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## MECHANICAL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| **PLAN-VIEW LINE TYPES** | |
| ——— | WORK SHOWN FADED INDICATES EXISTING WORK TO REMAIN OR NEW WORK BY OTHERS AS APPLICABLE |
| ━━━ | WORK SHOWN BOLD-CONTINUOUS INDICATES NEW WORK |
| **PIPING LINE TYPES** | |
| —— CHWS —— | CHILLED WATER SUPPLY |
| —— CHWR —— | CHILLED WATER RETURN |
| —— CD —— | CONDENSATE DRAIN |
| ━━━ | SUPPLY MAIN OR BRANCH |
| — — — — | RETURN MAIN OR BRANCH |
| **MECHANICAL PIPING ACCESSORIES** | |
| —⋈— | MANUAL ISOLATION VALVE |
| **MECHANICAL STATS & SENSORS** | |
| TS | TEMPERATURE SENSOR |
| T | LOW VOLTAGE THERMOSTAT |
| **MECHANICAL DUCTWORK ACCESSORIES** | |
| | DUCT WITH MANUAL VOLUME DAMPER |
| M | MOTOR OPERATED DAMPER - LOW VOLTAGE |
| FD 1.5 HR<br>F 1.5 | FIRE DAMPER - 1.5 HR |
| FD 3.0 HR<br>F 3 | FIRE DAMPER - 3 HR |
| S | DUCT MOUNTED SMOKE DETECTOR (HARD WIRE INTERLOCK TO FAN MOTOR BY E.C.) FURNISHED BY E.C., INSTALLED BY M.C. |
| **MECHANICAL AIR DEVICES** | |
| ER ☒ | EXHAUST REGISTER |
| RG ⧄ | RETURN GRILLE |
| CD ☒ | CEILING DIFFUSER |
| | LINEAR SLOT DIFFUSER |
| **MECHANICAL DUCTWORK** | |
| ☒ UP | SUPPLY DUCT WITH ELBOW TURNED UP |
| ☒ DN | SUPPLY DUCT WITH ELBOW TURNED DOWN |
| ⧄ UP | RETURN DUCT WITH ELBOW TURNED UP |
| ⧄ DN | RETURN DUCT WITH ELBOW TURNED DOWN |
| ☒ UP | EXHAUST DUCT WITH ELBOW TURNED UP |
| ☒ DN | EXHAUST DUCT WITH ELBOW TURNED DOWN |
| 24X12 SA | SUPPLY DUCT |
| 24X12 RA | RETURN DUCT |
| 24X12 EA | EXHAUST DUCT |
| 24X12 OA | OUTSIDE AIR DUCT |
| | FLEXIBLE DUCTWORK CONNECTION |
| | BRANCH TAKEOFF |

## STANDARD HVAC ABBREVIATIONS

| | |
|---|---|
| AAV | AUTOMATIC AIR VENT |
| ACCESS | ACCESSORIES |
| AD | ACCESS DOOR |
| AFF | ABOVE FINISHED FLOOR |
| AMP | AMPERE |
| AP | ACCESS PANEL |
| APD | AIR PRESSURE DROP |
| ARI | AIR CONDITIONING AND REFRIGERATION INSTITUTE |
| ASME | AMERICAN SOCIETY OF MECHANICAL ENGINEERS |
| BAS | BUILDING AUTOMATION SYSTEM |
| BD | BACKDRAFT DAMPER |
| BHP | BRAKE HORSEPOWER |
| BTU | BRITISH THERMAL UNIT |
| BTUH | BRITISH THERMAL UNIT PER HOUR |
| CD | CEILING DIFFUSER |
| CFH | CUBIC FEET PER HOUR |
| CFM | CUBIC FEET PER MINUTE |
| CHWR | CHILLED WATER RETURN |
| CHWS | CHILLED WATER SUPPLY |
| CI | CAST IRON |
| CLG | COOLING |
| CO | CARBON MONOXIDE |
| CO2 | CARBON DIOXODE |
| COP | COEFFICIENT OF PERFORMANCE |
| CV | CONSTANT VOLUME |
| CWR | CONDENSER WATER RETURN |
| CWS | CONDENSER WATER SUPPLY |
| DB | DECIBELS |
| DB | DRY-BULB TEMPERATURE |
| DC | DISCONNECT |
| DDC | DIRECT DIGITAL CONTROLS |
| DEG | DEGREE DELTA(CHANGE IN TEMPERATURE) |
| DIA | DIAMETER |
| DIW | DEIONIZED WATER |
| DP | DEW POINT TEMPERATURE |
| DX | DIRECT EXPANSION |
| EA | EXHAUST AIR |
| EAT | ENTERING AIR TEMPERATURE |
| EER | ENERGY EFFICIENCY RATIO |
| EG | EXHAUST GRILLE |
| EMERG | EMERGENCY POWER |
| ESP | EXTERNAL STATIC PRESSURE |
| EWT | ENTERING WATER TEMPERATURE |
| EX. | EXISTING |
| F | FAHRENHEIT |
| F&T | FLOAT AND THERMOSTATIC |
| FA | FREE AREA |
| FD | FIRE DAMPER |
| FLA | FULL LOAD AMPERES |
| FPM | FEET PER MINUTE |
| FPS | FEET PER SECOND |
| FT | FEET |
| FURN | FURNISHED |
| GA | GAUGE |
| GAL | GALLONS |
| GPM | GALLONS PER MINUTE |
| HD | HEAD |
| HOA | HAND/OFF/AUTOMATIC |
| HP | HORSEPOWER |
| HPR | HIGH PRESSURE RETURN (STEAM CONDENSATE) |
| HSTAT | HUMIDISTAT |
| HTG | HEATING |
| HWR | HEATING HOT WATER RETURN |
| HWS | HEATING HOT WATER SUPPLY |
| HZ | HERTZ |
| I/O | INPUT/OUTPUT |
| IAQ | INDOOR AIR QUALITY |
| IN HG | INCHES OF MERCURY |
| IN WC | INCH WATER COLUMN |
| IN WG | INCH WATER GAUGE |
| IPLV | INTERGRATED PART LOAD VALUE |
| INST | INSTALLED |
| KW | KILOWATT |
| KWH | KILOWATT HOUR |
| LAT | LEAVING AIR TEMPERATURE |
| LBS/HR | POUNDS PER HOUR |
| LF | LINEAR FOOT (FEET) |
| LPR | LOW PRESSURE RETURN (STEAM CONDENSATE) |
| LPS | LOW PRESSURE STEAM |
| LWT | LEAVING WATER TEMPERATURE |
| MAX | MAXIMUM |
| MBH | 1000 BTUH |
| MCA | MINIMUM BRANCH CIRCUIT AMPACITY |
| MERV | MINIMUM EFFICIENCY REPORTING VALUE |
| MIN | MINIMUM |
| MOD | MOTOR OPERATED DAMPER |
| MPR | MEDIUM PRESSURE RETURN (STEAM CONDENSATE) |
| MPS | MEDIUM PRESSURE STEAM |
| MRI | MAGNETIC RESONANCE IMAGING |
| MVD | MANUAL VOLUME DAMPER |
| NA | NOT APPLICABLE |
| NC | NOISE CRITERIA |
| NC | NORMALLY CLOSED |
| NO | NORMALLY OPEN |
| NTS | NOT TO SCALE |
| OA | OUTSIDE AIR |
| OCP | OVER CURRENT PROTECTION |
| PD | PRESSURE DROP |
| PPM | PARTS PER MILLION |
| PRS | PRESSURE REGULATING (VALVE) STATION |
| PRV | PRESSURE REGULATING VALVE |
| PSI | POUNDS PER SQUARE INCH |
| PSIA | POUNDS PER SQUARE INCH – ABSOLUTE |
| PSIG | POUNDS PER SQUARE INCH – GAGE |
| RA | RETURN AIR |
| RAT | RETURN AIR TEMPERATURE |
| RH | RELATIVE HUMIDITY |
| RL | REFRIGERANT LIQUID LINE |
| RLA | RUN LOAD AMPERE |
| RO | REVERSE OSMOSIS |
| RPM | REVOLUTIONS PER MINUTE |
| RS | REFRIGERANT SUCTION |
| SA | SUPPLY AIR |
| SAT | SUPPLY AIR TEMPERATURE |
| SC | SHADING COEFFICIENT |
| SCD | SMOKE CONTROL DAMPER |
| SD | SMOKE DETECTOR |
| SENS | SENSIBLE HEAT |
| SP | STATIC PRESSURE |
| TAB | TESTING, ADJUSTING, BALANCE |
| TDH | TOTAL DYNAMIC HEAD |
| TDS | TOTAL DISSOLVED SOLIDS |
| TSP | TOTAL STATIC PRESSURE |
| TSTAT | THERMOSTAT |
| UL | UNDERWRITERS LABORATORY |
| VAV | VARIABLE AIR VOLUME |
| VFD | VARIABLE FREQUENCY DRIVE |
| WB | WET-BULB (TEMPERATURE) |
| WG | WATER GAGE |
| WPD | WATER SIDE PRESSURE DROP |
| WIRE | WIRED |

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL

KLH ENGINEERS
KOHRS LONNEMANN HEIL ENGINEERS, INC.

MECHANICAL/ELECTRICAL ENGINEERS

WWW.KLHENGRS.COM

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FT. THOMAS, KENTUCKY 41075
800-354-9783
859-442-8050
859-442-8058 FAX

KLH JOB #: 26861

DOLCE & GABBANA

**VALLEY FAIR**

2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

**LMA Project No.**

| NO. | DATE | ISSUE |
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| 6 | 06.02.25 | Issue for Construction |
| 5 | 03.21.25 | Addendum 3 |
| 3 | 02.27.25 | Building Department Response |
| | 01.16.25 | Permit and Bid Set |

MECHANICAL COVER SHEET

M0.00

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### SECTION 23 05 01.00 – COMMON REQUIREMENTS FOR HVAC

General
General Provisions of the Contract including General and Supplementary Conditions and General Requirements apply to work of this section.
Scope
The base bid includes furnishing all materials, labor, tools, and equipment and the performance of all work required to install a complete heating and air conditioning system as outlined herein.
Guarantee
The contractor shall provide a guarantee in written form stating that all work under this section shall be free of defective work, materials, or parts for a period of one year from the date of owner's final acceptance and shall repair, revise or replace at no cost to the owner any such defects occurring within the guarantee period. Contractor shall also state in written form that any items or occurrences arising during the guarantee period will be attended to in a timely manner and will in no case exceed four (4) working days from date of notification by owner.
Quality Assurance
Provide a complete installation in conformance with the following standards.
ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
NFPA: National Fire Protection Association
SMACNA: Sheet Metal and Air Conditioning Contractors National Association.
Statewide Building Code
Permits, Fees, Inspections, Laws and Regulations
Permits and fees of every nature required in connection with this work shall be obtained and paid for by this contractor who shall also pay for all the installation fees and similar charges. Laws and regulations, which bear upon or affect the various branches of this work shall be complied with by this contractor and are hereby made a part of this contract. All work, which such laws require to be inspected, shall be submitted to the proper public official for inspection and a certificate of final approval must be furnished.
Work in Existing Spaces
General: Care shall be taken when working in existing spaces so as not to damage existing walls and ceilings where work is being performed.
Ceilings: Where work is being performed above ceilings, and the architectural drawings do not indicate ceiling modifications by the general contractor, it shall be the responsibility of this contractor to remove and replace existing ceilings where work is being performed. In those instances, all repair and installation of new grid, ceiling panels, etc shall be the responsibility of this contractor. Match existing finishes.
Walls & Floors: It shall be the responsibility of this contractor to patch existing walls and floors and match existing finishes where work is being removed or installed and patching is being performed, unless noted otherwise on the architectural drawings.
Tests and Adjustments
No ducts, piping, fixtures or equipment shall be concealed or covered until they have been inspected and approved by the Architect and the inspector who shall be notified by the contractor when the work is ready for inspection.
Work shall be completely installed, tested and leak tight before inspection is required. All tests shall be repeated to the satisfaction of those making the inspection.
Architectural coordination items
Cutting and Patching: Cut and drill all openings in walls and floors required for the installation. Secure approval of Engineer before cutting and drilling. Neatly patch all openings cut.
Fire Caulking: Patching through fire rated walls and enclosures shall not diminish the rating of that wall or enclosure. Patch shall be equal to rockwool, firestop, caulk or approved "rated" patch.
Access Panels and Pathways: Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed valves, vents, controls, cleanout doors, and sprinkler devices required by NFPA. Provide access panels for all fire and/or fire & smoke dampers. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x 12", units to be 16 gauge steel, locking device shall be screwdriver cam locks.
project conditions
Where new HVAC systems are required to be connected to existing HVAC systems, it is the contractor's responsibility to verify the location, size, pressure, condition, and they shall verify that the existing HVAC system is indeed the correct and appropriate HVAC system before any work is done. Provide all necessary camera scoping and dye testing as necessary. If there is any need for concern, if it is determined that the existing HVAC system is not a correct or appropriate HVAC system or not connected to a correct or appropriate HVAC system, if the condition of the existing HVAC system is not viable for re-use, or any other condition that would not allow the proper functioning of the new HVAC system, the contractor shall notify the engineer in writing immediately via RFI and wait for direction before proceeding.
MECHANICAL EQUIPMENT COMMON REQUIREMENTS
INSPECTION
Examine areas and conditions under which mechanical equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
Uncrate equipment and inspect for damage. Verify that nameplate data corresponds with unit designation.
INSTALLATION
General: Install mechanical equipment as indicated, and in accordance with manufacturer's installation instructions.
Location: Install each unit level/plum and accurately in position indicated in relation to other work; and maintain sufficient clearance for normal service and maintenance, but in no case less than that recommended by manufacturer.
Coordinate with other trades to assure correct recess size for recessed units.
Protect interior mechanical equipment with protective covers during balance of construction.
For ducted equipment, connect ductwork to units with flexible duct connections. Provide transitions to exactly match unit duct connection size. Provide 1" acoustic duct lining on return air side a minimum of 10' from fan.
Piping: Restrictors or piping changes shall be made as necessary to achieve manufacturers recommended pressure drops. The findings shall be reported to the engineer at project closeout.
Provide trap at drain piping connection to unit sized per manufacturer's recommendations.
Access: Provide access space around and over mechanical equipment for service as indicated, but in no case less than that recommended by manufacturer or required by code in effect.
Access Panels: Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed valves, vents, controls and cleanout doors, and sprinkler devices required by NFPA. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x 12", units to be 16 gauge steel, locking device shall be screwdriver cam locks.
Rooftop mechanical equipment shall be installed a minimum of 10'-0" from any roof edge regardless of location indicated on plans, unless a screen wall or railing is installed per the local building code. See the architectural plans for coordination.
Roof Curbs: Furnish roof curbs to roofing Installer for installation. Install and secure roof curb to roof structure, in accordance with National Roofing Contractor's Association (NRCA) installation recommendations and shop drawings. Install and secure units on curbs and coordinate roof penetrations and flashing. Install according to roofing manufacturer's recommendation and specifications.
Indoor Suspended Equipment: Install suspended from structure with all threaded rod and vibration isolators.
ELECTRICAL COORDINATION ITEMS
Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer.
Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division 26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
Install electric heating terminal units including components in accordance with equipment manufacturer's written instructions, and with recognized industry practices; complying with applicable installation requirements of NEC and NECA's "Standard of Installation".
Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A.
Grounding: Provide equipment grounding connections for electric heating terminals as indicated. Tighten connections to comply with tightening torque values specified in UL Std 486A to assure permanent and effective grounding.
FIELD QUALITY CONTROL
Testing: After installation has been completed, test to demonstrate proper operation of mechanical equipment at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units, which cannot be satisfactorily corrected. Test controls and demonstrate compliance with requirements.
Cleaning: After construction is completed, including painting, clean unit exposed surfaces, vacuum clean coils and inside of cabinets. Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
START-UP
Provide the services of a factory-authorized service representative to start-up rooftop units, in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
TRAINING OF OWNER'S PERSONNEL
Provide services of manufacturer's technical representative for 1-half day to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least 7-day notice to Contractor and Engineer of training date.

