LEGEND

SYMBOL	ABBR	DESCRIPTION
VAV 3-1		EQUIPMENT IDENTIFICATION EQUIPMENT NUMBER (FLOOR NUMBER – UNIT SEQUENCE)
	CSD1	CEILING SUPPLY AIR DIFFUSER
	CRG1	CEILING RETURN AIR GRILLE
	CEG1	CEILING EXHAUST AIR GRILLE
		CEILING ACCESS PANEL
CODE / X CFM		AIR OUTLET DESIGNATION CODE AND CFM INLET NECK SIZE
CODE / CFM		EXHAUST AIR OUTLET DESIGNATION CODE CFM
OR		(E) DUCTWORK, PIPING OR EQUIPMENT TO REMAIN
OR		(E) DUCTWORK, PIPING OR EQUIPMENT TO BE REMOVED
OR		(N) OR (R) DUCTWORK, PIPING OR EQUIPMENT
OR	AL	ACOUSTICAL LINING (1" FIBER FREE, UON)
OR		SQUARE TO ROUND DUCT
OR		REDUCING TRANSITION
	VD	VOLUME DAMPER
		VOLUME DAMPER WITH REMOTE REGULATOR
		FLEX CONNECTION
	FD, FSD	FIRE DAMPER, COMBINATION FIRE/SMOKE DAMPER
R	R, D	DUCT RISE, DUCT DROP
		FLEXIBLE DUCT
	CFF	CAPPED FOR FUTURE
		DUCT DOWN
		DIRECTION OF AIRFLOW
T		THERMOSTAT
S		SWITCH
SD		DUCT SMOKE DETECTOR
	CTE	CONNECT TO EXISTING
	(E)	EXISTING
	(N)	NEW
	(R)	RELOCATED
	OSA	OUTSIDE AIR
	RA	RETURN AIR
	EA	EXHAUST AIR
	ACV	AUTOMATIC CONTROL VALVE
	BMS	BUILDING MANAGEMENT SYSTEM
	BDD	BACKDRAFT DAMPER
	UON	UNLESS OTHERWISE NOTED
	AFF	ABOVE FINISHED FLOOR
	CD	CONDENSATE DRAIN
	N/A	NOT APPLICABLE
	EF	EXHAUST FAN
	SAD	SEE ARCHITECTURAL DRAWINGS

GENERAL NOTES

1. CONTRACTOR SHALL CONFIRM ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS BEFORE START OF THIS WORK. DISCREPANCIES, IF ANY, MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IMMEDIATELY.
2. CONTRACTOR SHALL FOLLOW LATEST VERSION BUILDING TENANT CONSTRUCTION STANDARDS.
3. ALL BRANCH DUCTS CONNECTING TO DIFFUSERS TO BE OF SAME SIZE AS DIFFUSER NECK. (EXAMPLE: FOR DIFFUSER NECK SIZE 10" X 10". USE 10" ROUND DUCT).
4. USE ROUND TO SQUARE TRANSITION AT THE DIFFUSER NECK.
5. ALL BRANCH DUCTS CONNECTING TO VAV BOXES TO BE OF SAME SIZE AS VAV BOX INLET, UON. SEE VAV BOX SCHEDULE FOR VAV BOX INLET SIZE.
6. PROVIDE CONICAL TAKE–OFF FOR ALL NEW VAV BRANCH DUCTS CONNECTING TO EXISTING MAIN SUPPLY AIR LOOP.
7. SEAL ALL PIPE AND DUCT OPENINGS THROUGH FIRE RATED PARTITIONS USING FIRE SAFING FOAM.
8. RELOCATE EXISTING PIPES, DUCTWORK, ELECTRICAL CONDUITS, ETC. TO ACCOMMODATE NEW WORK.
9. PROVIDE AIR/WATER BALANCING FOR ALL SYSTEMS SHOWN ON THE DRAWING. (AIR OUTLETS, VRF, FAN COIL UNITS, AC UNITS, EF, ETC.) BALANCING SHALL BE PERFORMED BY AABC CERTIFIED INDEPENDENT FIRM AS PER BUILDING STANDARDS. MEASURE AND DOCUMENT SUPPLY AIR TEMPERATURE AT FULL HEATING AND FULL COOLING MODES.
10. MAINTAIN MINIMUM 2 FEET CLEARANCE IN FRONT OF THE VAV BOX CONTROLLER.
11. INSTALL EQUIPMENT AS HIGH AS POSSIBLE.
12. LOCATE THERMOSTATS SERVING FAN COILS/AC UNIT PER MECHANICAL FLOOR PLANS. COORDINATE EXACT LOCATION IN THE FIELD WITH ARCHITECT AND FURNITURE. FURNITURE SHALL NOT OBSTRUCT THERMOSTAT. TOP OF THE THERMOSTAT SHALL BE INSTALLED 48" AFF.
13. CEILING AND PLENUM SPACE FOR THIS PROJECT IS VERY LIMITED. VERY CLOSE COORDINATION BETWEEN THIS CONTRACTOR, ELECTRICAL, FIRE PROTECTION CONTRACTOR, PLUMBING CONTRACTOR, DATA AND SECURITY CONTRACTORS IS MANDATORY. MECHANICAL CONTRACTOR SHALL NOT START DUCTWORK FABRICATION UNTIL ALL AREAS OF THE PLENUM SPACE ARE FULLY COORDINATED AT ALL LOCATIONS. ADJUST AND PROVIDE DUCT SLICE FITTINGS, DUCT SIZES, SEAM SPACING, ETC. AS REQUIRED. PRODUCE SHOP DRAWINGS AND COORDINATE LAYOUT WITH ALL TRADES.
14. ALL PIPING, DUCTWORK, CONDUITS, WIRING, ETC. SHALL BE INSTALLED PARALLEL AND PERPENDICULAR TO BUILDING LINES.
15. LIFE SAFETY WORK/ INTERFACE (INCLUDING DUCT SMOKE DETECTORS) SHALL BE PROVIDED BY THE BUILDING'S LIFE SAFETY CONTRACTOR.
16. PROVIDE BUILDING STANDARD DUCT SMOKE DETECTOR AT NEW FC/AC UNITS AND WHERE SHOWN. DUCT DETECTOR SHALL BE FURNISHED AND INSTALLED BY DIV. 15. ELECTRICAL WIRING SHALL BE BY DIV. 16. LIFE SAFETY WIRING AND INTERFACING WITH BUILDING'S LIFE SAFETY SYSTEM SHALL BE BY THE BUILDING'S LIFE SAFETY SYSTEM PROVIDER. UPON SMOKE DETECTION ASSOCIATED FAN COIL/AC UNIT SHALL STOP OPERATION.

CONTROLS

17. PROVIDE STANDALONE CONTROLS BY VRV SYSTEM MANUFACTURER.
18. SET THERMOSTATS TO THE FOLLOWING, UON.:
    - FAN COIL UNITS (FC 1–1, 1–3, FC 1–4) – 74°F(COOLING), 70°F(HEATING) – ADJUSTABLE
    - FAN COIL UNIT (FC 1–2, –5) – 70°F(COOLING) – ADJUSTABLE
    - ROOF TOP UNIT (E)AC–1 74°F(COOLING), 70°F(HEATING) – ADJUSTABLE
19. ALL CONTROL WIRING SHALL BE NEATLY TIED TO THE BUILDING STRUCTURE.

SCOPE OF WORK

- NEW AIR DISTRIBUTION DUCTWORK AND AIR OUTLETS ARE BEING PROVIDED.
- (5) NEW FAN COIL UNITS (VRV SYSTEM) ARE BEING ADDED.
- (1) NEW CONDENSING UNIT (VRV SYSTEM) IS BEING ADDED.
- (1) NEW ROOF MOUNTED EXHAUST FAN IS BEING ADDED.
- NO NEW FSD IS BEING ADDED.

CALGREEN COMPLIANCE REQUIREMENTS

COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CALIFORNIA GREEN CODE REQUIREMENTS WITH LOCAL AMENDMENTS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- PROVIDE EQUIPMENTS AND CONTROLS TO COMPLY WITH THE T–24 ENERGY EFFICIENCY REQUIREMENTS.
- PLUMBING TRADE WORK TO PROVIDE WATER–EFFICIENT PLUMBING FIXTURES AND FAUCETS TO COMPLY WITH THE WATER EFFICIENCY REQUIREMENTS.
- PROVIDE EQUIPMENTS THAT DO NOT USE ENVIRONMENTALLY HARMFUL REFRIGERANTS SUCH AS CFCs, HCFCs, AND HALONS. NO NEW REFRIGERANT USING HVAC EQUIPMENT SPECIFIED FOR THE REMODELED SPACE.
- WHEN INSTALLING DUCTWORK, PIPING AND EQUIPMENTS, KEEP THE OPENINGS COVERED WITH SHEETMETAL CAPS TO ENSURE THAT CONSTRUCTION DUST AND POLLUTANTS DO NOT ENTER THE SYSTEM. PROTECT THE RETURN AIR SYSTEM DUCT OPENINGS WITH MERV 8 CONSTRUCTION FILTERS. REMOVE THE FILTERS AFTER THE CONSTRUCTION WORK IS COMPLETED.
- COMPLY WITH THE T–24 MANDATED TESTING, START–UP, COMMISSIONING, CERTIFICATION REQUIREMENTS INCLUDING HERS TESTING. PROVIDE OUTSIDE AIR CERTIFICATION EACH ZONES.
- PROVIDE THERMAL AND ACOUSTICAL INSULATION FOR THE HVAC AND PLUMBING SYSTEM TO SATISFY T–24 ENERGY EFFICIENCY REQUIREMENTS.
- COMPLY WITH ALL OTHER REQUIREMENTS LISTED IN THE CAL–GREEN CODE (CGC) CHECKLIST AND THE LOCAL CITY REQUIREMENTS FOR THE PROJECT.
- HVAC WORK SHALL BE PERFORMED BY A LICENSED MECHANICAL CONTRACTOR WHO IS TRAINED AND CERTIFIED IN THE PROPER INSTALLATION OF THE HVAC SYSTEMS, EQUIPMENTS, CONTROLS AND HAS AT LEAST 10 YEARS OF EXPERIENCE IN UNDERTAKING AND COMPLETING WORK SIMILAR TO THIS PROJECT IN SIZE, TYPE AND COMPLEXITY. PLUMBING CONTRACTOR SHALL BE QUALIFIED WITH MIN 7 YEARS OF EXPERIENCE IN PROJECTS OF SIMILAR TYPE AND COMPLEXITY.
- PREPARE AND SUBMIT OPERATING AND MAINTENANCE MANUALS FOR EACH SYSTEM OR EQUIPMENT (MECHANICAL, PLUMBING, ELECTRICAL AND CONTROL SYSTEMS) INSTALLED OR MODIFIED UNDER THIS CONTRACT, ALONG WITH SERVICE AND MAINTENANCE INSTRUCTIONS, AS–BUILT PLANS, GAURANTY/WARRANTY INFORMATION PRIOR TO FINAL INSPECTION IN ACCORDANCE WITH CBC5.410.5. SUBMIT COPIES OF ALL INSPECTION VERIFICATIONS AND REPORTS, T–24 FORMS REQUIRED BY THE ENFORCING AGENCY.
- ALL ADHESIVES, SEALANTS AND CAULKS USED ON THE PROJECT SHALL MEET THE REQUIREMENTS OF THE CGC 5.504.4.1 STANDARDS.
- PLUMBING FIXTURES AND FITTINGS SHALL MEET THE APPLICABLE STANDARDS REFERENCED IN TABLE 1401.1 OF 2016 CALIFORNIA PLUMBING CODE AND IN CHAPTER 6 OF CGC.
- GREEN BUILDING CHECKLIST IS IN THE ARCHITECTURAL SET.

ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH APPLICABLE CODES FOR CITY OF RICHMOND

2016 CALIFORNIA BUILDING CODE

2016 CALIFORNIA MECHANICAL CODE

2016 CALIFORNIA ELECTRICAL CODE

2016 CALIFORNIA PLUMBING CODE

2016 CALIFORNIA FIRE CODE

2016 CALIFORNIA ENERGY COMMISSION BUILDING ENERGY EFFICIENCY STANDARDS

2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CAL–GREEN)

(ALL APPLICABLE CODES WITH ALL RICHMOND AMENDMENTS)

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1M0.0.3	MECHANICAL SCHEDULES
1M0.0.4	MECHANICAL SPECIFICATIONS
1MD1.0.1	1ST FLOOR – MECHANICAL DEMOLITION PLAN
1M2.0.1	1ST FLOOR – MECHANICAL FLOOR PLAN
1M2.0.2	1ST FLOOR – MECHANICAL PIPING PLAN
1M2.1.1	MECHANICAL ROOF PLAN
1M3.0.1	MECHANICAL DETAILS
1M3.0.2	MECHANICAL DETAILS
1TM4.0.1	MECHANICAL TITLE 24
1TM4.0.2	MECHANICAL TITLE 24
1TM4.0.3	MECHANICAL TITLE 24
1TM4.0.4	MECHANICAL TITLE 24
1TM4.0.5	MECHANICAL TITLE 24

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER AMIT WADHWA M30894 EXP. 12/31/20 MECHANICAL STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates Engineers
870 Market Street
(Penof 886) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

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GENERAL NOTES, LEGEND & DRAWING INDEX

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Drawn By: PT Reviewed By: AW
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1M0.0.1

VRV SYSTEM SCHEDULE

MFR: DAIKIN

FAN COIL UNIT

CODE	MODEL	SYSTEM COOLING CAPACITY (NOMINAL)	SEER	FAN		O.A. CFM	2-PIPE REFRIGERANT PIPE CONNECTION	WEIGHT	ELECTRICAL				
				CFM	ESP				VOLT	PH	Hz	MCA	MOCP
FC 1-1	FXMQ96MVJU	8.0 TONS	–	2540	0.4	275	PER MANUFACTURER'S RECOMMENDATIONS	305 LBS.	230	1	60	10.7	15
FC 1-2	FXAQ24PVJU	2.0 TONS	–	635	0.4	–	PER MANUFACTURER'S RECOMMENDATIONS	35 LBS.	230	1	60	0.6	15
FC 1-3	FXMQ36PBVJU	3.0 TONS	–	1090	0.4	100	PER MANUFACTURER'S RECOMMENDATIONS	105 LBS.	230	1	60	2.9	15
FC 1-4	FXMQ24PBVJU	2.0 TONS	–	685	0.4	100	PER MANUFACTURER'S RECOMMENDATIONS	80 LBS.	230	1	60	1.8	15
FC 1-5	FXAQ24PVJU	2.0 TONS	–	635	0.4	–	PER MANUFACTURER'S RECOMMENDATIONS	35 LBS.	230	1	60	0.6	15

BRANCH SELECTOR

CODE	PORT CONFIGURATION	MODEL NO.	3-PIPE REFRIGERANT PIPE CONNECTION	WEIGHT	ELECTRICAL				
					VOLT	PH	Hz	MCA	MOCP
BS 1-A1	MULTI-PORT	BS8Q54TVJ	PER MANUFACTURER'S RECOMMENDATIONS	75 LBS	208	1	60	0.8	15

REMARKS

1. PROVIDE PROGRAMMABLE ROOM THERMOSTAT. THERMOSTAT SHALL MEET TITLE 24 REQUIREMENTS.
2. ALL REFRIGERANT PIPE SIZES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE WRITTEN DOCUMENTATION FROM THE MANUFACTURER INDICATING THE REQUIRED PIPE SIZES FOR EACH UNIT AND THE MAIN/ BRANCH LINES.
4. ALL REFRIGERANT PIPE SHALL BE INSULATED.
5. CONTRACTOR TO RUN LOW/ HIGH VOLTAGE CONTROL WIRING IN CONDUIT BETWEEN CONDENSING UNIT, FAN COIL UNIT AND BRANCH SELECTOR AS REQUIRED.
6. PROVIDE NECESSARY WIRING PER MANUFACTURER'S RECOMMENDATION BETWEEN BETWEEN CONDENSING UNIT, FAN COIL UNIT AND BRANCH SELECTOR AS REQUIRED.
7. PROVIDE ALL REQUIRED ACCESSORIES FOR LONG REFRIGERANT LINE APPLICATION.
8. PROVIDE NECESSARY LOW VOLTAGE TRANSFORMER AS REQUIRED.
9. IF REQUIRED, PROVIDE ADDITIONAL REFRIGERANT CHARGE PER MANUFACTURER'S RECOMMENDATIONS.
10. ALL FAN COIL UNITS ARE HEATING/ COOLING UNITS. FC 1-2 & -5 SHALL BE COOLING ONLY.
11. PROVIDE OPTIONAL IN-BUILT CONDENSATE PUMP.
12. REFRIGERANT SHALL BE R-410A.
13. PROVIDE LONG LIFE FILTER. MERV 13.
14. PROVIDE DAIKIN VRV I TOUCH SYSTEM CONTROLLER.
15. PROVIDE FACTORY SHOP DRAWINGS SHOWING THE ENTIRE VRV SYSTEM LAYOUT (FCUs, BRANCH SELECTOR, CU, PIPING, ETC.) DRAWN TO ACTUAL SCALE.
16. PROVIDE SPEED CONTROLLER FOR FC.
17. EXTERIOR AIR COOLED CONDENSER UNITS SHALL SHALL BE INSTALLED ON THE ROOF.
18. REFRIGERANT GAS QUANTITY IS 50.8 LBS.
19. EER: NON-DUCTED=11.6, DUCTED=11.2
20. IEER: NON-DUCTED=22.0, DUCTED=20.7
21. HEATING COP: DUCTED=3.2
22. PROVIDE MINIMUM 8 PORT BRANCH SELECTOR. ALL PORTS (INCLUDING SPARE) SHALL BE PROVIDED WITH MUELLER CYCLEMASTER BALL VALVES AND REFNET JOINT OUTLET CONNECTION.
23. MFR: DAIKIN OR APPROVED EQUAL.

