PROJECT INFORMATION

PROJECT DESCRIPTION
THE SCOPE OF THE WORK IS TO ADD A NEW FREE-STANDING DUPLEX ACCESSORY DWELLING UNIT TO THE REAR YARD OF THE PROJECT ADDRESS AS WELL AS CONVERT THE EXISTING DETACHED GARAGE INTO AN ADU.
A SEPARATE PERMIT FOR EACH DUPLEX ADU UNIT AND FOR THE GARAGE CONVERSION. THESE DRAWINGS ARE COMMON TO BOTH NEW ADU UNITS.
PROJECT ADDRESS: 245 ROBLE AVENUE, REDWOOD CITY, CALIFORNIA 95063
PARCELS (BLOCK / LOT): APN: 059122070 PARCEL ID: 2811631
PARCEL AREA: 13,278 SQUARE FEET
EXISTING BUILDING AREA: 2856 SQUARE FEET
PROPOSED BUILDING AREA: 4172 SQUARE FEET
STORIES & BUILDING HEIGHT: 1 STORY
ACCESSORY DWELLING UNIT WILL BE LESS THAN 20' HIGH
BUILDING USE / OCCUPANCY GROUP R-3/U
CONSTRUCTION TYPE: V-B
NEW RESIDENTIAL SQ. FOOTAGE:1316 SQUARE FEET, GROSS BUILDING AREA (EACH UNIT 658 SQUARE FEET)
SPRINKLERS:
SPRINKLER SYSTEM IS REQUIRED DUE TO DISTANCE FROM THE STREET (MAIN HOUSE DOES NOT HAVE SPRINKLERS)
REQUIREMENTS TO COMPLY WITH LOCAL AUTHORITY HAVING JURISDICTION.
DEFERRED SUBMITTALS: AUTOMATIC SPRINKLER SYSTEM
PHOTOVOLTAIC SOLAR PANELS
FLOOD HAZARD ZONE: FEMA FLOOD ZONE ZONE X (LOW/MODERATE RISK)
FIRE HAZARD SEVERITY ZONE: NON-VHFHSZ
WILDLAND URBAN INTERFACE (WUI): NO
SEISMIC DESIGN CATEGORY D2

BUILDING - FEATURES INFORMATION
THE FOLLOWING ARE FEATURES THAT MUST BE INSTALLED AS CONDITION FOR MEETING THE MODELED ENERGY PERFORMANCE FOR THIS COMPUTER ANALYSIS.

- PV SYSTEM: 5.07 KWDC
- BATTERY SYSTEM: 5 KWH
- INDOOR AIR QUALITY, BALANCED FAN
- COOL ROOF
- CEILING HAS HIGH LEVEL OF INSULATION
- FLOOR HAS HIGH LEVEL OF INSULATION
- WINDOW OVERHANGS AND/OR FINS
- EXPOSED SLAB FLOOR IN CONDITIONED ZONE
- SLAB EDGE INSULATION
- NORTHWEST ENERGY EFFICIENCY ALLIANCE (NEEA) RATED HEAT PUMP WATER HEATER; SPECIFIC BRAND/MODEL, OR EQUIVALENT, MUST BE INSTALLED

HERS FEATURE SUMMARY
THE FOLLOWING IS A SUMMARY OF THE FEATURES THAT MUST BE FIELD-VERIFIED BY A CERTIFIED HERS RATER AS A CONDITION FOR MEETING THE MODELED ENERGY PERFORMANCE FOR THIS COMPUTER ANALYSIS.
ADDITIONAL
DETAIL IS PROVIDED IN THE BUILDNG TABLES BELOW. REGISTERED CF2RS AND CF3RS ARE REQUIRED TO BE COMPLETED IN THE HERS REGISTRY
BUILDING-LEVEL VERIFICATIONS:

- QUALITY INSULATION INSTALLATION (QII)
- INDOOR AIR QUALITY VENTILATION
- KITCHEN RANGE HOOD

COOLING SYSTEM VERIFICATIONS:

- VERIFIED REFRIGERANT CHARGE

HEATING SYSTEM VERIFICATIONS: -- NONE --
HVAC DISTRIBUTION SYSTEM VERIFICATIONS: -- NONE --
DOMESTIC HOT WATER SYSTEM VERIFICATIONS: -- NONE --

PROJECT DIRECTORY

JEFF MILLER (650)799-6880 JEFF@REDWOODOAKS.COM
OWNER/BUILDER/DESIGNER

LEE MILLER (650) 996-9945 LEEBMR@GMAIL.COMOWNER/BUILDER/DESIGNER

APPLICABLE CODES:

2019 CALIFORNIA RESIDENTIAL CODE
2019 CALIFORNIA MECHANICAL CODE
2019 CALIFORNIA ELECTRICAL CODE
2019 CALIFORNIA PLUMBING CODE
2019 CALIFORNIA ENERGY CODE
2019 CALIFORNIA FIRE CODE

VICINITY MAP

SATELLITE PHOTO

City allowed construction hours are Monday through Friday from 7am to 8 pm.
Work is prohibited for contractors Saturday, Sunday and City observed holidays.

California Residential Code sections R314.6.2(a)(1) and R315.2.2 require smoke alarms and carbon monoxide alarms be installed with any permit. Thr Building Inspector will check for smoke and CO alarms at the time of Final Inspection

RECYCLING C & D PROJECT
Recycling facility receipts and reports due 60 days after final inspection

A new address must be obtained prior to rough frame inspection

ARCHITECTURAL - 245 ROBLE AVE DUPLEX ADU	
A1	TITLE SHEET
A2	SITE PLAN
A3	FLOOR PLAN
A4	BUILDING ELEVATIONS, NORTH AND SOUTH
A5	BUILDING ELEVATIONS, EAST AND WEST
A6	SECTIONS
A7	FOUNDATION PLAN
A8	ROOF PLAN
A9	WALL FRAMING
A10	PLUMBING
A11	LIGHTING & ELECTRICAL
A12	HVAC
A13	DOORS & WINDOWS
A14	GRADING AND DRAINAGE
COMMON DETAILS	
DD1	TYPICAL DETAILS
REGULATORY	
T24-1-1	T24 ENERGY REPORT – UNIT 1, LEFT
T24-1-2	T24 ENERGY REPORT – UNIT 1, LEFT
T24-1-3	T24 ENERGY REPORT– UNIT 1, LEFT
T24-2-1	T24 ENERGY REPORT – UNIT 2, RIGHT
T24-2-2	T24 ENERGY REPORT – UNIT 2, RIGHT
T24-2-3	T24 ENERGY REPORT – UNIT 2, RIGHT
S1	STRUCTURAL
MM	MANDATORY MEASURES
CG1	CAL GREEN
CG2	CAL GREEN
CBMP	CONSTRUCTION BMP
FF	FIRE HYDRANT FLOW TEST

DRAWN BY
JEFF MILLER

DUPLEX ADU

245 ROBLE AVE.,
REDWOOD CITY,
CA 94061
APN 059-122-070

APPROVALS:

