities for storage and curing of test samples.

5. Deliver samples to testing laboratories.

6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.

7. Provide security and protection of samples and test equipment at the project site.

D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling and testing of materials and construction specified in individual sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.

2. The agency is not authorized to release, revoke, alter or enlarge requirements of the contract documents or approve or accept any portion of the work.

3. The agency shall not perform any duties of the Contractor.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities. The Contractor will also be responsible for standby charges from the Owner’s laboratory if they are due to a scheduling error by the Contractor.

1.4 SUBMITTALS

A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:

    a. Date of issue
    b. Project title and number
    c. Name, address and telephone number of testing agency
    d. Dates and locations of samples and tests or inspections
    e. Names of individuals making the inspection or test
    f. Designation of the work and test method
    g. Identification of product and specification section
    h. Complete inspection or test data
    i. Test results and an interpretation of test results
    j. Ambient conditions at the time of sample taking and testing
    k. Comments or professional opinion on whether inspected or tested work complies with the contract document requirements
    l. Name and signature of laboratory inspector
    m. Recommendations on retesting

1.5 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' *Recommended Requirements for Independent Laboratory Qualification* and that specialize in the types of inspections and tests to be performed.

    1. Each independent inspection and testing agency engaged on the project shall be authorized by AHJ to operate in the State of Nevada.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with the contract document requirements for Division 1 SECTION 01045 – CUTTING AND PATCHING

B. Protect construction exposed by or for quality control service activities and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01420 – REFERENCES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section includes abbreviations and acronyms, additional definitions, and reference standards used in the contract documents.

B. Refer to Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project for further information.

1.2 ABBREVIATIONS AND ACRONYMS

A. The following abbreviations and acronyms may be used in the contract documents. Refer uncertainties to the Architect for a decision before proceeding.

AA	Aluminium Association
AAADM	American Association of Automatic Door Manufacturers
AAMA	Architectural Aluminum Manufacturers' Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AFPA	American Forest and Paper Association
AIA	American Institute of Architects
AIMA	Acoustical and Insulation Materials Association
AISC	American Institute of Steel Construction
AMCA	American Movement and Control Association
ANSI	American National Standards Institute
APA	The Engineered Wood Association (formerly the American Plywood Association)
ARI	Air Conditioning and Refrigeration Institute
ASA	American Standards Association
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers' Association
AWWA	American Water Works Association
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers' Association
BIA	Brick Institute of America
CAL/OSHA	State of California Construction Safety Orders
CALTRANS	State of California, Business and Transportation Agency,

	Department of Transportation, *Standard Specifications*
CCR	California Code of Regulations
CDA	Copper Development Association
CISCA	Ceilings and Interior Systems Construction Association
CFFA	Chemical Fabrics and Film Association, Inc.
CFMG	Cabinet and Fixture Manufacturers Guild
CLFMI	Chain Link Fence Manufacturers' Institute
CPA	Composite Panel Association (formerly the National Particleboard Association)
CRI	Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CPSC	United States Consumer Products Safety Commission
CS	Commercial Standard, United States Department of Commerce
CSA	Canadian Standards Association
DASMA	Door and Access Systems Manufacturers Association International
EIMA	EIFS Industry Members Association
EPA	Environmental Protection Agency
ESO	Electrical Safety Orders
FAA	Federal Aviation Administration, United States Department of Transportation
FCC	Federal Communications Commission
FGMA	Flat Glass Marketing Association (now the GANA)
FM	Factory Mutual System, Factory Mutual Engineering Corporation
FS	Federal Specification Unit
GA	Gypsum Association
GANA	Glass Association of North America (formerly the Flat Glass Marketing Association and Glass Tempering Association)
GRI	Geosynthetic Research Institute
GTA	Glass Tempering Association (now the GANA)
HMA	Hardwood Manufacturers Association
HPMA	Hardwood Plywood Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
HUD	United States Department of Housing and Urban Development
IEEE	Institute of Electrical and Electronic Engineers
IGCC	Insulating Glass Certification Council
ITS-WH	Intertek Testing Service - Warnock Hersey
LSGA`	Laminator’s Safety Glass Association
MIA	Marble Institute of America or the Masonry Institute of America

MIL	Military Standardization Document, United States Department of Defense
MIW	Masonry Institute of Washington
ML/SFA	Metal Lath/Steel Framing Association
MM	“Materials Manual”, State of California, Business and Transportation Agency, Department of Transportation
NAAMM	National Association of Architectural Metal Manufacturers
NBGQA	National Building Granite Quarries Association, Inc.
NBS	National Bureau of Standards (now the NIST)
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electric Manufacturers' Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association (now the AFPA)
NFRC	National Fenestration Rating Council
NHLA	National Hardwood Lumber Association
NIST	National Institute of Standards and Technology, United States Department of Commerce (formerly the National Bureau of Standards)
NOFMA	National Oak Flooring Manufacturers Association
NPDES	National Pollutant Discharge Elimination System
NRCA	National Roofing Contractors Association
NSF	NSF International (formerly National Sanitary Foundation)
NTMA	National Terrazzo and Mosaic Association
NWWDA	National Wood Window and Door Association (now WDMA)
OSA	Office of the State Architect, State of California
OSHPD	Office of Statewide Health Planning and Development, State of California
PCI	Precast / Prestressed Concrete Institute
PS	Product Standard, United States Department of Commerce
RCW	Revised Code of Washington, State of Washington
RIS	Redwood Inspection Service
SDI	Steel Deck Institute or the Steel Door Institute
SFM	Office of State Fire Marshal, State of California
SIGMA	Sealed Insulated Glass Manufacturer’s Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Society for Protective Coatings (formerly the Steel Structures Painting Council)
SWI	Steel Window Institute
TCA	Tile Council of America

UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USPS	United States Postal Service
USS	United States Standard
WAC	Washington Administrative Code, State of Washington
WCLIB	West Coast Lumber Inspection Bureau
WDMA	Window and Door Manufacturers Association (formerly the National Wood Window and Door Association)
WIC	Woodwork Institute of California
WLPDIA	Western Lath Plaster /Drywall Industries Association (now the WWCCA)
WSDOT	Washington State Department of Transportation
WWCCA	Western Wall & Ceiling Contractors Association
WWPA	Woven Wire Products Association or Western Wood Products Association

B. Additional abbreviations, used only on the drawings, are listed and defined thereon.

USE SECTION 1.03 ONLY IF THESE DEFINITIONS ARE NOT INCLUDED IN THE GENERAL CONDITIONS FOR THE SPECIFIC CONTRACT.

1.03 ADDITIONAL DEFINITIONS

A. In addition to the terms defined in the General Conditions, the following terms are used in the contract documents and are defined as follows:

Accepted Equal	As accepted by the Architect as being of equivalent quality, utility and appearance.
Addenda	Written or graphic instruments issued by the Owner/Architect prior to the execution of the Contract which modify or interpret the bidding documents by additions, deletions, clarifications or corrections.
By Owner	Work on this project that will be performed by the Owner or its agents, at the Owner's cost.
By Others	Work on this project that is outside the Scope of Work to be performed by the Contractor under this Contract, but that will be performed by the Owner, other contractors or other means.
Consultant	A consultant to the Architect
Directed	Directed by the Architect

Furnish	Supply only; do not install
Indicated	As shown and/or noted on the drawings
Install	Install or apply only; do not furnish
Owner-Furnished, Contractor-Installed	The Owner will furnish at their cost and the Contractor shall install under their contract for this work.
Project Manual	The Project Manual consists of two volumes: Volume 1 includes the bidding and contract requirements and Specifications; and Volume 2 includes the details and schedules. One volume which includes the bidding and contract requirements and specifications and the details and schedules.
Provide	Furnish and install
Site	Geographical location of the project
Specified	As written in the specifications

1.4 REFERENCE STANDARDS

A. Specified standards of the construction industry shall have the same force and effect on the performance of the work as if bound or copied directly into the contract documents. Such standards are made a part of the contract documents by reference.

B. Each entity or person engaged in the work shall be familiar with the industry standards applicable to its construction activity.

C. Where compliance with two (2) or more standards is specified and the standards establish different or conflicting requirements for minimum qualities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the Architect for a decision before proceeding.

D. Copies of applicable standards are not bound with the contract documents. Where copies are required for proper performance of the work, obtain and pay for authorized copies directly from publication source and maintain at the site during submittals, planning and performance of work until final acceptance by the Owner. Make such copies of standards available to the Owner and Architect for review upon request.

E. For products or quality of installation specified by association, trade, military, federal or other reference standards, comply with requirements of the standard, except when more rigid requirements are specified in the contract documents or are required by applicable codes and/or public Authorities Having Jurisdiction (AHJ).

1. Except as otherwise indicated or specified, where compliance with a reference standard is required, comply with the standard in effect as of the

date established for the receipt of bids. Where a reference standard has been revised and reissued after the date established for the receipt of bids and before performance of the work affected, notify the Architect in writing and request a decision on how to proceed. The Architect may issue a contract modification or an Architect's Supplemental Instruction (ASI) for proceeding in accordance with the updated standard.

2. The contractual relationship of the parties to the Contract shall not be altered from the contract documents by mention or inference otherwise in a reference standard. The provisions of the bidding requirements; contract documents including, but not limited to all issued addendums; and the Contract shall void the general, but not technical, provisions of a reference standard in conflict therewith.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01420

SECTION 01600 – MATERIALS AND EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements governing the Contractor's selection of products for use in the project.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 1 SECTION 01420 - REFERENCES specifies the applicability of industry standards to products specified.

2. Division 1 SECTION 01300 – SUBMITTALS specifies requirements for submittal of the Contractor's construction schedule and the submittal schedule.

3. Division 1 SECTION 01631 – SUBSTITUTIONS specifies administrative procedures for handling requests for substitutions made after award of the contract.

1.3 DEFINITIONS

A. Definitions used in this section are not intended to change the meaning of other terms used in the contract documents such as *Specialties, Systems, Structure, Finishes, Accessories* and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.

1. *Products* are items purchased for incorporation in the work, whether purchased for the project or taken from previously purchased stock. The term *Product* includes the terms *Material, Equipment, System* and terms of similar intent.

a. *Named Products* are items identified by the Manufacturer's product name, including make and model number or other designation, shown or listed in the Manufacturer's published product literature that is current as of the date of the contract documents.

b. *Foreign Products* as distinguished from domestic products are items substantially manufactured fifty percent [(50%) or more of value] outside the United States and its possessions. Products produced or supplied by entities substantially owned [more than fifty percent (50%)] by persons who are not citizens of, nor living within, the United States and its possessions.

2. *Materials* are products substantially shaped, cut worked, mixed, finished, refined or otherwise fabricated, processed or installed to form a part of the work.

3. *Equipment* is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

A. Product List: A list of products required is included at the end of this section. Prepare a schedule in tabular form showing each product listed. Include the Manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's construction schedule and the schedule of submittals.

2. Form: Prepare product list with information on each item tabulated under the following column headings:

   a. Related Specification Section Number
   b. Generic name used in the contract documents
   c. Proprietary Name, Model Number and similar designations
   d. Manufacturer's Name and Address
   e. Supplier's Name and Address
   f. Installer's Name and Address
   g. Projected Delivery Date or time span of delivery period

3. Initial Submittal: Within thirty (30) days after date of commencement of the work, submit three (3) copies of an initial product list. Provide a written explanation for omissions of data and for known variations from the contract requirements.

   a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the contract period.

4. Completed List: Within sixty (60) days after date of commencement of work, submit three (3) copies of the completed product list. Provide a written explanation for omissions of data and for known variations from the contract requirements.

5. Architect's Action: The Architect will respond in writing to Contractor within two (2) weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with the contract documents. The Architect's response will include a list of unacceptable product selections containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability or compatibility. When a determination has been made select products from sources producing products that possess these qualities to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two (2) or more products for use on the project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each Prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contactors.

2. If a dispute arises between Prime Contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the work:

1. No available domestic product complies with the contract documents.

2. Domestic products that comply with the contract documents are available only at prices or terms substantially higher than foreign products that comply with the contract documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturers or producer’s nameplate or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces, or where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service connected or power operated equipment. Locate on an easily accessible

surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

a. Name of Product and Manufacturer
b. Model and Serial Number
c. Capacity
d. Speed
e. Ratings

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products according to the Manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged or sensitive to deterioration, theft and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

4. Inspect products upon delivery to ensure compliance with the contract documents and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 – PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the contract documents that are undamaged and, unless otherwise indicated, new at the time of installation.

   1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.

   2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The contract documents and governing regulations govern product selection. Procedures governing product selection include the following:

   1. Proprietary Specification Requirements: Where specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.

   2. Semi Proprietary Specification Requirements: Where specifications name two (2) or more products or manufacturers, provide one (1) of the products indicated. No substitutions will be permitted.

      a. Where specifications specify products or manufactures by name, accompanied by the term “or equal” or “or approved equal.” Comply with the contract document provisions concerning *Substitutions* to obtain approval for use of an unnamed product.

   3. Non-Proprietary Specifications: When specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with contract requirements. Comply with contract document provisions concerning *Substitutions* to obtain approval for use of an unnamed product.

   4. Descriptive Specification Requirements: Where specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with contract requirements.

   5. Performance Specification Requirements: Where specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.

a. Manufacturer's recommendations may be contained in published product literature or by the Manufacturer's Certification of Performance.

6. Compliance with Standards, Codes, and Regulations: Where specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

7. Visual Matching: Where specifications require matching an established sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

   a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the contract documents concerning *Substitutions* for selection of a matching product in another product category.

8. Visual Selection: Where specified product requirements include the phrase "…as selected from Manufacturer's standard colors, patterns, textures…" or a similar phrase, select a product and Manufacturer that comply with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

9. Allowances: Refer to individual specification sections and *Allowance* provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

PART 3 – EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with Manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work.

   1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01600

SECTION 01631 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall 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 01420 - REFERENCES specifies the applicability of industry standards to products specified.

2. Division 1 SECTION 01300 - 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 Architect.

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 SUBMITTALS

A. Substitution Request Submittal: The Architect will consider requests for substitution if received within sixty (60) days after commencement of the work. Requests received more than sixty (60) days after commencement of the work may be considered or rejected at the discretion of the Architect.

1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals and include the Product Evaluation Questionaire (CP-F116) found within these bid documents.

2. Identify the product or the fabrication or 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 the 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.

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. Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one (1) week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within three (3) weeks of receipt of the request, or two (2) weeks 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 Architect cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect 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 within the Contract Time. The Architect 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 Architect 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.

B. The Contractor's submittal and the Architect'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.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01631

PRODUCT EVALUATION QUESTIONNAIRE

When proposing to substitute products for those specified or proposing a product to meet a specified performance standard, please furnish the following information to assist the Owner and Architect in evaluating the proposed product.

Bid/Quote #: _____

Project: _____

Specification Section: _____

Division:_____

Article #: _____

Name of Product: _____

Manufacturer's Name and Address: _____

_____

1. Attach manufacturer's complete technical data and all information relating to limitations of the product information requiring further testing be deemed necessary by the Architect, the cost of the prescribed test shall be borne by the Contractor. Contractor shall send product samples upon request.

2. Attach a list of projects where comparable use has been made of this product. List the name and location of the project, name of Owner or Architect, Engineer, General Contractor, and Subcontractor (if applicable), and the year installed.

3. List any problems encountered with this product on projects where it has been used. What corrective measures were required?

4. Provide a detailed comparison of the proposed substitute product with that of the specified product. Differences are to be highlighted and called out.

5. Submit a detailed specification, conforming to the format of the technical specifications herein contained, tailored to this project for installation of this product.

6. Will the services of an expert field representative be furnished to supervise the installation of this product?

7. Describe maintenance requirements for this product and availability of expert repair service, if needed.

8. Will the proposed substitution result in a change in Contract price or time of completion? If so, submit itemization of price change and explain effect on time of completion.

9. Will the use of the proposed product necessitate a change in the contract drawings or specifications?

10. Will the use of this product necessitate the payment of any license fees or royalties?

11. Furnish information establishing financial responsibility of the manufacturer. (Number of years in business, volume of business, Dunn & Bradstreet rating, etc.)

12. The Contractor certifies that he or she understands the conditions of use to which this product will be put and he/she warrants this product as stipulated in the General Conditions.

_____
Name of Contractor

_____
Signature of Officer, Owner or Partner

_____
Date

SECTION 01650 - CONTRACTOR MOVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and supervisory requirements necessary for coordinating construction contractor moving requirements including, but not necessarily limited to, the following:

1. General Project Coordination Procedures

2. Conservation

3. Coordination Drawings

4. Administrative and Supervisory Personnel

5. Cleaning and Protection

B. Related Sections: The following sections contain requirements that relate to this section:

1. Division 1 SECTION 01200 – PROJECT MEETINGS for progress meetings and coordination meetings.

2. Division 1 SECTION 01300 - SUBMITTALS for preparing and submitting the Contractor's construction schedule.

1.3 OWNER RESPONSIBILITIES

A. The Owner shall complete all of the preparatory work required for the moving of furnishings, equipment, files, etc. as listed below:

1. Supply boxes, tape and box labels.

2. All personal property is the responsibility of WCSD.

3. All WCSD property that will fit in the WCSD provided boxes are to be boxed.
4. All file cabinets, desks, shelves and closets are to be emptied.

5. All loose trash shall be picked up and disposed of.

6. Inform school of time frames and schedules.

7. Coordinate staging area for temporary storage containers with site, as required.

8. All items will be ready to move based upon the Contractor's approved schedule.

1.4 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall be responsible for moving all furnishings, equipment, files, etc. as directed by the Owner and listed above and all of the items as listed:

1. Hire movers and manage all aspects of the move.

2. Supply all required moving tools, dollies, hand trucks, carts, etc.

3. Supply steel lockable temporary storage containers, if required.

4. Photograph the space prior to moving out.

5. Replace all items in space as indicated on photographs.

6. Repair or replace any WCSD owned property damaged by the Contractor.

7. Disconnect and reconnect, as needed, any computer, audio, copy and print equipment, etc.

1.5 COORDINATION

A. Coordinate the construction operations included in various sections of these specifications to assure efficient and orderly installation of each part of the work. Coordinate the construction operations included under different sections that depend on each other for proper installation, connection and operation.

1. Schedule construction operations in the 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 to assure maximum accessibility for required maintenance, service and repair.
3. Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination, include such items as required such as, notices, reports and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules

2. Installation and removal of temporary facilities

3. Delivery and processing of submittals

4. Progress meetings

5. Project closeout activities

D. Conservation: Coordinate moving operations to assure that operations are carried out with consideration given to conservation of energy, water and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the work.

E. Intent of Drawings:

1. The work of the Contractor and any applicable sub-contractors shall conform to the intent of the architectural and moving coordination work as reviewed by the Architect. Drawings are partly diagrammatic and do not intend to show in detail all features of the work. The Contractor shall carefully review the work to be performed by other trades, compare related drawings and shall thoroughly understand the moving responsibilities affecting their work.

2. All changes required in the work caused by failure to do so shall be at no expense to the Owner.

F. Moving Coordination Drawings:

1. Floor Plans and Wall Elevations shall include dimensioned sizes and locations for all door and window openings.

1.6 SUBMITTALS

A. Coordination Drawings: Prepare moving coordination drawings where careful coordination is needed for installation of products, materials and equipment to be relocated and stored.

1. Show the relationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences. Acknowledge the Contractor's responsibilities in written fashion.

3. Comply with requirements contained in Division 1 SECTION 01300 - SUBMITTALS.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the mover of each component to inspect the conditions under which the work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 CLEANING AND PROTECTION

A. Clean and protect material and equipment during handling and installation. Apply protective covering, where required, to assure protection from damage or deterioration at the time of Substantial Completion.

B. Clean and provide maintenance on moved and stored work as frequently as necessary through the remainder of the construction period.

C. Limiting Exposures: Supervise construction operations to assure that no part of the relocated work completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading

2. Excessive internal or external pressures

3. Excessively high or low temperatures
4. Thermal shock
5. Excessively high or low humidity
6. Air contamination or pollution
7. Water or ice
8. Solvents
9. Chemicals
10. Light
11. Radiation
12. Puncture
13. Abrasion
14. Heavy traffic
15. Soiling, staining and corrosion
16. Bacteria
17. Rodent and insect infestation
18. Combustion
19. Electrical current
20. High speed operation
21. Improper lubrication
22. Unusual wear or other misuse
23. Contact between incompatible materials
24. Destructive testing
25. Misalignment

26. Excessive weathering
27. Unprotected storage
28. Improper shipping or handling
29. Theft
30. Vandalism

END OF SECTION 01650

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all bid documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection Procedures
2. Submittal of Project Record Document
3. Submittal of Operation and Maintenance Manual
4. Submittal of Warranties
5. Final Cleaning
6. Submittal of Regulated Systems [ACBM (Asbestos Containing Building Materials) & Lead] Closeout Documents
7. Submittal of any Final Prevailing Wage Reports

B. Closeout requirements for specific construction activities are included in the appropriate sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show one hundred percent (100%) completion for the portion of the work claimed as substantially complete.

    a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the contract sum.

    b. If one hundred percent (100%) completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.

c. Provide a list of all warranties, provide warranty duration, complete contract information of firm, and name of individual who will be performing work – post one (1) year. extended warranties will be submitted on a separate spread sheet within the closeout documents in the following format. Specification #, Company responsible for performing the warranty work, Local contact for responsible individual, phone number and email address, warranty description, warranty period, warranty start and end dates.

2. Advise the Owner of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities.

5. Include occupancy permits, operating certificates, and similar releases.

6. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.

7. Submit all required training meeting minutes and video recordings of all training courses.

8. Deliver tools, spare parts, extra stock, and similar items.

9. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.

10. Complete startup testing of systems and videoed training instruction of/for the Owner's Operation and Maintenance personnel.

11. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.

12. Complete final clean-up requirements, including touch up painting.

13. Touch-up and otherwise repair and restore marred, exposed finishes.

14. Provide Contractor furnished fixtures, furnishings, and equipment individually valued over $5,000 including description, manufacturer model and serial number, location at site, and specific value for equipment.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect will repeat inspection when requested and assured that the work is substantially complete.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

3. The cost for any Architectural services for reinspection is the Contractor's sole responsibility.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the WCSD's, Architect's & Engineer's final inspection lists of items to be completed or corrected, endorsed, and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.

4. Submit consent of surety to final payment.

5. Submit a final liquidated damages settlement statement.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

7. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the work.

B. Reinspection Procedure: The Architect will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a Certificate of Final Acceptance. If the work is incomplete, the Architect will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set black line white prints of Contract Drawings and Shop Drawings or continuous live electronic as built drawings with appropriate mark ups. Mark the set to show the actual installation where the installation varies from the work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. At the conclusion of the project, this record set of prints shall be submitted to the Architect for his/her review and comment. If the record set of prints is found to be complete and accurate, the prints shall be returned to the Contractor for submittal to the Owner with other closeout documents.

Record drawings must be reviewed and approved prior to each pay request by the Owner’s representative. The drawings should reflect the work that has been accomplished during the time period of the pay request. Lack of record drawings approval at the time of submittal of a pay request will result in a potential delay in the processing of the pay request.

1. Mark record sets with red erasable pencil or electronic. Use other colors to distinguish between variations in separate categories of work.

2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related change order numbers where applicable.

4. Organize record drawing sheets into manageable sets.

5. Provide one Bound set of record drawings with durable paper cover sheets; print suitable titles, dates and other identification on the cover of each set.

6. . Provide record drawings using electronic media, including one PDF and one Auto Cad compatible. Original media will be provided for Contractor to make required record drawing notations.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual, one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

Record specifications must be reviewed and approved prior to each pay request by the Owner's representative. The specifications should reflect the work that has been accomplished during the time period of the pay request. Lack of record specification approval at the time of submittal of a pay request will result in a potential delay in the processing of the pay request.

1. Mark these documents to show substantial variations in actual work performed in comparison with the text of the specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and product data.

4. Upon completion of the work, submit an electronic record specifications to the Architect for the Owner's records.

D. Record Product Data: Maintain one (1) copy of each Product Data submittal. Note related Change Orders and markup of record drawings and specifications.

1. Mark these documents to show significant variations in actual work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the work that cannot otherwise be readily discerned later by direct observation.

3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.

E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the project site to determine which samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's sample storage area.

F. Miscellaneous Record Submittals: Refer to other specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or electronic file, ready for continued use and reference. Submit to the Architect for the Owner's records.

G. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind 2 copies (1 hard copy / 1 electronic) properly indexed data in individual, heavy duty, 2-inch, 3-ring, vinyl covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions
2. Spare parts list
3. Copies of warranties
4. Wiring diagrams
5. Recommended turn around cycles
6. Inspection procedures
7. Shop Drawings and Product Data
8. Fixture lamping schedule
9. Any other applicable information

H. Warranty Manuals: organize warranty data into suitable set of manageable size, Bind 1 copy and 1 electronic properly indexed in individual, heavy duty 3 ring binder. Mark appropriate identification on front and spine. Include the following types of information:

1. All products with extended warranties beyond 1 year, including duration (start and end date, similar to what is described in 1.3, A, 1,c)
2. Manufacturer

3. Model / Serial where applicable

4. Manufacturer contact information

I. Provide one complete download of all Procore Files properly organized and linked in PDF versions. Contractor to ensure original Procore file and documentation remains in place on Procore for use by owner. Owner shall instruct the contractor of the proper file structure

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Film Document each training and demonstration. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools
5. Lubricants
6. Fuels
7. Identification systems
8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up
2. Shut down
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments
7. Effective energy utilization

END OF SECTION 01700

SECTION 01710 - FINAL CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including all contract documents and addendums associated with this project shall apply to this section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for final cleaning at Substantial Completion.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 1 SECTION 01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS specifies general cleanup and waste removal requirements.

2. Division 1 SECTION 1700 – CONTRACT CLOSEOUT specifies general contract closeout requirements.

3. Special cleaning requirements for specific construction elements are included in appropriate sections of Divisions 2 through 16.

C. Multiple Prime Contracts: Each Prime Contractor is responsible for final cleaning their own work. The Contractor for General Construction is responsible for coordinating final cleaning of an area or piece of equipment where more than one (1) Prime Contractor is involved.

D. Environmental Requirements: Conduct cleaning and waste disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.

1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the 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 operations to all work spaces and any adjacent spaces affected by the work performed. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign substances.

2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3. Remove petrochemical spills, stains, and other foreign deposits.

4. Remove tools, construction equipment, machinery, and surplus material from the site.

5. Remove snow and ice to provide safe access to the building.

6. 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. Wax any required flooring to the District standard.

7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

8. Broom clean concrete floors in unoccupied spaces.

9. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo, if required.

10. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

11. Remove labels that are not permanent labels.

12. 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.

    a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

14. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

16. Clean ducts, blowers, and coils if units were operated without filters during construction.

17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.

18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.

19. Leave the Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities. This section is only applicable for a new facility or an addition to an existing facility.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Compliances: Comply with regulations of Authorities Having Jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01710

WCSD BILLINGHURST MS
HEAT PUMP
REPLACEMENT- PHASE 1

Ainsworth Associate Mechanical Engineers

Project No. 2024-050

Specifications

100% CD Set Submittal

April 1, 2025

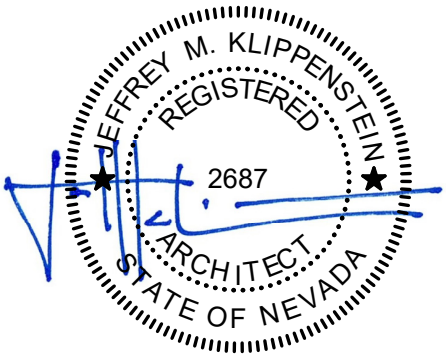
AINSWORTH ASSOCIATES
MECHANICAL ENGINEERS

Washoe County School District

BILLINGHURST MIDDLE SCHOOL HEAT PUMP REPLACEMENT

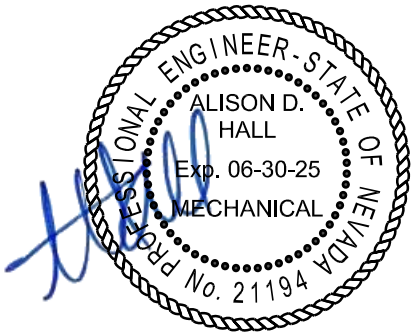
PHASE 1

April 1, 2025
AAME #2024-050



4.1.2025

H+K Architects
Architect
(Division 07, Division 08, Division 09)



04/01/2025

Ainsworth Associates Mechanical Engineers
Mechanical Engineer
(Division 21, Division 23)

TABLE OF CONTENTS

DIVISION 7	ROOFING, WATERPROOFING, AND INSULATION
07 54 19	POLYVINYL-CHLORIDE (PVC) ROOFING
DIVISION 8	WINDOWS AND DOORS
08 31 13	ACCESS DOORS AND FRAMES
DIVISION 9	FINISHES
09 91 23	INTERIOR PAINTING
DIVISION 21	FIRE PROTECTION
21 00 00	FIRE SUPPRESSION SYSTEMS
21 05 30	HANGERS AND SUPPORTS FOR FIRE SUPPRESSION SYSTEMS
21 05 40	SEISMIC BRACING FOR FIRE SUPPRESSION SYSTEMS
DIVISION 23	MECHANICAL
23 00 00	HEATING, VENTILATING, AND AIR CONDITIONING
23 05 00	BASIC MATERIALS AND METHODS FOR HVAC SYSTEMS
23 05 10	VALVES FOR HVAC SYSTEMS
23 05 20	OPERATION AND MAINTENANCE OF HVAC SYSTEMS
23 05 30	HANGERS AND SUPPORTS FOR HVAC SYSTEMS
23 05 40	SEISMIC BRACING FOR HVAC SYSTEMS
23 05 50	VIBRATION ISOLATOR FOR HVAC SYSTEMS
23 07 00	HVAC SYSTEMS INSULATION
23 08 00	TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS
23 08 10	HVAC SYSTEMS COMMISSIONING
23 09 00	TEMPERATURE CONTROLS
23 09 10	SEQUENCE OF OPERATION
23 21 00	HYDRONIC PIPING AND ACCESSORIES
23 31 00	HVAC DUCTWORK
23 31 10	HVAC DUCTWORK ACCESSORIES
23 35 00	AIR FILTERS
23 75 00	WATER SOURCE HEAT PUMPS (6 TONS AND BELOW)
23 75 10	WATER SOURCE HEAT PUMPS (7 TONS AND BELOW)
23 81 10	MAKE-UP AIR UNITS (EVAPORATIVE COOLING – GAS HEAT)

SECTION 07 54 19 - POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Adhered polyvinyl-chloride (PVC) roofing system.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 INSTALLATION MEETINGS

A. Finished Roof Inspection: Upon completion of all specified roofing items, a finished roof inspection shall be performed with the following in attendance: roofing contractor, roofing manufacturer’s technical representative, architect, owner’s representative, and any applicable subcontractors. Any discrepancies or incomplete work shall be documented in a list of corrective actions which will be issued to the contractor. A finished roof inspection is required at the completion of the roofing membrane installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is FM Global approved for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Existing roof is still under warranty through Sika Sarnafil. All roof work shall be inspected by manufacturer to ensure that existing warranty will be maintained at the completion of work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain components including roof insulation for roofing system from manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:

Corner Uplift Pressure: 122 psf (ACSE 7-16 Figure 30.4-1, Zone 3)

Perimeter Uplift Pressure: 90 psf (ACSE 7-16 Figure 30.4-1, Zone2)

Field-of-Roof Uplift Pressure: 68 psf (ACSE 7-16 Figure 30.4-1, Zone 1)

Based upon an Ultimate Design Wind Speed of 130 mph.

D. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a single-ply roofing system and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
   1. Fire/Windstorm Classification: Class 1A-90.
   2. Hail-Resistance Rating: MH.

2.3 PVC ROOFING

A. PVC Sheet: ASTM D 4434/D 4434M, Type III, fabric reinforced, and fabric backed.
   1. Thickness: 60 mils, nominal.
   2. Exposed Face Color: White.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Sarnafil G-410 Feltback or comparable product in accordance with Division 1 Section “Product Requirements”.

2.4 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer's standard flashing sheet (of same material, type, reinforcement, thickness, and color as PVC sheet).

C. Bonding Adhesive: Manufacturer's standard, water based. Suitable for both horizontal and vertical surfaces. Follow manufacturer’s instructions for direction and height limitations.

D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

E. Reglet and Flashing: 24-gauge galvanized steel reglet and spring-action flashing.
   1. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet (3.6 m) designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:
      a. Zinc-Coated Steel: Nominal 0.028-inch (0.71-mm) thickness.

F. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.

G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 VAPOR RETARDER

A. Self-Adhering-Sheet Vapor Retarder: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 10-mil-total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer. Product shall be acceptable to the roofing system manufacturer.

1. Basis-of-Design Product: Subject to compliance requirements, provide Vapor Retarder SA 31, by SIKA Sarnafil or equal.

2.6 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by PVC roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses required to achieve a minimum R30 R-value.

B. Polyisocyanurate Board Insulation: ASTM C 1289 Type II, Class 1, Grade 2, fiber reinforced felt facers on both major surfaces. of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 25 and less than 450, respectively, per ASTM E 84.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Sarnafil, Sarnatherm – 20 psi, Roof Insulation or a comparable product that may be incorporated into the Work including, but not limited to, the following:
   a. ENERGY 3 by Johns Mansville Roofing Systems Group
   b. Insulbase by Carlisle SynTecSystems
   c. Elevate Building Products.
2. Long-Term Thermal Resistance: R-23.6 at 4”.
3. Compressive Resistance ASTM C1621: 20 psi min.
4. Tensile Strength ASTM D1623: 730 psi.
5. Water Absorption ASTM C209, % by volume, max: <1.0.
6. Moisture Vapor Permeance ASTM E96: <1 perms.
7. Dimensional Stability Change (length & width) ASTM D2126: <2% linear.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.6 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

B. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
   1. Length: Fastener length shall not exceed depth of structural steel deck.

C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
   1. Full-spread spray-applied, low-rise, two-component urethane adhesive.

D. Cover Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. CertainTeed Corporation; GlasRoc Sheathing.
      b. Georgia-Pacific Building Products; Dens Deck.
      c. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.
      d. United States Gypsum Company; Securock Glass Mat Roof Board.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
   1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
   2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of each workday. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install roofing and auxiliary materials to tie into existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

3.4 VAPOR-RETARDER INSTALLATION

A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 4 inches and 6 inches, respectively with butyl tape. Seal laps by rolling.

B. Extend vapor retarder up perimeter walls and curbs to the future height up the roofing insulation.

C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.5 INSULATION INSTALLATION

A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

E. Mechanically Fastened and Adhered Insulation: Install each layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Loose-lay first and mechanically attach the second layer of insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
   2. Set each subsequent layer of insulation in a uniform coverage of bead-applied or full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

F. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together.

3.6 ADHERED ROOFING INSTALLATION

A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.

   1. Install sheet according to ASTM D 5036.

B. Accurately align roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Bonding Adhesive: Apply to substrate and/or (as recommended by adhesive manufacturer) underside of roofing at rate required by manufacturer. Immediately roll the membrane into the adhesive while the adhesive is wet. Do not apply to splice area of roofing.

D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing as required by manufacturer.

E. Apply roofing with side laps shingled with slope of roof deck where possible.

F. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant as required to seal cut edges of sheet.
   2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
   3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

3.7 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars. Provide sealant behind the top edge of the flashing.

3.8 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

C. The installed PVC membrane shall be visually free of pinholes, particles of foreign matter, undispersed raw material, protruding fibers or reinforcement. Sheets shall be free of nicks, cuts, scratches, abrasions, voids, and any other defects upon completion of the Work.

3.9 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 19

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Access doors and frames.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details material descriptions, dimensions of individual components and profiles, and finishes.

PART 2 - PRODUCTS

2.1 FIRE-RATED ACCESS DOORS AND FRAMES

A. Fire-Rated Access Doors with Exposed Flanges:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include:
      a. Best Access Doors
      b. J. L. Industries, Inc.; Activar Construction Products Group, Inc.
      c. Larsen's Manufacturing Company.
      d. Or equal.
   2. Description: Face of door flush with frame, with a core of mineral-fiber insulation enclosed in sheet metal; with exposed flange, self-closing door, and continuous piano hinge.
   3. Locations: Wall.
   4. Door Size: 3-foot by 3-foot to fit in existing opening.
   5. Fire Resistance Rating: Not less than 20 minutes.
   6. Material: 16 gauge cold rolled steel frame with 20 gauge galvanneal steel door.
   7. Latch and Lock: Self latching ring key operated slam latch.
   8. Finish: White powder coat primer for field painting.

2.2 MATERIALS

A. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
    1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:
   1. Steel.
   2. Gypsum board.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. MPI Standards:
   1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
   2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with Washoe County School District standard requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Glidden
   2. Sherwin-Williams

3. PPG

2.2 PAINT, GENERAL

A. Material Compatibility:
   1. Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
B. Colors: To match Washoe County School District Standard Colors.
C. **All products shall be "0 (Zero) Lead", utilizing the lead safe work practices identified in the EPA Guidance Document titled "Steps to Lead Safe Renovation, Repair and Painting", pages 12 thru 23. This document is available electronically by contacting the WCSD RS&A Department at 775-851-5675.**

PART 3 - EXECUTION

3.1 EXAMINATION

A. Architecturally exposed structural steel shall be protected from spills, splatter and drips during construction.
B. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
C. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Gypsum Board: 12 percent.
D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
E. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
   1. In addition, all work will be completed, as a minimum, utilizing the lead safe work practices identified in the EPA Guidance Document titled "Steps to Lead Safe Renovation, Repair and Painting", pages 12 thru 23. This document is available electronically by contacting the WCSD RS&A Department at 775-851-5675.
B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
   2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Steel Substrates: Finishes on exposed steel members shall result in an Architecturally acceptable finish.

1. Before applying finish coat:
    a. Remove rust and loose mill scale.
    b. Remove any drips, runs, sags, wrinkling or webbing from the primer coat.
    c. Remove drips, and splatter from work above.
    d. Clean using methods recommended in writing by paint manufacturer.
    e. Re-prime as necessary.

E. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. Steel Substrates: All steel substrates exposed to view including hollow metal door frames, stair railings, structural steel columns, structural steel beams, joists, metal decking, electrical conduits, plumbing piping, mechanical ductwork, etc.

1. Alkyd System: MPI INT 5.1E.

a. Bottom Coat: Glidden Professional; Alkyd Semi-Gloss Paint; GP-1507
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Glidden Professional; Alkyd Semi-Gloss Paint; GP-1507

B. Gypsum Board & Plywood Substrates:
1. Latex System: MPI INT 9.2A.
a. Prime Coat: Glidden Professional; PVA Drywall Interior Primer and Sealer, GPD-0000
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Glidden Professional; Diamond 450 Interior Premium Acrylic Satin; GP-7400

END OF SECTION

SECTION 21 00 00 - FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. The Conditions of the Contract (General, Supplementary, and other Conditions) are hereby made a part of this Section.

B. This section lists general requirements for fire suppression systems work and is hereby made a part of each Division 21 specification section.

C. For convenience or reference the Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the Owner for a complete project.

D. Wherever the word ‘provide’ is utilized with regard to materials or equipment on the drawings or in the specifications it shall be interpreted to mean ‘furnish and install’.

1.2 WORK INCLUDED

A. Furnish all labor, materials, tools, and equipment necessary to complete the automatic fire sprinkler system as hereinafter described, ready for service, to the entire satisfaction of the Architect/Engineer.

B. In the event of an inconsistency between or within the plans, specifications, any of the contract documents, codes, or regulations, the better quality, higher cost, and/or greater quantity of materials and work shall be provided at no additional cost to the Owner

C. Areas requiring freeze protection shall be served by dry pipe systems as indicated on the drawings. Air compressor horsepower requirements shall be determined by the Contractor and coordinated with other trades as appropriate.

D. Provide hydraulically calculated systems for light and ordinary hazard occupancy as noted in NFPA 13.

1. Provide calculations based on a minimum 10% safety factor.
2. At the Contractor's option, the sprinkler system may be designed based on the pipe schedule requirements listed in NFPA 13.

E. Determine the static and residual pressure for the site as required for accurate determination of system requirements. Base system calculations on the lowest expected static and residual pressure for the area.

F. It is the intent of these specifications and the drawings to provide for a complete and operating automatic fire protection sprinkler system in full compliance with the standards of the National Fire Protection Association as set forth in NFPA Pamphlet No. 13. The work must also be in accordance with all local or state requirements which apply.

G. Provide fire sprinklers to protect all building overhangs greater than 4 feet wide, or as required by the local authority.

1.3 COORDINATION

A. Coordinate work of this section with that of other sections to ensure that work will be carried out in an orderly fashion without conflicts with other trades.

B. Coordinate all fire sprinkler piping locations with other trades. Coordinate fire sprinkler piping routing with all equipment, hydronic and plumbing piping, ductwork, air distribution, conduit, cable trays, light fixtures, electrical outlets, structural, skylights, and architectural features.

1.4 QUALITY ASSURANCE

A. Firms regularly engaged in manufacture of fire protection products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Requirements of Regulatory Agencies:

1. NFPA Compliance: Install fire protection systems in accordance with the following standards: NFPA 13 (Standard for the Installation of Sprinkler Systems) and NFPA 24 (Private Fire Service Mains).
2. UL Compliance: Provide fire protection products in accordance with UL standards; provide UL label on each product.
3. All piping used in the project shall be both UL listed and FM approved.
4. Fire Department/Fire Marshal Compliance: Install fire protection systems in accordance with the regulations of the local fire department and of the State Fire Marshal.

C. The automatic sprinkler system shall conform in every regard to the requirements of the International Building Code.

D. Installation of the sprinkler system shall not be started until complete plans and specifications (including water supply information and type of existing sprinkler system) have been reviewed by the authority having jurisdiction.

E. The fire suppression sprinkler system shall be installed by a licensed fire systems contractor, licensed by the State Fire Marshal’s Office. Plans for such systems shall be submitted to the State Fire Marshal's office for review and approval prior to commencing installation.

1.5 SUBMITTALS

A. Reflected Ceiling Plans: Provide drawings showing location of all sprinkler heads throughout the building or project area and their relationship to all other materials forming part of the ceiling system. No fire sprinkler piping shall be shown on these drawings. Submit drawings to the Architect/Engineer prior to any other work. The Contractor shall make allowance in his bid for preparation and submittal of sprinkler location drawings in all areas. Prepare these drawings prior to the preparation of the engineered drawings required herein. Superimpose the fire sparkler layout drawings upon the reflected ceiling plans including showing ceiling outlines, light fixtures, air inlets and outlets, and tile pattern where applicable.

B. Adjustments by the Architect/Engineer of the proposed sprinkler head locations are to be anticipated by the Contractor and shall be allowed for in the Contractor’s bid. No extra compensation will be allowed for spacing of sprinklers closer than the maximum area of coverage allowed by NFPA 13 where it is necessary to suit the ceiling modules and lighting layout.

C. Drawings: Prepare and submit drawings to the Architect/Engineer for review. Drawings shall include product data for fire protection systems indicating pipe sizes, pipe locations, fittings, shutoffs, equipment, etc. and shall be stamped by a licensed Fire Protection Engineer. Submit reviewed copies to the agency having jurisdiction, and obtain as set of drawings that is stamped with their approval before proceeding with the installation.

D. Calculations: Prepare hydraulic calculations for each fire protection system. Submit reviewed copies to the Architect/Engineer for review bearing the stamp and/or signature of the agency having jurisdiction, before proceeding with installation.

E. Product Data: Submit manufacturer's technical product data for fire protection materials and products as part of submittal to the Architect/Engineer.

F. As-Built Drawings: Any and all adjustments to the fire sprinkler system layout shall be identified on a set of plans at the job site as work progresses.

G. Record Drawings: At project closeout, submit record drawings of the installed fire protection system piping and products in accordance with all associated requirements.

H. Certificate of Installation: Submit a certificate upon completion of fire protection piping work which indicates that work has been tested in accordance with NFPA 13 and that the system is operational, complete, and has no defects.

I. Operation and Maintenance Data: Submit operation and maintenance data and parts lists for all fire protection materials and products. Include the operation and maintenance data, product data, drawings, calculations, certificate of installation, and record drawings in the operation and maintenance manual in accordance with all associated requirements.

PART 2 - MATERIALS

2.1 GENERAL

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure rating, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Contractor to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in fire protection systems. Where more than one type of materials or product is indicated, selection is the Contractor's option.

B. Equipment to be furnished under this specification shall be essentially standard product of manufacturer. Where two or more units of same class of equipment are required, these units shall be products of a single manufacturer. Component parts of the system need not be products of the same manufacturer.

2.2 BASIC IDENTIFICATION

A. Provide identification complying with Specification Section 230500 (Basic Materials and Methods for HVAC) in accordance with the following listing:

1. Fire Protection Valves: Brass valve tags.
2. Fire Protection Signs: Provide the following signs:
   a. At each sprinkler valve, including roof manifold, sign indicating what portion of system valve controls.
   b. At each outside alarm device, sign indicating what authority to call if device is activated.

2.3 BASIC PIPING AND PIPE FITTINGS

A. General: Provide piping and pipe fittings complying with Specification Section 230500 (Basic Materials and Methods for HVAC), Section 232100 (Hydronic Piping and Accessories), and in accordance with the following listing:

B. Pipe

1. Below ground piping shall be ductile iron, complying with Federal Specification WW-P-421D.
2. At the Contractor's option, piping more than 2 feet from the building may be Polyvinyl Chloride (PVC) water pipe, Class 200, DR14, cast iron or ductile iron fittings, with Ring-Tite joints. Pipe shall be listed under AWWA C900.
3. Above ground piping shall be Schedule 40 black steel pipe, in accordance with ASTM A135 and A53. At the Contractor's option, above ground piping may be Schedule 10 black steel, in accordance with ASTM A135.

C. Pipe Fittings

1. Below ground fittings shall be Ames series IBR in building riser, one piece 90 degree fitting fabricated of 304 stainless steel tubing. For use with cast iron pipe, American Water Works Association Standard Specification C100, Class D, 150 pounds; or listed as approved by Underwriters' Laboratories, Inc., list of Inspected Fire Protection Equipment and Materials or approved by any other appropriate, nationally recognized testing laboratory for use in sprinkler system.
2. Above ground fittings shall be Federal Specification WW-P-501, Type I, Class A piping.

2.4 HANGERS AND SUPPORTS FOR FIRE SUPPRESSION SYSTEMS

A. See Specification Section 210530 (Hangers and Supports for Fire Suppression Systems).

2.5 SEISMIC BRACING FOR FIRE SUPPRESSION SYSTEMS

A. See Specification Section 210540 (Seismic Bracing for Fire Suppression Systems).

2.6 BASIC PIPING SPECIALTIES

A. Provide piping specialties complying with Section 220500 (Basic Materials and Methods for Plumbing) and in accordance with the following listing:

Pipe Escutcheons
Dielectric Unions
Pipe Sleeves
Sleeve Seals

2.7 FLEXIBLE CONNECTIONS

A. At the contractor’s option, flexible braided hose connections may be utilized for connection to fire sprinkler heads. Flexible connections shall be installed in strict accordance with the product listing and with the manufacturer’s installation instructions. Flexible connections shall be Tyco Fastflex Model FB, or approved equal.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering valves which may be incorporated in the work include the following, or approved equal:

Tyco Fastflex
Viking Flexhead
Victaulic VicFlex

2.8 BASIC SUPPORTS AND ANCHORS

A. Provide supports and anchors complying with Section 210530 (Hangers and Supports for Fire Suppression Systems) and in compliance with NFPA 13.

2.9 BASIC VALVES

A. Provide valves complying with Section 220500 (Basic Materials and Methods for Plumbing) and in accordance with the following listing:

1. Interior Valves
   a. Sectional: Gate valves or butterfly valves, UL listed.
   b. Check: Swing check valves, UL listed.

2.10 SPECIALTY VALVES

A. Provide UL listed valves in accordance with the following listing. Provide sizes and types which mate and match piping and equipment connections.
   1. Alarm Check Valve: Provide cast iron water flow alarm check valve, 175 psi working pressure.
   2. Hose Outlet Valves: Provide angle hose valves, 2-1/2 inch size where not otherwise indicated. Hose threads shall match the requirements of the local authority having jurisdiction. Provide bronze cap and chain at each valve location.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering valves which may be incorporated in the work include the following, or approved equal:

   Tyco Fire Products
   Potter Roemer
   Guardian Fire Equipment
   Stockham Valves and Fittings

2.11 BASIC METERS AND GAUGES

A. Provide meters and Specification Section 230500 (Basic Materials and Methods for HVAC). Pressure gauges shall be 0-250 psi range.

2.12 DOUBLE CHECK VALVE BACKFLOW PREVENTERS

A. Provide double check valve assembly consisting of two spring loaded brass check valves, two cast iron bronze fitted OS&Y gate valves and four test cocks, Febco Model LF856, or approved equal. Construct in accordance with AWWA Standard C510.
   1. Provide meter assembly and piping required to allow the unit to be used as a double detector check valve assembly.
   2. Backflow preventer shall be located inside the building. See drawings for location.

2.13 FIRE PROTECTION SPECIALTIES

A. Provide UL listed fire protection specialties in accordance with the following listing. Provide sizes and types which match piping and equipment connections.
   1. Install drains on main risers and auxiliary drains at all low points in the system.
   2. One inspector's test drain shall be installed for each sprinkler system.
   3. Drains and inspector's tests shall be at locations approved by the Architect.
   4. Provide drain line to floor sink or to outside, as required, to suit Project conditions.
   5. Five or fewer trapped heads will not require a drain valve but may be drained through a plugged fitting.
   6. Drain valves shall be of the angle type. Install in accordance with NFPA 13.
   7. Pipe drain valves to a floor sink or to the outside of the building. Discharge shall be visible from sight drain fitting or open-end drain pipe. Provide flushing connections at ends of all cross mains.