### SECTION 23 05 03.00 – SUBMITTALS FOR HVAC

General
Where submittals are required by the Contract Documents, they shall be prepared and supplied in accordance with the Contract Documents. In addition to Division 01, the Contractor is advised to review and comply with the requirements articulated within each Division and within each section of that Division.
Some Divisions may include a division-specific "Submittal Requirements for …." section. Where this section exists, it articulates additional requirements for submittals that apply to the work of that Division.
The following requirements help to identify, track and keep the project organized for all parties involved. They are necessary to ensure a timely turnaround and an appropriate technical review. Submittals that do not conform to the administrative requirements are rejected and returned, without technical review.
Requirements
Supply submittals for each section: Submittals shall be supplied on a section-by-section and type-by-type basis. For example, independent product data submittals shall be furnished for each section that requires product data submittals. Independent shop drawing submittals shall be furnished for each section that requires shop drawings.
Refer to the specifications for identification of which submittals are required for the project. Separate PDF file packages shall be supplied for each section, for each submittal type, where electronic submittals are required.
Each PDF shall represent a single standalone submittal.
Separately bound and identified submittals shall be provided where hardcopies are required.
Include a transmittal: Transmittals shall enumerate each submittal for each section of each type and iteration.
Include cover sheet / title page: The cover sheet shall include the information identified in the contract documents. It shall be included as the first page of each electronic and/or hardcopy document-based submittal. An editable and printable PDF form created with editable fields and specification compliant appearance is available from KLH upon request. It is also downloadable from the KLH website at www.klhengrs.com.
Include an index: The index shall enumerate the contents of the submittal.
Include checklists: Where checklists are included with the specifications, complete and include them within the appropriate submittal. Supply complete submittals: Complete submittals of each type are required. Partial submittals will be rejected. Where a section requires a product data submittal, all product data for that section shall be supplied together, at one time, as one complete submittal. Do not send half the product data as one submittal and the other half as a separate one. When resubmittal is required (e.g. Revise and Resubmit) the revised submittal shall be more complete, more accurate and more contract-compliant than its rejected predecessor. The submittal number (for each section and type) shall increment for each subsequent submittal (00 – Original submission, 01 – First Resubmission, 02 – Second Resubmission, etc…). Resubmittals shall include a copy of the reviewer's comments supplied with the prior submittal rejection and shall be amended with a description of the specific action taken to comply with the reviewer's comments. The absence of this on resubmittal is cause for rejection.
Name electronic files to match the submittal ID and cover sheet: The electronic file name of submittals shall match the submittal ID included on the submittals cover page.
For example: The original/first product data submittal for Section 234116 would be labeled as "234116.00-PD-00"; the first resubmittal of same shall be labeled "234116.00-PD-01". The original/first shop drawings submittal file for the same section would be labeled "234116.00-SD-00"; the first resubmittal of same shall be labeled "234116.00-SD-01".
Use of Electronic Drawings from the Owner's Design Team
Plan drawings for the Project were created with AutoCAD and Revit.
If expressly permitted by the Owner and the terms of the Contract, editable electronic versions of standard-scale, AutoCAD-based plan drawings may be made available for the creation of shop and as-built drawings.
Due to the proprietary nature of internal design systems, editable native-software versions of some drawings, including but not limited to system diagrams and details will not be made available in an editable form. In these cases, electronic versions of the drawings may be made available only in PDF, JPG or similar non-editable electronic form, at the sole discretion of the Design Professional.
The Request Drawings form can be accessed, filled out and submitted at the following internet address (scroll down to bottom of home page): http://www.klhengrs.com.

### SECTION 23 05 29.00 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

Submittal Requirements
Product Data: For each type of product indicated.
Shop Drawings: Fabrication and installation details.

General
Support all piping, ductwork and equipment by hangers or brackets properly from the building structure. Support from decking above is prohibited. Furnish structural steel members where required to support piping and equipment. No portion of piping or valves shall be supported by equipment.
Ductwork - Support by means of hangers as follows:

| Duct Width | Hanger Size and Type | Max. Spacing |
|---|---|---|
| 30 or less | (#16 gage) | 8 |
| 31 to 60 | (#14 gage) | 8 |

A pair of hangers shall be located at every transverse joint and elsewhere according to the table.
Piping
Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible. Where piping of various sizes is supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe as specified above for individual pipe hangers.
Individual pipe hangers to be Anvil International Clevis Hanger Fig. 260, Elcen, or approved equal.
Rod sizes to conform to the following: 3/8" rods for 3/4"-2" pipe; 1/2" rods for 2-1/2"-3" pipe; 5/8" for 4"-5" pipe and 3/4" for 6" pipe.
Hangers shall be sized to allow insulation to pass through unobstructed, provide saddle support for insulation at all hanger.
Hanger spacing for steel piping unless otherwise noted is to be as follows: 1-1/4" or smaller to be 8' on center; 1-1/2"-2" to be 10' on center; 2-1/2" and larger to be 12' on center and at each change of direction. Hanger spacing for copper pipe to be as follows: 1" or smaller 6' on center; 1-1/4" or larger 8' on center.
Piping shall be also supported at each change in direction, at valves, and at equipment.

### SECTION 23 05 93.00 – TESTING, ADJUSTING AND BALANCING FOR HVAC

Submittal Requirements
Shop Drawings: Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Final Report: Upon verification and approval prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final report to the landlord.

General
Test, adjust, and balance the following mechanical systems:
Supply air systems, all pressure ranges
Return air systems.
Exhaust air systems.
Hydronic systems.
Verify temperature control system operation.
Test systems for proper sound and vibration levels.
Quality Assurance
Codes and Standards:
AABC: "National Standards for Total System Balance".
ASHRAE: ASHRAE Handbook, 2011 Applications, Chapter 38, Testing, Adjusting, and Balancing.
Qualifications
The contractor shall procure the services of an independent Balance and Testing Agency, approved by the Engineer, and a member of Associated Air Balance Council (AABC) or NEBB, which specializes in the balancing and testing of heating, ventilating and air conditioning systems, to balance, adjust and test all air and water systems and equipment as herein specified. All work by this agency shall be done under direct supervision of a qualified heating and ventilating Engineer employed by this agency. All instruments used by this agency shall be accurately calibrated and maintained in good working order.
Sequencing and Scheduling
Test, adjust, and balance the air systems before hydronic, steam, and refrigerant systems.
Test, adjust and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg F wet bulb temperature of maximum summer design condition, and within 10 deg F dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.
Check all filters for cleanliness, provide new as required.
Check dampers (volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans. Place outlet dampers in full open position. Lubricate all motors and bearings.
Check fan belt tension. Check fan rotation.
Air balance and testing shall not begin until the system has been completed and is in full working order. The Contractor shall put all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing. The contractor shall submit within 30 days after receipt of contract, 8 copies of submittal data for the testing and balancing of the air conditioning, heating, and ventilating systems. The Air Balance and Testing Agency shall provide proof of having successfully completed at least five projects of similar size and scope.
The air balancing contractor shall include the additional cost to change every fan factory installed sheave, pulley and/or belt of in order to obtain the design air flows.
Performing Testing, Adjusting and Balancing
Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.
Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.
Patch insulation, ductwork, and housings, using materials identical to those removed.
Seal ducts and piping, and test for and repair leaks.
Seal insulation to re-establish integrity of the vapor barrier.
Mark equipment settings, including damper control positions; valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.
Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

### SECTION 23 07 13.00 – DUCT INSULATION

Submittal Requirements
Product Data: For each product indicated.
Shop Drawings: Include plans, elevations, sections, details and attachments to other work.

All liners, insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50. Insulation shall have a minimum installed thermal resistance value of R8 or code minimum, whichever higher.
Rigid Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IB, without facing and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.
Flexible Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II, without facing and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.
Vapor Barrier Material for Ductwork: Paper-backed aluminum-foil, except as otherwise indicated; strength and permeability rating equivalent to factory-applied vapor barriers on adjoining ductwork insulation, where available; with following additional construction characteristics:
High Puncture Resistance: Low vapor transmission (for ducts in exposed areas: Mech. Rooms, etc.)
Moderate Puncture Resistance: Medium vapor transmission (for ducts in concealed areas).
All ductwork shall be insulated except:
Double wall ductwork
Fabric ductwork
Metal ducts with duct liner of sufficient thickness to comply with energy code.
Factory insulated flexible ductwork
Factory insulated plenums and casings
Flexible connectors
Vibration control devices
Factory insulated access panels and doors
Supply ductwork exposed in conditioned spaces excluding mechanical rooms, server rooms and electric equipment rooms
Toilet exhaust, general exhaust and return ductwork in an insulated joist or attic space.

### SECTION 23 07 19.00 – HVAC PIPING INSULATION

Submittal Requirements
Product Data: For each type of product indicated.

Provide 3/4" Armaflex on refrigerant piping.
Provide 1" fiberglass insulation on concealed condensate drain piping.
Insulation shall have a minimum thickness as required by Code.
All insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50.

### SECTION 23 09 93.00 – SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

Submittal Requirements
Product Data: Provide written sequences of operation for each controlled system and piece of equipment.

Split System ACU (Electric Heat/DX, with O.A.)
Provide two-way, fail-safe open, modulating control valve for hot water coils. All setpoints listed in this section are adjustable through the Building Automation System (BAS).
1. Startup
The unit shall operate on an occupied/unoccupied cycle as controlled from the BAS. Occupancy shall be predetermined by the owner and programmed into the BAS.
2. Supply Fan Control
The supply fan speed shall be constant, run continuously during occupied mode and set to the required CFM.
3. Space Temperature Control
Provide 7-day programmable thermostat with digital display of space temperature and setpoint (+/- deg. F. adjustable), with override feature and remote space temperature sensor.
4. Minimum Outside Air Control
During occupied mode the minimum outside air damper shall be open. Provide motorized outdoor air damper.
5. Cooling Control
Cooling shall be controlled to maintain space temperature setpoint. On a call for cooling the heating valve shall be closed. On a further call for cooling the mechanical cooling shall be staged on.
6. Heating Control
Heating shall be controlled to maintain space temperature setpoint. On a call for heating, the electric heater integral to FCU shall be staged on.
7. Mixed Air Low Limit Control
Provide a mixed air low limit whenever the mixed air temperature drops below 40 deg. F dry bulb that will alarm the system, modulate the outside air damper below minimum to maintain mixed air setpoint equal to supply air setpoint.
8. Freeze Stat Control
A low temperature cutout thermostat located in the discharge of the heating coil, will alarm the system and put the air handler in fail safe position when the temperature falls below 37 degrees. Provide an adjustable time delay of 5 minutes for start-up. The low temperature cutout thermostat shall require manual reset.
9. Smoke Detector
When the smoke detector is alarmed, the system shall be alarmed and the air handler shall fail safe with manual reset.
10. Unoccupied Mode
During the unoccupied mode of operation, the ACU shall go into night setback.
11. Night Setback/Shut Down
At night setback/shutdown the ACU shall go to fail safe position. Fail safe position is defined by the following: The supply fan is off, the outdoor air intake damper is closed, the heating valve is open and the mechanical cooling is off. The supply fan shall cycle in conjunction with either the heating or cooling system to maintain a minimum/maximum space temperature depending on the season.

Exhaust Fans (Timeclock)
Exhaust fans shall be tied to timeclock, which shall be furnished, installed and wired by electrical contractor.
When activated, exhaust fan motor damper shall open and fan shall start.
(Indicated by EC on HECS schedule)

Controls
Electrical contractor will provide power wiring. HVAC contractor shall provide all the low voltage wiring of HVAC units and controls, thermostats and controllers.
Thermostat shall be by the manufacturer of the HVAC unit (heat/cool/auto/off) with night setback. Provide plastic protective cover for all thermostats.

Temperature Sensors tied to BAS
Sensors shall be furnished, installed and wired by the Temperature Control Contractor. The electrical contractor shall provide 4" square x 1- 1/2" deep wall outlet boxes at 54" above finished floor (with single-gang rings) for all thermostats/sensors. The electrical contractor shall provide one 3/4" empty conduit from each thermostat/sensor location, turned out above accessible ceilings (in joist space or against overhead slab/deck).
The Temperature Control Contractor shall provide all other necessary conduit, raceway and wiring related work.
Conduit shall be identified in ceiling cavity and shall be provided with sweep bends, bushings and dragline.
The HVAC/Temperature Control Contractor shall coordinate with the General Contractor to ensure thermal envelope is maintained at these locations.

General Control Wiring Requirements and Installation Methods
Except where specifically indicated otherwise above, the HVAC/Temperature Control Contractor shall provide all electrical work as required for all temperature control related wiring (i.e. conduit, raceway, outlet boxes, junction boxes, wiring, etc.) in accordance with Electrical Specifications requirements. All conduit shall be 3/4" minimum.
Coordinate all thermostat/sensor locations in field (case by case) with Architect, Owner and Electrical Contractor to ensure that they are placed in locations that will not interfere with furniture, equipment, artwork, wall-hung specialties, room finishes, etc. All thermostat/sensor wall locations indicated on HVAC drawings are schematic only and must be verified case-by-case prior to rough-in.
All electrical work as described in this specification shall be per the latest edition of the National Electrical Code (NEC) and per applicable state and local codes.
Where "free-air" installation methods (either exposed above the ceilings, in bridle rings or in cable trays) are permitted under Electrical Specifications above ceilings, provide plenum-rated cables wherever plenum ceilings (if any) exist and install as defined under Electrical Specifications. Install low voltage circuits, located in concrete slabs and masonry walls, in inaccessible locations, or exposed in occupied areas, in electrical conduit regardless of what wiring methods are permitted under Electrical Specifications.
Where cable trays or bridle rings are provided by the electrical contractor for low voltage cables, these raceways may be utilized for control wiring by this contractor (provide special color coded jackets, label cable jackets per Electrical Specifications and group control wiring cables together). Provide conduit drops from cable tray/bridle ring paths to wall outlet boxes and equipment unless directed otherwise under Electrical Specifications.
Regardless of permitted methods in Electrical Specifications, all cables/wiring installed concealed by gypsum board, masonry or other inaccessible materials in walls or above ceilings shall be installed in conduit, 3/4" minimum.
All conduit, bridle rings, raceway, outlet boxes, etc. necessary for complete operational installation of control wiring shall be provided (furnished and installed) by the temperature control contractor in strict compliance with Electrical Specifications documents. Coordinate all work with all other applicable trades including the electrical contractor.
Provide all required conduit work to and between equipment in a manner compliant with that described above (i.e. between VAV boxes, to boilers, starters, condensing units, etc. as applicable).
Install control wiring without splices between terminal points, color-coded. Install in neat workmanlike manner, securely fastened. Install in accordance with National Electrical Code and per Electrical Specifications.
Install circuits over 25 volt with color-coded No. 12 wire in electrical metallic tubing, per Electrical Specifications.
Install circuits under 25 volt with color-coded No. 18 wire with 0.031" high temperature (105 degs. F) plastic insulation on each conductor and plastic sheath over all.
Install electronic circuits with color-coded No. 22 wire with 0.023" polyethylene insulation on each conductor with plastic-jacketed copper shield over all.

Smoke Detector
All duct smoke detectors will be furnished by electrical contractor, installed by the HVAC contractor, and wired by the electrical contractor per local codes. HVAC contractor will interlock fan with smoke detector.

Motor Operated Dampers
All fresh air intakes and exhaust louvers shall have motor operated dampers. Dampers shall be low leak with blade and edge seals. All motor operated dampers shall be provided and wired by the mechanical contractor unless otherwise noted. Provide all necessary transformers, contactors, controls and wiring for interlocking equipment to motor operated dampers.

### SECTION 23 21 13.23 – ABOVEGROUND HYDRONIC PIPING AND SPECIALTIES

Submittal Requirements
Product Data: For each type listed.
Shop Drawings: Detail the piping layout, fabrication of pipe anchors, hangers, supports, alignment guides, expansion joints and loops and attachments of the same to the building structure.
Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems.
Locations and arrangements of piping take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated. Locate groups of pipes parallel to each other, spaced to permit full insulation and servicing of valves.

Hydronic Piping
Copper tubing, 3 inch and smaller: ASTM B 88, Type L with wrought-copper, solder joint, streamlined pattern fittings.
Steel pipe, 2 inch and smaller: ASTM A 53, Type S (seamless) or Type F (furnace-butt welded), Grade B, Schedule 40, black steel, plain ends with malleable-iron threaded fittings.
Steel pipe, 2-1/2 inch through 8 inch: ASTM A 53, Type E (electric-resistance welded), Grade B, Schedule 40, black steel, plain ends with seamless or welded steel fittings for welded joints.
Condensate drain piping shall be type L copper with soldered or brazed joints.
Installation
Install all hydronic piping, except for condensate piping, at a uniform grade of 1 inch per 40 feet upward in the direction of flow.
Install all condensate piping at a uniform grade of 1/8 inch per 1 foot downward in the direction of flow to the nearest drain location.
Install isolation valves in all branches serving two or more pieces of equipment.
Install valves at the inlet and outlet of each terminal with unions or flanges and shutoff/balancing valves.

### SECTION 23 31 13.00 – METAL DUCTS

Submittal Requirements
Product Data: For liners, adhesives, sealants and gaskets.
Shop Drawings: Sheet metal thickness, reinforcing details, duct layouts indicating sizes, configuration, liner material, elevation and static pressure class.