REFRIGERANT LINES NOTES

1. THIS PROJECT ENTAILS LONG REFRIGERANT LINES. PROVIDE ALL ACCESSORIES REQUIRED FOR LONG REFRIGERANT LINE APPLICATION. THESE SHOULD INCLUDE, BUT NOT LIMITED TO:
   a. ADDITIONAL REFRIGERANT CHARGE AS NEEDED
   b. ADDITIONAL OIL AS NEEDED
   c. PROVIDE VIBRATION ELIMINATING DEVICES

   COORDINATE WITH THE MANUFACTURER AND PROVIDE ALL THE REQUIRED ACCESSORIES.
3. STRICTLY FOLLOW MANUFACTURER'S INSTALLATION GUIDELINES.
4. USE CONTINUOUS COPPER TUBING WITHOUT BREAKS AND LONG-RADIUS ELBOWS. DO NOT USE SHORT PIPE SECTIONS WITH BRAZED JOINTS. LIMIT ELBOWS, TURNS AND FITTINGS TO ABSOLUTE MINIMUM. RUN IN STRAIGHT LINE.
5. PITCH ALL HORIZONTAL RUNS ½" PER 10 FEET IN THE DIRECTION OF FLOW.
6. REFRIGERANT LINE SIZES SHALL BE STRICTLY PER MANUFACTURERS RECOMMENDATIONS.

CONDENSER UNIT

CODE	MODEL NO.	UNIT TYPE	SYSTEM TONAGE	SYSTEM (COOLING BTU)	WEIGHT (EACH MODULE)	ELECTRICAL				
						VOLT	PH	Hz	MCA	MOCP
CU 1-1	REYQ168TAYDU	EXTERIOR AIR COOLED	14 TONS	144,000	800 LBS	460	3	60	36.1	40

COMPLIANCE WITH CMC TABLE 1102.2
REFRIGERANT ALLOWABLE QUANTITIES CALCULATION

1ST FLOOR VRV SYSTEM

ROOM/AREA	AREA (sq.sf)	HEIGHT (ft.)	VOLUME (cu.ft)	MAXIMUM ALLOWABLE QUANTITY (lbs.)	ACTUAL REFRIGERANT AMOUNT (lbs.)	REQUIRED ROOM OPEN FOR CALCULATION COMPLIANCE	TOTAL VOLUME (cu.ft.) WITH OPENING	MAXIMUM ALLOWABLE QUANTITY (lbs.) IN COMBINED SPACE	ROOM VOLUME COMPLIES	REMARKS
IDF ROOM 106	140	17	2380	62	50.8	N/A	N/A	N/A	YES	62 >50.8
STORAGE ROOM 116	155	17	2635	69	50.8	N/A	N/A	N/A	YES	69 >50.8
ELECTRICAL ROOM 117	295	17	5015	130	50.8	N/A	N/A	N/A	YES	130 > 50.8
OPEN OFFICE	6730	17	114410	2975	50.8	N/A	N/A	N/A	YES	2975 > 50.8

PER 2016 CMC, TABLE1102.2 "REFRIGERANT GROUPS, PROPERTIES, AND ALLOWABLE QUANTITIES":

- R-410A: ALLOWABLE IS 26LBS PER 1000 CUBIC FEET OF SPACE.
- MAXIMUM ALLOWABLE QUANTITY FORMULA: (ROOM) cu.ft x 26LBS/ 1000 cu.ft = (REFRIGERANT AMOUNT) LBS
- AMOUNT OF REFRIGERANT USED FOR VRV SYSTEM IS 50.8 LBS.

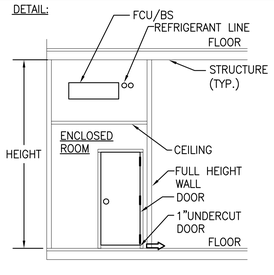
GENERAL NOTES:

1. ROOMS AND AREA INDICATE THE LOCATION OF FCU LOCATIONS AND THE AREA WHERE THE REFRIGERANT PIPING IS ROUTED.
2. VOLUME IS CALCULATED USING FLOOR-TO-CEILING HEIGHT PER 2016 CMC 1104.2.3.2 PLENUM DUE TO EXISTING WOOD STRUCTURE. PLENUMS ARE NOT PART OF THE AIR SUPPLY OR RETURN SYSTEM.
3. MAXIMUM ALLOWABLE QUANTITY CALCULATIONS HAVE BEEN DONE FOR COMMON AREA AND EACH ENCLOSED ROOM WHERE A FAN COIL UNIT IS LOCATED. ROOM NUMBERS INDICATED IN TABLE.
4. HALLWAY/COMMON AREA SQUARE FOOTAGE NOTED IN TABLE INDICATES THE SUMMATION OF ALL ADJACENT CONTIGUOUS OPEN COMMON AREAS' SQUARE FOOTAGE. THE COMMON AREAS' VOLUME SHALL BE USED TO DISSIPATE REFRIGERANT GAS IF A LEAK OCCURS.

TABLE NOTES:

A. PROVIDE 1" UNDERCUT FOR ENTRY DOOR OF ALL ENCLOSED ROOMS THAT HAS FAN COIL UNITS, BRANCH CONTROLLER AND REFRIGERANT PIPING TO ALLOW ANY REFRIGERANT WITHIN ROOM TO SPILL OUT AND DILUTE INTO THE COMMON AREAS. SEE MECHANICAL PIPING PLAN DRAWING 1M2.0.2.

DETAIL:



ECONOMIZER EXCEPTION CALCULATIONS

A. ECONOMIZER EXCEPTION 4 TO SECTION 140.4(e)1.

B. PER TABLE 110.2-H: ELECTRICALLY OPERATED VRF AIR CONDITIONERS MINIMUM EFFICIENCY REQUIREMENTS.
   1. AIR COOLED VRF AIR CONDITIONERS SIZED ≤ 240,000 BTU/H : 11.6 IEER.

C. PER TABLE 140.4-A ECONOMIZER TRADE-OFF TABLE FOR COOLING SYSTEMS.
   1. FOR CLIMATE ZONE 3: EFFICIENCY IMPROVEMENT IS 65%.
   2. 65% EFFICIENCY IMPROVEMENT OF 11.6 IEER IS 17.8 IEER.

D. IEER FOR DUCTED FCUs IS 20.7, NON-DUCTED FCUs IS 22.0.
   1. IEER FOR DESIGNED SYSTEM IS 22.05 IEER.
   2. 20.0 IEER IS GREATER THAN REQUIRED 17.8 IEER. FAN COIL UNITS LARGER THAN 54,000 BTU/H ARE EXEMPTED FROM ECONOMIZER REQUIREMENTS.

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER AMIT WADHWA M30894 EXP. 12/31/20 MECHANICAL STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates Engineers
870 Market Street
(Floor 985) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

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MECHANICAL SCHEDULES

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1M0.0.2

AIR OUTLET SCHEDULE

MFR: TITUS OR APPROVED EQUAL

CODE	MODEL	DESCRIPTION
CSD1	PMC	PERFORATED FACE CEILING SUPPLY DIFFUSER WITH 24" x 24" FACE. MODULAR CORE WITH ADJUSTABLE DISCHARGE PATTERNS. SEE PLAN FOR ROUND NECK SIZE AND THROW PATTERN.
CRG1	PAR	PERFORATED FACE CEILING RETURN GRILLE WITH 24" x 24" FACE AND 22" x 22" NECK. (ALL RETURN AIR GRILLES)
CEG1	PAR	PERFORATED FACE CEILING RETURN GRILLE WITH 24 x 24" FACE AND 22" x 22" NECK. (ALL RETURN AIR GRILLES)
CEG2	355ZFL	CEILING MOUNTED GRILLE. 1/2" FIXED BLADE, 0° DEFLECTION. ALUMINUM CONSTRUCTION. SEE PLAN FOR SIZE. PROVIDE SHEET METAL TRANSITION TO CONNECT TO DUCTWORK.

NOTE:

1. COORDINATE BORDER/FACE TYPE WITH THE ARCHITECT AND CEILING TYPE. UON.
2. PROVIDE ALL HARDWARE AS REQUIRED FOR MOUNTING AIR–OUTLETS ON VARIOUS CEILING TYPES. COORDINATE WITH CEILING PROVIDER.
3. VARIOUS CEILING TYPES ARE BEING USED ON THE FLOOR. IT IS MANDATORY TO CHECK COMPATIBILITY OF AIR OUTLET BORDER WITH CEILING TYPE PRIOR TO PLACING ORDER.

VIBRATION ISOLATOR SCHEDULE

MFR: MASON OR APPROVED EQUAL

EQUIPMENT	ISOLATOR		SEISMIC RESTRAINT	REMARKS
	TYPE	S.D.		
FAN COIL UNITS(FC 1–1, –3, –4)	30N	1"	SEISMIC BRACE CABLE	①②
BRANCH SELECTOR	30N	1"	SEISMIC BRACE CABLE	①②
CU1–1	SLR	1"	IN–BUILT IN SLR	①②

NOTES:

① FOR NUMBER OF MOUNTS, DIMENSION, ETC. COORDINATE WITH EQUIPMENT MANUFACTURER.

② PROVIDE HEIGHT SAVING BRACKETS.

EXHAUST FAN SCHEDULE

MFR: GREENHECK OR APPROVED EQUAL

CODE	TYPE AND SIZE	CFM	ESP "W.G.	MTR. WATTS	VOLTS PHASE	SERVICE	LOCATION	REMARKS
EF 1–1	ROOF CENTRIFUGAL, G–123–VG	950	0.6	¼HP	120V/1ø	RESTROOMS/COPY/PANTRY	ROOF	

NOTES:

1. INSTALL EXHAUST FAN ON FACTORY ROOF CURB.
2. PROVIDE BACKDRAFT DAMPER.
3. FAN SHALL BE UL LISTED. PROVIDE VARI–GREEN EC MOTOR WITH POTENTIOMETER DIAL. POTENTIOMETER DIAL SHALL BE ACCESSIBLE.
4. MECHANICAL CONTRACTOR TO PROVIDE 7–DAY TIME CLOCK FOR START/ STOP. WIRING BY ELECTRICAL CONTRACTOR.

EXISTING PACKAGED ROOFTOP AIR CONDITIONING UNIT SCHEDULE

CODE	SERVICE	LOCATION	MANUFACTURER	MODEL	CFM	ESP (IN.WC)	COOLING CAPACITY			HEATING CAPACITY					UNIT ELECTRICAL			MOTOR (BHP)	SEER (EER)	MINIMUM OUTSIDE AIR (CFM)	OPER. WEIGHT LBS.	REMARKS
							TONS	SENS MBH	TOTAL MBH	INPUT MBH	OUTPUT MBH	FUEL	EAT (°F)	LAT (°F)	MCA	MOCP	V/ø/Hz					
(E)AC–1	FIRST FLOOR	ROOF	TRANE	YCD180B4L0EA	5415	(E)	15	(E)	(E)	(E)	(E)	NATURAL GAS	(E)	(E)	(E)	(E)	(E)	(E)	(E)	750	(E)	SEE NOTE 3

NOTES:

1. BALANCE AIR FLOW TO CFM QUANTITIES INDICATED. RECOMMISSION THE UNIT.
2. PROVIDE NEW MERV 13 FILTERS.
3. PROVIDE CERTIFIED STARTUP REPORT VALIDATING THE PERFORMANCE OF THE UNIT. PROVIDE POINT–BYPOINT INSPECTION BY A FACTORY AUTHORIZED TECHNICIAN.
4. THE UNIT SHALL BE TESTED THROUGH THEIR ENTIRE RANGE OF OPERATION FROM FULL COOLING TO FULL HEATING. DOCUMENT SUPPLY, RETURN AND OA TEMPERATURES AT FULL COOLING AND FULL HEATING.
5. ENTIRE ELECTRIC/GAS UNIT SECTIONS BE RECOMMISSIONED, REFURBISHED AND RECHARGED IN ORDER TO ACHIEVE TO THEIR ORIGINAL FACTORY PERFORMANCE. ALL WORK SHALL BE DONE BY FACTORY AUTHORIZED TECHNICIAN. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO BRING THE UNITS TO PERFORM AT THEIR INTENDED DESIGN.
6. RE–CALIBRATE CONTROLS AND SETTINGS.
7. PROVIDE NEW THERMOSTAT.

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER
AMIT WADHWA
M30894
EXP. 12/31/20
MECHANICAL
STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers
870 Market Street
(Floor 984) Suite 446
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

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MECHANICAL SCHEDULES

Scale: NONE Issue Date: 17APR19
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Sheet: 3 of 15

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SPECIFICATIONS - DIVISION 15

1 - GENERAL

1.1 Provide all labor, equipment and materials that are required, to provide a complete, properly operating and safe mechanical installation. The extent of the work is indicated on the drawings and as described in these specifications, shall include all that may be reasonably inferred to be required for proper execution of installation work and/or systems' operation.

1.2 Provide cutting and patching as required for execution of work performed under this Section unless specifically provided for, under other Sections.

1.3 Repair or replace, to the satisfaction of the Owner, any damage to work of this Section, damage caused by leaks or breaks in systems of this Section, and damage caused by work of this Section.

1.4 Coordinate with work performed by other Sections, in order to accommodate the requirements of this Section, and to assure adequate space and proper location for all necessary work of this project whether or not work is under this Section.

1.5 Provide all necessary rigging equipment and manpower to set new equipment and materials in place.

1.6 Provide all seismic restraints required by code, or this specification, for all equipment, duct, pipe, and materials furnished under this Section. This Contractor is responsible for the design of the restraints and for proof of adequacy of the restraints. Equipment, ductwork, and piping shall be restrained in all directions.

1.7 Provide all labor and material required to set and adjust the installation so that it performs in accordance with the design intent included in the drawings and these specifications.

1.8 The work installed under this Section shall conform to all applicable federal, state and local codes, regulations, and standards.

1.9 Reasonable effort has been made to coordinate the location of equipment and materials with the structure and other trades, it is the responsibility of this Contractor to coordinate exact requirements and locations as governed by actual job conditions, manufacturer's recommendations etc. Check all information and report any discrepancies to the Architect before fabrication or purchasing any equipment and in time to avoid unnecessary work.

1.10 Provide, procure, and pay for all permits, services, meters, licenses, fees, etc., required for performance of work of this Section.

1.11 Install equipment and materials with all working parts readily accessible for inspection, repair, and renewal.

1.12 Confer with the Owner/Architect to establish exact locations, mounting heights, and arrangements of all the finish work prior to roughing in.

1.13 Workmanship shall be first class throughout and performed only by competent and experienced workmen in a manner satisfactory to the Owner. Constant supervision of the work, either by the Contractor or his competent representative, shall be maintained.

1.14 Include all cutting and repairing necessary and required for this installation that is not covered by other trades. Structural members shall not be cut except with the written approval of the Architect. Repairing shall be performed by workmen skilled in the trades involved in a manner satisfactory to the Architect.

1.15 Submit for approval shop drawings/and Equipment submittals (including controls).

1.16 Refer to and follow Building Tenant Construction Standards. If discrepancies are found, follow the more stringent requirement.

1.17 All equipment piping, ductwork, etc. shall be braced and anchored to resist horizontal forces acting in any direction in accordance with the latest California/ City of Richmond Codes.

1.18 Install all piping and ductwork to best suit field conditions and coordinate with the installation work of other trades. The drawings are diagrammatic and shall not be scaled to determine exact locations of piping or ductwork.

1.19 Coordinate ductwork, piping with structural drawings, electrical including lighting, audio visual and sprinkler system. Provide transitions as required.

1.20 Contractor shall coordinate with architect ceiling access panels for all required fire, smoke, volume dampers and Mechanical equipment in inaccessible ceiling as required.

1.21 Provide all miscellaneous steel, special supports and anchoring for all Mechanical equipment requiring such.

1.22 Seal all fire rated penetrations with fire retardant material as required per NFPA and CBC.

1.23 Ducts stored on the construction site shall be protected and isolated from dust contamination.

1.24 Not all existing pipes, conduits, ducts, etc. are shown on these drawings. Where existing pipes, conduits and/or ducts which are to remain prevent installation of new work, relocate, or arrange for relocation of existing pipes, conduits and/or ducts, to facilitate new work.