B. Flow Alarm: Furnish and install a flow alarm system for each main sprinkler riser as shown on the drawings. The systems shall be complete with an Anvil VSR-F, or equal, flow switch, a UL approved 10 inch bell and a marked switch box with lock and wiring. The Contractor shall be responsible for wiring between switch, bell, and junction box. Provide junction box under Division 26. Wiring shall meet the requirements of Division 26.

C. All controls shall be identified by permanent metal tags or other approved means. Alarm switch shall be UL or FM approved and shall have adjustable retard mechanism and two sets of contacts. Wiring between electrical distribution panel and junction box will be provided under Division 26.

D. Supervisory Switch: Fit the control valves on the fire sprinkler risers with monitor switch, Potter Electric Model OSYSU-1, or approved equal, with single pole, double throw switch actuator installed to change switch position when the OS&Y valve is being closed.

E. Available Manufacturers: Subject to compliance with requirements, manufacturers offering fire protection specialties which may be incorporated in the work include the following, or approved equal:

Tyco Fire Products
Potter Electric
Potter Roemer
Guardian Fire Equipment

2.14 AUTOMATIC SPRINKLERS

A. Provide automatic sprinklers in accordance with the following listing. Provide 3mm glass bulb type quick response sprinklers with a temperature rating of 155°F, unless otherwise indicated.

B. Type: Spray pattern type, automatic closed type heads of ordinary degree temperature rating, except that sprinklers to be installed in the vicinity of heating equipment shall be of temperature ratings required by NFPA for such locations.

C. Available Manufacturers: Subject to compliance with requirements, manufacturer offering automatic sprinklers which may be incorporated in the work include the following, or approved equal:
Tyco Sprinkler Company.

D. Types of Sprinklers:

1. Exposed Locations: Provide upright type heads at all areas with no finished ceilings, equal to Tyco Sprinkler Series TY-FRB quick response, upright, 5.6 K-factor, with 1/2” orifice.
   a. Where heads are located less than 8 feet above finished floor, or where heads are located in a gymnasium area, provide wire guards to protect heads from damage.
2. Concealed Locations: Provide upright-type heads or pendent type heads equal to Tyco Sprinkler Series TY-FRB quick response, 5.6 K-factor, with 1/2” orifice.
3. Sidewall Locations: Where required and where approved by the Architect/Engineer provide Tyco Sprinkler Series TY-FRB quick response, horizontal sidewall, 5.6 K-factor, with 1/2” orifice.
4. Finished Ceilings: Provide at all ceilings with lay-in acoustical tile and at plaster or gypsum board type ceilings Tyco Sprinkler Series RF-II concealed pendent sprinkler, 5.6 K-factor, with 1/2” orifice, and white cover plate.
5. Sprinkler Cabinet and Wrench: Furnish steel, baked red enameled, sprinkler box with capacity to store sprinklers and wrench sized to sprinklers. Spare sprinklers and wrenches called for under ‘Extra Stock’.

2.15 FIRE DEPARTMENT CONNECTIONS

A. Fire department connections are typically indicated to be provided by others on the civil drawings, and shall be connected to the building fire riser as shown on the fire suppression system drawings.

B. When shown on the fire suppression system drawings, provide exterior wall mount type cast brass fire department connection and escutcheon plate assembly, with fire department inlet hose connections as required by the local fire authority. Provide 6 inch inlet and body equipped with individual drop clapper valves, brass plugs and chains, constructed with the following additional features:

1. Finish: Brass or Chrome.
2. Cast Lettering: ‘AUTO SPKR’.
3. Escutcheon: As required to suit the number and size of inlets.

4. Provide a check valve in the piping between the fire department connection and the fire protection system. Where indicated on the drawings, provide a wafer style check valve, above grade in the riser to the fire department connection. Provide a ball drip above grade, on the fire department connection side of the check valve.

C. Available Manufacturers: Subject to compliance with requirements manufacturers offering fire department connections which may be incorporated in the work include the following, or approved equal:

Potter Roemer
Fire End & Croker Corporation
Elkhart Brass Manufacturing

2.16 PIPE SLEEVES

A. Where pipes pass through a non-rated concrete floor slab the pipe shall be covered with high density fiberglass insulation. Pipe insulation shall be 1/2” to 1” thick Johns Manville Microlok HP or Johns Manville Trymer 25-50 for the full thickness of the concrete. After the piping has been installed and the concrete has been poured, the fiberglass insulation shall be cut away or compressed leaving a 1/2” deep space that shall then be filled with a high quality silicone sealant resulting in a flat, water-tight installation.

B. Where pipes pass through fire rated concrete floors or walls install a Schedule 10 galvanized metal sleeve providing between a 1/2 inch and 1 inch clearance around the sides of the pipe and/or pipe insulation for the full thickness of the concrete. After the piping has been installed, fill the annular space in accordance with the applicable UL fire rating system.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering pipe sleeves which may be incorporated in the work include the following, or approved equal:

3M

PART 3 - EXECUTION

3.1 LOCATION OF EQUIPMENT AND VALVES

A. Provide a fire department connection at the main entry to building, or where indicated on the drawings.

B. Provide zone valves and sprinkler systems at all floors and where indicated on the drawings.

3.2 INSPECTION

A. Examine areas and conditions under which fire sprinklers are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Contractor.

3.3 INSTALLATION OF SPRINKLERS IN FINISHED CEILINGS

A. Where heads are located in grid or tile ceilings with a regular pattern, heads shall be in the center of the tile or grid measured in both directions.

3.4 CLEARANCE

A. Clearance through walls and floors shall adhere to NFPA 13 Section 9.3.4 (Clearance).

3.5 EXTRA STOCK

A. Spare Heads: For each style and temperature range required, furnish additional sprinkler heads, amounting to one unit for every 100 installed units but not less than 10 heads, in proportion to the total number of each style of head.

B. Wrenches: Furnish two sprinkler wrenches for each type and size of sprinkler connection.

C. Obtain receipt from the Owner that the extra stock has been received.

3.6 FIELD QUALITY CONTROL

A. Sprinkler Piping Flushing: Prior to connecting sprinkler risers for flushing, flush water feed mains, lead-in connections, and control portions of sprinkler piping. After fire sprinkler piping installation has been completed and before piping is placed in service, flush entire sprinkler system as required to remove foreign substances under pressure as specified in NFPA 13. Continue flushing until water is clear, and check to ensure that debris has not clogged sprinklers.

B. Hydrostatic Testing: After flushing system, test fire sprinkler piping hydrostatically for period of 2 hours at not less than 200 psi or at 50 psi greater than system pressure where pressure is anticipated to be in excess of 150 psi. Check system for leakage of joints. Measure hydrostatic pressure at low point of each system or zone being tested.

C. Repair or replace piping system as required to eliminate leakage in accordance with NFPA standards for ‘little or no leakage’ and re-test as specified to demonstrate compliance.

3.7 DEMOLITION WORK

A. Demolition work shall be performed only where specifically identified on the drawings. Unless specifically indicated otherwise, demolition work shall include removal of all associated equipment, electrical and controls components, conduit and wiring, piping, valves and accessories, and supports. The surfaces where the demolition work was performed shall be restored to match the adjacent surfaces to the best extent practical.

B. When demolition work involves leaving existing systems in place for a prolonged time period (more than 30 days and/or any time period when there is the potential for freezing temperatures) the Contractor shall protect all existing equipment, piping, and ductwork from potential damage during the time that the equipment, piping, and ductwork is out of service. The protection procedures shall include draining all hydronic coils and the associated piping systems that may be susceptible to freezing temperatures when the building heating system is disabled. This requirement applies to both hydronic piping and domestic water piping systems. After the piping systems are drained, the Contractor shall purge all water from the hydronic coils, hydronic piping systems, and domestic water piping systems using compressed air or other appropriate means, and shall seal any open ends such that the potential for corrosion is minimized. This work shall be performed by an experienced mechanical or plumbing contractor, rather than by a demolition contractor.

C. When it is necessary to drain an existing fire protection system, the Contractor shall utilize the procedures outlined above, and prior to draining shall confirm with the Authority Having Jurisdiction whether a 24 hour fire watch is an acceptable means of protection until the fire protection system is made operational. The Contractor shall advise the Architect/Engineer immediately if it is determined that a 24 fire watch is required.

3.8 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.9 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to the Architect/Engineer. At completion, carefully clean and adjust equipment and trim that are installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.10 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 21 05 30 - HANGERS AND SUPPORTS FOR FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Section 210000 (Fire Suppression Systems) and Section 210540 (Seismic Bracing for Fire Suppression Systems) are hereby made a part of this section.

1.2 HANGER AND SUPPORT LAYOUT

A. The following information is for pipe hanger and support layout and design reference only. The actual design of all hangers, supports, and seismic bracing is the responsibility of the Contractor per the following specification sections:

Specification Section 21 05 30 (Hangers and Supports for Fire Suppression Systems)
Specification Section 21 05 40 (Seismic Bracing for Fire Suppression Systems)

B. Fire Sprinkler Piping: Hangers and supports for fire sprinkler piping shall be designed in accordance with the latest adopted edition of NFPA Standard 13 Chapter 17 (Hangers and Supports).

Steel Piping	Maximum Spacing	Reference
1-1/4” and smaller	12 feet	NFPA 13 Table 17.4.2.1
1-1/2”	15 feet	NFPA 13 Table 17.4.2.1
2” thru 8”	15 feet	NFPA 13 Table 17.4.2.1
Lightwall Steel Piping	**Maximum Spacing**	**Reference**
3” and smaller	12 feet	NFPA 13 Table 17.4.2.1

1.3 SUMMARY

A. This section Includes the following:
   1. Metal pipe hangers and supports
   2. Thermal hanger shield inserts
   3. Fastener systems
   4. Pipe stands
   5. Equipment stands
   6. Equipment supports

B. Related Requirements: All hangers and support systems shall be designed, selected, and installed by the Contractor to comply with the requirements listed in Section 210540 (Seismic Bracing for Fire Suppression Systems).

C. Costs for hangers, supports, and seismic bracing systems complying with the requirements listed herein are the responsibility of the Contractor and shall be included in the Contractor’s bid. No extra cost will be allowed for failure to include the associated costs in the Contractor’s bid.

D. In no case shall hangers and/or supports for fire protection piping or equipment be attached to a metal roof deck, unless provisions or allowances are explicitly shown on the structural drawings.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include product data for all components, including, but not limited to:
   1. Trapeze Pipe Hangers
   2. Metal Framing (Strut) Systems

C. Delegated Design Submittal: Provide comprehensive, all-inclusive, delegated design submittals for fabrication and assembly of trapeze hangers. Submittals shall comply with all NFPA 13 performance requirements and design criteria.

D. The work of this section shall be coordinated with the requirements for the Contractor furnished seismic design submittal for hangers and supports specified in Section 210540 (Seismic Bracing for Fire Suppression Piping and Equipment). Design and detailing of seismic bracing, hangers, and supports is the responsibility of the Contractor.

E. Submittals shall be fully coordinated with the structural drawings and shall include all applicable structural and seismic attachment details. Locations and the methods of attachment of hangers and supports to the main structural frame shall comply with the limitations specified in the structural drawings. Each specific load shall be indicated in the submittals and the structural element that the support is attached to shall be clearly depicted/identified.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS

A. Aluminum: ASTM B221.

B. Carbon Steel: ASTM A1011/A1011M.

C. Structural Steel: ASTM A36/A36M, carbon steel plates, shapes, and bars; galvanized.

D. Stainless Steel: ASTM A240/A240M.

E. Threaded Rods: Continuously threaded, zinc plated or galvanized steel for indoor applications, and stainless steel for outdoor applications. Mating nuts and washers shall be of similar material as the rods.

F. Grout: ASTM C1107/C1107M, factory mixed and packaged, dry hydraulic cement, non-shrink and non-metallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, non-corrosive, and non-gaseous.
2. Design Mix: 5,000 psi, 28 day compressive strength.

2.2 FIRE PROTECTION PIPE HANGER AND SUPPORT MATERIALS

A. All fire protection pipe hanger and support materials shall be per NFPA 13.

2.3 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. Powder actuated fasteners may only be utilized for point loads of 50 lbs or less.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

   Hilti
   ITW Ramset/Red Head
   Simpson Strong-Tie

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 stainless steel.
2. Outdoor Applications: Stainless steel.

3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

   Hilti
   ITW Ramset/Red Head
   B-line

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with all requirements in other section of the specifications for firestopping materials and installation for penetrations through fire rated walls, ceilings, and assemblies.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lbs.

3.2 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe Hanger Installation: Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. 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.

C. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

D. Install lateral bracing for pipe hangers and supports to prevent swaying.

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 1-1/2 inches.

END OF SECTION

SECTION 21 05 40 - SEISMIC BRACING FOR FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Section 210000 (Fire Suppression Systems) and Section 210530 (Hangers and Supports for Fire Suppression Systems) are hereby made a part of this section.

1.2 GENERAL

A. Seismic bracing for fire suppression systems (equipment, piping, and conduit) shall comply with all applicable requirements of the latest adopted edition of NFPA 13.

B. Component Importance Factors (Ip) for all equipment, piping, and conduit shall be determined and assigned in accordance with NFPA 13.

C. Design and detailing of seismic bracing, hangers, and supports for equipment, piping, and conduit is the responsibility of the Contractor.

D. The work of this section shall be coordinated with the requirements for the Contractor furnished delegated design submittal for hangers and supports specified in Section 210530 (Hangers and Supports for Fire Suppression Systems).

1.3 SUBMITTALS

A. The Contractor shall provide the required number of seismic shop drawing submittal sets for review and approval by the Engineer. Submittals shall include a comprehensive set of shop drawings clearly depicting the seismic bracing requirements for all equipment, piping, and conduit. Any piping or conduit that does not require seismic bracing shall be specifically identified in the submittal, and the reason for exemption shall be provided. Cite any and all references for the exemption. In cases where seismic bracing is not required due to the supported items being less than 12 inches below the supporting structure, a single note may be provided to cover those locations.

B. 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.

END OF SECTION

SECTION 23 00 00 - HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this section.

B. This section lists general requirements for Heating, Ventilating, and Air Conditioning (HVAC) work and is hereby made a part of each Division 23 specification section.

C. For convenience or reference the Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the owner for a complete job.

D. Wherever the word ‘provide’ is utilized with regard to materials or equipment on the drawings or in the specifications it shall be interpreted to mean ‘furnish and install’.

E. The term ‘exposed’ shall be interpreted to mean any equipment, ductwork, or piping that is not concealed above a continuous ceiling or inside a finished wall.

1.2 WORK INCLUDED

A. This section consists of general requirements and standard specifications covering certain parts of the HVAC work and is supplemented by other Division 23 specification sections covering additional work, requirements, and materials specifically applicable to the HVAC work of each section. Requirements of subsequent sections of the specifications, if in conflict with these general requirements, shall govern.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

A. Provide work and materials in full accordance with the latest rules and regulations of the following:

Nevada

2018 International Building Code
2018 International Existing Building Code (when applicable)
2018 Uniform Mechanical Code
2018 Uniform Plumbing Code
2018 International Energy Conservation Code
2017 National Electrical Code
2018 International Fire Code
2018 NFPA Codes and Standards
Nevada State Fire Marshal
Nevada Occupational Safety and Health
National Fire Protection Association
Underwriters Laboratories
All other applicable state codes, rules, and regulations

B. Nothing in the drawings or specifications shall be construed to permit work not conforming to the listed codes and regulations.

C. In the event of an inconsistency between or within the plans, specifications, any of the contract documents, codes, or regulations, the better quality, higher cost, and/or greater quantity of materials and work shall be provided at no additional cost to the Owner.

1.4 FEES, PERMITS, AND UTILITY SERVICES

A. Obtain and pay for all permits and service required for installation of this work; arrange for required inspections and secure approvals from the authorities having jurisdiction.

B. Arrange for utility connections and coordinate work with utility company.

C. Arrange required inspections and secure approvals from the authorities having jurisdiction.

1.5 SITE EXAMINATION

A. Examine site, verify dimensions and locations against 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 services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform to actual locations and conditions without extra cost. Verify location and elevation of all utilities prior to commencement of excavation for new piping or its installation.

C. Exercise extreme care in excavating near existing utilities to avoid any damage thereto. This Contractor is responsible for any damage caused by his operations.

1.6 PLACEMENT OF EQUIPMENT AND WORK

A. The placement of equipment and mechanical work in the locations and spaces shown on the drawings is the Contractor’s responsibility.

B. Move equipment and/or work into spaces through openings provided or located in the spaces during construction, as required.

C. Perform disassembling and reassembling of equipment and/or other work necessary to accomplish this requirement without extra cost to the Owner.

1.7 SUBMITTALS AND SUBSTITUTIONS

A. In all cases, there is one basis of design manufacturer or product for each item of equipment or product shown on the drawings and/or specified herein. These products are identified by name and model number on the drawings and/or in the specifications. Alternative manufacturers and products are also listed; however, their inclusion as an alternative manufacturer or product does not cause them to be the basis of design. If an alternative manufacturer and/or product is desired to be used by the Contractor, it will be considered a substitution. Substitutions will be interpreted to be all manufacturers or products other than the basis of design. Only one request for substitution will be considered for each item of material or equipment. No substitutions will be considered thereafter. After a substitution request is reviewed and is found to be unacceptable the Architect/Engineer reserves the right to require the originally specified equipment or product at no additional cost to the Owner.

B. If the Contractor desires to make a substitution, he shall submit complete information or catalog data to show equality of equipment or material offered to that specified. No substitutions will be allowed unless requested and reviewed in writing. The Architect/Engineer will review and take appropriate action on shop drawings, product data, samples, and other submittals as required by the contract documents. Such review shall be only for general conformance with the design concept and general compliance with the information given in the contract documents.

C. The review of submittals will not include review of quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with the work of other trades, or construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Architect/Engineer shall not be required to review and shall not be responsible for any deviations from the Contract Documents not clearly noted by the Contractor, nor shall the Architect/Engineer be required to review partial submissions or those for which submissions for correlated items have not been received. The Architect/Engineer reserves the right to require the originally specified item.

D. Installation of reviewed substitutions is the Contractor's responsibility. Any changes required for installation of reviewed substituted equipment must be made without additional cost to the Owner. Review by the Architect/Engineer of the substituted equipment and/or the dimensioned drawings does not waive the requirements stated herein.

E. In any case where the Contractor intends to utilize a listed or unlisted acceptable equipment manufacturer that is not the basis of design as listed on the drawings and in the specifications it is the Contractor's responsibility to confirm prior to bidding that all ductwork, piping, controls, electrical power, conduit, service clearances, space requirements, and structural requirements match those of the basis of design equipment. Costs for any revisions necessary to accommodate the ductwork, piping, controls, electrical power, conduit, service clearances, space requirements, and structural requirements for the alternative equipment are the responsibility of the Contractor and shall be included in the Contractor's bid. No extra cost will be allowed for failure to allow for accommodations related to the alternative equipment in the Contractor's bid.

F. Submit to the Architect/Engineer for review, within a reasonable time after award of Contract and in ample time to avoid delay of construction, shop drawings or submittals on all items of equipment and materials, including all substitutions. Also see Division 1 for additional related requirements.

G. Partial or incomplete sets of equipment and materials submittals will not be acceptable.

H. Assessment of quantities is solely the Contractor's responsibility and will not be reviewed.

I. All submittal data shall be tailored to suit the specific project, with appropriate model or part numbers, materials, sizes, options, and accessories clearly indicated for each different submittal item and on each submittal page. Submittal pages without this information will be returned and will need to be resubmitted with all of the required information indicated on each sheet.

J. The Contractor shall certify that he has examined all submittal data and that the equipment and materials submitted for review meet or exceed the requirements of the drawings and specifications. Submittals without the required certification will not be acceptable.

K. Should the Contractor neglect to include submittal data for any item of equipment or material it shall be assumed and agreed that the associated equipment or material is the exact item specified as the basis of design on the drawings and in the specifications.

L. Items indicated by the Architect/Engineer to be resubmitted shall be resubmitted as follows:
   1. Retain items marked as 'No Exceptions Taken' or 'Make Corrections Noted' and resubmit with the revised package. Do not provide new sheets for these items.
   2. Provide revised submittal sheets for all other reviewed items. Provide originally submitted sheet with Architect/Engineer comments. Clearly indicate amendments and modifications made in response to previous submittal review comments.

M. Electronic Formatted Submittals
   1. Provide submittals in electronic form (.pdf file format).
   2. Identify and incorporate submitted information, including a cover sheet, and the following:
      a. Project Name
      b. Submittal Package Number (with revision number identified)
      c. Date
      d. Name of Architect/Engineer
      e. Name of Contractor
      f. Name of Subcontractor
   3. Group submitted items by specification section, and provide the following:
      a. Index of submitted products with page numbers
      b. Name of Firm or entity that prepared submittal
      c. Name of Supplier
      d. Name of Manufacturer
      e. Equipment and/or fixture tag, if applicable
      f. Number and title of appropriate specification section
   4. Items indicated by the Architect/Engineer to be resubmitted shall be resubmitted as follows:
      a. Retain items marked as ‘No Exceptions Taken’ or ‘Make Corrections Noted’ and resubmit with the revised package. Do not provide new sheets for these items.
      b. Provide revised submittal sheets for all other reviewed items.
      c. Provide originally submitted sheet with Architect/Engineer comments.
      d. Clearly indicate amendments and modifications made in response to previous submittal review comments.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Mention herein or on the drawings requires that this Contractor provide each item listed of the quality noted, or equal. All material shall be new, full weight, standard in all respects, and in first class condition. Provide materials of the same brand or manufacturer throughout for each class of material or equipment wherever possible. Materials shall be tested within the continental United States by an independent, nationally recognized testing agency and shall be listed in accordance with testing agency requirements.

B. The grade or quality of materials desired is indicated by the trade names and/or catalog numbers stated on the drawings and in the specifications.

C. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without the written permission of the Architect/Engineer.

D. All equipment shall comply with the mandatory equipment efficiencies listed in International Energy Conservation Code Section C403.3.2.

E. No material installed as part of this work shall contain asbestos in any form.

2.2 MATERIALS FURNISHED

A. Identify all materials and equipment by the manufacturer’s name and model number. Remove any unidentified materials and equipment from the site.

B. Equipment scheduled and/or specified by the manufacturer's model number shall include all accessories, controls, etc. listed in the catalog as standard with the equipment. Furnish optional or additional accessories as scheduled and/or specified.

C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged, and shall be replaced with new equipment. Variance from this requirement will be permitted only with the written consent of the Architect/Engineer.

D. Provide an authorized representative to constantly supervise the work of this division. Check all materials prior to installation for conformance with drawings and specifications.

PART 3 - EXECUTION

3.1 ACCESS TO HVAC WORK

A. Comply with manufacturer's written instructions for installation of access doors.

B. Access panels shall be furnished and installed wherever valves, balance valves, damper operating mechanisms, air terminal boxes, fans, and similar items normally requiring adjustment or servicing are installed in concealed or inaccessible spaces. Coordinate with access doors shown on architectural drawings.

C. Continuously check architectural drawings for clearance and accessibility of equipment specified herein to be placed. No allowance of any kind will be made for negligence on part of the Contractor to foresee means of installing his equipment into proper position.

3.2 DRAWINGS AND COORDINATION

A. General arrangement and location of piping, ductwork, equipment, etc. are shown on the drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work.

B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid any conflicts. This shall not be cause for additional cost.

C. Verify all measurements at the building and be responsible for the correctness of same. No extra compensation will be allowed on account of differences between actual dimensions and those indicated on the drawings.

D. In addition, obtain all necessary information from the other trades regarding centers of partitions, walls, location of plumbing mains, fire sprinkler mains, and electrical conduits, ducts, pipes, etc. in order that pipes, equipment, and ductwork may be placed in their correct positions.

E. Execute all work shown on the drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from drawings or specifications of any minor details of construction, installation, materials, or essential specialties does not relieve the Contractor of furnishing and installing same in a complete and operational condition.

F. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and operational system.

G. Furnish materials and work at proper time to avoid delay of the work.

3.3 AS-BUILT DRAWINGS

A. Upon completion of work submit to the Architect/Engineer as-built drawings showing all changes in equipment, piping, ductwork, etc. installed as part of this project which are not in accordance with the contract drawings. As-built drawing deliverables shall be in accordance with the requirements of Division 1, and shall consist of the following as a minimum.

1. Provide as-built drawings in electronic file format (pdf file). In addition to the electronic file, when field mark-ups have been utilized, provide a complete set of full size neatly and legibly marked as-built drawings on 20 pound white bond paper.
2. As-built drawings shall be full size (same size as the contract documents) and shall be standard engineering scale. The minimum drawing scale shall match those provided in the contract documents.
3. As-built drawings shall include all outside utility connections, piping, etc. installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

B. Match all symbols and designations used in the contract drawings when preparing the as-built drawings.

C. Indicate clearly and correctly all work installed differently from that shown, and maintain records up to date as work progresses. Include invert elevations of pipes below grade of floor, the floor lines, plugged wyes, tees, caps, exact locations and sizing of piping, location of valves, and the like. Dimension locations from structural points.

D. Properly identify all stubs for future connections as to locations and use by setting of concrete markers at finished grade in manner suitable to the Architect/Engineer.

3.4 PROJECT MODIFICATIONS

A. During the progress of construction, if any conditions arise that necessitate revisions, modifications, or relocation of any mechanical equipment or materials, such revisions shall be immediately brought to the attention of the Architect/Engineer. The Contractor shall then prepare necessary drawings showing the proposed changes. All proposed changes shall be submitted, reviewed, and approved by the Architect/Engineer prior to proceeding with any associated revision work in the field.

B. Maintain copies of all approved changes at the project site for reference by all parties during the remaining work.

C. Incorporate all revisions into the as-built drawings.

3.5 CLOSING IN OF UNINSPECTED WORK

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.6 FORMING, CUTTING, AND PATCHING

A. Coordinate with other contractors as necessary to provide any special forming, recesses, chases, etc., and provide wood blocking, backing, and grounds as necessary for proper installation of mechanical work.

B. If this Contractor fails to coordinate with other contractors at proper time or fails to locate items properly, resulting in extra work, then this Contractor is responsible.

C. This Contractor is responsible for proper placement of pipe sleeves, hangers, inserts, and supports for work.

D. Cutting, patching, and repairing of existing (old) construction to permit installation of piping, etc. is responsibility of this Contractor. Repair or replace damage to existing work with skilled mechanics for each trade involved in a first class manner.

3.7 EXISTING SERVICES

A. Provide and install all required connections to existing systems as required by the drawings and specifications.

B. Integrate existing systems with all new work to provide a complete working system.

C. Provide minimum 48 hour notice to Owner of any service interruptions. All service interruptions shall be kept to the minimum possible time. When requested by Owner service interruptions shall occur outside of normal working hours.

D. The Contractor shall be responsible for damage to any part of the premises during the guarantee period that is caused by defects, leaks, or breaks in work furnished and/or installed under this section.

E. The Contractor shall replace refrigerant, lubricants, and/or gases lost as a result of defects, breaks, or leaks in the work.

3.8 PROJECT COMPLETION TESTS AND STARTUP

A. Upon completion of the mechanical work, or at such time prior to completion as may be determined by the Architect/Engineer, operate and test all mechanical equipment and systems for a period of at least five consecutive 8 hour days to demonstrate the satisfactory overall operation of the building or project as a complete unit. Include operation of heating and air conditioning equipment and systems for a period of not less than two 8 hour days at not less than 90 percent of full specified heating and cooling capacities in tests.

B. Commence tests after preliminary balancing and adjustments to equipment have been checked. Immediately before starting tests, install air filters and lubricate all running equipment. The Contractor shall notify the Architect/Engineer at least seven calendar days in advance of starting the tests listed herein.

C. Provide training and orientation of the Owner’s facilities staff in proper care and operation of equipment, systems, and controls.

D. Neatly tabulate and deliver to the Architect/Engineer complete operational data, including air flows, room temperatures, fan speeds, motor currents, plenum and duct static pressures, and other data as required. The Architect/Engineer reserves the right to spot check results, and if discrepancies or errors are noted, the Contractor will be required to redo balancing tests and tabulations entirely.

E. During the test period, make final adjustments and balancing of equipment, systems, controls, and circuits so that all are placed in a first class operating condition.

F. Mark final positions of balancing valves after balancing is complete.

G. All areas of the building shall receive proper flow of hot and chilled water to assure adequate and uniform temperatures throughout.

H. Final observation will not be conducted until all of the above requirements have been completed and the balance report has been submitted and reviewed.

3.9 TEMPORARY UTILITIES, HEATING, AND COOLING

A. Temporary utilities may be connected to the Owner's existing metered utilities only with the Owner's and the utility company's written authorization. Any connection to the Owner's existing utilities shall be separately metered to allow for proper allocation of utility costs unless another arrangement is specifically agreed to and authorized by the Owner in writing. Temporary meters shall be removed upon completion of the Work.

B. The Contractor shall be solely responsible for providing temporary heating, cooling, and/or ventilation as required to prevent degradation or damage to the Work. The permanent heating, cooling, and air handling systems shall not be utilized for the purpose of temporary heating, cooling, or ventilation until the Owner approves of such use in writing. In no case shall the permanent heating, cooling, or air handling systems be operated until they are complete, including formal startup, check out, and testing and balancing.

C. Utilization of any of the permanent heating, cooling, or air handling systems prior to the date of Substantial Completion shall not impact the specified warranty for such equipment, which shall begin on the date of Substantial Completion.

3.10 POST CONTRACT COMPLETION TESTS

A. If the required full load operation conditions cannot be conducted at the time of the 'Project Completion Tests and Startup' due to outdoor seasonal temperatures, the Contractor shall return to the job site when appropriate weather conditions arise (and/or when requested by the Architect/Engineer) to complete proper loading of equipment and systems as required. The Contractor will be allowed seven calendar days after notification to begin the tests. The Owner will be responsible for providing new air filters for the Contractor to install prior to this testing if necessary.

3.11 PRE-SEASON START UP

A. Within one year of filing of the Notice of Substantial Completion, when all full load tests required under 'Project Completion Tests and Startup' and 'Post Contract Completion Tests' have not yet been performed, the Contractor shall perform startup of any equipment or systems required for heating or cooling season operation when such equipment and systems have remained shut down or remain to be tested under full load. The Contractor shall ensure that all equipment and systems are operating properly before being turned over for the first operational use by the Owner. All such testing shall occur within one year of filing the Notice of Substantial Completion. The Owner will be responsible for providing new air filters for the Contractor to install prior to this testing if necessary.

3.12 GUARANTEE

A. The Contractor shall be responsible for all work done and material installed under the plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show itself within one year of filing of the Notice of Substantial Completion and be responsible for damage to other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect/Engineer said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to the Owner.

3.13 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 05 00 - BASIC MATERIALS AND METHODS FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Section 230000 (Heating, Ventilating, and Air Conditioning) is hereby made a part of this section.

B. This section provides requirements for basic materials and methods related to all of the HVAC work. This section applies to all other Division 23 specification sections.

1.2 WORK INCLUDED

A. Types of HVAC items specified in this section include the following:

1. Materials
2. Valves
3. Hangers and Supports for HVAC Systems
4. Seismic Bracing for HVAC Systems
5. Flow Meters
6. Access Doors and Panels
7. Pressure Gauges
8. Thermometers
9. Unions and Flanges
10. Pipe Escutcheons
11. Pipe Sleeves
12. Sleeve Seals
13. Wye Strainers
14. Basket Strainers
15. Pipe Anchors and Guides
16. Piping and Equipment Identification
17. Electric Heat Tracing
18. Painting
19. Concrete Work
20. Electric Motors
21. Welding

B. Types of flow meters specified in this section include the following:

- Heat Pump Loop Flow Meters

1.3 PROJECT CONDITIONS

A. Existing Utilities: Locate and protect existing utilities and other underground work in manner which will ensure that no damage or service interruption will result from excavating and backfilling.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in the manufacture of valves and piping specialties of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Valve Types: Provide valves of same type by the same manufacturer.

C. Identification: Provide valves and piping specialties with the manufacturer's name or trademark and pressure rating clearly marked on the valve body.

1.5 SUBMITTALS

A. Submit manufacturer's technical product data and installation instructions for each type of manufactured valve and piping specialty. Include pressure drop curve or chart for each type and size of isolation valve, balancing valve, and control valve.

B. Operation and Maintenance Data: Submit operation and maintenance data and spare parts lists for each type of manufactured valve and piping specialty. Include this data and product data in the operating and maintenance manual in accordance with all associated requirements.

C. All interface requirements (BACnet or other) shall be coordinated with the temperature control system subcontractor prior to issuing submittals and/or ordering any equipment that is required to have an interface.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide factory-fabricated valves and piping specialties as recommended by the manufacturer for use in the service indicated. Provide valves and piping specialties of types and with pressure ratings indicated for each service, or if not indicated, provide proper selections as determined by the Contractor to comply with the installation requirements. Provide sizes and connections which properly mate with pipe, tube, and equipment connections.

2.2 VALVES

A. See Specification Section 230510 (Valves for HVAC Systems).

2.3 VALVE BOXES

A. Provide at each valve in ground a concrete valve box with the cover marked for the applicable service. Furnish an extension handle for valves as required for opening and closing the valve. In areas that are not subject to vehicle traffic concrete valve boxes shall be Christy Model B-09, or approved equal, with a steel checker plate cover. In areas that are subject to vehicle traffic concrete valve boxes shall be Christy Model B-1017, or approved equal, with a steel checker plate cover.
   1. Do not locate valve boxes in areas subject to vehicle traffic, in walkways, or in covered passageways unless absolutely necessary.
   2. Provide valve box extensions as required to set the bottom of the valve box tight on top of the piping in which the valve is installed.
   3. Provide special valve boxes where required to conform to local codes.

2.4 HANGERS AND SUPPORTS FOR HVAC SYSTEMS

A. See Specification Section 230530 (Hangers and Supports for HVAC Systems).

2.5 SEISMIC BRACING FOR HVAC SYSTEMS

A. See Specification Section 230540 (Seismic Bracing for HVAC Systems).

2.6 FLOW METERS

A. See Specification Section 230900 (Temperature Controls).

B. Flow meters shall be installed in strict conformance with the manufacturer’s installation instructions, including required straight pipe length upstream and downstream of the flow meter.

2.7 ACCESS DOORS AND PANELS

A. Where floors, walls, or ceilings must be penetrated for access to mechanical equipment, provide access doors, 22 inch by 22 inch minimum size in usable opening. Where entry of service personnel may be required, provide a 22 inch by 30 inch minimum usable opening.

B. Access doors shall match those listed in the architectural documents in all respects, except as noted herein.

C. Where panels are located on ducts or plenums, provide neoprene gaskets to prevent air leakage, and use frames to set door out to flush with insulation.

D. Provide insulated access doors where located in internally insulated ducts or casings.

E. Where specific information or details relating to access panels different from the above is shown or given on the drawings or other divisions of work, then that information shall supersede this specification.

F. Available Manufacturers: Subject to compliance with requirements, manufacturers offering access doors which may be incorporated in the work include Milcor, Best, or approved equal:

Milcor Style M	Drywall and/or Masonry
Milcor Style K	Plaster
Milcor Style UFR	Fire Rated (where required)

2.8 PRESSURE GAUGES

A. Pressure gauges shall be flangeless case type, Miljoco Model P4598L, or approved equal by Weiss or Weksler. Gauges shall be accurate to within plus or minus 1% throughout the entire scale range. Scales shall have a minimum of 2 degrees between graduations and a maximum of 20 degrees between figures.

B. Pressure gauges shall be 4-1/2 inch diameter with acrylic lens, stainless steel case, and stainless steel ring. Gauge movement shall be brass with precision-milled teeth. Gauges shall be selected with a pressure range such that the gauge reads near the middle of the total gauge range at the pressure indicated on the drawings. The most common gauge selections will be for ranges of 0 to 160, 0 to 60, and/or 0 to 30 psi.

2.9 THERMOMETERS

A. Thermometers shall be of the bimetal helix type, Miljoco Model B5098A, or approved equal by Weiss or Weksler. Thermometers shall be accurate to within plus or minus 1% throughout the entire scale range. Scales shall have a minimum of 2 degrees between graduations and a maximum of 20 degrees between figures.

B. Thermometers shall be 5 inch diameter with polycarbonate lens, stainless steel case and ring, stainless steel stem, and stainless steel well. Thermometer stem length for piping shall be 2-1/2 inches, and stem length for tanks shall be 9 inches. Thermometers installed on insulated tanks or piping shall be provided with an extension neck well to compensate for the thickness of the insulation.

C. Thermometer ranges shall be as listed below.

Location	Range
Chilled water supply and return mains.	25° to 125°F
Heating water supply and return mains.	0° to 250°F
Heat pump well field supply and return mains at each header.	25° to 125°F

D. Thermometers used for air temperature in ductwork, plenums, etc., shall have a perforated guard over the stem suitable for sensing air temperature. Stem length shall be 9 inches minimum.

E. Thermometers shall include an adjustable bracket allowing rotation to any position, and shall be located such that they are easily read from a normal vantage point.

F. Thermometer wells with chain and cap shall be provided as spares wherever spare wells are indicated on the drawings.

2.10 UNIONS AND FLANGES

A. Furnish and install unions at each threaded or soldered connection to all equipment, tanks and valves, of type specified in following schedule:

Type of Pipe	Union
Steel pipe 2" and smaller	150 lb threaded malleable ground joint, brass to iron seat, black for black piping, galvanized for galvanized piping.
Steel pipe 2-1/2" and larger	125 lb cast iron threaded flanged union, flat faced, gasket, black for black piping, galvanized for galvanized piping.
Copper tubing 2" and smaller	150 lb bronze ground joint, bronze to bronze sweat connection.
Copper tubing 2-1/2" and larger	150 lb cast bronze, flat faced flange with silver brazing threadless ends.

B. Insulating couplings or flanges shall be furnished and installed at all connections of piping with dissimilar materials. Construct couplings so that the two pipes being connected are completely insulated from each other with no metal-to-metal contact. Heavily line the couplings with a hard, insulating, phenolic threaded coupling in standard pipe sizes.

C. Furnish and install flanges at each flanged connection to equipment, tanks, and valves per the following schedule:

Type of Pipe	Flanges
Threaded black or galvanized steel pipe 2-1/2" and larger	125 lb threaded cast iron, flat face flange, black or galvanized steel as applicable.
Welded steel pipe 2-1/2" and larger	150 lb welded forged steel, raised face flange.

D. Provide full faced or ring type gasket material to suit facing on flanges. Gasket material shall be 1/16" thick Garlock Blue-Gard, or approved equal. Gasket material shall be suitable for the connected piping system content and temperature.

2.11 PIPE ESCUTCHEONS

A. Provide chrome plated brass pipe escutcheons with inside diameter closely fitting pipe outside diameter or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, ceilings, or pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish and screw or spring clamping device with concealed hinge.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering pipe escutcheons which may be incorporated in the work include the following, or approved equal:

Chicago Specialty Manufacturing Company
Producers Specialty and Manufacturing Corporation
Sanitary Dash Manufacturing Company

2.12 PIPE SLEEVES

A. Where pipes pass through a concrete floor slab the pipe shall be covered with high density fiberglass insulation. Pipe insulation shall be 1/2” to 1” thick Johns Manville Microlok HP or Johns Manville Trymer 25-50 for the full thickness of the concrete. After the piping has been installed and the concrete has been poured, the fiberglass insulation shall be cut away or compressed leaving a 1/2” deep space that shall then be filled with a high quality silicone sealant resulting in a flat, water-tight installation.

B. Where pipes pass through fire rated concrete floors or walls install a Schedule 10 galvanized metal sleeve providing between a 1/2 inch and 1 inch clearance around the sides of the pipe and/or pipe insulation for the full thickness of the concrete. After the piping has been installed, fill the annular space in accordance with the applicable UL fire rating system.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering pipe sleeves which may be incorporated in the work include the following, or approved equal:

   3M

2.13 SLEEVE SEALS

A. Provide sleeve seals for sleeves located in foundation walls below grade or in exterior walls as follows:

   1. Pipe Sleeves Through Foundations & Walls Below Grade: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing water-tight seal.
   2. Available Manufacturers: Subject to compliance with requirement, manufacturers offering sleeve seals which may be incorporated in the work include the following, or approved equal:

      Thunderline Link-Seal
      Calpico

2.14 WYE STRAINERS

A. Provide wye strainers as indicated on the drawings. Strainers shall be full line size of connecting piping, with ends matching the piping system materials, and with cast iron body. Select strainers for 125 psi working pressure, with stainless steel screens, and gasket seal. Provide a hose end ball valve on the drain fitting.

B. Strainer screens shall have an open area equal to at least twice the cross-sectional area of the pipe in which they are installed (based on IPS) and may be either woven wire or perforated type. Strainer openings shall be .045 inch diameter perforations for strainers up to 3” size and .125 inch diameter perforations for strainer sizes 4” and larger.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering low pressure strainers which may be incorporated in the work include the following, or approved equal:

   Zurn
   Watts
   Metraflex

2.15 BASKET STRAINERS

A. Provide basket strainers as indicated on the drawings. Strainers shall be full line size of connecting piping, with ends matching the piping system materials, and with cast iron body. Select strainers for 125 psi working pressure, with stainless steel screens, and gasket seal.

B. Strainer screens shall have an open area equal to at least twice the cross-sectional area of the pipe in which they are installed (based on IPS) and may be either woven wire or perforated type. Strainer openings shall be .045 inch diameter perforations for strainers up to 3" size and .125 inch diameter perforations for strainers 4" size and larger.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering low pressure strainers which may be incorporated in the work include the following, or approved equal:

Watts
Metraflex
Titan

D. When a low pressure drop basket strainer with automatic blowdown is scheduled on the drawings the strainer shall be Miller-Leaman Thompson Model MLS, or approved equal.

2.16 PIPE ANCHORS AND GUIDES

A. Provide pipe anchors and guides as indicated on the drawings and/or as required to accommodate any thermal expansion, contraction, or seismic movement of the piping system. Pipe anchors and guides shall be Metraflex Model PGIV, or approved equal by Mason Industries.

2.17 PIPING AND EQUIPMENT IDENTIFICATION

A. Each piping system furnished and installed under this work shall be identified and the direction of flow indicated by means of colored labels and flow arrows, all as specified herein. The labels shall be applied after all painting, priming, and cleaning of the piping and insulation is completed.

B. Provide prefabricated coiled plastic piping labels as manufactured by Marking Services Incorporated (MSI), or approved equal. Labels shall comply with ASME A13.1 with regard to color, letter height, and marker size. The labels shall have black or white lettering and flow arrows on colored backgrounds and shall not require adhesive. The background colors shall conform to the color schedule included in the 'Execution' section of this specification.

1. For pipe labels used indoors use coiled polyester labels, MSI Model MS-975, or equal.
2. For pipe labels used outdoors use coiled polyester labels, MSI Model MS-995, or equal.
3. For piping with an outside diameter, including insulation, greater than 6 inches provide the label manufacturer's nylon straps to secure label to piping. Labels shall lie smoothly against pipe or insulation completely around the pipe.
4. The size of the lettering and label shall be such that the lettering can be easily read from the floor and the colors shall be easily discernible.

C. Provide a white plastic lamacoid plate for each and every piece of equipment installed in this work. Lettering on plate shall be black, with size of lettering to suit equipment. Lettering shall be a minimum of 1/2 inch in height. Plates shall be riveted or bolted to equipment near electrical disconnect or control access panel.

D. Where mechanical or plumbing equipment requiring access is located above a ceiling or behind an access panel, provide an adhesive clear plastic label with 3/8" black lettering on the ceiling grid or access panel identifying the equipment.

E. Ground loop circuit piping inside a mechanical room shall be labeled to coincide with the numbering indicated on the mechanical drawings.

F. Available Manufacturers: Subject to compliance with requirements, manufacturers which may be incorporated in the work include the following, or approved equal:

Marking Services Incorporated (MSI)
LEM Products
Seton

Craftmark

2.18 DETECTABLE UNDERGROUND WARNING TAPE WITH EMBEDDED TRACER WIRE

A. Protect the following underground piping and conduit systems (when shown on the mechanical and/or plumbing drawings) with detectable underground warning tape, ‘Tracetape’ as manufactured by Damage Protection Solutions, or approved equal.
   1. All gas and/or fuel oil piping.
   2. All heating water, chilled water, and condenser water piping.
   3. All heat pump loop piping.
   4. Temperature control communication conduits.

B. Detectable underground warning tape shall consist of a No. 12 AWG solid copper tracer wire embedded in a 12 mil woven polyethylene jacket. The jacket shall be water and corrosion resistant, able to be elongated up to 500% before breaking, with custom colors and labeling.

C. Jacket color and labeling shall be specifically matched to the piping or conduit below.

D. Tape shall be buried approximately one half of the pipe buried depth, and in strict accordance with the manufacturer’s written installation instructions.
   1. Tape buried up to 24” deep shall be a minimum of 4” wide.
   2. Tape buried greater than 24” deep shall be a minimum of 6” wide.

E. The methodology for locating the installed detectable underground warning tape shall be demonstrated to the Owner and Engineer by the Contractor utilizing an appropriate locating device. Locating device shall be Ridgid ‘Seetech’, Ridgid ‘Navitrack’, or approved equal.

2.19 PAINTING

A. In general, painting will be done by others. Exposed piping and unfinished portions of equipment to be painted shall be cleaned by this Contractor of grease, oil, rust, or dirt in preparation for painting. Spot prime all factory primed surfaces as necessary.

2.20 CONCRETE WORK

A. Where specifically indicated on the drawings or specified as part of the mechanical work, this Contractor shall furnish and install concrete work such as thrust blocks and/or spring isolator bases.

B. Concrete and reinforcing steel shall be equal to that specified for general construction.

C. Except as noted above, concrete work will be furnished and installed by others. This Contractor shall coordinate all requirements accordingly.

2.21 ELECTRIC MOTORS

A. Electric motors larger than 1/2 horsepower rating, unless otherwise noted, shall be ball bearing, open drip proof, squirrel cage, induction type, normal starting torque, 3 phase, 60 cycle service, 40°C continuous rating, and shall conform in all respects to latest applicable standards of NEMA and AIEE. Motors shall be Century, Louis Allis, Baldor, or equal. Motors located outdoors shall be TEFC type.

B. All motors 1 horsepower and above shall be premium efficiency type, Century E-Plus, or approved equal.

C. Motors utilized with variable frequency drives shall be rated as inverter duty per NEMA standards.

D. Motors shall have nameplate voltage rating of operating voltage specified in subsequent sections of specifications or as shown on drawings and shall have a 1.15 service factor.

E. For normal applications, motors shall be furnished for normal starting torque duty. It shall be this Contractor's responsibility, however, to provide motors and starters (where starters are furnished under this section) having suitable starting torque and current characteristics to allow starting the equipment within the branch circuit protection provided and within the overload protection required by code.

F. Splash-proof or totally enclosed motors having a continuous duty temperature rise rating not exceeding 35°C shall have adequate starting torque, as recommended by the manufacturer, for the service intended.

G. All motors shall be rated at ±10% of the scheduled voltage. If not, provide each motor with a boost transformer sized for the intended use and installed in a rated enclosure.

1. Boost transformers for equipment provided under the mechanical work shall be furnished by the mechanical contractor and turned over to the electrical contractor for installation, unless otherwise noted.

H. Shaft Grounding

1. All variable frequency drive motors less than 300 horsepower shall have a single shaft grounding system to protect the bearings from capacitive discharge through the bearings.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers which may be incorporated in the work include the following, or approved equal:

   CR Series by Shaft Grounding Systems
   AEGIS SGR Conductive Microfiber Brush

2.22 WELDING

A. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

B. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M (Structural Welding Code - Steel).

C. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code Section IX. Comply with ASME B31.9 (Building Services Piping) for materials, products, and installation.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING SPECIALTIES

A. Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole and is flush with adjoining surface.

B. Sleeves: Secure sleeves to metal or wood forms in such a manner that they will not become displaced during pouring of concrete. Fill sleeves on deck with sand. After forms have been removed from concrete, the sleeves shall be removed from the openings.

C. Core drill properly sized holes in the concrete to replace metal sleeves that are crushed or knocked out of position during pouring of concrete.

D. Provide piping passing through concrete fire walls with sleeves of standard black steel pipe nominally one size larger than pipe enclosed, but in the case of insulated pipe, large enough for insulation to pass through. Caulk space between pipe and sleeve with fire rated wicking, and provide metal retainer plates at both sides of the wall.

3.2 INSTALLATION OF WYE STRAINERS

A. Install low pressure wye strainers shall be full size of the connected piping in accordance with manufacturer's installation instructions. Install pipe nipple and shutoff valve in the strainer blowdown connection, full size of connection, except for strainers 2 inches and smaller installed ahead of control valves feeding individual equipment. Where indicated, provide a drain line from the shutoff valve to the nearest plumbing drain, same size as the blowdown connection.

B. Locate strainers in the supply line ahead of the following equipment and elsewhere as appropriate, if an integral strainer is not included in the equipment:

Pumps
Temperature and/or flow control valves
Pressure reducing valves
Temperature and/or pressure regulating valves

3.3 INSTALLATION OF HANGERS AND SUPPORTS

A. See Specification Section 230530 (Hangers and Supports for HVAC Systems). Where special hanger/support of piping or ductwork is detailed or shown on the drawings, the drawings shall be followed.

3.4 INSTALLATION OF VALVES

A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane.

C. Provide union at each connection to equipment and downstream of each valve. Provide unions at both ends of valves when valves cannot be turned due to an obstruction.

D. After piping systems have been tested and put into service, but before final testing, adjusting, and balancing, inspect each valve for possible leaks. Adjust or replace packing to stop leaks; replace valve if leak persists.

E. Tag each valve and provide a complete listing of valve locations and functions. Valve and tag listing shall be laminated and turned over to the Owner for posting as desired. In addition, where valves are located above a ceiling or behind an access panel, provide an adhesive clear plastic label with black 3/8” lettering on ceiling grid or access panel identifying the valve.

3.5 INSTALLATION OF UNIONS AND FLANGES

A. Install unions and flanges so that piping can be easily disconnected for removal of tanks, equipment, and valves. Provide two unions at each 2-way valve and 3 unions at each 3-way valve.