Ductwork Materials
Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting. Mechanical contractor shall confirm ductwork paint scope and color with architect.
Exposed ductwork which is to be painted shall have paint grip applied and be oil free.
Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel, lock forming quality; with G 90 zinc coating and mill phosphatized for exposed locations. Minimum gauge shall be 24.
Miscellaneous Ductwork Materials
Volume Dampers: Provide volume dampers in all branch ducts or as required for balancing to required air flows.
Fittings: Provide radius type fittings fabricated of multiple sections with maximum 15 deg. change of direction per section. Unless specifically detailed otherwise, use 45 deg. laterals and 45 deg. elbows for branch takeoff connections. Where 90 deg. branches are indicated, provide conical type tees.
Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
Duct Cement: Non-hardening migrating mastic or liquid neoprene based cement, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for cementing fitting components, or longitudinal seams in ductwork.
Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
Flexible Ducts
Either spiral-wound spring steel with flameproof vinyl sheathing, or corrugated aluminum. Unless specifically mentioned, the maximum length of flex duct on the supply equals 5 feet. Flex is not allowed for return, relief or exhaust applications. The flexible ducts indicated for use in the H.V.A.C. system shall conform to the requirements of UL 181 for Class 0 or Class 1 flexible air ducts and shall be so identified.
Where installed in unconditioned spaces other than return air plenums, provide 1" thick 1-1/2 lb. continuous flexible fiberglass sheath with vinyl vapor barrier jacket.
Installation is not permitted above drywall ceilings and inaccessible ceilings.
Fabrication
Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. All ductwork shall be Pittsburgh Construction with a minimum of thickness of 24 gauge. In addition, ductwork used in systems over 3" W.G. shall have cold sealant applied.
Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards".
Lined Duct
Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners.
Duct liner to be 3-lb density for acoustic requirements 1" thick or as noted. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.
Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.
Duct Liner: Fibrous glass of thickness indicated. 3-lb density. All liners, insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50.
Duct Liner Adhesive: As recommended by insulation manufacturer and complying with NFPA 90A or NFPA 90B.
Duct Liner Fasteners: Comply with SMACNA HVAC Duct Construction Standards.
Installation of Metal Ductwork
General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints.
Align ductwork accurately at connections, within 1/8" 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. Support vertical ducts at every floor.
Sealing: Seal all longitudinal seams, S's and drives and all joints with mastic or cement. Install according to SMACNA standards.
Balancing Dampers: The sheet metal contractor shall be fully responsible for installing balancing dampers in the ductwork, (whether shown on the drawing or not) in order to arrive at the intended air flow. The balancing sub-contractor shall provide direction and assistance in determining locations where dampers are required.
Additional dampers, if required shall be installed at no additional cost to the owner.
Wall Penetrations: Seal and pack around all ducts and piping sleeves which pass through walls that extend to bottom side of structure and rated walls.
Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.
Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
Limit clearance to 1/2" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
Electrical Equipment Spaces: Do not route ductwork through transformer vaults and their electrical equipment spaces and enclosures.
Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2". Fasten to duct and substrate.
Where ducts pass through fire-rated floors, walls, or partitions, provide fire dampers and firestopping between duct and substrate, in accordance with requirements of Division-7 Section "Firestopping".
All dampers shall be low leakage with edge and blade seals. Damper manufacturers are subject to specification compliance. Provide products by one of the following:
Greenheck Fan Corporation
Nailor Industries
Pottorff
Ruskin Company
Young Regulator Company
Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
Installation of Duct Liner
General: Install duct liner in accordance with SMACNA HVAC Duct Construction Standards. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.
Store internally lined ductwork up off of the floor. Protect internally lined ductwork from water and dust.
The following ductwork shall be lined in addition to that shown per plans:
Return from open ceiling plenum return to HVAC unit.
Supply and return ductwork 10 feet downstream of HVAC unit.
Transfer air ducts.
Butter the leading edge of all internal duct lining with the manufacturer's recommended adhesive.
Inspect and repair all damaged lining prior to installation of ductwork.
Installation of Flexible Ducts
Maximum Length: For any duct run using flexible ductwork, do not exceed 5' - 0" extended length.
Installation shall have smooth full radius turns down to diffuser.
Installation not permitted above inaccessible ceilings.

### 23 34 23.00 – HVAC POWER VENTILATORS

Submittal Requirements
Product Data: For each type of product indicated.
Centrifugal Roof Ventilators
Provide centrifugal roof type, curb mounted, power ventilators of type, size, and capacity as scheduled, and as specified herein.
Type: Centrifugal fan, direct or belt driven as scheduled.
Provide aluminum, galvanized steel, or fiberglass weatherproof housings as scheduled. Provide square base to suit roof curb. Provide permanent split-capacitor type motor for direct driven fans; capacitor-start, induction-run type motor for belt driven fans.
Provide the Following Types of Housing Design:
Hooded dome type.
Electrical: Provide factory-wired non-fusible type disconnect switch at motor in fan housing. Provide thermal overload protection in fan motor. Provide conduit chase within unit for electrical connection.
Provide NEMA 1 disconnect factory mounted. For single phase fractional HP fans use a toggle type disconnect switch. On three phase integral HP fans use a NEMA 1 safety switch.
Bird Screens: Provide removable bird screens, 1/2" mesh, 16-ga aluminum or brass wire.
Roof Curb: Provide factory fabricated roof curb by the same manufacturer as the equipment. Roof curb to be insulated.
Manufacturer: Subject to compliance with requirements, provide centrifugal roof ventilators of one of the following:
Acme
CaptiveAire
Cook (Loren) Co.
Greenheck.
Twin City Fan & Blower
Prefabricated Roof Curbs
General: Provide manufacturer's standard shop-fabricated units, modified if necessary to comply with requirements.
Fabricate structural framing for units of structural quality sheet steel, formed to manufacturer's standard profiles for coordination with roofing, insulation and deck construction.
Include 45 deg. cant strips and deck flanges with offsets to accommodate roof insulation. Weld corners and seams to form watertight units.
Clean and paint units with manufacturer's standard rust-inhibitive metal primer paint.
Reinforce continuous runs of over 3'-0" length, by inserting welded stiffeners of heavy gage with flanges as required to provide sufficient rigidity and strength to withstand maximum lateral forces in addition to superimposed vertical loads.
Gage and Height: Fabricate units of metal gage and to height above roof surface as indicated.
Where gage or height are not indicated, fabricate units of 14-ga metal, and nominal height of 14".
Provide pressure treated wood nailer, not less than 1-5/8" thick and of width indicated, but not less than width of support wall assembly. Anchor nailer securely to top of metal frame unit.
Provide lumber pressure treated with water-borne preservatives for "above ground" use.
Insulate units inside structural support wall with rigid glass fiber insulation board of approximately 3-lb. density and 1-1/2" minimum thickness, except as otherwise indicated.
Manufacturer: Subject to compliance with requirements, provide prefabricated roof curbs of one of the following:
Custom Curb, Inc.
Equipment Manufacturer.
MicroMetl
Pate Co.
Shipman.
Thycurb.
INSTALLATION
Coordinate ventilator work with work of roofing, walls, and ceilings, as necessary for proper interfacing.
Provide access door in duct below ventilator to service damper.
Solder bottom joints and up 2" of side joints of duct under roof ventilator to retain any moisture entering ventilator.

### 23 37 13.00 – DIFFUSERS, REGISTERS AND LOUVERS

Submittal Requirements
Product Data: For each type of product indicated.

DIFFUSERS, GRILLES AND REGISTERS
Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:
Anemostat Products Div., Dynamics Corp. of America.
Metal-Aire
Titus Products Div., Philips Industries, Inc.
Tuttle and Bailey.
Price
Louvers and dampers
Provide louvers and dampers of size as noted.
Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:
Aerolite
Prefco
Pottorff
Greenheck
Ruskin

### 23 82 19.00 – FAN COIL UNITS

Submittal Requirements
Product Data: For each type of product indicated.

General
Provide fan-coil units having cabinet sizes, and in locations indicated, and of capacities, style, and having accessories as scheduled. Include in basic unit chassis, coils, fanboard, drain pan assembly, fans, housing, motor, filter, and insulation.
End Pockets: End pockets for completely housing factory installed valves and piping.
Chassis: Construct chassis of galvanized steel with flanged edges.
Insulation: Faced, heavy density glass fiber.
Cabinet: Construct of 18-ga steel removable panels, 16-ga front. Provide insulation over entire coil section.
Clean cabinet parts, bonderize, phosphatize, and flow-coat with baked-on primer and finished coat. Color selected by architect.
Coils: Construct of 5/8" seamless copper tubes mechanically bonded to configurated aluminum fins. Design for 300 psi working pressure, and leak test at 300 psi under water.
Auxiliary Heating Coils: Construct of 7/16" seamless copper tubes mechanically bonded to configurated aluminum fins. Design for 300 psi working pressure.
Drain Pans: Construct of galvanized steel. Insulate with polystyrene or polyurethane insulation. Provide drain connection.
Fans: Provide centrifugal forward curved double width wheels of reinforced fiberglass, in galvanized steel fan scrolls.
Motors: Provide motors with integral thermal overload protection. Run test motors at factory in assembled unit prior to shipping. Provide quickly detachable motor cords.

Filters:
The filters shall have a designated efficiency equal MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 um range, and equal to or greater than 85% in the 1.0-3.0 um range when tested in accordance with AHRI Standard 680.

High Static Fan: Provide high static motor for ducted fancoil applications.
Condensate Overflow: Provide secondary drain pan with level alarm which will shut unit and alarm system of condensate overflow.
Control Options:
BAS interface requirements.
Provide factory mounted shut-off valves, manual circuit setter, unions and strainer.
Accessories: Provide the following accessories as indicated and/or scheduled:
Provide a multi-directional louvered supply grille/outlet that can be adjusted in the field for desired airflow direction.
Manufacturer: Subject to compliance with requirements, provide fan-coil units of one of the following:
Carrier Corp.
Daikin
Trane (The) Co.
International Environmental Corporation
Enviro-Tec

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL

KLH ENGINEERS
KOHRS LONNEMANN HEIL ENGINEERS, INC.
MECHANICAL/ELECTRICAL ENGINEERS
WWW.KLHENGRS.COM
1538 ALEXANDRIA PIKE, SUITE 11
FT. THOMAS, KENTUCKY 41075
800-354-9783
859-442-8050
859-442-8058 FAX
KLH JOB #: 26861

DOLCE & GABBANA

**VALLEY FAIR**

2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

**LMA Project No.**

| NO. | DATE | ISSUE |
|---|---|---|
| 6 | 06.02.25 | Issue for Construction |
| 5 | 03.21.25 | Addendum 3 |
| 3 | 02.27.25 | Building Department Response |
|  | 01.16.25 | Permit and Bid Set |

MECHANICAL SPECIFICATIONS

M0.01

**OWNERSHIP OF INSTRUMENTS OF SERVICE**
*All reports, plans, specifications, computer files, field data, notes and other documents and instruments prepared by the Consultant as instruments of service shall remain the property of the Consultant. The Consultant shall retain all common law, statutory and other reserved rights, including, without limitation, the copyright thereto.*

## HVAC AIR SOURCE UNITARY HEAT PUMP SCHEDULE

Equipment shall be braced and labeled by the equipment manufacturer to withstand the minimum scheduled available fault current value for listed equipment.

| EQUIPMENT MARK | DESCRIPTION | STATUS | WEIGHT (lbs) | MANUFACTURER | MODEL | NOMINAL TONS | EMERGENCY | ELECTRIC CONNECTION SUMMARY | AVAILABLE FAULT CURRENT |
|---|---|---|---|---|---|---|---|---|---|
| HP-1 | AIR SOURCE OUTDOOR HEAT PUMP | NEW | 62 | CARRIER | 37MARAQ12AA3 | 1 | NO | HP-1 - 208V/1PH, 12 MCA, 15A OCP | 3512 |

## HVAC DUCTLESS SPLIT SYSTEMS (INDOOR UNITS) SCHEDULE

| EQUIPMENT MARK | DESCRIPTION | LOCATION | STATUS | FED FROM | MANUFACTURER | MODEL | NOMINAL TONS | ELECTRIC CONNECTION SUMMARY |
|---|---|---|---|---|---|---|---|---|
| DS-1 | DUCTLESS SPLIT INDOOR UNIT |  | NEW | HP-1 | CARRIER | 45MAHAQ12XA3 | 1 | DS-1 - 208V/1PH, 3 MCA |

## CHILLED WATER FAN COIL UNIT SCHEDULE

| PRODUCT |  |  |  |  |  | GENERAL |  | AIRFLOW |  |  |  |  |  | COOLING |  |  |  |  |  |  |  |  |  |  | HEATING |  |  |  | ELECTRICAL |  | MISC | ELECTRICAL |  |  |  |  |  |  |  |  |  |  |  | PRODUCT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SHEET(S) | DESCRIPTION | MANUFACTURER | MODEL | SECTION NUMBER | LOCATION | STATUS | SA (CFM) | OA (CFM) | DCV MIN AIRFLOW (CFM) | ESP (IN. W.C.) | SF SPEED (RPM) | DESIGN EXTERNAL STATIC PRESSURE | NOM CLG CAP (TON) | TOTAL CLG MBH | SENS CLG MBH | EAT DB CLG | EAT WB CLG | LAT DB CLG | LAT WB CLG | CHWS (GPM) | ECHWT | LCHWT | MAX EVAP WPD CLG (IN. W.C.) | EHWT | LHWT | HWS (GPM) | MAX WPD HTG (IN. W.C.) | EMERGENCY | SMOKE DET LOC | ACCESSORIES | CONNECTION MARK | ELECTRIC CONNECTION SUMMARY | CN FURNISHED BY | CN INSTALLED BY | CN TYPE | CN WIRED BY | MC FURNISHED BY | MC INSTALLED BY | MC TYPE | MC WIRED BY | FA REQUIRED | FAULT CURRENT | MARK |
| FC-1 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 800 | 246 | 101.33 | 1 | 1350 | 1 | 2 | 23.5 | 20.9 | 80 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-1 | FC-1 - 480V/3PH, 3 KW HTG, 1.1A FLA, 5.88 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | DUCT | FC-1: 1127 | FC-1 |
| FC-2 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 800 | 133 | 70.7 | 1 | 1350 | 1 | 2 | 19.97 | 18.17 | 78 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-2 | FC-2 - 480V/3PH, 1.5 KW HTG, 1.1A FLA, 3.63 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | DUCT | FC-2: 2044 | FC-2 |
| FC-3 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 800 | 147 | 56.55 | 1 | 1350 | 1 | 2 | 20.66 | 19.06 | 78 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-3 | FC-3 - 480V/3PH, 2 KW HTG, 1.1A FLA, 4.38 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | DUCT | FC-3: 2380 | FC-3 |
| FC-4 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 800 | 184 | 72.08 | 1 | 1350 | 1 | 2 | 21.9 | 19.9 | 79 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-4 | FC-4 - 480V/3PH, 2.5 KW HTG, 1.1A FLA, 5.13 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | DUCT | FC-4: 2403 | FC-4 |
| FC-5 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 800 | 54 | 33.83 | 1 | 1350 | 1 | 2 | 17.96 | 17.56 | 77 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-5 | FC-5 - 480V/3PH, 2.5 KW HTG, 1.1A FLA, 5.13 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | DUCT | FC-5: 3073 | FC-5 |
| FC-6 | M1.00 | CHILLED WATER FAN COIL UNIT | CARRIER | 42BHE08RG4R60810DE | 23 82 19.00 | -- | NEW | 855 | 105 | 63.67 | 1 | 1350 | 1 | 2 | 20.42 | 19.62 | 78 | 64 | 55 | 54 | 4.4 | 45 | 59 | -- | 140 | 120 | -- | -- | NO | NA | -- | FC-6 | FC-6 - 480V/3PH, 3 KW HTG, 1.1A FLA, 5.88 MCA | HC | HC | BAS | HC | MFR | MFR | MG | MFR | -- | FC-6: 3923 | FC-6 |

## HVAC FAN SCHEDULE

| PRODUCT |  |  |  |  |  |  | GENERAL |  | AIRFLOW |  |  |  | ELECTRICAL | MISC | ELECTRICAL |  |  |  |  |  |  |  |  |  |  |  | PRODUCT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARK | SHEET(S) | DESCRIPTION | MANUFACTURER | MODEL | OPERATING WEIGHT | SECTION NUMBER | LOCATION | STATUS | EA (CFM) | ESP (IN. W.C.) | FAN BHP | FAN MTR SPEED (RPM) | EMERGENCY | ACCESSORIES | CONNECTION MARK | ELECTRIC CONNECTION SUMMARY | CN FURNISHED BY | CN INSTALLED BY | CN TYPE | CN WIRED BY | MC FURNISHED BY | MC INSTALLED BY | MC TYPE | MC WIRED BY | FA REQUIRED | FAULT CURRENT | MARK |
| EF-1 | M1.00 | HVAC FAN | GREENHECK | G-097-VG | 65 | 23 34 00.00 | -- | NEW | 125 | 0.4 | -- | -- | NO | 1,3 | EF-1 | EF-1 - 120V/1PH, 0.25 HP, 3.8A FLA, 4.8 MCA, 15A OCP | EC | EC | TC | EC | MFR | MFR | MG | MFR | -- | EF-1: 2366 | EF-1 |

## HVAC LOAD SCHEDULE

THE HEATING AND COOLING LOAD CALCULATIONS ARE BASED ON THE RTS (RADIANT TIME SERIES) METHOD. ASSUMPTIONS AND EXECUTION OF THESE METHODS ARE PER ASHRAE 183-2007 STANDARD FOR PEAK COOLING AND HEATING LOAD CALCULATIONS IN BUILDINGS EXCEPT LOW-RISE RESIDENTAL BUILDINGS.