CITY OF REDWOOD CITY
PLANS REVIEWED FOR COMPLIANCE WITH.
2019 yr. CBC, CRC, CMC, CEC, CPC CAL GREEN CAL ENERGY
PLAN CHECK OF DOCUMENTS DOES NOT AUTHORIZE CONSTRUCTION TO PROCEED IN VIOLATION OF ANY FEDERAL, STATE OR LOCAL REGULATIONS.
SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

04/11/2023

SCALE: AS INDICATED

TITLE SHEET

A1

JOB COPY

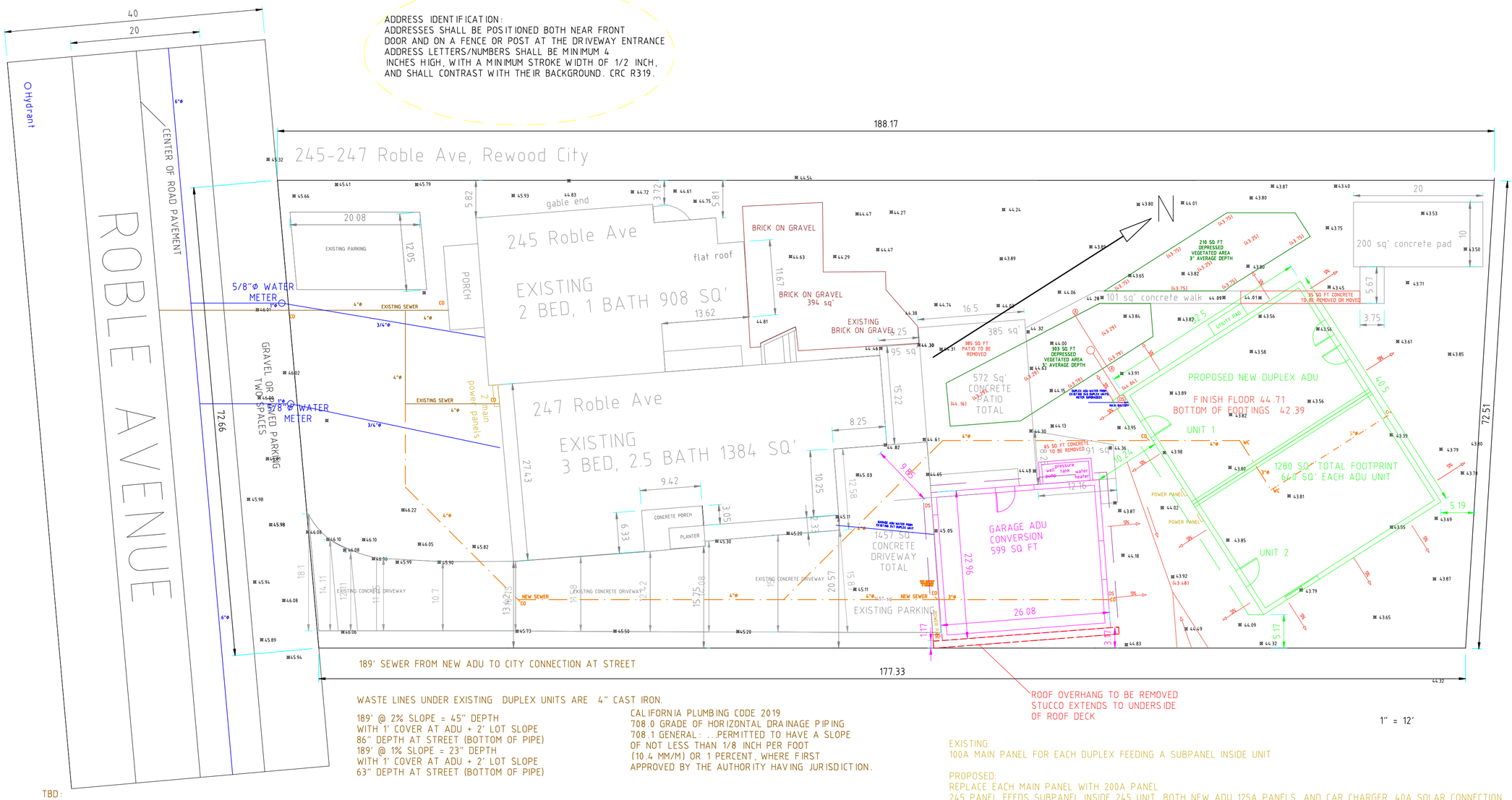
ADU22-0077 & ADU22-0078

PARCEL AREA: 13,278 SQUARE FEET
EXISTING BUILDING AREA: 2856 SQUARE FEET
PROPOSED ADDITIONAL BUILDING AREA: 1280 SQUARE FEET
EXISTING CONCRETE DRIVEWAYS AND PATIO: 2730 SQUARE FEET
EXISTING TOTAL BUILDING AND PAVED AREA 5592 SQUARE FEET, 42%
REMOVE 485 SQ FT CONCRETE PATIO
PROPOSED TOTAL BUILDING AND NON-PERVIOUS AREA 6390 SQUARE FEET, 48.29%
ADDING 303 SQ FT DEPRESSED VEGETATED AREA 3" AVERAGE DEPTH

LOT IS SLOPED DOWN AWAY FROM THE STREET

UPGRADE 245 WATER SERVICE AS NEEDED FOR FIRE SPRINKLERS IN NEW DUPLEX ADU BUILDING
EXISTING: 1" LINE TO 5/8" METER

ADDRESS IDENTIFICATION:
ADDRESSES SHALL BE POSITIONED BOTH NEAR FRONT DOOR AND ON A FENCE OR POST AT THE DRIVEWAY ENTRANCE
ADDRESS LETTERS/NUMBERS SHALL BE MINIMUM 4 INCHES HIGH, WITH A MINIMUM STROKE WIDTH OF 1/2 INCH, AND SHALL CONTRAST WITH THEIR BACKGROUND. CRC R319.



ROOF OVERHANG TO BE REMOVED
STUCCO EXTENDS TO UNDERSIDE OF ROOF DECK

1" = 12'

WASTE LINES UNDER EXISTING DUPLEX UNITS ARE 4" CAST IRON.

189' @ 2% SLOPE = 45" DEPTH
WITH 1' COVER AT ADU + 2' LOT SLOPE
86" DEPTH AT STREET (BOTTOM OF PIPE)
189' @ 1% SLOPE = 23" DEPTH
WITH 1' COVER AT ADU + 2' LOT SLOPE
63" DEPTH AT STREET (BOTTOM OF PIPE)

CALIFORNIA PLUMBING CODE 2019
708.0 GRADE OF HORIZONTAL DRAINAGE PIPING
708.1 GENERAL: ...PERMITTED TO HAVE A SLOPE OF NOT LESS THAN 1/8 INCH PER FOOT (10.4 MM/M) OR 1 PERCENT, WHERE FIRST APPROVED BY THE AUTHORITY HAVING JURISDICTION.