3.6 INSTALLATION OF EXPANSION ANCHORS

A. Where permitted in other sections of this specification, expansion anchors may be used in hardened concrete.

B. Job testing: Load test 50 percent of the expansion anchors on each job to twice 80 percent of the ICBO recommended allowable load in tension for that particular anchor, except that if the design load is less than 75 pounds, only one anchor in ten need be tested. If any anchor fails, then test all anchors. Perform the load test in the presence of the building inspector or other designated owner’s representative.

3.7 INSTALLATION OF CATHODIC PROTECTION

A. Install dielectric unions in the following locations:
   1. At points in piping where dissimilar metal pipes are connected together.
   2. Any special applications shown on the drawings.

3.8 INSTALLATION OF GAUGES

A. Provide gauge connections at the following locations:
   1. Suction and discharge of chilled water, heating water, and geothermal bore field pumps.
   2. Inlet and outlet of butterfly type balancing valves.
   3. Elsewhere as shown on the drawings.

B. Gauges shall be provided in convenient locations within approximately 3 feet of the flanges or connections and elsewhere as may be shown on the drawings.

C. Gauge Valves and Siphons
   1. A needle point globe valve, Crane No. 88 or equal, shall be installed at each gauge.
   2. A gauge siphon shall be installed at each hot water gauge.

3.9 INSTALLATION OF THERMOMETERS

A. Thermometers for piping systems shall be installed so that the liquid flows completely around the sensing well. Pipe sizes at the bulb shall be increased where necessary to allow for full flow without excessive resistance.

B. Where shown on the temperature control diagrams, the temperature control subcontractor shall furnish and install remote panel-mounted thermometers. Duct-mounted thermometers may be omitted at these locations.

C. Thermometers shall be placed at all locations shown on the drawings.

D. In cases where the specified thermometers cannot be located so as to be easily read, a remote reading type thermometer shall be installed, as approved by the Architect/Engineer.

E. Thermometers provided as part of the temperature control work and located on a control panel need not be duplicated by the requirements listed above.

3.10 INSTALLATION OF PIPE IDENTIFICATION

A. Identification shall be applied to all piping, except piping located in furred spaces without access to permit entrance of personnel, and piping buried in the ground or concrete.

B. The legend and flow arrow shall be applied at all valve locations, at all points where piping enters or leaves a wall, partition, cluster of piping, or similar obstruction, and at approximately 20 foot intervals on pipe runs.

C. Practical variations or changes in locations and spacing may be made with the specific approval of the Architect/Engineer to meet specific conditions.

D. Wherever two or more pipes run parallel, the printed legend and other markings shall be applied in the same relative location so that all piping is easily identified.

E. Markings shall be located to be conspicuous from any reasonable vantage point.

F. The legends and flow arrows shall be in the colors as indicated in the pipe marking schedule.

G. Pipe labels shall be as described in Section 2.20 of this specification (Piping and Equipment Identification).

H. Pipe Marking Schedule

Service	Color
Heating Water Supply and Return	White on Green
Chilled Water Supply and Return	White on Blue
Heat Pump Supply and Return Water	White on Gray
Steam	Black on Yellow
Steam Condensate	White on Yellow

I. Where different equipment such as fire sprinklers are supplied from a common main, such as a domestic water main, the main should be identified as 'Domestic Water' and each respective branch takeoff as 'Fire Water', etc.

3.11 INSTALLATION OF AIR VENTS

A. Install air vents in hydronic systems at all high points and as required to adequately bleed all air from the piping systems and equipment during initial filling, normal operation, and subsequent filling of each piping system.

B. Install air vents in steam and condensate systems at all high points and as required to adequately bleed all air from the piping systems and equipment during initial filling, normal operation, and subsequent filling of each piping system. Air vents for steam systems shall be balanced pressure type, Spirax Sarco Model VS-204, or approved equal by Armstrong.

3.12 DEMOLITION WORK

A. Demolition work shall be performed only where specifically identified on the drawings. Unless specifically indicated otherwise, demolition work shall include removal of all associated equipment, electrical and controls components, conduit and wiring, piping, valves and accessories, and supports. The surfaces where the demolition work was performed shall be restored to match the adjacent surfaces to the best extent practical.

B. When demolition work involves leaving existing systems in place for a prolonged time period (more than 30 days and/or any time period when there is the potential for freezing temperatures) the Contractor shall protect all existing equipment, piping, and ductwork from potential damage during the time that the equipment, piping, and ductwork is out of service.

C. The protection procedures shall include draining all hydronic coils and the associated piping systems that may be susceptible to freezing temperatures when the building heating system is disabled.

D. The protection procedures apply to both hydronic piping and domestic water piping systems. After the piping systems are drained, the Contractor shall purge all water from the hydronic coils, hydronic piping systems, and domestic water piping systems using compressed air or other appropriate means, and shall seal any open ends such that the potential for corrosion is minimized. This work shall be performed by an experienced mechanical or plumbing contractor, rather than by a demolition contractor.

3.13 FORMING, CUTTING, AND PATCHING

A. Coordinate with other contractors as necessary to provide any special forming, recesses, chases, etc., and provide wood blocking, backing, and grounds as necessary for proper installation of mechanical work.

B. If this Contractor fails to coordinate with other contractors at the proper time or fails to locate items properly, resulting in extra work, the Contractor is responsible for the additional work, at no cost to the Owner.

C. This Contractor is responsible for proper placement of pipe sleeves, hangers, inserts, and supports for all work.

D. Cutting, patching, and repairing of existing (prior) construction to permit installation of piping, conduit, etc. is the responsibility of the Contractor. Repair or replace any damage that occurs to existing work in a first class manner using skilled mechanics for each trade involved.

E. Cut existing construction in a neat and workmanlike manner by the use of a concrete saw. Use of pneumatic devices is not acceptable.

F. Core openings through existing construction as required for the passage of any new piping and/or conduit. Cut holes of the minimum diameter required to suit the size of the pipe to be installed, including the associated insulation.

3.14 ELECTRICAL WORK

A. Adequate working space shall be provided around electrical equipment in compliance with the National Electrical Code and other applicable codes. Mechanical work shall be coordinated with the electrical work in order to comply with these requirements. Any work which does not conform to these requirements shall be corrected without additional cost to the Owner.

B. Furnish and install all line and low voltage temperature control wiring in the mechanical work (typically furnished and installed by the temperature control subcontractor) including all interlock wiring between motor starter coils, interlock relays, and temperature control equipment. Unless noted otherwise, this does not include primary control wiring between starters and pushbuttons, other manual starter switches, or branch power circuits required for the temperature control system.

C. Electrical Coordination

1. Starters located in motor control centers will be provided under the electrical work. The Contractor is referred to electrical drawings for motors served by motor control centers.
2. Motors furnished under the mechanical work shall be furnished by the mechanical contractor, but connection to power wiring shall be by the electrical contractor. Coordinate all motor starter requirements with the electrical contractor.
3. Temperature control equipment, including relays shown on control diagram, shall be furnished and installed by the temperature control subcontractor.
4. Electrical devices with piping connections, such as solenoid valves, insertion thermostats, strap-on aquastats, and similar items which are to be wired under the electrical work or by the temperature control subcontractor, shall be installed by the mechanical contractor.

D. Equipment furnished in this work that is factory wired but requires modification to internal wiring to meet specifications or drawing requirements shall have such internal modifications made at the factory before shipment.

E. All electrical work and equipment, including internal wiring, shall comply with applicable codes and applicable portions of the electrical specifications. Route line and low voltage control wiring in conduit. Conduit for temperature control wiring shall be the responsibility of the mechanical contractor and shall be of the type specified in Division 26.

3.15 POST-CONSTRUCTION OWNER TRAINING

A. In addition to the Owner training requirements listed in all other specification sections, the Contractor shall provide an overall comprehensive training session one month prior to the one year warranty expiration date. This session is intended to address any and all questions that the Owner’s facility staff may have with regard to operation and maintenance of all of the installed mechanical systems.

3.16 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.17 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.18 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 05 10 - VALVES FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of valves specified in this section include the following:

- Ball Valves
- Butterfly Valves
- OS&Y Valves
- Check Valves
- Manual Balance Valves
- Automatic Pressure-Compensating Flow Limiting Valves
- Air Vent Valves
- Tempering Valves
- Pressure Relief Valves
- Pressure Reducing Valves
- Miscellaneous/Specialty Valves

PART 2 - PRODUCTS

2.1 VALVES

A. Provide factory-fabricated valves as recommended by the manufacturer for use in the service indicated. Provide valves of types and with pressure ratings indicated for each service, or if not indicated, provide proper selections to comply with the installation requirements. Provide sizes and connections which properly mate with pipe, tube, and equipment connections.

B. Unless otherwise indicated, valves shall be the same size as the upstream pipe size.

C. Provide valves as shown on drawings and other valves necessary to segregate branches and equipment.

D. Furnish discs suitable for the service intended. Furnish a brass tag for each valve identifying the applicable service. Properly pack and lubricate all valves per manufacturer’s recommendations. Place a union adjacent to each threaded valve. Provide a union on both sides of soldered valves. Furnish the flow performance curve for each valve.

E. All valves 6 inch and larger located 10 feet or higher above finished floor shall be provided with chain operators.

F. Provide flanged valves in welded pipe, provide ball valves in water lines, unless otherwise indicated on the drawings.

G. Valves shall be full size of pipe, manufactured by Nibco, Milwaukee, Apollo, or equal, in accordance with the following listing:

Ball Valves	2" and below	Nibco T-585-70-66	Milwaukee BA-400S
Butterfly Valves	2-1/2" and above	Nibco LD-2022	Milwaukee HL-234E
OS&Y Valves	2-1/2" and above	Nibco F-667-O	Milwaukee F-2894-M
Check Valves	2” and below 2-1/2" and above	Nibco T-453-B Nibco F-968-B	Milwaukee 508 Milwaukee F-2970-M
Gas Valves	4” and below 5” and above	Nibco T-FP-600A Nordstrom 149	Apollo 94ALF-A Resun R-1431-WGA

H. Ball Valves: All ball valves shall have stainless steel ball and stem, PTFE packing, and throttling handle. Provide motor-operated ball valves where indicated on the drawings. Motor-operated ball valves shall be Belimo B2 Series, or approved equal.

I. Butterfly Valves: All butterfly valves shall be lug style ductile iron body, with EPDM seats, stainless steel disc and stem, and throttling handle with memory stop. Provide handles for shutoff service, and infinite position throttling capability, with indicator plates for balancing. Provide motor-operated butterfly valves where indicated on the drawings. Motor-operated butterfly valves shall be Belimo F6 Series, or approved equal.

1. For projects at the University of Nevada, Reno, butterfly valves shall be high performance double offset type with stainless steel body, disc, and stem. High performance butterfly valves shall be Nibco LCS-6822, Milwaukee HP Series, Pratt HP Series, or approved equal.

J. Lockshield valves shall be lead-free ball type with locking lever, Nibco T-585-80-LF-LL, Crane D171LS, or approved equal.

K. Globe valves and their trim shall be selected for the specific service that they are associated with. Globe valves shall be Nibco F-718-B, Milwaukee 2981-M, or approved equal.

L. Gate valves and their trim shall be selected for the specific service that they are associated with. Gate valves shall be Nibco NP450, Milwaukee 1140, or approved equal.

M. Manual Balance Valves (2” and Below): Fixed port venturi style, Pro-Hydronic CBV Series, IMI Flow Design AccuSetter UA Series, Pro-Hydronic CBVF Series, Taco Accu-Flo, Bell & Gossett Circuit Setter Plus, Nibco T-1810, or approved equal. Variable orifice balancing valves are not acceptable.

N. Manual Balance Valves (2-1/2” and Above): Fixed port venturi style, Pro-Hydronic CBVF Series, IMI Flow Design AccuSetter AF Series, Hays Series CBVF, Nexus Series NVFB, Bell and Gossett Circuit Setter Plus, Nibco F739, or approved equal. Variable orifice balancing valves are not acceptable.

O. Automatic Pressure-Compensating Flow Limiting Valves: Valves shall be Pro-Hydronic Model AFLB, IMI Flow Design Model AC, Hays Mesurflo Model 2517, Nibco Model T-1880, or approved equal. Include removable stainless steel cartridge, union, and test ports. Field adjustable type valves shall be Bell & Gossett Ultra Setter, Oventrop Cocon QTZ, or approved equal.

P. Manual Air Vent Valves: Manual air vents shall be furnished as indicated on the drawings, complete with ball type isolation valve, Hoffman Model 78, or approved equal. Valve pressure rating shall be as required for the system in which installed.

Q. Automatic Air Vent Valves: Automatic air vents shall be furnished as indicated on the drawings and shall be Hoffman No. 79, Spirotherm Spirotop, or approved equal. Pipe vents to the nearest floor sink. Valve pressure rating shall be as required for the system in which installed.

R. Tempering Valves: Provide tempering valves as scheduled on the drawings. Install per manufacturer’s written recommendations. Tempering valves shall be Lawler Series 61, or approved equal, with bronze finish, thermometer, and dual tempered water isolation valves.

S. Pressure Relief Valves

1. Provide ASME rated pressure relief valves and temperature and pressure relief valves as indicated on the drawings. Valve size and capacity shall be as required for proper relieving capacity equal to or greater than the capacity of the associated equipment output rating. Valves shall be sized and rated for compliance with Section IV of the ASME Boiler and Pressure Vessel Code and ANSI Z21.22 where applicable.

2. Pressure Relief Valves: Where indicated on the drawings for boilers, heat exchangers, chillers, etc. provide bronze body relief valves with test lever, complying with listing requirements for temperature and pressure discharge capacity. Valves shall be Watts Series 174A, Series 374, Series 740, or approved equal.
3. Combined Pressure and Temperature Relief Valves: When indicated on the drawings for water heaters and/or hot water storage tanks provide bronze body relief valves with test lever and thermal sensor (thermostat), complying with listing requirements for temperature and pressure discharge capacity. Valves shall be Watts XL Series, or approved equal.
4. Available Manufacturers: Subject to compliance with requirements, manufacturers offering relief valves which may be incorporated in the Work include the following, or approved equal:

   Watts
   Bell and Gossett
   Spirax Sarco

T. Pressure Reducing Valves
   1. Pressure reducing valves shall comply with ASSE Standard 1003.
   2. Pressure reducing valves shall be provided with the manufacturer's upstream strainer, and with an integral bypass capability. Provide upstream and downstream pressure gauges, and a full size valved bypass at each pressure reducing valve location.
   3. Pressure reducing valve size shall be as indicated on the drawings, and/or as appropriate for the associated maximum water flow. Pressure reducing valves for closed hot water and chilled water system make-up shall be 1 inch unless indicated otherwise on the drawings. Provide parallel valves for water flows that are beyond the capacity of a 3 inch pressure reducing valve.
   4. Valve Body shall be lead free brass or bronze. Valve end connections shall be threaded for valve sizes 2-1/2 inch and smaller, flanged for 3 inch valves.
   5. Valves shall be rated for an initial pressure of 150 psi. Valves shall be selected for inlet and outlet pressures as indicated on the drawings.
   6. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include the following, or approved equal:

      Watts Model 223-S-B
      Zurn Model 500XLYSBR

U. General Purpose Solenoid Valves: General purpose solenoid valves for air or water shall be Asco Series 8210, or approved equal.

V. Multi-Purpose Valves (Triple Duty Valves)
   1. Only when specifically indicated on the drawings, provide multi-purpose (triple duty) valves of size and capacity as indicated on the drawings. Valves shall provide shutoff, flow control, non-slam check, and flow metering functions.
   2. Construction: Cast or ductile iron body with non-slam bronze seat dish with EPDM seat insert, stainless steel stem and spring, and non-asbestos Teflon impregnated packing. Valve shall be rated at a working pressure of 125 psi. Provide with flanged end connections.

PART 3 - EXECUTION

3.1 INSTALLATION OF VALVES

A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane.

C. Provide union at each connection to equipment and downstream of each valve. Provide unions at both ends of valves when valves cannot be turned due to an obstruction.

D. After piping systems have been tested and put into service, but before final testing, adjusting, and balancing, inspect each valve for possible leaks. Adjust or replace packing to stop leaks; replace valve if leak persists.

E. Tag each valve and provide a complete listing of valve locations and functions. Valve and tag listing shall be laminated and turned over to the Owner for posting as desired. In addition, where valves are located above a ceiling or behind an access panel, provide an adhesive clear plastic label with black 3/8” lettering on ceiling grid or access panel identifying the valve.

3.2 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.3 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.4 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 05 20 - OPERATION AND MAINTENANCE OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Furnish the Architect/Engineer with two complete sets of typewritten operating and maintenance instructions, descriptive literature, catalog cuts, and diagrams covering all items of operation and maintenance for each and every mechanical system and piece of equipment furnished under these specifications.

B. In addition to the bound hard copies the Contractor shall provide an electronic copy (pdf file).

C. The Contractor shall begin compiling the above data (including obtaining operating and maintenance instruction data, catalog cuts, and diagrams from the manufacturer of the reviewed equipment) immediately upon review of his list of materials, so as not to delay the final installation and acceptance of the work.

D. Bind and index each set in a durable, hardboard binder. Final observation should not be requested until the operating and maintenance binders are submitted and have been reviewed by the Architect/Engineer.

E. Incorporate complete operating instructions including starting, stopping, and description of emergency manual operation methods for the following:

1. Heating Systems
2. Ventilating Systems
3. Air Conditioning Systems
4. Piping Systems
5. Temperature Control Diagrams
6. Test Data and Startup Reports

F. Provide charts and diagrams as required.

G. Provide operating manual for all equipment listed in individual sections of the specification.

H. Provide maintenance instructions for each item of individual equipment covering pertinent maintenance data, such as lubricants to be used, frequency of lubrication, inspections required, adjustments required, etc.

I. Provide parts bulletins containing manufacturer's part numbers, instructions, etc. for each item of equipment. Strip bulletins so that useless bulk is avoided.

J. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect/Engineer or Owner.

END OF SECTION

SECTION 23 05 30 - HANGERS AND SUPPORTS FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Section 230000 (Heating, Ventilating, and Air Conditioning), Section 230500 (Basic Materials and Methods for HVAC Systems), and Section 230540 (Seismic Bracing for HVAC Systems) are hereby made a part of this section.

1.2 GENERAL

A. The following information is for pipe hanger and support layout and design reference only. The actual design of all hangers, supports, and seismic bracing is the responsibility of the Contractor per the following specification sections:

Specification Section 23 05 30 (Hangers and Supports for HVAC Systems)
Specification Section 23 05 40 (Seismic Bracing for HVAC Systems)

B. Piping: Hangers and supports for piping shall be designed in accordance with the latest adopted edition of the standards and codes listed below, and with any other applicable standards. Except in cases where a pipe stress analysis is performed to justify adjusted support and restraint spacing, pipe hangers and supports shall not be placed at intervals that are further apart than the requirements listed in UPC Table 313.3 and in UMC Table 313.3.

Steel Piping	Maximum Spacing	Reference
1-1/4” and smaller	7 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
1-1/2”	9 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
2”	10 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
2-1/2”	11 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
3”	12 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
3-1/2”	13 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
4”	14 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
5”	16 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
6”	17 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
8”	19 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
10”	22 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
12”	23 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
14”	25 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
Copper Piping	**Maximum Spacing**	**Reference**
3/4” and smaller	5 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
1”	6 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
1-1/4”	7 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
1-1/2”	8 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
2”	8 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
2-1/2”	9 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
3”	10 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
3-1/2”	11 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
4”	12 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
5”	13 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
6”	14 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
8”	16 feet	ANSI/MSS SP-69 & SP-58 Tables 3 & 4
Gas Piping	**Maximum Spacing**	**Reference**
1/2”	6 feet	International Fuel Gas Code
3/4” & 1”	8 feet	International Fuel Gas Code
1-1/4” and larger	10 feet	International Fuel Gas Code

C. Ductwork: Hangers and supports for rectangular and round ductwork shall be designed in accordance with the latest adopted edition of the SMACNA HVAC Duct Construction Standards. Vertical duct supports shall also be designed in accordance with the latest adopted edition of the SMACNA HVAC Duct Construction Standards. Note that the SMACNA HVAC Duct Construction Standards require that duct hangers also be installed within 2 feet of duct elbows and within 4 feet of duct branch fittings.

D. Rectangular Ducts: Maximum spacing and strap and/or hanger rod sizes shall be in accordance with SMACNA HVAC Duct Construction Standards Table 4.1.

E. Round Ducts: Maximum spacing and strap and/or hanger rod sizes shall be in accordance with SMACNA HVAC Duct Construction Standards Table 4.2.

1.3 SUMMARY

A. This section includes the following:
   1. Metal Pipe Hangers and Supports
   2. Thermal Hanger Shield Inserts
   3. Fastener Systems
   4. Pipe Stands
   5. Ductwork Supports
   6. Equipment Stands
   7. Equipment Supports

B. Related Requirements: All hangers and support systems shall be designed, selected, and installed by the Contractor to comply with the requirements listed in Section 230540 (Seismic Bracing for HVAC Systems).

C. Costs for hanger, support, and seismic bracing systems complying with the requirements listed herein are the responsibility of the Contractor and shall be included in the Contractor’s bid. No extra cost will be allowed for failure to include the associated costs in the Contractor’s bid.

D. In no case shall hangers and/or supports for HVAC piping, ductwork, or equipment be attached to a metal roof deck, unless provisions or allowances are explicitly shown on the structural drawings.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for the following (Include product data for all components):
   1. Metal Framing (Strut) Systems
   2. Trapeze Pipe Hangers
   3. Pipe Stands
   4. Ductwork Supports
   5. Equipment Supports

C. Delegated Design Submittals: Provide comprehensive, all-inclusive, delegated design submittals for all listed items. Submittals shall comply with all performance requirements and design criteria, including analysis data, signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Details for fabrication and assembly of trapeze hangers.
   2. Design calculations utilized for designing the trapeze hangers.
   3. Design details and calculations for ductwork and equipment supports.

D. The work of this section shall be coordinated with the requirements for the Contractor furnished seismic design submittal for hangers and supports specified in Section 230540 (Seismic Bracing for HVAC Systems). Design and detailing of seismic bracing, hangers, and supports is the responsibility of the Contractor.

E. Submittals shall be fully coordinated with the structural drawings and shall include all applicable structural and seismic attachment details. Locations and the methods of attachment of hangers and supports to the main structural frame shall comply with the limitations specified in the structural drawings.

F. Submittals shall include all support anchorage loads and vectors broken out by discrete load type. Each specific load shall be indicated in the submittals and the structural element that the support is attached to shall be clearly depicted/identified.

G. Shop drawing submittals will be reviewed by both the design mechanical engineer and the design structural engineer (structural engineer when applicable).

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, Section IX.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Where required, engage a licensed professional engineer (licensed in the state where the project is located), to design trapeze pipe hangers/supports, ductwork hangers/supports, & equipment hangers/supports.

B. Structural Performance: Hangers and supports for HVAC piping, ductwork, and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE Standard 7-16.

1. Design hangers/supports for piping, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design hangers/supports for ductwork and associated accessories.
3. Design equipment hangers/supports capable of supporting combined operating weight of supported equipment, including connected systems and components.
4. Design seismic restraint hangers and supports for piping, ductwork, and equipment. See Section 230540 (Seismic Bracing for HVAC Systems).
5. Design of connections for hangers, supports, and bracing shall comply with the requirements indicated on the structural drawings.

2.2 GENERAL MATERIALS

A. Aluminum: ASTM B221.

B. Carbon Steel: ASTM A1011/A1011M.

C. Structural Steel: ASTM A36/A36M, carbon steel plates, shapes, and bars; galvanized.

D. Stainless Steel: ASTM A240/A240M.

E. Threaded Rods: Continuously threaded. Zinc plated or galvanized steel for indoor applications and stainless steel for outdoor applications. Mating nuts and washers shall be same or similar materials as rods.

F. Grout: ASTM C1107/C1107M, factory mixed and packaged, dry hydraulic cement, non-shrink and non-metallic grout; suitable for interior and exterior applications.
   1. Properties: Non-staining, non-corrosive, and non-gaseous.
   2. Design Mix: 5,000 psi, 28 day compressive strength.

2.3 HVAC EQUIPMENT HANGERS AND SUPPORTS

A. Provide delegated design as applicable for the specific equipment.

2.4 DUCTWORK HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Galvanized steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electro-galvanized, all-thread rods, or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA HVAC Duct Construction Standards - Metal and Flexible, Table 5-1 (Minimum Hanger Sizes for Rectangular Ducts) and Table 5-2 (Minimum Hanger Sizes for Round Ducts).

D. Steel Cables for Galvanized Steel Ducts: Galvanized steel complying with ASTM A603.

E. Steel Cables for Stainless Steel Ducts: Stainless steel complying with ASTM A492.

F. Steel Cable End Connections: Galvanized steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. Trapeze and Riser Supports
   1. Supports for Galvanized Steel Ducts: Galvanized steel shapes and plates.
   2. Supports for Stainless Steel Ducts: Stainless steel shapes and plates.
   3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.5 HVAC 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: Pre-galvanized, hot dip galvanized, or electro-galvanized.
   3. Non-Metallic Coatings: Plastic coated or epoxy powder coated.
   4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support the bearing surface of the piping.
   5. Hanger Rods: Continuous thread rod, nuts, and washers 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 washers made of carbon steel.

C. Copper Pipe and Tube Hangers
   1. Description: MSS SP-58, Types 1 through 58, copper plated steel, factory fabricated components.
   2. Hanger Rods: Continuous thread rod, nuts, and washers made of carbon steel.

2.6 HANGER AND SUPPORT MATERIALS

A. Additional hanger and support requirements are listed in sections specifying piping, ductwork, and equipment.

B. Comply with MSS SP-58 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, ductwork, 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 metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

F. Use copper plated pipe hangers and copper or stainless steel attachments for copper piping and tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Use thermal hanger shield inserts for insulated piping and tubing.

I. 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 non-insulated or insulated, stationary pipes 1/2” thru 30” size.
2. Yoke Type Pipe Clamps (MSS Type 2): For suspension of up to 1050°F, pipes 4” thru 24” size, requiring up to 4 inchesof insulation.
3. Carbon or Alloy Steel, Double Bolt Pipe Clamps (MSS Type 3): For suspension of pipes 3/4” thru 36” size, requiring clamp flexibility and up to 4 inchesof insulation.
4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes 1/2” thru 24” size if little or no insulation is required.
5. Pipe Hangers (MSS Type 5): For suspension of pipes 1/2” thru 4” size, to allow off center closure for hanger installation before pipe erection.
6. Adjustable Swivel Split or Solid Ring Hangers (MSS Type 6): For suspension of non-insulated, stationary pipes 3/4” thru 8” size.
7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated, stationary pipes 1/2” thru 8” size.
8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated, stationary pipes 1/2” thru 8” size.
9. Adjustable, Swivel Ring Band Hangers (MSS Type 10): For suspension of non-insulated, stationary pipes 1/2” thru 8” size.
10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of non-insulated, stationary pipes 3/8” thru 8” size.
11. Extension Hinged or Two Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated, stationary pipes 3/8” thru 3” size.
12. U-Bolts (MSS Type 24): For support of heavy pipes 1/2” thru 30” size.
13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
14. Pipe Saddle Supports (MSS Type 36): For support of pipes 4” thru 36” size, with steel pipe base stanchion support and cast iron floor flange or carbon steel plate.
15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes 4” thru 36” size, with steel pipe base stanchion support and cast iron floor flange or carbon steel plate, and with U-bolt to retain pipe.

16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion type support for pipes 2-1/2” thru 3” size, 6” size if vertical adjustment is required, with steel pipe base stanchion support and cast iron floor flange.
17. Single Pipe Rolls (MSS Type 41): For suspension of pipes 1” thru 3” size, from two rods if longitudinal movement caused by expansion and contraction may occur.
18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes 2-1/2” thru 24” size, from single rod if horizontal movement caused by expansion and contraction may occur.
19. Complete Pipe Rolls (MSS Type 44): For support of pipes 2” thru 42” size if longitudinal movement caused by expansion and contraction may occur but vertical adjustment is unnecessary.
20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes 2” thru 24” size if small horizontal movement caused by expansion and contraction may occur and vertical adjustment is unnecessary.
21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes 2” thru 30” size if vertical and lateral adjustment during installation may be required in addition to expansion and contraction.

J. 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 3/4” thru 24”.
   2. Carbon or Alloy Steel Riser Clamps (MSS Type 42): For support of pipe risers 3/4” thru 24” size if longer ends are required for riser clamps.

K. 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 inchesfor heavy loads.
   2. Steel Clevises (MSS Type 14): For 120°F to 450°Fpiping installations.
   3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
   4. Malleable Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
   5. Steel Weldless Eye Nuts (MSS Type 17): For 120°F to 450°Fpiping installations.

L. 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. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
   8. Side Beam Clamps (MSS Type 27): For bottom of steel I-beams.
   9. Steel Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
   10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.

11. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. 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 lbs.
    b. Medium (MSS Type 32): 1,500 lbs.
    c. Heavy (MSS Type 33): 3,000 lbs.
13. Side Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

M. 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.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system sections, install the following types:
    1. Restraint Control Devices (MSS Type 47): Where indicated to control piping movement.
    2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
    3. Spring Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
    4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
    5. Variable Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
    6. 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.
    7. Variable Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
    8. Constant Supports: For critical piping stress and if necessary, to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load adjustment capability. These supports include the following types:
        a. Horizontal (MSS Type 54): Mounted horizontally.
        b. Vertical (MSS Type 55): Mounted vertically.
        c. Trapeze (MSS Type 56): Two vertical type supports and one trapeze member.

O. Comply with MSS SP-58 for trapeze pipe hanger selections and applications that are not specified in piping system sections.

P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system sections.

Q. Use powder actuated fasteners and mechanical expansion anchors instead of building attachments where required in concrete construction.

2.7 TRAPEZE PIPE HANGERS

A. Description: MSS SP-58, 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.

2.8 METAL FRAMING (STRUT) SYSTEMS

A. Metal Framing Manufacturers Association (MFMA) Metal Framing Systems

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

   B-line
   Unistrut
   Flex-Strut
   G-Strut
   Miro Industries

2. Description: Shop or field fabricated, pipe support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
3. Standard: Comply with MFMA-4 factory fabricated components for field assembly.
4. Channels: Continuous slotted carbon steel channel with in-turned lips.
5. Channel Width: Selected for applicable load criteria.
6. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
7. Hanger Rods: Continuous thread rod, nuts, and washers made of carbon steel.
8. Metallic Coating: Zinc dichromate finish applied over an electro-galvanized zinc plating.

2.9 THERMAL HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:
   Pipe Shields
   nVent/Caddy
   Buckaroos

B. Standard Insulation Insert Material for Cold Piping: Polyisocyanurate high density insulation, with 125 psiminimum compressive strength, a flame spread/smoke developed rating of 25/50 or less, and vapor barrier.

C. Standard Insulation Insert Material for Hot Piping: Polyisocyanurate high density insulation, with 125 psiminimum compressive strength, a flame spread/smoke developed rating of 25/50 or less; or calcium silicate with 100 psiminimum compressive strength.

D. Structural/Seismic Insert Material for Cold Piping: Polyisocyanurate high density insulation, with a minimum density of 14 lbs/ft^3, a minimum compressive strength of 900 psi, and a flame spread/smoke developed rating of 25/50 or less. Structural inserts shall be used as recommended by the insert manufacturer to meet load ratings.

E. Structural/Seismic Insert Material for Hot Piping: Calcium Silicate with a minimum density of 28 lbs/ft^3 and a minimum compressive strength of 900 psi. Structural inserts shall be used as recommended by the insert manufacturer to meet load ratings.

F. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

G. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

H. Insert Length: Extend 2 inchesbeyond sheet metal shield for piping operating below ambient air temperature.

I. Provide a vapor barrier steel jacket around insulation. Insulation jackets shall be galvanized steel conforming to ASTM A653. Hanger bearing surface shall consist of a galvanized sheet metal insulation protection shield or casing.

J. Thermal hanger supports shall be load rated. Load ratings shall be established by the pipe support manufacturer based upon testing and analysis in conformance with the current edition of following codes and standards: ASME B31.1, MSS SP-68, SP-69, and SP-89.

K. Unless otherwise indicated, thermal hanger supports shall be as indicated in the following schedule, or approved equal. The listed model numbers are based on Pipe Shields.
   1. Pipe supported on hangers: Models A2000, A4000, A9000, and D3000 series.
   2. Pipe supported on flat surfaces: Models A2000, A4000, A6000, A7000, A7200, and A7400.
   3. Pipe Supported on pipe rolls: Models A4000, A6000, A8200, and A8400.
   4. Pipe supported on slides and guides: Model B series.
   5. Riser pipe supports: Model E series.

L. The selected model(s) shall conform to pipe service, support style, and support spacing.

M. Pipe support spacing shall be in accordance with the manufacturer's recommendations, but in no case shall exceed the maximum spacing required by ASME B31.1.

2.10 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. Powder actuated fasteners may only be utilized for point loads of 50 lbs or less.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

      Hilti
      ITW Ramset (Red Head)
      Simpson Strong-Tie

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 stainless steel.
   2. Outdoor Applications: Stainless steel.
   3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

      Hilti
      ITW Ramset/Red Head
      B-line

2.11 PIPE STANDS

A. General Requirements for Pipe Stands: Shop or field fabricated assemblies made of manufactured corrosion resistant components to support roof mounted piping.

B. Compact Pipe Stand
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

      Miro Industries
      PHP Systems/Design
      Rooftop Support Systems
   2. Description: Single base unit with integral rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
   3. Base: Single, vulcanized rubber, molded polypropylene, or polycarbonate.
   4. Hardware: Galvanized steel or polycarbonate.
   5. Accessories: Protection pads.

C. Low Profile, Single Base, Single Pipe Stand
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

      Miro Industries
      PHP Systems/Design
      Rooftop Support Systems
   2. Description: Single base with vertical and horizontal members, and pipe support, for roof installation without membrane protection.
   3. Base: Single, vulcanized rubber, molded polypropylene, or polycarbonate.
   4. Vertical Members: Two galvanized steel, continuous thread 1/2 inchrods.
   5. Horizontal Member: Adjustable horizontal, galvanized steel pipe support channels.
   6. Pipe Supports: Roller strut clamps, clevis hanger, or swivel hanger.
   7. Hardware: Galvanized steel.
   8. Accessories: Protection pads.
   9. Height: 12 inchesabove roof, or as indicated on the drawings.

D. High Profile, Multiple Pipe Stand
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

      Miro Industries
      PHP Systems/Design
      Rooftop Support Systems
   2. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
   3. Bases: Two or more vulcanized rubber molded polypropylene insert material.
   4. Vertical Members: Two or more galvanized steel channels.
   5. Horizontal Members: One or more adjustable height, galvanized steel pipe supports.
   6. Pipe Supports: Roller strut clamps, clevis hanger, swivel hanger.
   7. Hardware: Galvanized steel.
   8. Accessories: Protection pads**,** 1/2 inchcontinuous thread rod.
   9. Height: 24 inchesabove the roof or as indicated on the drawings.

E. Curb Mounted Type Pipe Stands: Shop or field fabricated pipe supports made from structural steel shapes, continuous thread rods, and rollers, for mounting on permanent stationary roof curb.

2.12 EQUIPMENT SUPPORTS

A. Description: Welded, shop or field fabricated equipment supports made from structural carbon steel shapes.

2.13 OUTDOOR EQUIPMENT STANDS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or approved equal:

Miro Industries
Rooftop Support Systems

B. Description

1. Description: Individual foot supports with elevated adjustable channel cross bars and clamps/fasteners/bolts for ground or roof supported outdoor equipment components, without roof membrane penetration, in a pre-fabricated system that can be modularly assembled on site.
2. Foot Material: Rubber or polypropylene.
3. Rails Material: Hot dip galvanized carbon steel.
4. Wind/Sliding Load Resistance: Up to 120 mph, or as indicated on the structural drawings.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with all requirements in other section of the specifications for firestopping materials and installation for penetrations through fire rated walls, ceilings, and assemblies.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lbs.

3.2 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe Hanger Installation: Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe Hanger Installation: Comply with MSS SP-58. 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 A36/A36M, 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 inchesthick 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 Stand Installation
   1. Pipe Stand Types Except Curb Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate the roof membrane.
   2. Curb Mounted Type Pipe Stands: Assemble components or fabricate pipe stands and mounts on a permanent, stationary roof curb.

F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

G. 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.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, 2-1/2” pipe size 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.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. 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.

L. 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. Optional: Thermal hanger shield inserts may be used. Include steel weight distribution plate for pipe NPS 4and 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. Optional: Thermal hanger shield inserts may be used. Include steel weight distribution plate for pipes 4”and larger if pipe is installed on rollers.
   4. Shield Dimensions for Pipe: Not less than the following:
      a. 1/2” to 3-1/2” pipe: 12 incheslong and 0.048 inchthick.
      b. 4” and 5” pipe: 18 incheslong and 0.06 inchthick.
      c. 8” thru 14” pipe: 24 incheslong and 0.075 inchthick.
      d. 16” thru 24” pipe: 24 incheslong and 0.105 inchthick.
   5. Pipes 8”and Larger: Include wood or reinforced calcium silicate insulation inserts of length at least as long as the protective shield.
   6. Thermal Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT HANGERS/SUPPORTS

A. Fabricate structural steel supports to suspend equipment from structure overhead or structural steel stands to support equipment above the floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing for equipment supports to prevent swaying.

3.4 DUCTWORK HANGERS/SUPPORTS

A. Fabricate structural steel supports to suspend ductwork from structure overhead.

B. Fabricate structural steel stands to support ductwork above the floor (when indicated on the drawings). Provide lateral bracing for ductwork supports to prevent swaying.

3.5 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.

3.6 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 1-1/2 inches.

3.7 PAINTING

A. 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. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A780/A780M.

END OF SECTION

SECTION 23 05 40 - SEISMIC BRACING FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Section 230000 (Heating, Ventilating, and Air Conditioning), Section 230500 (Basic Materials and Methods for HVAC), and Section 230530 (Hangers and Supports for HVAC Systems) are hereby made a part of this section.

1.2 GENERAL

A. Seismic bracing for mechanical systems (equipment, ductwork, piping, and conduit) shall comply with all applicable requirements of the latest adopted edition of the International Building Code (IBC) including all applicable provisions of the latest adopted edition 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. The anchorage calculations shall show compliance with the latest adopted edition of the American Concrete Institute (ACI) Standards, Handbooks, and Manuals where anchoring to concrete for the project-specific loads and conditions, including project specific calculations for anchors, clips, and fasteners.

C. Anchorage calculations for seismic roof curbs shall be included in seismic roof curb submittal, including a stamped plan or detail showing the anchorage requirement. This detail shall include specific anchor type, diameter, embedment, and layout or spacing. The anchorage calculation shall show compliance with the American Concrete Institute (ACI) where anchoring to concrete for the specific loads and conditions present, including project specific calculations for anchors, clips, and fasteners

D. Compliance with the applicable seismic bracing requirements for equipment, ductwork, piping, and conduit shall be accomplished utilizing the most current version of one of the following design manuals, or approved equal.

International Seismic Application Technology (ISAT) Design Manual

Mason Industries Seismic Restraint Design Manual

Vibro-Acoustics Seismic Design Manual

SMACNA Seismic Restraint Manual (Guidelines for Mechanical Systems)

E. Component Importance Factors (Ip) for all equipment, ductwork, piping, and conduit shall be determined and assigned in accordance with ASCE Standard 7-16 Section 13.1.3.

F. Design and detailing of seismic bracing, hangers, and supports for equipment, ductwork, piping, and conduit is the responsibility of the Contractor.

G. Design of connections for hangers, supports, and bracing shall comply with the requirements indicated on the structural drawings (when provided).

H. The work of this section shall be coordinated with the requirements for the Contractor furnished delegated design submittal for hangers and supports specified in Section 230530 (Hangers and Supports for HVAC Systems). Design and detailing of seismic bracing, hangers, and supports is the responsibility of the Contractor.

1.3 SUBMITTALS

A. The Contractor shall provide the required number of seismic shop drawing submittal sets for review and approval by the Engineer. Submittals shall include a comprehensive set of shop drawings clearly depicting the seismic bracing requirements for all equipment, ductwork, piping, and conduit. Any piping or conduit that does not require seismic bracing shall be specifically identified in the submittal, and the reason for exemption shall be provided. Cite any and all references for the exemption. In cases where seismic bracing is not required due to the supported items being less than 12 inches below the supporting structure, a single note may be provided to cover those locations.

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 with current registration licensed in the State of Nevada (or licensed in the state where the project is located, if the project is located outside the State of Nevada).

C. Seismic shop drawing submittals will be reviewed by both the design mechanical engineer and the design structural engineer.

1.4 SITE VISITS (QUALITY CONTROL)

A. 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. As a minimum, an authorized representative shall visit the site when the seismic bracing installation is complete (and prior to installation of the ceilings).

B. A written report shall be issued within one week the site visit summarizing the observations made during the site visit and listing all required corrective actions and/or deficiencies. The report shall be made available to both the design mechanical engineer and the design structural engineer.

C. 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

D. Site visits shall be coordinated with the Owner and shall be scheduled in writing a minimum of one week prior to the proposed site visit date.

END OF SECTION

SECTION 23 05 50 VIBRATION ISOLATORS FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning), 230500 (Basic Materials and Methods for HVAC Systems), and 230530 (Hangers and Supports for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of vibration isolation products specified in this section include the following:
   1. Spring Isolators
   2. Spring Hangers
   3. Waffle Pad Isolators
   4. Roof or Exterior Concrete Slab Mounted Supports
   5. Pipe Riser Support Isolators
   6. Seismic Snubbers

B. Vibration isolation products furnished as part of factory-fabricated equipment are specified as part of the equipment assembly in other Division 23 sections.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in the manufacture of vibration isolation products of types and sizes required, whose products have been in satisfactory use in similar service for a minimum of 5 years.

B. Unless noted otherwise, all isolators shall be from single manufacturer.

C. Select isolation devices for uniform static deflections according to distribution of weight.

D. Select isolators to minimize vibration and noise transmission from equipment to the building structure using mounts and hangers. Coordinate weights and locations as required.

E. Reference Standards: SMACNA (Sheet Metal and Air Conditioning Contractors National Association). Provide isolation and seismic snubbing in accordance with the SMACNA standards.

F. For projects located in California all isolators shall be California Department of Health Care Access and Information (HCAI) pre-approved. Non-approved isolators will not be considered.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data including installation instructions for each type of vibration isolation product.

B. For all spring isolators include a tabulation of the design data, including supported equipment weight, free spring height, operating spring height, and solid spring height.

PART 2 - PRODUCTS

2.1 SPRING ISOLATORS

A. Spring isolators shall be housed type, with a minimum deflection of 1 inch and minimum outside diameter not less than spring operating height. Provide housing with screw-type adjustment at top of housing and with neoprene isolation material at all potential points of metal-to-metal contact. The size of spring isolators shall be as recommended by the isolator manufacturer for the weight of the supported equipment.

B. See Section 3.1 (Application) for equipment requiring spring isolators.

C. Spring isolators shall be furnished with height-saving brackets welded to channel base frames, with leveling bolts and base plate with non-skid neoprene or one inch thick pre-compressed fiberglas isolation pad. The springs shall have a minimum travel of 50 percent between the design height and the solid height. Isolator base plates shall be bolted to the floor, with size and number of bolts as recommended by the isolator manufacturer.

D. Available Manufacturers: Subject to compliance with requirements, manufacturer offering products which may be incorporated in the work include the following, or approved equal:

Mason Industries Model SSLFH
Kinetics Noise Control Model FLSS

2.2 SPRING HANGERS

A. Support equipment suspended from overhead with combination spring and rubber-in-shear hangers in the support rods. Provide hangers with a minimum of 1 inch of deflection, capable of moving through a 30 degree arc without any metal-to-metal contact. The size of spring isolators shall be as recommended by the isolator manufacturer for the weight of the supported equipment. Spring hangers shall be pre-loaded

B. See Section 3.1 (Application) for equipment requiring spring hangers.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following, or approved equal:

Mason Industries Model PC30N
Kinetics Noise Control Model SPH

2.3 PIPE RISER SUPPORT ISOLATORS

A. Provide manufacturer's standard pad-type isolator and secure to pipe riser clamp for support of piping at each floor level above grade.

2.4 SEISMIC SNUBBERS

A. Provide all spring-isolated equipment or structures with adequate seismic snubbing. Select snubbers to restrict lateral movement in all directions and bolt to both the equipment and the floor or overhead structure. Select snubbers to allow 1/4 inch motion in any horizontal direction, and provide adjustments to limit vertical or rocking motion to 0.1 inch. Provide snubbers with a minimum rating equal to the weight of the equipment and base divided by the number of snubbers (1 g rating). Arrest motion with resilient material designed for 500 psi minimum at the 1 g load. Accommodate a 2 g load without distortion.

B. The vibration isolation manufacturer shall provide seismic snubbers as part of a complete package, including base frame and springs, or spring hangers.

PART 3 - EXECUTION

3.1 APPLICATION

A. General: Except as otherwise indicated, apply the following types of vibration isolators at the indicated locations.

Waffle Pad Isolators:	Chillers Condensing Units 6 Tons and Larger Base Mounted Pumps Floor Mounted Heat Pumps
Spring Isolators:	Pumps Mounted Inside a Building Above Grade Air Compressors
Spring Hangers:	Fan Coil Units Horizontal Heat Pumps In-Line Fans (1 HP and Larger) In-Line Circulating Pumps (1 HP and Larger) Steam, Steam Condensate, and HTHW Piping

3.2 INSTALLATION

A. Except as otherwise indicated, comply with manufacturer's instructions for installation and load application for vibration isolation materials and units. Adjust to ensure that units do not exceed rated operating deflections or bottom out under loading, and are not short-circuited by other contact or bearing points.

3.3 INSPECTION

A. Examine areas and conditions under which vibration isolation products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Contractor and Engineer.

3.4 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect/Engineer. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.5 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.6 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 07 00 - HVAC SYSTEMS INSULATION

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of mechanical insulation specified in this section include the following:

1. Ductwork Systems Insulation

   Supply Air and Return Air Ducts
   Outside Air Intake Ducts

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Insulation specialty firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

B. IECC Compliance: Comply with applicable portions of the 2024 International Energy Conservation Code, including, but not limited to Section C403.13.

C. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) recommendations for all work in this section.

D. ASHRAE Standards: Comply with applicable portions of American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommendations for all work in this section.

E. NFPA Standards: Comply with applicable portions of ANSI/NFPA Standard 90A (Standard for the Installation of Air Conditioning and Ventilating Systems) and ANSI/NFPA 90B (Standard for the Installation of Warm Air Heating and Air Conditioning Systems) for all work in this section.

F. NAIMA Standards: Comply with all applicable portions of the North American Insulation Manufacturers Association (NAIMA) standards for all related work in this section.

G. MICA Standards: Comply with all applicable portions of the Midwest Insulation Contractors Association standards for all related work in this section.

H. Install thermal insulation products on equipment in accordance with the manufacturer's written instructions and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of insulation. Submit schedule showing manufacturer's product number, k-Value, thickness, density, and furnished accessories for each mechanical system requiring insulation. Include complete description of installation methods with this submittal.

PART 2 - PRODUCTS

2.1 DUCTWORK INSULATION MATERIALS

A. General: All duct insulation R-Values and thicknesses shall meet or exceed the requirements listed in 2024 International Energy Conservation Code Section C403.13.

B. See Specification Section 233100 (HVAC Ductwork) for additional related requirements.

C. Ductwork Insulation (General)

1. All concealed supply air ductwork (rectangular and round) shall be internally insulated unless indicated otherwise on the drawings.
2. All concealed return air ductwork (rectangular and round) that is located in a return air plenum is not required to be insulated, unless indicated otherwise on the drawings.
3. Supply air and return air ductwork that is exposed in a conditioned space does not require insulation.
4. All outside air ductwork is required to be insulated.

D. Ductwork Liner Insulation (See Specification Section 233100 (HVAC Ductwork).

.Sound Attenuating Duct Wrap

1. Where indicated on the drawings acoustical insulation shall be applied to the supply and return air vertical drops at each air handling unit plus the next 15 feet of horizontal supply and return air duct (as measured to/from the centerline dimension of the associated duct elbows). In any case where the first 15 feet of horizontal ductwork includes branches in two or more directions each of those branches shall also be sound insulated to the specified 15 feet distance.
2. Acoustical duct wrap shall consist of 2” thick, nominal 2 lb density fiberglass insulation plus a 2.0 lbs/sf reinforced foil faced sound barrier. Acoustical duct wrap shall be Industrial Noise Control Products ‘Sound Seal B-20’, or approved equal, with an overall R-value equal to 9.0. Sound insulation shall be installed in strict accordance with the manufacturer's written instructions and in accordance with these specifications. Duct liner is not required on ducts that receive sound attenuating duct wrap. Duct wrap shall have a flame/smoke rating less than 25/50 complying with ASTM E84.
3. All sound insulation seams shall be sealed with pressure-sensitive tape (Shurtape AF-984CT, or approved equal). Longitudinal seams shall have a 4 inch overlap of the sound barrier secured with outward clinching staples and pressure-sensitive tape. In addition to the specified sealing procedure secure insulation with 16 gauge galvanized wire tied on 16” centers and within 8 inches of insulation seams.
4. Secure insulation on the underside of ducts that are wider than 24 inches with Duro-Dyne PBH Dynastick Fasteners adhered with Duro-Dyne PBACZVOC Dynastick Adhesive placed on 18” centers and within 6 inches of insulation seams.
5. Galvanized wire ties are also required on the rectangular ducts that are wider than 24 inches where the insulation is secured with pins and washers as outlined in the preceding paragraph.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING INSULATION

A. The term ‘piping’ used herein shall include pipe, valves, strainers, and fittings. Apply insulating cements to fittings, valves, and strainers, and trowel smooth to the thickness of adjacent covering. Covering on valves shall extend up to the bonnet. The covering cement shall be of the types specified herein.

B. Install all insulation products in accordance with the manufacturer's written instructions and in accordance with recognized industry practices.