COOLING LOAD BREAKDOWN

|  |  |
|---|---|
| CROOF | SENSIBLE HEAT GAIN FROM ROOF |
| CWALL | SENSIBLE HEAT GAIN FROM EXTERIOR WALLS |
| CPART | SENSIBLE HEAT GAIN FROM PARITIONS |
| CGLASS | SENSIBLE HEAT GAIN FROM GLAZING |
| CSOLAR | SENSIBLE HEAT GAIN FROM SOLAR GAIN THROGH GLAZING |
| CLIGHTS | SENSIBLE HEAT GAIN FROM INTERIOR LIGHTING |
| CEQUIP | SENSIBLE HEAT GAIN FROM PLUG LOADS, COMPUTERS, ETC. |
| CPSENS | SENSIBLE HEAT GAIN FROM PEOPLE |
| CSSENS | TOTAL SENSIBLE HEAT GAIN TO SPACE |
| CFAN | SENSIBLE HEAT GAIN FROM AIR HANDLER FAN |
| COAS | SENSIBLE HEAT GAIN FROM OUTDOOR VENTILATION AIR |
| CTSENS | TOTAL SENSIBLE HEAT GAIN |
| CPLAT | LATENT HEAT GAIN FROM PEOPLE |
| COAL | LATENT HEAT GAIN FROM OUTDOOR VENTILATION AIR |
| CTLAT | TOTAL LATENT HEAT GAIN |
| CTOT | TOTAL HEAT GAIN (SENSIBLE + LATENT) |

HEATING LOAD BREAKDOWN

|  |  |
|---|---|
| HROOF | HEAT LOSS FROM ROOF |
| HWALL | HEAT LOSS FROM EXTERIOR WALLS |
| HPART | HEAT LOSS FROM PARTITIONS |
| HGLASS | HEAT LOSS FROM GLAZING |
| HSLAB | HEAT LOSS FROM SLAB |
| HSPACE | TOTAL HEAT LOSS FROM SPACE |
| HOA | HEAT LOSS FROM OUTDOOR VENTILATION AIR |
| HTOT | TOTAL HEAT LOSS |

| EQUIPMENT MARK | CROOF | CWALL | CPART | CGLASS | CSOLAR | CLIGHTS | CEQUIP | CPSENS | CSSENS | CFAN | COAS | CTSENS | CPLAT | COAL | CTLAT | CTOT | HROOF | HWALL | HPART | HGLASS | HSPACE | HSLAB | HOA | HTOT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FC-1 | 0 | 0 | 0 | 0 | 0 | 11.38 | 0 | 4.99 | 16.37 | 0.4 | 4.13 | 20.9 | 2.6 | 0 | 2.6 | 23.5 | 0 | 0 | 0 | 0 | 0.73 | 0.73 | 9.08 | 9.81 |
| FC-2 | 0 | 0 | 0 | 0 | 0 | 9.95 | 2.41 | 3.18 | 15.54 | 0.4 | 2.23 | 18.17 | 1.8 | 0 | 1.8 | 19.97 | 0 | 0 | 0 | 0 | 0.63 | 0.63 | 4.91 | 5.54 |
| FC-3 | 0 | 2.4 | 0 | 0 | 0 | 7.6 | 2.85 | 3.33 | 16.18 | 0.4 | 2.48 | 19.06 | 1.6 | 0 | 1.6 | 20.66 | 0 | 4.59 | 0 | 0 | 6.38 | 1.79 | 5.45 | 11.83 |
| FC-4 | 0 | 0 | 0 | 0 | 0 | 9.01 | 3 | 4.4 | 16.41 | 0.4 | 3.09 | 19.9 | 2 | 0 | 2 | 21.9 | 0 | 0 | 0 | 0 | 0.57 | 0.56 | 6.79 | 7.36 |
| FC-5 | 0 | 2.2 | 0 | 0 | 0 | 8.92 | 3.95 | 1.16 | 16.24 | 0.4 | 0.92 | 17.56 | 0.4 | 0 | 0.4 | 17.96 | 0 | 4.08 | 0 | 0 | 6.9 | 2.82 | 2.01 | 8.91 |
| FC-6 | 1.19 | 1.63 | 0 | 0 | 0 | 7.3 | 6.17 | 1.13 | 17.43 | 0.43 | 1.76 | 19.62 | 0.8 | 0 | 0.8 | 20.42 | 1.33 | 3.15 | 0 | 0 | 4.49 | 0 | 3.87 | 8.36 |

## HVAC VENTILATION SCHEDULE

| NUMBER | NAME | AREA | LEVEL | PEOPLE | OA PER PERSON | OA PER SQ FT. | REQ SUP | ACT SUP | REQ OA | ACT OA | ACT RET | ACT EXH | CRIT OA | PRESSURE | PCT OPERABLE | NATURAL VENTILATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SALES | 492 SF | Level 1 | 8 | 7.5 | 0.12 | 450 | 750 | 138 | 138 | 750 | 0 | 19.4 | Neutral |  | False |
| 1D | MEN'S AREA | 603 SF | Level 1 | 10 | 7.5 | 0.12 | 455 | 800 | 184 | 184 | 800 | 0 | 23 | Neutral |  | False |
| 1E | SALES | 575 SF | Level 1 | 9 | 7.5 | 0.12 | 425 | 600 | 138 | 100 | 600 | 0 | 27.7 | Neutral |  | False |
| 1F | SALES | 791 SF | Level 1 | 12 | 7.5 | 0.12 | 475 | 750 | 230 | 230 | 750 | 0 | 30.8 | Neutral |  | False |
| 2A | CASHWRAP | 111 SF | Level 1 | 1 | 5 | 0.06 | 50 | 50 | 15 | 15 | 50 | 0 | 29.2 | Neutral |  | False |
| 2B | ACC. FITTING ROOM #1 | 46 SF | Level 1 | 0 | 0 | 0 | 20 | 50 | 12 | 8 | 50 | 0 | 0 | Neutral |  | False |
| 2C | VESTIBULE #1 | 44 SF | Level 1 | 0 | 0 | 0.06 | 15 | 50 | 12 | 8 | 50 | 0 | 6.6 | Neutral |  | False |
| 2D | RESTROOM | 52 SF | Level 1 | 0 | 0 | 0 | 20 | 50 | 12 | 8 | 0 | 80 | 0 | Negative |  | False |
| 2E | ACCESS. FITTING RM #2 | 53 SF | Level 1 | 0 | 0 | 0 | 15 | 50 | 9 | 9 | 50 | 0 | 0 | Neutral |  | False |
| 2F | VESTIBULE #2 | 41 SF | Level 1 | 0 | 0 | 0.06 | 15 | 50 | 12 | 8 | 50 | 0 | 6.2 | Neutral |  | False |
| 3A | BACK OF HOUSE | 546 SF | Level 1 | 2 | 5 | 0.06 | 345 | 800 | 55 | 54 | 800 | 0 | 6.8 | Neutral |  | False |
| 3D | STOCK | 1004 SF | Level 2 | 3 | 5 | 0.06 | 755 | 755 | 93 | 93 | 755 | 0 | 12.5 | Neutral |  | False |
| 3E | OFFICE | 56 SF | Level 2 | 1 | 5 | 0.06 | 65 | 100 | 12 | 12 | 100 | 0 | 10.5 | Neutral |  | False |
| TOTAL |  | 4413 SF |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## HVAC DIFFUSERS AND REGISTERS SCHEDULE

| TAG | MANUFACTURER | MODEL | FACE | MOUNTING | MATERIAL | FINISH | DAMPER TYPE | BORDER STYLE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| ER-1 | TITUS | FL-10 | 2'-0"-(1) 1" SLOT | CEILING | ALUMINUM | STANDARD WHITE | OPPOSED BLADE | BORDER TYPE 22, TAP & SPACKLE | SEE LINEAR DIFFUSER NOTES |
| LD-1 | TITUS | FL-10 | 4'-0"-(1) 1" SLOT | CEILING | ALUMINUM | STANDARD WHITE | OPPOSED BLADE | BORDER TYPE 22, TAP & SPACKLE | SEE LINEAR DIFFUSER NOTES |
| LD-2 | TITUS | FL-10 | 2'-0"-(1) 1" SLOT | CEILING | ALUMINUM | STANDARD WHITE | OPPOSED BLADE | BORDER TYPE 22, TAP & SPACKLE | SEE LINEAR DIFFUSER NOTES |
| SR-1 | TITUS | S300FL | 18"x6" | DUCT | ALUMINUM | STANDARD WHITE | SCOOP DAMPER | SURFACE MOUNT |  |
| TG-1 | TITUS | 350RL | 12"x12" | SIDEWALL | ALUMINUM | STANDARD WHITE | (none) | SURFACE MOUNT |  |

**LINEAR DIFFUSER NOTES**

- TAPE AND SPACKLE BORDER TYPE 22
- TO APPEAR CONTINUOUS FROM OCCUPIED AREAS
- PROVIDE END CAPS, SPLINES, AND MOUNTING HARDWARE FOR COMPLETE INSTALLATION
- PROVIDE PRE-MANUFACTURED SUPPLY PLENUM BOXES
- PROVIDE RETURN HOOD LIGHT SHEILDED FOR RETURN SECTIONS
- PROVIDE CUSTOM LENGTH AS NECESSARY PER ARCHITECTURAL DRAWINGS

## HVAC ELECTRICAL COORDINATION SCHEDULE

ABBREVIATIONS

|  |  |
|---|---|
| DC | LOCAL DISCONNECT |
| MC | MOTOR CONTROL (POWER) |
| SD | DUCT SMOKE DETECTOR |
| CN | CONTROLS |
| TS | TOGGLE SWITCH |
| C/B | H.A.C.R. CIRCUIT BREAKER AT SOURCE PANELBOARD |
| FUSE | FUSE AT LOCAL DISCONNECT (VERIFY FIELD RATING) |
| FLA | OPERATING FULL LOAD AMPS |
| MCA | MINIMUM CIRCUIT AMPACITY |
| CP | CORD AND PLUG CONNECTION |
| [BLANK] | HARD WIRED (WHEN INDICATED FOR DC TYPE) |

CONTRACTOR TYPE

|  |  |
|---|---|
| EC | ELECTRICAL CONTRACTOR |
| EX | EXISTING |
| FC | FIRE PROTECTION CONTRACTOR |
| GC | GENERAL CONTRACTOR |
| HC | HVAC CONTRACTOR |
| MFR | MANUFACTURER |
| PC | PLUMBING CONTRACTOR |
| OR | OWNER OR OTHERS |

MOTOR CONTROL TYPE

|  |  |
|---|---|
| CS | COMBINATION STARTER |
| MCC | MOTOR CONTROL STARTER |
| MG | MAGNETIC STARTER OR CONTACT |
| MS | MANUAL STARTER |
| VFD | VARIABLE FREQUENCY DRIVE |
| MSR | MANUAL STARTER W/ CONTROL RELAY |
| OV | OVERCURRENT PROTECTION |

CONTROL TYPE

|  |  |
|---|---|
| TC | TIMECLOCK |
| CPT | CONTROL POWER TRANSFORMER |
| BAS | BUILDING AUTOMATION SYSTEM |
| LOW | LOW VOLTAGE CONTROLS |
| LINE | LINE VOLTAGE CONTROLS |
| RLINE | REVERSE ACTING LINE VOLTAGE THERMOSTAT |
| MAN | MANUAL |
| FA | FIRE ALARM |
| CO | CARBON MONOXIDE SENSOR |
| INT | INTEGRAL TO EQUIPMENT |
| ASD | AREA SMOKE DETECTOR |
| DSD | DUCT SMOKE DETECTOR |

CONTROL TYPE

WHERE SHORT CIRCUIT RATING CODE REQUIRED VALUE INDICATES "YES" APPLICABLE EQUIPMENT'S SHORT CIRCUIT RATING SHALL EXCEED THE AVAILABLE FAULT CURRENT VALUE INDICATED.

| CONNECTION MARK | DESCRIPTION | VOLTAGE | PHASE | EMERGENCY | HP | WATTS | HTG KW | FLA | MCA | OCP | FED FROM | DC TYPE | DC FURN | DC INST | DC WIRE | MC TYPE | MC FURN | MC INST | MC WIRE | CN TYPE | CN FURN | CN INST | CN WIRE | SHORT CIRCUIT RATING CODE REQUIRED? | AVAILABLE FAULT CURRENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS-1 | DUCTLESS SPLIT INDOOR UNIT | 208 V | 1 | NO |  |  |  |  | 3 |  | HP-1 |  | EC | EC | EC | MG | MFR | MFR | MFR | LOW | HC | HC | HC | Yes |  |
| EF-1 | HVAC FAN | 120 V | 1 | NO | 0.25 |  |  | 3.8 | 4.8 | 15 |  |  | EC | EC | EC | MG | MFR | MFR | MFR | TC | EC | EC | EC | No | 2239 |
| FC-1 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 3 | 1.1 | 5.88 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 1177 |
| FC-2 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 1.5 | 1.1 | 3.63 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 2227 |
| FC-3 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 2 | 1.1 | 4.38 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 2403 |
| FC-4 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 2.5 | 1.1 | 5.13 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 2241 |
| FC-5 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 2.5 | 1.1 | 5.13 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 2812 |
| FC-6 | CHILLED WATER FAN COIL UNIT | 480 V | 3 | NO |  |  | 3 | 1.1 | 5.88 |  |  |  | EC | EC | EC | MG | MFR | MFR | MFR | BAS | HC | HC | HC | Yes | 3483 |
| HP-1 | AIR SOURCE OUTDOOR HEAT PUMP | 208 V | 1 | NO |  |  |  |  | 12 | 15 |  |  | EC | EC | EC | MG | MFR | MFR | MFR | LOW | HC | HC | HC | Yes | 3512 |

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL

KLH ENGINEERS
KOHRS LONNEMANN HEIL ENGINEERS, INC.
MECHANICAL/ELECTRICAL ENGINEERS
WWW.KLHENGRS.COM
1538 ALEXANDRIA PIKE, SUITE 11
FT. THOMAS, KENTUCKY 41075
800-354-9783
859-442-8050
859-442-8058 FAX
KLH JOB #: 26861

DOLCE & GABBANA

**VALLEY FAIR**

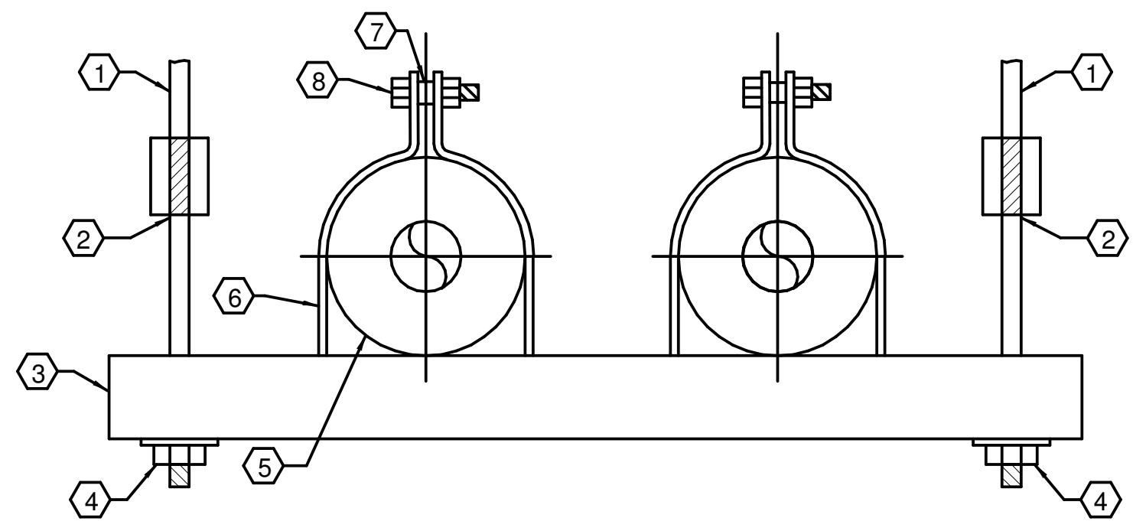
2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

**LMA Project No.**

| NO. | DATE | ISSUE |
|---|---|---|
| 6 | 06.02.25 | Issue for Construction |
| 5 | 03.21.25 | Addendum 3 |
| 3 | 02.27.25 | Building Department Response |
|  | 01.16.25 | Permit and Bid Set |