TBD:
IF SEWER DEPTH AT STREET ALLOWS, 2% SLOPE.
IF 2% NOT FEASIBLE BUT 1% SLOPE IS THEN 1% SLOPE IF APPROVED.
OTHERWISE A SUMP AND PUMP IN FRONT OF GARAGE CONNECTED WITH 2" LINE TO BACK OF EXISTING 247 DUPLEX UNIT

SEWER DEPTH AT A MANHOLE ABOUT 200' UPSTREAM IS APPROXIMATELY 5' 10"
THE ROAD IS NEARLY LEVEL
THERE ARE SEVERAL HOUSES FURTHER BACK FROM THE STREET JUST TO THE EAST (263,265,273 AND 275 ROBLE).

EXISTING:
100A MAIN PANEL FOR EACH DUPLEX FEEDING A SUBPANEL INSIDE UNIT

PROPOSED:
REPLACE EACH MAIN PANEL WITH 200A PANEL
245 PANEL FEEDS SUBPANEL INSIDE 245 UNIT, BOTH NEW ADU 125A PANELS, AND CAR CHARGER. 40A SOLAR CONNECTION
247 PANEL FEEDS SUBPANEL INSIDE 247 UNIT, GARAGE ADU 125A PANEL, AND 2 CAR CHARGERS. 40A SOLAR CONNECTION

JOB COPY

DRAWN BY
JEFF MILLER

REV3 3-1-23 ADDED NOTES REGARDING PATIO REMOVAL, WATER SERVICE, ADDRESS ID, AND GARAGE OVERHANG

DUPLEX ADU AND GARAGE ADU CONVERSION

245-247 ROBLE AVE.,
REDWOOD CITY,
CA 94061
APN 059-122-070

APROVALS:

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CAL ENERGY
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SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

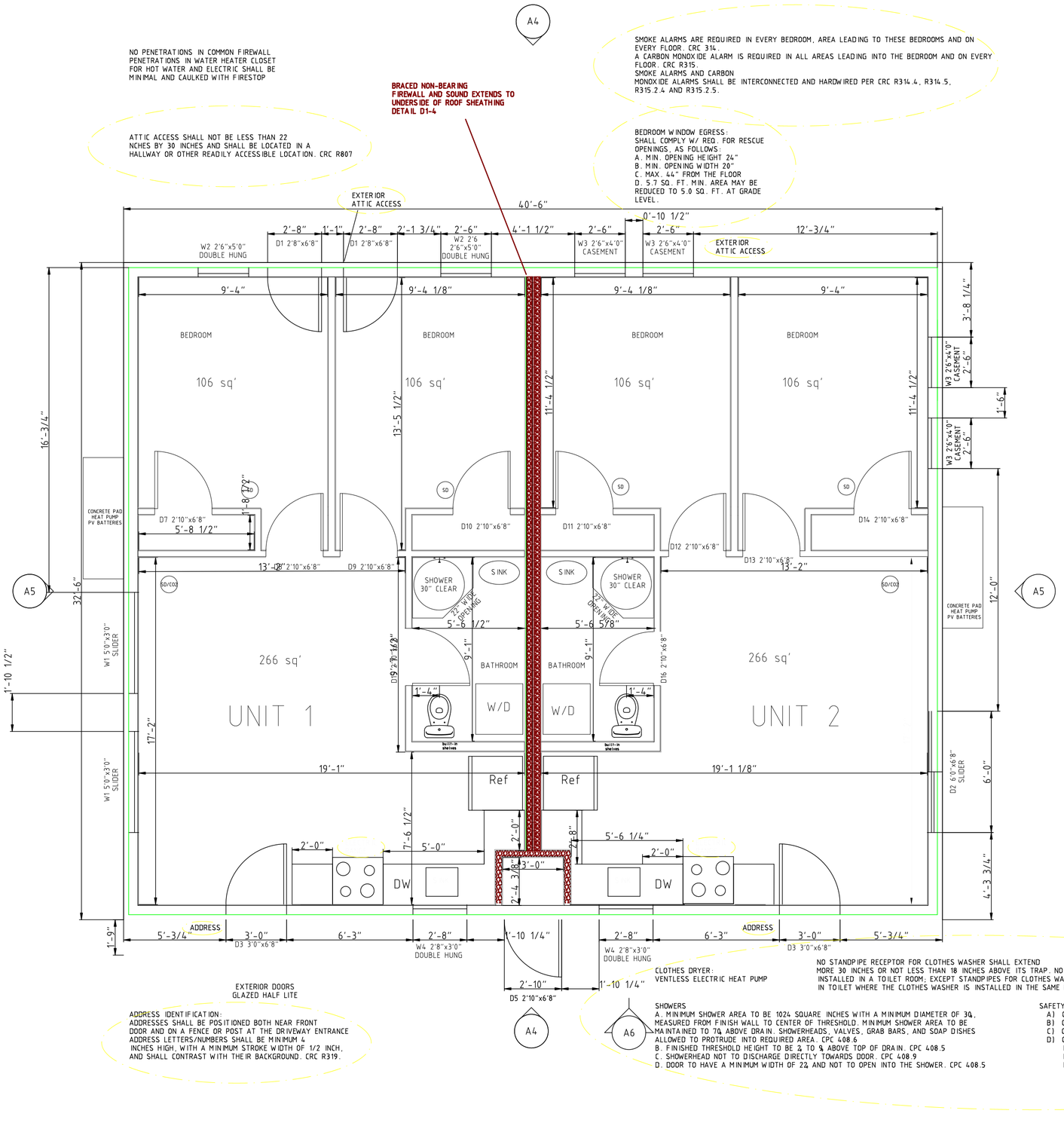
12/19/2022

SCALE: 1 : 144

SITE PLAN

A2

ADU22-0077 & ADU22-0078



DRAWN BY
JEFF MILLER

REV3 3-1-23 ADDED NOTES REGARDING ATTIC ACCESS, SMOKE/CO2 ALARMS, BEDROOM EGRESS, LAUNDRY, SHOWER, ADDRESS ID

DUPLEX ADU

245 ROBLE AVE.,
REDWOOD CITY,
CA 94061
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SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