1.25 All materials and workmanship are subject to review and approval by the architect. Any portion of the work found to be defective shall be replaced by the contractor as part of this contract at no additional cost to the owner.

1.26 Not all duct and piping transitions and/or offsets are shown. Provide transitions and/or offsets at no additional cost to owner.

1.27 Provide all required miscellaneous steel for complete installation of systems and for support of ductwork, piping, etc.

1.28 Drawing are diagrammatic in nature and all conditions shall be contractor coordinated and verified for exact location and sizes. The contractor is responsible to thoroughly verify all existing field conditions before submitting his/her bid.

1.29 Contractor shall provide dust covers as required to contain dust and debris within construction area and keep dust to a minimum.

1.30 Absolute accuracy of the drawings can not be guaranteed. While every effort has been made to coordinate the location of existing equipment, piping, etc., it is the responsibility of the contractor to coordinate the exact requirements governed by actual job conditions.

1.31 The submission of bid proposal shall be considered as conclusive evidence that the contractor is thoroughly familiar with the intent of the contract documents and scope of work. The contractor, prior to bidding, shall visit the job site, check existing installations and systems related to his/her work and shall, in the bid proposal, include all labor and material required to complete the system.

1.32 Contractor shall complete the work with minimum interference with existing systems. Any shutdown of the existing system shall be coordinated with the general contractor and the owner's representative three weeks in advance.

1.33 All work shall be in compliance with all applicable federal, state and local codes, regulations and standards.

1.34 Contractor shall protect the equipment, duct openings, pipes, etc. to prevent dust & debris from entering during construction. The existing air handling system return air openings shall be protected with minimum MERV 8 rated construction filters until, the construction activity is completed and ready for balancing in accordance with CAL-Green requirements.

2 - MATERIALS

2.1 Fabricate ductwork of galvanized sheet metal in accordance with latest edition of the SMACNA duct manual and ASHRAE guide. Seal and tape all duct joints airtight.

2.2 Acoustical Lining: Acoustical lining shall be 1" thick, fiber-free duct liner and shall meet UL-181 requirements. Install per manufacturer's recommendations.

2.3 Flexible Round Ducts: UL Class I air ducts with helical support wire, scrim cloth inner liner, R-4 insulation and outer plastic liner. Cody/West or equal. Use only to make final connections to the air-outlets. Maximum length allowed is 5 feet.

2.4 Fan Coil Units Supply/ Return ductwork for 2" pressure rating, seal Class A.

2.5 Transfer/ Return/Outside Air Ducts: 2" static pressure rating; 2,000 FPM maximum, seal Class A.

2.6 Insulate all condensate drain lines with $\frac{1}{2}$" thick jacketed Owens Corning fiberglass SSL-II insulation. Provide vapor barrier.

2.7 All ductwork shall be spiral round as shown with no flanged joints. Ductwork shall be neatly supported and braced seismically.

2.8 All insulation material shall meet flame spread rating of 25 and smoke developed rating of 50.

2.9 Refrigerant lines shall be copper Type K (Domestically manufactured in the USA) and silver brazed. Working pressure rating for the entire refrigerant assembly shall be 1.5X the system pressure.

2.10 All drain lines shall be copper Type M, 95/ 5 solder. Domestically manufactured in the USA.

2.11 Insulate entire length of refrigerant lines. Provide hard aluminum jacket to protect piping and insulation routed outside. Interior piping insulation shall incorporate soft jacket to protect insulation. Provide vapor barrier. Insulation thickness and density shall meet Title 24 requirements.

2.12 Insulate all condensate drain lines with $\frac{1}{2}$" thick jacketed Owens Corning fiberglass SSL-II insulation.

2.13 All insulation material shall meet flame spread rating of 25 and smoke developed rating of 50.

2.14 Duct insulation shall be by Owens Corning. $1\frac{1}{2}$" thick and minimum density of 1 PCF. Insulation shall incorporate protective aluminum foil jacket.

2.15 All material in the ceiling plenum shall be plenum rated.

2.16 Provide dielectric union when connecting dissimilar metals.

3 - EXECUTION

3.1 Supports and Hangers: Use Super Strut, Unistrut, B-Line, Elcen or Grinnell hangers and structural attachments to properly support equipment, ductwork, and piping systems according to good standard practice and according to the manufacturer's recommendations. Minimum safety factor of 5.0. Support system shall meet all local codes.

3.2 No piping shall have direct contact with the hanging and support system or the structure. On pipes that are insulated, run the insulation continuous through the hanger and provide sheet metal shields of proper length and gages under the insulation to prevent crushing. On uninsulated copper piping, use Stoneman "trisolator" or similar Unistrut or Super-Strut device at each hanger or support point.

3.3 Design seismic restraints per SMACNA/PPIC "Guidelines for Seismic Restraints of Mechanical Systems and Piping Systems", for equipment, ducts, and piping.

3.4 Provide Access door and panels whenever a piece of equipment or valve and operator is inaccessible and requires access for maintenance, repair or adjustment.

3.5 Provide equipment (FC, etc.) and piping identification labeling. ¾" lettering on pipes and 1-1/2" lettering on equipment. Include directional arrows on piping. Coordinate style/ color with the Chief Building Engineer.

3.6 Fire/Smoke dampers shall be installed according to state and local codes and exactly as tested by UL to develop fire ratings.

3.7 Provide 18" x 12" minimum access doors in ductwork and furring to provide easy access to each fire damper. Use insulated access doors in insulated ducts.

3.8 The installation of all ductwork, louvers, dampers, etc., shall be according to the SMACNA standards.

3.9 Ducts shall be hung with galvanized 1" x 18 gauge duct straps with spacing as recommended by SMACNA or as required by local codes, whichever is most stringent. Provide sway bracing on all ductwork in accordance with the local codes.

3.10 Throughout the progress of the work, protect all pipe, conduit, ducts, fixtures, and equipment from intrusion by rain, dirt, and foreign matter, and from damage of any kind. Thoroughly clean all metallic, plastic, and painted surfaces of equipment prior to final inspection.

3.11 Flush pipes and ducts free from foreign substances before installing valves, stops, or making final connections.

3.12 After all other work has been accomplished, clean all air outlet faces. Remove all debris of work of this Section from site.

3.13 All materials, parts, equipment, modifications made, and workmanship shall be guaranteed for a period of one year from date of acceptance of the work. This guarantee is contingent upon the system being properly maintained by a qualified mechanic familiar with this equipment and that the equipment is not abused. Excluded is normal wear and tear, replacement of filters and belts, and acts of God. If the manufacturer provides for a longer guarantee period, it shall also be submitted.

3.14 Develop and provide final as-built, reproducible drawings and all O&M manuals prior to final acceptance.

3.15 Start, operate and commission all systems. Provide the services of factory trained technicians for start-up of major equipment and all systems including but not limited to temperature controls, VRV system.

3.16 Air balancing shall be performed by AABC certified independent balancing contractor per AABC format.

3.17 Insulate all unexposed Supply and Return air ductwork.

3.18 All new filters shall be minimum MERV 13.

3.19 All equipment, ductwork and piping shall be supported using drilled anchors. Do not use powder driven inserts.

3.20 No CFC equipment shall be added.

3.21 Contractor to provide all labor and material required to complete and perform all acceptance tests as required by 2016 Title 24. Acceptance tests forms are included under Title 24 sheets. Contractor to provide additional forms as required. Review all forms and provide cost for all acceptance tests in the base bid.

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

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SPECIFICATIOS

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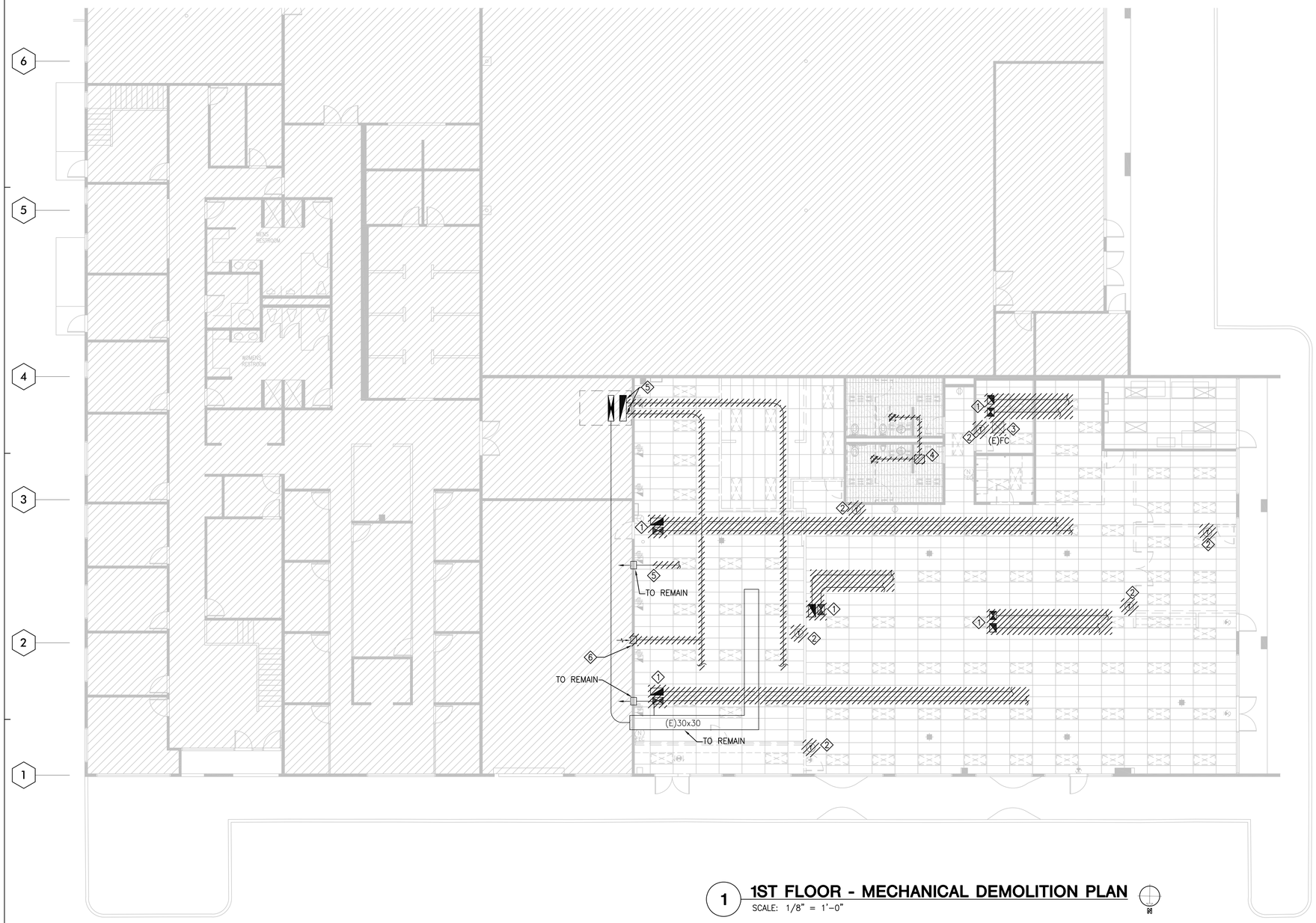

DEMOLITION SHEET NOTES:

1. U.O.N., REMOVE EXISTING BRANCH DUCTWORK, DIFFUSERS, SUPPLY & RETURN AIR PLENUM & SUPPORTS DOWNSTREAM OF ROOFTOP AC UNIT.
2. EXISTING THERMOSTAT & WIRING TO BE REMOVED.
3. REMOVE EXISTING CEILING AC UNIT & ASSOCIATED PIPING, THERMOSTAT AND CONTROL. REMOVE ASSOCIATED SUPPORTS.
4. REMOVE EXISTING EXHAUST DUCT AND ASSOCIATED DUCTWORK, GRILLES, SUPPORTS.
5. DEMO UP TO THIS POINT.
6. REMOVE GRILLE AND PATCH & SEAL WALL OPENING TO MATCH EXISTING. SEAL OPENING AIR TIGHT.

1 1ST FLOOR - MECHANICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

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brereton

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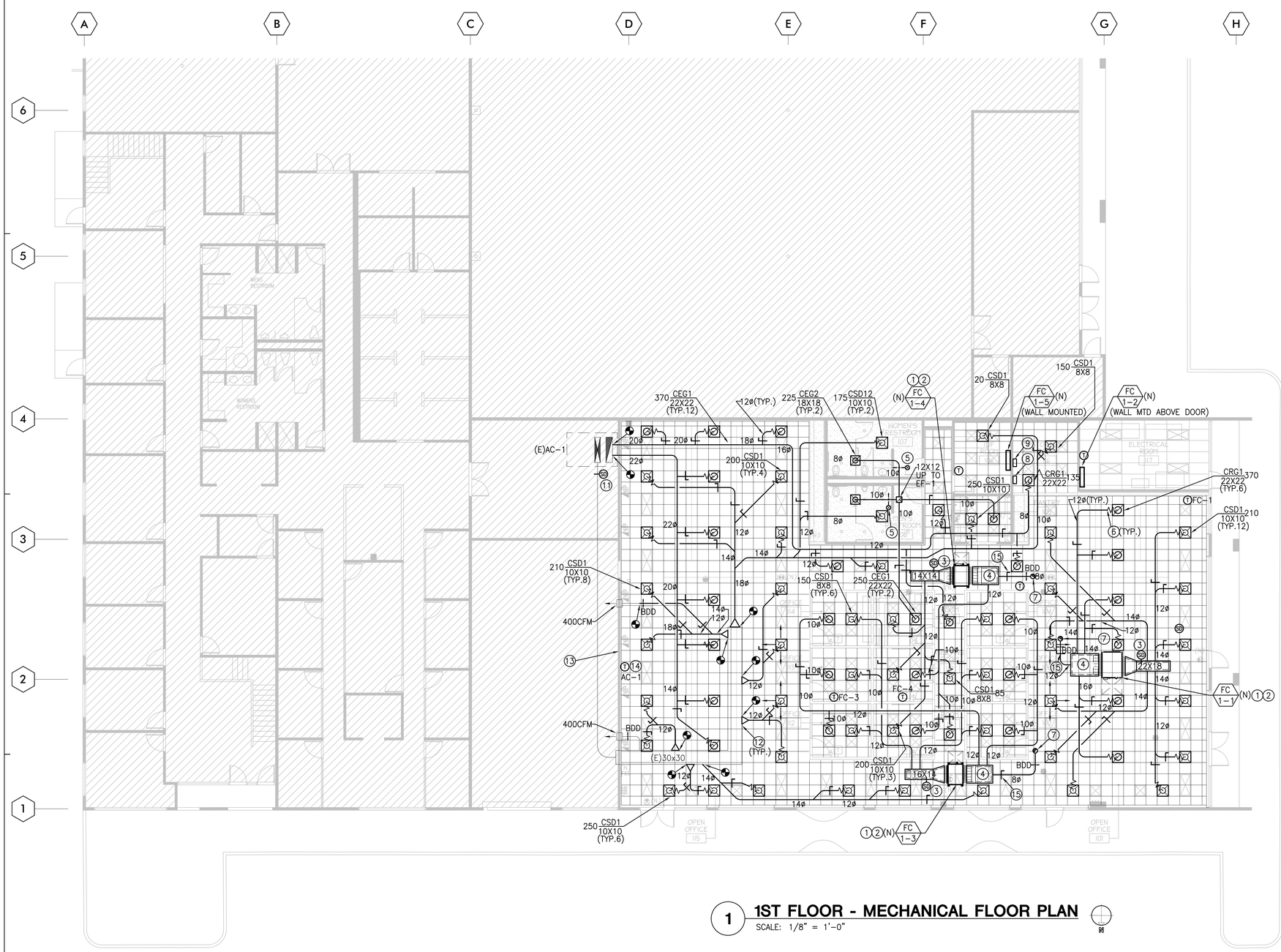