C. Install insulation on pipe systems subsequent to installation of heat tracing, testing, and acceptance of tests.

D. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full length units of insulation, with single-cut pieces to complete each run. Do not use cut pieces or scraps abutting each other.

E. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

F. Extend piping insulation without interruption through walls, floors, and similar penetrations, except piping through fire walls.

G. Install pipe hangers on the outside of the insulation and not in contact with the pipe. Protect insulation as specified in Specification Section 230500 (Basic Materials and Methods for HVAC Systems) under 'Hangers and Supports for Ductwork and Piping'.

H. Install a 6 inch long section of rigid insulation at each pipe saddle and/or hanger. Rigid sections shall be calcium silicate, except on chilled water piping where rigid sections shall be foamglas.

I. Seal all raw ends of insulation with Childers CP-10 weather barrier sealant, or approved equal.

3.2 INSTALLATION OF DUCTWORK INSULATION

A. Install insulation products in accordance with the manufacturer's written instructions and in accordance with these specifications.

B. Extend ductwork insulation without interruption through walls, floors, and similar penetrations, except ductwork through fire rated walls and where otherwise indicated.

C. Except where otherwise indicated, external duct insulation may be omitted on ductwork where internal duct liner insulation has been specified.

D. Except where otherwise indicated, ductwork exposed in conditioned spaces is not required to be insulated.

3.3 INSTALLATION OF EQUIPMENT INSULATION

A. Install all equipment insulation materials with smooth and even surfaces and on clean and dry surfaces. Replace any poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.

B. Do not apply insulation to equipment, flues, breechings, or stacks while hot.

C. Do not insulate cleanouts, ASME stamps, or equipment manufacturer's nameplates. Provide neatly beveled edges at interruptions of insulation.

3.4 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective insulation. Leave entire work in condition satisfactory to the Architect/Engineer. At completion, carefully clean equipment installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.5 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 08 00 - TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

B. Section 230910 (Sequence of Operation) is hereby made a part of this section.

1.2 WORK INCLUDED

A. Temperature performance testing on all heat transfer equipment and/or components.

B. Test and balance of air distribution systems and associated equipment and apparatus.

C. Test and balance of hydronic distribution systems and associated equipment and apparatus.

D. Testing, setting, and adjusting speed and volume of systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required by the contract documents.

E. Component types of testing, adjusting, and balancing specified in this section includes the following as applied to mechanical equipment:

Piping Systems
Heat Pumps (Water)
Ductwork Systems
Balancing Valves for HVAC Systems

1.3 QUALITY ASSURANCE

A. Balance Agency: Provide services and facilities of an independent agency that specializes in testing, analysis, and balancing of hydronic systems and air distribution for heating and/or cooling systems. Work shall be done by qualified engineering technicians and trained personnel, using instruments certified accurate to limits used in standard practice for testing and balancing of hydronic and air distribution for heating and cooling systems. The balance agency shall field test air and hydronic flows in accordance with the methods prescribed by the Associated Air Balance Council, National Standard Volume 1, latest edition.

B. The balance agency shall be a member of the Associated Air Balance Council. Subject to compliance with requirements, the balance agency shall be one of the following (no exceptions):

RS Analysis
Raglen System Balance

C. The balance agency shall submit the results of tests in this section to the Architect/Engineer for review and acceptance.

D. AABC Compliance: Comply with AABC ‘National Standards’ Volume 1, as applicable to mechanical air and hydronic distribution systems and associated equipment and apparatus.

E. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments, and testing, adjusting and balancing, except as otherwise indicated.

F. Reference Standards

1. AABC (Associated Air Balance Council) AABC National Standards Volume 1.
2. ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers).

G. Test Instruments: Utilize test instruments and equipment for the test and balance work required, of type, precision, and capacity as recommended in AABC National Standards Volume 1.

1.4 SUBMITTALS

A. Provide a test and balance agenda that includes step-by-step testing and balancing procedures, test sheets, and schematic drawings, all being specific to the project.

B. Provide submittals to indicate the extent of work proposed. Submit certified test reports as hereinafter specified signed by test and balance technician/supervisor that performed test and balance work.

C. Include identification and types of instruments used and their most recent calibration date with submission of final test report.

D. The completed balance report shall be submitted for review and approval prior to requesting final observation of the project.

1.5 GENERAL REQUIREMENTS

A. The balance agency shall perform the following during the installation phase of systems:

1. Study the design drawings and specifications and prepare a schedule to physically inspect mechanical equipment for the hydronic and air distribution systems to be tested and balanced. The Contractor shall provide the balance agency with one copy of the contract drawings and specifications, mechanical equipment submittals, and change orders as necessary for proper balancing of the hydronic and air distribution systems.
2. The test and balance agency shall make field inspections prior to closing in portions of systems to be balanced. The balance agency shall verify that all work, fittings, dampers, balancing devices, etc. are properly fabricated and installed as shown or specified and that the balance agency will be able to properly balance the systems. Any problems or deficiencies shall be reported in writing to the Contractor, Mechanical Engineer, and CxA as soon as possible.
3. Prepare a testing and balancing schedule, test record forms, and necessary technical information regarding hydronic and air distribution systems for the installed heating and cooling equipment.
4. Provide written documentation when the above noted items have been completed, (see example checklist provided at the end of this section). A single page letter signed off by the mechanical contractor and the test and balance agency will suffice.
5. Recommend adjustments and/or corrections to mechanical equipment and hydronic and air distribution systems that are necessary for proper balancing of systems. Provide written documentation of the recommended items to the Architect/Engineer for review.

B. Patching Materials: Except as otherwise indicated, use same products as used by original installer for patching holes in insulation, ductwork, and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes. At tester's option, plastic plugs with retainers may be used to patch drilled holes in low pressure ductwork and housings (2” w.g. and below).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TESTING AND BALANCING

A. Upon completion of hydronic and air handling systems, the test and balance agency shall complete tests, analysis, and balance of hydronic and air handling systems for all heating and cooling equipment.

B. The report shall include as minimum, design and actual information for the following:
   1. All mechanical equipment scheduled on the drawings.
   2. Central plant equipment: Performance data for chillers, boilers, cooling towers, heat exchangers, accessory equipment, pumps, etc.
   3. Motors, pumps, and fans: Horsepower, brake horsepower, revolutions per minute, actual amperage, full load rated amperage, pump flow and head data, etc.
   4. Air handling unit fan, filter, and heating & cooling section performance data.
   5. Air handling unit heat exchanger performance data (when applicable).
   6. Rooftop unit fan, filter, and heating & cooling section performance data.
   7. Supply, return, and exhaust fans: CFM, static pressure, and outlet velocity.
   8. Pumps: Suction, discharge, and shutoff pressures.
   9. Self-sensing pumps: Data as required for proper system operation, including balancing to the project specific self-sensing pump curves.
   10. Heat pumps: GPM flow and fluid temperatures, and air temperatures at inlet and outlet.
   11. Energy recovery ventilators (fan, temperature, and cfm data).
   12. Terminal units: CFM, reheat coil pressure drop and air temperatures at inlet and outlet.
   13. Inlets, outlets, and main branch ducts: CFM and air velocity.
   14. All rooms: Air temperature during testing.
   15. Other information as required to establish completely balanced systems under design conditions.

3.2 DUCT LEAKAGE TESTING

A. All duct system pressure testing shall be witnessed and documented by the test and balance contractor. See Specification Section 233100-3.2 (Duct Leakage Testing).

B. All duct system joints/connections shall be reviewed by the test and balance subcontractor for compliance with the duct sealing requirements listed in Specification Section 233100-3.1 (Installation of Ductwork) prior to commencement of any duct leakage testing.

3.3 BALANCING REQUIREMENTS AND TOLERANCES

A. All water systems, coils, and balancing valves shall be balanced to within 0 to +5% of design.

B. All air systems and air distribution devices (supply, return, and exhaust) shall be balanced to within 0 to +10% of design. This requirement applies to all main supply, return, and exhaust air ducts, as well as all air distribution devices.

C. On all air handling systems scheduled for 3,500 cfm or greater, make allowance for air filter resistance at the time of testing, by false-loading the filter bank with cardboard or other suitable material such that the test results can be repeated during the commissioning process.

D. When applicable, maintaining the designed space pressure relationships shall have priority over the tolerances specified above.

E. After final air and hydronic testing and balancing make necessary adjustments to obtain uniform temperatures during actual occupancy.

F. Take static pressure and air velocity readings with instruments that have been recently calibrated. Take final velocity readings with an Alnor velometer, Anemostat air meter, or vane type anemometer, all recently calibrated prior to testing. Include certified correction curves for each calibration as part of the record. Certify instruments are accurate to standards currently used in common practice for system balance work. Use test cones for diffusers.

G. Run tests with supply, return, and exhaust systems operating and doors, windows, etc. closed or under normal traffic. Conduct final testing with cooling coils under load to ensure that static pressures are or near design conditions.

H. Adjust deflection of supply outlets to ensure proper and uniform air distribution.

I. Work with the temperature control subcontractor in adjustment of automatic dampers, valves, thermostats, etc. as required to maintain proper temperatures in all portions of the building.

J. The Contractor responsible for installing heating, cooling, and ventilating equipment shall make any changes, additions, or modifications to dampers, fan drives, motor sheaves, pump impellers, motors, and other equipment as necessary for proper air and hydronic balance.

K. Balance of systems shall be reviewed by the Architect/Engineer. During this review the mechanical contractor shall furnish workmen, materials, ladders, etc. to enable the Architect/Engineer to witness all readings as may be directed. If any errors are found, the Testing and Balancing Agency shall readjust the system to the satisfaction of the Architect/Engineer.

L. A kitchen hood performance test per 2018 Uniform Mechanical Code Section 511.2.2.1 shall be conducted upon completion and before final approval of the installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow in accordance with UMC Sections 508.5.1.2 through 508.5.1.5. The permit holder shall furnish the necessary test equipment and devices required to perform the tests (see ASHRAE Standard 154 Section 4.7.1). The permit holder shall verify the capture performance of Type I and Type II hoods. A field test shall be conducted with all appliances under the hoods operating at design capacity, and with all sources of replacement air operating at design airflows for a restaurant. Capture and containment shall be verified visually by observing smoke or steam produced by actual cooking operation or by simulating cooking using devices such as smoke candles or smoke puffers. Smoke bombs shall not be used (see ASHRAE Standard 154 Section 4.7.2).

M. The test and balance agency shall complete a Field Observation Report upon completion of the testing and balancing. See the following Field Observation Checklist Example.

Field Observation Checklist (Example)			
YES	**NO**	**N/A**	
□	□	□	Is all ductwork intact?
□	□	□	Are all access doors installed and secured tightly?
□	□	□	Are any air distribution inlets or outlets missing?
□	□	□	Are all turning vanes installed correctly?
□	□	□	Is the ductwork, fan inlets and outlets, installed according to the plans and specifications?
□	□	□	Are all balancing dampers, including fire-smoke dampers, installed and accessible?
□	□	□	Are all terminal boxes, reheat coils, and reheat components installed and accessible?
□	□	□	Does the return air have an unobstructed path from each conditioned space back to the unit?
□	□	□	Is the building architecturally complete?
□	□	□	Are all doors, windows, ceilings, and partitions installed?
□	□	□	Are all filters installed correctly and have frames that will not allow leakage?
□	□	□	Are all coils clean and properly installed?
□	□	□	Are the automatic control dampers installed in the correct locations?
□	□	□	Are the fan housings & plenums sealed & installed according to the plans and specifications?
□	□	□	Are all flexible duct connections installed properly without kinks?
□	□	□	Are suitable duct traverse locations available wherever necessary?
□	□	□	Is all piping intact and free of leaks?
□	□	□	Are all pumps, piping, and equipment installed according to the plans and specifications?
□	□	□	Are all valves, flow meters, and temperature-pressure taps installed to allow for TAB?
□	□	□	Are all valves, flow meters, and temperature-pressure taps accessible?
□	□	□	Are all valves piped correctly?
□	□	□	Are all terminal unit coils installed and piped correctly, and accessible?
□	□	□	Have all piping systems been cleaned, flushed, and treated?
□	□	□	Are all air vents properly installed?
□	□	□	Are vibration isolators properly installed and adjusted?
□	□	□	Are all flexible coil connections installed properly?

Notes: This checklist is an example and shall be customized for each individual project.
N/A = Not Applicable to this project.

END OF SECTION

SECTION 23 08 10 - HVAC SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

B. When applicable to the project, Section 230800 (Third Party HVAC Systems Commissioning) is hereby made a part of this section.

1.2 GENERAL

A. The mechanical systems commissioning process shall demonstrate that each temperature control sequence and the associated test and balance data corresponds with the contract documents and with the final test and balance report. The finalized temperature control software with graphic displays shall be installed and operational (at all required locations) and the final test and balance report shall be provided for review and acceptance by the Owner and the Engineer a minimum of ten days prior to requesting date(s) for the formal on-site mechanical systems commissioning session(s). Additionally, the temperature control contractor and the test and balance contractor (along with any other necessary parties) shall complete a 'dry-run commissioning' and shall certify in writing that all mechanical systems are operating in accordance with the finalized written control sequences prior to requesting dates for the formal on-site mechanical systems commissioning sessions.

B. The test and balance contractor shall thoroughly review all temperature control sequences prior to bidding to ensure that all control sequences requiring testing and balancing are understood and accounted for in the test and balance scope of work.

C. The mechanical systems commissioning process shall demonstrate that the quantities read and displayed by the control system are in agreement with actual/tested quantities (e.g., variable air volume box cfm readings, minimum outside air cfm readings, air temperatures, water temperatures, duct static pressures, building static pressures, etc.). The mechanical systems commissioning process shall also demonstrate that all quantities listed in the final test and balance report (cfm readings, gpm readings, temperature differences, pressure drops, etc.) are correctly reported.

D. The Contractor should anticipate that the original written control sequences will be reviewed and revised on an ongoing basis during the submittal review process, during the programming process, and during construction, until such time that the sequences are finalized. The finalized temperature control sequences will likely include additional detail and/or modifications to the original sequences contained in the contract documents (since such details are commonly omitted from the original written control sequences and are developed after the equipment submittals and the temperature control system submittals are received). The work associated with these additions and/or revisions to the written control sequences shall be provided by the Contractor at no additional cost to the Owner.

E. The Contractor shall furnish a set of two-way radios which will be utilized to expedite the commissioning process (typically, a minimum of three fully charged radios will be required for the duration of the commissioning process).

F. The demonstration of each control sequence shall be performed under conditions which simulate as close to an actual condition as possible. The Contractor shall provide all necessary materials and temporary system modifications as required to 'false-load' the system(s) to demonstrate each temperature control sequence (including appropriate test gas as required to simulate a refrigerant leak in the chiller room). The temperature control system software shall be configured and programmed to allow for temporarily overriding analog inputs in order to facilitate demonstration of the temperature control sequences.

G. The temperature control contractor shall provide and utilize a laptop computer equipped with the complete graphic interface software package (the software on the laptop computer shall be identical to the software provided to the Owner) during the on-site commissioning session. The laptop computer shall be utilized by the temperature control contractor such that the on-site desktop computer is left available for use by the Owner and/or his representatives during the commissioning session(s). The requirement for a separate laptop computer is intended to facilitate review of multiple issues at any one time.

H. The Contractor shall provide access to the finalized temperature control system programming and/or flow charts as may be applicable for review and assessment as part of the commissioning process. In addition to real-time access to programming the Contractor shall also provide hard copies to allow for off-site review and assessment prior to commencement of the initial on-site commissioning session.

I. Mechanical systems commissioning shall be conducted with representatives from the following entities (all required participants shall be confirmed with the Owner's project manager):
   1. General Contractor (with a complete set of plans, specifications, and addenda; and with two 30" by 60" tables with six folding cushioned chairs).
   2. Mechanical Contractor (with a complete set of mechanical equipment submittals and operating and maintenance manuals). Submittal data shall include all pump curves and fan curves.
   3. Temperature Control Contractor (with a laptop computer loaded with the finalized programming and graphic interface software).
   4. Test and Balance Contractor (with a complete set of testing apparatus as utilized during testing and balancing and a complete copy of the final test and balance report).
   5. Electrical Contractor (for discussion/verification of electrical power provisions at all equipment).
   6. Factory-authorized technicians for all major equipment (chillers, boilers, cooling towers, variable frequency drives, etc.). Technicians shall be available to verify that equipment start-up has been properly completed and to make any necessary or desired adjustments to equipment control settings.
   7. Chemical Treatment Contractor (with copies of all water treatment reports).
   8. Owner's designated representative(s).
   9. Mechanical Engineer and/or his designated representative (as necessary).
   10. Third party commissioning agent (when applicable).

J. The aforementioned representatives shall be present during all portions of the testing (and re-testing as required) and shall be equipped to promptly remedy any deficiencies observed during the commissioning process. The chemical treatment contractor and the factory-authorized technicians for major equipment will be required to attend only as necessary to confirm completion of their portion of the work.

K. The temperature control contractor and the test and balance contractor (along with any other necessary parties) shall conduct a 'dry-run commissioning'. The dry-run commissioning effort shall include a complete checkout of every control sequence and observation/confirmation of proper valve, damper, and equipment operations during each control mode (all occupied mode and unoccupied mode sequences). The dry-run commissioning effort shall also include verification that all mechanical equipment is fully functional and shall include a complete review of each item on the commissioning checklist. Written confirmation shall be provided stating that the dry-run commissioning procedures (including review and confirmation of each item on the checklist) have been completed in their entirety prior to requesting a date for the formal on-site commissioning session(s). The dry-run commissioning checkout shall include generation of screen prints as described in this specification.

L. Should any of the aforementioned requirements not be met on the date that the commissioning process commences and/or if deficiencies are observed during the commissioning process the commissioning will be considered a failure and the deficiencies will be required to be remedied prior to requesting a date for re-commissioning. There will be no additional costs allowed to the Contractor for re-commissioning sessions as may be required to address work that is found to be in non-compliance with the requirements of this specification and/or in non-compliance with the remainder of the contract documents.

M. The Contractor shall include an adequate time period and adequate resources for all commissioning tasks in the project schedule. The necessary time periods shall be carefully reviewed with all of the appropriate subcontractors to ensure that the subcontractors are in agreement with the time allotted for each scheduled task.

N. Successful completion of the entire mechanical systems commissioning scope of work shall be a condition of Substantial Completion. The building shall be considered 'ready to utilize for its intended use' only at such time that the entire mechanical systems commissioning scope of work is successfully completed and accepted by the Owner.

1.3 SCREEN PRINTS

A. The temperature control contractor shall generate a complete set of color screen prints that depicts the function of the various mechanical systems during each mode of operation. The submitted screen prints shall include, but not be limited to, screen prints that depict the following list of operating modes. The following list is intended to be a minimum list of typically required screen prints. The temperature control contractor shall provide a complete set of screen prints as necessary to depict all operating modes pertaining to the mechanical systems on the specific project.

1. Chilled water system screen with chiller(s) operating at or near full load (create load as required).
2. Heating water system screen operating at or near full load (create load with all zones set at 85°F).
3. Air handling unit cooling coil capacity (at design mixed air temp, partially open HW valve).
4. Air handling unit economizer mode operation (create load with all zones set at 55°F).
5. Air handling unit in minimum outside air mode (per table in the sequence of operation).
6. Air handling unit disabled during unoccupied mode (with all valves and dampers closed).
7. All vav box summaries with zones set at full cooling (with global room setpoint at 55°F).
8. All vav box summaries with zones set at full heating (with global room setpoint at 85°F).
9. One vav box zone in unoccupied heating mode (override zone temperature to 54°F).
10. One vav box zone in unoccupied cooling mode (override zone temperature to 86°F).
11. Fan coil summary with all fan coil units at the intended setpoints.
12. Exhaust fan summary with all fans operating normally during occupied mode.

Note: All vav box summary screen prints shall be generated with the heating water supply temperature at or near the design HWS temperature (typically 160°F).

1.4 PRE-COMMISSIONING/PRE-BALANCING MEETING

A. A pre-commissioning/pre-balancing meeting shall be scheduled with the Owner and/or the Owner's representatives, with all appropriate subcontractors in attendance, a minimum of two weeks prior to the scheduled start of testing and balancing (earlier on larger projects). The meeting will be utilized to review and discuss the finalized temperature control sequences and some of the specific requirements for testing and balancing of the mechanical systems. The most current revised temperature control sequences will be distributed and reviewed during this meeting.

B. Testing and/or balancing of minimum outside air quantities shall not be commenced until the method of measurement and verification is reviewed and agreed upon.

1.5 SCHEDULING

A. The following list is a general set of tasks and criteria for each task. This list is intended to facilitate discussion and planning of an appropriate schedule for some of the work related to mechanical systems commissioning. The time required for each task will vary depending on the size and complexity of the mechanical systems on each particular project. Determination of the dates and duration of each task is the responsibility of the Contractor and shall be developed via review and discussions with all of the involved subcontractors prior to preparing and submitting the proposed schedule. The following events (start date and duration) shall be incorporated into the general contractor's overall project schedule.

1. Establish the date when electrical power will be complete to all mechanical equipment and to all temperature control panels. Also confirm status of network connection to temperature control system (for remote access).
2. Conduct cleaning, flushing, and chemical treatment of all HVAC piping systems (to be witnessed by owner's representatives - see chemical treatment specifications).
3. Conduct start-up and check-out of all major mechanical equipment (air handling units, pumps, fans, chillers, cooling towers, boilers, variable frequency drives, etc.). Coordinate date and time for State Boiler Inspector site visit regarding issuance of boiler and chiller operating permits.
4. Begin testing and balancing (required time for completion of testing and balancing shall be determined via consultation with the test and balance contractor).
5. Print and distribute the final test and balance report.
6. Temperature control contractor (with assistance from the mechanical contractor and the test and balance contractor as necessary) conducts 'dry-run commissioning' utilizing the Mechanical Systems Commissioning Checklist as a guide. All temperature control sequences are to be fully tested/confirmed and all control loops are to be tuned. Note that on most projects approximately half of the work related to this task can be completed during the testing and balancing process.
7. The mechanical contractor (with assistance from the temperature control contractor) shall provide a copy of the Mechanical Systems Commissioning Checklist with each applicable item checked and initialed by the person responsible for completing the checkout and verification of that item. The completed checklist shall be accompanied with written notification that the pre-commissioning verification process has been successfully completed.
8. The Owner conducts a pre-commissioning review via network interface, commencing after written notice is received stating that the Contractor's pre-commissioning verification process has been successfully completed (requires that the dedicated network connection be in place and functional). This item is typically conducted in two segments.
9. Schedule formal on-site commissioning dates.
10. Allow a minimum of two weeks at the end of the construction schedule for correction and verification of all deficiencies noted during the formal on-site commissioning session(s).

COMMISSIONING CHECKLIST

Central Plant

1. Review location and calibration of outside air temperature sensor.
2. Verify that all strainers have been removed and cleaned (at pumps, chillers, and heat exchanger).
3. Verify pump lead/lag programming and alarm display.
4. Verify pump head and gpm (compare test & balance report to design requirements).
5. Verify boiler integral control setpoints.
6. Verify boiler room emergency shut-down switch locations and operation.
7. Verify boiler lead/lag programming and alarm display.
8. Verify chiller integral control setpoints (and remote CHWS temperature reset when applicable).
9. Verify central cooling plant changeover sequence (from normal mode to free cooling mode).
10. Verify chiller compressor lead/lag programming and alarm display.
11. Verify chilled water system fill pressure and expansion tank charge pressure.
12. Verify heating water system fill pressure and expansion tank charge pressure.
13. Verify boiler relief valve pressure rating.
14. Verify water treatment reports for the chilled water system and for the heating water system.
15. Verify location of air vents in each closed loop piping system (purge any remaining air).
16. Verify location & calibration of chilled water and heating water system differential pressure sensors.
17. Verify programming of all vfd's (minimum speed, input/output speed calibration, ramp time, etc.).

Air Handling Units

1. Verify that air handling unit compartments (and adjacent roof areas) are clean.
2. Verify that all air handling unit compartments are labeled.
3. Verify function of lights inside air handling unit compartments (typically led lights).
4. Verify that each air handling unit heating and cooling coil strainer has been removed and cleaned.
5. Verify that all dampers open and close completely (adjust linkage as required).
6. Verify unoccupied mode operation (confirm that dampers and valves are fully closed).
7. Verify location of building static pressure sensors (and associated surge suppressors).
8. Verify calibration of building static pressure sensors(s).
9. Verify location and calibration of duct static pressure sensor(s).
10. Verify performance of heating and cooling coils (simulate design entering air & water temperatures).
11. Verify minimum outside air control sequences and programmed damper positions.
12. Verify outside air economizer control sequence.
13. Verify building static pressure control sequence.
14. Verify calibration of air filter differential pressure sensors (and magnahelic gauges).
15. Verify set-up and function of occupancy schedules.
16. Verify set-up and function of holiday schedules.
17. Verify that duct smoke detectors initiate the intended fan shut-down sequence.

VAV Boxes and Room Sensors

1. Verify room sensor programming, displays, and calibration.
2. Verify room sensor unoccupied mode override feature.
3. Verify room sensor labeling.
4. Verify global, remote, and local room setpoint functions.
5. Verify adjustment range for local room setpoint (between 72°F and 76°F).
6. Verify night set-back (heating) control sequence.
7. Verify night set-back (cooling) control sequence.
8. Verify morning warm-up control sequence.
9. Verify that each vav box reheat coil strainer has been removed and cleaned.
10. Verify vav box maximum, minimum, and reheat cfm air flows (random verification).
11. Verify vav box discharge air temperatures in both heating and cooling modes (provide screen prints).
12. Verify diffuser air flows at vav box maximum cfm (random verification).

Miscellaneous HVAC

1. Verify that all temperature control system trend logs have been set up and coordinated with the Owner.
2. Verify operation of all fire/smoke dampers (including monitoring of end switches, when applicable).
3. Verify equipment room temperature setpoints and deadbands.
4. Verify that all valves and dampers have been programmed to operate without hunting.
5. Verify that all valves and dampers identified to include spring-return actuators are configured to fail in the appropriate position.
6. Verify set-up of all required alarms (review automatic dial-out or automatic e-mail set-up).
7. Verify that mechanical system roof penetrations are properly installed (per roofing details).
8. Verify/test glycol concentration in piping systems (when applicable).
9. Verify acceptable air noise and equipment noise levels throughout the building.
10. Verify operation of mechanical equipment on emergency power (when applicable).
11. Verify bleed rate at the make-up air unit evaporative cooling section.
12. Verify chemical treatment at all evaporative cooling sections.

Lighting Controls Interface

1. Verify operation of lighting control system occupancy sensors, schedule, overrides, etc. (when applicable).

END OF SECTION

SECTION 23 09 00 - TEMPERATURE CONTROLS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

B. Section 230910 (Sequence of Operation) is hereby made a part of this section.

PART 2 - SCOPE OF WORK

2.1 GENERAL

A. The control system shall provide direct digital control with a Windows-based user interface. Third party viewing software is not acceptable. 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 and shall be as follows (no substitutions):

Manufacturers	Northern Nevada Contractors	Telephone
Alerton Controls	Cerris Systems (formerly BCS Controls)	(775) 826-8998

B. Furnish and install an energy management control system (EMCS) and direct digital control (DDC) system complete with computer terminal (when specified), modem, surge suppressor, operating software, and training. Install the temperature control system software (most current edition) on the existing computer at the using agency's office and on the computer at the project site (when an on-site computer is specified). When third party software is necessary to allow for control system programming and/or editing of graphic displays that software (most current edition) shall also be provided on each of the aforementioned computers.

C. There shall be no annual maintenance or licensing fees of any kind required to be paid by the Owner at any time during the ongoing use of the installed system and software. Licenses shall be issued and authorized as directed by the Owner. Licenses shall be issued such that they can be modified by the Owner without the permission of the contractor and/or local system integrator. Specific license wording and format shall be provided as part of the contractor's submittals.

D. On any project that involves removal of existing controls, the Owner shall be given an opportunity to identify any control devices that they would like to have turned over to them for potential future use.

E. The temperature control contractor shall assist the testing and balancing contractor with temporary adjustments of control system programming and setpoints as necessary for proper completion of the testing and balancing scope of work.

F. Alerton Controls System

1. The Alerton Controls System shall be configured with multiple Ethernet connections to allow for remote network access and for direct connection of multiple computers via local area network. The Alerton Controls system shall utilize 'Compass' web-based graphic interface software (most current version). Communication with equipment controllers shall be via BACnet IP Ethernet backbone at 100.0 Mbps minimum speed. Controllers for central plant equipment and/or air handling units shall be Alerton ACM series with AXM expansion I/O modules or Alerton VIP series equipment controllers. All equipment controllers shall be furnished with integral hand-off-auto switches. Communication between equipment controllers and application specific controllers (Alerton VLC series) shall be via BACnet MS/TP network at 76.8k minimum speed.

2.2 COMMISSIONING FURNITURE

A. Furnish a folding table (48" x 30" minimum size) and four folding chairs (with cushioned seats) at the location where the commissioning sessions will be conducted. The table and chairs are only intended to be on site during the commissioning sessions, and may be removed by the contractor after successful completion of commissioning.

2.3 SPARE CONTROLLER CAPACITY

A. All controllers for central plant equipment and air handling units (except application-specific controllers for unitary equipment) shall be furnished with a minimum of 10 percent spare capacity to allow for addition of both analog and digital inputs and outputs.

2.4 SUBMITTALS AND AS-BUILT DOCUMENTATION

A. The written control sequences, initial setpoints, dead-bands, and the graphic displays shall all be reviewed and confirmed with the Owner and the Engineer prior to preparing and forwarding the finalized submittals.

B. The submittals shall include complete written control sequences for each item of equipment requiring control. The sequences shall include all setpoints, 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 excluded from the Engineer’s written control sequences) and all work associated with developing and incorporating those details shall be provided by the Temperature Controls Contractor at no additional cost to the Owner.

C. The Temperature Control Contractor shall prepare and submit a complete listing of BACnet points that are to be set up as trended and stored historical data. The list shall be broken down to include each system and/or item of equipment and shall be reviewed with the Owner and the Engineer for approval prior to setting up the trending in the temperature control system. The BACnet trend log names shall also be provided for approval.

D. After all temperature control sequences have been finalized and have been approved by the Owner and the Engineer (and after the HVAC systems commissioning process has been completed) the Contractor shall provide as-built documentation which shall include both an electronic copy of the finalized programming and a hard copy of the finalized programming (programming flow charts or line code as may be applicable) and written control sequences.

2.5 TRAINING

A. Upon completion of the commissioning process, the Temperature Controls 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 sequence for each item of equipment, and shall provide instructions on the operation and maintenance of all control devices. Training time shall be a minimum of 8 total hours (consisting of 2 separate 4 hour sessions).

2.6 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, as a minimum, calibration of all sensors and other control devices, adjustments to setpoints, and modifications to control sequences or programming as required/desired to fine-tune and/or finalize all control sequences.

B. The Contractor shall provide a scheduled monitoring and reporting service for the duration of the one year warranty period. Monitoring shall be conducted via the remote control system interface (via modem or network connection) and the associated report shall be issued via email the same day that the monitoring is conducted. Monitoring shall be conducted on a weekly basis, preferably on either Monday or Tuesday. Reports shall include a specific listing of all alarms, all equipment failures, any noted operational problems or irregularities, and a set of screen prints.

2.7 SOFTWARE AND PROGRAMMING REQUIREMENTS

A. Provide a security/password system with two passwords (username and password). The security/password system shall allow access based on user security level as follows:

Level 1 Viewing only
Level 2 Room temperature and occupancy schedule adjustment
Level 3 Adjustment of all setpoints
Level 4 Full access to all setpoints and programming

B. The Temperature Controls Contractor shall program the applicable holidays into the EMCS software for the five years following the date of the installation.

C. Equipment Schedules: Schedules shall be coordinated with the Owner. A separate or combined occupied/unoccupied schedule shall be provided for each air handling unit, fan coil unit, exhaust fan, and/or other individual air handling system as designated by the Owner.

2.8 GRAPHIC DISPLAYS

A. All temperature setpoints and all other setpoints identified as adjustable in the written control sequence shall be adjustable from the appropriate graphic display(s). Setpoints listed in the contract documents are for initial set-up and trial of system operations. Control system shop drawings shall utilize the same (or similar) written sequences with all setpoints, throttling ranges, and differentials identified. As-built drawings shall include this same information with final setpoints resulting from startup, 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 displays shall be dynamic (animated). All graphic displays shall be submitted to the Owner and the Engineer for review and modification as directed.

C. All temperatures shall be displayed with zero decimal places.

D. All valve and damper positions shall be displayed as percent open and shall be displayed with zero decimal places.

E. All setpoints which are identified as ‘adjustable’ in the written control sequences shall be adjustable via the associated graphic displays (including deadband between room setpoints).

F. All occupied mode and unoccupied mode room temperature setpoints shall have an adjustable deadband (adjustable from the associated graphic display).

G. All displays specified to be dynamic shall depict motion (as a minimum, dynamic displays shall include chiller compressors, boiler burners, rotating fan wheels, and rotating pump impellers).

H. All setpoints adjustable from the graphic displays shall be programmed with the deadband on one side of the setpoint (not split evenly across the setpoint) unless otherwise specified.

I. All outputs shall be programmed with the capability for the user to override the controlled commands/positions via the associated graphic display (this requirement applies to all equipment, valves, dampers, fans, pumps, etc.).

J. Alarm data fields shall be displayed with a red text when an alarm condition exists.

K. A summary table shall be provided in the graphic screens to display the current status of each fire-smoke damper. The summary data shall also include the approximate location of each fire-smoke damper.

L. A set of zone temperature summary screens shall indicate the current room temperature setpoint and current room temperature for each zone. A separate global setpoint and deadband shall be assigned to all zones associated with each air handling unit. The zone summary screens shall also include additional information for each zone such as the remote setpoint and deadband, discharge air temperature, valve position, fan command, fan status, deadband setpoint(s), etc. Summary screen format, function, and required display data shall be coordinated with the Owner prior to developing the graphic displays.

M. Each zone shall be capable of being set to any of three setpoints (depending on which setpoint is selected). The three available setpoints shall be the global setpoint (a single setpoint for all associated zones), the remote setpoint (a separate individually adjustable setpoint for each zone), and the local setpoint (adjustable at the room sensor by utilizing a slide or dial type control on the room sensor). The local setpoint adjustment range shall be programmed to allow adjustment only between a fixed temperature range (typically between 73ºF and 75ºF - range to be confirmed with the Owner prior to programming).

N. The current total cfm of all vav boxes associated with each vav air handling unit shall be calculated and displayed on the appropriate air handling unit screen.

O. Each variable frequency drive shall be programmed to display command, status (via current sensor), input speed, output speed, and alarm/failure status (via alarm contacts at each vfd).

P. Floor Plan(s): Provide a display showing the building floor plan(s) with all space temperature sensors including identification of the associated terminal unit or fan coil unit number. Specifically identify each thermal zone on the associated floor plan (AutoCAD file with thermal zone borders can be obtained from the mechanical engineer at no cost to the Contractor).

Q. The current room temperature status shall be indicated utilizing custom thermal geometry outlines around each thermal zone with dynamic color and opacity based on the current zone temperature.

R. The finalized sequence of operation shall be inserted into the graphics for viewing as a pdf file.

2.9 SPECIALTY CONTROL DEVICES AND REQUIREMENTS

A. Outdoor temperature sensor (dry bulb only) shall be Mamac Systems Model TE-213-F with solar radiation and precipitation shield, Dwyer Model TE-RND with solar radiation and precipitation shield, or approved equal.

B. Current sensors for fan and pump motors less than one horsepower shall be split core digital output type and shall have an adjustable setpoint capability.

C. Duct temperature sensor probes shall have a minimum length of 6 inches and shall be selected with longer lengths when required to ensure accurate temperature readings and to avoid dead air spaces.

D. Averaging sensors and freeze sensors shall be a minimum length of 12 feet. Longer lengths and/or multiple sensors shall be provided as required to ensure adequate coverage of the entire surface of each coil. Sensors shall be sized to provide complete coil coverage based on the requirements listed herein. Averaging and freeze sensor capillaries shall be installed in a serpentine arrangement with coverage extending to within 6” of each coil perimeter edge (top, bottom, and side edges) and shall be installed such that there is no more than 12” between horizontal passes. Averaging sensors shall provide for averaging of the entire length of the capillary element rather than an average of individual sensing locations.

E. Modulating control valves for typical heating and cooling coil applications shall be Belimo characterized control valves, B200S Series (2-way) or Belimo B300S Series (3-way) as indicated on the drawings, with Belimo LRX24 actuators. Control valves for HVAC applications shall be chrome plated brass body with stainless steel ball and stem. All actuators shall include a clutch to allow manual rotation of the valve. Actuators shall be spring return type when indicated on the drawings. Modulating control valves for pipe sizes 2-1/2" and larger shall be flanged body type. Modulating control valves shall be selected for a Cv that is adequately greater than the associated coil pressure drop (see equipment schedules on drawings for coil pressure drops).

F. Carbon Dioxide (CO_2) sensors for indoor applications shall be Vaisala GMW90 series for wall mount applications, Model GMD110 for duct mount applications, or approved equal. There shall be no value displayed on the wall mount sensor (only displayed on the control system remote graphic interface).

G. Carbon Dioxide (CO_2) sensors for outdoor wall mount applications shall be Vaisala GMP340 series, or approved equal. There shall be no value displayed on the room sensor (only displayed on the control system remote graphic interface).

H. Indoor relative humidity sensors for indoor applications shall be Senva HT1-2A, Vaisala HMW92D, or approved equal.

I. Air filter differential pressure sensors shall be Dwyer Model MS2-X102, or approved equal. Dip switches for pre-filters shall be set for a 0 to 1" w.c. range, and dip switches for final filters shall be set for a 0 to 2" w.c. range.

J. Differential pressure sensors for dry applications shall be Dwyer 650 Series, Veris Industries Model PX, Senva Model P4, or approved equal. Verify desired/required sensing range prior to submitting and/or ordering. Sensor tubing connections shall be fitted with brass test tees for use by the test and balance contractor for verification/calibration.

K. Differential pressure sensors for wet applications shall be Veris Industries PWRLX series, or approved equal. Verify the desired/required sensing range prior to submitting and/or ordering. Sensor tubing connections shall be fitted with brass test tees for use by the test and balance contractor for verification/calibration.

L. Sensors for room differential pressure shall have a control range of ± .10" w.c. Sensors shall be Veris Industries Model PX-01-F (fast response) or Setra Model 2641-0R1WB, furnished with Air Monitor Corporation Model SAP probes. Sensor tubing connections shall be fitted with brass test tees for use by the test and balance contractor for verification/calibration.

M. Heat tracing for piping systems is typically specified to include the heat tracing manufacturer's outdoor temperature sensor and a BACnet interface gateway. The outdoor air temperature sensor shall be mounted on a north facing wall at approximately 7-6" above grade and shall be wired to the gateway device. The direct digital control system shall display approximately 4 points of data pertaining the electrical heat tracing status. The specific data points shall be coordinated and confirmed during the temperature controls submittal process.

N. Carbon monoxide and methane sensors for boiler rooms. Sensors shall be analog type with the capability of BACnet or Modbus communication, and shall be mounted at 5 feet above finished floor. Combination sensors are acceptable when available.
   1. Carbon monoxide (CO) sensors shall be Senva TGW-C, Macurco CM-6, or approved equal. The alarm setpoint for carbon monoxide shall be 100 ppm.
   2. Methane (CH_4) sensors shall be Senva TGW-M, Macurco GD-6, or approved equal. The alarm setpoint for methane shall be 25% of the lower explosion limit.

O. Carbon monoxide (CO) and nitrogen dioxide (NO_2) sensors for vehicle maintenance bays and welding labs. Sensors shall be analog type with the capability of BACnet or Modbus communication, and shall be mounted at 5 feet above finished floor. Combination sensors are acceptable when available.
   1. Carbon monoxide (CO) sensors shall be Senva TGW-C, Macurco CM-6, or approved equal. The alarm setpoint for carbon monoxide shall be 100 ppm.
   2. Nitrogen dioxide (NO_2) sensors shall be Senva TGW-N, Macurco TX-6-ND, or approved equal. The alarm setpoint for nitrogen dioxide shall be 3 ppm.
   3. As an alternative, a combination sensor may be provided. Combination carbon monoxide and nitrogen dioxide sensors shall be Macurco CX-6, Senva TGW-A-CN, or approved equal.

P. LP gas sensors shall be installed in all boiler rooms and in all gas-fired water heater rooms that are served with LP gas. LP gas sensors shall be Macurco Model GD-6 with horn and strobe, or approved equal, and shall be installed at 12 inches above finished floor. LP gas sensors shall be set to alarm at 10% of the LEL (lower explosive limit).

Q. Carbon Dioxide (CO_2) sensors for welding labs shall be Macurco IAQ-CO_2-A-W, or approved equal. Provide an audible/visible alarm horn/strobe inside the welding space, Amseco Model CSHB-BG with blue light lens, or approved equal by Kele & Associates. A low level alarm (visible only) shall occur at 1.5% CO_2 concentration and a high level alarm (audible and visible) shall occur at 3.0% CO_2 concentration.

R. Oxygen sensors for gas storage cabinets shall be analog type with an audible/visible alarm. Sensors shall be Macurco Model OX-6, Senva TGS Series, or approved equal. Oxygen (O_2) sensors shall be installed in gas storage cabinets where shown on the drawings. The initial alarm setpoint for oxygen shall be 20%.

S. Air flow measuring stations shall be thermal dispersion type, Ebtron Gold Series Model GTx116, Ruskin Airflow IQ Series Model TDP05K, or approved equal. Sensor density and location shall be configured in strict conformance with the manufacturer's written installation instructions. Duct mounted air flow measuring stations shall be installed with a minimum of 12" of straight duct upstream of the sensor and with a minimum of 6" of straight duct downstream of the sensor. Duct sizing shall ensure a minimum velocity of 250 fpm.

T. Building static pressure sensors shall have a control range of ± .10" w.c. Sensor shall be Mamac Model PR-275-R2, Dwyer MSX series, Veris Industries Model PX-01-F (fast response), Setra Model 264-0R1WB, or approved equal, and shall be furnished with indoor and outdoor reference probes.
   1. Outdoor static pressure probe shall be constructed of anodized aluminum and shall be capable of sensing static pressure to within 2% accuracy when subject to radial wind velocities of up to 80 mph with an approach angle of up to 30 degrees from horizontal. Outdoor probe shall be 'Static Outside Air Probe' by Air Monitor Corporation, Model PE-8000 Outside Air Probe by Paragon Controls, or approved equal.
   2. Indoor static pressure probe(s) shall be suitable for flush mounting, shall be constructed of 10 gauge brushed aluminum, and shall be capable of sensing static pressure to within 1% accuracy when subject to air velocities of up to 1,000 fpm. Indoor static pressure probes shall be 'Shielded Static Air Probe No. 3' by Air Monitor Corporation, Paragon PE-7000 Indoor Static Pressure Probe, or approved equal.
   3. Provide a surge dampener for each indoor static pressure probe/sensor. Surge dampeners shall be Schneider Electric Model 21-153, Kele & Associates Model SD-01, or approved equal. Interconnecting tubing between sensor and indoor/outdoor probes shall be 3/8" diameter braid-reinforced pvc or polyethylene tubing. Copper tubing is required in any case where the tubing is installed in a return air plenum.

U. Water flow meters for chilled water, heating water, and heat pump systems shall be electromagnetic type (Onicon Model FT-3100, Rosemount Model 8700, ModMag Model M2000, or approved equal). Turbine type flow meters are not acceptable. Flow meters shall be installed in strict conformance with the manufacturer's installation instructions, including required straight pipe length upstream and downstream of the flow meter.

V. Water flow meters for make-up water serving chilled water, heating water, and heat pump system shall be ultrasonic type (Belimo FM series, Onicon F-4600 series, or approved equal). Turbine type flow meters are not acceptable. Flow meters shall be installed in strict conformance with the manufacturer's installation instructions, including required straight pipe length upstream and downstream of the flow meter.

W. Emergency shutdown switches shall be mushroom type with a clear hinged lockout lid (Pilla WPS-MP Series, or approved equal).

X. Audible/visible alarm horn/strobe for seismic gas valves shall be Amseco Model CSHB-BG with blue light lens, or approved equal. The alarm horn/strobe shall be located on the building exterior adjacent to the seismic gas valve (mounted at 7'-6" above finished grade).

2.10 MISCELLANEOUS REQUIREMENTS

A. All control devices shall be installed in reasonably accessible locations. Control devices that may require occasional calibration or adjustment shall be given special consideration with regard to being installed in a reasonably accessible location.

B. Room temperature sensors shall be programmable touchscreen type and shall be provided with an override feature and setpoint adjustment with the ability to be limited or locked out via the operator workstation.

C. Room temperature sensors shall be labeled with the corresponding terminal unit or fan coil unit number. Labels shall be self-adhesive with black lettering (1/8" height lettering).

D. Room temperature sensors in laboratory areas shall be sealed at the wall penetration behind the sensor to prevent air migration into the sensor from adjacent areas (due to the negative pressure of labs as compared to adjoining spaces).

E. Equipment specified to include a BACnet interface shall be provided with a terminal strip to allow remote control of the equipment via the direct digital control system (verify this requirement on the equipment schedules and/or in the equipment specifications).

F. When an air handling unit is depicted as including a temperature sensor at the inlet and at the outlet of the chilled water and/or heating water coil those sensors shall be 'paired thermistors'.

G. Sensor wells installed in a potable water system shall be stainless steel.

H. All control dampers in stainless steel ductwork shall be constructed of stainless steel and shall have flanged connections.

I. An as-built control diagram shall be laminated and secured inside of each temperature control panel prior to commencement of the final on-site mechanical systems commissioning sessions.

J. Trend logs shall be coordinated with the Owner and shall include as a minimum all identified temperature, pressure, gpm, cfm, percentage, status, and alarm data that is requested.

K. All low voltage wiring (whether plenum rated or not) shall be installed in raceways with the following conditions, clarifications, and exceptions.
   1. Raceways shall be as defined in the National Electrical Code and open cable trays shall not be construed as meeting the definition of a raceway.
   2. Low voltage wiring for temperature controls and energy management systems may be routed utilizing open cable trays above accessible ceilings. Low voltage wiring for temperature controls and energy management systems may also be installed utilizing appropriately spaced and neatly routed j-supports above accessible ceilings. Low voltage wiring routed in walls or at roof penetrations shall be installed in conduit.
   3. Where open cable trays are utilized above accessible ceilings the following conditions apply.
      a. Low voltage wiring routed in open cable trays shall be plenum-rated (whether or not the ceiling space is utilized as a return air plenum).
      b. Low voltage wiring concealed in walls, floors, and above inaccessible ceilings shall be routed in raceways.
      c. Low voltage wiring routed between conduit stubs and cable trays shall be secured with appropriately spaced j-supports.

2.11 CHILLER ROOM CONTROL DEVICES AND SIGNAGE

A. Chiller room exhaust fan differential pressure switches (when required at the emergency exhaust fan) shall be Dwyer Instruments Model 1640-0 with Kele Model SSS-1003 duct sensing probes, or approved equal.

B. Refrigerant leak monitors shall be MSA Chillgard 5000, or approved equal. Refrigerant leak monitors shall be a photo-acoustic infrared sensor with single point sensing capability, dual alarm outputs, and the capability to transmit the current refrigerant concentration utilizing a 0 to 10 volt signal for remote monitoring via the direct digital control system. Provide sensor(s) suitable for sensing refrigerant R-134A, or as required for the specified chiller.
   1. Provide two remote sensing probes with end-of-line filters and interconnecting tubing as required to locate the probes as indicated on the drawings (or as field-directed by the mechanical engineer). Interconnecting tubing shall be installed such that the branch tubing to each sensor is the same length. Probes shall be mounted at approximately 6” above finished floor at or near each chiller.
   2. The refrigerant sensor shall be factory calibrated to alarm at 1,000 ppm. The refrigerant leak monitor shall be furnished with a calibration/test kit (MSA Model 50G) and with the appropriate test gas cylinders as required for calibration, testing, and commissioning of the leak monitor. The sensor shall also be furnished with two spare end-of-line filters for future use by the Owner. Locate two alarm horn/strobes at each chiller room exit (one inside and one outside of each exit door). Install each horn/strobe at approximately 7'-6" above finished floor. Remote audible/visible alarm horn/strobes shall be suitable for either indoor or outdoor installation (Amseco Model CSHB-BG with blue light lens, or approved equal by Kele & Associates).

C. Chiller room signage shall comply with all requirements listed in UMC Chapter 11 and in ASHRAE Standard 15. All signage shall be submitted to the Owner for review and approval prior to ordering and installation. Provide plastic labels with a minimum lettering height of ½”. Signage shall be in accordance with the requirements listed in this specification (although additional signage may be required in the applicable codes and standards).

D. Provide signage at each chiller room door to read as follows (per ASHRAE Standard 15):

Machinery Room - Authorized Personnel Only
No Entry Allowed During a Refrigerant Leak Alarm Condition Except by Authorized Personnel

Emergency Refrigerant Leak Procedures
If the refrigerant leak alarm is determined to be a reportable event please contact the following representative(s):

Owner’s Designated Representative
Address
Phone (Normal Business Hours)
Phone (Nights and Weekends)

END OF SECTION

SECTION 23 09 10 - SEQUENCE OF OPERATION

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

B. Section 230900 (Temperature Controls) is hereby made a part of this section.

1.2 SEQUENCE OF OPERATION

HEAT PUMP LOOP UPDATED SEQUENCES

Bypass Control

The heat pump loop bypass valve in the central plant shall be modulated open whenever the water flow falls below the minimum pump flow (flow as determined by the heat pump loop flow meter). The bypass valve shall be modulated to maintain the heat pump loop water minimum flow (250 gpm minimum flow, with a 5 gpm differential, valve closed at 300 gpm).

Secondary Pump Control

The secondary pumps variable frequency drive shall be modulated from 20% to 100% of maximum speed (from 12 to 60 Hz) as required to maintain the heat loop remote differential pressure setpoint (approximately 10 psi, adjustable - as determined by the test and balance contractor).