MECHANICAL - SCHEDULES

M0.02

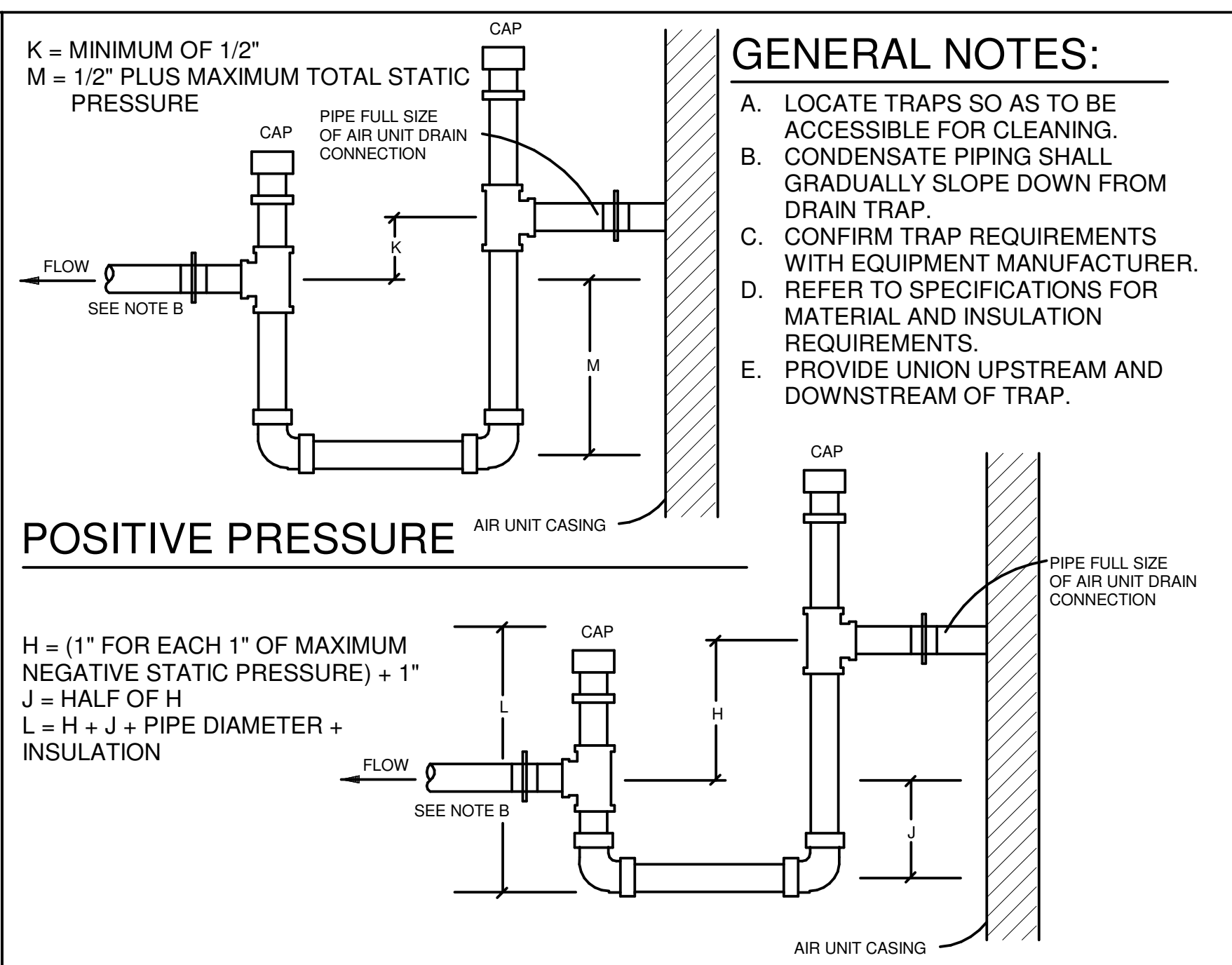


KEYED NOTES:

1. CONNECT TO STRUCTURE (TYPICAL).
2. GALVANIZED THREADED HANGER RODS (TYPICAL). SEE SPECIFICATIONS.
3. UNISTRUT.
4. PLATED NUT & WASHER (TYPICAL).
5. CONTINUOUS INSULATION AS SPECIFIED, (TYPICAL).
6. CHANNEL MOUNTED CLAMPING SYSTEM (TYPICAL).
7. SPACER SIZED TO PREVENT COMPRESSION OF INSULATION.
8. PLATED DOUBLE NUT AND WASHER.

230529.00-02 - REFRIGERANT PIPING SUPPORT

SCALE: NONE



POSITIVE PRESSURE

NEGATIVE PRESSURE

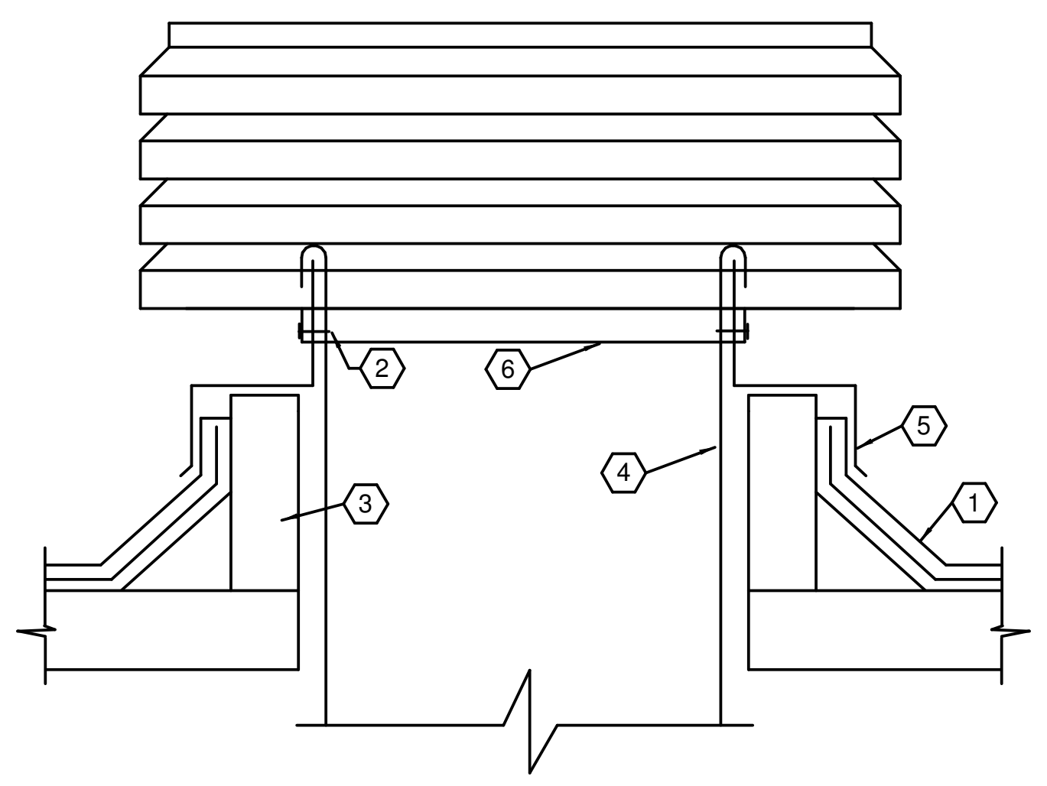
GENERAL NOTES:

A. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
B. CONDENSATE PIPING SHALL GRADUALLY SLOPE DOWN FROM DRAIN TRAP.
C. CONFIRM TRAP REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
D. REFER TO SPECIFICATIONS FOR MATERIAL AND INSULATION REQUIREMENTS.
E. PROVIDE UNION UPSTREAM AND DOWNSTREAM OF TRAP.

NOTE: OUTDOOR UNITS AND UNITS LOCATED IN UNCONDITIONED SPACES WHICH PROVIDE COOLING IN THE WINTER MUST HAVE HEAT TRACE ON THE CONDENSATE PIPING.

232113.23-05 - CONDENSATE DRAIN TRAP POSITIVE & NEGATIVE

SCALE: NONE



KEYED NOTES:

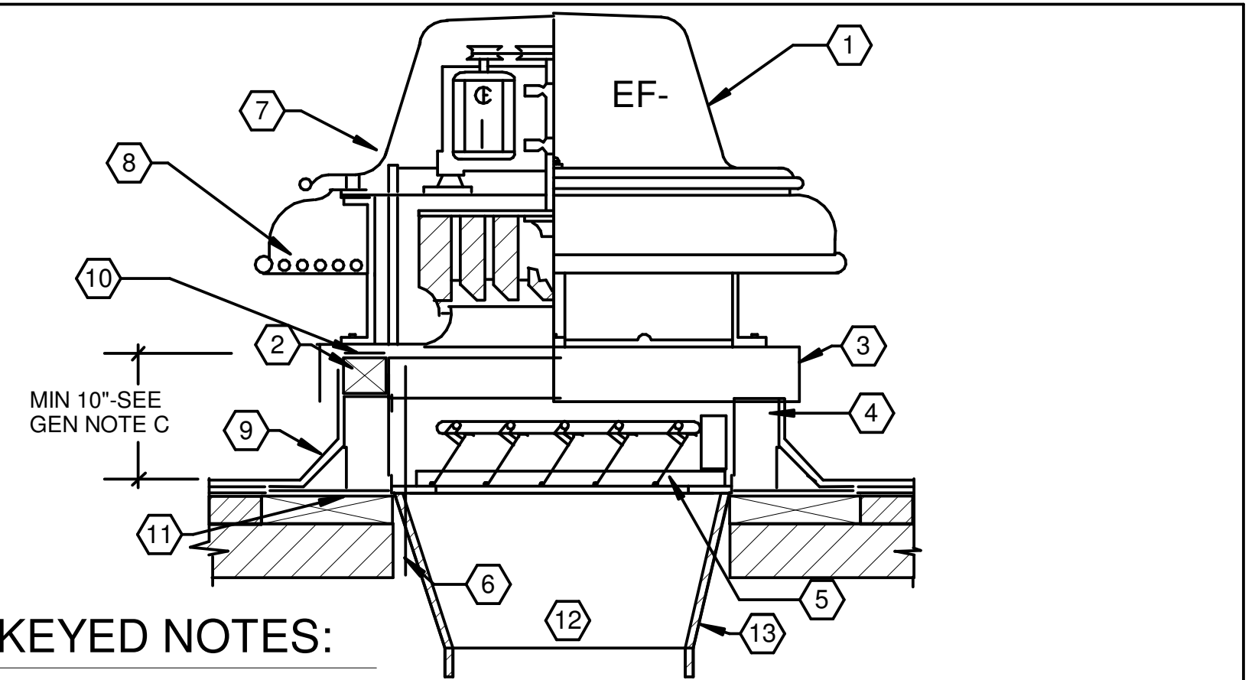
1. ROOF MEMBRANE UP AND OVER WOOD NAILER, FLASH PER ROOFING MFG'R REQMTS.
2. SHEET METAL SCREWS. 4" O/C, 4 SIDES
3. PREFABRICATED, INSULATED ROOF CURB
4. INSULATED GALVANIZED SHEET METAL DUCT
5. COUNTER FLASHING
6. PENTHOUSE THROAT

GENERAL NOTES:

A. CONTRACTOR SHALL PROVIDE CURB TO MAINTAIN 10" MINIMUM ABOVE FINISHED ROOFING SYSTEM. PROVIDE ADDITIONAL BLOCKING AS REQUIRED TO ACCOMMODATE ROOF INSULATION THICKNESS.

233723.00-04 - LOUVERED PENTHOUSE W CURB A

SCALE: NONE



KEYED NOTES:

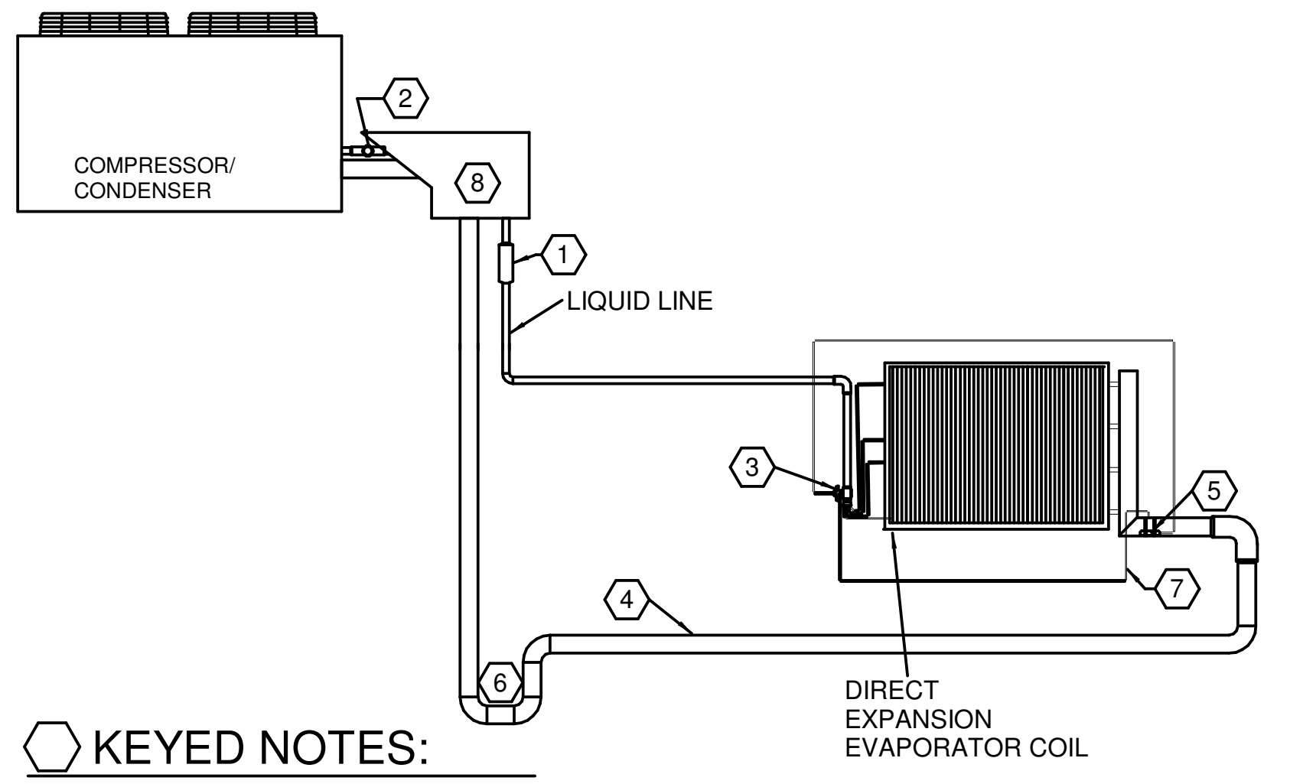
1. SPUN ALUMINUM ROOF EXHAUSTER
2. WOOD NAILER
3. ANCHOR ALL FOUR SIDES OF CURB CAP INTO NAILER SCREWS AT 12" O.C.
4. PREFABRICATED, INSULATED ALUMINUM CURB
5. MOTOR OPERATED DAMPER WIRED TO INTERFACE WITH EXHAUST FAN START/STOP
6. CONDUIT THROUGH HOLE IN DAMPER SHELF
7. POWER DISCONNECT
8. ALUMINUM BIRD SCREEN
9. CURB TYPE AND FLASHING PER ROOFING MANUFACTURER'S REQUIREMENTS
10. RUBBER GASKET APPLIED TO TOP OF CURB
11. ANCHOR TO ROOF DECK AS REQUIRED
12. CENTER TRANSITION TO DUCTWORK FROM DAMPER OR CURB. PROVIDE 3x DIAMETER STRAIGHT RUN MINIMUM.
13. INSULATED DUCTWORK

GENERAL NOTES:

A. DELETE CANT FOR SINGLE MEMBRANE ROOFS.
B. TOP OF CURB MUST BE LEVEL. FABRICATE PITCH IN CURB OR SHIM AS NECESSARY.
C. TOP OF CURB SHALL BE A MINIMUM OF 10" ABOVE FINISHED ROOF SURFACE. CONTRACTOR HAS THE OPTION TO EITHER FURNISH A CURB WITH SUFFICIENT HEIGHT TO ACCOMMODATE ROOF INSULATION THICKNESS OR TO ADD PRESSURE TREATED WOOD BLOCKING, SECURED TO THE ROOF DECK, BELOW THE CURB
D. LOCATE FAN A MINIMUM OF 10'-0" FROM EDGE OF ROOF, INTAKES, AND ROOF HATCH.
E. INSTALL ROOF MEMBRANE UP UNDER FLASHING, FLASH PER ROOFING MFGR. RQMTS.

233423.00-10 - ROOF EXHAUSTER A

SCALE: NONE



KEYED NOTES:

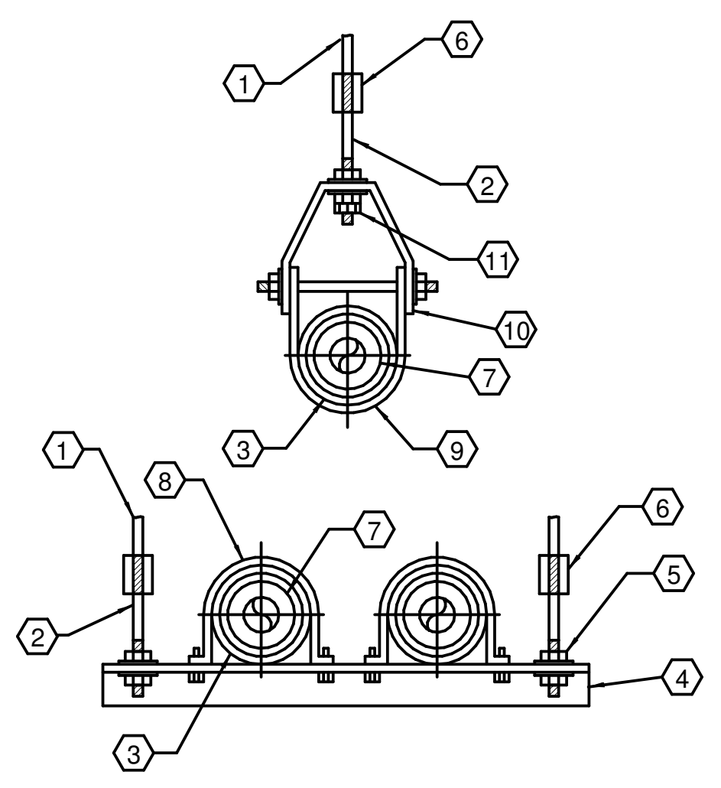
1. FIELD SUPPLIED FILTER DRIER, UNLESS PROVIDED INTERNALLY BY THE EQUIPMENT MANUFACTURER.
2. SIGHT GLASS
3. EXPANSION VALVE
4. SUCTION LINE W/FLEXIBLE CLOSED CELL ELASTOMER INSULATION
5. EXPANSION VALVE THERMAL BULB
6. TRAP FOR LONG VERTICAL RUNS (PER MFG. RECOMMENDATIONS)
7. EXPANSION VALVE EQUALIZER LINE
8. PROVIDE APPROPRIATELY SIZED DOG HOUSE CONSTRUCTION FOR ROOF PENETRATIONS.