1 1ST FLOOR - MECHANICAL FLOOR PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. OFFSET FULL HEIGHT WALL(S) ABOVE CEILING TO AVOID CONFLICT WITH THE DUCTWORK/ PIPING.
2. COORDINATE THERMOSTAT LOCATION/HEIGHT WITH THE ARCHITECT AND FURNITURE LAYOUT. FURNITURE SHALL NOT OBSTRUCT THERMOSTAT. CENTER THERMOSTAT ON COLUMNS IN OPEN OFFICE AREAS. TOP OF THERMOSTATS SHALL BE INSTALLED AT 48" ABOVE FINISHED FLOOR.
3. INSTALL ALL PIPING AS HIGH AS POSSIBLE TO THE STRUCTURE TO AVOID CONFLICT WITH DUCTWORK AND HVAC EQUIPMENT. PROVIDE TRANSITIONS AS REQUIRED TO CROSS ABOVE DUCTWORK AND HVAC EQUIPMENT. ALLOW ROOM FOR ONLY FIRE PROOFING AND PIPE INSULATION. COORDINATE WITH CHIEF BUILDING ENGINEER.
4. VERIFY ALL NEW DUCT ROUTING WITH EXISTING BEAMS, DUCTWORK, PIPING, CONDUITS, ETC. PRIOR TO DUCT FABRICATION.
5. PRIOR TO FABRICATION AND INSTALLATION COORDINATE DUCT/ PIPE ROUTING AND EQUIPMENT PLACEMENT WITH ALL OTHER CEILING ELEMENTS SUCH AS BEAMS, SPRINKLER LINES, LIGHT FIXTURES, PLUMBING LINES, CONDUITS, ETC. MARK AND DRAFT ON THE FLOOR ENTIRE LAYOUT SHOWING THE COMPLETE SYSTEM (MAIN LOOP, FAN COIL UNITS, DUCT DISTRIBUTION, AIR OUTLETS, ETC.), INCLUDING HEIGHTS/ ELEVATIONS, FOR ARCHITECT'S REVIEW AND APPROVAL. PROVIDE TRANSITIONAL FITTINGS, ADJUSTMENTS AS PER ARCHITECT'S DIRECTION. DO NOT FABRICATE/ INSTALL WITHOUT THIS EXERCISE AND ARCHITECT'S APPROVAL.
6. PROVIDE CONDUIT FOR CONTROL WIRING FOR THERMOSTATS LOCATED ON NON-FURRED COLUMN AND WALLS.
7. PROVIDE DUCT/ PIPE TRANSITIONS AS REQUIRED TO CLEAR FLOATING CEILING, BEAMS, SPRINKLER LINES, ETC.
8. ROUTE CONDUIT ALONG SIDE REFRIGERANT LINES FOR CONTROL WIRING.
9. PROVIDE TURNING VANES FOR ALL RECTANGULAR DUCT ELBOW FITTINGS.
10. DRAWINGS ARE ONLY DIAGRAMMATIC. PROVIDE DUCT/ PIPE TRANSITIONS, OFFSETS, FITTINGS AS REQUIRED TO CLEAR BEAMS, HIGH CEILINGS AND OTHER CEILING CONSTRAINTS. ALL TRANSITIONS, FITTINGS, ETC. NEEDED ARE NOT SHOWN. EXTREMELY TIGHT FIT IN CEILING PLENUM DUE TO HIGH CEILING HEIGHT. REFER TO ARCHITECTURAL DRAWINGS (CEILING HEIGHT, ELEVATION SECTIONS, ETC.) TO UNDERSTAND AND TAKE INTO ACCOUNT THE UNIQUE NATURE OF THIS PROJECT AND THE NEED FOR ADDITIONAL OFFSETS, TRANSITIONS, ETC. PRIOR TO BIDDING.
11. CEILING ACCESS PANEL SHALL BE 24"x24". CEILING ACCESS PANEL SHALL BE LOCATED TO ALLOW FULL ACCESS FOR MAINTENANCE OF HVAC EQUIPMENT (FIRE/SMOKE DAMPER(S), SHUT-OFF VALVE(S), ETC.).

SHEET NOTES:

1. RELOCATE EXISTING SPRINKLER LINES, J-BOXES, CONDUITS, PIPING, ETC. TO ACCOMMODATE NEW EQUIPMENT, DUCTWORK AND PIPING. PROVIDE CLEARANCES AND ADEQUATE MAINTENANCE ACCESS.
2. SECONDARY DRAIN PAN UNDER THE UNIT. DRAIN PAN SHALL HAVE CROSS-SECTIONAL AREA BIG ENOUGH TO COVER THE ENTIRE UNIT AS WELL AS PIPE CONNECTIONS AT THE UNIT. CONDENSATE LINE FROM THE PAN SHALL DISCHARGE THROUGH THE CEILING TILE ½" BELOW THE CEILING. COORDINATE EXACT LOCATION WITH THE ARCHITECT.
3. PROVIDE DUCT SMOKE DETECTOR AT UNIT DISCHARGE.(TYP.)
4. PROVIDE ACOUSTICALLY LINED RETURN AIR PLENUM. PLENUM SHALL BE FULL SIZE OF UNIT'S RETURN AIR OPENING x 48" LONG. CONNECT OA DUCT TO THE PLENUM AS SHOWN. BALANCE OUTSIDE AIR TO THE CFM SHOWN ON THE FC UNIT SCHEDULE.
5. REMOTE VOLUME DAMPER. PROVIDE ADDITIONAL HARDWARE AS REQUIRED.
6. FLEX DUCT CONNECTED TO CRG1. 5 FT MAXIMUM LENGTH.(TYP.)
7. OUTSIDE AIR DUCT UP THRU ROOF.
8. 7-DAY TIME CLOCK FOR EF 1-1.
9. VRV SYSTEM CONTROLLER.
10. 12x12 UP TO EF-1 ON ROOF.
11. PROVIDE NEW DUCT SMOKE DETECTOR FOR (E)AC-1 ID NONE EXIST. DUCT DETECTOR TO SHUT UNIT OFF UPON SMOKE DETECTION. PROVIDE SEPERATE COST FOR THIS LINE ITEM.
12. PROVIDE CONICAL CONNECTION.(TYP.)
13. SEAL ALL OPENINGS IN THE WALL AIRTIGHT.
14. PROVIDE NEW PROGRAMMABLE THERMOSTAT FOR (E)AC-1 BEING REUSED.
15. BALANCE OSA TO CFM NOTED IN THE VRV SCHEDULE.

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1ST FLOOR - MECHANICAL FLOOR PLAN

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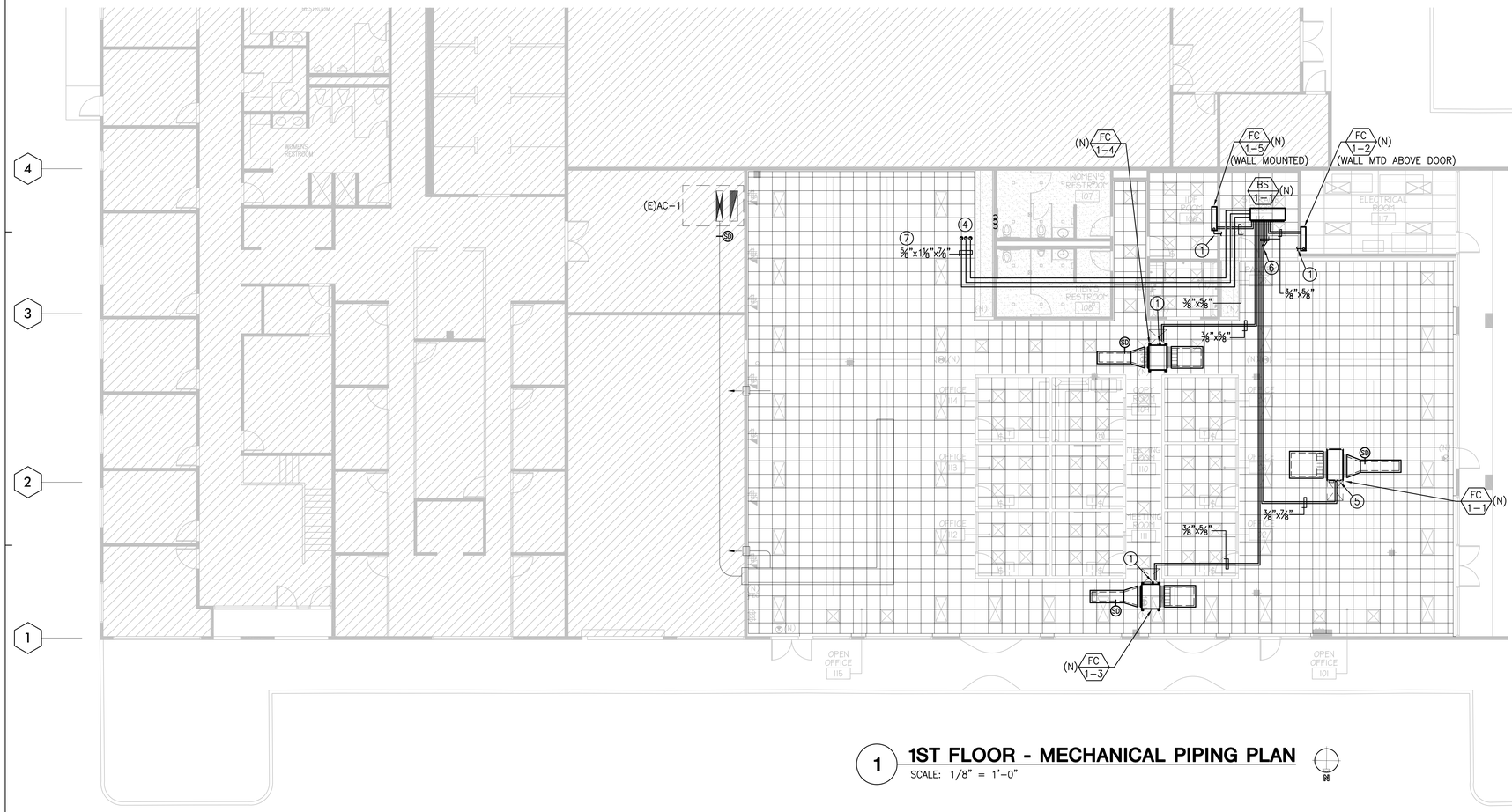


1 1ST FLOOR - MECHANICAL PIPING PLAN

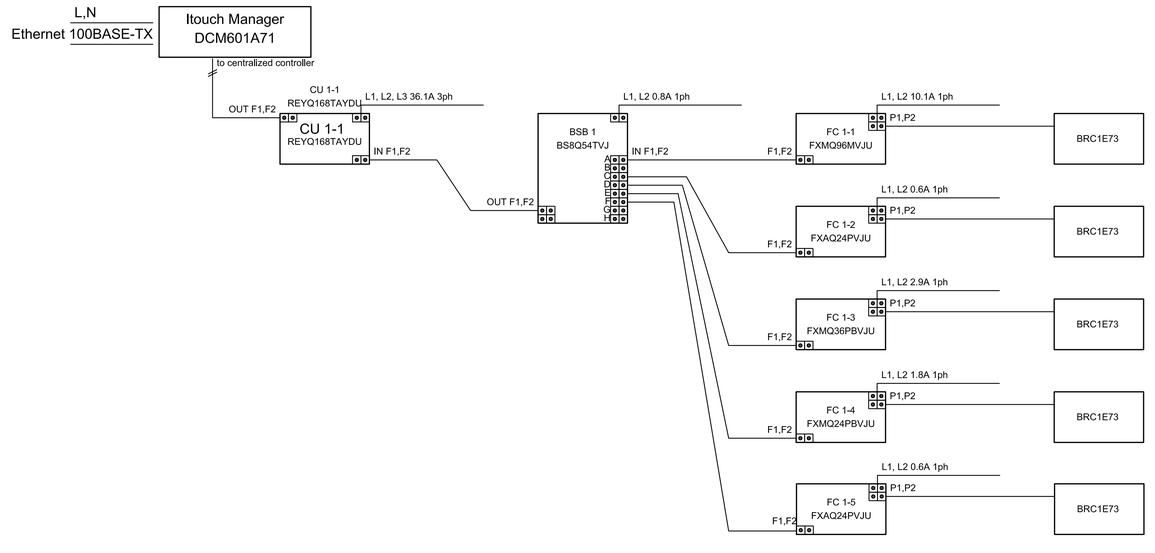
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. INSTALL ALL PIPING AS HIGH AS POSSIBLE TO THE STRUCTURE TO AVOID CONFLICT WITH DUCTWORK AND HVAC EQUIPMENT. PROVIDE OFFSETS AS REQUIRED TO CROSS ABOVE DUCTWORK AND HVAC EQUIPMENT.
2. PRIOR TO FABRICATION AND INSTALLATION COORDINATE DUCT/ PIPE ROUTING AND EQUIPMENT PLACEMENT WITH ALL OTHER CEILING ELEMENTS SUCH AS BEAMS, SPRINKLER LINES, LIGHT FIXTURES, PLUMBING LINES, CONDUITS, ETC. MARK AND DRAFT ON THE FLOOR ENTIRE LAYOUT SHOWING THE COMPLETE SYSTEM (MAIN LOOP, FAN COIL UNITS, DUCT DISTRIBUTION, AIR OUTLETS, ETC.), INCLUDING HEIGHTS/ ELEVATIONS, FOR ARCHITECT'S REVIEW AND APPROVAL. PROVIDE TRANSITIONAL FITTINGS, ADJUSTMENTS AS PER ARCHITECT'S DIRECTION. DO NOT FABRICATE/ INSTALL WITHOUT THIS EXERCISE AND ARCHITECT'S APPROVAL.
3. ALL CONTROL WIRING SHALL BE ROUTED WITHIN METAL CONDUIT OR SECURED ON TOP OF DUCTWORK. ALL CONTROL WIRING SHALL BE UN-SEEN AND SECURED.
4. PROVIDE DUCT/ PIPE TRANSITIONS AS REQUIRED TO CLEAR CEILING, BEAMS, SPRINKLER LINES, ETC.
5. ROUTE CONDUIT ALONG SIDE REFRIGERANT LINES FOR CONTROL WIRING.
6. DRAWINGS ARE ONLY DIAGRAMMATIC. PROVIDE DUCT/ PIPE TRANSITIONS, OFFSETS, FITTINGS AS REQUIRED TO CLEAR BEAMS, HIGH CEILINGS AND OTHER CEILING CONSTRAINTS. ALL TRANSITIONS, FITTINGS, ETC. NEEDED ARE NOT SHOWN. EXTREMELY TIGHT FIT IN CEILING PLENUM DUE TO HIGH CEILING HEIGHT. REFER TO ARCHITECTURAL DRAWINGS (CEILING HEIGHT, ELEVATION SECTIONS, ETC.) TO UNDERSTAND AND TAKE INTO ACCOUNT THE UNIQUE NATURE OF THIS PROJECT AND THE NEED FOR ADDITIONAL OFFSETS, TRANSITIONS, ETC. PRIOR TO BIDDING.
7. SYSTEM DESIGNED USING VRF MANUFACTURED BY DAIKIN. IF CONTRACTOR CHOOSES TO USE A DIFFERENT APPROVED EQUAL, THE SYSTEM DESIGN CHANGE FOR BRANCH SELECTOR, PIPING, FCUs, ETC. SHALL BE PROVIDED BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE NEW DESIGN DRAWINGS SHOWING ALL THE COMPONENTS OF THE NEW SYSTEM INCLUDING PIPE SIZES FOR REVIEW AND APPROVAL.

SHEET NOTES:

1. 3/4" CONDENSATE DRAIN. SEE PLUMBING DRAWINGS FOR CONDENSATE DRAIN LINE TERMINATION.
2. PROVIDE PENETRATION WITH WALL PENETRATION SLEEVE. SEAL PENETRATION WATER-TIGHT.
3. PROVIDE OVERHEAD UNISTRUT /FRAME TO SUPPORT THE REFRIGERANT LINES AND CONTROL WIRING.
4. REFRIGERANT LINES & CONTROL WIRING UP TO CONDENSER ON ROOF.
5. 1" CONDENSATE DRAIN. SEE PLUMBING DRAWINGS FOR CONDENSATE DRAIN LINE TERMINATION.
6. MULTI-PORT TWINNING KIT.
7. EXACT SIZING SHALL BE BY VRV MANUFACTURER GUILDLINE AND INSTRUCTIONS.(TYP.)