HEAT PUMP CONTROL

General

During both occupied and unoccupied mode operation whenever there is an initial call for a heat pump to be enabled, the lead loop pump shall be enabled for two minutes (adjustable) prior to enabling the heat pump(s) that initiated the call. This is intended to ensure that when heat pumps are enabled, they will not trip off on their integral flow sensor.

The ddc control system shall display approximately 8 points of data for each water source heat pump via the associated BACnet interface (specific points to be selected during the submittal review process). The following list of data points shall be included as a starting place:

- Heat Pump Enable Status
- Heat Pump Alarm Status
- Current Mode (Heating or Cooling)
- Compressor Enable Status
- Compressor Operating Status
- Supply Air Temperature
- Return Air Temperature

Occupied Mode

The fan shall be enabled to run continuously and the heat pump 2-position control valve shall be open as required to maintain the room temperature setpoint (initial cooling setpoint of 75°F, with a 5°F deadband, initial heating setpoint of 70°F). Both setpoint and deadband shall be adjustable for each heat pump.

Unoccupied Mode

The fan shall be disabled and the heat pump 2-position control valve shall be closed.

Unoccupied Heating Mode

The fan shall be enabled and the heat pump 2-position control valve shall be open whenever the room temperature falls below the unoccupied mode heating setpoint (55°F setpoint with a 5°F differential, off at 60°F). Both setpoint and deadband shall be adjustable for each heat pump.

Unoccupied Cooling Mode

The fan shall be enabled and the heat pump 2-position control valve shall be open whenever the room temperature rises above the unoccupied mode cooling setpoint (85°F setpoint with a 5°F differential, off at 80°F). Both setpoint and deadband shall be adjustable for each heat pump.

Optimum Start Mode (Morning Warm-Up and Morning Cool-Down Modes)

During morning warm-up and/or morning cool-down modes the heat pumps shall operate in accordance with the appropriate unoccupied mode sequence (Unoccupied Heating Mode or Unoccupied Cooling Mode). The optimum start period shall be limited to a maximum of 2 hours (adjustable) prior to the occupied time.

Demand Limiting

During morning warm-up and/or morning cool-down modes the heat pumps shall be enabled in groups of 20 heat pumps every 10 seconds.

Unoccupied Override Mode

Whenever one of the room sensor override buttons is pressed during the unoccupied time period the air handling unit shall be enabled and controlled in the normal occupied mode for a period of 2 hours (adjustable).

END OF SECTION

SECTION 23 21 00 - HYDRONIC PIPING AND ACCESSORIES

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of hydronic piping and pumping systems specified in this section include the following:

Hydronic Piping, Valves, and Fittings
Heat Pump Loop Piping

Hydronic Accessories
Valves
Flexible Connections
Strainers

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of hydronic piping products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering pumping equipment which may be incorporated in the work include the following:

Taco
Bell and Gossett

C. UL Compliance: Provide electric components for pumps which are UL listed.

D. Codes and Standards

1. ASME Compliance: Fabricate and install hydronic piping in accordance with ASME B31.9 (Code for Building Services Piping).
2. UMC Compliance: Fabricate and install hydronic piping in accordance with the Uniform Mechanical Code.

1.4 SUBMITTALS

A. As-Built Drawings: At project closeout, submit as-built drawings of installed hydronic pumps, piping, and hydronic specialties in accordance with all associated requirements.

B. Operation and Maintenance Data
   1. Submit operation and maintenance data and parts lists for hydronic piping materials and products. Include this data, product data, shop drawings, and as-built drawings in operating and maintenance manual in accordance with all associated requirements.
   2. Submit operation and maintenance data and parts lists for each type of pump, control, and accessory, including trouble-shooting maintenance guides.

C. Product Data
   1. Submit manufacturers pump specifications, installation and start-up instructions, and current accurate pump characteristic performance curves with selection points clearly indicated. Pump efficiencies, as well as construction, will be taken into consideration.
   2. Submit manufacturer's technical product data and installation instructions for each type of hydronic specialty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with ASME B31.9 (Code for Building Services Piping) where applicable, base pressure rating on hydronic piping systems maximum design pressures or as specified. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in hydronic piping systems.

2.2 GENERAL PIPE AND PIPE FITTING REQUIREMENTS

A. General
   1. Provide pipe and tubing, joint type, grade, size, and weight indicated for each service, and complying with all governing regulations and industry standards.
   2. Remove scale, oxidation, slag, oil, grease, rust, dirt, and debris from inside and outside of pipe and fittings prior to assembly. Ream ends of pipe and tubes to remove burrs. Bevel plain ends of steel pipe.
   3. Cut all pipe threads using sharp dies. Tapered threads shall comply with ASME B1.20.1.

B. Steel Pipe and Pipe Fittings
   1. When Schedule 40 black steel pipe is specified in sizes 12” and larger the wall thickness shall be .375” to match the associated fitting thickness.
   2. Black Steel Pipe: ASTM A53, A106, or A120; except comply with ASTM A53 or A106 where close coiling or bending is required.
   3. Galvanized Steel Pipe: ASTM A53 or A120; except comply with ASTM A53 where close coiling or bending is required.
   4. Malleable Iron Threaded Fittings: ANSI B16.3; plain or galvanized to suit piping. For use above grade only, except where indicated otherwise.
   5. Malleable Iron Threaded Unions: ANSI B16.39; selected by the Contractor for proper piping fabrication and service requirements, including style, end connections, and metal-to-metal seats (iron, bronze, or brass), plain or galvanized as indicated.
   6. Forged Steel Socket Welding and Threaded Fittings: ANSI B16.11, except MSS SP-79 for threaded reducer inserts; rated to match schedule of connected pipe.
   7. Wrought Steel Butt-Welding Fittings: ANSI B16.9, except ANSI B16.28 for short radius elbows and returns; rated to match connected pipe.

8. Pipe Nipples: Fabricated from same pipe as used for connected pipe, except do not use less than Schedule 80 pipe where the length remaining unthreaded is less than 1-1/2 inches and where the pipe size is less than 1-1/2 inches. Do not thread nipples full length (no close nipples are allowed).

C. Copper Tube and Fittings
   1. Copper Tube: ASTM B88; Type L, hard drawn temper, except as otherwise indicated.
   2. Wrought Copper Solder Joint Fittings: ANSI B16.22.

D. Elbows
   1. All elbows in hydronic piping systems shall be long radius.
   2. Short radius elbows shall be utilized only where necessitated by space constraints. Such instances shall be submitted to the Engineer for review and approval.

E. Miscellaneous Piping Materials/Products
   1. General: Where applicable all pipe joining methods shall comply with the requirements of the ASME Boiler and Pressure Vessel Code.
   2. Welded Joints: Except as otherwise indicated, provide welding materials as determined by the Contractor to comply with all installation requirements and to comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials.
   3. Soldered Joints: Construct joints in accordance with ASTM B828 or the Copper Development Association ‘Copper Tube Handbook’ using lead free solder complying with ASTM B32. Apply ASTM B813 water-flushable flux, to tube ends, unless otherwise indicated.
   4. Brazed Joints: Construct joints in accordance with American Welding Society ‘Brazing Handbook’ using a copper-phosphorus brazing filler metal complying with American Welding Society Section A5.8 and with the ASME Boiler and Pressure Vessel Code.
   5. Comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials.
   6. Gaskets for Flanged Joints: ANSI B16.21; full faced for cast iron flanges; raised face for steel flanges, unless otherwise indicated.

2.3 PIPE AND PIPE FITTING SYSTEMS

A. Heat Pump Loop Piping Indoors
   1. ASTM A53 or ASTM A120 Schedule 40 black steel with standard weight, long radius, butt-welding fittings and 150 lb forged steel, weld-neck type flanges. Connections to threaded equipment, valves, etc. shall be made with 150 lb cast iron, threaded fittings. Piping 2 inches and smaller shall have 150 lb screwed, cast iron fittings. Slip-on flanges will be permitted where space is limited with prior written approval by the Architect/Engineer. All slip-on flanges shall be back-welded.
   2. At the Contractor's option heat pump loop piping 2” and under may be copper tube; ASTM B88 Type L, hard drawn temper, with wrought copper fittings and brazed joints.

2.4 HYDRONIC ACCESSORIES

A. Hydronic Valves
   1. Provide valves complying with Section 230510 (Valves for HVAC Systems).

B. Flexible Connections (Air Handling Units, Chillers, Cooling Towers, Fluid Coolers, etc.)
   1. Provide flexible connections where indicated on the drawings and/or as required to accommodate movement or vibration of the piping system.
   2. Flexible connections shall be all stainless steel with carbon steel flanges and a 1/16” lateral offset capability. Flexible connections shall be rated for a minimum working pressure of 200 psi at 70°F. Flexible connections shall be Twin City Hose Model TCHS, or approved equal.

C. Flexible Connections (Rooftop Units, Fan Coil Units, Heat Pumps, Motorized Equipment)
   1. Provide 18 inch long flexible connections where indicated on the drawings and/or as required to accommodate movement or vibration of the piping system.
   2. Flexible connections shall be all stainless steel with carbon steel ends. Flexible connections shall be rated for no less than 370 psi working pressure at 70°F. Flexible connections shall be Twin City Hose Model HPH, or approved equal.

D. Wye Strainers
   1. Provide wye strainers of size and capacity as indicated on the drawings. Strainers shall be constructed of epoxy painted cast iron or ductile iron, shall be ANSI Class 125, rated for 200 psi at 150°F, with pressure tappings to allow for assessment of strainer pressure drop. Wye strainers shall be constructed of stainless steel with .015” openings (40 mesh).
   2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering wye strainers which may be incorporated in the work include the following, or approved equal:

      Titan Flow Control Model YS-58-CI
      Zurn Wilkins Model FSC

E. Basket Strainers
   1. Provide basket strainers of size and capacity as indicated on the drawings. Basket strainers shall have a quick release clamped lid, stainless steel strainer with .125” openings, and be rated for 150 psi at 200°F.
   2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering basket strainers which may be incorporated in the work include the following, or approved equal:

      Titan Model BS-25F
      Metraflex Model B1TC

F. Specialty Basket Strainers
   1. Provide specialty basket strainers of size and capacity as indicated on the drawings. Strainers shall be Thompson Strainer Model MLS with quick release clamped lid, Model PDA2 pressure differential alarm package, constructed of Type 304 stainless steel, and rated for 150 psi at 150°F. Strainer screen shall be constructed of heavy duty stainless steel (.006 inch wire diameter) with .007” openings (80 mesh). Pressure drop at the design flow shall be 1.0 psi or less.

G. Reduced Pressure Backflow Preventers
   1. Provide reduced pressure principle backflow preventers consisting of complete assembly, including ball type shutoff valves on inlet and outlet, strainer on the inlet, and oversized air gap fitting. Backflow preventers shall include test valves and a pressure differential relief valve located between two positive seating check valves.
   2. Air gap fitting sizes shall be as follows:

      1” and 1-1/2” backflow preventer: 3” air gap fitting and drain piping

2” and 2-1/2” backflow preventer: 4” air gap fitting and drain piping
3” and 4” backflow preventer: 6” air gap fitting and drain piping
5” and 6” backflow preventer: 8” air gap fitting and drain piping

3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering backflow preventers which may be incorporated in the work include the following, or approved equal by Apollo or Watts:

   Zurn Wilkins Model 375XL or BF-475 (depending on water line size and flow)

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which hydronic piping systems and specialties are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF PIPING

A. The drawings, details, and diagrams indicate the general location and arrangement of the piping systems. The indicated piping locations and arrangements were utilized to determine appropriate pipe sizes and to calculate piping friction loss, expansion, system volume, pump sizes, and for other design considerations. Install piping as indicated unless deviations to the layout are identified and approved as part of the Contractor’s shop drawings or submittals.

B. Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently leak-proof piping systems, capable of performing each indicated service without piping failure.

C. Install each pipe run with minimum joints and couplings but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes where indicated by use of reducing fittings. Align piping accurately at connections, within 1/16 inch misalignment tolerance.

D. Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain), avoiding diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described in drawings, diagrams, details, and notations. If not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and the equipment.

E. Hold piping close to walls, overhead construction, columns, and other structural and permanent building elements. Limit clearance to 1/2” where furring is shown for enclosure/concealment of piping. Locate insulated piping with 1” clearance outside of the insulation.

F. Wherever possible in finished and occupied spaces, conceal piping from view by locating in column enclosures, in hollow wall construction, or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.

G. Electrical Equipment Spaces: Do not run piping through transformer vaults or other electrical or electronic equipment spaces and enclosures unless unavoidable. Install a drip pan under piping that must be run through electrical spaces and in all other locations indicated on the drawings.

H. Should structural difficulties or work of other contractors prevent the routing of pipes or the setting of equipment at the points shown on the drawings, the necessary deviations therefrom, as determined by the Contractor, with the Architect/Engineer's review and acceptance, will be allowed but must be made without additional cost to the Owner.

I. Inspect each piece of pipe and each fitting to see that there is no defective workmanship on pipe or obstructions in pipes and fittings.

J. Install exposed polished or enameled connections from fixtures or equipment with special care, showing no tool marks or threads at fittings.

K. Cap or plug openings in pipe and fittings immediately to exclude all dirt until fixtures are installed or final connections made.

L. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

M. Condensate Drain Piping: Run piping with downward pitch as indicated, without pockets.

N. Grade water circulating piping used for space heating and/or cooling up to high points at the rate of 1/4 inch in 10 feet in the direction of flow with returns grading down at same rate. Air vent valves specified hereinafter shall be installed at high points. Changes in pipe sizes shall be made with eccentric reducers flat on top.

O. Couplings shall not be used except where required pipe runs between fittings are longer than a standard length of the type of pipe being used and except where their use is specifically reviewed by the Architect/Engineer.

P. Conceal piping in finished portions of building, above the floor line, except where otherwise shown or noted. Cutting of walls and floors shall be held to the minimum possible to secure the proper installation.

Q. Install piping subject to expansion or contraction in a manner permitting strains to be evenly distributed and alleviated by expansion loops installed as required.

R. Sleeves for branches through walls from adjacent mains shall be of sufficient size to allow for free side motion of covered pipe in sleeve.

3.3 INSTALLATION OF VALVES

A. All valves shall be installed in locations that are reasonably accessible without the use of a ladder unless otherwise indicated on the drawings (such as in the case of valves equipped with chain operators).

B. Drain Valves: Install at each mechanical equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop, and elsewhere as indicated or required to completely drain each piping system

C. Check Valves: Install on the discharge side of each pump and elsewhere as indicated.

3.4 INSTALLATION OF UNDERGROUND VALVES AND FITTINGS

A. All direct buried metal valves, pipe fittings, and accessories shall be protected from corrosion.

B. All metal joints and fittings shall be wrapped in 8 mil polyethylene film that is secured and sealed tightly at ends and seams.

C. All buried valves and their actuation systems shall be wrapped in 8 mil polyethylene film that is secured and sealed tightly at ends and seams. This requirement applies to both direct buried valves and valves installed in a valve box below grade. Sleeves for valve operator extensions to grade shall be coated with primer and latex waterproofing. See Specification Section 232170 (Latex Waterproofing for Underground Vaults) for additional information. Care shall be taken to fully seal the interface between the valve operator sleeve and the valve actuator.

D. When buried valves are installed in a valve box the exterior of the valve box shall be coated with primer and latex waterproofing. See Specification Section 232170 (Latex Waterproofing for Underground Vaults) for additional information.

3.5 INSTALLATION OF HYDRONIC ACCESSORIES

A. Balance Valves: Install balance valves on each hydronic terminal and elsewhere as indicated. After hydronic system balancing has been completed, mark each balance valve with stripe of yellow lacquer across body and stop plate to permanently mark final balanced position.

B. Manual Vent Valves: Install manual vent valves on each hydronic terminal at the highest point and on each hydronic piping drop in the direction of flow for mains, branches, runouts, and elsewhere as indicated on the drawings.

C. Automatic Vent Valves: Install automatic vent valves at the top of each hydronic riser and elsewhere as indicated on the drawings. Install a shutoff valve between each riser and vent valve, pipe the outlet to a suitable plumbing drain or as indicated on the drawings.

D. Pressure Reducing Valves: Install for each heat exchanger as indicated and in accordance with manufacturer's installation instructions.

3.6 INSTALLATION OF HANGERS AND SUPPORTS FOR PIPING SYSTEMS

A. See Specification Section 230530 (Hangers and Supports for HVAC Piping, Ductwork, and Equipment). Where special hanging or support of ductwork or piping is detailed or shown on the drawings, the drawings shall be followed.

3.7 INSTALLATION OF BACKFLOW PREVENTERS

A. Install backflow preventers where indicated on the drawings. Pipe the oversized air gap fitting outlet full size to the nearest floor drain or sink, or as otherwise indicated on the drawings.

3.8 EQUIPMENT CONNECTIONS

A. Connect hydronic piping system to mechanical equipment as indicated, and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and union on supply and return; drain valve on drain connection.

3.9 TESTING OF PIPING

A. Test piping in accordance with the following schedule. There shall be no loss in pressure and no visible leaks after a minimum duration of four hours at the test pressures indicated.

System Tested	Test Pressure	Test With
Chilled Water Piping Heating Water Piping (250°F & Under) Heat Pump Loop Water Piping	150 psi at rough-in and 100 psi after equipment connection	Water

3.10 CLEANING OF HYDRONIC PIPING SYSTEMS AND EQUIPMENT

A. System Preparation
   1. System shall be operational prior to cleaning.
   2. Make temporary piping connections and provide a temporary bypass filter to properly accomplish cleaning the entire system. Provide temporary pumps when indicated on the drawings and/or when necessary to protect the new pumps from contamination/debris in an existing piping system.
   3. Place all manual, pressure regulating and control valves serving the system in open position during cleaning so that circulation through the system is obtained during cleaning.
   4. Verify that electric power is available and of the correct characteristics for any cleaning equipment.

B. Cleaning Sequence

1. Any and all cleaning and flushing procedures outlined in this section and in Section 232500 (Chemical Treatment) shall occur before any piping is connected to the heat pump equipment or any other coils (*No Exceptions*). No flushing will be permitted after any equipment and/or coils are connected to the system.
2. Projects with distribution to/from other buildings or to a ground source bore field: Provide a temporary basket strainer with .125" perforations to protect the piping inside the building from the ground loop piping outside the building. The ground loop piping shall be flushed and cleaned prior to connecting to the piping inside the building.
3. If any equipment and/or coils are connected to the system during cleaning and flushing procedures, the Owner has the right to have each affected water coil replaced with a new factory coil at no cost to the Owner.
4. Initial Flush (all hydronic systems)
   a. 1st filling: Completely fill the system with fresh water and circulate at 6 feet per second for 4 hour minimum.
   b. Initial flushing shall be sufficient to remove all contaminants such as cuttings, filings, loose rust and scale, welding and soldering, residue and debris.
   c. 2nd filling: Drain the entire system and refill with fresh water.
5. Cleaning Flush
   1. Use concentrated chemical cleaner in piping system. Cleaner shall be a solution consisting of 2 lbs tri-sodium phosphate for each 1000 lbs of water contained in the system.
   2. Circulate the solution at 6 feet per second for the recommended time period corresponding to the cleaning fluid temperature.
      a. Partially close and reopen all manual valves twice during the flushing duration.
         1) Test solution for proper concentration and document results.
         2) Completely drain the entire system.
      b. 3rd filling: Refill the system with fresh water. Then, with the circulation pump running, open drain(s) as far downstream from the fill point as is possible. Ensure makeup is sufficient to keep up with the drain to maintain a full system.
      c. Partially close and reopen all manual valves twice during the flushing duration.
      d. Blowdown all strainers, dead legs and low points in the system.
      e. Continue to flush the system in this manner until the drain water is of the same clarity as the makeup water and testing reveals no further traces of cleaning solution (flush for minimum of 1 hour). Document the results.
      f. Following the fresh water flush, drain the entire system.
      g. Clean all strainers, and then fill and treat the entire system.

3.11 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect/Engineer. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.12 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.13 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 31 00 - HVAC DUCTWORK

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of ductwork specified in this section include the following:

Sheet Metal Ductwork
Internally Lined Ductwork

1.3 QUALITY ASSURANCE

A. Installer: A firm with at least three years of successful installation experience on projects similar to that required for this work.

B. IECC Compliance: Comply with applicable portions of the 2024 International Energy Conservation Code, including, but not limited to Section C403.13.

C. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) recommendations for all work in this section.

D. ASHRAE Standards: Comply with applicable portions of American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommendations for all work in this section.

E. NFPA Standards: Comply with applicable portions of ANSI/NFPA Standard 90A (Standard for the Installation of Air Conditioning and Ventilating Systems) and ANSI/NFPA 90B (Standard for the Installation of Warm Air Heating and Air Conditioning Systems) for all work in this section.

F. NAIMA Standards: Comply with all applicable portions of the North American Insulation Manufacturers Association (NAIMA) standards for all related work in this section.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's specifications on manufactured products and factory fabricated ductwork used for the work of this section.

B. As-Built Drawings: At project closeout, submit as-built drawings of installed ductwork, duct accessories, outlets, and inlets.

PART 2 - PRODUCTS

2.1 GENERAL

A. Fabricate all ductwork using a commercial grade of galvanized steel complying with the SMACNA HVAC Duct Construction Standards (latest edition) for the specified duct pressure class.

B. Fabricate ductwork with all accessories installed during fabrication to the greatest extent possible. Refer to Specification Section 233110 (HVAC Ductwork Accessories) for accessory requirements.

C. See Specification Section 230700 (HVAC Systems Insulation) for additional requirements.

D. All ductwork shall be constructed and sealed in accordance with the requirements of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) unless indicated otherwise herein.

E. Construct and seal all ductwork in accordance with the pressure related to the equipment or system to which it is connected unless indicated otherwise herein. See Section 3.1 of this specification for additional requirements and clarification.

F. Ductwork upstream of terminal units shall be 4” w.c. pressure class and ductwork downstream of terminal units shall be 2” w.c. pressure class.

G. Wherever ductwork is to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, oil canning, stains and discolorations, and other imperfections, including those which would impair painting.

H. Wherever ductwork is to be exposed to view in occupied spaces and is indicated to be painted, that ductwork shall be fabricated using a commercial grade of phosphatized, galvannealed, or bonderized sheet metal that is specifically formulated for painting.

I. Duct fittings shall be constructed to match the adjoining ductwork and to comply with all duct requirements applicable to fittings. See ‘Typical Branch Ducts’ details on the drawings for acceptable fitting types.

J. Turning Vanes in Rectangular Duct Elbows: Turning vanes shall be provided in all rectangular duct elbows unless indicated otherwise on the drawings, such as in return air transfer ducts, where turning vanes shall not be installed. All turning vanes shall be SMACNA ‘Large’ (R=4.5”/SP=3.25”). Turning vanes in medium pressure ducts (3.0“ w.c. or greater) shall be double thickness. Turning vanes in low pressure ducts (2.0“ w.c. or less) with duct widths 30 inches and smaller shall be single thickness. Turning vanes in low pressure ducts (2.0“ w.c. or less) with duct widths 32 inches and larger shall be double thickness.

K. Except as otherwise indicated, or where a reaction between dissimilar metals might occur, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim, and angles for support of all ductwork. Utilize Unistrut channel supports and hangers as appropriate for larger duct sizes. Penetrating ductwork with screws shall be avoided to the greatest extent possible. Wherever screws are required to penetrate ductwork the penetrations shall be sealed air and water tight.

2.2 TWO INCH PRESSURE CLASS DUCTWORK

A. Rectangular ductwork shall be fabricated using a commercial grade of galvanized steel complying with the SMACNA HVAC Duct Construction Standards (latest edition) for the specified duct pressure class. Ductwork and fitting gauges shall be in accordance with Chapter 2 of the SMACNA HVAC Duct Construction Standards (latest edition).

B. Round ductwork shall be spiral lock seam round and/or oval duct and fittings

2.3 HANGERS AND SUPPORTS FOR DUCTWORK

A. See Section 230530 (Hangers and Supports for HVAC Systems)

2.4 SEISMIC BRACING FOR DUCTWORK

A. See Section 230540 (Seismic Bracing for HVAC Systems)

2.5 DUCT ACCESS DOORS

A. See Specification Section 233110 (HVAC Ductwork Accessories).

2.6 DUCTWORK INSULATION

A. All 2 inch pressure class rectangular and round supply, return, and outside air ductwork shall be internal insulated unless specifically indicated otherwise in these specifications or on the drawings. See Specification Section 230700 (HVAC Insulation) for associated requirements.

B. Internal Duct Liner Insulation

1. Provide internal duct liner for the following, unless indicated otherwise on the drawings:
   a. The first 4 feet of rectangular ductwork downstream of each terminal unit.
   b. Rectangular transfer air ducts.
   c. Rectangular ductwork elsewhere as noted on the drawings.
2. Internal duct liner shall be 1-1/2” thick Johns Manville Linacoustic R-300 Duct Liner, or approved equal, with an insulating value of R-6.3 and a 25/50 flame and smoke spread rating in accordance with ASTM E84.
3. Cut and adhere internal duct liner and seal edges in strict accordance with the duct liner manufacturer’s written application instructions.
4. Additionally secure duct liner with weld pins or with Duro-Dyne PBH Dynastick Fasteners adhered with Duro-Dyne PBACZVOC Dynastick Adhesive. Faster spacing shall be in accordance with the insulation manufacturer’s written instructions.
5. Adjust duct sizes to accommodate liner thickness to provide the net internal duct dimensions shown on the drawings.

2.7 MISCELLANEOUS DUCTWORK MATERIALS

A. Provide miscellaneous materials and products of types and sizes indicated, unless otherwise indicated. Provide per the requirements listed in the latest SMACNA manuals, including proper connection of ductwork and equipment.

B. Duct Joints: Join and seal prefabricated, factory built ducts, fittings, and couplings in strict accordance with duct manufacturer's instructions. Install duct sealers, pop rivets, or sheet metal screws, canvas, and lagging adhesive on each joint. Duct sealer shall be fire retardant. Sheet metal screws for joints shall be minimum #10 size galvanized.

2.8 SEALANTS

A. Duct sealant shall be water-based, non-fibrated, and fire resistive with a UL 181B listing for use on low, medium, and high pressure ductwork. Sealant VOC levels shall also meet all federal, state, and local requirements and be classified with mildew resistance per ASTM G21 with 0 growth rating.

B. Sealant shall be rated for up to 10” w.c. and shall be installed in strict accordance with the manufacturer’s written instructions. Pressure sensitive tapes are not acceptable.

C. Subject to compliance with requirements, manufacturers offering sealants which may be incorporated in the work include the following:

Design Polymerics DP-1010
Hardcast Iron-Grip 601
Foster 32-19
Childers CP-146

PART 3 - EXECUTION

3.1 INSTALLATION OF DUCTWORK

A. Assemble and install ductwork to achieve air tight and noiseless (no objectionable noise) systems capable of performing each indicated service.

B. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8 inch misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type which will hold ducts true to shape and to prevent buckling.

C. Install concrete inserts for support of ductwork in coordination with formwork as required to avoid delays in work.

D. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct-plus-insulation with sheet metal flanges of same gauge as duct. Overlap opening on four sides by at least 1-1/2 inches.

E. Support ductwork and piping in a manner complying with Section 230530 (Hangers and Supports for HVAC Piping and Equipment). Where special hanging of ductwork or piping is detailed or shown on drawings, the drawings shall be followed.

F. Duct hangers used in areas where a specialty architectural ceiling or floor occurs shall be compatible for use with that system. See architectural and structural drawings for locations.

G. Seal all ductwork to the seal class required in the following table, and using the methods prescribed in the SMACNA HVAC Air Duct Leakage Test Manual, latest edition.

Duct Class	Up to 2” w.c.	3” w.c.	4” thru 10” w.c. or exposed to weather
Seal Class	C	B	A
Sealing	Transverse Joints Only	Transverse Joints and Seams	Joints, Seams, and all Applicable Wall Penetrations
Leakage Class			
Rectangular Metal	16	8	4
Round Metal	8	4	2

1. Sealant shall be applied 3 inches wide and at 32 mil wet film thickness.
2. For ducts greater than 2” pressure class, or exposed to weather, a first layer of sealant shall be applied to an 18 mil thickness, with scrim applied over the sealant, and then another 18 mil thickness of sealant shall be applied over the scrim.

3.2 DUCT LEAKAGE TESTING

A. Leakage testing is not required for low pressure ductwork (2” w.c. and below).

B. As the medium pressure duct systems are installed, each system shall be leak tested in an orderly sequence as appropriate to minimize the impact on the overall construction schedule. Medium pressure duct systems may be tested in sections as the work progresses, with all open ends capped and sealed. Leak testing shall be performed in accordance with the SMACNA HVAC Air Duct Leakage Test Manual (most current edition) and in accordance with the test requirements listed in the following paragraphs.

C. All medium pressure ductwork shall be leak tested in sections as the work progresses, and as directed by the Architect/Engineer.

D. All medium pressure ductwork leak testing shall be witnessed and documented by the test and balance contractor.

E. All medium pressure duct system joints/connections shall be reviewed by the test and balance contractor prior to commencement of any duct leakage testing. The test and balance contractor shall verify in writing that the reviewed sections or systems are in compliance with the sealing requirements listed herein, prior to testing.

F. The maximum allowable duct leakage for each medium pressure ductwork system (systems rated for 3” w.c. and above) shall be based on the applicable duct seal class, duct leakage class, and duct surface area, as prescribed in Table 5-1 of the SMACNA HVAC Air Duct Leakage Test Manual, latest edition, and shall also comply with the requirements listed in 2024 International Energy Conservation Code Section C403.13.

G. Unless noted otherwise on the drawings or herein, the test pressure for variable air volume system medium pressure supply air ducts shall be 4” w.c.

H. Test fans shall be capable of supplying at least 110% of the design static pressure for each section of duct to be tested.

I. In no case shall any duct leakage test pressure exceed the pressure rating of the installed ductwork.

J. Duct leakage testing for medium pressure ductwork shall be in accordance with the following:

1. Leak testing for medium pressure ductwork (3” w.c. thru 6” w.c.) Leakage Class 6
2. Leak testing for medium pressure ductwork (above 6” w.c.) Leakage Class 3

3.3 INSTALLATION OF FLEXIBLE DUCTWORK

A. Provide supports at or near the mid-length point using 2 inch wide 28 gauge steel hanger collars attached to the structure with an approved duct hanger. Installation shall eliminate sharp radius turns, offsets, or kinks.

B. Bends in flexible ductwork shall be kept to a minimum. The minimum bend radius shall be 1.5 times the duct diameter with no bends greater than 45 degrees. This specifications and any applicable drawings or details shall be strictly adhered to.

C. Each length of flexible duct shall be provided with steel connection collars.

D. Make connections to rigid duct and equipment with draw bands and sealer, and then apply duct tape over outside of sheath.

3.4 CLEANING AND PROTECTION OF DUCTWORK

A. Clean ductwork internally, unit by unit as it is installed, of any dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or where ductwork is to be painted.

B. Strip protective paper from stainless steel ductwork surfaces, and repair finish wherever it has been damaged.

C. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at the time of ductwork installation, provide temporary closure using polyethylene film or other covering which will prevent entrance of dust and debris until the time that connections are to be completed.

3.5 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, and tools, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 31 10 - HVAC DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 WORK INCLUDED

A. Types of ductwork accessories specified in this section include volume dampers, control dampers, fire-smoke dampers, turning vanes, duct hardware, duct access doors, flexible connections, and backdraft dampers.

1.3 QUALITY ASSURANCE

A. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) HVAC Duct Construction Standards (Metal and Flexible) latest edition, for all work in this section.

B. ASHRAE Standards: Comply with American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommendations, latest edition, for all work in this section.

C. NFPA Compliance: Comply with ANSI/NFPA 90A (Standard for the Installation of Air Conditioning and Ventilating Systems) and ANSI/NFPA 90B (Standard for the Installation of Warm Air Heating and Air Conditioning Systems).

D. Compliance: Construct, test, install and label fire dampers and fire doors in accordance with Underwriters Laboratories (UL) Standard 555 (Fire Dampers and Ceiling Dampers).

E. Dampers shall be warranted against manufacturing defects for a period of 5 years.

F. Dampers shall be tested, rated and labeled in accordance with the latest requirements of UL 555 (Fire Dampers) and UL 555S (Smoke Dampers).

G. Damper pressure drop ratings shall be based on tests and procedures performed in accordance with AMCA 500.

H. Damper pressure drop ratings shall be based on tests and procedures performed in accordance with AMCA 500 and certified in accordance with AMCA 500D.

1.4 REFERENCES

AMCA 500D	Laboratory Test Methods for Testing Dampers for Ratings
AMCA 511	Certified Ratings Program for Air Control Devices
IBC	International Building Code
NFPA 80	Fire Doors and Other Opening Protectives
NFPA 90A	Standard for the Installation of Air Conditioning and Ventilating Systems
NFPA 90B	Standard for the Installation of Warm Air Heating and Air Conditioning Systems
NFPA 92A	Smoke Control Systems
NFPA 101	Life Safety Code
NFPA 105	Standard for the Installation of Smoke Door Assemblies
UL 555	Standard for Safety; Fire Dampers
UL 555S	Standard for Safety; Smoke Dampers

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data for each type of ductwork accessory, including dimensions, capacities, and materials of construction, and installation instructions.

B. Fire-Smoke Dampers: Submit complete installation instructions for all types of fire damper to be used on this project, as part of main submittal.

PART 2 - PRODUCTS

2.1 TURNING VANES

A. Fabricated Turning Vanes: Provide fabricated turning vanes and vane runners, constructed in accordance with SMACNA HVAC Duct Construction Standards, latest edition.

B. Turning Vanes in Rectangular Duct Elbows: Turning vanes shall be provided in all rectangular duct elbows unless indicated otherwise on the drawings, such as in return air transfer ducts, where turning vanes shall not be installed. All turning vanes shall be SMACNA ‘Large’ (R=4.5”/SP=3.25”). Turning vanes in medium pressure ducts (3.0“ w.c. or greater) shall be double thickness. Turning vanes in low pressure ducts (2.0“ w.c. or less) with duct widths 30 inches and smaller shall be single thickness. Turning vanes in low pressure ducts (2.0“ w.c. or less) with duct widths 32 inches and larger shall be double thickness.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering turning vanes which may be incorporated in the work include the following, or approved equal:

Anemostat
Airsan Corporation

2.2 DUCT HARDWARE

A. Provide duct hardware manufactured by one manufacturer for all items on project for the following:

1. Test Holes: Provide in ductwork at fan inlet and outlet and elsewhere as required. Plastic test plugs may only be used on low pressure ductwork (2” w.c. or less). Test holes installed in medium pressure ductwork (above 2” w.c.) and at outdoor equipment shall be covered with Ventlok Model 699 covers, or approved equal.
2. Quadrant Locks: Provide for each damper quadrant lock device on one end of shaft and end-bearing plate on other end. Provide extended quadrant locks and extended bearing plates for externally insulated ductwork.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering duct hardware which may be incorporated in the work include the following, or approved equal:

Ventfabrics
Ventlok by Ventfabrics

2.3 DUCT ACCESS DOORS

A. Provide airtight access doors in ducts and plenums for cleaning and repairs of fire dampers, control devices, etc. and where shown on the drawings. Access door size shall be duct width by duct height for all ducts under 24 inches. Minimum access door size shall be 8 inches by 8 inches. Ducts over 24 inches in diameter shall have 24 inch by 18 inch access doors.

B. Access doors shall be rated for the associated duct pressure (positive or negative).

C. Access doors in supply air and return air ducts shall be insulated as required to provide a minimum R-6.0 rating. Insulation shall be 25/50 rated in accordance with ASTM E84. Access doors in supply air and return air ducts shall be Ductmate Model FD, or approved equal.

D. Access doors in low pressure ductwork (3.0” w.c. and below) shall be hinged with cam latches, and a perimeter gasket.

E. Access doors in medium pressure ductwork (4.0” w.c. and above) shall be constructed with cam latches and a perimeter gasket.

F. Access doors in stainless steel ductwork shall be constructed of stainless steel.

G. Access doors in grease exhaust ducts shall be UL listed, shall be Ductmate Ultimate, or approved equal.

H. Access doors shall be permanently identified on the exterior by a permanent label with letters not less than 1/2 inch in height reading ‘Fire-Smoke Damper’ or as otherwise appropriate.

I. Available Manufacturers: Subject to compliance with requirements, manufacturers offering duct access doors which may be incorporated in the work include the following, or approved equal:

Ductmate
Best Access Doors
United McGill

2.4 FLEXIBLE CONNECTIONS

A. Furnish and install flexible connections at following locations:

At supply connection on all motorized heating and cooling equipment.
At return connection on all motorized heating and cooling equipment.
At duct connection on all exhaust fans.
Elsewhere as shown on the drawings.

B. Flexible connections are not required for curb-mounted or roof-mounted exhaust fans.

C. Flexible duct connections shall be preassembled flexible connectors constructed of coated glass fabric applied in accordance with manufacturer's recommendations. Width of flexible connections shall be sufficient to allow minimum of 2 inches of free space between two metal collars to be connected. Install sheet metal band completely around duct or fan outlet, at end of flexible connection. Fasten with metal screws through band and coated glass fabric. Space screws approximately 3 inches apart. Coated glass fabric shall be equal to Ventfabrics Ventglas with neoprene coating for use inside building and Ventlon with hypalon coating when exposed to weather.

D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering flexible connections which may be incorporated in the work include the following:

Ventfabrics
Thermaflex

2.5 MANUAL VOLUME DAMPERS, CONTROL DAMPERS, AND BACKDRAFT DAMPERS

A. Manual Dampers: Provide manual volume dampers in all locations shown on the drawings. Dampers shall be single blade type or multi-blade type, constructed in accordance with the SMACNA HVAC Duct Construction Standards, latest edition. Damper blades shall not exceed 6 inch width, except that 8 inch wide dampers may be used in 8 inch wide ducts.

B. Concealed Damper Actuators: Where dampers are installed above non-accessible ceilings and are not served by access doors, provide extension cables and concealed ceiling mounted damper regulators. Damper regulator shall be Young Regulator Model 270-896, or approved equal.

C. Remote Powered Balancing Dampers: Where indicated on the drawings, provide remote powered balancing dampers complete with motorized damper, connecting cable, wall plate with ports, and battery powered remote control device. Dampers shall be Greenheck Model RBDR-50, Pottorff Model RD-10R, or approved equal.

D. Control Dampers: Provide dampers with low leakage opposed blades, frame and blades constructed of 16 gauge galvanized steel, suitable for electric actuators.

E. Backdraft Dampers: Provide dampers with parallel blades, constructed of 16 gauge aluminum; provide 1/2 inch diameter ball bearings, 1/2 inch diameter steel axles spaced on 9 inch centers. Construct frame of 2” x 1/2” x 1/8” thick steel channel for face areas 25 sf and under; and 4” x 1-1/4” x 16 gauge channel for face areas over 25 sf. Provide galvanized steel finish on frame with aluminum touch-up.

F. Available Manufacturers: Subject to compliance with requirements, manufacturers offering dampers which may be incorporated in the work include the following, or approved equal:

Greenheck
Ruskin
Air Balance

2.6 DUCT SMOKE DETECTORS

A. Duct smoke detectors shall be installed at the locations shown on the drawings, as listed in the equipment schedules, and as described herein.

B. Duct smoke detectors shall be furnished by Division 26. Installation of duct smoke detectors and wiring between duct smoke detectors and the associated mechanical equipment shall be by Division 23. Electrical power to duct smoke detectors and wiring to the fire alarm control panel shall be by Division 26.

C. It is the mechanical contractor’s responsibility to ensure that their bid includes a complete installation that is coordinated with the duct smoke detectors, equipment, and all applicable code requirements.

D. Duct smoke detectors shall be installed in conformance with Uniform Mechanical Code Section 608. Equipment that has a scheduled airflow in excess of 2,000 cfm shall have a duct smoke detector installed in both the supply air and the return air.

E. Equipment that has a scheduled airflow in excess of 15,000 cfm and serves multiple floors of a building shall have duct smoke detectors installed in the return air duct where the return air exits each floor of the building (prior to the main return air riser) in addition to the supply air duct smoke detector(s) specified in this section.

F. In cases where there are no Division 26 plans and specifications, duct smoke detectors shall be furnished and installed by Division 23. Such duct smoke detectors shall be manufactured by Edwards, Notifier, or approved equal. On projects where duct smoke detectors will be connected to an existing fire alarm system, the new duct detectors shall match the existing system manufacturer’s devices. Duct smoke detectors shall include dual auxiliary contacts for interface with the fire alarm system and the direct digital control system.

PART 3 - EXECUTION

3.1 INSTALLATION OF DUCT ACCESSORIES

A. Install duct accessories in accordance with the manufacturer's installation instructions, with applicable portions of details of construction as shown in the SMACNA Standards, and in accordance with recognized industry practices as necessary to ensure that the products serve the intended function.

B. Install turning vanes in square and/or rectangular 90 degree elbows in supply and exhaust air systems and elsewhere as indicated.

C. Install access doors to open against system air pressure, with latches operable from either side, except on the outside only where the duct is too small for a person to enter.

D. Coordinate with other work as necessary to interface installation of duct accessories properly with other work.

E. Field Quality Control: Operate installed duct accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories as required to obtain proper operation and leak-proof performance.

3.2 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to the Architect/Engineer. At completion, carefully clean and adjust equipment, fixtures, and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.3 INSPECTION OF FIRE-SMOKE DAMPERS

A. Upon completion of this work all fire-smoke dampers shall be tested by the installing contractor in the presence of the local fire department. Provide spare fusible links as required to complete testing to the complete satisfaction of the local fire department.

3.4 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.5 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

END OF SECTION

SECTION 23 35 00 - AIR FILTERS

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data for each type of air filter, including dimensions, thickness, capacity, and materials of construction.

1.3 CERTIFICATIONS

A. The filter manufacturing facility shall be certified to comply with ISO 9001:2015. Filters shall be listed by Underwriters Laboratories as UL Class 900.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering air filters which may be incorporated in the work include the following, or approved equal:

Camfil
American Air Filter

2.2 MERV 9A PLEATED AIR FILTERS (2” & 4” THICK)

A. General

1. Air filters shall be medium efficiency ASHRAE panel filter type, of size, thickness, and quantity as scheduled on the drawings. Filters shall be Camfil 30/30 Dual 9, or approved equal.
2. The filter manufacturer shall have evidence of facility certification to ISO 9001:2015.

B. Construction

1. Filters shall be configured into high capacity pleat densities of 15 pleats per linear foot for 2” thick filters, and 11 pleats per linear foot for 4” thick filters. Filter enclosing frame shall be constructed of a 24 point high wet-strength beverage board that is bonded to the media shall provide a rigid and durable enclosure. Filters shall have a welded wire grid, spot-welded on centers, and treated for corrosion resistance, shall be bonded to the downstream side of the media to maintain the radial pleat and prevent media oscillation
2. Filters shall have charged synthetic media, lofted to a uniform depth, and formed into a uniform radial pleat.

C. Performance

1. The filter shall have a Minimum Efficiency Reporting Value (MERV) rating of 9 when evaluated under ASHRAE Standard 52.2. Additionally, filters shall have a MERV-A rating of 9 when tested per Appendix J of the same standard.
2. The filter shall have a performance rating of ePM10 - 55% when evaluated in accordance with ISO Filter Testing Standard16890.
3. The initial resistance to airflow for 2 inch thick filters shall not exceed 0.28” w.c. at 500 fpm, and 0.20” w.c. at 400 fpm.
4. The initial resistance to airflow for 4 inch thick filters shall not exceed 0.25” w.c. at 500 fpm, and 0.17” w.c. at 400 fpm.
5. The recommended filter change-out resistance is 1.0” w.c.

2.3 MERV 13 PLEATED AIR FILTERS (2" & 4" THICK)

A. General
1. Air filters shall be medium efficiency ASHRAE panel filter type, of size, thickness, and quantity as scheduled on the drawings. Filters shall be Camfil AP-Thirteen, or approved equal.

B. Construction
1. Filters shall be configured into high capacity pleat densities of 15 pleats per linear foot for 2" thick filters, and 11 pleats per linear foot for 4" thick filters. Filter enclosing frame shall be constructed of a 24 point high wet-strength beverage board that is bonded to the media shall provide a rigid and durable enclosure. Filters shall have a welded wire grid, spot-welded on centers, and treated for corrosion resistance, shall be bonded to the downstream side of the media to maintain the radial pleat and prevent media oscillation
2. Filters shall have charged synthetic media, lofted to a uniform depth, and formed into a uniform radial pleat.

C. Performance
1. The filter shall have a Minimum Efficiency Reporting Value (MERV) rating of 13 when evaluated under ASHRAE Standard 52.2.
2. The initial resistance to airflow for 2 inch thick filters shall not exceed 0.38" w.c. at 500 fpm, and 0.30" w.c. at 400 fpm.
3. The initial resistance to airflow for 4 inch thick filters shall not exceed 0.33" w.c. at 500 fpm, and 0.25" w.c. at 400 fpm.
4. The recommended filter change-out resistance is 1.0" w.c.

2.4 MERV 14A V-BANK MINI-PLEAT AIR FILTERS (12" THICK)

A. General
1. Air filters shall be high efficiency v-bank mini-pleat fiberglass disposable type, of size, thickness, and quantity as scheduled on the drawings. Filters shall be configured with pleat separators, polyurethane pack-to-frame sealant, and a polystyrene enclosing frame. Filters shall be Camfil Durafil ES3, or approved equal.

B. Construction
1. Filters shall be configured with pleat separators, polyurethane pack-to-frame sealant, and a polystyrene enclosing frame.
2. Filter media shall be of microfine glass fibers formed into uniform pleats with a spacing of 8.5 pleats per inch and a uniform pleat height of .866 inches (22 millimeters). Pleats shall be separated at .984 inch (25 millimeter) intervals to ensure pleat separation and uniform airflow through the filter pack.
3. Media packs shall be assembled into a v-bank configuration with sufficient total media area to meet airflow requirements. The filter outlet shall be radial in shape with a maximum of 60% open area to maintain a low pressure drop and uniform airflow.
4. Media packs shall be bonded to the inside periphery of an ABS enclosing frame with a polyurethane sealant. The enclosing frame shall include top and bottom molded tracks as in integral part of the frame to ensure a proper seal.
5. Media packs shall be recessed at least 1" from the entering air side of the enclosing frame to allow uniform airflow when a pre-filter is mounted directly to the enclosing frame.
6. Rigid plastic end caps shall be mechanically fastened to the top and bottom of the media pack enclosing structure to ensure a rigid and durable filter.
7. Carrying handles shall be an integral part of the filter frame and shall bridge from media pack to media pack providing additional filter support and filter rigidity. Handles shall include fastener connection locations for the application of spring mounting fasteners when the filter is applied in reverse flow applications.

C. Performance

1. The filter shall have a Minimum Efficiency Reporting Value (MERV) rating of 14 when evaluated under ASHRAE Standard 52.2. Additionally, filters shall have a MERV-A rating of 14 when tested per Appendix J of the same standard.
2. The filter shall have performance rating of ePM1-70 when evaluated in accordance with ISO Filter Testing Standard 16890.
3. The filter shall be capable of withstanding 10.0” w.c. without failure of the media pack.
4. The filter shall have a 5 star rating when evaluated per the Energy Cost Index (ECI).

2.5 CARBON FILTERS (12” THICK)

A. General

1. Carbon air filters shall be compact 12” deep adsorber type with combination sorbent/particulate removal media, impact-resistant plastic end caps, plastic vertical support channels, and a nominal 1” header for front or side access applications. Sizes shall be as scheduled on the drawings. The filter manufacturer shall provide evidence of facility certification to ISO 9001:2008. Filters shall be ‘Camfil CityCarb I’ pleated v-cell cartridges, or approved equal.

B. Construction

1. Filter media shall be specifically manufactured for the removal of molecular and particulate contaminants. Sorbent shall be a broad spectrum grade of carbon incorporating Rapid Adsorption Dynamics (RAD) designed for the removal of a wide range of odors and VOC’s. The total media area shall be 0.038 square feet per rated cfm of filter area minimum. The media shall be formed into uniform pleats using hot-melt separators, assembled into multi-media packs, and bonded into a high impact resistant plastic frame to prevent air bypass.

C. Particulate and Initial Resistance Performance

1. The initial resistance to airflow shall not exceed 0.6” w.c. (+/-10%) at a face velocity of 500 feet per minute. Filters shall have a minimum efficiency rating of MERV 15 when evaluated in accordance with ASHRAE Standard 52.2 and shall also have a minimum efficiency rating of MERV 14A when tested per Appendix J of ASHRAE 52.2.

D. Molecular Performance Testing

1. Filters shall be tested by the manufacturer using a protocol in accordance with ASHRAE Standard 145.2. Full details of the test protocol to be included with photographic evidence. A full size (24”x24”) filter shall be tested at a flow rate of 2,000 cfm at 73°F and 50% RH. Gas detectors shall have lower level of detection values of <1 ppb. As a minimum, the initial removal efficiency and test concentration data shall be provided for Ozone, Nitrogen Dioxide, Sulfur Dioxide, and Toluene.

END OF SECTION

SECTION 23 75 00 - WATER SOURCE HEAT PUMPS (6 TONS AND BELOW)

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 SUMMARY

A. Furnish and install water source heat pumps with capacities and characteristics as listed on the drawings and in these specifications.

1.3 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and identified with labels describing contents.
   1. Three sets of spare filters for each unit.
   2. One set of spare fan belts.

1.4 WARRANTY

A. The unit manufacturer shall provide a 5 year parts only warranty against defects in material and workmanship on all parts.

B. The Contractor shall provide a 5 year labor warranty.

C. The warranty period shall commence upon acceptance of the operational units by the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering water source heat pumps which may be incorporated in the work include the following:

Daikin
WaterFurnace
Skymark
Trane

2.2 GENERAL

A. Furnish and install water source heat pumps as indicated on the drawings. Equipment shall be completely assembled, piped, and internally wired. Capacities and characteristics shall be as listed in the schedule on the drawings and in these specifications. The reverse cycle heating/cooling units shall be either suspended type with horizontal air inlet and discharge or floor mounted type with horizontal air inlet and vertical up-flow air discharge.