12/27/2022

SCALE: 1 : 48

FLOOR PLAN

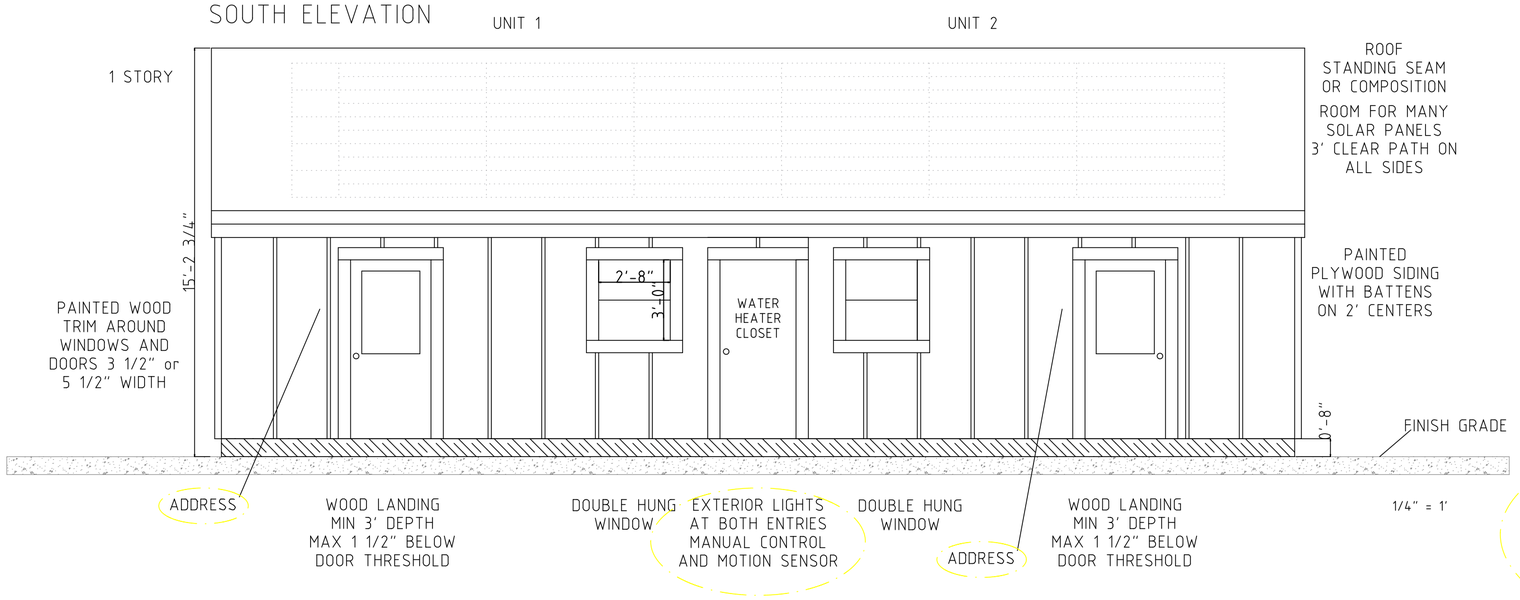
A3

JOB COPY

ADU22-0077 & ADU22-0078

NORTH ELEVATION

SOUTH ELEVATION



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JOB COPY

REV3 3-1-23 ADDED NOTES REGARDING ATTIC ACCESS

DUPLEX ADU

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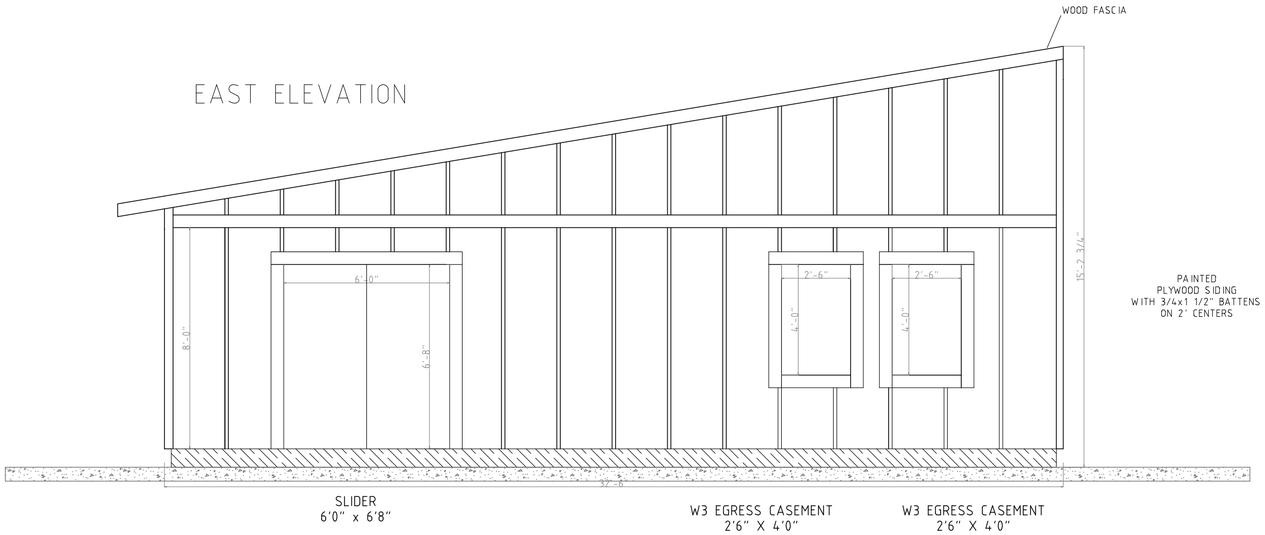
CBC [A]105.3.1 [A]107.3.1