CONTROLLER WIRING SCHEMATICS

NTS

RICHMOND LAKESIDE
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1ST FLOOR - MECHANICAL PIPING PLAN

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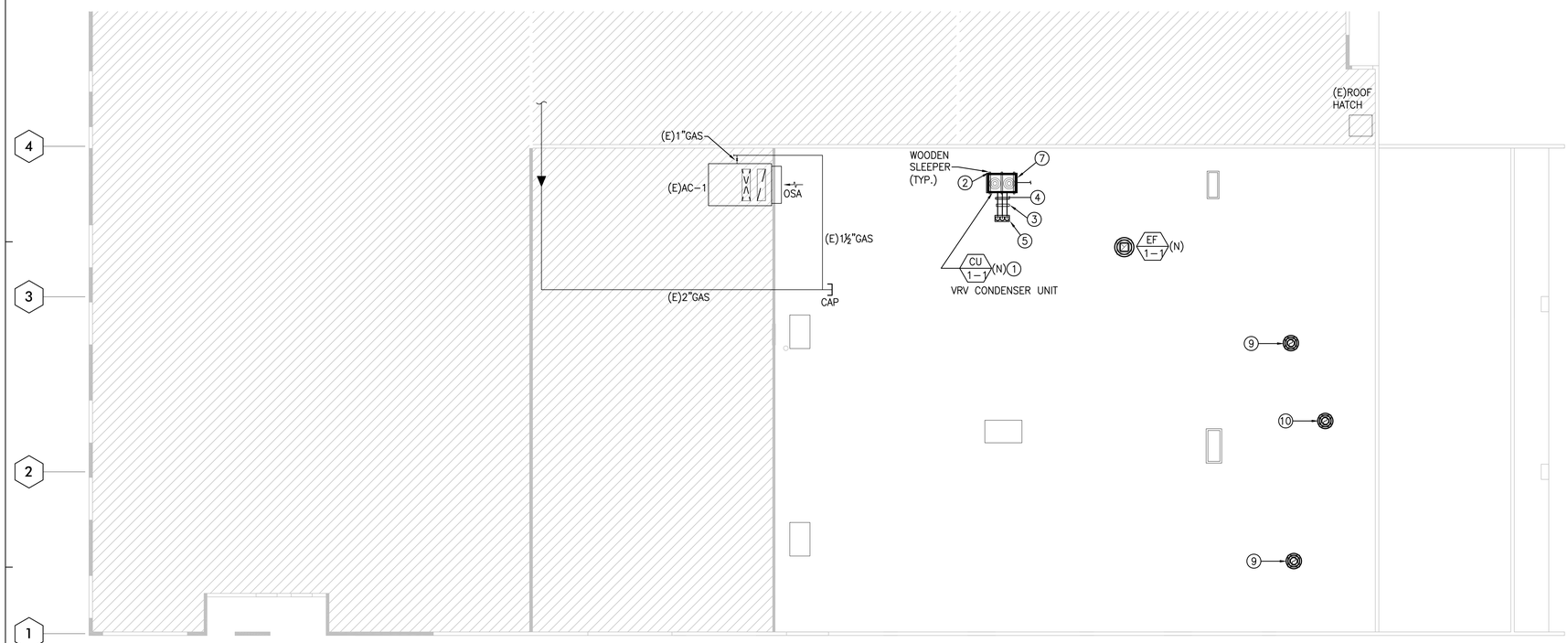


1 MECHANICAL ROOF PLAN

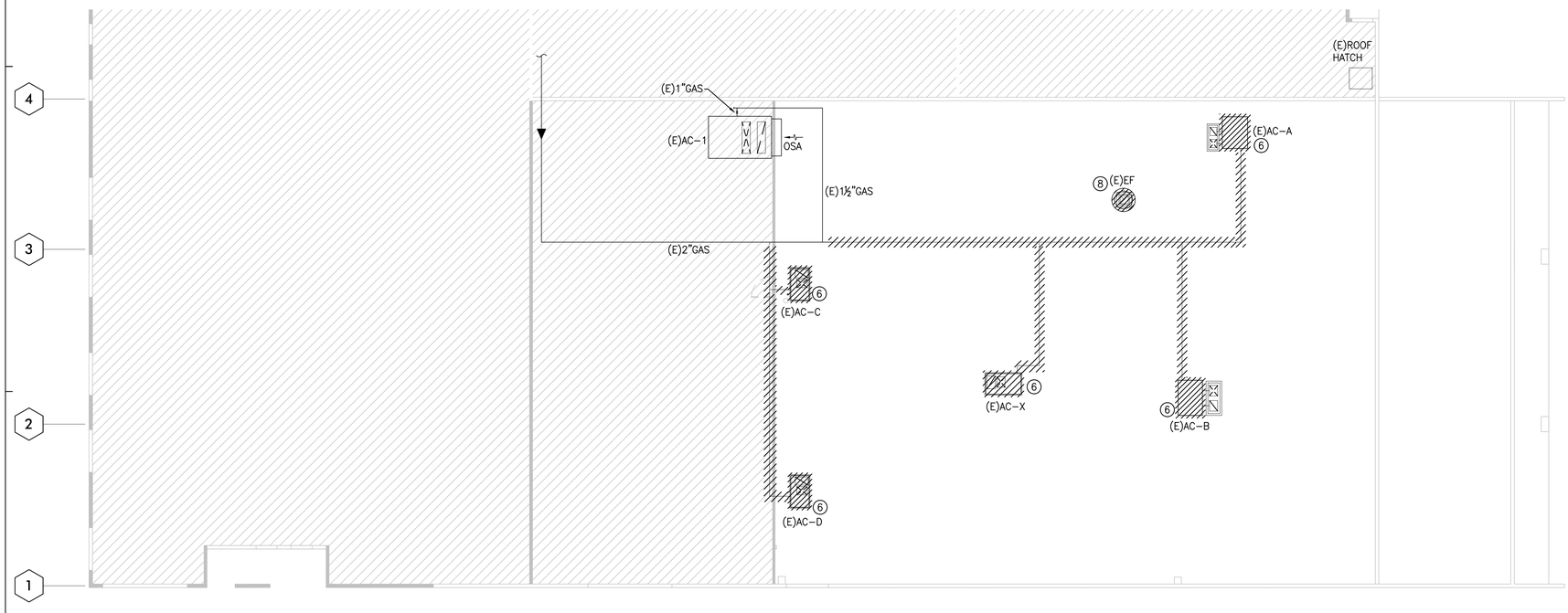
SCALE: 1/8" = 1'-0"

RECOMMISSIONING OF AC-1 UNIT:

1. PROVIDE CERTIFIED STARTUP REPORT VALIDATING THE PERFORMANCE OF THE UNIT. PROVIDE POINT-BYPOINT INSPECTION BY A FACTORY AUTHORIZED TECHNICIAN.
2. THE UNIT SHALL BE TESTED THROUGH THEIR ENTIRE RANGE OF OPERATION FROM FULL COOLING TO FULL HEATING. DOCUMENT SUPPLY, RETURN AND OA TEMPERATURES AT FULL COOLING AND FULL HEATING.
3. ENTIRE ELECTRIC/GAS UNIT SHALL BE RECOMMISSIONED, REFURBISHED AND RECHARGED IN ORDER TO ACHIEVE TO THEIR ORIGINAL FACTORY PERFORMANCE. ALL WORK SHALL BE DONE BY FACTORY AUTHORIZED TECHNICIAN. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO BRING THE UNITS TO PERFORM AT THEIR INTENDED DESIGN.
4. RE-CALIBRATE CONTROLS.
5. PROVIDE NEW FILTERS.

SHEET NOTES:

1. REFRIGERANT LINES & CONTROL WIRING DOWN TO FAN COIL UNITS. PROVIDE EMT CONDUIT TO RUN CONTROL WIRING BETWEEN FAN COIL UNITS AND CONDENSER UNIT. RUN CONDUITS ADJACENT TO REFRIGERANT LINES.
2. CONDENSER UNIT SHALL BE SECURED TO WOODEN SLEEPERS WITH BOLTS AND ANGLE IRONS. COORDINATE MOUNTED POINTS WITH MANUFACTURER. PROVIDE MASON SLR SPRING ISOLATORS WITH 1" DEFLECTION. EXACT LOCATION OF UNIT SHALL BE FIELD VERIFIED AND COORDINATED WITH OTHER TRADES. SEE DETAIL 3/1M3.0.2 FOR WOODEN SLEEPER MOUNTING DETAIL.
3. PROVIDE DURA BLOCK SUPPORTS FOR REFRIGERANT PIPING, & CONDUITS. NUMBER AND EXACT LOCATION OF SUPPORTS SHALL BE COORDINATED IN FIELD.
4. PROVIDE INSULATION FOR ENTIRE LENGTH OF REFRIGERANT LINES. PROVIDE ALUMINUM JACKET AROUND REFRIGERANT LINES AND INSULATION TO PROTECT EXTERIOR PIPING.
5. SEAL ROOF PENETRATION WATER-TIGHT.
6. REMOVE EXISTING AC UNIT AND ASSOCIATED GAS LINE & DRAIN PIPE. PATCH ROOF OPENINGS. CAP EXISTING ROOF CURB WATER & AIR TIGHT WITH 20 GAUGE SHEET METAL CAP.
7. PROVIDE 2" DEEP GALVANIZED SHEET METAL DRAIN PAN WITH 1" DRAIN. PIPE DRAIN LINE TO THE NEAREST ROOF RECEPTOR.
8. REMOVE EXISTING EXHAUST FAN & CAP EXISTING ROOF CURB OPENING.
9. 10ø OUTSIDE AIR INTAKE GREENHECK MODEL GRS-10 WITH BUILT-IN ROOF CAP. PROVIDE MATCHING ROOF CURB. PROVIDE FLASHING AND COUNTERFLASHING TO MAKE THE ENTIRE ASSEMBLY WATER PROOF.
10. 12ø OUTSIDE AIR INTAKE GREENHECK MODEL GRS-12 WITH BUILT-IN ROOF CAP. PROVIDE MATCHING ROOF CURB. PROVIDE FLASHING AND COUNTERFLASHING TO MAKE THE ENTIRE ASSEMBLY WATER PROOF.



2 MECHANICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER
AMIT WADHWA
M30894
EXP. 12/31/20
MECHANICAL
STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers
870 Market Street
(Floor 885) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

Issue/Revision:

No.	Proj. No. Date:	Description
1	32243.01 29MAR19	ISSUE FOR REVIEW
2	32243.01 22APR19	ISSUE FOR PERMIT

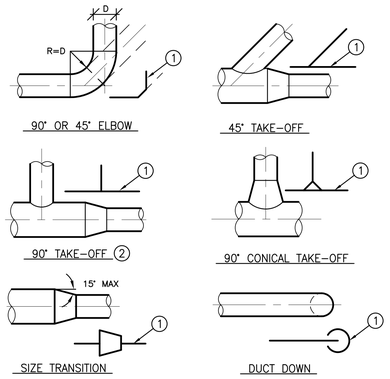
Approval Signature:

Co/ Title: Date:

MECHANICAL ROOF PLAN

Scale: 1/8"=1'-0" Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 8 of X

1M2.1.1

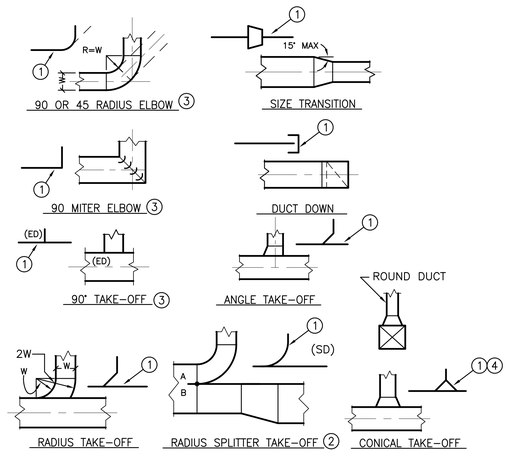


NOTES:

1. SINGLE-LINE ILLUSTRATIONS ARE SYMBOLS USED ON DRAWINGS.
2. FOR LOW PRESSURE SYSTEM ONLY.

1 ROUND DUCT DETAILS

SCALE: NONE

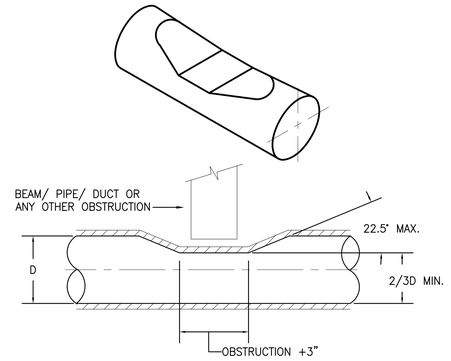


NOTES:

1. SINGLE-LINE ILLUSTRATIONS ARE SYMBOLS USED ON DRAWINGS.
2. SIZE A & B DIMENSIONS IN PROPORTION TO AIR QUANTITIES IN EACH LEG SPLIT.
3.
4. FOR LOW PRESSURE SYSTEM ONLY. CONICAL CONNECTION SHALL INCORPORATE SIDE FLARE THAT IS 3" LARGER THAN THE DUCT WIDTH/ DIAMETER ON EITHER SIDE.

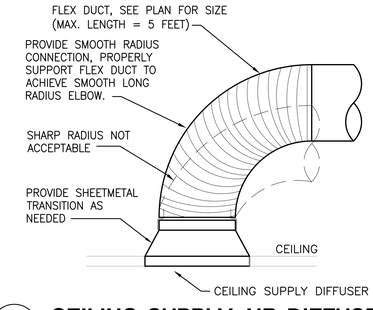
2 RECTANGULAR DUCT DETAILS

SCALE: NONE



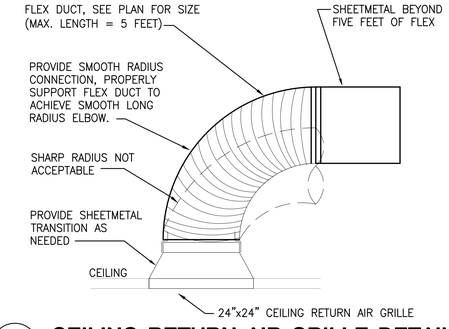
3 DUCT SLICE FITTING DETAIL

SCALE: NONE



4 CEILING SUPPLY AIR DIFFUSER DETAIL

SCALE: NONE



5 CEILING RETURN AIR GRILLE DETAIL

SCALE: NONE

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER AMIT WADHWA M30894 EXP. 12/31/20 MECHANICAL STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates Engineers
870 Market Street
(Floor 686) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
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Approval Signature:

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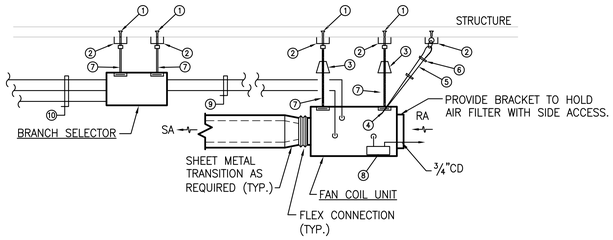
MECHANICAL DETAILS

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 9 of 15

1M3.0.1



NOTE:

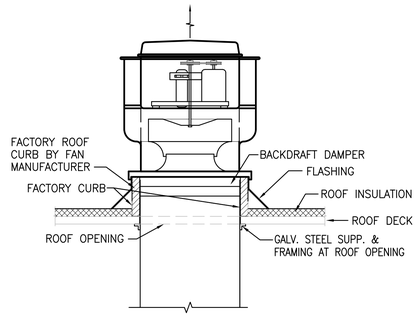
1. ALL SUPPORT COMPONENT SIZES AND MINIMUM BOLT EMBEDMENT SHALL BE BY MANUFACTURE'S INSTRUCTIONS OR CALCULATED BY A REGISTERED STRUCTURAL ENGINEER BASED ON UNIT WEIGHT.
2. INSTALL BRANCH SELECTOR AND FAN COIL UNIT PER MANUFACTURE'S INSTRUCTION.
3. FAN COIL UNIT MAINTENANCE ACCESS IS AT THE BOTTOM OF THE UNIT. FOR UNITS INSTALL ABOVE CEILING STRUCTURE PROVIDE SHUT–OFF VALVES AND UNION FITTINGS TO DISCONNECT REFRIGERANT LINES TO LIFT UP UNIT. ALSO PROVIDE DUCT CONNECTION AT FLEXIBLE DUCT TO ALLOW FOR DISCONNECTION.

DETAIL NOTES:

① STRUCTURAL ENGINEER HIRED BY THE CONTRACTOR TO ESTABLISH CONNECTION TYPE.
② UNISTRUT OR "L" ANGLE IRON
③ MASON VIBRATION ISOLATORS
④ "Z" SHAPED BRACKET
⑤ SEISMIC BRACE CABLE (TENSION CABLE ONLY TO REMOVE SLACK)(TYPICAL OF 4)
⑥ U–BOLT CLIPS
⑦ THREADED ROD (TYPICAL OF 4)
⑧ CONDENSATE PUMP(LIMITED HEAD, ONLY TO RAISE DRAIN LINE TO MEET SLOPE)
⑨ 2–PIPE (LIQUID, GAS) BETWEEN BRANCH SELECTOR AND FAN COIL UNIT. PIPE SIZE AND REQUIRED ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS.
⑩ 3–PIPE (LIQUID, SUCTION GAS, DISCHARGE GAS) BETWEEN CONDENSING UNIT AND BRANCH SELECTOR. PIPE SIZE AND REQUIRED ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS.
⑪ PROVIDE SHUT–OFF VALVES FOR EACH FAN COIL UNITS LOCATED ABOVE AND SUPPORTED BY CEILING STRUCTURE.
⑫ PROVIDE UNION FITTINGS FOR EACH FAN COIL UNITS LOCATED ABOVE AND SUPPORTED BY CEILING STRUCTURE.

1 FAN COIL UNIT (FC) AND BRANCH SELECTOR INSTALLATION DETAIL

SCALE: NONE

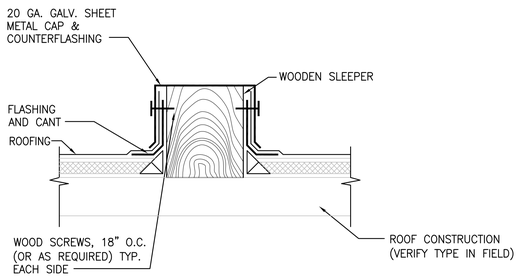


NOTES:

1. INTENT ONLY IS DEPICTED HERE. ACTUAL ROOF/ ROOFING CONDITION MAY VARY. COORDINATE IN FIELD AND PROVIDE COMPATIBLE ASSEMBLY.