B. Units shall be AHRI/ISO 13256-1 certified and listed by a nationally recognized safety testing laboratory or agency such as the ETL Testing Laboratory. Each unit shall be computer run tested at the factory with conditioned water and operation verified to match catalog data. Each unit shall be mounted on a pallet and shipped in a corrugated box or stretch wrapped. The units shall be designed to operate with an entering fluid temperature between 20°F and 120°F.

2.3 CASING AND CABINET

A. The cabinet shall be fabricated from heavy gauge galvanized steel and finished with optional corrosion resistant powder coating. This corrosion protection system shall meet the 1,000 hour salt spray test per ASTM B117.

B. The interior shall be insulated with 1/2 inch thick, multi-density neoprene or cleanable aluminum foil coated glass fiber, with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. Standard cabinet panel insulation shall meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, fungal resistance test per ASTM C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22.

C. One horizontal blower compartment, two vertical blower compartments, and two compressor compartment access panels shall be 'lift-out' removable with supply and return ductwork in place. A duct collar shall be provided on the supply air opening.

D. See filter rack schedule on the drawings for size and quantity of 2" thick MERV 13 filters.

E. Units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise. Vertical units shall be supplied with left or right horizontal air inlet and top vertical air discharge. Horizontal units shall be supplied with left or right air inlet and side or end air discharge.

F. The compressor shall be isolation mounted using selected durometer grommets to provide a vibration free compressor mounting. The compressor mounting bracket shall be acoustically deadened galvanized steel to prevent vibration transmission to the cabinet.

G. All units shall have a double sloped, positively pitched, insulated stainless steel drain pan. Galvanized or painted steel drain pans are not acceptable. Provide a secondary drain connection where indicated on the drawings or in the equipment schedule.

H. *Required Option:* Compressor Sound Reduction Package. Provide multi-density full coverage compressor sound blanket.

2.4 REFRIGERANT CIRCUIT

A. All units shall utilize R-32. All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bi-directional thermostatic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, and service ports.

B. Compressors shall be high efficiency single speed scroll type designed for heat pump duty and mounted on vibration isolators. The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting.

C. The thermostatic expansion valve shall provide proper superheat over the entire liquid temperature range with minimal hunting. The valve shall operate bi-directionally without the use of check valves.

D. The coaxial water-to-refrigerant heat exchanger shall be designed for low water pressure drop and constructed of a convoluted copper (cupro-nickel) inner tube and a steel outer tube. Refrigerant-to-air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled aluminum tube construction rated for a 600 psi refrigerant working pressure.

E. *Required Option:* Cupro-Nickel Refrigerant-to-Water Heat Exchanger. Refrigerant-to-water heat exchanger shall be of copper-nickel inner water tube and steel refrigerant outer tube design, rated for a 600 psi working refrigerant pressure and a 450 psi working water pressure. Water lines shall also be of cupro-nickel construction.

F. *Required Option:* Insulated Water-to-Refrigerant Heat Exchanger, Water Lines, and Refrigerant Suction Lines. Insulate to prevent condensation at low liquid temperatures (below 50°F).

2.5 BLOWER MOTOR AND ASSEMBLY

A. The blower shall be a direct drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low outlet velocity operation. The blower housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the blower motor. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermostatic overload protection.

B. *Required Option:* Multiple Speed ECM Type Blower Motor. The ECM blower motor shall have a minimum of 3 speeds, shall be soft starting, shall maintain constant torque over its operating static range, and shall provide 5 speed settings. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermostatic overload protection. 5 speed ECM motors shall be long life ball bearing type.

2.6 ELECTRICAL

A. A control box shall be located within the unit compressor compartment and shall contain a 50VA or 75VA transformer, 24 volt activated, 2 pole compressor contactor, terminal block for thermostat wiring and solid state controller for complete unit operation. Electro-mechanical operation is not acceptable. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 volt and provide heating or cooling as required by the remote thermostat/sensor.

B. A microprocessor-based controller that interfaces with a multi-stage electronic thermostat to monitor and control unit operation shall be provided. The control shall provide operational sequencing, blower speed control, high and low pressure switch monitoring, freeze detection, condensate overflow sensing, lockout mode control, LED status and fault indicators, fault memory, field selectable options and accessory output. The control shall provide fault retry three times before locking out to limit nuisance trips.

C. A detachable terminal block with screw terminals will be provided for field control wiring. All units shall have knockouts for entrance of low and line voltage wiring. The blower motor and control box shall be harness plug wired for easy removal.

D. *Required Option (Units 3 Tons and Larger):* Compressor Soft Starter. Soft start capability shall be factory-installed to provide low starting amps, reduced compressor startup noise, and improved startup behavior. Soft starter shall reduce normal starting current by up to 60%.

2.7 PIPING

A. Supply and return water connections shall be FPT copper fittings fixed to the corner post, which eliminate the need for backup pipe wrenches. With vertical units, the condensate connection shall be a 3/4 inch PVC socket with an internally trapped hose that can be routed to front or side corner post locations.

2.8 HANGER KIT (INCLUDED WITH HORIZONTAL UNITS ONLY - FOR FIELD INSTALLATION)

A. The hanger kit shall consist of galvanized steel brackets, bolts, lock washers, and isolators and shall be designed to fasten to the unit bottom panel for suspension from 3/8 inch threaded rods. Unit sizes 009-060 shall require four brackets and unit sizes 070-072 shall require five brackets. Brackets shall not inhibit filter removal in any way.

PART 3 - EXECUTION

3.1 HEAT PUMP INSTALLATION

A. Install heat pumps in locations and arrangements indicated on the drawings.

3.2 CARE AND CLEANING

A. Repair or replace broken, damaged or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Owner's representative. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.3 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.4 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like and leave the premises clean, neat and orderly.

END OF SECTION

SECTION 23 75 10 - WATER SOURCE HEAT PUMPS (7 TONS AND ABOVE)

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 SUMMARY

A. Furnish and install water source heat pumps with capacities and characteristics as listed on the drawings and in these specifications.

1.3 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and identified with labels describing contents.
   1. Three sets of spare filters for each unit.
   2. One set of spare fan belts.

1.4 WARRANTY

A. The unit manufacturer shall provide a 5 year parts only warranty against defects in material and workmanship on all parts.

B. The Contractor shall provide a 5 year labor warranty.

C. The warranty period shall commence upon acceptance of the operational units by the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering water source heat pumps which may be incorporated in the work include the following:

Daikin
WaterFurnace
Skymark
Trane

2.2 GENERAL

A. Furnish and install water source heat pumps as indicated on the drawings. Equipment shall be completely assembled, piped, and internally wired. Capacities and characteristics shall be as listed in the schedule on the drawings and in these specifications. The reverse cycle heating/cooling units shall be either suspended type with horizontal air inlet and discharge or floor mounted type with horizontal air inlet and vertical upflow air discharge.

B. Units shall be AHRI/ISO 13256-1 certified and listed by a nationally recognized safety testing laboratory or agency such as the ETL Testing Laboratory. Each unit shall be computer run tested at the factory with conditioned water and operation verified to match catalog data. Each unit shall be mounted on a pallet and shipped in a corrugated box or stretch wrapped. The units shall be designed to operate with an entering fluid temperature between 20°F and 120°F.

C. *Required Option:* Multiple Speed ECM Type Blower Motor. The ECM blower motor shall have a minimum of 3 speeds, shall be soft starting, shall maintain constant torque over its operating static range, and shall provide 5 speed settings. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermostatic overload protection. 5 speed ECM motors shall be long life ball bearing type.

2.3 CASING AND CABINET

A. The cabinet shall be fabricated from heavy gauge galvanized steel and finished with optional corrosion resistant powder coating. This corrosion protection system shall meet the 1,000 hour salt spray test per ASTM B117. The interior shall be insulated with 1/2 inch thick, multi-density neoprene or cleanable aluminum foil coated glass fiber, with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. Standard cabinet panel insulation shall meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, fungal resistance test per ASTM C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22.

B. One horizontal blower compartment, two vertical blower compartments, and two compressor compartment access panels shall be ‘lift-out’ removable with supply and return ductwork in place. A duct collar shall be provided on the supply air opening.

C. See filter rack schedule on the drawings for size and quantity of 2” thick MERV 13 filters.

D. Units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise. Vertical units shall be supplied with left or right horizontal air inlet and top vertical air discharge. Horizontal units shall be supplied with left or right air inlet and side or end air discharge.

E. The compressor shall be isolation mounted using selected durometer grommets to provide vibration free compressor mounting. The compressor mounting bracket shall be acoustically deadened galvanized steel to prevent vibration transmission to the cabinet.

F. All units shall have a double sloped, positively pitched, insulated stainless steel drain pan. Galvanized or painted steel drain pans are not acceptable. Provide a secondary drain connection where indicated on the drawings or in the equipment schedule.

G. *Required Option:* Compressor Sound Reduction Package. Provide multi-density full coverage compressor sound blanket.

2.4 REFRIGERANT CIRCUIT

A. All units shall utilize R-32. All units shall contain <u>two</u> sealed refrigerant circuits, including a hermetic motor-compressor, bi-directional thermostatic expansion valve, finned tube air-to-refrigerant heat exchanger, coaxial tube water-to-refrigerant heat exchanger, and service ports.

B. Dual compressors shall be high efficiency single speed scroll type designed for heat pump duty and mounted on vibration isolators. The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting.

C. The thermostatic expansion valve shall provide proper superheat over the entire liquid temperature range with minimal hunting. The valve shall operate bi-directionally without the use of check valves.

D. AlumiSeal electro-coated air coil. The coaxial water-to-refrigerant heat exchanger shall be designed for low water pressure drop and constructed of a convoluted copper (cupro-nickel option) inner tube and a steel outer tube. Refrigerant-to-air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled aluminum tube construction rated for a 600 psi refrigerant working pressure.

E. *Required Option:* Cupro-Nickel Refrigerant-to-Water Heat Exchanger. Refrigerant-to-water heat exchanger shall be of copper-nickel inner water tube and steel refrigerant outer tube design, rated for a 600 psi working refrigerant pressure and a 450 psi working water pressure. Water lines shall also be of cupro-nickel construction.

F. *Required Option:* Insulated Water-to-Refrigerant Heat Exchanger, Water Lines, and Refrigerant Suction Lines. Insulate to prevent condensation at low liquid temperatures (below 50°F).

2.5 BLOWER MOTOR AND ASSEMBLY

A. All units shall have belt driven centrifugal blowers. Blower motors shall be permanently lubricated with thermal overload protection. Units supplied without permanently lubricated motors must provide external oilers for easy service. The blower shall be double width, double inlet forward curved with dynamically balanced wheels. Blower motors shall be 1725 rpm, type 56 frame, sealed ball bearing type. The drive shall include a fixed pitch blower sheave and variable pitch motor sheave sized for 115% of the blower brake horsepower. Airflow and static pressure rating of the unit shall be based on a wet coil and a clean filter in place. Ratings based on a dry coil and/or no filter, or on an external static pressure less than 0.25 inches are not acceptable.

2.6 ELECTRICAL

A. A control box shall be located within the unit compressor compartment and shall contain a 50VA or 75VA transformer, 24 volt activated, 2 pole compressor contactor, terminal block for thermostat wiring and solid state controller for complete unit operation. Electro-mechanical operation is not acceptable. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 volt and provide heating or cooling as required by the remote thermostat/sensor.

B. A microprocessor-based controller that interfaces with a multi-stage electronic thermostat to monitor and control unit operation shall be provided. The control shall provide operational sequencing, blower speed control, high and low pressure switch monitoring, freeze detection, condensate overflow sensing, lockout mode control, LED status and fault indicators, fault memory, field selectable options and accessory output. The control shall provide fault retry three times before locking out to limit nuisance trips.

C. A detachable terminal block with screw terminals will be provided for field control wiring. All units shall have knockouts for entrance of low and line voltage wiring. The blower motor and control box shall be harness plug wired for easy removal.

D. *Required Option:* Compressor Soft Starter. Soft start capability shall be factory-installed to provide low starting amps, reduced compressor startup noise, and improved startup behavior. Soft starter shall reduce normal starting current by up to 60%.

2.7 PIPING

A. Supply and return water connections shall be FPT copper fittings fixed to the corner post, which eliminate the need for backup pipe wrenches. On vertical units the condensate connection shall be a 3/4 inch PVC socket with an internally trapped hose that can be routed to the front or side corner post locations.

PART 3 - EXECUTION

3.1 HEAT PUMP INSTALLATION

A. Install heat pumps in locations and arrangements indicated on the drawings.

3.2 CARE AND CLEANING

A. Repair or replace broken, damaged or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Owner's representative. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.3 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.4 CLEANING UP

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like and leave the premises clean, neat and orderly.

END OF SECTION

SECTION 23 81 10 - MAKE-UP AIR UNITS (EVAPORATIVE COOLING - GAS HEAT)

PART 1 - GENERAL

1.1 CONDITIONS OF THE CONTRACT

A. Sections 230000 (Heating, Ventilating, and Air Conditioning) and 230500 (Basic Materials and Methods for HVAC Systems) are hereby made a part of this section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and configuration of make-up air unit.

B. Shop Drawings: For each type and configuration of make-up air unit.

1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints, and for designing vibration isolation bases.

1.3 SUBMITTALS

A. Sample warranty.

B. Seismic calculations for roof curb (stamped by a licensed engineer).

C. Operation and maintenance data (at project closeout).

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. ASHRAE Compliance: Comply with the applicable requirements listed in ASHRAE 62.1, Section 5 (Systems and Equipment) and Section 7 (Construction and Startup).

C. ASHRAE Compliance: Comply with the applicable requirements listed in ASHRAE 90.1 Section 6 (Heating, Ventilating, and Air Conditioning).

1.5 WARRANTY

A. The manufacturer shall repair or replace any components of the make-up air unit(s) that fail in materials or workmanship within the one year warranty period. The manufacturer shall provide a minimum 5 year extended warranty for the heat exchanger.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Provide make-up air units as manufactured by one of the following, or approved equal:

CaptiveAire
Daikin
Greenheck
York
Trane

2.2 UNIT DESCRIPTION

A. Furnish single zone heating and cooling units. Unit performance and electrical characteristics shall be as scheduled on the drawings and as specified herein.

B. Configuration: Fabricate as detailed on prints and drawings:
   1. Return plenum/economizer section
   2. Filter section
   3. Direct evaporative cooling section
   4. Supply fan section
   5. Gas heating section

C. The complete unit shall be cETLus listed.

D. The unit shall be ASHRAE 90.1 2016 compliant and labeled.

E. Each unit shall be specifically designed for outdoor rooftop application and include a weatherproof cabinet. Each unit shall be completely factory assembled and shipped in one piece.

F. The unit shall undergo a complete factory run test prior to shipment.

G. All units shall have decals and tags to indicate caution areas and aid unit service. Unit nameplates shall be fixed to the main control panel door. Electrical wiring diagrams shall be attached to the control panels. Installation, operating and maintenance bulletins and startup forms shall be supplied with each unit.

H. Performance: All scheduled capacities and face areas are minimum accepted values. All scheduled amps, kW, and HP are maximum accepted values that allow scheduled capacity to be met.

2.3 CABINET

A. Panel construction shall be double wall for all panels. All floor panels shall have a solid galvanized steel inner liner on the air stream side of the unit to protect insulation during service and maintenance. Insulation shall be a minimum of 1" thick with an R-Value of 7.0, and shall be two part injected foam. Panel design shall include no exposed insulation edges. Unit cabinet shall be designed to operate at total static pressures up to 5.0 inches w.g.

B. Exterior surfaces shall be constructed of painted galvanized steel. Paint finish shall include a base primer with a high quality polyester resin topcoat. Finished, unabraded panel surfaces shall be exposed to an ASTM B117 salt spray environment and exhibit no visible red rust at a minimum of 3,000 hours exposure. Finished, abraded surfaces shall be tested per ASTM D1654, having a mean scribe creepage not exceeding 1/16” at 1,000 hours minimum exposure to an ASTM B117 salt spray environment. Measurements of results shall be quantified using ASTM D1654 in conjunction with ASTM D610 and ASTM D714 to evaluate blister and rust ratings.

C. Service doors shall be provided on the fan section, filter section, control panel section, and heating vestibule in order to provide user access to unit components. All service access doors shall be mounted on multiple, stainless steel hinges and shall be secured by a latch system. Removable service panels secured by multiple mechanical fasteners are not acceptable.

D. The unit base shall overhang the roof curb for positive water runoff and shall seat on the roof curb gasket to provide a positive weathertight seal. Lifting brackets shall be provided on the unit base to accept cable or chain hooks for rigging the equipment.

2.4 OUTDOOR AIR/RETURN AIR SECTION

A. Unit shall be provided with a 100% outdoor air hood. The 100% outdoor air hood shall allow outdoor air to enter from the back of the unit, at the draw through filter section. The outdoor air hood shall be factory installed and constructed from galvanized steel finished with the same paint finish as the main unit. The hood shall include a bird screen to prevent infiltration of foreign materials and a rain lip to drain water away from the entering air stream.

B. Dampers shall be low leakage type. Damper blades shall be fully gasketed and side sealed and arranged vertically in the hood. Damper leakage shall be less than 1.5 cfm/sf of damper area at 1.0 inch static pressure differential. Leakage rate to be tested in accordance with AMCA Standard 500. The outside air damper actuator shall be normally closed spring return.

C. Damper blades shall be operated from multiple sets of linkage mounted on the leaving face of the dampers. Control of the outdoor dampers shall be by a factory installed modulating actuator. Damper shall open when supply fan starts and close when supply fan stops.

2.5 SUPPLY FAN

A. Supply fan shall be a single width, single inlet (SWSI) airfoil centrifugal fan. The fan wheel shall be Class II construction with fan blades that are continuously welded to the hub plate and end rim. The supply fan shall be a direct drive fan mounted to the motor shaft. Belts and sheaves are not acceptable due to the additional maintenance.

B. All fan assemblies shall be statically and dynamically balanced at the factory, including a final trim balance, prior to shipment.

C. Supply fan and motor assembly combinations larger than 8 horsepower or 22” diameter shall be internally isolated on 1” deflection spring isolators and include removable shipping tie downs.

D. The fan motor shall be a totally enclosed EC motor that is speed controlled by the rooftop unit controller. The motor shall include thermal overload protection and protect the motor in the case of excessive motor temperatures. The motor shall have phase failure protection and prevent the motor from operation in the event of a loss of phase. Motors shall be premium efficiency.

E. The supply fan shall be capable of airflow modulation from 30% to 100% of the scheduled designed airflow. The fan shall not operate in a state of surge at any point within the modulation range.

2.6 VARIABLE AIR VOLUME CONTROL

A. The unit controller shall proportionally control the ECM motors on the supply fan based on space temperature. The unit controller shall increase/decrease the speed of the supply fan in order to maintain the space temperature within its setpoint and deadband. The unit controller shall provide discharge air temperature control with the compressor modulation.

2.7 FILTERS

A. The unit shall be provided with a draw-through filter section. The filter rack shall be designed to accept a 2” thick pre-filter and a 2” thick final filter. The unit shall have a hinged access door for the filter section. The manufacturer shall ship the unit with 2” Merv 13 filters. The Contractor shall furnish and install the final set of filters per the contract documents.

2.8 DAMPERS

A. Outdoor Air Damper: Galvanized steel, opposed blade dampers with vinyl blade seals and stainless steel jamb seals, having a maximum leakage of 10 cfm/sf. of damper area, at a differential pressure of 2 inches w.g. The damper operator shall be direct coupled, electronic, with spring return or fully modulating as required by the sequence of operation.

2.9 EQUIPMENT CURB

A. All roof curbs shall be constructed such that the top of the curb is a minimum of 14 inches above the lowest point of the finished roof surface.

B. A prefabricated heavy gauge galvanized steel mounting curb shall be provided for field assembly on the roof decking prior to unit shipment. The roof curb shall be a full perimeter type with complete perimeter support of the air handling and condensing sections. Gasketing shall be provided for field mounting between the unit base and roof curb.

2.10 DIRECT EVAPORATIVE COOLING SECTION

A. Evaporative media casing and sump pan shall be fabricated of stainless steel and shall include 12” thick GLASdek evaporative media. Gutter and sump shall be sized to supply the system with enough water to operate at the maximum flow rate and not overflow when the system is shut down. The evaporative cooling module shall be equipped with a circulating pump, bleed valve, and bleed tubing.

B. Fill and drain valves are to be provided by the temperature control contractor (see drawings and sequence of operation).

C. Provide a water filter for each evaporative cooler. Water filters shall be Axiom Model SPF-10, or approved equal.

D. See Specification Section 232500 (Chemical Treatment) for required chemicals.

2.11 INDIRECT FIRED NATURAL GAS BURNER

A. The rooftop unit shall include a natural gas heating section. The gas furnace design shall be one natural gas fired heating module factory installed downstream of the supply air fan in the heat section. The heating module shall be a tubular design with in-shot gas burners.

B. The module shall be complete with furnace controller and control valve capable of 5:1 modulating operation.

C. The heat exchanger tubes shall be constructed of stainless steel.

D. The module shall have an induced draft fan that maintains a negative pressure in the heat exchanger tubes for the removal of the flue gases.

E. Each burner module shall have two flame roll-out safety protection switches and a high temperature limit switch that will shut the gas valve off upon detection of improper burner manifold operation. The induced draft fan shall have an airflow safety switch that will prevent the heating module from turning on in the event of no airflow in the flue chamber.

2.12 UNIT CONTROLS

A. Provide a complete integrated microprocessor based direct digital control (DDC) system to control all unit functions including temperature control, scheduling, monitoring, unit safety protection, including compressor minimum run and minimum off times, and diagnostics. This system shall consist of all required temperature sensors, pressure sensors, controller and keypad/display operator interface. All miniature circuit breakers and sensors shall be factory mounted, wired, and tested.

B. The stand-alone DDC controllers shall not be dependent on communications with any on site or remote PC or master control panel for proper unit operation. The microprocessor shall maintain existing setpoints and operate standalone if the unit loses either direct connected or network communications. The microprocessor memory shall be protected from voltage fluctuations as well as any extended power failures. All factory and user set schedules and control setpoints shall be maintained in nonvolatile memory. No settings shall be lost, even during extended power shutdowns.

C. The DDC control system shall permit starting and stopping of the unit locally or remotely. The control system shall be capable of providing a remote alarm indication. The unit control system shall provide for outside air damper actuation, emergency shutdown, remote heat enable/disable, remote cool enable/disable, heat indication, cool indication, and fan operation.

D. All digital inputs and outputs shall be protected against damage from transient or incorrect voltages. All field wiring shall be terminated at a separate, clearly marked terminal strip.

E. The DDC controller shall have a built in time schedule. The schedule shall be programmable from the unit keypad interface. The schedule shall be maintained in nonvolatile memory to ensure that it is not lost during a power failure. There shall be one start/stop per day and a separate holiday schedule. The controller shall accept up to sixteen holidays each with up to a 5 day duration. Each unit shall also have the ability to accept a time schedule via DDC network communication.

F. The keypad interface shall allow convenient navigation and access to all control functions.

2.13 UNIT ELECTRICAL

A. Unit wiring shall comply with NEC requirements and with all applicable UL standards. All electrical components shall be UL recognized where applicable. All wiring and electrical components provided with the unit shall be numbered, color coded, and labeled according to the electrical diagram provided by the manufacturer.

B. The unit shall be provided with a factory wired weatherproof control panel. Unit shall have a single point power terminal block for main power connection. A terminal board shall be provided for low voltage control wiring. Branch short circuit protection, 115 volt control circuit transformer and fuse, system switches, and a high temperature sensor shall also be provided with the unit.

C. A single non-fused disconnect switch shall be provided for disconnecting electrical power at the unit. Disconnect switches shall be mounted internally to the control panel and operated by an externally mounted handle.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Unit Support: Install heating and ventilating unit level on structural curbs. Coordinate wall penetrations and flashings with wall construction. Secure units to structural support with anchor bolts.

B. Adjust initial temperature setpoints, and set field adjustable switches and circuit breaker trip ranges as indicated.

3.2 CONNECTIONS

A. The drawings indicate general arrangement of piping, fittings, and specialties.

B. Gas Piping: Connect gas piping with shutoff valve and union and with sufficient clearance for burner removal and service. Make final connections of gas piping to unit with corrugated, stainless steel tubing flexible connectors complying with ANSI LC 1/CSA 6.26 equipment connections.

C. Drains: Comply with the requirements in Division 22 for traps and accessories on piping connections to condensate drain pans and under condensing heat exchangers.

D. Where installing piping adjacent to heating and ventilating units, allow space for service and maintenance.

E. Duct Connections: Connect supply and return ducts to indirect fired heating and ventilating units with flexible duct connectors.

F. Ground equipment in accordance with the requirements listed in Division 26.

G. Connect wiring equipment in accordance with the requirements listed in Division 26.

3.3 FACTORY STARTUP AND TRAINING

A. Provide startup and owner training by a certified factory trained and authorized technician. Provide a startup report and certification for each unit, ensuring and confirming proper installation and operation.

3.4 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect/Engineer. At completion, carefully clean and adjust equipment and trim installed as part of this work. Leave systems and equipment in a satisfactory operating condition.

3.5 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with the indicated requirements.

3.6 CLEANING

A. Upon completion of the Work remove materials, equipment, apparatus, tools, and the like, and leave the premises clean, neat, and orderly.

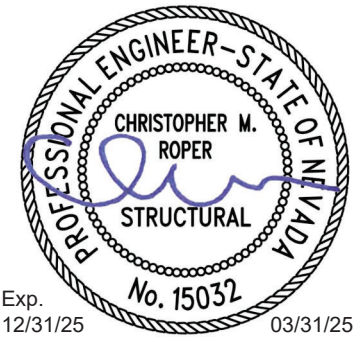
END OF SECTION

CFBR STRUCTURAL GROUP, LLC

STRUCTURAL CALCULATIONS

WCSD BILLINGHURST MS HEAT PUMP REPLACEMENT - PHASE 1
6685 CHESTERFIELD LANE
RENO, NV 89523

CFBR #24_121



Exp. 12/31/25

03/31/25

Chris Roper

Digitally signed by Chris Roper
DN: C=US, E=chris@cfbrgroup.com, O=CFBR Structural Group, CN=Chris Roper
Reason: I am the author of this document
Date: 2025.03.31 14:19:03-07'00'

EQUIPMENT

	TYP. MAU	
W =	1800	lb
H unit =	3.6	ft
H base =	1.8	ft
H tot =	5.40	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 = 2.70 ft

Projected Width B1 (for wind) =	17	ft, long side 1	Af1 =	92	sf, long side 1 wind area
Base Anchor Spacing across B1 direction =	2.3	ft, short side to short side			
Projected Width B2 (for wind) =	3.5	ft, short side 2	Af2 =	19	sf, short side 2 wind area
Base Anchor Spacing across B2 direction =	13	ft, long side to long side			

WIND

Basic Wind Speed, V =	130	mph, per local requirements
Exposure =	C	per local requirements
Kz =	0.85	exposure coefficient
Kzt =	1	topographic factor
Kd =	0.9	directionality factor
Ke =	1	elevation factor
qz = 0.00256(Kz)(Kzt)Kd)(Ke)(V^2) =	33.1	psf - LRFD
0.6 qz =	19.9	psf - ASD
G =	0.85	gust factor
h/D =	2.3	max
Cf (or Cr) =	1.76	force coefficient

ASD Loading Normal to Long Side 1

F1=0.6(qz)(G)(Cf)(Af1) =	2727	lb
OTM1 =	7363	ft-lb
0.6MR1 =	7020	ft-lb
Max. Uplift @ B1 =	-26	lb

ASD Loading Normal to Short Side 2

F2=0.6(qz)(G)(Cf)(Af2) =	561	lb
OTM2 =	1516	ft-lb
0.6MR2 =	1242	ft-lb
Max. Uplift @ B2 =	-119	lb

LRFD Loading Normal to Long Side 1

F1=(qz)(G)(Cf)(Af1) =	4545	lb
OTM1 =	12272	ft-lb
0.9MR1 =	10530	ft-lb
Max. Uplift @ B1 =	-134	lb

LRFD Loading Normal to Short Side 2

F2=(qz)(G)(Cf)(Af2) =	936	lb
OTM2 =	2527	ft-lb
0.9MR2 =	1863	ft-lb
Max. Uplift @ B2 =	-289	lb

SEISMIC (NON-STRUCTURAL COMPONENT)

Sds =	1.28	
Ip =	1.00	
ap =	2.5	
Rp =	6	
z =	0	ft, point of attachment ht.
h =	16	ft, roof ht.
Fp = 0.4(ap)(Sds)(Ip)(Wp)/Rp (1+2z/h) =	385	lb
Fp min = 0.3(Sds)(Ip)(Wp) =	692	lb
Fp max = 1.6(Sds)(Ip)(Wp) =	3692	lb
Fp final =	692	lb

ASD Loading Normal to Long Side 1

F1 = 0.7Fp =	485	lb
OTM1 =	1745	ft-lb
0.6MR1 =	7020	ft-lb
Max. Uplift @ B1 =	0	lb

ASD Loading Normal to Short Side 2

F2 = 0.7Fp =	485	lb
OTM2 =	1745	ft-lb
0.6MR2 =	1242	ft-lb
Max. Uplift @ B2 =	-218	lb

LRFD Loading Normal to Long Side 1

F1 = Fp =	692	lb
OTM1 =	2492	ft-lb
0.9MR1 =	10530	ft-lb
Max. Uplift @ B1 =	0	lb

LRFD Loading Normal to Short Side 2

F2 = Fp =	692	lb
OTM2 =	2492	ft-lb
0.9MR2 =	1863	ft-lb
Max. Uplift @ B2 =	-274	lb

CONTROLLING LOADS

ASD Loading Normal to Long Side 1

F1 =	2727	lb, Wind
OTM1 =	7363	ft-lb, Wind
Max. Uplift @ B1 =	-26	lb, Wind

ASD Loading Normal to Short Side 2

F2 =	561	lb, Wind
OTM2 =	1745	ft-lb, Seismic
Max. Uplift @ B2 =	-218	lb, Seismic

LRFD Loading Normal to Long Side 1

F1 =	4545	lb, Wind
OTM1 =	12272	ft-lb, Wind
Max. Uplift @ B1 =	-134	lb, Wind

LRFD Loading Normal to Short Side 2

F2 =	936	lb, Wind
OTM2 =	2527	ft-lb, Wind
Max. Uplift @ B2 =	-289	lb, Wind

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in timeout error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Billinghurst MS HP Replacement

6685 Chesterfield Ln, Reno, NV 89523, USA

Latitude, Longitude: 39.5219521, -119.8943172

Date	3/12/2025, 10:52:21 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.682	MCE_R ground motion. (for 0.2 second period)
S_1	0.564	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.923	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.282	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.661	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.817	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	1.682	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.773	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.877	Factored deterministic acceleration value. (0.2 second)
S1RT	0.564	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.633	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.774	Factored deterministic acceleration value. (1.0 second)
PGAd	0.771	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.661	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.904	Mapped value of the risk coefficient at short periods
C_{R1}	0.892	Mapped value of the risk coefficient at a period of 1 s
C_V	1.42	Vertical coefficient

FOR QUESTIONS, CALL THE
Northern Nevada Mechanical
REGION 113
PHONE: (775) 236 - 5843
EMAIL: reg113@captiveaire.com

MUA FAN INFORMATION – JOB#7343121

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	MCA	MOCP	EVAP FLOW RATE (Gal/Hr)	EVAP COOLER ENTERING DB TEMP	EVAP COOLER ENTERING WB TEMP	EVAP COOLER LEAVING DB TEMP	EVAP COOLER LEAVING WB TEMP	WEIGHT (LBS)	SONES
1	MAU-1	1	A1-D.250-16Z-R	16Z-1-MOD	A1-D.250	1000	1400	1.000	2157	ODP-ECM	3.400	0.9400	3	460	3.3	4.7A	15A	2.87	100.0°F	62.0°F	79.0°F	62.0°F	889	21.6
2	MAU-2	1	A2-D.500-20D	20MF-2-MOD	A2-D.500	2000	3400	1.000	1711	ODP,PREMIUM	3.000	2.0940	3	460	4.3	5.9A	15A	4.85	100.0°F	62.0°F	78.0°F	62.0°F	1133	18.4

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO	TAG	INPUT BTUs	OUTPUT BTUs	TEMP RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE	BURNER EFFICIENCY(%)
1	MAU-1	139826	128640	111°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	92
2	MAU-2	339578	312412	111°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	92

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	MAU-1	1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC
		1	SHIP LOOSE GAS STRAINER 3/4"
		1	MOTORIZED BACKDRAFT DAMPER FOR A1-D HOUSING - MEETS AMCA CLASS 1A RATING
		1	IBT/MUA EVAP INTERLOCK
		1	COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS
		1	FREEZE PROTECTION DRAIN KIT FOR IBT/MUA WITH EVAPORATIVE COOLERS
		1	SINGLE ELECTRICAL CABINET LED LIGHTS USED ON MODULAR MUA UNITS
		1	CLOGGED FILTER SWITCH - NOTIFICATION ON HMI
		1	SIZE 1 MIXING BOX - MANUAL/DDC CONTROL
		1	FREEZESTAT
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	EXHAUST CONTACTOR BEFORE AIRFLOW SWITCH - FIELD WIRED
		1	AUXILIARY START RELAY
		1	INSULATION OPTION FOR VBANK FILTER SECTION
		1	V-BANK DOWNSTREAM OF MIXING-BOX OPTION SIZE 1
		1	ECM WIRING PACKAGE - SUPPLY FAN CONTROL-(3 PHASE ZIEHL MOTOR)
		1	2 YEAR PARTS WARRANTY
		1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET
2	MAU-2	1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC
		1	BUTTERFLY MOD VALVE OPTION FOR MOD SIZE 2 (1" MOD VALVE)
		1	SHIP LOOSE GAS STRAINER 1"
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	MOTORIZED BACKDRAFT DAMPER FOR A2-D HOUSING - MEETS AMCA CLASS 1A RATING
		1	IBT/MUA EVAP INTERLOCK
		1	COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS
		1	FREEZE PROTECTION DRAIN KIT FOR IBT/MUA WITH EVAPORATIVE COOLERS
		1	EXHAUST CONTACTOR BEFORE AIRFLOW SWITCH - FIELD WIRED
		1	AUXILIARY START RELAY
		1	SINGLE ELECTRICAL CABINET LED LIGHTS USED ON MODULAR MUA UNITS
		1	FREEZESTAT
		1	VAV PACKAGE W/ MANUAL/DDC CONTROL (571 VFD INCLUDED)
		1	VFD FACTORY MOUNTED AND WIRED IN COMMERCIAL CONTROL VESTIBULE FOR TEMPERED SUPPLY FAN
		1	SIZE 2 DIRECT FIRED HEATER LOW CFM PROFILE PACKAGE - USED ON HEATERS UNDER 2500 CFM
		1	LOAD REACTOR MOUNTED IN FAN
		1	CLOGGED FILTER SWITCH - NOTIFICATION ON HMI
		1	2 YEAR PARTS WARRANTY
		1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET

FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	MAU-1				YES		YES	
2	MAU-2				YES		YES	

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #1	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55
FAN #1	HMI #2 - SPACE		AVERAGED	56
FAN #2	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55

REVISIONS

	DESCRIPTION	DATE
△		
△		
△		
△		

CAPTIVE-AIRE
Northern Nevada Mechanical
www.captiveaire.com
P.O. Box 17480, Reno, NV. 89511 | PHONE: (775) 236 - 5843 FAX: 7752365843 EMAIL: reg113@captiveaire.com

Billinghurst MAUs
6685 Chesterfield Lane,
Reno, NV, 89523

DATE: 2/14/2025

DWG.#: 7343121

DRAWN BY: KB-Reg113

SCALE: 3/4" = 1'-0"

MASTER DRAWING

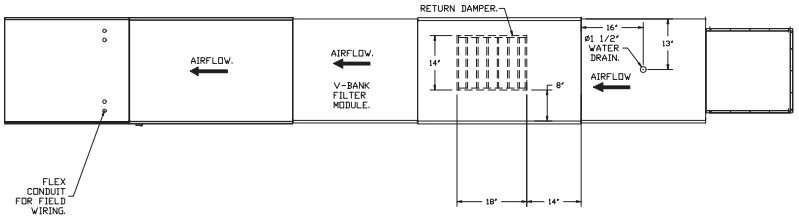
SHEET NO. 1

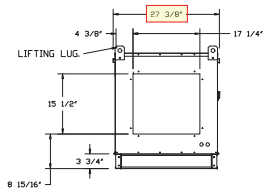
FAN #1 A1-D250-16Z-R - HEATER (MAU-1)
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 16" DIRECT DRIVE FAN.
2. EVAP COOLER (CELDEK) & V-BANK WITH 2" TA-13 FILTERS - OUTDOOR.
3. SIDE DISCHARGE - AIR FLOW RIGHT -> LEFT.
4. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE.
5. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC, 2.5" DIAMETER, 1/4" THREAD SIZE.
6. SHIP LOOSE GAS STRAINER. TO BE INSTALLED UPSTREAM OF UNIT CONNECTION. 3/4" CONNECTION.
7. MOTORIZED BACK DRAFT DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, TFB120S ACTUATOR INCLUDED.
8. LAYER CONTROL FOR IBT EVAP.
9. COMMERCIAL SMOKE DETECTOR INTERLOCK (DETECTOR BY OTHERS).
10. FREEZE PROTECTION DRAIN CONTROL KIT FOR EVAPORATIVE COOLERS. INCLUDES 3-WAY WATER SOLENOID VALVE 83160064 (SHIPPED LOOSE), PRESSURE SWITCH INSTALLED UPSTREAM OF 2WAY SOLENOID IN UNIT, BRASS TEE AND 2 NPT HALF INCH NIPPLES. FIELD WIRING REQUIRED BY OTHERS FOR 3-WAY VALVE. FOR BOTH CELDEK AND STANDARD V-BANK TYPE CONFIGURATIONS.
11. SINGLE ELECTRICAL CABINET LED LIGHTS USED ON MODULAR MUA UNITS.
12. CLOGGED FILTER SWITCH WITH NOTIFICATION ON HMI.
13. MIXING BOX FOR SIZE 1 IBT. ACTUATOR CONTROL BY 0-10V OUTPUT ON IBT BOARD.
14. FREEZESTAT.
15. CASLINK BUILDING MONITORING SYSTEM COMMUNICATIONS MODULE. REQUIRES INTERNET & FIELD WIRED ETHERNET CONNECTION OR 3G CELLULAR SERVICE. INCLUDES REV 3 COMM MODULE, RJ45 TO MODBUS CONVERTER, 3 FT CAT5 CABLE, AND 1 FT OF SHIELDED TWISTED PAIR.
16. FIELD WIRED EXHAUST CONTACTOR BEFORE AIRFLOW SWITCH. RATED 23 AMPS. STARTS UP TO (2) SINGLE PHASE MOTORS. 2HP MAX 115V, 3HP MAX 240V. STARTS ONE THREE PHASE MOTOR. 5HP MAX 208V, 7.5HP MAX 230V, 15HP MAX 460V. OVERLOAD NOT INCLUDED.
17. 120V AUXILIARY RELAY.
18. "INSULATION" FOR V-BANK INTAKE OPTION.
19. V-BANK DOWNSTREAM OF MIXING-BOX OPTION SIZE 1.
20. ECM CONTROL FOR RTU/MUA SUPPLY FAN CONTROLLED BY OUTPUT SIGNAL FROM CONTROL BOARD.
21. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER/EVAP SECTION).
22. EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.
23. 2 YEAR PARTS WARRANTY.

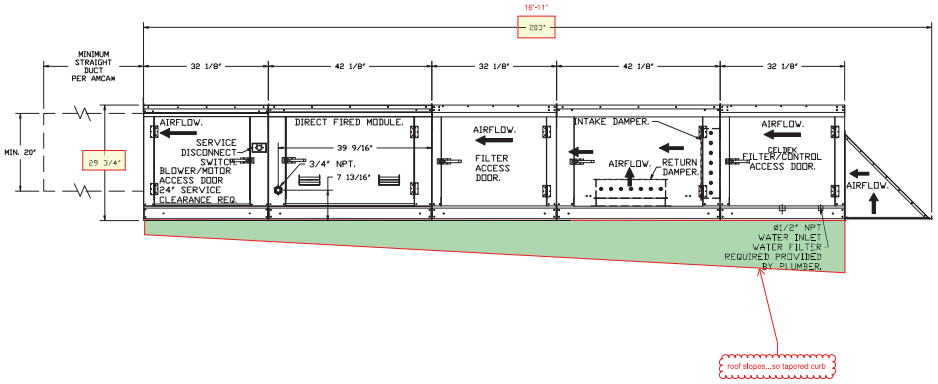
NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 20" x 20".

SUPPLY SIDE HEATER INFORMATION

WINTER TEMPERATURE = 0°F. TEMP. RISE = 111°F.
BTUs CALCULATED OFF ACTUAL AIR DENSITY.
OUTPUT BTUs AT ALTITUDE OF 0.0 FT. = 155547.
INPUT BTUs AT ALTITUDE OF 0.0 FT. = 169073.
OUTPUT BTUs AT ALTITUDE OF 5162 FT. = 128640.
INPUT BTUs AT ALTITUDE OF 5162 FT. = 139826.







REVISIONS

	DESCRIPTION	DATE
△		
△		
△		
△		

CAPTIVAIRE
Northern Nevada Mechanical
www.captivaire.com
P.O. Box 17480, Reno, NV. 89511 | PHONE: (775) 236 - 5843 FAX: 7752365843 EMAIL: reg113@captivaire.com

Billinghurst MAUs
6685 Chesterfield Lane,
Reno, NV, 89523

DATE: 2/14/2025

DWG.#: 7343121

DRAWN BY: KB-Reg113

SCALE: 3/4" = 1'-0"

MASTER DRAWING

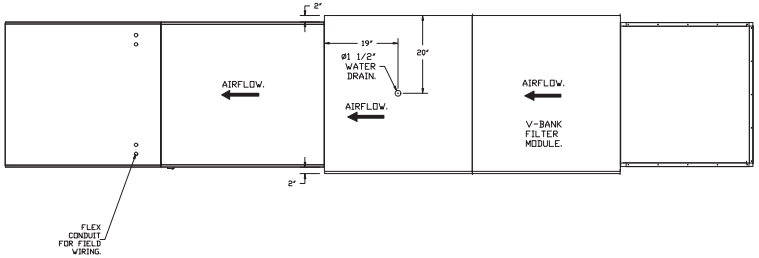
SHEET NO. 2

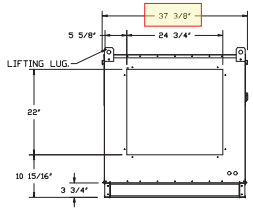
FAN #2 A2-D500-20D - HEATER (MAU-2)
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 20" MIXED FLOW DIRECT DRIVE FAN.
2. EVAP COOLER (LP3 CELDEK) & V-BANK WITH 2" TA-13 FILTERS-OUTDOOR.
3. SIDE DISCHARGE - AIR FLOW RIGHT -> LEFT.
4. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE.
5. GAS PRESSURE GAUGE, -5 TO +15 INCHES W.C., 2.5" DIAMETER, 1/4" THREAD SIZE.
6. BUTTERFLY MOD VALVE OPTION FOR MOD SIZE 2 (1" MOD VALVE).
7. SHIP LOOSE GAS STRAINER. TO BE INSTALLED UPSTREAM OF UNIT CONNECTION. 1" CONNECTION.
8. CASLINK BUILDING MONITORING SYSTEM COMMUNICATIONS MODULE. REQUIRES INTERNET & FIELD WIRED ETHERNET CONNECTION OR 3G CELLULAR SERVICE. INCLUDES REV 3 COMM MODULE, RJ45 TO MODBUS CONVERTER, 3 FT CAT5 CABLE, AND 1 FT OF SHIELDED TWISTED PAIR.
9. MOTORIZED BACK DRAFT DAMPER 22.75" X 24" FOR SIZE 0 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, LF120S ACTUATOR INCLUDED.
10. LAYER CONTROL FOR IBT EVAP.
11. COMMERCIAL SMOKE DETECTOR INTERLOCK (DETECTOR BY OTHERS).
12. FREEZE PROTECTION DRAIN CONTROL KIT FOR EVAPORATIVE COOLERS. INCLUDES 3-WAY WATER SOLENOID VALVE 8316G064 (SHIPPED LOOSE), PRESSURE SWITCH INSTALLED UPSTREAM OF 2WAY SOLENOID IN UNIT, BRASS TEE AND 2 NPT HALF INCH NIPPLES. FIELD WIRING REQUIRED BY OTHERS FOR 3-WAY VALVE FOR BOTH CELDEK AND STANDARD V-BANK TYPE CONFIGURATIONS.
13. FIELD WIRED EXHAUST CONTACTOR BEFORE AIRFLOW SWITCH. RATED 23 AMPS. STARTS UP TO (2) SINGLE PHASE MOTORS. 2HP MAX. 115V, 3HP MAX. 240V. STARTS ONE THREE PHASE MOTOR. 5HP MAX. 208V, 7.5HP MAX 230V, 15HP MAX. 460V. OVERLOAD NOT INCLUDED.
14. 120V AUXILIARY RELAY.
15. SINGLE ELECTRICAL CABINET LED LIGHTS USED ON MODULAR MUA UNITS.
16. FREEZESTAT.
17. VAV (VARIABLE-AIR-VOLUME) WIRING PACKAGE FOR COMMERCIAL FANS.
MANUAL SPEED CONTROL VARIABLE FREQUENCY DRIVE INCLUDED.
18. VFD FACTORY MOUNTED AND WIRED IN UNIT CONTROL VESTIBULE.
19. PROFILE PLATE CONFIGURATION FOR SIZE 2 DIRECT FIRED UNIT FOR LOW CFM APPLICATIONS.
20. MOUNT LOAD REACTOR IN FAN.
21. CLOGGED FILTER SWITCH WITH NOTIFICATION ON HMI.
22. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER/EVAP SECTION).
23. EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.
24. 2 YEAR PARTS WARRANTY.

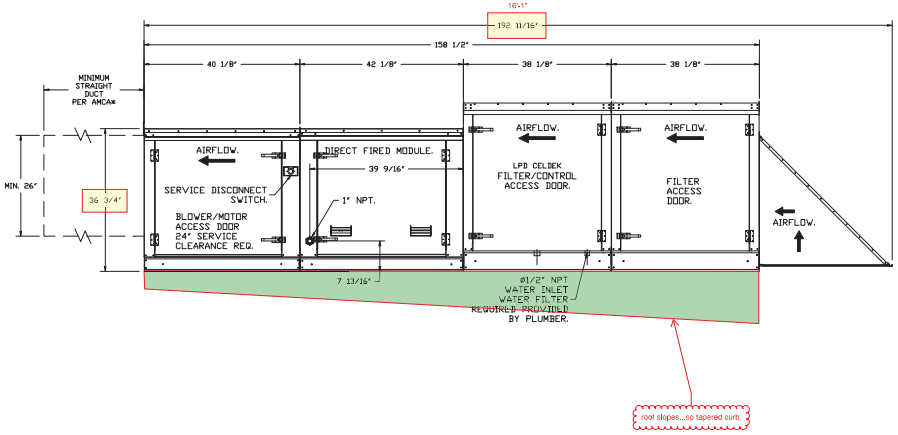
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 26" x 26".

SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = 0°F. TEMP. RISE = 111°F.
BTUs CALCULATED OFF ACTUAL AIR DENSITY.
OUTPUT BTUs AT ALTITUDE OF 0.0 FT. = 377757.
INPUT BTUs AT ALTITUDE OF 0.0 FT. = 410605.
OUTPUT BTUs AT ALTITUDE OF 5162 FT. = 318412.
INPUT BTUs AT ALTITUDE OF 5162 FT. = 339579.







REVISIONS

	DESCRIPTION	DATE
△		
△		
△		
△		

CAPTIVE-AIRE
Northern Nevada Mechanical
www.captiveaire.com
P.O. Box 17480, Reno, NV. 89511 | PHONE: (775) 236 - 5843 FAX: 7752365843 EMAIL: reg113@captiveaire.com

Billinghurst MAUs
6685 Chesterfield Lane,
Reno, NV, 89523

DATE: 2/14/2025

DWG.#: 7343121

DRAWN BY: KB-Reg113

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 4

WASHOE COUNTY SCHOOL DISTRICT

MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT

FACILITY AND MATERIAL LOCATION: Billinghurst MS **MDP #25-086**

DESCRIPTION OF WORK TO BE PERFORMED: Phase 1 Heat Pumps Replacement

IT IS THE RESPONSIBILITY OF THE CONTRACTOR/WORKER TO IDENTIFY MATERIAL TYPE PRIOR TO DISTURBANCE. ONLY MATERIALS LISTED ON THIS PERMIT MAY BE DISTURBED. ANY NEW MATERIAL DISCOVERED OR ANY MATERIAL WHOSE EXACT NATURE OR CHARACTER IS UNCERTAIN REQUIRES A NEW PERMIT PRIOR TO DISTURBANCE. ANY CITATIONS OR ASBESTOS/LEAD CONTAMINATION RESULTING FROM THE IMPROPER OR UNAUTHORIZED DISTURBANCE OF ASBESTOS OR LEAD MATERIALS IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. A COPY OF THIS PERMIT MUST BE SIGNED BY THE CONTRACTOR AND SUBMITTED TO THE DISTRICT PRIOR TO STARTING THE PROJECT.