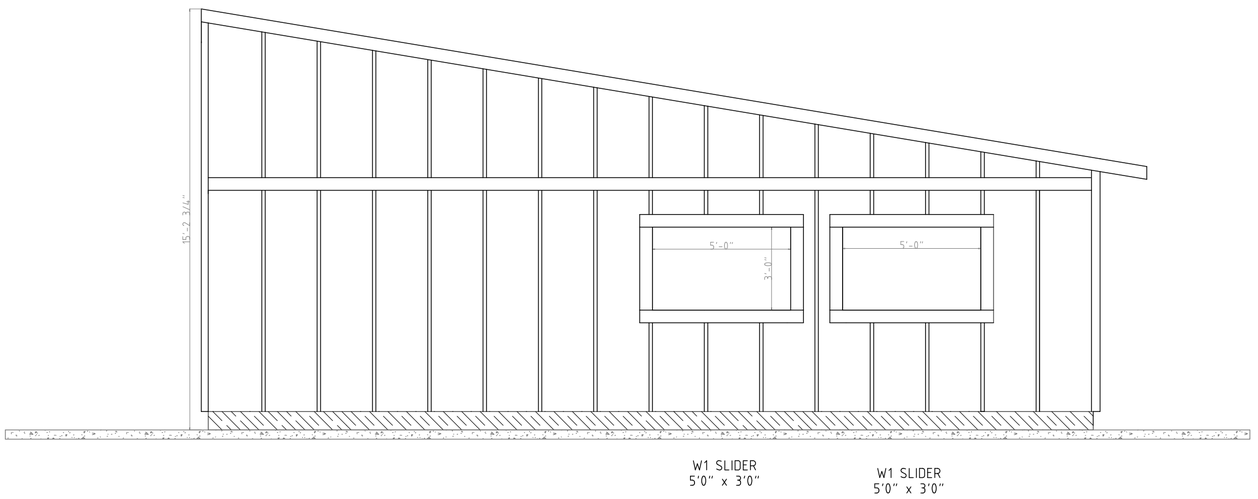
12/18/2022

SCALE: 1 : 48
NORTH & SOUTH ELEVATIONS
A4

ADU22-0077 & ADU22-0078

EAST ELEVATION





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DUPLEX ADU

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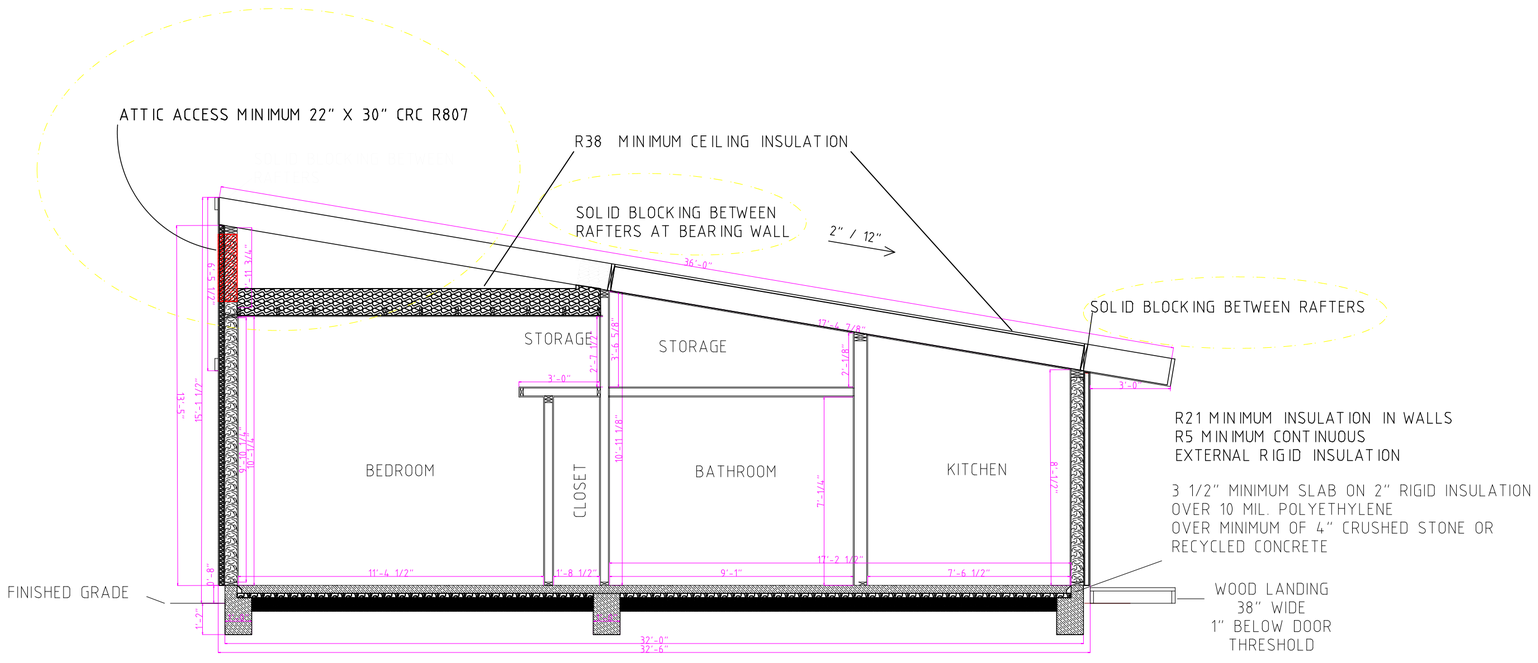
CBC [A]105.3.1 [A]107.3.1

12/18/2022

SCALE: 1 : 48
EAST & WEST
ELEVATIONS
A5

JOB COPY

ADU22-0077 & ADU22-0078



DRAWN BY
JEFF MILLER

REV3 3-1-23 CLARIFIED INSULATION, ADDED ATTIC ACCESS, RAFTER BLOCKING

DUPLEX ADU

245 ROBLE AVE.,
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SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

SCALE: 1 : 48

SECTIONS

A6

JOB COPY

ADU22-0077 & ADU22-0078

CAPILLARY BREAK: MINIMUM 4-INCH-THICK (101.6 MM) BASE OF 1/2 INCH (12.7 MM) OR LARGER CLEAN AGGREGATE SHALL BE PROVIDED WITH A VAPOR RETARDER IN DIRECT CONTACT WITH CONCRETE

10 MIL. POLYETHYLENE W/ JOINTS LAPPED NOT LESS THAN 6", MIN.

STEEL REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A615, A706 OR A996. ASTM A996 BARS PRODUCED FROM RAIL STEEL SHALL BE TYPE R. THE MINIMUM YIELD STRENGTH OF REINFORCING STEEL SHALL BE 40,000 PSI (GRADE 40) (276 MPA). CRC R403.1.3.5.1

ONE NO. 4 BAR AT THE TOP AND THE BOTTOM OF THE FOOTINGS

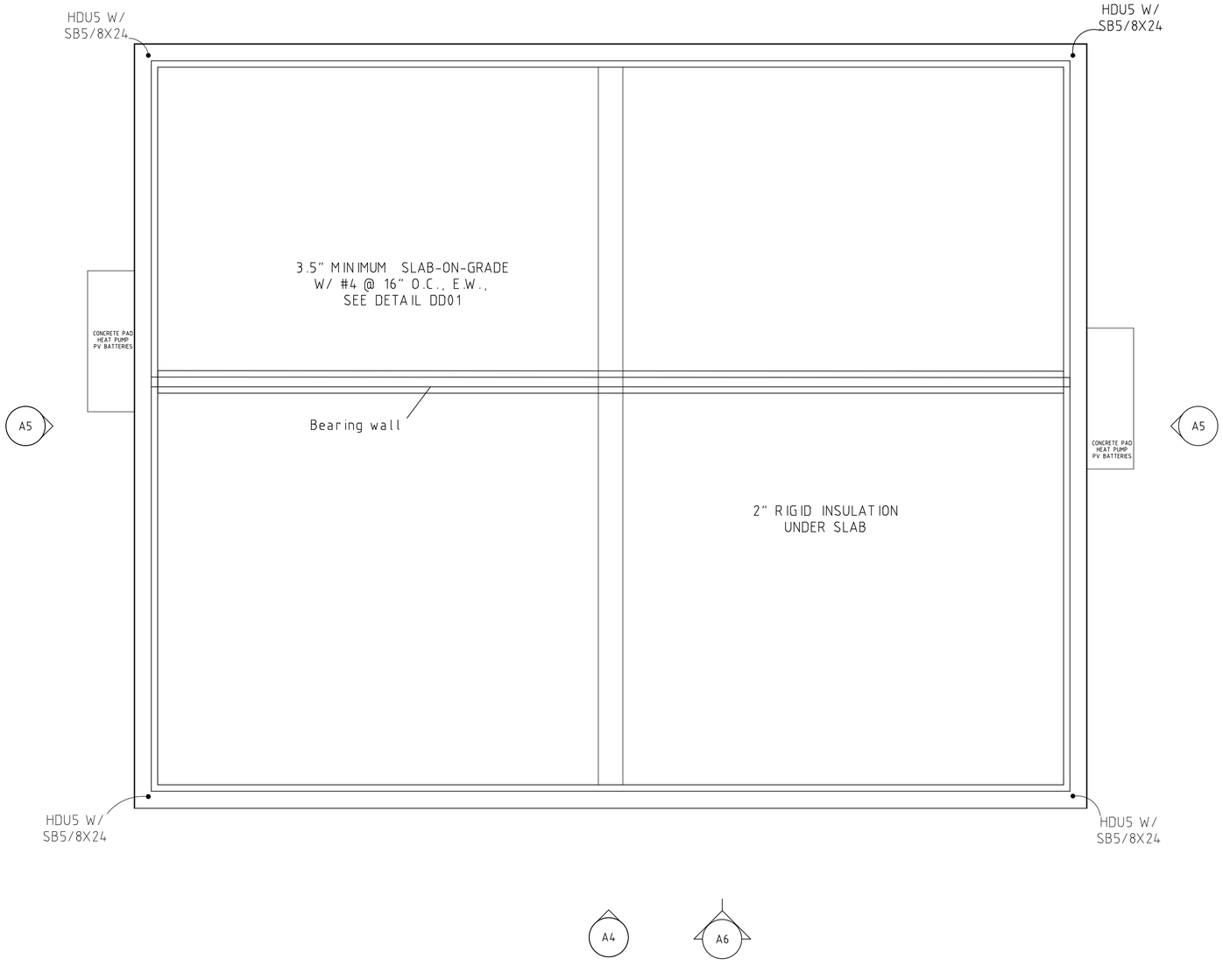
2,500 PSI CONCRETE STRENGTH AT 28 DAYS TABLE R402.2