2 ROOF EXHAUST FAN INSTALLATION DETAIL

SCALE: NONE

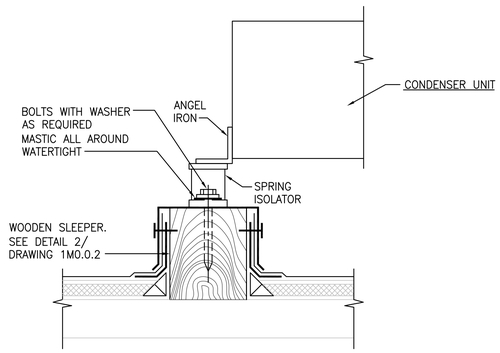


NOTES:

1. ROOF SLOPES. PROVIDE ADDITIONAL HARDWARE AS REQUIRED FOR FULLY HORIZONTAL INSTALLATION.
2. INTERFACING WITH EXISTING ROOFING SHALL BE FIELD COORDINATED. HIRE ROOFING CONTRACTOR FOR ASSOCIATED ROOFING WORK. ASSEMBLY SHALL BE TOTALLY WATER PROOF.
3. INTENT ONLY IS DEPICTED HERE. ACTUAL ROOF / ROOFING CONDITION MAY VARY. COORDINATE IN FIELD AND PROVIDE COMPATIBLE ASSEMBLY.

3 WOODEN SLEEPER MOUNTING DETAIL

SCALE: N.T.S.

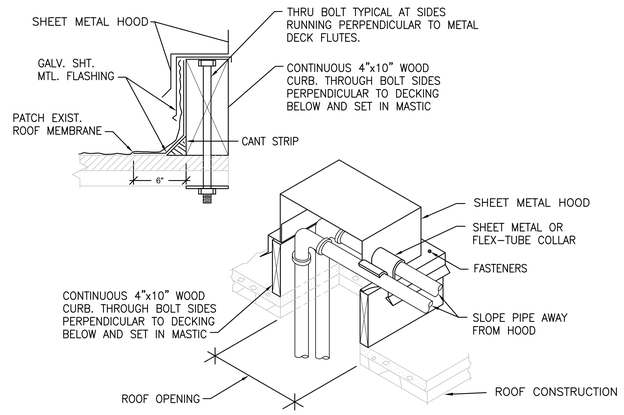


NOTES:

1. FOR NUMBER AND PLACEMENT OF UNIT'S MOUNTING LUGS COORDINATE WITH UNIT MANUFACTURER.
2. ROOF SLOPES. PROVIDE ADDITIONAL HARDWARE AS REQUIRED FOR FULLY HORIZONTAL INSTALLATION.
3. INTERFACING WITH EXISTING ROOFING SHALL BE FIELD COORDINATED. HIRE ROOFING CONTRACTOR FOR ASSOCIATED ROOFING WORK. ASSEMBLY SHALL BE TOTALLY WATER PROOF.
4. INTENT ONLY IS DEPICTED HERE. ACTUAL ROOF / ROOFING CONDITION MAY VARY. COORDINATE IN FIELD AND PROVIDE COMPATIBLE ASSEMBLY.

4 CONDENSER UNIT MOUNTING DETAIL

SCALE: NONE



NOTES:

1. ROOF SLOPES. PROVIDE ADDITIONAL HARDWARE AS REQUIRED FOR FULLY HORIZONTAL INSTALLATION.

5 PIPE ROOF PENERATION

SCALE: NONE

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

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Consultant

Amit Wadhwa & Associates Engineers
870 Market Street
(Floor 885) Suite 846
San Francisco, CA 94102
415.788.9999 tel
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Approval Signature:

Co/ Title: Date:

MECHANICAL DETAILS

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 10 of 15

1M3.0.2

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CEC-NRCC-MCH-01-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	Page 1 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. MECHANICAL COMPLIANCE DOCUMENTS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2016 Nonresidential Manual
Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Comp. Doc./Worksheet #	Title
◉	○	NRCC-MCH-01-E (Part 1 of 3)	Certificate of Compliance, Declaration. Required on plans for all submittals.
◉	○	NRCC-MCH-01-E (Part 2 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-02-A to 11-A). Required on plans for all submittals.
◉	○	NRCC-MCH-01-E (Part 3 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-12-A to 18-A). Required on plans where applicable.
◉	○	NRCC-MCH-02-E (Part 1 of 2)	Mechanical Dry Equipment Summary is required for all submittals with Central Air Systems. It is optional on plans.
◉	○	NRCC-MCH-02-E (Part 2 of 2)	Mechanical Wet Equipment Summary is required for all submittals with chilled water, hot water or condenser water systems. It is optional on plans.
◉	○	NRCC-MCH-03-E	Mechanical Ventilation and Reheat is required for all submittals with multiple zone heating and cooling systems. It is optional on plans.
○	○	NRCC-MCH-07-E (Part 1 of 2)	Power Consumption of Fans. Required on plans where applicable
○	○	NRCC-MCH-07-E (Part 2 of 2)	Power Consumption of Fans, Declaration. Required on plans where applicable

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CEC-NRCC-MCH-01-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	Page 2 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

B. MECHANICAL HVAC ACCEPTANCE FORMS (check box for required compliance documents)

Test Performed By:

Designer:
This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:
Plancheck - The NRCC-MCH-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-02-A	MCH-03-A	MCH-04-A	MCH-05-A	MCH-06-A	MCH-07-A	MCH-08-A	MCH-09-A	MCH-10-A	MCH-11-A
Equipment Requiring Testing or Verification	# of Units	Outdoor Air	Single Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Controlled Ventilation (DCV)	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
FAN COIL UNITS	5	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

Add Row | Remove Last

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CEC-NRCC-MCH-01-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	Page 3 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

C. MECHANICAL HVAC ACCEPTANCE FORMS (check box for required compliance documents)

Test Performed By:

Designer:
This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:
Plancheck - The NRCC-MCH-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-12-A	MCH-13-A	MCH-14-A	MCH-15-A	MCH-16-A	MCH-17-A	MCH-18-A
Equipment Requiring Testing or Verification	# of Units	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Supply Air Temperature Reset Controls	Condenser Water Reset Controls	ECMS
		☐	☐	☐	☐	☐	☐	☐

Add Row | Remove Last

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CEC-NRCC-MCH-01-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	Page 4 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA & ASSOCIATES	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

STATE OF CALIFORNIA
HVAC DRY & WET SYSTEM REQUIREMENTS
CEC-NRCC-MCH-02-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Dry System Requirements	(Page 1 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. Equipment Tags and System Description[1]- Dry Systems		FC 1-1	FC 1-2	FC 1-3
MANDATORY MEASURES	*T-24 Sections*	*Reference to the Requirements in the Contract Documents[2]*		
Heating Equipment Efficiency[3]	110.1 or 110.2(a)	1M0.0.2	N/A	1M0.0.2
Cooling Equipment Efficiency[3]	110.1 or 110.2(a)	1M0.0.2	1M0.0.2	1M0.0.2
HVAC or Heat Pump Thermostats	110.2(b), 110.2(c)	PROGRAMMABLE	PROGRAMMABLE	PROGRAMMABLE
Furnace Standby Loss Control	110.2(d)	N/A	N/A	N/A
Low Leakage AHUs	110.2(f)	N/A	N/A	N/A
Ventilation[4]	120.1(b)	1M0.0.2	1M0.0.2	1M0.0.2
Demand Control Ventilation[5]	120.1(c)4	N/A	N/A	N/A
Occupant Sensor Ventilation Control[6]	120.1(c)5, 120.2(e)3	N/A	N/A	N/A
Shutoff and Reset Controls[7]	120.2(e)	N/A	N/A	N/A
Outdoor Air and Exhaust Damper Control	120.2(f)	1M2.0.1	N/A	1M2.0.1
Isolation Zones	120.2(g)	N/A	N/A	N/A
Automatic Demand Shed Controls	120.2(h)	N/A	N/A	N/A
Economizer FDD	120.2(i)	N/A	N/A	N/A
Duct Insulation	120.4	1M0.0.4	N/A	1M0.0.4
PRESCRIPTIVE MEASURES				
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)	○ Yes ○ No	○ Yes ○ No	◉ Yes ○ No
Supply Fan Pressure Control	140.4(c)	N/A	N/A	N/A
Simultaneous Heat/Cool[8]	140.4(d)	N/A	N/A	N/A
Economizer	140.4(e)	N/A	N/A	N/A
Heat and Cool Air Supply Reset	140.4(f)	N/A	N/A	N/A
Electric Resistance Heating[9]	140.4(g)	N/A	N/A	N/A
Duct Leakage Sealing and Testing.[10]	140.4(l)	N/A	N/A	N/A

Notes:
1. *Provide equipment tags (e.g. AHU 1 to 10) and system description (e.g. Single Duct VAV reheat) as appropriate. Multiple units with common requirements can be grouped together.*
2. *Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.*
3. *The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. Where appliance standards apply (110.1), identify where equipment is required to be listed per Title 20 1601 et seq.*
4. *Identify where the ventilation requirements are documented for each central HVAC system. Include references to both central unit schedules and sequences of operation. If one or more spaces is naturally ventilated identify where this is documented in the plans and specifications. Multiple zone central air systems must also provide a MCH-03-E compliance document.*
5. *If one or more spaces has demand controlled ventilation identify where it is specified including the sensor specifications and the sequence of operation.*
6. *If one or more space has occupant sensor ventilation control identify where it is specified including the sensor specifications and the sequence of operation*
7. *If the system is DDC identify the sequences for the system start/stop, optimal start, setback (if required) and setup (if required). For all systems identify the specification for the thermostats and time clocks (if applicable).*
8. *Identify where the heating, cooling and deadband airflows are scheduled for this system. Include a reference to the specification of the zone controls. Provide a MCH-03-E compliance document.*
9. *Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies.*
10. *If duct leakage sealing and testing is required, a MCH-04-A compliance document must be submitted.*

STATE OF CALIFORNIA
HVAC DRY & WET SYSTEM REQUIREMENTS
CEC-NRCC-MCH-02-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Dry System Requirements	(Page 1 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. Equipment Tags and System Description[1]- Dry Systems		FC 1-4	FC 1-5	[E]AC-1
MANDATORY MEASURES	*T-24 Sections*	*Reference to the Requirements in the Contract Documents[2]*		
Heating Equipment Efficiency[3]	110.1 or 110.2(a)	1M0.0.2	N/A	N/A
Cooling Equipment Efficiency[3]	110.1 or 110.2(a)	1M0.0.2	1M0.0.2	N/A
HVAC or Heat Pump Thermostats	110.2(b), 110.2(c)	PROGRAMMABLE	PROGRAMMABLE	PROGRAMMABLE
Furnace Standby Loss Control	110.2(d)	N/A	N/A	N/A
Low Leakage AHUs	110.2(f)	N/A	N/A	N/A
Ventilation[4]	120.1(b)	1M0.0.2	1M0.0.2	1M0.0.2
Demand Control Ventilation[5]	120.1(c)4	N/A	N/A	N/A
Occupant Sensor Ventilation Control[6]	120.1(c)5, 120.2(e)3	N/A	N/A	N/A
Shutoff and Reset Controls[7]	120.2(e)	N/A	N/A	N/A
Outdoor Air and Exhaust Damper Control	120.2(f)	1M2.0.1	N/A	EXISTING
Isolation Zones	120.2(g)	N/A	N/A	N/A
Automatic Demand Shed Controls	120.2(h)	N/A	N/A	N/A
Economizer FDD	120.2(i)	N/A	N/A	N/A
Duct Insulation	120.4	1M0.0.4	N/A	1M0.0.4
PRESCRIPTIVE MEASURES				
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)	○ Yes ○ No	○ Yes ○ No	○ Yes ◉ No
Supply Fan Pressure Control	140.4(c)	N/A	N/A	N/A
Simultaneous Heat/Cool[8]	140.4(d)	N/A	N/A	N/A
Economizer	140.4(e)	N/A	N/A	N/A
Heat and Cool Air Supply Reset	140.4(f)	N/A	N/A	N/A
Electric Resistance Heating[9]	140.4(g)	N/A	N/A	N/A
Duct Leakage Sealing and Testing.[10]	140.4(l)	N/A	N/A	N/A

Notes:
1. *Provide equipment tags (e.g. AHU 1 to 10) and system description (e.g. Single Duct VAV reheat) as appropriate. Multiple units with common requirements can be grouped together.*
2. *Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.*
3. *The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. Where appliance standards apply (110.1), identify where equipment is required to be listed per Title 20 1601 et seq.*
4. *Identify where the ventilation requirements are documented for each central HVAC system. Include references to both central unit schedules and sequences of operation. If one or more spaces is naturally ventilated identify where this is documented in the plans and specifications. Multiple zone central air systems must also provide a MCH-03-E compliance document.*
5. *If one or more spaces has demand controlled ventilation identify where it is specified including the sensor specifications and the sequence of operation.*
6. *If one or more space has occupant sensor ventilation control identify where it is specified including the sensor specifications and the sequence of operation*
7. *If the system is DDC identify the sequences for the system start/stop, optimal start, setback (if required) and setup (if required). For all systems identify the specification for the thermostats and time clocks (if applicable).*
8. *Identify where the heating, cooling and deadband airflows are scheduled for this system. Include a reference to the specification of the zone controls. Provide a MCH-03-E compliance document.*
9. *Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies.*
10. *If duct leakage sealing and testing is required, a MCH-04-A compliance document must be submitted.*

STATE OF CALIFORNIA
HVAC DRY & WET SYSTEM REQUIREMENTS
CEC-NRCC-MCH-02-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Dry & Wet System Requirements	(Page 2 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

B. Equipment Tags and System Description[1]- Wet Systems		N/A		
MANDATORY MEASURES	*T-24 Sections*	*Reference to the Requirements in the Contract Documents[2]*		
Heating Hot Water Equipment Efficiency[3]	110.1			
Cooling Chilled and Condenser Water Equipment Efficiency[3]	110.1, 140.4(i)			
Open and Closed Circuit Cooling Towers conductivity or flow-based controls	110.2(e) 1			
Open and Closed Circuit Cooling Towers Maximum Achievable Cycles of Concentration (LSI)[6]	110.2(e) 2			
Open and Closed Circuit Cooling Towers Flow Meter with analog output	110.2(e) 3			
Open and Closed Circuit Cooling Towers Overflow Alarm	110.2(e) 4			
Open and Closed Circuit Cooling Towers Efficient Drift Eliminators	110.2(e) 5			
Pipe Insulation	120.3			
PRESCRIPTIVE MEASURES				
Cooling Tower Fan Controls	140.4(h)2, 140.4(h)5	○ Yes ◉ No	○ Yes ○ No	○ Yes ○ No
Cooling Tower Flow Controls	140.4(h)3			
Centrifugal Fan Cooling Towers[4]	140.4(h)4			
Air-Cooled Chiller Limitation[5]	140.4(j)			
Variable Flow System Design	140.4(k)			
Chiller and Boiler Isolation	140.4(k)			
CHW and HHW Reset Controls	140.4(k)			
W.LHP Isolation Valves	140.4(k)			
VSD on CHW, CW & WLHP Pumps >5HP	140.4(k)			
DP Sensor Location	140.4(k)			

Notes:
1. *Provide equipment tags (e.g. CH 1 to 3) or system description (e.g. CHW loop) as appropriate. Multiple units with common requirements can be grouped together.*
2. *Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.*
3. *The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. For chillers operating at non-standard efficiencies provide the Kadj values. For chillers also note whether the efficiencies are Path A or Path B.*
4. *Identify if cooling towers have propeller fans. If towers use centrifugal fans document which exception is used.*
5. *If air-cooled chillers are used, document which exceptions have been used to comply with 140.4(j) and the total installed design capacity of the air-cooled chillers in the chilled water plant.*
6. *Identify the existence of a completed MCH-06-E when open or closed circuit cooling towers are specified to be installed, otherwise enter "N/A".*

STATE OF CALIFORNIA
HVAC SYSTEM REQUIREMENTS
CEC-NRCC-MCH-02-E (Revised 01/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Wet System Requirements	(Page 3 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA & ASSOCIATES	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER
AMIT WADHWA
M30894
EXP. 12/31/20
MECHANICAL
STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers
870 Market Street
(Floor 8th) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

Issue/Revision:

No.	Proj. No. Date:	Description
1	32243.01 29MAR19	ISSUE FOR REVIEW
2	32243.01 22APR19	ISSUE FOR PERMIT

Approval Signature:

Co/ Title: Date:

MECHANICAL
TITLE 24

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 11 of 15

1TM4.0.1

STATE OF CALIFORNIA
MECHANICAL VENTILATION AND REHEAT
CEC-NRCC-MCH-03-E (Rev Mar'16)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-MCH-03-E**
MECHANICAL VENTILATION AND REHEAT — Page 1 of 2
PROJECT NAME: RICHMOND LAKESIDE TENANT IMPROVEMENT — DATE PREPARED: 4/15/19

A. MECHANICAL VENTILATION AND REHEAT

In lieu of this compliance document,the required outdoor ventilation rates and airflow s may be show n on the plans or the calculations can be presented in a spreadsheet.Mechanical Ventilation and Reheat w orksheet available on the Energy Commission's w ebsite at: http://w w w. energy.ca.gov/title24/2016standards/.
Note: In all of the calculations that compare a supply quantity to the REQ'D.V.A. quantity,the actual percentage of outdoor air in the supply is ignored.
Areas in buildings for w hich natural ventilation is used should be clearly designated. Specifications must require that building operating instructions include explanations of the natural ventilation system.