GENERAL NOTES:

A. PIPE SIZES SHALL BE PER MFGR'S RECOMMENDATIONS.
B. PROVIDE 4" CONCRETE PAD ALL EXTERIOR UNITS ON GRADE.
C. PIPING LAYOUT AND CONFIGURATION SHALL BE INSTALLED PER MFGR'S RECOMMENDATIONS.
D. REFRIGERANT SPECIALTIES ARE SHOWN FOR SCHEMATIC PURPOSES ONLY AND SHALL BE COORDINATED PER MFGR'S INSTALLATION INSTRUCTIONS.
E. PROVIDE LOCKING-TYPE TAMPER RESISTANT CAPS ON ALL OUTDOOR REFRIGERANT CIRCUIT ACCESS PORTS.

232313.00-03 - REFRIGERANT PIPING A

SCALE: NONE



KEYED NOTES:

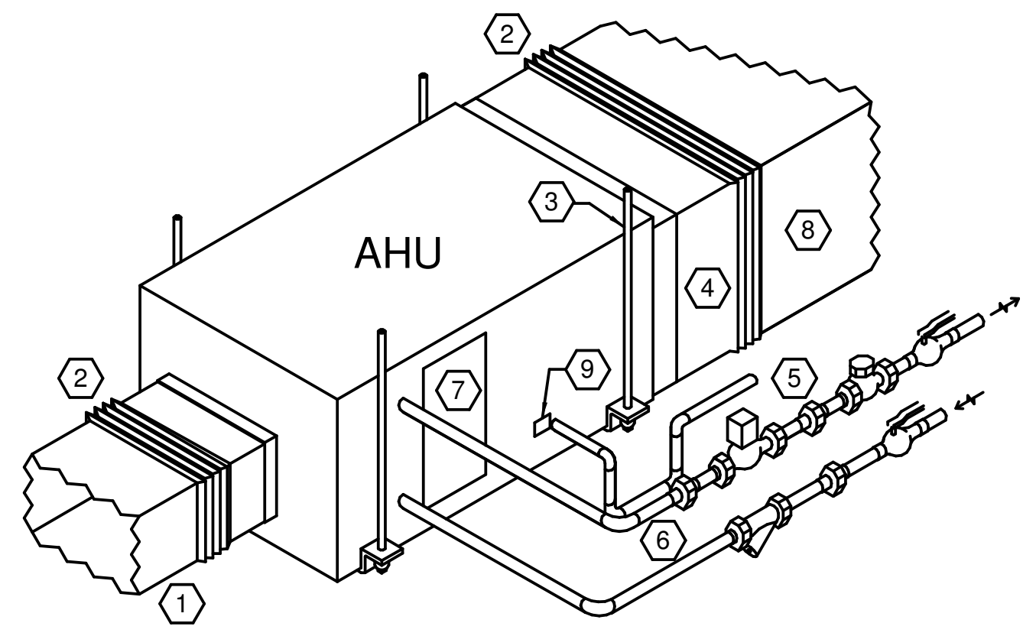
1. CONNECT TO STRUCTURE TYP.
2. GALVANIZED THREADED HANGER RODS, TYP. SEE SPECS.
3. INSULATION PROTECTIVE SADDLE, TYP.
4. 1-1/2" x 1-1/2" x 1/4" STEEL ANGLE HANGER PRIME PAINTED.
5. PLATED BUT & WASHER TOP & BOTTOM,
6. TYP. VIBRATION ISOLATORS IN MECH. ROOMS, TYP.
7. INSULATION AS SPECIFIED, TYP.
8. REFER TO SPECS FOR CLAMP SPACING, TYP.
9. SADDLE
10. CLEVIS TYPE HANGER (PRIME PAINTED)
11. PLATED DOUBLE NUT AND WASHER

GENERAL NOTES:

A. IF HOT WATER PIPING IS ON THE SAME RACK AS OTHER PIPING, THE HOT WATER SHALL BE ON ROLLER SUPPORTS.
B. REGARDLESS OF WHAT IS INDICATED ON ANY FLOOR PLANS OR OTHER DETAILS THE ACTUAL INSTALLATION OF ANY HYDRONIC PIPING SHALL CONFORM TO WHAT IS SHOWN BELOW

232113.23-14 - PIPE HANGERS TYPICAL

SCALE: NONE



KEYED NOTES:

1. INSULATED SUPPLY DUCT
2. FLEXIBLE CONNECTION
3. GALVANIZED ALL-THREAD ROD WITH VIBRATION ISOLATOR (TYPICAL) ATTACHED TO STRUCTURE
4. FILTER RACK AND ACCESS DOOR
5. CONDENSATE LINE WITH TRAP
6. CHILLED WATER PIPE. COPPER , MINIMUM 1" INSULATION WITH TWO WAY CONTROL VALVE, BALANCING VLAVE WITH PRESSURE TEST PORTS, ISOLATION VALVES, STRAINER AND UNIONS.
7. SERVICE ACCESS PANEL
8. RETURN DUCT 1/2" ACOUSTIC LINING (MINIMUM OF 10')
9. HIGH WATER ALARM IN CONDENSATE DRAIN PAN. WIRE TO BREAK 24 VOLT CONTROL POWER IN THE CASE OF A HIGH WATER EVENT.

238219.00-01 - AIR HANDLING UNIT CHILLED WATER

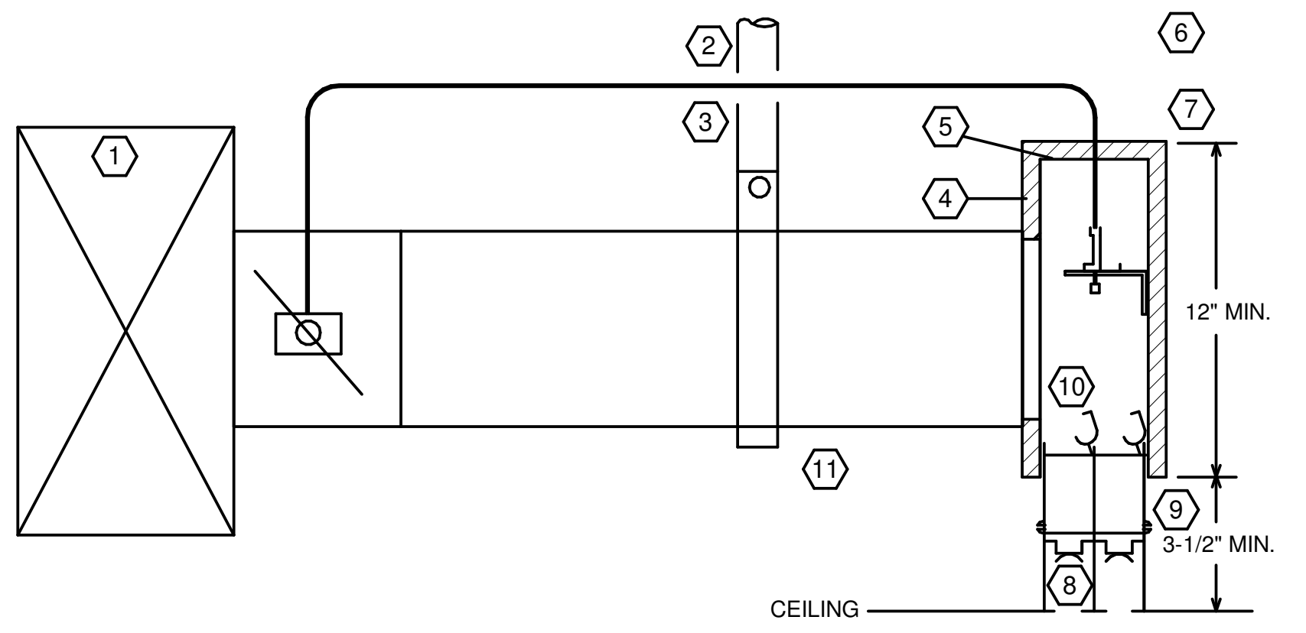
SCALE: NONE

GENERAL NOTES:

A. WHERE LINEAR DIFFUSER IS ADJACENT TO WINDOWS, ADJUST PATTERN CONTROLLER TO DIRECT AIRFLOW HORIZONTALLY TOWARDS WINDOWS.
B. OMIT FLEX DUCT ON DISTRIBUTION SYSTEMS THAT PENETRATE 1-HR FIRE BARRIERS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS OF FIRE BARRIERS.

KEYED NOTES:

1. LOW PRESSURE SUPPLY DUCT
2. 1" WIDE BAND AND CLAMP.
3. SHEET METAL SCREW.
4. SHEET METAL PLENUM.
5. 1/2" ACOUSTICAL LINING.
6. PATTERN CONTROLLER.
7. SCREWS, MIN 6" ON CENTER & SEAL AIRTIGHT, TYP, BOTH SIDES
8. VOLUME ADJUSTER
9. BAND CLAMP
10. INACCESSIBLE VOLUME DAMPERS SHALL BE ADJUSTABLE FROM THE FACE OF THE DIFFUSER BY USE OF THE BOWDEN CABLE CONTROL SYSTEM (#270-275 CONTROLLER) MANUFACTURED BY YOUNG REGULATOR COMPANY OR APPROVED EQUIVALENT.
11. SHEET METAL BRANCH DUCT

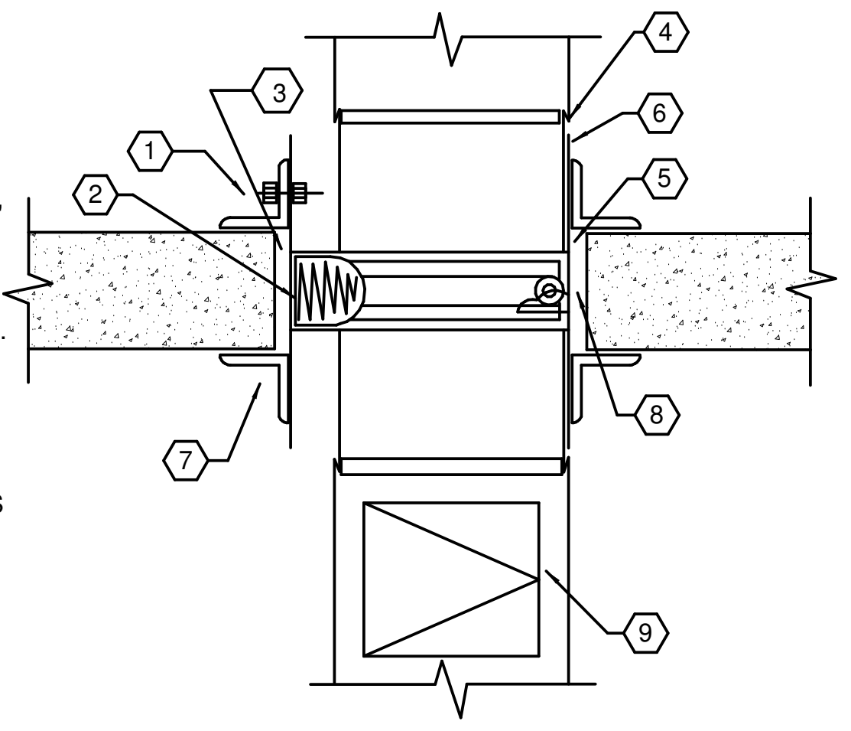


233713.00-12 - PLENUM/LINEAR DIFFUSER W/ YOUNG REG.

SCALE: NONE

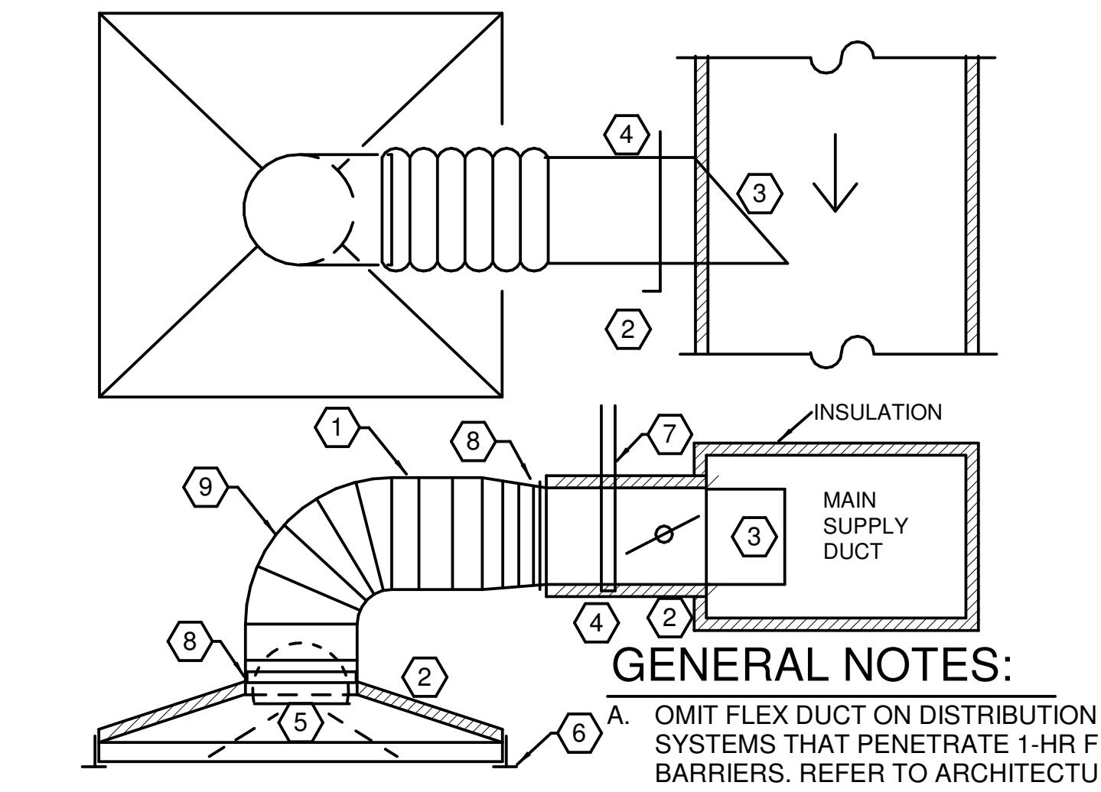
KEYED NOTES:

1. RETAINING ANGLES ATTACHED TO SLEEVES WITH 1/4" BOLTS OR 1/2" WELDS 6" O.C. BEGIN 2" FROM CORNERS
2. FIRE DAMPER BLADES
3. CLEARANCE FOR THERMAL EXPANSION 1/8" PER FOOT OF DUCT DIMENSION. MAX 1/2" - HALF FOR EACH SIDE
4. SLEEVE TO EXTEND MIN. OF 3" BEYOND FLOOR LINE
5. BOLT OR WELD DAMPER TO SLEEVE (TYP).
6. STEEL SLEEVE MIN. 14 GAUGE.
7. RETAINIG ANGLES MIN 1-1/2" x 1-1/2" 12 GA. FOR DUCTS UP TO 48"
8. INTERIOR OF OPENING LINED W/ U.L. LISTED MATERIAL HAVING SAME FIRE RATING AS FLOOR.
9. ACCESS DOOR



233313.00-15 - FIRE DAMPER FLOOR PENETRATION

SCALE: NONE



GENERAL NOTES:

A. OMIT FLEX DUCT ON DISTRIBUTION SYSTEMS THAT PENETRATE 1-HR FIRE BARRIERS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS OF FIRE BARRIERS.