5/8"Ø X 12" ANCHOR BOLTS SHALL BE PLACED @ 32" O.C. AND 1'-0" TO THE END, U.N.O. WITH PLATE WASHERS, NOT LESS THAN 0.229 INCH BY 3 INCHES BY 3 INCHES CRC R602.11.1 HOLDOWNS AND ANCHOR BOLTS MUST BE SECURED IN PLACE PRIOR TO THE FOUNDATION INSPECTION.

A4

PERIMITER FOOTING 12" WIDE x 6" DEEP MINIMUM 12" DEPTH
TOP OF FOUNDATION 8" ABOVE FINISHED GRADE
6, DEEP FOOTING WILL BE PLACED 12, BELOW SURFACE
PER CODE SECTION R403.1.4.

FOOTING UNDER BEARING WALL AND INTERIOR FIREWALL SHALL BE 12" WIDE AND EXTEND TO DEPTH OF NOT LESS THAN 12 INCHES (305 MM) BELOW THE TOP OF THE SLAB. R403.1.3.4



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REV3 3-1-23 ADDED NOTES REGARDING CODE REQUIREMENTS

DUPLEX ADU

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12/27/2022

SCALE: 1 : 48
FOUNDATION

A7

JOB COPY

ADU22-0077 & ADU22-0078

PHOTOVOLTAIC PANELS;
SYSTEM CONFIGURATION, PANEL
COUNT AND LOCATION TO BE
CONFIRMED BY INSTALLER

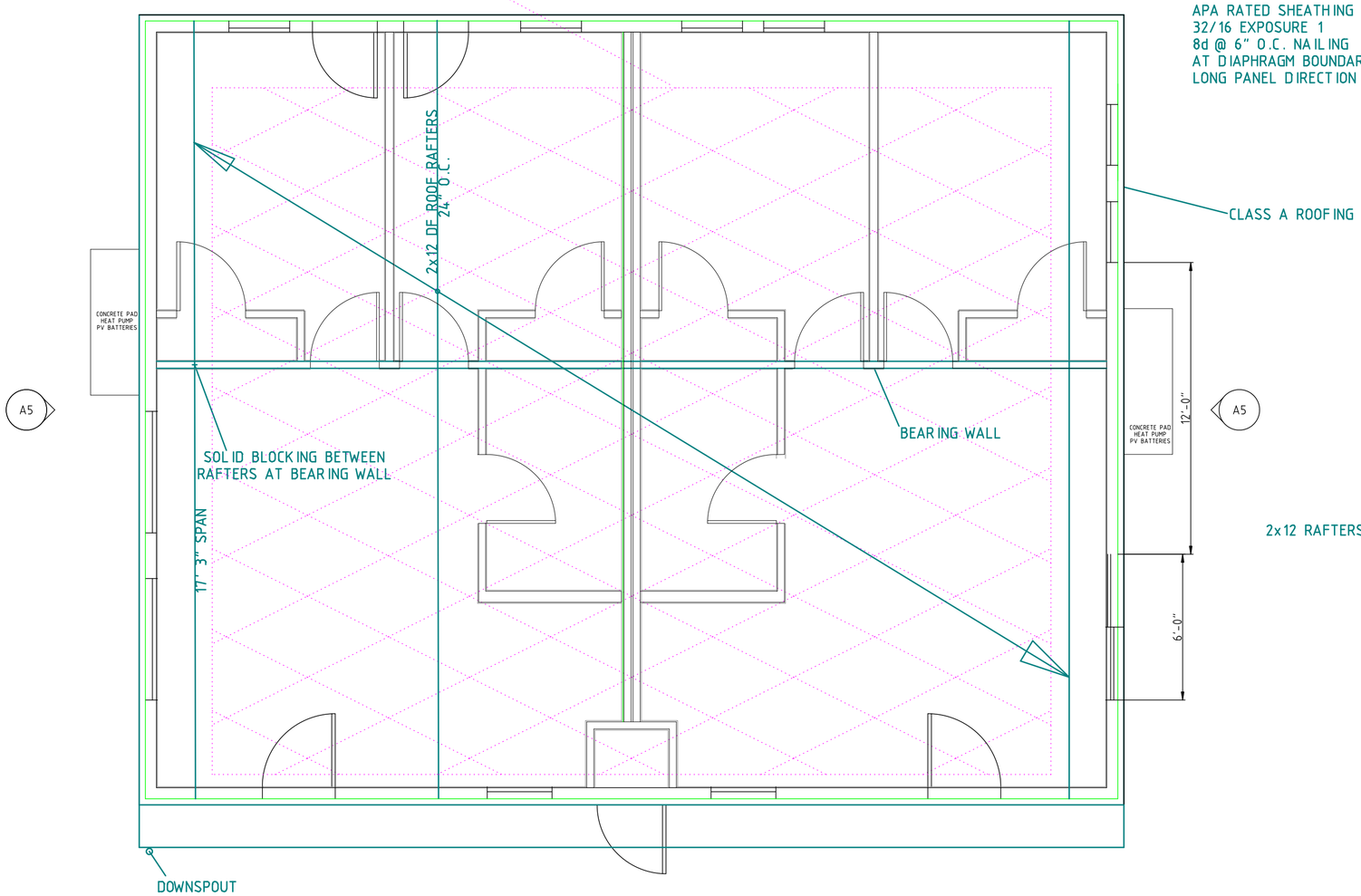
A4

SHED ROOF 2" PER FOOT SLOPE
NO OVERHANG ON SIDES AND BACK
PORCH OVERHANG ON FRONT ~2'