ACTUAL DESIGN INFO (FROM EQUIPMENT SCHEDULES, ETC.)						AREA BASIS			OCCUPANCY BASIS			ROOM BASIS	MINIMUM		VAV Reheated Primary Air CFM			VAV Deadband Primary Air CFM		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ZONE/SYSTEM/VAV BOX TAG	DESIGN PRIMARY COOLING AIRFLOW (CFM)	DESIGN PRIMARY REHEAT AIRFLOW (CFM)	DESIGN PRIMARY HEATING AIRFLOW (CFM)	CONTROL TYPE DDC (Y/N)	TRANSFER AIRFLOW (CFM)	CONDITIONED AREA (ft²)	MIN CFM PER AREA (CFM/ ft²)	MIN CFM BY AREA (CFM)	NUM. OF PEOPLE	CFM PER PERSON	MIN CFM BY OCCUPANT (CFM)	MIN CFM BY ROOM (CFM)	REQ'D VENTILATION AIRFLOW (CFM)	COMPLIES?	BASED DESIGN PRIMARY COOLING AIR	MAXIMUM REHEAT (CFM)	COMPLIES?	PRIMARY COOLING AIR	AIRFLOW	COMPLIES?
FC 1-1	2,540	2,540	2,540	DDC	0	1,715	0.15	257	10	15	150	N/A	257	Y	1,270	1,270	N	508	508	Y
FC 1-2	635	635	635	DDC	0	295	0.15	44	1	15	15	N/A	44	Y	318	318	N	127	127	Y
FC 1-3	1,080	1,080	1,080	DDC	0	654	0.15	98	6	15	90	N/A	98	Y	540	540	N	216	216	Y
FC 1-4	685	685	685	DDC	0	495	0.15	74	10	15	150	N/A	150	Y	343	343	N	137	150	Y
FC 1-5	635	635	635	DDC	0	140	0.15	21	1	15	15	N/A	21	Y	318	318	N	127	127	Y
AC-1	5,415	5,415	5,415	DDC	0	3,185	0.15	478	28	15	420	N/A	478	Y	2,708	2,708	N	1,083	1,083	Y

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance — May 2016

NOTE:

1. EXISTING AC−1 & NEW FC 1−1 THRU −5 ARE A CONSTANT VOLUME SYSTEM.
2. CALCULATIONS ARE FOR VENTILATION AIR ONLY. REHEAT CALCULATIONS DOES NOT APPLY.

STATE OF CALIFORNIA
MECHANICAL VENTILATION AND REHEAT
CEC-NRCC-MCH-03-E (Revised 05/16)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-MCH-03-E
Mechanical Ventilation & Reheat — Page 2 of 2
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT — Date Prepared: 4/15/19

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA & ASSOCIATES	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance — May 2016

STATE OF CALIFORNIA
OUTDOOR AIR ACCEPTANCE
CEC-NRCA-MCH-02-A (Revised 07/16)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE — NRCA-MCH-02-A
Outdoor Air Acceptance — (Page 1 of 3)

Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identification/Tag: FC	System Location or Area Served: 1ST FLOOR	

Note: Submit one Certificate of Acceptance for each system that demonstrate compliance. — Enforcement Agency Use: Checked by/Date

Intent: *Verify measured outside airflow reading is within 10% of the total required outside airflow. Required for all newly installed HVAC units. Reference MCH-03 (Column 14) or Mechanical Equipment Schedules.*

A. Construction Inspection

Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.

1. Supporting documentation needed to perform test includes:
   a. As-built and/or design documents (for example, Mechanical Equipment Schedules, Equipment Start-Up Sheets or Balancing Reports).
   b. 2016 Building Energy Efficiency Standards Nonresidential Compliance Manual *(NA7.5.1.1 Ventilation Systems: Variable Air Systems At-A-Glance and NA7.5.1.2 Constant Volume Systems Outdoor Air Acceptance At-A-Glance).*
   c. 2016 Building Energy Efficiency Standards.
2. Instrumentation needed to perform test includes:
   a. Watch
   b. Calibrated means to measure airflow (i.e. hot-wire anemometer, velocity pressure probe, etc.).
      i. Method and equipment used:_____
      ii. Equipment calibration date (must be within one year):_____
3. System type (check either VAV or CAV): ☐ VAV ☐ CAV
   a. Check if Variable Air Volume (VAV) and complete the following:
      i. Outside airflow is either factory calibrated or field calibrated.
         ☐ Check if factory calibrated and attach calibration certification.
         ☐ Check if field calibrated and attach calibration results.
      ii. Damper Control (must be checked):
         ☐ Dynamic damper control is being used to control outside air. (This is NOT a fixed minimum position).
      iii. One of the following dynamic controls is being utilized to control outside air (check method used)
         ☐ Outdoor Air CFM Compensation
         ☐ Energy Balance Method
         ☐ Demand Control Ventilation
         ☐ Return Fan Tracking
         ☐ Injection Fan Method
         ☐ Dedicated Minimum Ventilation Damper with Pressure Control
         ☐ Other Active Control, Describe: _____
   b. Check if Constant Air Volume (CAV) and verify the following:
      ☐ System is designed to provide a fixed minimum OSA when the unit is on.
4. Method of delivering outside air to the unit (check one of the following):
   ☐ Outside air is ducted to the return air plenum. Confirm that outside air is ducted to within (check one of the following):
      ☐ 5 ft. of the unit.
      ☐ 15 ft. of the unit, with the air directed substantially toward the unit.
   ☐ Return air plenum is NOT used to distribute outside air to the unit. (i.e. outside air is ducted directly to the unit; outside air is provided independent of the unit, or economizer)
5. Pre-occupancy purge has been programmed for the 1-hour period immediately before the building is normally occupied to provide (one of the following methods must be verified and checked):
   ☐ The conditioned floor area times the ventilation rate from the 2016 Building Energy Efficiency Standards TABLE 120.1-A, or 15 cfm per person times the expected number of occupants, whichever is greater.
   ☐ Complete air changes to the zone served by the air handler.

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance — July 2016

STATE OF CALIFORNIA
OUTDOOR AIR ACCEPTANCE
CEC-NRCA-MCH-02-A (Revised 07/16)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE — NRCA-MCH-02-A
Outdoor Air Acceptance — (Page 2 of 3)

Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identification/Tag: FC	System Location or Area Served: 1ST FLOOR	

B. NA7.5.1.1 Outdoor Air Acceptance Functional Testing

	CAV	VAV
Step 1: Disable demand control ventilation (if applicable)	☐	☐
Step 2: Verify unit is not in economizer mode during test (economizer disabled)	☐	☐
Note: Shaded boxes do not apply for CAV systems		
Step 3: CAV and VAV testing at full supply airflow		
a. Adjust supply air to achieve design airflow or maximum airflow at full cooling. Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm)	cfm	cfm
c. Required outdoor airflow (cfm) *(from MCH-03, Column 14, or Mechanical Equipment Schedules).*	cfm	cfm
d. Time for outside air damper to stabilize after full supply airflow is achieved (minutes):		min
Step 4: VAV testing at reduced supply airflow	**CAV**	**VAV**
a. Adjust supply airflow to either the sum of the minimum zone airflows, full heating, or 30% of the total design airflow. Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm).		cfm
c. Required outdoor airflow (cfm) *(from MCH-03, Column 14, or Mechanical Equipment Schedules).*		cfm
d. Time for outside air damper to stabilize after reduced supply airflow is achieved (minutes):		min
Step 5: Return to initial conditions (check)	☐	☐

C. Testing Calculations & Results

Determine Percent Outside Air at full supply airflow ($\%OA_{Ps}$) for Step 3.

a.	$\%OA_{Ps}$ = Measured outdoor airflow reading /Required outdoor airflow. (Step3b/Step3c)	%	%
b.	$\%OA_{Ps}$ is within 10% of design Outside Air. ($90\% \le \%OA_{Ps} \le 110\%$)	Yes ○ No ○	Yes ○ No ○
c.	Outside air damper position stabilizes within 5 minutes. (Step 3d < 5 minutes)		Yes ○ No ●

Determine Percent Outside Air at reduced supply airflow ($\%OA_{Pv}$) for Step 4. (VAV only)

a.	$\%OA_{Pv}$ = Measured outdoor airflow reading /Required outdoor airflow reading. (Step4b/Step4c)		%
b.	$\%OA_{Pv}$ is within 10% of design Outside Air. ($90\% \le \%OA_{Pv} \le 110\%$)		Yes ○ No ○
c.	Outside air damper position stabilizes within 5 minutes. (Step 4d < 5 minutes)		Yes ○ No ○

Note: The intent of this test is to ensure that 1) all air handlers provide the minimum amount of OSA and 2) VAV air handlers use dynamic controls to avoid over ventilation.

D. Evaluation

☐ PASS: All Construction Inspection responses are complete and Testing Calculations & Results responses are positive.

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance — July 2016

STATE OF CALIFORNIA
OUTDOOR AIR ACCEPTANCE
CEC-NRCA-MCH-02-A (Revised 07/16)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE — NRCA-MCH-02-A
Outdoor Air Acceptance — (Page 3 of 3)

Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identification/Tag: FC	System Location or Area Served: 1ST FLOOR	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Documentation Author Company Name: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	ATT Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

FIELD TECHNICIAN'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance — July 2016

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER
AMIT WADHWA
M30894
EXP. 12/31/20
MECHANICAL
STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers
870 Market Street
(Floor 8th) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax

19036

Issue/Revision:

No.	Proj. No. Date:	Description
1	32243.01	ISSUE FOR REVIEW 29MAR19
2	32243.01	ISSUE FOR PERMIT 22APR19

Approval Signature:

Co/ Title: Date:

MECHANICAL
TITLE 24

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 12 of 15

1TM4.0.2

STATE OF CALIFORNIA
CONSTANT VOLUME, SINGLE ZONE, UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS
CEC-MCH-03-A (Revised 07/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume, Single Zone, Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems		Page 1 of 3
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identifier(s)/Tag: VRV SYSTEM	System Location or Area Served: 1ST FLOOR	

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance. | Enforcement Agency Use: Checked by/Date

A. Construction Inspection

1. Supporting documentation needed to perform test includes, but not limited to:
   a. 2016 Building Energy Efficiency Standards Nonresidential Compliance Manual *(NA7.5.2 Constant Volume, Single-zone, Unitary Air Conditioner and Heat Pumps Systems Acceptance At-A-Glance)*.
   b. 2016 Building Energy Efficiency Standards Manual.
2. Instrumentation to perform test may include:
   a. Temperature Meter
   b. Amp Meter
3. Installation (check if applies):
   ☐ Thermostat is located within the space-conditioning zone that is served by the HVAC system.
4. Programming (check all those that apply):
   ☐ Thermostat meets the temperature adjustment and dead band requirements of 2016 Building Energy Efficiency Standards Manual Section 120.2(b).
   Minimum heating setpoint: _____°F. Maximum cooling setpoint _____°F. Deadband: _____°F.
   ☐ Occupied, unoccupied, and holiday schedules have been programmed per the schedule provided.
   ☐ Pre-occupancy purge has been programmed to meet the requirements of 2016 Building Energy Efficiency Standards Manual Section 120.1(c)2.
   1.. Check method used to determine pre-occupancy purge:
      ☐ Lesser of: conditioned floor area times ventilation rate from 2016 Building Energy Efficiency Standards TABLE 120.1-A or 15cfm per person times the expected number of occupants.
      ☐ 3 complete air changes.

Notes:

STATE OF CALIFORNIA
CONSTANT VOLUME, SINGLE ZONE, UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS
CEC-MCH-03-A (Revised 07/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume, Single Zone, Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems		Page 2 of 3
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identifier(s)/Tag: VRV SYSTEM	System Location or Area Served: 1ST FLOOR	

B. Functional Testing Requirements — Operating Modes

		8	7	6	5	4	3	2
Step 1: Disable economizer control and demand-controlled ventilation (if applicable) to prevent unexpected interactions.								
Occupied Mode								
Step 2: Heating load during occupied condition								
Step 3: No-load during occupied condition								
Step 4: Cooling load during occupied condition								
Unoccupied Mode								
Step 5: No-load during unoccupied condition								
Step 6: Heating load during unoccupied condition								
Step 7: Cooling load during unoccupied condition								
Step 8: Manual override								
Step 2 – 8: Check and verify the following for each simulation mode required								
a.	Supply fan operates continually							
b.	Supply fan turns off							
c.	Supply fan cycles on and off							
d.	System reverts to "occupied" mode to satisfy any condition							
e.	System turns off when manual override time period expires							
f.	Gas-fired furnace, heat pump, or electric heater stages on							
g.	No heating is provided by the unit							
h.	No cooling is provided by the unit							
i.	Compressor stages on							
j.	Outside air damper is open to minimum position							
k.	Outside air damper closes completely							

Step 9: System returned to initial operating conditions after all tests have been completed: Yes ○ No ○

C. Testing Results

Indicate if Passed (P), Failed (F), or N/A (X), fill in appropriate letter	8	7	6	5	4	3	2

D. Evaluation

☐ PASS: **All Construction Inspection** responses are complete and all applicable **Testing Results** responses are "Pass" (P).

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance July 2016

STATE OF CALIFORNIA
CONSTANT VOLUME, SINGLE ZONE, UNITARY (PACKAGED AND SPLIT) AIR CONDITIONER AND HEAT PUMP SYSTEMS
CEC-MCH-03-A (Revised 07/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-03-A
Constant Volume, Single Zone, Unitary (Packaged and Split) Air Conditioner and Heat Pump Systems		Page 3 of 3
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806
System Name or Identifier(s)/Tag: VRV SYSTEM	System Location or Area Served: 1ST FLOOR	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Documentation Author Company Name: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	ATT Certification Identification (If applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance July 2016

STATE OF CALIFORNIA
MECHANICAL
CEC-NRCI-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		NRCI-MCH-01-E
Mechanical		Page 1 of 2
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806

A. GENERAL INFORMATION

DATE OF PERMIT:			
BUILDING TYPE:	☑ Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel
PHASE OF CONSTRUCTION:	☐ New Construction	☐ Addition	☑ Alteration

B. SCOPE OF RESPONSIBILITY

Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate. Date:

In the table below identify all applicable construction documents that specify the features, materials, components, manufactured devices, or system performance diagnostic results required for the scope of responsibility for this Installation Certificate (continued).

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved by Enforcement Agency

Add Row | Remove Last

STATE OF CALIFORNIA
MECHANICAL
CEC-NRCI-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		NRCI-MCH-01-E
Mechanical		Page 2 of 2
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency:	Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND	Zip Code: 94806

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Documentation Author Company Name: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	CEA Certification Identification (If applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance January 2016

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER AMIT WADHWA M30894 EXP. 12/31/20 MECHANICAL STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates Engineers
870 Market Street
(Penof Bldg) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

Issue/Revision:

No.	Proj. No. Date:	Description
1	32243.01 29MAR19	ISSUE FOR REVIEW
2	32243.01 22APR19	ISSUE FOR PERMIT

Approval Signature:

Co/ Title: Date:

MECHANICAL
TITLE 24

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 13 of 15

1TM4.0.3

STATE OF CALIFORNIA

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 04/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-01-E
Process Compliance Forms & Checklists	(Page 1 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. PROCESS COMPLIANCE DOCUMENTS & WORKSHEETS

Check box if worksheet is included.

For detailed instructions on the use of this and all Energy Standards compliance documents, refer to the 2016 Nonresidential Manual.

Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Doc/Worksheet #	Title
☒	☐	PRC-01-E (1 of 2)	Covered Process Certificate of Compliance. Required on plans for all submittals with covered processes.
☒	☐	PRC-01-E (2 of 2)	Certificate of Compliance, Required Acceptance Tests (PRC-02-A to PRC-08-A). Required on plans for all submittals.
☐	☒	PRC-02-E	Certificate of Compliance for Enclosed Parking Garage Exhaust Fans
☐	☒	PRC-03-E	Certificate of Compliance for Commercial Kitchens
☒	☐	PRC-04-E	Certificate of Compliance for Computer Rooms
☐	☒	PRC-05-E	Certificate of Compliance for Commercial Refrigeration
☐	☒	PRC-06-E	Certificate of Compliance for **ALL** Refrigerated Warehouses
☐	☒	PRC-07-E	Certificate of Compliance for Refrigerated Warehouse ≥ 3,000 ft^2
☐	☒	PRC-08-E	Certificate of Compliance for Refrigerated Warehouse Where **Multiple** Spaces that (i) comprise a total of 3,000ft^2 or more; and (ii) are collectively served by the same refrigeration system compressor(s) and condenser(s) (central systems).
☐	☒	PRC-09-E	Certificate of Compliance for Laboratory Exhaust
☐	☒	PRC-10-E	Certificate of Compliance for Compressed Air Systems
☐	☒	PRC-11-E	Certificate of Compliance for Process Boilers
☐	☒	PRC-12-E	Certificate of Compliance for Elevator Lighting and Ventilation Controls
☐	☒	PRC-13-E	Certificate of Compliance for Escalators and Moving Walkways Speed Controls

STATE OF CALIFORNIA

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 04/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-01-E
Process Compliance Forms & Checklists	(Page 2 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

B. PROCESS ACCEPTANCE DOCUMENTS

Check box for required compliance documents.

Designer:

This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for process systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of the same type requires a test, list the equipment description and the number of systems.

Installing Contractor:

The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:

Plancheck – The NRCC-PRC-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.

Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		PRC-01-A	PRC-02-A	PRC-03-A	PRC-04-A	PRC-05-A	PRC-06-A	PRC-07-A	PRC-08-A	PRC-12-A	PRC-13-A
Equipment Requiring Testing or Verification	# of Units	Compressed Air Systems	Garage Exhaust	Kitchen Exhaust	RHW Evap Fan Motor Controls	RHW Evap Condenser Controls	RHW Air-Cooled Condenser Controls	RHW Variable Speed Compressors	RHW Elect. Underslab Heating	Elevator Lighting and Ventilation Controls	Escalators and Moving Walkways Speed Controls
FC 1-2	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
FC 1-5	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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STATE OF CALIFORNIA

PROCESS COMPLIANCE FORMS AND WORKSHEETS

CEC-NRCC-PRC-01-E (Revised 04/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-01-E
Process Compliance Forms & Checklists	(Page 3 of 3)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA & ASSOCIATES	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/HERS Certification Identification (If applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company : AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

STATE OF CALIFORNIA

COMPUTER ROOM REQUIREMENTS

CEC-NRCC-PRC-04-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-04-E
Computer Room Requirements	(Page 1 of 2)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/2019

TOTAL INSTALLED COOLING CAPACITY (TONS)[1]: 2 TON

Equipment Tags and System Description[2]		FC 1-1		
PRESCRIPTIVE MEASURES	***T-24 Sections***	***Reference to the Requirements in the Contract Documents[3]***		
Economizers	140.9(a)1	N/A, SEE EXCEPTION 1		
Reheat	140.9(a)2	COOLING ONLY UNIT		
Humidification	140.9(a)3	N/A		
Fan Power	140.9(a)4	UNDER 27W/KBTU		
Fan Control	140.9(a)5	N/A, UNDER 60000BTU/H		
Containment	140.9(a)6	N/A, SEE EXCEPTION 2		

Notes:

1. Enter the total installed cooling capacity for all computer rooms under this permit
2. Provide equipment tags (e.g. CRAC-1 to 10, AHU 1 to 5 and CH 1 to 3) for all cooling systems that are covered by these requirements. Groups of equipment that are similar can be combined into one column.
3. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. Explicitly list any exceptions used to avoid a requirement.

STATE OF CALIFORNIA

COMPUTER ROOM REQUIREMENTS

CEC-NRCC-PRC-04-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-04-E
Computer Room Requirements	(Page 2 of 2)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/2019

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/ HERS Certification Identification (if applicable): N/A
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 738-9829

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company : AMIT WADHWA	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 738-9829

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton

909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER
AMIT WADHWA
M30894
EXP. 12/31/20
MECHANICAL
STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers

870 Market Street
(Flood Bldg) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

Issue/Revision:

No.	Proj. No. Date:	Description
1	32243.01 29MAR19	ISSUE FOR REVIEW
2	32243.01 22APR19	ISSUE FOR PERMIT

Approval Signature:

Co/ Title: Date:

MECHANICAL TITLE 24

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 14 of 15

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STATE OF CALIFORNIA
WATER HEATING SYSTEM GENERAL INFORMATION
CEC-NRCC-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PLB-01-E
Water Heating System General Information	(Page 1 of 2)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. GENERAL INFORMATION/SYSTEM INFORMATION

01	Water Heater System Name:	IWH 1-1
02	Water Heater System Configuration:	Single Dwelling Unit
03	Water Heater System Type:	Domestic Hot Water
04	Building Type:	Nonresidential
05	Total Number of Water Heaters in Systems:	1
06	Central DHW Distribution Type:	N/A
07	Dwelling Unit DHW Distribution Type:	Standard Distribution System (STD)

B. WATER HEATER INFORMATION
Each water heater type requires a separate compliance document.

01	Water Heater Type:	Instantaneous Small - Electric
02	Fuel Type:	Electricity
03	Manufacture Name:	CHRONOMITE
04	Model Number:	E-46LLP
05	Number of Identical Water Heaters:	1
06	Installed Water Heater System Efficiency:	99%
07	Required Minimum Efficiency:	-
08	Standby Loss Percent or Standby Loss Total:	N/A
09	Rated Input:	4.6 KW
10	Pilot Energy:	N/A
11	Water Heater Tank Storage Volume:	N/A
12	Exterior Insulation on Water Heater:	N/A
13	Volume of Supplemental Storage:	N/A
14	Internal Insulation on Supplemental Storage:	N/A
15	Exterior Insulation on Supplemental Storage:	N/A

C. PLUMBING COMPLIANCE FORMS & WORKSHEETS
Check box if worksheet is included.
For detailed instructions on the use of this and all Energy Standards compliance documents, refer to the 2016 Nonresidential Manual
Note: The Enforcement Agency may require all compliance documents to be incorporated onto the building plans.

YES	NO	Doc/Worksheet #	Title
⦿	○	NRCC-PLB-01-E	Certificate of Compliance, Declaration. Required on plans for all submittals.
⦿	○	NRCI-PLB-01-E	Certificate of Installation. Required on plans for all submittals.
○	○	NRCI-PLB-02-E	Certificate of Installation, required on central systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-03-E	Certificate of Installation, required on single dwelling unit systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-21-H	Certificate of Installation, required on HERS verified central systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-22-H	Certificate of Installation, required on HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.
○	○	NRCI-STH-01-E	Certificate of Installation, required on any solar water heating

STATE OF CALIFORNIA
WATER HEATING SYSTEM GENERAL INFORMATION
CEC-NRCC-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PLB-01-E
Water Heating System General Information	(Page 1 of 2)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

A. GENERAL INFORMATION/SYSTEM INFORMATION

01	Water Heater System Name:	IWH 1-2
02	Water Heater System Configuration:	Single Dwelling Unit
03	Water Heater System Type:	Domestic Hot Water
04	Building Type:	Nonresidential
05	Total Number of Water Heaters in Systems:	1
06	Central DHW Distribution Type:	N/A
07	Dwelling Unit DHW Distribution Type:	Standard Distribution System (STD)

B. WATER HEATER INFORMATION
Each water heater type requires a separate compliance document.

01	Water Heater Type:	Instantaneous Small - Electric
02	Fuel Type:	Electricity
03	Manufacture Name:	CHRONOMITE
04	Model Number:	E-70ELP
05	Number of Identical Water Heaters:	1
06	Installed Water Heater System Efficiency:	99%
07	Required Minimum Efficiency:	-
08	Standby Loss Percent or Standby Loss Total:	N/A
09	Rated Input:	7.0 KW
10	Pilot Energy:	N/A
11	Water Heater Tank Storage Volume:	N/A
12	Exterior Insulation on Water Heater:	N/A
13	Volume of Supplemental Storage:	N/A
14	Internal Insulation on Supplemental Storage:	N/A
15	Exterior Insulation on Supplemental Storage:	N/A

C. PLUMBING COMPLIANCE FORMS & WORKSHEETS
Check box if worksheet is included.
For detailed instructions on the use of this and all Energy Standards compliance documents, refer to the 2016 Nonresidential Manual
Note: The Enforcement Agency may require all compliance documents to be incorporated onto the building plans.

YES	NO	Doc/Worksheet #	Title
⦿	○	NRCC-PLB-01-E	Certificate of Compliance, Declaration. Required on plans for all submittals.
⦿	○	NRCI-PLB-01-E	Certificate of Installation. Required on plans for all submittals.
○	○	NRCI-PLB-02-E	Certificate of Installation, required on central systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-03-E	Certificate of Installation, required on single dwelling unit systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-21-H	Certificate of Installation, required on HERS verified central systems in high-rise residential, hotel/motel application.
○	○	NRCI-PLB-22-H	Certificate of Installation, required on HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.
○	○	NRCI-STH-01-E	Certificate of Installation, required on any solar water heating

STATE OF CALIFORNIA
WATER HEATING SYSTEM GENERAL INFORMATION
CEC-NRCC-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PLB-01-E
Water Heating System General Information	(Page 2 of 2)
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Date Prepared: 4/15/19

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Company: AMIT WADHWA & ASSOCIATES	Signature Date:
Address: 870 MARKET STREET, SUITE 846	CEA/HERS Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: AMIT WADHWA	Responsible Designer Signature:
Company: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	License: M30894
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

STATE OF CALIFORNIA
PLUMBING
CEC-NRCI-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION	NRCI-PLB-01-E
Plumbing	Page 1 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency: / Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND / Zip Code: 94806

A. GENERAL INFORMATION

DATE OF PERMIT:			
BUILDING TYPE:	☑ Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel
PHASE OF CONSTRUCTION:	☐ New Construction	☐ Addition	☑ Alteration

If more than one person has responsibility for building construction, each person shall prepare and sign an Installation Certificate document applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the installation Certificate document(s) for the entire construction.

B. SCOPE OF RESPONSIBILITY
Enter the date of approval by enforcement agency of the Certificate of Compliance that provides the specifications for the energy efficiency measures for the scope of responsibility for this Installation Certificate. Date:
In the table below identify all applicable construction documents that specify the features, materials, components, manufactured devices, or system performance diagnostic results required for the scope of responsibility for this Installation Certificate (continued).

Document Title or Description	Applicable Sheets or Pages, Tables, Schedules, etc.	Date Approved by Enforcement Agency

Add Row Remove Last

STATE OF CALIFORNIA
PLUMBING
CEC-NRCI-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION	NRCI-PLB-01-E
Plumbing	Page 2 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency: / Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND / Zip Code: 94806

C. MANDATORY REQUIREMENTS FOR ALL CENTRAL DOMESTIC HOT WATER RECIRCULATION SYSTEMS

01	On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
02	Systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
03	For public lavatories, the control system shall limit the outlet temperature to 110° F. (Section 110.3(c)3).
04	Unfired storage tanks are insulated with an external R-12 or combination of R-16 internal and external insulation. Alternatively, the heat loss of the tank surface based on an 80° F water-air temperature difference shall be less than 6.5 Btu per hour per square foot. (Section 110.3(c)4).
05	All sections of the recirculation loop, and the first 5 feet of all branches off the loop are insulated, to the thicknesses required by Table 120.3A, except for the following: (RA4.4.1) • Piping installed in interior or exterior walls that is surrounded on all sides by at least 1inch of insulation. • Piping installed in attics with a minimum of 4 inches (10 cm) of attic insulation on top • Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Metal piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members. • Insulation is not required on the cold water line when it is used as the return
06	Hot water pipes that are buried below grade are installed in a water proof and non-crushable casing or sleeve that allows for installation, removal, and replacement of the enclosed pipe and insulation. (RA4.4.1)
07	Insulation outside conditioned space is protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. (RA4.4.1)
08	Pipe insulation fits tightly to the pipe. (RA4.4.1)
09	On insulated sections of pipe, no piping is visible due to insulation voids, and all elbows and tees are fully insulated.. (RA4.4.1)
10	The recirculation pump is mounted on a vertical section of the return line, OR an automatic air release valve is installed on a riser at least 12 inches in length, on the inlet side of the recirculation pump, no more than 4 feet from the pump. (Section 110.3(c)5A).
11	A check valve is located between the recirculation pump and the water heater. (Section 110.3(c)5B).
12	A hose bibb is installed between the pump and the water heating equipment with an isolation valve between the hose bibb and the water heating equipment. (Section 110.3(c)5C).
13	Isolation valves are installed on both sides of the pump. One of the isolation valves may be the same isolation valve as in item 12 above. (Section 110.3(c)5D).
14	The cold water supply piping and the recirculation loop piping is not connected to the hot water storage tank drain port. (Section 110.3(c)5E).
15	A check valve is installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply. (Section 110.3(c)5F).
16	The hot water distribution system piping from the water heater(s) to the fixtures and appliances takes the most direct path. (RA 4.4.7.1)
17	Installation and operation instructions that provide details of the operation of the pump and controls are available at the jobsite for inspection. (RA 4.4.7.1)
18	More than one circulation loop may be installed. Each loop shall have its own pump and controls. (RA4.4.8, RA 4.4.9, RA 4.4.10)

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

STATE OF CALIFORNIA
PLUMBING
CEC-NRCI-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION	NRCI-PLB-01-E
Plumbing	Page 3 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency: / Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND / Zip Code: 94806

D. MANDATORY MEASURES FOR ALL SINGLE DWELLING HOT WATER DISTRIBUTION SYSTEMS

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)11).
02	Unfired Storage Tanks are insulated with an external R-12 or combination of R-16 internal and external Insulation. (Section 110.3(c)4).
03	The following pipes are insulated, to the thicknesses required by Table 120.3A, except for those sections of pipe that are subject to one of the exceptions below: (RA4.4.1) • The first 5 feet (1.5 meters) of hot and cold water pipes from the storage tank. • All piping with a nominal diameter of 3/4 inch (19 millimeter) or larger. • All piping associated with a domestic hot water recirculation system regardless of the pipe diameter, except when cold water return is used in a demand system. • Piping from the heating source to storage tank or between tanks. • Piping buried below grade. • All hot water pipes from the heating source to the kitchen fixtures. The following sections of pipe do not have to be insulated: (RA4.4.1) • Piping installed in interior or exterior walls that is surrounded on all sides by at least 1 inch of insulation. • Piping installed in attics with a minimum of 4 inches (10 cm) of attic insulation on top • Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Metal piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.
04	Piping buried below grade must be installed in a water proof and non-crushable casing or sleeve that allows for installation, removal, and replacement of the enclosed pipe and insulation. (Section 150.0(j))
05	All elbows and tees shall be fully insulated. (RA4.4.1)
06	Where insulation is required, no piping shall be visible due to insulation voids, and all insulation shall fit tightly to the pipe. (RA4.4.1)
07	**For Gas or Propane Water Heaters:** Ensure the following are installed (Section 150.0(n)) 1. A 120V electrical receptacle is within 3 feet from the water heater and accessible with no obstructions 2. A Category III or IV vent, or a Type B vent with straight pipe between outside and water heater 3. A condensate drain no more than 2 inches higher than the base on water heater for natural draining 4. A gas supply line with capacity of at least 200,000 Btu/hr

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

STATE OF CALIFORNIA
PLUMBING
CEC-NRCI-PLB-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION	NRCI-PLB-01-E
Plumbing	Page 4 of 4
Project Name: RICHMOND LAKESIDE TENANT IMPROVEMENT	Enforcement Agency: / Permit Number:
Project Address: 4114 LAKESIDE DRIVE	City: RICHMOND / Zip Code: 94806

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name: AMIT WADHWA	Documentation Author Signature:
Documentation Author Company Name: AMIT WADHWA & ASSOCIATES	Date Signed:
Address: 870 MARKET STREET, SUITE 846	CEA Certification Identification (if applicable):
City/State/Zip: SAN FRANCISCO, CA 94102	Phone: (415) 788-9999

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):
Address:	CSLB License:
City/State/Zip:	Phone: / Date Signed:

RICHMOND LAKESIDE
TENANT IMPROVEMENT

4114 Lakeside Drive
Richmond, CA 94806

brereton
909 Montgomery St., Suite 260
San Francisco, California 94133
T 415 546 1212 brereton.com

Stamp

REGISTERED PROFESSIONAL ENGINEER AMIT WADHWA M30894 EXP. 12/31/20 MECHANICAL STATE OF CALIFORNIA

Consultant

Amit Wadhwa & Associates
Engineers
870 Market Street
(Floor 885) Suite 846
San Francisco, CA 94102
415.788.9999 tel
415.617.0076 fax
19036

Issue/Revision:

No.	Proj. No, Date:	Description
1	32243.01 19MAR19	ISSUE FOR REVIEW
2	32243.01 22APR19	ISSUE FOR PERMIT

Approval Signature:

Co/ Title: Date:

MECHANICAL
TITLE 24

Scale: NONE Issue Date: 17APR19
Drawn By: PT Reviewed By: AW
Sheet: 15 of 15

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