ALL ITEMS	MATERIAL DESCRIPTION: **SEE FACS REPORT**
AHERA MATERIAL NUMBER: N/A	CONTAINS ASBESTOS ?: **SEE FACS REPORT**
MATERIAL DISTURBANCE INSTRUCTIONS: MATERIAL DISTURBANCE INSTRUCTIONS: THE PLANNING DEPARTMENT USED AN OUTSIDE CONSULTING COMPANY (FACS) TO CREATE AN ASBESTOS AND LEAD ASSESSMENT FOR THIS PROJECT. FOR LEAD AND ASBESTOS INFORMATION REFER TO THE FACS REPORT DATED 1/14/25. ANY QUESTIONS RELATED TO ASBESTOS AND LEAD CONTENT, OR DISTURBANCE REQUIREMENTS SHOULD BE ADDRESSED TO THE PLANNING DEPARTMENT, PROJECT MANAGER, OR FACS.	

NOTE: THE ASBESTOS MATERIAL DISTURBANCE INSTRUCTIONS LISTED ABOVE ARE BASED ON THE AHERA REGULATION. THERE MAY EXIST OTHER REGULATIONS THAT MAY BE MORE STRINGENT THEN THESE RECOMMENDATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE COMPLIANCE WITH ALL REGULATIONS THAT ARE APPLICABLE TO THE DISTURBANCE OF ASBESTOS/LEAD CONTAINING MATERIALS. ASBESTOS IS A MICROSCOPIC FIBER AND THE CLEANING OF ASBESTOS DEBRIS MUST BE CONDUCTED TO A MICROSCOPIC LEVEL. IN THE EVENT THAT ANY VISIBLE DEBRIS IS DISCOVERED FROM A DISTURBANCE OR AIR SAMPLING RESULTS ARE NOT PROVIDED TO THE DISTRICT, THE DISTRICT WILL IMMEDIATELY HIRE A THIRD PARTY LEAD/ASBESTOS CONSULTANT TO INVESTIGATE POSSIBLE LEAD/ASBESTOS CONTAMINATION AND AN LEAD/ASBESTOS ABATEMENT CONTRACTOR TO PERFORM ANY RECOMMENDED CLEAN-UP. THE CONTRACTOR WILL BE REQUIRED TO REIMBURSE THE DISTRICT FOR ALL COSTS INCURRED. IF AIR MONITORING IS REQUIRED, AIR MONITORING MUST BE CONDUCTED THROUGHOUT THE PROJECT. AIR MONITORING RESULTS FAXED DIRECTLY FROM THE LAB TO THE ES&A DEPARTMENT @ 851-5695, WITHIN 48 HOURS OF THE DISTURBANCE

DATE ISSUED: March 20, 2025

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

Material Water & Lead Disturbance Permit, Water System Disturbance Permit Appendix Page #1

Contractors, their sub-contractors or workers are responsible in completing all work without impacting the water quality of District facilities and the domestic water supplies which feed district facilities. This Water System Disturbance Permit identifies the minimum requirements that Contractors, their sub-contractors and all workers will utilize to perform disturbance to the Districts water systems.

The following general requirements shall apply to any person who will be disturbing a District water system. In addition, they must contact the Environmental, Safety and Assessment Department (ES&A Dept) prior to any disturbance at 325-8494. This phone number has an answering machine and can be accessed 24 hours a day. These disturbances will be logged in and documented by the ES&A department.

All requirements for isolation are designed to protect the facility's potable water source from existing as well as potential cross-connections and to prevent any backflow occurrences in the form of backpressure or backsiphonage. The Water Disturbance Procedures listed are not site or incident specific and great care must be taken by technicians during all valving and isolation activities within a facility to prevent a potential backflow occurrence. There may be additional requirements that must be utilized to prevent any cross-connection or backflow occurrence, and each entity performing the disturbance is responsible for ensuring none occur and utilizing any additional steps as necessary to ensure none result from the completion of this project.

Any costs to correct any cross-connections and/or any backflow occurrences that result from the performance of this project are solely the responsibility of the Contractor, their sub-contractor and workers and the signing of this ES&A Department Disturbance Permit on acknowledges and agrees to this requirement.

FACILITY ISOLATION MINIMUM REQUIREMENTS

MECHANICAL ROOMS:

When turning off or disrupting the water service to a mechanical room all applicable requirements below must be conducted per this permit

1. **Remove all hoses from custodial faucets and bibs in location to be effected.**
2. **Shut down all boiler and chiller circulating pumps. Heating, Cooling and Domestic.**
3. **Shut down boiler, chiller and cooling tower if present.**
4. **Isolate boiler, cooling tower, chiller and relieve pressure from boiler.**
5. **Shut down hot water return pump, isolate any hot water heaters and turn off heating source.**
6. **Isolate domestic service to mechanical room.**
7. **Re-establish service to mechanical room in reverse order.**

BASIC WING:

When turning off or disrupting the water service to a facility wing all applicable requirements below must be conducted per this permit

1. **Remove all hoses from custodial, art and science faucets along with bibs in location to be effected.**
2. **Isolate all water utilizing chemical dispensers in location to be effected.**
3. **Shut down and isolate any water using equipment if applicable. Hot water heaters, domestic make ups for heat exchangers, photo labs, etc.**
4. **Isolate domestic cold water main to wing.**
5. **Re-establish service to wing in reverse order. Flush system at the end of each lateral to remove any and all foreign material and air.**

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

Material Water & Lead Disturbance Permit, Water System Disturbance Permit Appendix Page #2

FACILITY:

When turning off or disrupting the water service to a facility all applicable requirements below must be conducted per this permit. Turning off or disturbing the waters services to a facility should only be done as a last resort. If it is possible to isolate the area of disturbance without disrupting facilities entire water service that is the way the project is to be accomplished. This will also keep the contractor, his sub-contractors or workers from having to perform all the listed requirements.

1. **Remove all hoses from custodial, art and science faucets along with bibs in entire facility.**
2. **Isolate mechanical room. See above requirements.**
3. **Isolate each individual wing where possible. See above requirements.**
4. **Isolate all irrigation laterals connected to the domestic potable water supply.**
5. **Isolate domestic cold water main at all locations present to allow as little drain back as possible.**
6. **Re-establish service to facility in reverse order. Flush system at the end of each lateral to remove any foreign material and air.**

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

PAINTS AND COATINGS – Material Disturbance Permit Appendix - Lead in Paints and Coatings in WCSD Facilities

Lead containing paints and coating are present in WCSD facilities. Bidders/Contractors that disturb lead containing or potentially lead containing paints or coatings, by law, are required to know all applicable regulations applicable and comply with all state and federal regulations that apply to the disturbances to lead paints and coating they are conducting. The regulations that requires by a contractor to be properly trained and knowledgeable, related to lead disturbance includes, but is not limited to the following:

- **OSHA Regulation CFR 1926.62 – Lead & Appendix A, B, C, & D – Lead Construction Standard.**
- **OSHA Regulation CFR 1910. 1025 - Lead & Appendix A, B, C, & D – General Industry Standard.**
- **EPA, 40 CFR Part 745 – Lead; Renovation, Repair, and Painting Regulation.**

Bidders/Contractors accept and acknowledge by signing this Material Disturbance Permit, the existence of lead related regulations, and accept all liability related to the disturbance of lead containing materials, citation resulting from, or any other costs the District may incur by the action of all parties of the bidders company or companies hired by the successful bidder to complete this project.

LEAD CATEGORY #N/A	**PAINTS, COATINGS & CERAMIC TILE IN BUILDINGS**
CONTAINS LEAD?: **SEE FACS REPORT**	**Buildings:** ALL

Lead Containing or Assumed Lead Containing Paints and Coatings Disturbance Instructions

The planning department used FACS to create an asbestos and lead assessment for this project. For lead and asbestos information refer to the FACS report dated 1/14/25.

OSHA Requirements

All persons performing any disturbance to coatings or paints to paints and coating in and on the buildings listed above must have taken an OSHA lead action level training class from a WCSD, ES&A department approved training provider, and utilize lead safe work practices. In addition, all work must be completed, as a minimum, utilizing the lead safe work practices identified in the EPA guidance document titled "steps to lead safe renovation, repair and painting", pages 12 thru 23. This document is available electronically at the following link: HTTP://WWW.EPA.GOV/LEAD/PUBS/STEPS.PDF.

EPA Renovation, Repair and Painting Regulation Requirements

In general, all firms that disturb 6 square feet of painted surface in a room or 20 square feet on the exterior within a 30 day period in **this** facility must comply with the EPA's Renovation, Remodel and Repair (RR&P) regulation and must be registered with the federal EPA. Per the Regulation, the area of disturbance is calculated, by adding up the entire surface areas being removed/disturbed, which then determines the amount of painted surface area disturbed. Work that involves window replacement or demolition of a painted surface, the RR&P regulation applies regardless of size. This regulation also requires that the contractor must assign a RR&P trained supervisor that is responsible for ensuring and documenting all work is conducted in compliance with the RR&P regulation and there are extensive record keeping and notification requirements that the Contractor must perform. In addition, This is a general overview of the regulation and the contractor must refer to regulation for additional requirements and information. Fines are expensive and the compliance with this regulation rests solely on the Contractor so it is very important that Bidders/Contractors are well versed in this regulation.

– CONTINUED SEE NEXT PAGE #11

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

LEAD CATEGORY #N/A	PAINTS, COATINGS & CERAMIC TILE IN BUILDINGS CONSTRUCTED BEFORE 1978
CONTAINS LEAD?: **SEE FACS REPORT**	**Buildings:** ALL

– CONTINUED FROM PAGE #10

WCSD Requirements

In addition to regulatory requirements, the WCSD has requirements that must be met by the Contractor/Bidder. The contractor is responsible for submitting to the ES&A department lead disturbance procedures that outline the lead safe work practices to be utilized and that procedure must comply with the Districts minimum lead disturbance requirements. The current minimum lead disturbance requirements, which will apply to this project, follow these tables.

OSHA action level training and RR&P training certification and RR&P firm certification must be submitted to the project manager and they are to submit a copy to the ES&A department. The ES&A department must review, verify, and approve all required documentation **prior** to the contractor being able to perform any disturbance, so time for review must be taken into account when developing schedules. Once the ES&A department has approved the procedures and training and firm certification, the contractor may proceed but they must notify the ES&A department at 325-8490 of **any** paint/coating disturbance immediately disturbance prior to the disturbance**.** ES&A department personnel, project managers and assistant project managers and other district personnel will spot check in the field, to ensure compliance with the contractors submitted and approved procedures.

Refer to section listed below regarding lead sampling that may be available.

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

A NOTE ABOUT SAMPLING AND SAMPLING REQUEST PROCEDURES

Only approximately 20% of the paints and coatings in the District have been found to contain lead. The majority of white and off-white paints on sheetrock and block walls does not contain lead in facilities constructed after approx. 1990. Brighter or more colorful paints/coatings on any surface, or all paints and coatings on metals, are much more likely to be found to contain lead in all facilities. In addition, ceramic tile in any age facility is very likely to contain lead. It is highly recommended that sampling be done to confirm lead content unless time does not allow a delay for processing samples through the WCSD ES&A department. If paints and coatings are not sampled, all paints and coatings must be assumed to be lead containing, above 5000 parts per million (lead based), and treated in accordance with all lead regulations, lead specifications, and requirements identified in this permit.

The process to request lead sampling is for anyone requiring sampling to submit through their project's Project Manager. The designated WCSD Project Manager will submit the required sampling forms, and sampling will be coordinated by the ES&A department. A minimum of 10 days will be allowed before sampling results are provided to the Project Manager for them to be distributed to all interested parties. All lead sampling must be processed through the ES&A department, and sampled by ES&A approved and trained lead professionals.

Any paints or coatings that are not specifically addressed on this permit, or on the project drawings, has to be assumed to be lead containing, and above 5000 parts per million (lead based) – no exceptions. Any disturbance to those paints and coatings not specifically addressed on this permit or on the project drawings must be done by properly trained (Minimum of OSHA action level training) personnel, and those disturbances must be performed in accordance with all lead requirements listed in this permit, as well as any applicable regulations and local requirements. Many times scope modifications are required after the bid, and new areas of the facility may need to be disturbed. These areas would not have been addressed on this permit, since they were unknown at the time of issuance. Additional sampling could be conducted by requesting lead sampling through their project's Project Manager, but there will be a delay getting sampling requests and a new MDP would be required. The District reserves the right to direct the Contractor to assume new paints and coatings, due to scope changes, are lead containing and the contractor would then be required to treat all paints and coatings as lead containing in compliance with all requirements of this permit.

REPLACEMENT PAINTS, COATINGS, CERAMIC TILE, AND OTHER LEAD CONTAINING MATERIALS

Unless otherwise specifically allowed by this projects specifications, the Contractor shall not reinstall any lead containing paints/coatings in any detectable levels during the process of completing this project. "lead containing" is defined as any paint or coating that has ANY detectable lead level when paint chip sampling is conducted and chip is analyzed by the ICP method. The District may perform sampling of replacement materials and if analysis finds any detectable levels of lead, the Contractor will be liable for all costs to properly remove that material and re-apply paints and coatings with no detectable levels of lead. Contractors are encouraged to pre-sample paints they may be using to determine the actual amount in paint/coatings used.

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

MINIMUM REQUIREMENTS TO PERFORM ATTACHMENTS AND PENETRATIONS IN WCSD FACILITIES

Below are the minimum requirements to perform any Attachment and Penetration activity to a known or assumed asbestos and/or lead containing material in Washoe County School District (WCSD) facilities. This document is not provided to address demolition, stabilization, abatement, or removal activities. If any work to known or assumed asbestos or lead materials need to be done on this project, and it is anything other than the installation of screws, the removal of screws, or the drilling of holes, the successful bidder must comply with, in addition to these minimum requirements, all applicable District asbestos and lead specifications and requirements. Regarding these procedures, the District has done its best to provide a complete and regulatory compliant attachment and penetration procedure, but by signing this MDP, the Contractor acknowledges that it is the successful bidder's sole responsibly for compliance with this MDP, as well as any other applicable regulatory requirements.

ASBESTOS/LEAD PROCEDURE SUBMISSION PROCESS

Prior to starting this project, each contractor working on this project is required to submit to the WCSD ES&A department an asbestos/lead procedure that includes all District requirements listed below. To simplify the procedure submittal process, an electronic PDF fillable template of these requirements will be provided to the successful bidder of this project. This document is available by contacting the assigned WCSD Capital Projects Project Manager for this project. Contractors must utilize the most current above-mentioned electronic template and fill out all required information, add company letterhead, sign, and date the document. The completed procedures will be e-mailed to the Project Manager by all contractors working on this project that will performing any applicable disturbances. Once submitted, the WCSD Project Manager will pass the document onto the ES&A department for approval. Successful bidders are required to add time to their project schedule for this procedure submittal and approval process.

The Contractor has the option to submit a site-specific or blanket district-wide applicable procedure. A district-wide blanket procedure applies to a scheduled project, as well as all future sites where a contractor will be performing disturbances. The site specific procedure will apply to just one site or project. District-wide procedures are valid for one year from the date the procedure is signed by the ES&A department. Site specific procedures will be valid for the term of the project. Each Contractor must receive a signed and approved procedure prior to performing any disturbances to all asbestos/lead paint or assumed asbestos/lead paint materials. The procedure is a combined procedure and it addresses both asbestos and lead disturbances. A minimum of one work day will be required by the ES&A department for the review and approval process.

In addition to the Material Disturbance Permit (MDP), the Contractors must also have a copy of the approved procedures on site at all times. The purpose of this procedure is to document the agreement between the Contractor and the District that all lead and asbestos disturbances performed by staff of the Contractor will be done per all noted District requirements, District Specifications, and project specifications. Again, Contractors must ensure that their procedure has been approved, and the approved signed procedure is on site prior to any disturbance.

MINIMUM REQUIREMENTS

1. Receive approved Lead/Asbestos procedures as identified above.

2. Technicians performing disturbances will be required to have a minimum of AHERA 16 Hour O&M training and OSHA action level training per 29 CFR 1926.62 (i) (2) lead training. In addition, as applicable, contractors must comply with the EPA RR&P training and certifications requirements listed in the RR&P section of this appendix. Copies of training certifications, including a refresher within the last 12 months, will be provided to the ES&A Department **prior** to the start of any project. Only personnel with the proper minimum training will be authorized to perform any disturbance to asbestos/lead paint or assumed asbestos/lead paint containing materials, or be in the adjacent area of a disturbance.

3. Notify the ES&A Department at **325-8490** and leave a message with the time, name of the technician doing the work, date and exact locations in the school where they will be performing any disturbance. This call should take place immediately prior to disturbance, this phone number (**325-8490**) will go to voice mail, and the contractors are to provide notifications with above identified information, 24 hours a day. The Contractor is also required to notify their assigned WCSD Construction Department Project Managers and Assistant Project Managers of scheduled disturbances so they can also verify compliance with the contractors approved disturbance procedures.

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

4. Contractors must refer to this Material Disturbance Permit to determine what materials contain asbestos or lead and utilize the applicable lead/asbestos procedures. Some materials cannot be disturbed, and each specific material disturbance permit will identify what can be disturbed and provided material disturbance instructions. The minimum disturbance permits in this section of the material permit are in addition to any requirements listed in the material disturbance instructions. Any instance where 100% of the minimum asbestos/lead requirements are not followed, the District will immediately hire an environmental remediation contractor as well as an environmental consultant to properly clean up the contamination and perform air sampling. The contractor will be responsible for reimbursing the District for all costs due to any improper or unauthorized disturbances.

5. Contractors or technicians who are new to performing asbestos/lead paint or assumed asbestos/lead paint disturbances for the District must contact the Capital Projects PM/PCI Department and schedule a disturbance. A Capital Projects PM/PCI employee will be scheduled to review the technician's compliance with the disturbance procedures in the field. Once a technician has demonstrated on a minimum of two (2) occasions to the Capital Projects Department that he has an understanding of the District disturbance requirements and has proper equipment, the ES&A Department will then authorize that technician to perform disturbances without prior approval of the Capital Projects Department. Notifications prior to starting all disturbances as listed above will still be required and technicians should expect unannounced random compliance inspections, from the ES&A Department. A list of approved technicians is available upon request form the ES&A department.

6. Post the appropriate "Danger Lead - Keep Out" or "Danger Asbestos Keep Out" signs on the entry side of all doors leading into classrooms, hallways, bathrooms, offices or mechanical rooms where drilling is to occur. Doors will be closed. It is the contractor /technician's responsibility to take adequate means to keep the public or school staff out of the disturbance area.

7. Large rooms, such as multipurpose rooms, will have yellow caution tape placed across all entries to the room in addition to signage but access to these areas must be restricted to ensure no unprotected person can enter the areas where disturbances are taking place. If unprotected personnel can see the activity, this is not a large enough area of demarcation.

8. A 6 ml plastic drop will be placed under the disturbance in a manner that extends 6' out in all directions from the disturbance area. This poly drop can be reused if properly wet-wiped or HEPA-vacuumed off after use.

9. Worker will don the respiratory protection and a protective suit, (protective suits are optional for lead disturbance, "attachments and penetration" disturbances if the Contractor will not exceed the lead action level) and initiate personal air monitoring procedures per item #10 below. Respiratory protection is required throughout all asbestos/lead paint or assumed asbestos/lead paint disturbances in WCSD regardless of air sampling results.

10. If a Contractor is performing a **lead** attachments and penetrations (see the definition in #20 below), air sampling will be conducted at the start of the project. If air sampling results show the technicians performing the work is below the OSHA Lead Action Level, air sampling can be suspended unless the work being performed is changed. Air sampling will be performed for each type of lead attachment and penetration activity to develop a representative sample for each lead activity. Air sampling will be performed during **all** asbestos disturbances, no exceptions.

11. Drill the hole or holes as required using an HEPA VAC and a shrouded or dust collecting apparatus (i.e. Bit Buddy. A HEPA VAC is to remain running during this whole process to ensure all debris is cleared from hole. All clean-up must be conducted the HEPA Vacuum. If a contractor fails to properly control the asbestos/lead containing dust, the District will then hire an environmental remediation contractor as well as an environmental consultant to properly clean up the contamination. The contractor will be responsible for reimbursing the District for all costs due to improper disturbances that result in debris exiting the area of disturbance.

12. All HEPA vacuums used will have been DOP challenge tested prior to first use and annually thereafter. If this project involves 30 or more disturbances over the span of this project, the HEPA vacuum will be DOP tested on-site prior to the start of the project.

WASHOE COUNTY SCHOOL DISTRICT
MATERIAL, WATER, AND LEAD DISTURBANCE PERMIT
CONTINUATION PAGE

13. If required, to be determined by the technician, an encapsulant material may be sprayed or brushed on to the area of the holes.

14. A device, backing, box or raceway, or any other equipment will then be mounted using anchors installed per #11 above, with the HEPA VAC running and properly directed at the area of the disturbance.

15. A HEPA VAC or wet methods will be used to clean up any debris on 6ml poly drop, around device box, technician's suit, and any surfaces below holes, such as tops of chalkboards and base boards.

16. The poly drop, if utilized, will be folded into itself in such a manner as to not spread any debris, the HEPA vacuum hose sealed, and personal air monitoring time logged appropriately. This poly drop can be reused if it is properly wet-wiped or HEPA-vacuumed off after use.

17. All signs and equipment are to be removed, and the technician is to move to the next location. The contaminated suit should be removed and a new suit utilized at the new disturbance location, unless the suit can be properly decontaminated.

18. Upon completion of a shift, air samples will be dated and sent in to a properly accredited lab to be analyzed. Results will be forwarded to WCSD. Lab results will be e-mailed directly from the lab to the ES&A Department within 48 hours of the disturbance. All lab results will reference the Material Disturbance Permit (MDP) # located on the top of the first page of this permit. Results without the MDP number prefix will be returned to the lab for clarification and the addition of the MDP tracking number

19. All debris, waste, poly drop, suits, etc. will be placed in 6 mil poly waste bags (double bagged) and disposed of properly.

20. The definition of "Attachment and Penetrations" in this document is **only** the drilling of holes through a HEPA shrouded device, the installation of screws through a HEPA shrouded device, or the removal of screws through a HEPA shrouded device. **Any other activity** that is not attachments and penetrations as listed in item #20 must be designed by an asbestos or lead project designer, done per a lead specification, and supervised by the District or District hired outside asbestos/lead consultant. Contractors cannot perform any work, other than "Attachments and Penetrations" without an onsite District or District hired asbestos or Lead Consultant being present.

21. All asbestos abatement or lead disturbances, other than "Attachment and Penetrations", must be completed in full compliance with applicable regulations, the District's Asbestos Abatement Specifications, and District hired asbestos or lead consultants supplement specifications. If in error, an asbestos abatement bid or quote is put forth without the District Asbestos Abatement Specifications, Contractors are required to request a copy of the most current asbestos abatement specifications from the bid or quote entity through the formal bid inquiry process

THE UNDERSIGNED AGREES TO COMPLY WITH THE CONDITIONS OF THIS MATERIAL, WATER & LEAD DISTURBANCE PERMIT, APPENDIXES, & ALL APPLICABLE REGULATIONS. UNDERSIGNED ACKNOWLEDGES LIABILITY FOR ANY COSTS THE DISTRICT MAY INCUR TO INVESTIGATE & CLEAN UP ANY DISCOVERY OF IMPROPER AND/OR UNAUTHORIZED DISTURBANCES DONE BY UNDERSIGNED'S EMPLOYEE(S) OR SUB-CONTRACTOR(S) TO MATERIALS LISTED AS LEAD/ASBESTOS-CONTAINING BY THE DISTRICT. IN ADDITION, THE UNDERSIGNED AGREES TO ALL REQUIREMENTS OF THE WATER & LEAD APPENDIX.

SIGNED BY (PRINT): _____SIGNATURE: _____

COMPANY (PRINT): _____

DATE RECEIVED: _____

FACS
Forensic Analytical Consulting Services

January 14, 2025

Asbestos & Lead Survey Report

Washoe County School District
Billinghurst Middle School
Heat Pumps Replacement Project
6685 Chesterfield Lane
Reno, NV 89523

Prepared for:

Caitlin Davis, Design Project Manager II
Capital Projects & Planning
Washoe County School District
14101 Old Virginia Road
Reno, NV 89521
(775) 789-3829 | caitlin.davis@washoeschools.net

Prepared By:

Daniel Prado, Assistant Director
Forensic Analytical Consulting Services
4600 Kietzke Lane, B118
Reno, NV 89502
775-391-3524 | danny.prado@facs.com

FACS Project #PJ84888

Contents

List of Acronyms 1

Executive Summary 2

Introduction 3

Scope of Work 3

Site Characterization 3

Survey Methods 3

Regulations 6

Findings and Recommendations 8

Limitations 9

Appendix A: Asbestos Survey Summary, Sample Chain-of-Custody and Laboratory Results Report

Appendix B: Lead Paint Chip Summary, Sample Chain-of-Custody and Laboratory Results Report

Appendix C: Site Photos and Sample Location Drawings

Appendix D: Certifications of Personnel and Laboratories

List of Acronyms

AAC	Asbestos Abatement Consultant
AAS	Atomic Absorption Spectroscopy
ACM	Asbestos Containing Material
AHERA	Asbestos Hazard Emergency Response Act
AIHA	American Industrial Hygiene Association
CFR	Code of Federal Regulation
DIR	Division of Industrial Relations
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency (EPA)
FACS	Forensic Analytical Consulting Services, Inc.
FALI	Forensic Analytical Laboratories, Inc.
LCP	Lead-Containing Paints and Coatings
LBP	Lead-Based Paints and Coatings
ND	None Detected
NESHAP	National Emissions Standard Hazardous Air Pollutants
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Science and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
PCM	Phase Contrast Microscopy
PLM	Polarized Light Microscopy
SGS	SGS - Forensic Laboratories
TEM	Transmission Electron Microscopy
TTLC	Total Threshold Limit Concentration
<	Less Than Reporting Limit

Executive Summary

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Washoe County School District to perform an asbestos and lead paint survey at the interior of Billinghurst Middle School, located at 6685 Chesterfield Lane in Reno, Nevada. The survey included any suspect asbestos-containing materials (ACM) and suspect lead containing paints which may be disturbed during the upcoming heat pump replacement project. A summary list of suspect asbestos-containing materials which were identified and sampled is included in Appendix A of this report. A table reporting suspect lead-containing paints which were identified and sampled is included in Appendix B of this report. The survey was performed on November 18 and 20, 2024.

Asbestos

The following materials sampled during this survey were identified to **not** contain asbestos by laboratory analysis.

- Acoustic ceiling tile and glue
- Black pipe mastic
- CMU, grout, and fill
- Canvas duct tape
- Duct insulation with mastic
- Unfinished drywall
- Drywall – heavy texture
- Drywall – medium texture
- 2'x4' FCP – Pinhole Fissure
- Fiberglass pipe wrap
- Fiberglass unit insulation

Please see Appendix A for a complete listing of materials sampled at the work areas and results from this survey.

Any suspect materials not included must be assumed to be asbestos-containing materials until tested and proven not to contain asbestos.

Lead

The following paints were sampled during this survey and identified to be **lead-based or lead-containing** by laboratory analysis:

- Black paint on metal heat pump (lead-based)
- White paint on metal T-grid

The following paints sampled during this survey were identified to **not** contain detectable concentrations of lead by laboratory analysis:

- Tan Paint on Metal Unit
- White Paint on ACT Ceiling
- White Paint on Drywall Hatch
- White Paint on Metal Hatch
- White Paint on FCP Ceiling

Please see Appendix B for a complete listing of paints sampled at the work areas from this survey.

Any paints or coatings not included in the survey must be handled as lead-containing unless sampled and proven otherwise.

FACS recommends that the results of this report be incorporated into any renovation plans provided for this project for informational purposes.

Introduction

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Washoe County School District to perform an asbestos and lead paint survey at the interior of Billinghurst Middle School, located at 6685 Chesterfield Lane in Reno, Nevada. The survey included any suspect asbestos-containing materials (ACM) and suspect paints and coatings which may be disturbed during the heat pumps replacement project. The survey was performed on November 18 and 20, 2024.

Scope of Work

The purpose of this survey was to identify asbestos-containing materials (ACMs) and lead-containing paints and coatings which may be disturbed during the upcoming heat pumps replacement project. The visual inspection, bulk sampling, and survey documentation were performed by Khong Lunaria, Zachary Ramos and Ryan Hettich. Mr. Lunaria is licensed by the DIR as an AAC Trainee and is a US EPA-accredited Asbestos Hazard Emergency Response Act (AHERA) Building Inspector. Mr. Ramos and Mr. Hettich are licensed by the Division of Industrial Relations (DIR) as Asbestos Abatement Consultants (AAC) and are US EPA-accredited AHERA Building Inspectors. Mr. Ramos is also licensed as a US EPA Certified Lead Inspector. The scope of the survey and the services provided by FACS included:

- Performing a visual inspection to identify accessible suspect asbestos-containing materials and lead-containing paints and coatings that will be disturbed during the upcoming project;
- Collection of bulk samples for asbestos analysis by polarized light microscopy (PLM);
- Collection of bulk paint chip samples for lead analysis using inductively coupled plasma (ICP);
- Ensuring the technical quality of all work by using Asbestos Hazard Emergency Response Act (AHERA) accredited Building Inspectors;
- Ensuring the technical quality of all work by using a US EPA Certified Lead Inspector / Assessor; and
- Consolidating data and findings into a report format.

Site Characterization

The upcoming heat pumps replacement project is taking place in multiple attic spaces inside the main building of the site. Suspect asbestos-containing materials observed included drywall, various insulations and mastics/glue, acoustic ceiling tiles, CMU, grout, and fill, canvas duct tape, false ceiling panels, and fiberglass pipe wrap.

Survey Methods

Document Review

Project plans were reviewed prior to this survey. The extent of the planned project was provided by Caitlin Davis, Design Project Manager II, of Capital Projects and Planning for Washoe County School District.

Visual Inspection

Accessible building materials were visually inspected using the methods presented in the Federal AHERA regulations (40 CFR, Part 763). AHERA inspection methodology is required to be used for inspections of K-12 schools and is generally accepted as the industry standard for all ACM inspections regardless of structure or facility type. Suspect ACMs were also physically assessed for friability, condition and possible disturbance factors.

Asbestos Inspection

Bulk Sample Collection

Bulk samples of identified homogeneous materials were collected in building areas that may be impacted by the planned renovation/demolition activities. Samples were collected of each separate homogeneous area. A homogeneous area is defined as a surfacing material, thermal system insulation, or miscellaneous material that is uniform in use, color and texture. An example of a homogeneous area could include:

False Ceiling Panel
Drywall
Fiberglass Pipe Wrap

The specific number of samples collected was determined by using the methods required by the Federal AHERA regulations (40 CFR, Part 763.86) as noted below:

1) For Surfacing Material:
   1,000 ft^2 or less - collect 3 samples
   1,001 to 5,000 ft^2 - collect 5 samples
   5,001 ft^2 or greater - collect 7 samples

2) For Thermal System Insulation:
   "In a randomly distributed manner" - collect 3 samples
   6 linear feet of patching or less - collect 1 sample
   cementitious pipe fittings - "In a manner sufficient to determine"

3) For all Miscellaneous Material:
   Collect samples "In a manner sufficient to determine whether material is ACM (asbestos-containing material) or not ACM..."

   Collect "A minimum of three bulk samples shall be collected of each homogeneous miscellaneous material, except that a single sample may suffice for small manufactured items such as HVAC vibration dampeners, gaskets and friction products. This exception applies to individual components of less than 6 ft^2 (0.557 m^2) in size and not to multiple installations of similar components." – ASTM E2356 – 18 Standard

The suspect ACMs were sampled using a knife, chisel, scraper, drill or other similar coring device suitable to the type of material sampled to cut through its entire thickness and to ensure that a cross-section of the material was obtained. The material was then placed in an appropriately labeled container that was sealed and submitted to Schneider Laboratories Global, Inc. (SLG) for analysis. A unique sample number was assigned to each sample.

Bulk samples will be retained by the laboratory for one month unless otherwise instructed. After this period, the samples will be disposed of appropriately.

Bulk Sample Analysis

A total of thirty-three (33) bulk samples were collected from a total of eleven (11) suspect materials identified in the projected area.

All bulk samples were delivered to the WCSD Environmental Safety and Assessment (ES&A) Department for submission to Schneider Laboratories Global, Inc. (SLG) in Richmond, Virginia.

SLG is accredited by the National Institute of Science and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP). SLG participates in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing Program and has substantial experience in the analysis of asbestos.

All samples were analyzed using Polarized Light Microscopy with Dispersion Staining (PLM/DS) techniques in accordance with the methodology approved by the U.S. Environmental Protection Agency (EPA). The percentage of asbestos present in the samples was determined on the basis of a visual area estimation. The EPA defines asbestos-containing materials (ACM) as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM). 40 CFR Part 763 identifies the lower limit of reliable quantification for asbestos using the PLM method as approximately one percent (1%) by volume. In addition to the percentages, the types of asbestos minerals are also reported. The PLM method is the standard method used to analyze asbestos bulk samples.

When "None Detected" (ND) appears in the laboratory results, it should be interpreted as meaning asbestos was not observed in the sample material.

Lead Inspection

The client-defined lead inspection was modeled upon the sampling protocol described in "Chapter 7: Lead Based Paint Inspection" of the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1997 Revision).

OSHA, in Title 29 Code of Federal Regulations (CFR) Part Number 1926, Standard Number 1926.62, regulates all construction work where an employee may be occupationally exposed to lead. Paints, coatings, or materials with any detectable level of lead is considered lead-containing by OSHA. Paints or coatings containing lead above 1.0 mg/cm^2, 0.5% by weight, or 5,000 parts per million are considered lead-based by the US EPA. For this inspection, a minimum of three bulk samples were collected from each suspect paint or coating to be potentially disturbed by the project, assuming sufficient material was present to justify.

Bulk Sampling Methodology

During this inspection, FACS personnel collected twenty-one (21) bulk paint chip samples from seven (7) suspect paints for laboratory confirmation of lead-content. Each sample was scraped from the substrate it had been applied to using a knife or chisel to obtain sufficient material for analysis.

All bulk samples were delivered to the WCSD Environmental Safety and Assessment (ES&A) Department for submission to Schneider Laboratories Global, Inc. (SLG) in Richmond, Virginia.

SLG is accredited by the American Industrial Hygiene Association's Environmental Lead Laboratory Accreditation Program for the analysis of lead in bulk paint chips by inductively coupled plasma.

Regulations

Background

Asbestos is the name of a class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite asbestos. Although the chrysotile minerals are the most common type of asbestos found in the construction industry, all types of asbestos are regulated in the same manner. Asbestos has been used in more than 3,000 different building materials. Asbestos was added to building materials to: increase fire-resistance, insulate against heat, cold and sound, resist corrosion, and increase tensile strength. Common building materials that may contain asbestos include but are not limited to the following: floor tile, resilient sheet flooring, ceiling tile, mastics, roofing materials, fireproofing, acoustical treatments, wallboard, pipe and boiler insulations. Adverse health effects have been associated with the inhalation of airborne asbestos. However, asbestos fibers that are tightly bound in the building material, may not represent an exposure hazard, unless disturbed in such a way that releases airborne fibers (i.e., cutting, drilling, sanding, and other abrasive methods).

Building Surveys

The following is a summary of some current Federal regulations which contain requirements related to the performance of building surveys for asbestos. These summaries are not intended to be all inclusive and do not contain every aspect of the regulations discussed.

U.S. EPA National Emission Standard for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61

Under the NESHAPs regulation, no visible emissions are allowed during building demolition or renovation activities which involve regulated asbestos-containing materials. For this reason, all buildings must be surveyed for asbestos-containing materials prior to demolition or renovation. The EPA, and/or the local Air Quality Management District which implements EPA actions, must be notified prior to any building demolition even if no asbestos-containing materials are present.
Regulated asbestos-containing material (RACM) is defined as a) any friable material with an asbestos content of greater than one percent, or b) any non-friable material with asbestos content of greater than one percent that will, or could, become friable.

Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763, Subpart E

AHERA requires performance of asbestos surveys and the development of Asbestos Management Plans for all primary and secondary schools in the United States. Although this regulation applies to primary and secondary schools only, the procedures mandated under AHERA are considered the industry standard and are applied to all surveys performed by FACS unless otherwise specified by the building owner.

Worker Protection

Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101 and 8 CCR 1529

The Federal and State Occupational Safety and Health Administrations (OSHA) require employers to implement specific work practices which protect workers from airborne asbestos exposure.

Building materials which contain even low levels of asbestos (<1%) can potentially generate significant concentrations of airborne asbestos fibers when disturbed. Therefore, control measures should be instituted which adequately address worker health and safety during planned renovation or demolition activities involving these materials.

Hazardous Waste

Building materials reported to contain less than one percent (<1%) of asbestos are not considered hazardous by the U.S. EPA, and hence, may not require removal and disposal prior to demolition or renovation. Regulations may vary, however, between regional air quality management districts and/or other state agencies responsible for implementing EPA's rules.
Therefore, local agencies should be contacted for specific ACM definitions and handling requirements.

Composite sampling, which may potentially reduce the total asbestos content of the material, is only permitted when sampling joint compound, tape, and gypsum wallboard according to EPA's Asbestos NESHAP Clarification Regarding Analysis of Multi-Layered Systems (40 CFR Part 61 FRL-4821-7).

Lead

OSHA regulates the handling of paints and coatings containing lead down to any detectable concentration. Therefore, workers that will handle paints or coatings on this project must have lead training. For work with Washoe County School District, this training must be OSHA Action Level training at minimum. Any contractor with workers disturbing any quantity of detectable lead must perform an initial determination regarding worker exposures to lead, which may be based on personal air monitoring at the start of the project, prior employee monitoring from the past 12 months under workplace conditions closely resembling the current project, or objective data demonstrating that exposures will not exceed the OSHA action level (30 micrograms per cubic meter of air). It is the employer's responsibility to conduct the initial determination and comply with any relevant OSHA requirements.

Workers must use lead-safe work practices when disturbing paints or coatings that contain lead. Disturbance of lead-containing paints or coatings must be performed within a contained area to prevent the spread and build-up of lead dust. HEPA vacuums, dustless tools or shrouds, and/or intact removal of components should be employed to minimize lead dust generation and work areas must be properly cleaned following disturbance to lead-containing materials during this project. Waste generated during disturbance to lead-containing materials must be profiled in a hazardous waste determination to ascertain proper disposal requirements.

Findings and Recommendations

Forensic Analytical Consulting Services, Inc. (FACS) was retained by Washoe County School District to perform an asbestos and lead paint survey at multiple interior spaces of Billinghurst Middle School, located at 6685 Chesterfield Lane in Reno, Nevada. The survey was performed on November 18 and 20, 2024.

Asbestos

The following materials sampled during this survey were identified to **not** contain asbestos by laboratory analysis.

- Acoustic ceiling tile and glue
- Black pipe mastic
- CMU, grout, and fill
- Canvas duct tape
- Duct insulation with mastic
- Unfinished drywall
- Drywall – heavy texture
- Drywall – medium texture
- 2'x4' FCP – Pinhole Fissure
- Fiberglass pipe wrap
- Fiberglass unit insulation

Please see Appendix A for a complete listing of materials sampled at the work areas and results from this survey.

Any suspect materials not included must be assumed to be asbestos-containing materials until tested and proven not to contain asbestos.

Lead

The following paints were sampled during this survey and identified to be **lead-based or lead-containing** by laboratory analysis:

- Black paint on metal heat pump (lead-based)
- White paint on metal T-grid

The following paints sampled during this survey were identified to **not** contain detectable concentrations of lead by laboratory analysis:

- Tan Paint on Metal Unit
- White Paint on ACT Ceiling
- White Paint on Drywall Hatch
- White Paint on Metal Hatch
- White Paint on FCP Ceiling

Please see Appendix B for a complete listing of paints sampled at the work areas from this survey.

Any suspect paints or coatings not included in this survey must be assumed to be lead-containing materials until tested and proven to be lead-free.

OSHA regulates the handling of paints and coatings containing lead down to any detectable concentration. Therefore, workers that will handle paints or coatings on this project must have lead training. For work with Washoe County School District, this training must be OSHA Action Level training at minimum. Any contractor with workers disturbing any quantity of detectable lead must perform an initial determination regarding worker exposures to lead, which may be based on personal air monitoring at the start of the project, prior employee monitoring from the past 12 months under workplace conditions closely resembling the current project, or objective data demonstrating that exposures will not exceed the OSHA action level (30 micrograms per cubic meter of air). It is the employer's responsibility to conduct the initial determination and comply with any relevant OSHA requirements.

Workers must use lead-safe work practices when disturbing paints or coatings that contain lead. Disturbance of lead-containing paints or coatings must be performed within a contained area to prevent the spread and build-up of lead dust. HEPA vacuums, dustless tools or shrouds, and/or intact removal of components should be employed to minimize lead dust generation and work areas must be properly cleaned following disturbance to lead-containing materials during this project. Waste generated during disturbance to lead-containing materials must be profiled in a hazardous waste determination to ascertain proper disposal requirements.

FACS recommends that the results of this report be incorporated into any renovation plans provided for this project for informational purposes.

Limitations

This investigation is limited to the conditions and practices observed, and information made available to FACS. The methods, conclusions and recommendations provided are based on FACS' judgment, expertise, and the standard of practice for professional service. They are subject to the limitations and variability inherent in the methodology employed. As with all environmental investigations, this investigation is limited to the defined scope and does not purport to set forth all hazards, nor indicate that other hazards do not exist.

Please do not hesitate to contact our office at 775-993-7389 with any questions or concerns. Thank you for the opportunity to assist Washoe County School District with promoting worker safety and a healthy environment.

Respectfully,
FORENSIC ANALYTICAL

Daniel Prado
Assistant Director, Reno
IJPM-2057
US EPA LBP-R-I214705-2

Reviewed by:
FORENSIC ANALYTICAL

Chris Chipponeri
Director, Central Valley Offices
IJPM-1410
US EPA LBP-R-128230-3

Appendix A

Asbestos Survey Summary, Sample Chain-of-Custody and Laboratory Results Report

Asbestos Survey Summary (Lab Report #600411) WCSD – Billinghurst Middle School – 6685 Chesterfield Lane, Reno, NV 89523 Survey Date: November 18 and 20, 2024						
Sample Number	**Material Description**	**Location(s) of Material**	**Material Number**	**Asbestos Content (%)**	**Asbestos NESHAP Category**	**Approximate Quantity (ft^2)**
33915-33917	ACT & Glue	All locations	1	Layer: ACT (None Detect) Layer: Glue (None Detect	NA	NA
33918-33920	Black Pipe Mastic	All locations	2	Layer: Pipe Mastic (None Detect)	NA	NA
33921-33923	CMU, Grout, and Fill	All locations	3	Layer: CMU (None Detect) Layer: Grout & Fill (None Detect)	NA	NA
33924-33926	Canvas Duct Tape	All locations	4	Layer: Canvas Duct Tape (None Detect)	NA	NA
33927-33929	Duct Insulation w/ Mastic	All locations	5	Layer: Duct Insulation (None Detect) Layer: Mastic (None Detect)	NA	NA
33930-33932	Drywall – Unfinished w/ Tape and Joint Compound	All locations	6	Layer: Drywall (None Detect) Layer Tape (None Detect) Layer Joint Compound (None Detect	NA	NA
33933-33935	Drywall – Heavy Knockdown Texture	Space 935	7	Layer: Drywall (None Detect) Layer: Texture (None Detect)	NA	NA
33936-33938	Drywall – Medium Texture	All locations	8	Layer: Drywall (None Detect) Layer: Texture (None Detect)	NA	NA

Asbestos Survey Summary (Lab Report #600411) WCSD – Billinghurst Middle School – 6685 Chesterfield Lane, Reno, NV 89523 Survey Date: November 18 and 20, 2024						
Sample Number	**Material Description**	**Location(s) of Material**	**Material Number**	**Asbestos Content (%)**	**Asbestos NESHAP Category**	**Approximate Quantity (ft^2)**
33939-33941	2’ x 4’ FCP – Pinhole Fissure	Admin Offices	9	Layer: 2x4 FCP – PF (None Detected)	NA	NA
33942-33944	Fiberglass Pipe Wrap	All location	10	Layer: Pipe Wrap (None Detected) Layer: Fibrous Material (None Detected)	NA	NA
33945-33947	Fiberglass Unit Insulation	All location	11	Layer: Insulation (None Detected)	NA	NA

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Washoe County School District (4991)
Address: 7495 S. Virginia Street
Reno, NV 89511

Order #: 600411

Attn:

Received 12/30/24
Analyzed 12/30/24
Reported 12/31/24

Project:
Location: 303 - Billinghurst MS
Number:

PO Number: PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763

PLM Analysis

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-001	12/30/24	303-4355-33915	S Side W End @ Hatch		
Layer 1: ACT White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
Layer 2: Glue Clear, Brittle				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-002	12/30/24	303-4355-33916	S Side W End @ Hatch		
Layer 1: ACT White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
Layer 2: Glue Clear, Soft				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-003	12/30/24	303-4355-33917	S Side W End @ Hatch		
Layer 1: ACT White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
Layer 2: Glue Clear, Soft				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-004	12/30/24	303-4355-33918	Attic S Side Center		
Layer 1: Pipe Mastic Black, Bituminous				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-005	12/30/24	303-4355-33919	Attic Center		
Layer 1: Pipe Mastic Black, Bituminous				No Asbestos Detected	100% NON FIBROUS MATERIAL

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Project:
Location: 303 - Billinghurst MS
Number: **PO Number:** PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763 **PLM Analysis**

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-006	12/30/24	303-4355-33920	Attic N Side Center		
Layer 1: Pipe Mastic Black, Bituminous				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-007	12/30/24	303-4355-33921	Attic E Side S End		
Layer 1: CMU Brown, Hard				No Asbestos Detected	100% NON FIBROUS MATERIAL
Layer 2: Grout & Fill Gray, Hard/Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
Unable to separate individual layers.					
600411-008	12/30/24	303-4355-33922	S Side Center		
Layer 1: CMU Brown, Hard				No Asbestos Detected	100% NON FIBROUS MATERIAL
Layer 2: Grout & Fill Gray, Hard/Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
Unable to separate individual layers.					
600411-009	12/30/24	303-4355-33923	Attic S Side Center		
Layer 1: CMU Brown, Hard				No Asbestos Detected	100% NON FIBROUS MATERIAL
Layer 2: Grout & Fill Gray, Hard/Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
Unable to separate individual layers.					
600411-010	12/30/24	303-4355-33924	Attic Center		
Layer 1: Canvas Duct Tape White, Soft/Fibrous				No Asbestos Detected	80% CELLULOSE FIBER 20% NON FIBROUS MATERIAL
600411-011	12/30/24	303-4355-33925	Attic W of Center		
Layer 1: Canvas Duct Tape White, Soft/Fibrous				No Asbestos Detected	80% CELLULOSE FIBER 20% NON FIBROUS MATERIAL
600411-012	12/30/24	303-4355-33926	Attic E Side Center		
Layer 1: Canvas Duct Tape White, Soft/Fibrous				No Asbestos Detected	80% CELLULOSE FIBER 20% NON FIBROUS MATERIAL

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Project:
Location: 303 - Billinghurst MS
Number: **PO Number:** PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763 **PLM Analysis**

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-013	12/30/24	303-4355-33927	Attic @ Hatch		
Layer 1: Duct Insulation Yellow, Fibrous				No Asbestos Detected	95% FIBERGLASS 5% NON FIBROUS MATERIAL
Layer 2: Mastic Gray, Soft				No Asbestos Detected	10% METAL FOIL 90% NON FIBROUS MATERIAL
600411-014	12/30/24	303-4355-33928	Attic @ Hatch		
Layer 1: Duct Insulation Yellow, Fibrous				No Asbestos Detected	95% FIBERGLASS 5% NON FIBROUS MATERIAL
Layer 2: Mastic Gray, Soft				No Asbestos Detected	10% METAL FOIL 90% NON FIBROUS MATERIAL
600411-015	12/30/24	303-4355-33929	Attic Center		
Layer 1: Duct Insulation Yellow, Fibrous				No Asbestos Detected	95% FIBERGLASS 5% NON FIBROUS MATERIAL
Layer 2: Mastic Gray, Soft				No Asbestos Detected	10% METAL FOIL 90% NON FIBROUS MATERIAL
600411-016	12/30/24	303-4355-33930	Attic E of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	2% CELLULOSE FIBER 98% NON FIBROUS MATERIAL
Layer 2: Tape Tan, Fibrous No joint compound found.				No Asbestos Detected	95% CELLULOSE FIBER 5% NON FIBROUS MATERIAL
600411-017	12/30/24	303-4355-33931	Attic E Side Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	2% CELLULOSE FIBER 98% NON FIBROUS MATERIAL
Layer 2: Tape Tan, Fibrous				No Asbestos Detected	95% CELLULOSE FIBER 5% NON FIBROUS MATERIAL
Layer 3: Joint Compound White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Project:
Location: 303 - Billinghurst MS
Number:

PO Number: PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763

PLM Analysis

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-018	12/30/24	303-4355-33932	Attic W of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	2% CELLULOSE FIBER 98% NON FIBROUS MATERIAL
Layer 2: Tape Tan, Fibrous				No Asbestos Detected	95% CELLULOSE FIBER 5% NON FIBROUS MATERIAL
Layer 3: Joint Compound White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-019	12/30/24	303-4355-33933	E of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	5% CELLULOSE FIBER 5% MINERAL/GLASS WOOL 90% NON FIBROUS MATERIAL
Layer 2: Texture White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-020	12/30/24	303-4355-33934	E of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	5% CELLULOSE FIBER 5% MINERAL/GLASS WOOL 90% NON FIBROUS MATERIAL
Layer 2: Texture White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-021	12/30/24	303-4355-33935	NE Corner		
Layer 1: Drywall White, Powdery				No Asbestos Detected	5% CELLULOSE FIBER 5% MINERAL/GLASS WOOL 90% NON FIBROUS MATERIAL
Layer 2: Texture White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-022	12/30/24	303-4355-33936	W of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	2% CELLULOSE FIBER 2% MINERAL/GLASS WOOL 96% NON FIBROUS MATERIAL
Layer 2: Texture White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Project:
Location: 303 - Billinghurst MS
Number:

PO Number: PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763

PLM Analysis

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-023	12/30/24	303-4355-33937	S of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	2% CELLULOSE FIBER 2% MINERAL/GLASS WOOL 96% NON FIBROUS MATERIAL
Layer 2: Texture White, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-024	12/30/24	303-4355-33938	N of Center		
Layer 1: Drywall White, Powdery				No Asbestos Detected	4% CELLULOSE FIBER 96% NON FIBROUS MATERIAL
Layer 2: Texture Beige, Granular				No Asbestos Detected	100% NON FIBROUS MATERIAL
600411-025	12/30/24	303-4355-33939	S Side E End		
Layer 1: 2X4 FCP-PF White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
600411-026	12/30/24	303-4355-33940	N Side E End		
Layer 1: 2X4 FCP-PF White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
600411-027	12/30/24	303-4355-33941	NW Corner		
Layer 1: 2X4 FCP-PF White, Fibrous				No Asbestos Detected	40% CELLULOSE FIBER 40% MINERAL/GLASS WOOL 20% NON FIBROUS MATERIAL
600411-028	12/30/24	303-4355-33942	Attic E of Center		
Layer 1: Pipe Wrap White, Soft				No Asbestos Detected	5% FIBERGLASS 5% METAL FOIL 90% NON FIBROUS MATERIAL
Layer 2: Fibrous Material Yellow, Fibrous				No Asbestos Detected	98% FIBERGLASS 2% NON FIBROUS MATERIAL

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Project:
Location: 303 - Billinghurst MS
Number:

PO Number: PO223225

Method: EPA 600/R-93/116 & 40 CFR App. E Sub. E Pt. 763

PLM Analysis

Sample ID	Collected	Cust. ID	Location	Asbestos Fibers	Other Materials
600411-029	12/30/24	303-4355-33943	Attic S of Center		
Layer 1: Pipe Wrap White, Soft				No Asbestos Detected	5% FIBERGLASS 5% METAL FOIL 90% NON FIBROUS MATERIAL
Layer 2: Fibrous Material Yellow, Fibrous				No Asbestos Detected	98% FIBERGLASS 2% NON FIBROUS MATERIAL
600411-030	12/30/24	303-4355-33944	Attic Center		
Layer 1: Pipe Wrap White, Soft				No Asbestos Detected	5% FIBERGLASS 5% METAL FOIL 90% NON FIBROUS MATERIAL
Layer 2: Fibrous Material Yellow, Fibrous				No Asbestos Detected	98% FIBERGLASS 2% NON FIBROUS MATERIAL
600411-031	12/30/24	303-4355-33945	Attic Center		
Layer 1: Insulation Yellow/Black, Fibrous				No Asbestos Detected	95% FIBERGLASS 5% NON FIBROUS MATERIAL
Unable to separate individual layers.					
600411-032	12/30/24	303-4355-33946	Attic Center		
Layer 1: Insulation Yellow/Black, Fibrous				No Asbestos Detected	95% FIBERGLASS 5% NON FIBROUS MATERIAL
Unable to separate individual layers.					
600411-033	12/30/24	303-4355-33947	Attic E of Center		
Layer 1: Insulation Yellow/Black, Fibrous				No Asbestos Detected	98% FIBERGLASS 2% NON FIBROUS MATERIAL
Unable to separate individual layers.					