VENTILATED ATTIC AREA = 1280 SF ÷ 300 = ~4.27 SF REQUIRED HIGH-LOW VENTILATION (~614 SQ IN)
LOW VENTS: 2.13 SF (307 SQ IN) OF VENTILATION AT EAVES, CORNICE AND/OR LOWER 1/3 OF THE ROOF
HIGH VENTS: 2.13 SF (307 SQ IN) OF VENTILATION AT GABLE, RIDGE, AND/OR TOP 3' OF ROOF
UPPER VENTS:
332 SQ" ON EACH SIDE IN UPPER TOP CORNER
LOWER VENTS:
2 X 3 1/4 " VENTS OR 3 X 3 5/8" ø VENTS
BETWEEN EACH PAIR OF RAFTERS

MAXIMUM AREA FOR SOLAR PANELS, 974 sq'. 34'6"X28'3"
3' CLEAR AROUND ROOF PERIMETER

APA RATED SHEATHING 15/32 PERFORMANCE CATEGORY
32/16 EXPOSURE 1
8d @ 6" O.C. NAILING
AT DIAPHRAGM BOUNDARY AND 12" O.C. IN FIELD.
LONG PANEL DIRECTION PERPENDICULAR TO SUPPORTS



CLASS A ROOFING

2x12 RAFTERS 24" OC

GUTTER (GUTTERS SHALL BE
SCREENED TO PREVENT THE
ACCUMULATION OF LEAVES
AND DEBRIS PER CRC R337.5.4)

SOLID BLOCKING BETWEEN RAFTERS ATTACHED TO TOP PLATES
WITH 6D @ 6" O.C.CRC R602.10.8.2 FIGURE R602.10.8.2(1)

A4 A6

DRAWN BY
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DUPLEX ADU

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CBC [A]105.3.1 [A]107.3.1

12/27/2022

SCALE: 1 : 48
ROOF PLAN

A8

JOB COPY

ADU22-0077 & ADU22-0078

NO PENETRATIONS IN COMMON FIREWALL
PENETRATIONS IN WATER HEATER CLOSET
FOR HOT WATER AND ELECTRIC SHALL BE
MINIMAL AND CAULKED WITH APPROVED FIRESTOP
R302.4.1.2

ALL EXTERIOR WALLS MUST BE FRAMED WITH MIN. 2X6 DF#2 @ 24" O.C.

INTERIOR WALLS MUST BE FRAMED WITH MIN. 2X4 DF#2 @ 24" O.C. U.N.O.

EXTERIOR AND LOAD BEARING WALLS FIRE BLOCKED AT CEILING, 10' MINIMUM

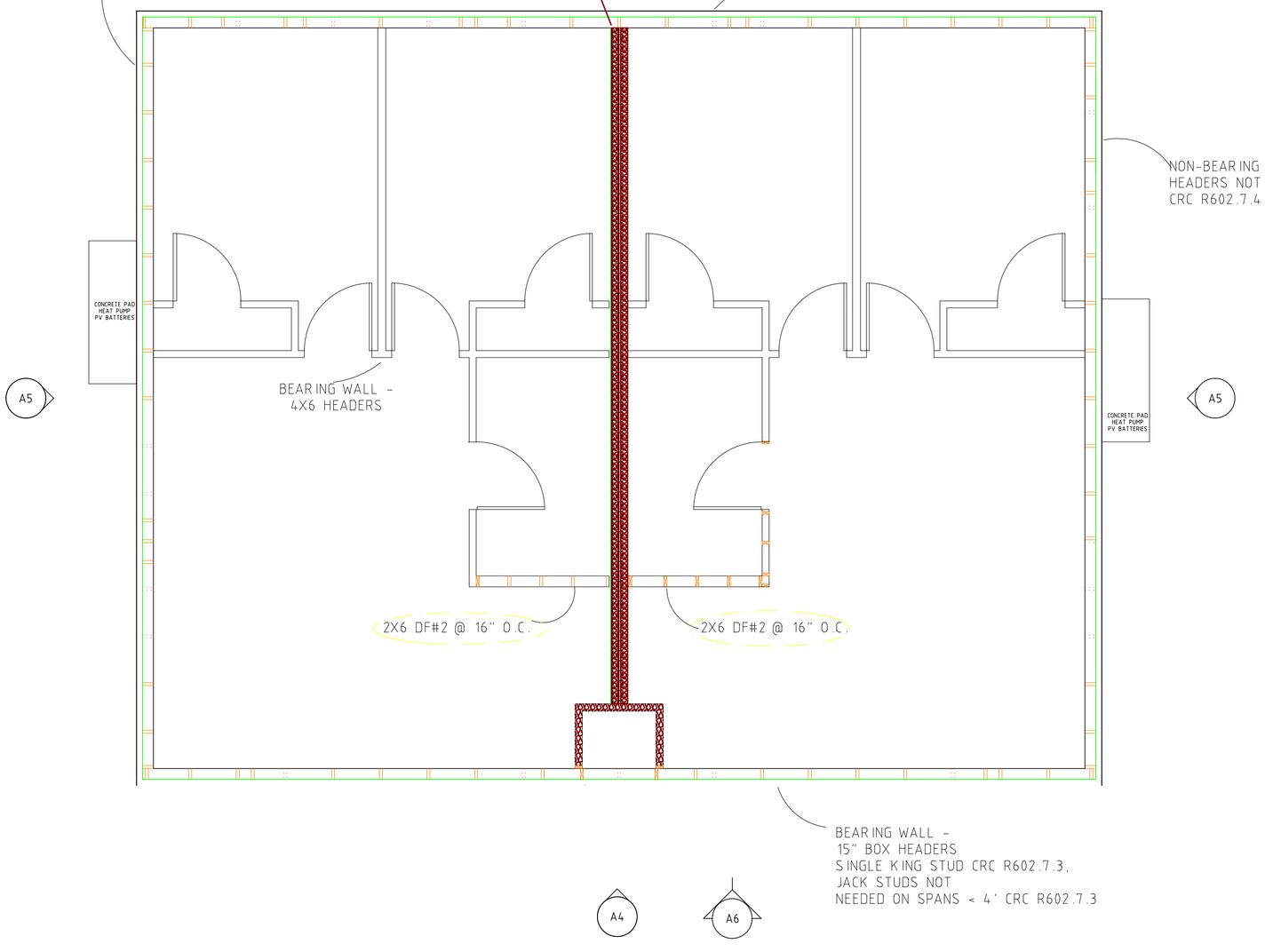
15/32" APA RATED PLYWOOD BRACING
CONTINUOUS ON ALL EXTERIOR WALLS
NAILING: 8D (0.131" DIA.) SPACED 6" AT EDGES, 12" IN FIELD
CRC R602.10.3 TABLE R602.10.3(3)
MINUMUM REQUIRED SHEARWALL SHOWN