KEYED NOTES:

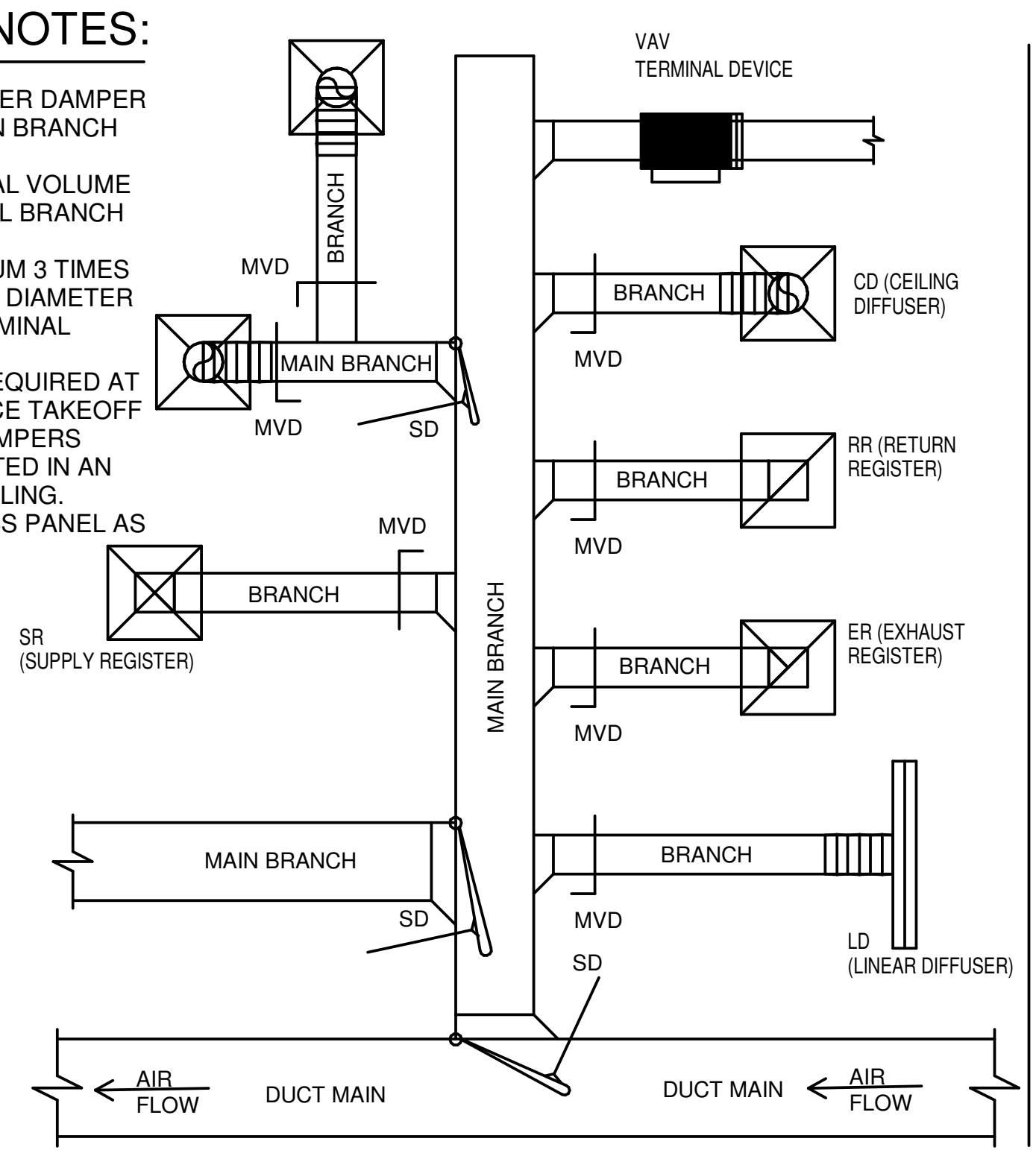
1. MAXIMUM LENGTH OF INSUL. FLEX DUCT EQUALS 5 FEET. FLEX NOT PERMITTED IN INACCESSIBLE CEILINGS
2. INSULATED DUCT, COLLAR AND DIFFUSER BY HVAC CONTRACTOR
3. SCOOP
4. SPIN IN FITTING WITH MANUAL VOLUME DAMPER
5. INTERNAL BUTTERFLY DAMPER FOR DRYWALL APPLICATIONS ONLY. (PROVIDE KEY FOR ADJUSTMENT)
6. SECURE TO CEILING PER MANUFACTURER'S RECOMMENDATIONS AND PER CEILING FINISH. PROVIDE GRID CLIPS PER MFG'R REQUIREMENTS. PROVIDE FRAMING FOR DRYWALL INSTALLATION.
7. HANGER, SECURE TO STRUCTURE AND DUCTWORK
8. PEEL BACK INSULATION AND PROVIDE STRAPPING AND SHEET METAL SCREWS AT FLEX CONNECTION TO DUCT. THEN PROVIDE STRAPPING AROUND INSULATION
9. SUPPORT FLEX TO PREVENT COLLAPSING

233713.00-04 - DIFFUSER INSTALLATION TYPICAL

SCALE: NONE

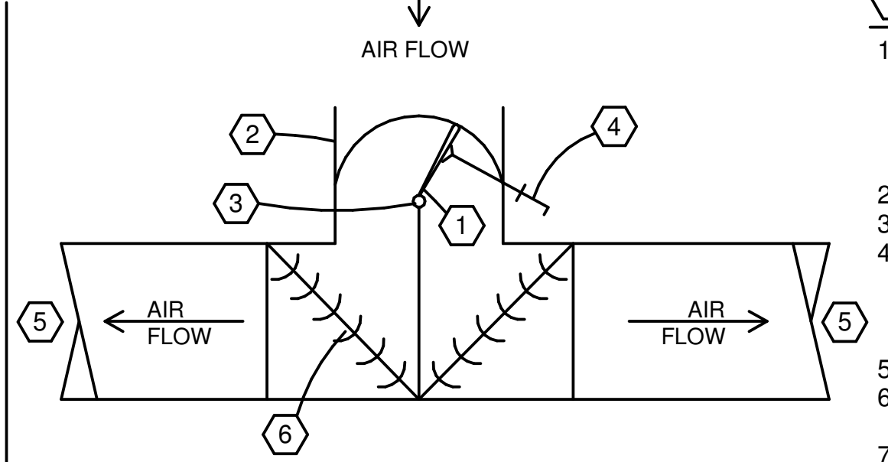
GENERAL NOTES:

1. PROVIDE SPLITTER DAMPER (SD) AT ALL MAIN BRANCH TAKEOFFS
2. PROVIDE MANUAL VOLUME DAMOERS AT ALL BRANCH TAKEOFFS
3. PROVIDE MINIMUM 3 TIMES STRAIGHT INLET DIAMETER TO ALL VAV TERMINAL DEVICES
4. DAMPER NOT REQUIRED AT TERMINAL DEVICE TAKEOFF
5. ALL MANUAL DAMPERS SHALL BE LOCATED IN AN ACCESSIBLE CEILING. PROVIDE ACCESS PANEL AS REQUIRED.



233300.00-01 - MANUAL DAMPER DETAIL

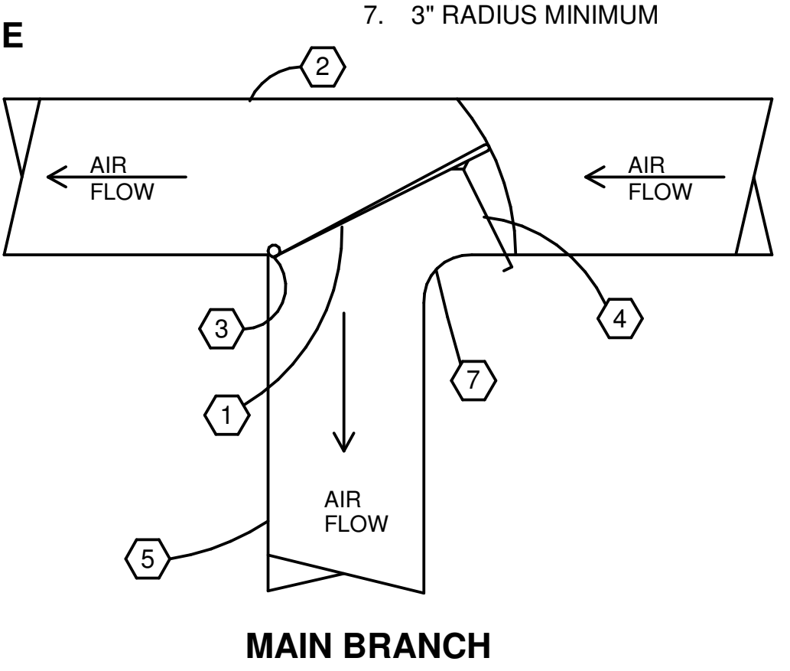
SCALE: NONE



**DUCT TEE**

KEYED NOTES:

1. 20 GAUGE DOUBLE SHEET METAL AIR FOIL FULL DEPTH OF MAIN DUCT UP TO 12" WIDE BRANCHES 18 GAUGE ON WIDER BRANCHES
2. MAIN DUCT
3. GALVANIZED 3/16" ROD
4. VENTLOCK NO. 600-3 DAMPER BLADE, BRACKTER & LOCKING BALL JOINT WITH 1/4" Ø GALVANIZED OPERATOR PAD
5. BRANCH MAIN DUCT
6. DOUBLE THICKNESS TURNING VANES (TYPICAL)
7. 3" RADIUS MINIMUM



**MAIN BRANCH**

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL

KLH ENGINEERS
KOHRS LONNEMANN HEIL ENGINEERS, INC.
MECHANICAL/ELECTRICAL ENGINEERS
WWW.KLHENGRS.COM
1538 ALEXANDRIA PIKE, SUITE 11
FT. THOMAS, KENTUCKY 41075
800-354-9783
859-442-8050
859-442-8058 FAX
KLH JOB #: 26861

DOLCE & GABBANA

VALLEY FAIR

2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

LMA Project No.

| NO. | DATE | ISSUE |
|---|---|---|
| 6 | 06.02.25 | Issue for Construction |
| 5 | 03.21.25 | Addendum 3 |
| 3 | 02.27.25 | Building Department Response |
|  | 01.16.25 | Permit and Bid Set |

MECHANICAL - DETAILS

M0.03

**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 1 of 18)**

**Project Name:** **Dolce & Gabbana** **Date Prepared:** **2025-01-20**

**A. General Information**

| | | | | | |
|---|---|---|---|---|---|
| **1** | Project Name | Dolce & Gabbana | | | |
| **2** | Run Title | Title 24 Analysis | | | |
| **3** | Project Location | 2855 Stevens Creek Blvd | | | |
| **4** | City | San Jose | **5** | Standards Version | Compliance 2022 |
| **6** | Zip code | 95050 | **7** | Compliance Software (version) | EnergyPro 9.3 |
| **8** | Climate Zone | 4 | **9** | Building Orientation (deg) | 0 |
| **10** | Building Type(s) | • Nonresidential | **11** | Weather File | SAN-JOSE-INTL_STYP20.epw |
| **12** | Project Scope | • Existing alteration | **13** | Number of Dwelling Units | 0 |
| **14** | Total Conditioned Floor Area in Scope ($ft^2$) | 4607 | **15** | Total # of hotel/motel rooms | 0 |
| **16** | Total Unconditioned Floor Area ($ft^2$) | 0 | **17** | Fuel Type | Natural gas |
| **18** | Nonresidential Conditioned Floor Area | 4607 | **19** | Total # of Stories (Habitable Above Grade) | 2 |
| **20** | Residential Conditioned Floor Area | 0 | | | |

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 2 of 18)**

**B. PROJECT SUMMARY**

*Table B shows which building components are included in the performance calculation. If indicated as not included, the project must show compliance prescriptively if within the permit application.*

| **Building Components Complying via Performance** | | | | | | **Building Components Complying Prescriptively** | |
|---|---|---|---|---|---|---|---|
| Envelope (See Table G) | Nonres | Not Included | Solar Thermal Water Heating (See Table I3) | ☐ | Performance | The following building components are ONLY eligible for prescriptive compliance and should be documented on the NRCC form listed if within the scope of the permit application (i.e. compliance will not be shown on the NRCC-PRF-E). | |
| | MultiFam | Not Included | | ☒ | Not Included | | |
| Mechanical (See Table H) | Nonres | Performance | Covered Process: Commercial Kitchens (see Table J) | ☐ | Performance | Indoor Lighting (Unconditioned) 140.6 & 170.2(e) | NRCC-LTI-E is required |
| | MultiFam | Not Included | | ☒ | Not Included | Outdoor Lighting 140.7 & 170.2(e) | NRCC-LTO-E is required |
| Domestic Hot Water (See Table I) | Nonres | Performance | Covered Process: Laboratory Exhaust (see Table J) | ☐ | Performance | Sign Lighting 140.8 & 170.2(e) | NRCC-LTS-E is required |
| | MultiFam | Not Included | | ☒ | Not Included | **Building Components Complying with Mandatory Measures** | |
| Lighting (Indoor Conditioned, see Table K) | Nonres | Performance | Photovoltaics (see Table F) | ☐ | Performance | Electrical power systems, commissioning, solar ready, elevator and escalator requirements are mandatory and should be documented on the NRCC form listed if applicable (i.e. compliance will not be shown on the NRCC-PRF-E.) | |
| | MultiFam | Not Included | | ☒ | Not Included | Electrical Power Distribution 110.11 | NRCC-ELC-E is required |
| | | | Battery (see Table F) | ☐ | Performance | Commissioning 120.8 | NRCC-CXR-E is required |
| | | | | ☒ | Not Included | Solar and Battery 110.10 | NRCC-SAB-E is required |

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 3 of 18)**

**C1. COMPLIANCE SUMMARY**

**COMPLIES[3]**

| | **Time Dependent Valuaton (TDV)** | | **Source Energy Use** |
|---|---|---|---|
| | **Efficiency[1] (kBtu/ft² - yr)** | **Total[2] (kBtu/ft² - yr)** | **Total[2] (kBtu/ft² - yr)** |
| Standard Design | 370.68 | n/a | n/a |
| Proposed Design | 370.59 | n/a | n/a |
| **Compliance Margins** | **0.09** | **n/a** | **n/a** |
| | **Pass** | **n/a** | **n/a** |

[1] *Efficiency measures include improvements like a better building envelope and more efficient equipment*

[2] *Compliance Totals include efficiency, photovoltaics and batteries*

[3] *New Construction, Complete Addition Scope: Building complies when all efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded*
*Existing, Addition and Alteration Scope: Building complies when efficiency compliance margin is greater than or equal to zero and unmet load hour limits are not exceeded*

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 4 of 18)**

**C2. TDV ENERGY COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft² - yr)**

**COMPLIES[2]**

| **Energy Component** | **Standard Design (TDV)** | **Proposed Design (TDV)** | **Compliance Margin (TDV)[1]** |
|---|---|---|---|
| Space Heating | 9.18 | 8.68 | 0.5 |
| Space Cooling | 75.35 | 57.18 | 18.17 |
| Indoor Fans | 123.69 | 88.68 | 35.01 |
| Heat Rejection | 0 | 0 | 0 |
| Pumps & Misc. | 0 | 0 | 0 |
| Domestic Hot Water | 14.76 | 7.76 | 7 |
| Indoor Lighting | 147.7 | 208.29 | -60.59 |
| Flexibility | --- | --- | --- |
| **EFFICIENCY COMPLIANCE TOTAL** | **370.68** | **370.59** | **0.09 (0%)** |
| Photovoltaics | --- | --- | --- |
| Batteries | --- | --- | --- |
| **TOTAL COMPLIANCE** | **370.68** | **370.59** | **0.09 (0%)** |

[1] *Notes: This number in parenthesis following the Compliance Margin in column 4, represents the Percent Better than Standard.*

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 5 of 18)**

**C3. TDV ENERGY RESULTS FOR NON-REGULATED COMPONENTS[1]**

| **Non-Regulated Energy Component** | **Standard Design (TDV)** | **Proposed Design (TDV)** | **Compliance Margin (TDV)[1]** |
|---|---|---|---|
| Receptacle | 76.98 | 76.98 | --- |
| Process | --- | --- | --- |
| Other Ltg | --- | --- | --- |
| Process Motors | --- | --- | --- |
| **TOTAL (TOTAL COMPLIANCE + NON-REGULATED COMPONENTS)** | **447.66** | **447.57** | **0.09 (0%)** |

[1] *Notes: This table is not used for Energy Code Compliance.*

**C6. 'ABOVE CODE' QUALIFICATIONS**

☐ This project is pursuing CalGreen Tier 1 ☐ This project is pursuing CalGreen Tier 2

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 6 of 18)**

**C7. ENERGY USE SUMMARY**

| **Energy Component** | **Standard Design Site (MWh)** | **Proposed Design Site (MWh)** | **Margin (MWh)** | **Standard Design Site (MBtu)** | **Proposed Design Site (MBtu)** | **Margin (MBtu)** |
|---|---|---|---|---|---|---|
| Space Heating | --- | 0.1 | --- | 15.6 | 13.7 | 1.9 |
| Space Cooling | 10.9 | 7 | 3.9 | --- | --- | --- |
| Indoor Fans | 20.7 | 14.8 | 5.9 | --- | --- | --- |
| Heat Rejection | --- | --- | --- | --- | --- | --- |
| Pumps & Misc. | --- | --- | --- | --- | --- | --- |
| Domestic Hot Water | 2.5 | 1.3 | 1.2 | --- | --- | --- |
| Indoor Lighting | 26.1 | 36.9 | -10.8 | --- | --- | --- |
| Flexibility | --- | --- | --- | --- | --- | --- |
| **EFFICIENCY TOTAL** | **60.2** | **60.1** | **0.1** | **15.6** | **13.7** | **1.9** |
| Photovoltaics | --- | --- | --- | --- | --- | --- |
| Batteries | --- | --- | --- | --- | --- | --- |
| **ENERGY USE SUBTOTAL** | **60.2** | **60.1** | **0.1** | **15.6** | **13.7** | **1.9** |
| Receptacle | 13.7 | 13.7 | 0 | --- | --- | --- |
| Process | --- | --- | --- | --- | --- | --- |
| Other Ltg | --- | --- | --- | --- | --- | --- |
| Process Motors | --- | --- | --- | --- | --- | --- |
| **ENERGY USE TOTAL** | **73.9** | **73.8** | **0.1** | **15.6** | **13.7** | **1.9** |

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 7 of 18)**

**C8. ENERGY USE INTENSITY (EUI)**

| | **Standard Design (kBtu/ft² / yr)** | **Proposed Design (kBtu/ft² / yr)** | **Margin (kBtu/ft² / yr)** | **Margin Percentage** |
|---|---|---|---|---|
| GROSS EUI[1] | 58.12 | 57.63 | 0.49 | 0.84 |
| NET EUI[1] | 58.12 | 57.63 | 0.49 | 0.84 |

[1] *Notes: Gross EUI is Energy Use Total (not including PV)/Total Building Area. Net EUI is Energy Use Total (including PV)/Total Building Area.*

**D1. EXCEPTIONAL CONDITIONS**

- The general lighting exceptional method is employed for one or more spaces. Verify that the lighting allowances match the lighting installed on the plans and serve the areas within each space as identified in the compliance model.
- The proposed building includes space(s) that are modeled with unknown HVAC system(s). Verify that the spaces modeled with unknown HVAC system(s) are either part of core and shell analysis which will be permitted for mechanical compliance in the future, or the spaces have an existing HVAC system not modeled for compliance, or the compliance scope does not include mechanical.