EPA Regulatory Limit: 1%

Total layers analyzed on order: 56

600411-12/31/24 12:09 PM

Analyst **Thoria Nadiem**

Reviewed By: **Michael Alers**
Analyst

Reporting Limit: 1% Gravimetrically Reduced Reporting Limit: 0.01% PLM analysis is based on Visual Estimation and NESHAP recommends that any friable sample with an asbestos content less than 10 percent be verified by Point Count or TEM Analysis. The EPA recommends that any attic loose fill vermiculite should be treated as asbestos containing material. This report must not be reproduced except in full with the approval of the laboratory. The test results apply to the sample as received.

Charge to CC

WCSD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Type: (PLM), PCM, TEM **Analysis Turn Around Time: 2hr, Same Day, 1 Day, 2 Day, (3 Day), 5 Day**

Instructions: Email results to the ESA Department, and produce a separate report for each facility. New prefix numbers on a sample identifies a new site. ACCT. #4991

SAMPLE #	DATE	MAT. DESCRIPTION	LOCATION	ROOM	SITE
303 - 4355 - 33915	12/20/2024	Act & Glue	S Side, W End @ Hatch	37	303 - Billinghurst MS
303 - 4355 - 33916	12/20/2024	ACT & Glue	S Side, W End @ Hatch	37	303 - Billinghurst MS
303 - 4355 - 33917	12/20/2024	ACT & Glue	S Side, W End @ Hatch	37	303 - Billinghurst MS
303 - 4355 - 33918	12/20/2024	Black pipe Mastic	Attic S Side Center	300	303 - Billinghurst MS
303 - 4355 - 33919	12/20/2024	Black Pipe Mastic	Attic - Center	800S	303 - Billinghurst MS
303 - 4355 - 33920	12/20/2024	Black Pipe Mastic	Attic N side, Center	10	303 - Billinghurst MS
303 - 4355 - 33921	12/20/2024	CMU, Grout & Fill	Attic E Side, S End	800	303 - Billinghurst MS
303 - 4355 - 33922	12/20/2024	CMU, Grout & Fill	S Side, Center	300	303 - Billinghurst MS
303 - 4355 - 33923	12/20/2024	CMU, Grout & Fill	Attic S side, Center	800S	303 - Billinghurst MS
303 - 4355 - 33924	12/20/2024	Canvas Duct Tape	Attic Center	47	303 - Billinghurst MS
303 - 4355 - 33925	12/20/2024	Canvas Duct Tape	Attic W of Center	201	303 - Billinghurst MS
303 - 4355 - 33926	12/20/2024	Canvas Duct Tape	Attic E Side, Center	932	303 - Billinghurst MS

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10 AM

RECEIVED BY: John T. **DATE/TIME:** 12-30-24 2:37 pm

RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

S 33

600411

V:\600\600411

jjoyce

U.S. Mail

12/30/2024 2:40:12 PM

N/A

Charge to CC

WCSD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Type: PLM, PCM, TEM **Analysis Turn Around Time: 2hr, Same Day, 1 Day, 2 Day, 3 Day, 5 Day**

Instructions: Email results to the ESA Department, and produce a separate report for each facility. New prefix numbers on a sample identifies a new site. ACCT. #4991

SAMPLE #	DATE	MAT. DESCRIPTION	LOCATION	ROOM	SITE
303 - 4355 - 33927	12/20/2024	Duct insulation w/mastic	Attic @ Hatch	501	303 - Billinghurst MS
303 - 4355 - 33928	12/20/2024	Duct insulation w/mastic	Attic @ Hatch	501	303 - Billinghurst MS
303 - 4355 - 33929	12/20/2024	Duct insulation w/mastic	Attic center	26	303 - Billinghurst MS
303 - 4355 - 33930	12/20/2024	Drywall-unfinished w/tape & joint compound	Attic E of Center	932	303 - Billinghurst MS
303 - 4355 - 33931	12/20/2024	Drywall-unfinished w/tape & Joint compound	Attic E Side, Center	47	303 - Billinghurst MS
303 - 4355 - 33932	12/20/2024	Drywall-unfinished w/tape & joint compound	Attic W of Center	201	303 - Billinghurst MS
303 - 4355 - 33933	12/20/2024	Drywall-heavy knockdown texture	E of Center	935	303 - Billinghurst MS
303 - 4355 - 33934	12/20/2024	Drywall-heavy knockdown texture	E of Center	935	303 - Billinghurst MS
303 - 4355 - 33935	12/20/2024	Drywall-heavy knockdown texture	NE Corner	935	303 - Billinghurst MS
303 - 4355 - 33936	12/20/2024	Drywall - Medium texture	W of Center	201	303 - Billinghurst MS
303 - 4355 - 33937	12/20/2024	Drywall - Medium texture	S of Center	300	303 - Billinghurst MS
303 - 4355 - 33938	12/20/2024	Drywall - Medium texture	N of Center	800	303 - Billinghurst MS

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10AM

RECEIVED BY: John J. **DATE/TIME:** 12-30-24 2:37pm

RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

Charge to CC

WCSD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Type: (PLM), PCM, TEM **Analysis Turn Around Time: 2hr, Same Day, 1 Day, 2 Day, (3 Day), 5 Day**

Instructions: Email results to the ESA Department, and produce a separate report for each facility. New prefix numbers on a sample identifies a new site. ACCT. #4991

SAMPLE #	DATE	MAT. DESCRIPTION	LOCATION	ROOM	SITE
303 - 4355 - 33939	12/20/2024	2x4 FCP-PF	S Side, E End	17	303 - Billinghurst MS
303 - 4355 - 33940	12/20/2024	2x4 FCP-PF	N Side, E End	17	303 - Billinghurst MS
303 - 4355 - 33941	12/20/2024	2x4 FCP-PF	NW Corner	27	303 - Billinghurst MS
303 - 4355 - 33942	12/20/2024	Fiberglass pipe wrap	Attic E of Center	905	303 - Billinghurst MS
303 - 4355 - 33943	12/20/2024	Fiberglass pipe wrap	Attic S of Center	800S	303 - Billinghurst MS
303 - 4355 - 33944	12/20/2024	Fiberglass pipe wrap	Attic Center	47	303 - Billinghurst MS
303 - 4355 - 33945	12/20/2024	Fiberlass unit insulation	Attic Center	800S	303 - Billinghurst MS
303 - 4355 - 33946	12/20/2024	Fiberglass unit insulation	Attic Center	47	303 - Billinghurst MS
303 - 4355 - 33947	12/20/2024	Fiberglass unit insulation	Attic E of Center	905	303 - Billinghurst MS

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10 AM

RECEIVED BY: John T. **DATE/TIME:** 12-30-24 2:37 pm

RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

Appendix B

Lead Paint Chip Summary, Sample Chain-of-Custody and Laboratory Results Report

Lead Paint Chip Summary (Lab Report #600412) WCSD – Billinghurst – 6685 Chesterfield Lane, Reno, NV 89523 Survey Date: November 18 and 20, 2024					
Sample Number	**Component Location**	**Component**	**Color**	**Substrate**	**Analytical Results (mg/kg)**
14895	47 Attic – Center	Heat Pump	Black	Metal	23400
14896	800 S Attic – S of center	Heat Pump	Black	Metal	1550
14897	800 S Attic – N of center	Heat Pump	Black	Metal	1550
14898	47 Attic – Center	Unit	Tan	Metal	<49.4
14899	800 S Attic – S side center	Unit	Tan	Metal	<24.9
14900	800 S Attic – N of center	Unit	Tan	Metal	<25.2
14901	28 – N side center	T Grid	White/Gray	Metal	104
14902	25 – N side center	T Grid	White/Gray	Metal	200
14903	27 – N side center	T Grid	White/Gray	Metal	181
14904	37 – S side W end	Ceiling	White	ACT	<13.2
14905	37 W – W side S end	Ceiling	White	ACT	<13.1
14906	37 – S side center	Ceiling	White	ACT	<13.2
14907	935 – S side center	Hatch	White	Drywall	<12.6
14908	800 – N of center	Wall	White	Drywall	<11.6
14909	201 – W of center	Wall	White	Drywall	<11.9

14910	300 1st hatch – S side center	Hatch	White	Metal	<16.4
14911	800 N – N of center	Hatch	White	Metal	<70.2
14912	714 – N side center by door	Hatch	White	Metal	<16.9
14913	28 Attic – center	Ceiling	White	FCP	<13.4
14914	26 – NE corner	Ceiling	White	FCP	<13.2
14915	25 – NE corner	Ceiling	White	FCP	<12.2

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Washoe County School District (4991)
Address: 7495 S. Virginia Street
Reno, NV 89511

Attn:

Project:
Location: 303 Billinghurst MS
Number:

Order #: 600412

Matrix Paint
Received 12/30/24
Reported 01/02/25

PO Number: PO224939

Sample ID / Parameter	Cust. Sample ID	Location / Method	Result	RL*	Units	Analysis Date	Analyst
600412-001	303PB-4355-14895	Attic Ctr Heat Pump					
Metals Analysis							
Lead		EPA 6010D / 3050B	**23400**	1150	mg/kg	01/02/25	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-002	303PB-4355-14896	Attic S Ctr Heat Pump					
Metals Analysis							
Lead		EPA 6010D / 3050B	**1550**	30.3	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-003	303PB-4355-14897	Attic N Ctr Heat Pump					
Metals Analysis							
Lead		EPA 6010D / 3050B	**1550**	44.0	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-004	303PB-4355-14898	Attic Ctr Unit					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<49.4**	49.4	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-005	303PB-4355-14899	Attic S Side Ctr Unit					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<24.9**	24.8	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-006	303PB-4355-14900	Attic N Side Ctr Unit					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<25.2**	25.2	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-007	303PB-4355-14901	N Side Ctr T Grid					
Metals Analysis							
Lead		EPA 6010D / 3050B	**104**	19.9	mg/kg	12/31/24	DM
600412-008	303PB-4355-14902	N Side Ctr T Grid					
Metals Analysis							
Lead		EPA 6010D / 3050B	**200**	19.5	mg/kg	12/31/24	DM

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Washoe County School District (4991)
Address: 7495 S. Virginia Street
Reno, NV 89511

Attn:

Project:
Location: 303 Billinghurst MS
Number:

Order #: 600412

Matrix Paint
Received 12/30/24
Reported 01/02/25

PO Number: PO224939

Sample ID / Parameter	Cust. Sample ID	Location / Method	Result	RL*	Units	Analysis Date	Analyst
600412-009	303PB-4355-14903	N Side Ctr T Grid					
Metals Analysis							
Lead		EPA 6010D / 3050B	**181**	12.3	mg/kg	12/31/24	DM
600412-010	303PB-4355-14904	S Side W End Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<13.2**	13.1	mg/kg	12/31/24	DM
600412-011	303PB-4355-14905	W Side S End Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<13.1**	13.0	mg/kg	12/31/24	DM
600412-012	303PB-4355-14906	S Side Ctr Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<13.2**	13.1	mg/kg	12/31/24	DM
600412-013	303PB-4355-14907	S Side Ctr Htch					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<12.6**	12.5	mg/kg	12/31/24	DM
600412-014	303PB-4355-14908	N of Ctr Wall					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<11.6**	11.6	mg/kg	12/31/24	DM
600412-015	303PB-4355-14909	W of Ctr Wall					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<11.9**	11.9	mg/kg	12/31/24	DM
600412-016	303PB-4355-14910	1st Htch S Side Ctr Htch					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<16.4**	16.3	mg/kg	12/31/24	DM
600412-017	303PB-4355-14911	N of Ctr Htch					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<70.2**	70.2	mg/kg	12/31/24	DM
Sample weight below methods guidelines; results are accurate for weight provided.							
600412-018	303PB-4355-14912	N Side Ctr by Door Htch					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<16.9**	16.9	mg/kg	12/31/24	DM

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: Washoe County School District (4991)
Address: 7495 S. Virginia Street
Reno, NV 89511

Attn:

Project:
Location: 303 Billinghurst MS
Number:

Order #: 600412

Matrix Paint
Received 12/30/24
Reported 01/02/25

PO Number: PO224939

Sample ID / Parameter	Cust. Sample ID	Location / Method	Result	RL*	Units	Analysis Date	Analyst
600412-019	303PB-4355-14913	Attic Ctr Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<13.4**	13.3	mg/kg	12/31/24	DM
600412-020	303PB-4355-14914	NE Corner Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<13.2**	13.2	mg/kg	12/31/24	DM
600412-021	303PB-4355-14915	NE Corner Ceiling					
Metals Analysis							
Lead		EPA 6010D / 3050B	**<12.2**	12.2	mg/kg	12/31/24	DM

Matrix spike failed for Pb due to possible interference. Sample results are unaffected.

600412-01/02/25 04:47 PM

Reviewed By: **Kelly Muncy**
Manager

State Certifications

Method	Parameter	Nevada	Virginia
EPA 6010D	Lead	Not Certified	VELAP Certified

State	Certificate Number
Virginia	VELAP 12761

All internal QC parameters were met. Unusual sample conditions, if any, are described. Surrogate Spike results designated with "D" indicate that the analyte was diluted out. "MI" indicates matrix interference. Concentration and *Reporting Limit (RL) based on areas provided by client. Values are reported to three significant figures. Solid PPM = mg/kg | PPB = µg/kg and Water PPM = mg/L | PPB = µg/L. The test results apply to the sample as received.

Charge to CC

WCSD LEAD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Turn Around Time: **Rush-Same Day, 1 Day, 2 Day, (3 Day), 5 Day**

Instructions: Email results to the ESA Department. In addition, produce a separate report for each facility. A new prefix number on a sample identifies a new site. ACCT. #4991

Analysis Type: (ICP) **Date Sampled: 12/20/2024** **Facility: 303 - Billinghurst MS**

SAMPLE #	ITEM DESCRIPTION	SUBSTRATE	COLOR	ROOM
303PB - 4355 - 14895	Attic Center Heat Pump	Metal	Black	47
303PB - 4355 - 14896	Attic - S of Center Heat Pump	Metal	Black	800S
303PB - 4355 - 14897	Attic - N of Center Heat Pump	Metal	Black	800S
303PB - 4355 - 14898	Attic - Center Unit	Metal	Tan	47
303PB - 4355 - 14899	Attic - S Side Center Unit	Metal	Tan	800S
303PB - 4355 - 14900	Attic - N Side Center Unit	Metal	Tan	800S
303PB - 4355 - 14901	N Side Center T Grid	Metal	White/Gray	28
303PB - 4355 - 14902	N Side Center T Grid	Metal	White/Gray	25

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10AM

RECEIVED BY: John T. **DATE/TIME:** 12-30-24 2:38pm

RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

S 21

600412

V:\600\600412

jjoyce

U.S. Mail

12/30/2024 2:40:12 PM

N/A

Charge to CC

WCSD LEAD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Turn Around Time: **Rush-Same Day, 1 Day, 2 Day, (3 Day,) 5 Day**

Instructions: Email results to the ESA Department. In addition, produce a separate report for each facility. A new prefix number on a sample identifies a new site. ACCT. #4991

Analysis Type: (ICP,) **Date Sampled: 12/20/2024** **Facility: 303 - Billinghurst MS**

SAMPLE #	ITEM DESCRIPTION	SUBSTRATE	COLOR	ROOM
303PB - 4355 - 14903	N Side Center T Grid	Metal	White/Gray	27
303PB - 4355 - 14904	S side W End Ceiling	ACT	White	37
303PB - 4355 - 14905	W Side S End Ceiling	ACT	White	37W
303PB - 4355 - 14906	S Side Center Ceiling	ACT	White	37
303PB - 4355 - 14907	S Side Center Hatch	Drywall	White	935
303PB - 4355 - 14908	N of Center Wall	Drywall	White	800
303PB - 4355 - 14909	W of Center Wall	Drywall	White	201
303PB - 4355 - 14910	1st Hatch - S Side Center Hatch	Metal	White	300

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10 AM

RECEIVED BY: John J **DATE/TIME:** 12-30-24 2:38pm

RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

Charge to CC

WCSD LEAD BULK SAMPLE CHAIN OF CUSTODY FORM

Requested By: John Nolan **Phone Number: 775-325-8491** **Fax Number: 775-851-5662**

Analysis Turn Around Time: **Rush-Same Day, 1 Day, 2 Day, (3 Day) 5 Day**

Instructions: Email results to the ESA Department. In addition, produce a separate report for each facility. A new prefix number on a sample identifies a new site. ACCT. #4991

Analysis Type: (ICP) **Date Sampled: 12/20/2024** **Facility: 303 - Billinghurst MS**

SAMPLE #	ITEM DESCRIPTION	SUBSTRATE	COLOR	ROOM
303PB - 4355 - 14911	N of Center Hatch	Metal	White	800N
303PB - 4355 - 14912	N Side Center by Door Hatch	Metal	White	714
303PB - 4355 - 14913	Attic - Center Ceiling	FCP	White	28
303PB - 4355 - 14914	NE Corner Ceiling	FCP	White	26
303PB - 4355 - 14915	NE Corner Ceiling	FCP	White	25

SENT BY: Brian Priest **DATE/TIME:** 12-27-24 6:10AM

RECEIVED BY: John J. **DATE/TIME:** 12-30-24 2:38pm

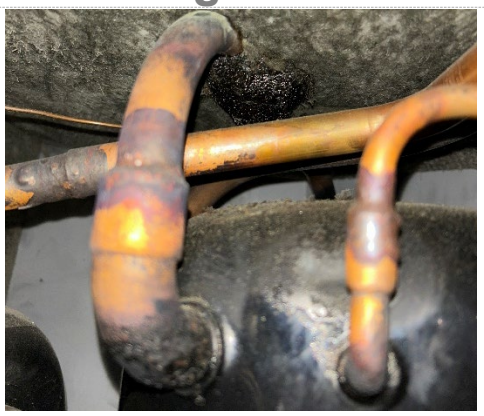
RECEIVED BY: **DATE/TIME:**

RECEIVED BY: **DATE/TIME:**

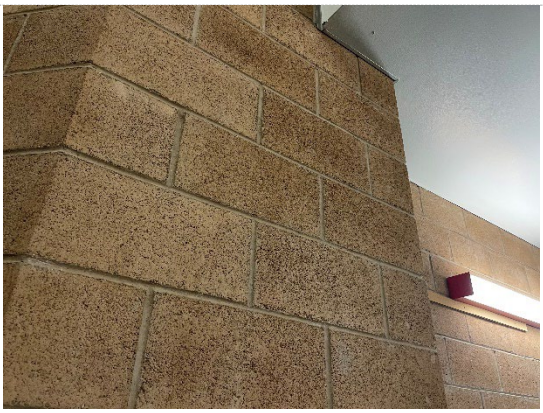
Appendix C

Site Photos and Sample Location Drawings

ACT & Glue and White Paint on ACT Ceiling



Black Pipe Mastic



CMU, grout, and fill

Canvas Duct Tape

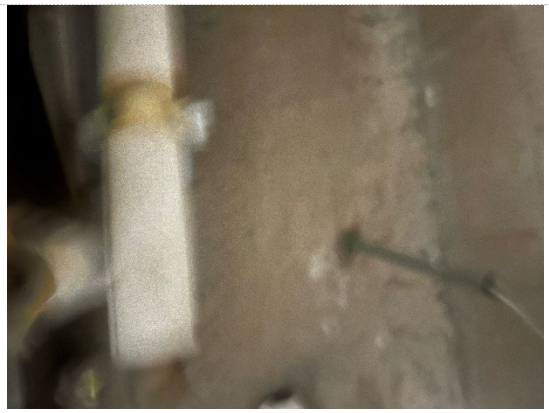
Duct Insulation w/ Mastic

Drywall – Unfinished w/ Tape & Joint Compound

Drywall – Heavy Knockdown Texture

Drywall – Medium Texture and White Paint on Drywall Wall

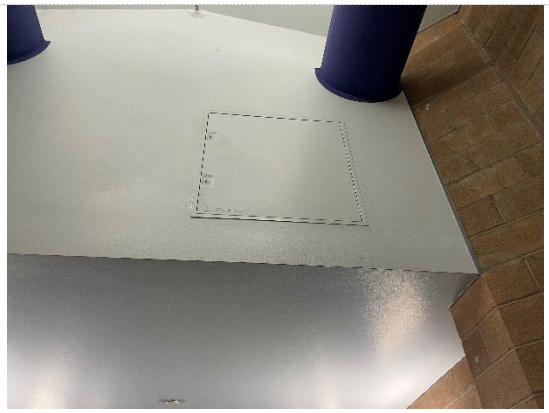
2’ x 4’ FCP – PF



Fiberglass Pipe Wrap

Fiberglass Unit Insulation

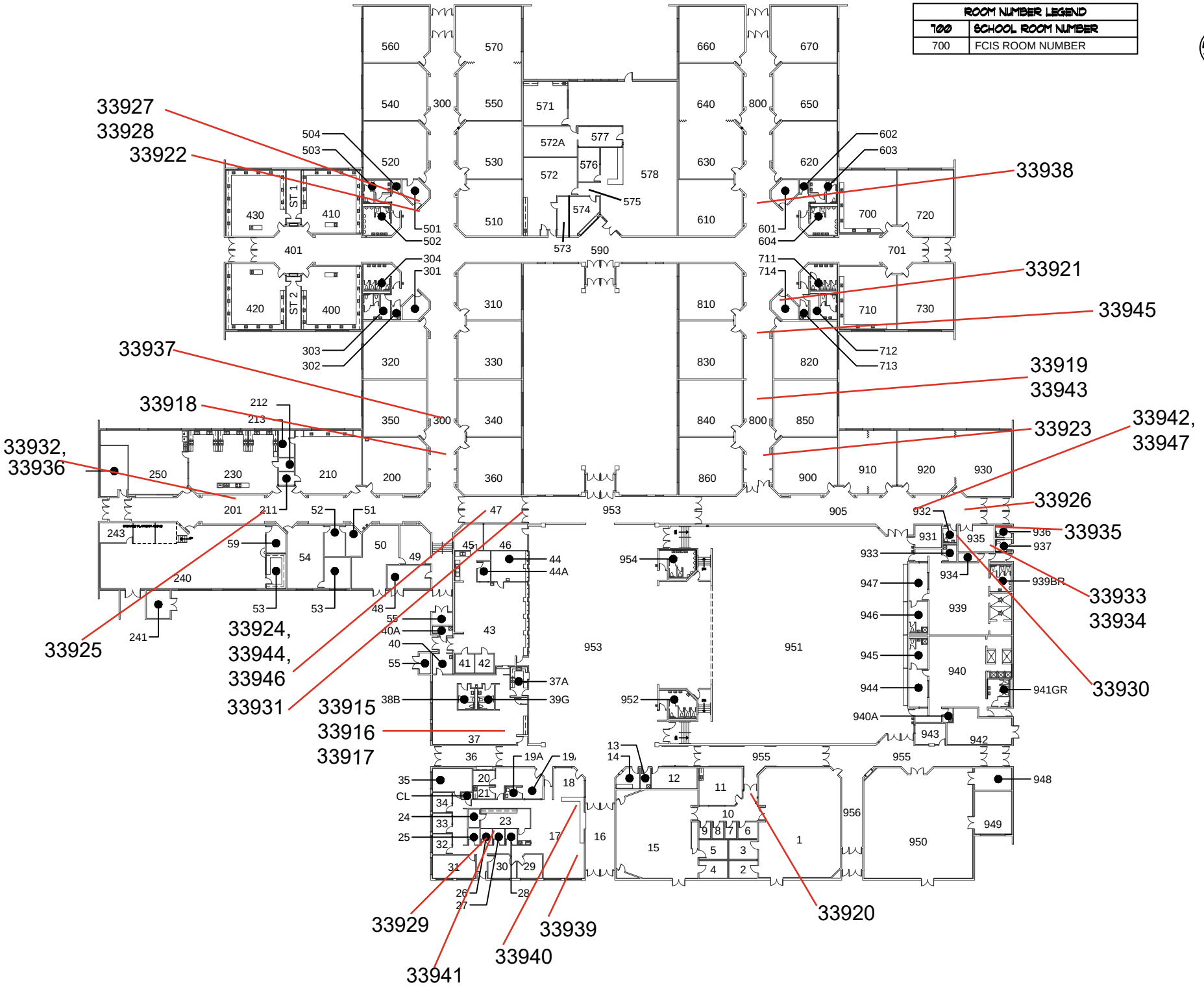
Black Paint on Metal Heat Pump

Tan Paint on Metal Unit	White/Gray Paint on Metal T Grid and White Paint on FCP Ceiling
	
White Paint on Metal Hatch	White Paint on Drywall Hatch

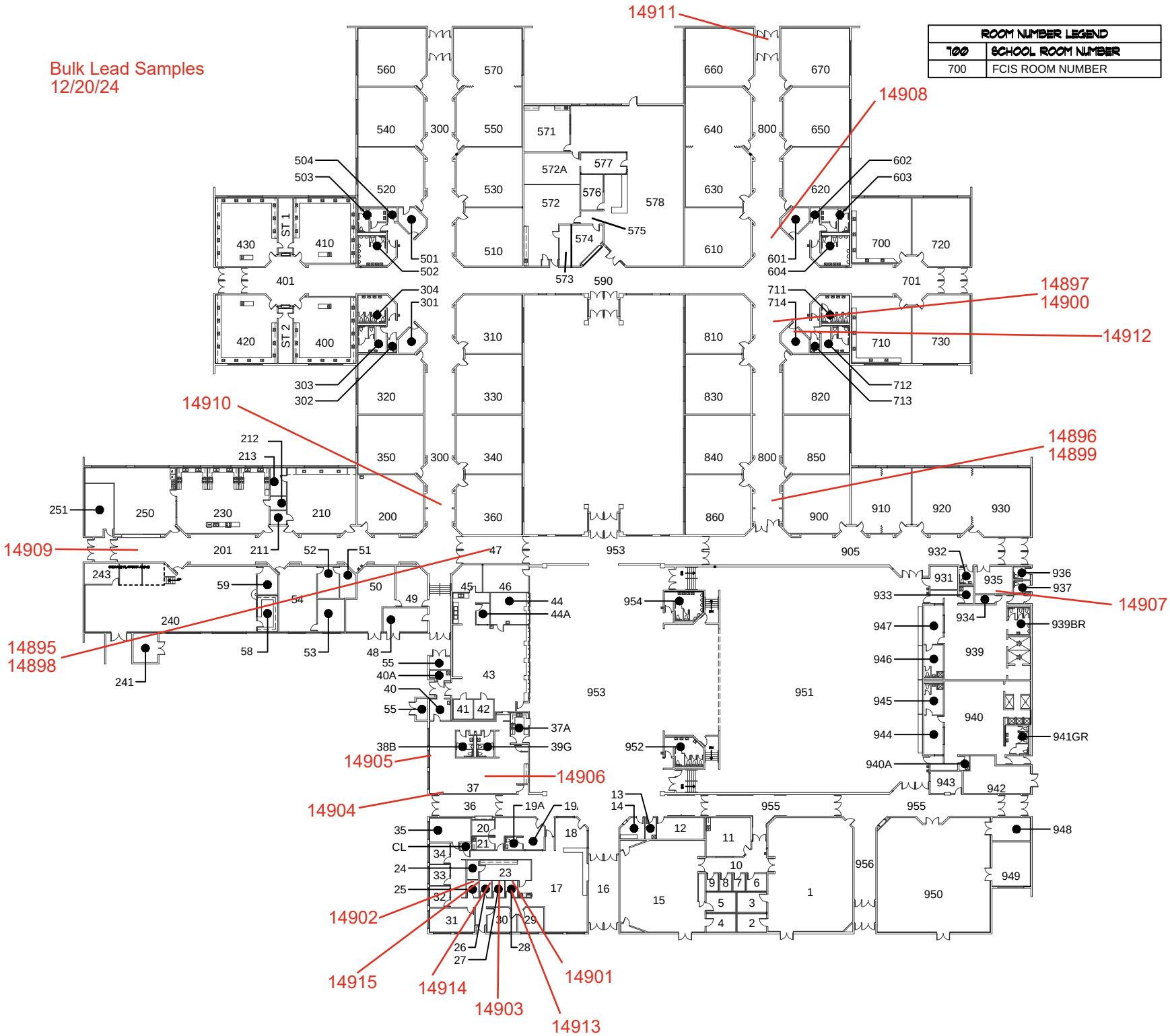
B.D. BILLINGHURST MIDDLE SCHOOL - FCIS ROOM NUMBER REFERENCE FLOOR PLAN

N.T.S.

ROOM NUMBER LEGEND	
700	SCHOOL ROOM NUMBER
700	FCIS ROOM NUMBER



Bulk Lead Samples
12/20/24



B.D. BILLINGHURST MIDDLE SCHOOL - FCIS ROOM NUMBER REFERENCE FLOOR PLAN

N.T.S.

Appendix D
Certifications of Personnel and Laboratories

STATE OF NEVADA
DEPARTMENT OF BUSINESS AND INDUSTRY
DIVISION OF INDUSTRIAL RELATIONS
Occupational Safety and Health Administration
Asbestos Control Program

Certifies That Zachary Ramos
Forensic Analytical Consulting Services
is Licensed As Asbestos Abatement Consultant

License No. IJM-2341 Expiration Date 04/19/2025

Signature Of Licensee_____

Forensic Analytical Consulting Services, Inc.

This is to confirm that

Zachary Ramos

Has attended the Four hour

AHERA Refresher Course for Asbestos Inspectors

And has completed the requisite training for asbestos accreditation under TSCA Title II

Course Date: 09-05-2024 to 09-05-2024

Certificate Number: PETBIR20240100
Valid Until: September 05, 2025

Cal/OSHA Approval Number:CA-025-06

FACS
Forensic Analytical Consulting Services

Fred J. Vinciguerra, Chief Executive Officer
Forensic Analytical Consulting Services, Inc.
21228 Cabot Blvd, Hayward, CA 94545
(800) 677-1483

United States Environmental Protection Agency

This is to certify that

Zachary E Ramos

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires November 01, 2026

LBP-I-I255969-1

Certification #

October 18, 2023

Issued On

Adrienne Priselac, Manager, Toxics Office

Land Division

STATE OF NEVADA
DEPARTMENT OF BUSINESS AND INDUSTRY
DIVISION OF INDUSTRIAL RELATIONS
Occupational Safety and Health Administration
Asbestos Control Program

Certifies That Ryan Hettich
Forensic Analytical Consulting Services
is Licensed As Asbestos Abatement Consultant

License No. IJPM-2342 Expiration Date 04/19/2025

Signature Of Licensee _____

Forensic Analytical Consulting Services, Inc.

This is to confirm that

Ryan Hettich

Has attended the Four hour

AHERA Refresher Course for Asbestos Inspectors

And has completed the requisite training for asbestos accreditation under TSCA Title II

Course Date: 09-05-2024 to 09-05-2024

Certificate Number: PETBIR20240095
Valid Until: September 05, 2025

Cal/OSHA Approval Number:CA-025-06

FACS
Forensic Analytical Consulting Services

Fred J. Vinciguerra, Chief Executive Officer
Forensic Analytical Consulting Services, Inc.
21228 Cabot Blvd, Hayward, CA 94545
(800) 677-1483

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
Ryan Hettich	Lead Sampling Technician	LRC-00010195	7/1/2025

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD

STATE OF NEVADA
DEPARTMENT OF BUSINESS AND INDUSTRY
DIVISION OF INDUSTRIAL RELATIONS
Occupational Safety and Health Administration
Asbestos Control Program

Certifies That Khong Lunaria

Forensic Analytical Consulting Services,

is Licensed As An Asbestos Abatement Consultant

License No. IM-2439 Expiration Date 06/07/2025

Trainee

Signature Of Licensee K. Lunaria

Forensic Analytical Consulting Services, Inc.

This is to confirm that

Khong Lunaria

Has attended the Twenty Four hour

Building Inspector Initial

And has completed the requisite training for asbestos accreditation under TSCA Title II

Course Date: 09-09-2024 to 09-11-2024

Certificate Number: PETBII20240019
Valid Until: September 11, 2025

Cal/OSHA Approval Number:CA-025-05

FACS
Forensic Analytical Consulting Services

Fred J. Vinciguerra, Chief Executive Officer
Forensic Analytical Consulting Services, Inc.
21228 Cabot Blvd, Hayward, CA 94545
(800) 677-1483

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
Khong Lunaria	Lead Sampling Technician	LRC-00012701	4/22/2025

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101150-0

Schneider Laboratories Global, Inc.

Richmond, VA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2024-04-01 through 2025-03-31

Effective Dates

For the National Voluntary Laboratory Accreditation Program

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Schneider Laboratories Global

2512 West Cary Street, Richmond, VA 23220-5117

Laboratory ID: LAP-100527

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs, LLC (AIHA LAP) accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: August 01, 2025
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: August 01, 2025
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: August 01, 2025
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:
☐	**BERYLLIUM FIELD/MOBILE**	Accreditation Expires:

Specific Field(s) of Testing/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision21: 05/15/2023

Date Issued: 08/01/2023

Right People

Right Perspective

Right Now

www.forensicanalytical.com

WASHOE COUNTY SCHOOL DISTRICT
WORK PLAN FOR SMALL-SCALE DISTURBANCE OF LEAD-CONTAINING PAINTS OR COMPONENTS
PROJECT LOCATION: BILLINGHURST MS

The Washoe County School District (WCSD) will be conducting renovation projects which may include small-scale disturbance of various painted components, penetrations and attachments to painted surfaces, selective demolition of painted components, or removal of paint from existing substrates. Paints and coatings which contain lead are documented in the Environmental, Safety and Assessment (ES&A) Material Disturbance Permit. Any disturbance to lead-containing painted or coated surfaces shall comply with this specification, the requirements contained Lead Appendix of the WCSD ES&A Material Disturbance Permit, Federal, State, and Local requirements.

Project Requirements

The contractor shall review all requirements set forth in these project specifications and all pertinent ES&A information prior to submittal of a bid to assure they are prepared to meet all necessary requirements.

Contractor shall be approved by the WCSD ES&A to perform lead disturbance activities within the District. **Approval of firms that have not performed activities impacting lead for the District previously, will need to submit all necessary documentation outlined in the WCSD ES&A Technical Specifications and/or Material Disturbance Permit for the project at least fifteen (15) business days prior to work commencing for approval. This includes a written work plan by the contractor for all work practices and containment procedures to be employed for the performance of work deemed as penetration and attachment.**

All workers that will impact lead-containing paints or coatings shall have OSHA Lead Action Level training, regardless of the size of the project or amount of lead disturbed.

If more than 6 square feet of painted surfaces on the interior or 20 square feet of painted surfaces on the exterior are to be disturbed (cumulatively totaled for all work at the site), and the project site is a child-occupied facility (elementary schools or other sites with child-care facilities) constructed prior to 1978, the contractor firm must be certified under the EPA's Lead Repair Renovation and Painting (RRP) rule. Workers performing such work shall have had training on RRP lead safe work practices, and the Supervisor shall be trained and certified as an RRP Renovator.

Copies of all certifications must be submitted to WCSD ES&A no less than fifteen (15) business days prior to the project start. All worker certifications – lead training – shall be submitted to the WCSD ES&A at least fifteen (15) working days prior to project commencement at minimum for approval. Contractor is responsible for reviewing WCSD ES&A worker roster for the company to assure all workers to be used on the project have been approved prior to arrival onsite. Workers not identified on the approved worker list for the contractor will not be allowed to perform any activities onsite, even if documentation is provided onsite at time of the project commencement.

The contractor's onsite supervisor shall have a copy of these Specifications onsite at all times and be familiar with the project requirements prior to arrival onsite at the project. The contractor shall follow this work plan, requirements found in the Material Disturbance Permit provided by WCSD's ES&A Department, and all Federal, State, and local regulations. Failure to follow requirements of these Specifications, or lack of knowledge of requirements to be followed during the project, are grounds for replacement of the contractor's onsite supervisor.

Only the contractor will be allowed to occupy the project area once lead disturbing activities are scheduled to start. This applies to all WCSD non-ES&A staff/personnel and site staff/personnel. The area shall only be occupied by the contractor, WCSD ES&A staff, and District's independent third-party consultant. Site personnel will not be allowed to occupy the building during lead disturbing activities.

Electricity and Water

Electricity and water are available onsite, but long hoses and extension cords may be necessary. Contractor shall provide new hose washers at hose connections to prevent leakage. Contractor shall install GFIs at primary plug-ins of electrical trains for all electrical equipment to be used. Contractor is responsible for any damage to water and electrical systems which their use causes.

Equipment

All equipment brought onsite shall be clean, and in proper functioning order. HEPA-vacuums shall be clean of debris and material and have new vacuum bags installed. Equipment shall be in proper functioning order (ladders not missing feet, cords with grounds, etc.). Any equipment that arrives onsite dirty or not in proper functioning order will be removed from the site for cleaning and/or repairs.

Worker Training

All workers that will disturb painted or coated components or materials to be used on this project shall have OSHA Action Level Lead Training as required by WCSD ES&A. If the disturbance to painted surfaces is above the RRP threshold amounts (6 ft^2 interior / 20 ft^2 exterior) at a pre-1978 child occupied facility, RRP worker training and supervisor certification shall be required. As noted previously, contractor shall provide all worker certifications to the WCSD ES&A at least fifteen business days prior to the project start for inclusion on the WCSD Approved Worker List. Any workers not on the approved list will not be allowed to performed lead disturbing activities on the site, even if documentation is provided onsite.

Copies of all worker and supervisor training certifications shall be provided to District's independent third-party consultant.

Personal Protection Equipment

All personnel entering the regulated work area for lead disturbance shall wear disposable coveralls (Tyvek or equivalent quality), safety glasses, gloves, hard-hats, and half-mask, negative-pressure respirators fitted with HEPA (P-100) filters, at minimum. Street clothes may be worn below coveralls, but HEPA-vacuum cleaning of clothing may be required in the event suits become ripped or torn during work.

Copies of valid medical clearance for respirator use and fit tests shall be provided to the District's independent third-party consultant.

Notifications

Notification for lead work is not required to be filed with regulatory agencies, but the contractor is responsible for notifying the District's third-party consultant at least 72 hours prior to any lead disturbing activities (including containment setup) commencing. Contractor shall also provide prior notification at least 72 hours in advance of

planned lead disturbing activities to WCSD ES&A, and provide a site-specific work-plan detailing containment procedures and work practices for review and approval by ES&A personnel.

Pre-Cleaning

No pre-cleaning of lead-containing materials is expected, however, small amounts of debris may be required to be cleaned to allow setup of containment.

Personal Air Monitoring

Contractors are responsible for the collection of personal air samples on workers during all disturbance activities for lead within the District. These samples shall be collected in accordance with OSHA sampling protocols and analyzed by a laboratory with the proper regulatory accreditation and approval from the WCSD ES&A Department.

For Contractors, their laboratory shall submit or fax final laboratory result documents for air monitoring to the WCSD ES&A Department within **48 hours** of the date the sample was taken. No hand-written results reports will be allowed. The laboratory reports will reference the air monitoring cassette's factory assigned number and the personal air monitoring results must be properly applied to generate an 8-hour time weighted average exposure level. Failure to submit results within the required 48-hour period may result in the District temporarily stopping the applicable abatement/remediation work until results are received. Continued failure to meet personal air monitoring requirements may also result in the termination of this contract.

Copies of the personal air sampling results, along with laboratory accreditation, shall be submitted to the WCSD ES&A as noted above, and copies shall also be submitted to District's independent third-party consultant.

Security and Safety

The Contractor is responsible for security of tools and equipment used on the project. Contractor is responsible for the safety of employees and for following all applicable OSHA requirements.

The contractor shall provide lockable storage bins as necessary for equipment and supplies. Contractor shall coordinate with WCSD personnel on placement of any storage bins delivered to the site.

Occupancy

As noted previously, the project area will be limited to the contractor, WCSD ES&A staff, and District's independent third-party consultant once lead disturbing activities are ready to commence. Once work areas have been cleared, other parties may occupy.

Emergency services may also occupy areas in the event of an emergency during the project.

Challenge Testing

All HEPA-filtered equipment to be used on site shall be Challenge Tested (DOP or equivalent) within the past 30 days. Copies of Challenge Testing results shall be provided to the District's independent third party consultant.

Respiratory Protection

At a minimum, half-face, negative pressure respirators with HEPA P-100 filters shall be utilized by all personnel within the regulated lead work area during all lead disturbance activities.

Decontamination Areas

A decontamination area must be sited adjacent to the regulated work area. This area shall be large enough to accommodate a washing area for personal hygiene and a clean area for donning personal protection (PPE) equipment and storage of street clothes / personal items. The decontamination area shall have a 6-mil polyethylene drop sheet and shall have privacy screens installed as needed.

Wash facilities shall include clean water, soap, and clean towels. A tack/sticky mat shall be placed at the threshold between the regulated area and decontamination area to prevent tracking of lead dust or debris out of the regulated area. If street clothes are worn under PPE, a HEPA vacuum shall be made available to decontaminate clothing. Lead contaminated water shall be captured for waste characterization and proper disposal. A labeled waste bin shall be available for collection, characterization, and proper disposal of contaminated PPE.

The contractor is responsible for prohibiting any eating or drinking by their employees in the decontamination area. Workers shall completely decontaminate and exit the area prior to consumption of any food or drink.

Containment and Lead Disturbance Procedure Requirements

All poly used on this project shall be 6-mil in thickness and fire-retardant.

1. For any lead disturbance, the contractor shall limit and control all access to the building or section for interior work, and shall limit and control exterior access within 50 feet of exterior work areas.
2. Critical barriers shall be erected at openings and shall be sealed with one layer of 6-mil poly. This includes doors, vents, windows, etc. For Interior areas, critical barriers shall be applied to all openings within the room. For exterior areas, critical barriers shall be applied to all openings within the work area and within 30 feet of the regulated area.
3. The doorway to be used to enter and exit the work area shall be equipped with a z-flap poly barrier.
4. Two layers of 6-mil poly shall cover the entire floor in the work area if it constitutes an entire interior room, or shall extend out at least 10 feet out in each direction from the site of lead disturbance. Two layers of 6-mil poly shall cover the ground in exterior work areas, extending at least 20 feet in each direction from the site of lead disturbance.
5. Poly drop sheets shall be secured to prevent billowing and creation of a trip hazard or movement of drop sheets.
6. Immovable objects not identified for removal within this area shall also be covered and sealed with poly. Any loose equipment, furnishings, or supplies will be removed by WCSD personnel prior to any containment activities commencing.
7. A decontamination area shall be sited adjacent to the regulated work area. See Decontamination Areas section above for specific requirements for this facility.
8. Entrances to the work area providing access to the entry/exit of the regulated area shall be demarcated with caution tape to dissuade any non-authorized persons onsite from approaching the work area.

9. Lead hazard tape or caution tape with lead hazard signage shall be placed at the perimeter of the work area or at entrances into the work area if comprised of an entire room to create a regulated work area. Personal Protection Equipment must be worn within this regulated area.
10. Disturbance to painted or coated components or materials shall be performed using hand tools, or power tools with HEPA-equipped vacuum attachments to limit dust and debris generated. Such items shall be removed in an intact state wherever possible.
11. Painted or coated components or materials to be disturbed shall be wetted prior to and during removal to limit the creation of dust.
12. A build-up of waste or debris within the work area is prohibited. Contractor workers shall assure the area is kept free of waste bags, paint chips, or other debris as work progresses to prevent the crushing of lead debris into finer lead dust.
13. At the conclusion of lead disturbance, the poly drop sheets shall be wet-wiped and HEPA-vacuumed clean of all debris and dust.
14. After final cleaning, the Contractor's supervisor shall perform a visual inspection to determine if the work area is ready for a visual clearance inspection, and shall notify the HMS, Inc. Project Manager when the work area is ready.
15. A visual clearance inspection shall be performed by the HMS, Inc. Project Manager. The criteria for passing visual clearance shall be the absence of any dust or debris within the regulated work area. All waste and debris shall be properly packaged and removed from the regulated area prior to this final inspection.
16. The contractor is responsible for performing wipe verification tests to meet requirements of the US EPA RR&P Rule as applicable. Photographic proof of cleaning verification shall be performed by contractor.
17. All waste shall be double-bagged in clear, 6-mil poly waste bags, or double-wrapped in 6-mil poly sheeting (see disposal section below).

Lead Wipe Sampling Criteria

The District will hire an independent third-party consultant to perform lead wipe sampling prior to commencement of work at the site at interior areas. The consultant will collect wipe samples from floors or other horizontal surfaces as appropriate within the work areas to verify lead dust levels prior to work commencing. If cleaning of floors or other horizontal surfaces to remove a detected lead hazard is required, the contractor shall be notified, and the hazardous materials contractor will be required to perform the cleaning.

At the conclusion of lead disturbances, post-project wipe samples will be collected from the floor or applicable horizontal surface in the work area, beneath the containment poly. If post-project wipe samples indicate that an EPA lead dust hazard exists or if samples indicate a higher level of lead on surfaces than shown on pre-project wipe samples, then recleaning of the work area will be necessary. The recleaning process will be required to be repeated until wipe samples indicate lead levels are below both current EPA lead dust hazard levels and below pre-project wipe sample levels.

Clearance – Lead

At the conclusion of remediation within a regulated area, a final visual inspection will be performed by the District's independent third-party consultant. The criteria for a successful final visual inspection are that a work area will need to be free of all dust and debris, with all lead disturbance completed within the regulated area, and any remaining paints at areas stabilized shall be tight to the substrate.

As noted previously, pre-job and post-job lead dust wipe samples will be collected in spaces to verify the contractor has not created a lead hazard by removal of their containment area and to verify that the spaces can be re-occupied by non-lead trained personnel. Post project wipe samples must be below pre-project levels and current EPA lead dust hazard levels for the surface tested to pass clearance.

In the event that a potential lead hazard has been created by a contractor, such as improper disturbance of painted surfaces outside of a contained area, the District's ES&A staff or independent third-party consultant will collect dust wipe samples to verify conditions. If a lead hazard has been created, the contractor performing the improper disturbance will be responsible for all cleaning costs required for the lead abatement contractor to remediate the hazard, including costs for collection of clearance dust wipe samples to document that the lead hazard has been remediated.

Waste Disposal - Lead

Contractor is responsible for the proper characterization and disposal of wastes created by lead-containing paint disturbance activities. Copies of the waste characterization, including chain of custody and testing results if laboratory analysis is used for the determination, shall be provided to District's independent third party consultant.

All lead waste shall be double-bagged in clear, 6-mil waste bags, or double-wrapped in 6-mil polyethylene sheeting. Waste bags shall be sealed in a leak-tight fashion using a "gooseneck" tie on both bags. Poly-wrapped bulk waste shall have both layers completely sealed in a leak-tight fashion with duct tape. Waste shall be stored in a lockable container provided by the Contractor. Equipment and waste may not be stored in the same container.

Waste characterization must occur before waste is removed from the site. Hazardous waste manifests if required, or other shipping records if waste is non-hazardous shall note all mandated information, including waste classification, quantity, generator identification, transporter identification, and disposal site identification. The lead remediation contractor shall notify and make arrangements at least 24 hours in advance if an authorized District representative is needed to sign a manifest or shipping paper. Neither the contractor nor the District's third-party consultant shall sign such documentation on behalf of the District.

[END]