**H1. DRY SYSTEM EQUIPMENT (FURNACES, AIR HANDLING UNITS, HEAT PUMPS, VRF, ECONOMIZERS ETC.)**

| **01** | **02** | **03** | **04** | **05** | **06** | **07** | **08** | **09** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Heating** | | | | **Cooling** | | | | |
| **Equipment Name** | **Equipment Type** | **Qty** | **Total Heating Output (kBtu/h)** | **Supp Heat Output (kBtu/h)** | **Efficiency Unit** | **Efficiency** | **Total Cooling Output (kBtu/h)** | **Efficiency Unit** | **Efficiency** | **Economizer Type (if present)** | **Status[1]** |
| FC 1-4 | Single Zone Air Conditioner (SZAC) Air System | 4 | 17.06 | 0 | N/A | NA - See Electric Resistance | 29.49 | EER<br>SEER | 12<br>13 | Fixed DB | N |
| Elevator Room | Single Zone Heat Pump | 1 | 12.5 | 0 | COP<br>HSPF2 | 4.45<br>10.7 | 11.52 | EER2<br>SEER2 | 13.1<br>25.5 | N/A | N |

[1] *Status: N - New, A - Altered, E - Existing*

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 8 of 18)**

**H3. NONRESIDENTIAL / COMMON USE AREA FAN SYSTEMS SUMMARY**

| **01** | **02** | **03** | **04** | **05** | **06** | **07** | **08** | **09** | **10** | **11** | **12** | **13** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Supply Fan** | | | | **Return / Relief Fan** | | | | | |
| **Name or Item Tag** | **Qty** | **Design OA CFM** | **CFM** | **Power** | **Power Units** | **Control** | **Fan Type** | **CFM** | **Power** | **Power Units** | **Control** | **Status[1]** |
| FC 1-4 | 4 | 184.44 | 1,000 | 0.38 | BHP | Constant Vol | N/A | N/A | N/A | N/A | N/A | N |
| Elevator Room | 1 | 0 | 441 | 0.75 | BHP | Constant Vol | N/A | N/A | N/A | N/A | N/A | N |

[1] *Status: N - New, A - Altered, E - Existing*

**H8. SYSTEM SPECIAL FEATURES**

| **01** | **02** | **03** | **04** |
|---|---|---|---|
| **System Name** | **Equipment Type** | **Interlocks per 140.4(n)[1]** | **Other Special Features and Controls** |
| FC 1-4 | Single Zone Air Conditioner (SZAC) Air System | N/A | Fixed DB |
| Undefined Plant1 - SHW | Service Hot Water | N/A | Fixed Temperature Control |

*Notes: This table includes controls related to the performance path only. For projects using the prescriptive path, mandatory and prescriptive controls requirements are documented on the NRCC-MCH-E.*

[1] *Yes = interlocks are provided, No = interlocks are not provided, NA means no operable openings.*

**H9. NONRESIDENTIAL / COMMON USE AREA & HOTEL/MOTEL VENTILATION**

| **01** | **02** | **03** | **04** | **05** | **06** | **07** |
|---|---|---|---|---|---|---|
| | **Mechanical Ventilation** | | | | | |
| **Zone Name** | **Ventilation Function** | **# of People** | **Supply OA CFM** | **Exhaust CFM** | **Conditioned Area (sf)** | **DCV or Occupant Sensor Controls, or Both** |
| 1-Retail | Retail - Sales | 24.6 | 737.75 | 0 | 2951 | N/A |
| 4-Elevator Machine Room | General - Unoccupied | 0.04 | 0 | 0 | 24.78 | N/A |

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**CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD** **NRCC-PRF-E**

**Nonresidential Performance Compliance Method** **(Page 9 of 18)**

**H11. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY**

| **01** | **02** | **03** | **04** | **05** | **06** | **07** | **08** | **09** | **10** | **11** | **12** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Rated Capacity (kBtuh)** | | **Airflow (cfm)** | | | **Fan** | | | |
| **System ID** | **System Type** | **Qty** | **Heating** | **Cooling** | **Design** | **MIn.** | **Min. Ratio** | **Power** | **Power Units** | **Cycles** | **VSD** |
| 1-Retail-Trm | Uncontrolled | 4 | N/A | N/A | 4,000 | N/A | 0 | N/A | N/A | N/A | ☐ |
| BaseVAVNoReheatTrmlUnit | Uncontrolled | 1 | N/A | N/A | 723.16 | N/A | 0.5 | N/A | N/A | N/A | ☐ |
| BaseVAVNoReheatTrmlUnit-2 | Uncontrolled | 1 | N/A | N/A | 963.08 | N/A | 0.5 | N/A | N/A | N/A | ☐ |
| Elevator Room | Single Zone Heat Pump | 1 | 12.5 | 11.52 | 441 | N/A | N/A | 0.75 | BHP | Cycling | ☐ |

**I1. WATER HEATER EQUIPMENT SUMMARY**

| **01** | **02** | **03** | **04** | **05** | **06** | **07** | **08** | **09** | **10** | **11** | **12** | **13** | **14** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Name** | **Heater Element Type** | **Tank Type** | **Qty** | **Tank Vol (gal)** | **Rated Input** | **Rated Input Unit** | **Efficiency** | **Efficiency Unit** | **Tank Insulation R-value Int/Ext** | **Standby Loss Fraction** | **1st Hr. Rating or Flow Rate (gal)** | **Heat Pump Type** | **Tank Location or Ambient Condition** |
| Rheem HPLD40-1RH (40 gal2 | Electricity | Storage | 1 | 40 | 5.86 | kW | 3.1 | UEF | N/A | N/A | 51 | Heat Pump Split Water Heater | N/A |

---

**MHC ENGINEERS**
150 8TH STREET
SAN FRANCISCO, CA 94103
PH. (415) 512-7141
FAX (415) 512-7120

M19582
EXP. 9/30/25

DOLCE & GABBANA

**VALLEY FAIR**

2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

| | | |
|---|---|---|
| | 01.21.2025 | ISSUE FOR PERMIT |
| NO. | DATE | ISSUE |

TITLE 24
DOCUMENTATION

**T24.0**

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL

---

**KLH ENGINEERS**
KOHRS LONNEMANN HEIL ENGINEERS, INC.
MECHANICAL/ELECTRICAL ENGINEERS
WWW.KLHENGRS.COM
1538 ALEXANDRIA PIKE, SUITE 11
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859-442-8050
859-442-8058 FAX
KLH JOB #: 26861

DOLCE & GABBANA

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2855 Stevens Creek Blvd
1668, First and Second Floors
San Jose, CA 95050

**LMA Project No.**

| | | |
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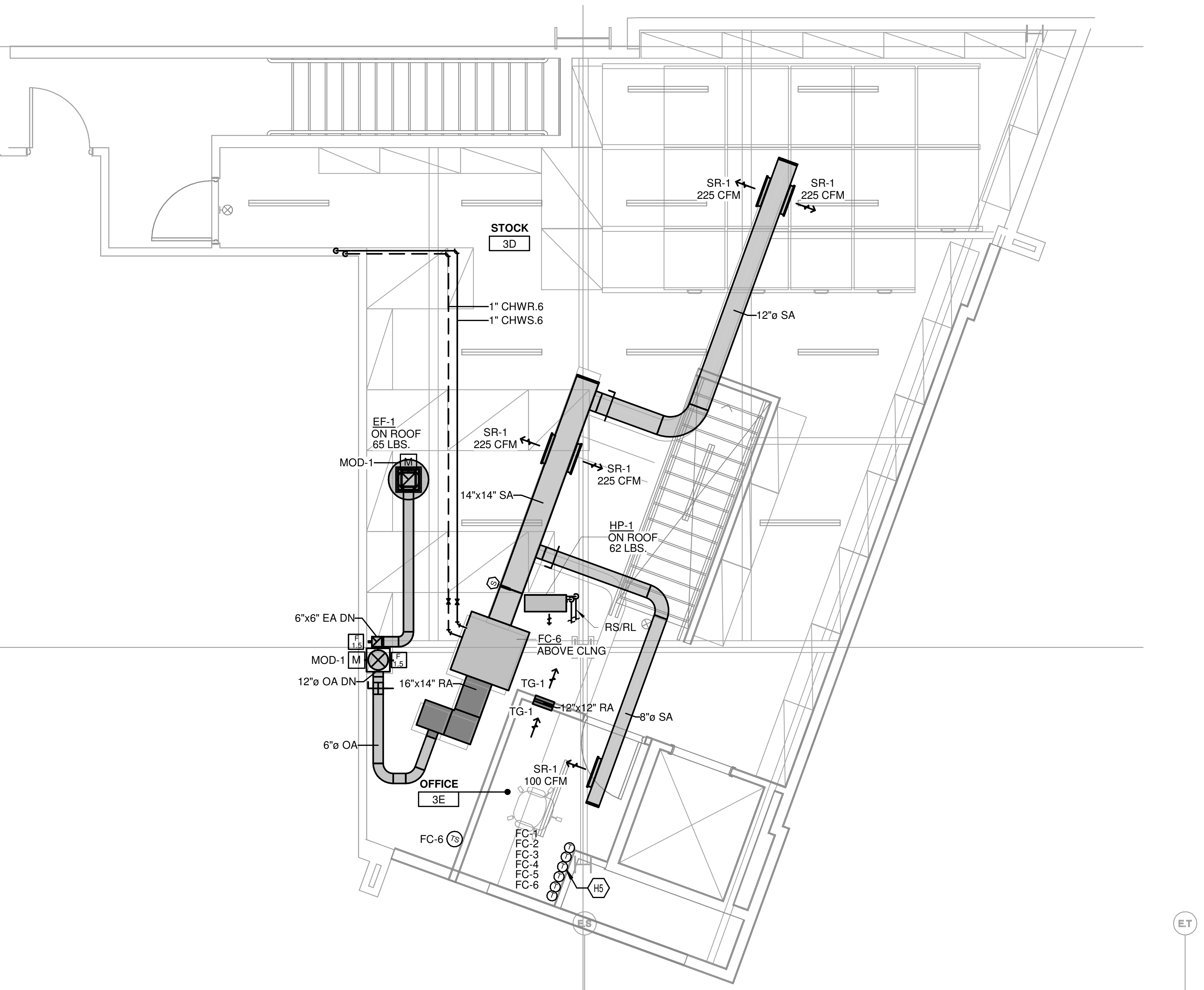
| 2 | 02.11.25 | BD Comments |
| | 01.16.25 | Permit and Bid Set |
| NO. | DATE | ISSUE |

MECHANICAL -
COMPLIANCE

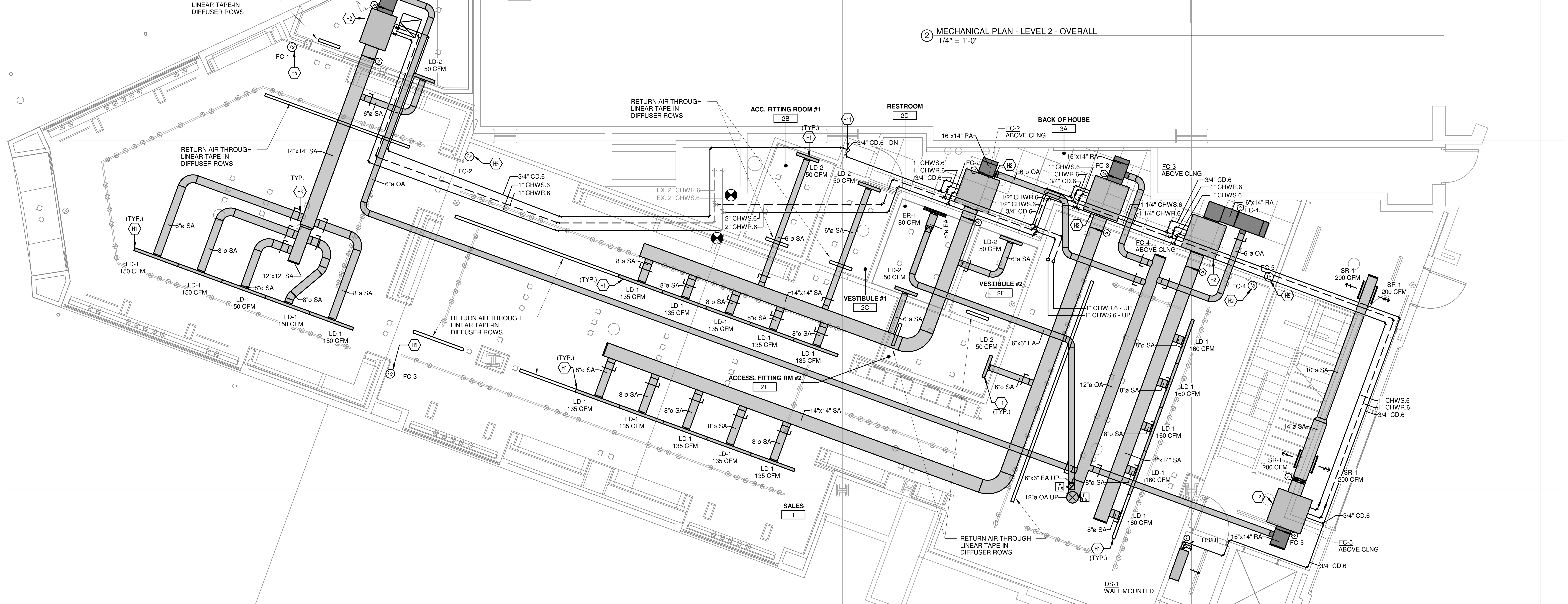
M0.04

## KEYED NOTES

| | |
|---|---|
| H1 | PROVIDE CABLE OPERATED DAMPER FOR SUPPLY BRANCH INSTALLED ABOVE INACCESSIBLE CEILING. |
| H2 | PROVIDE FAN COIL UNIT AS SCHEDULED. BALANCE TO THE SCHEDULED AIRFLOW. MAINTAIN ALL CODE AND MANUFACTURER REQUIRED CLEARANCES. INSTALL PER MANUFACTURER'S PUBLISHED INSTALLATION AND OPERATION MANUAL. DO NOT EXCEED MANUFACTURER'S MAXIMUM REFRIGERANT LINE LENGTH. |
| H3 | MECHANICAL CONTRACTOR SHALL FURNISH A NEW ADDRESSABLE SMOKE DETECTOR. MECHANICAL CONTRACTOR SHALL INSTALL SMOKE DETECTOR IN NEW AIR DUCT MAIN. MECHANICAL CONTRACTOR SHALL INTERLOCK SMOKE DETECTOR TO FAN MOTOR. ELECTRICAL CONTRACTOR SHALL WIRE SMOKE DETECTOR TO REMOTE ANNUNCIATOR. |
| H5 | PROVIDE TEMPERATURE CONTROLS (STATS / SENSORS) IN LOCATIONS SHOWN ON PLAN FOR AIR SOURCE VRF SYSTEM. CONFIRM FUTURE CONTROL REQUIREMENTS WITH LANDLORD FOR CONDENSER WATER SYSTEM PRIOR TO BID AND DOCUMENT FOR FUTURE SCOPE OF WORK UPON LANDLORD COMPLETION OF PLANT AND HYDRONIC STUB-INS TO TENANT SPACE. |
| H11 | EXTEND INSULATED COPPER CONDENSATE PIPING AS SHOWN TO FLOOR DRAIN AND TERMINATE WITH AIR GAP. |



② MECHANICAL PLAN - LEVEL 2 - OVERALL
1/4" = 1'-0"



① MECHANICAL PLAN - LEVEL 1 - OVERALL
1/4" = 1'-0"

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| | 01.16.25 | Permit and Bid Set |

MECHANICAL
DUCTWORK PLAN

M1.00

2" REFERENCE LINE
DESIGNER:AJK CHECKER: KSL