A4

BRACED NON-BEARING 1 HOUR FIREWALL
AND STC 57 SOUND WALL EXTENDS TO
UNDERSIDE OF ROOF SHEATHING
DETAIL D1-4

NON-BEARING WALL -
HEADERS NOT REQUIRED
CRC R602.7.4

BEARING WALL -
15" BOX HEADERS
SINGLE KING STUD CRC R602.7.3,
JACK STUDS NOT
NEEDED ON SPANS < 4' CRC R602.7.3



NON-BEARING WALL -
HEADERS NOT REQUIRED
CRC R602.7.4

A5

A5

BEARING WALL -
15" BOX HEADERS
SINGLE KING STUD CRC R602.7.3,
JACK STUDS NOT
NEEDED ON SPANS < 4' CRC R602.7.3

A4

A6

DRAWN BY
JEFF MILLER

REV3 3-1-23 ADDED NOTES REGARDING
STUD SIZES/SPACING AND FIRE BLOCKING,
AND BRACING NOTE

DUPLEX ADU

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12/27/2022

SCALE: 1 : 48

WALL FRAMING

A9

JOB COPY

ADU22-0077 & ADU22-0078

FIRE HYDRANT FLOW TEST JULY 25, 2022
1200 GPM @ 20 PSI

VENT PIPES
A. SLOPE VENTS TOWARDS WASTE OR SOIL PIPE.
B. VENT PIPES MUST BE AT LEAST 2 PIPE DIAMETERS FROM TRAP.
C. VENT PIPES SHALL BE COMBINED ABOVE CEILING
D. VENT PIPE SHALL TERMINATE THROUGH BACK WALL AND AT LEAST 6 INCHES ABOVE THE ROOF

LAUNDRY
A. TRAP TO BE BETWEEN 6 AND 18 ABOVE THE FLOOR.
B. STANDPIPE RECEPTOR TO BE >= 18 AND <= 42 IN HEIGHT.

A4

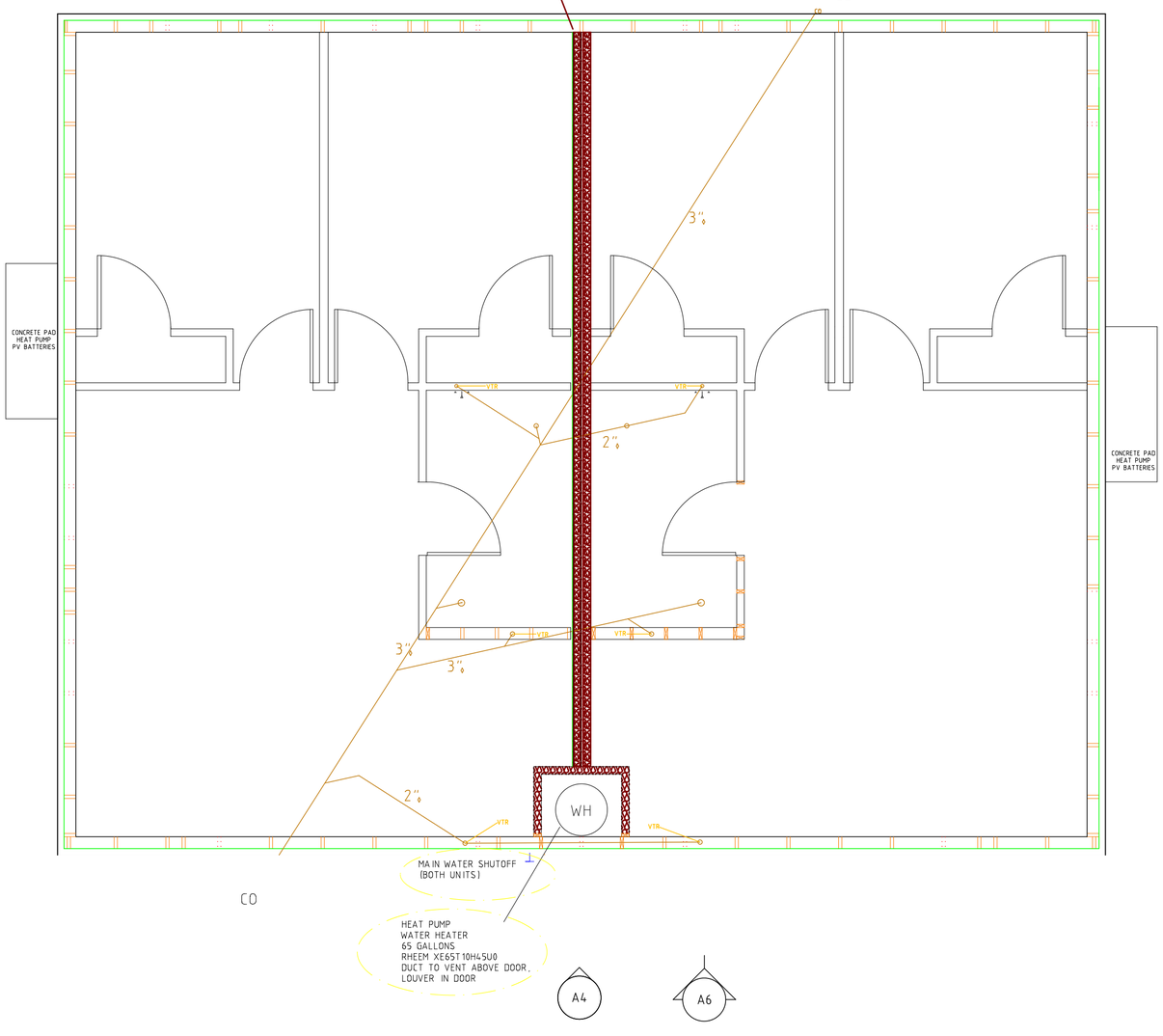
NO PENETRATIONS IN COMMON FIREWALL
PENETRATIONS IN WATER HEATER CLOSET
FOR HOT WATER AND ELECTRIC SHALL BE
MINIMAL AND CAULKED WITH FIRESTOP

PLUMBING DETAILS
COLD WATER: PEX OR COPPER
HOT WATER: PEX MANIFOLD OR COPPER

BRACED NON-BEARING 1 HOUR FIREWALL
AND STC 57 SOUND WALL EXTENDS TO
UNDERSIDE OF ROOF SHEATHING
DETAIL D1-4

PLUMBING FIXTURES
A. TOILETS SHALL NOT USE MORE THAN 1.28 GALLONS PER FLUSH.
B. LAVATORY FAUCET, KITCHEN FAUCET, & SHOWER HEAD FLOW RATES SHALL NOT EXCEED 2.0 GALLONS PER MINUTE.
C. CONTROL VALVE FOR SHOWER OR TUB-SHOWER SHALL BE OF PRESSURE BALANCE OR THERMOSTATIC MIXING VALVE TYPE.
D. TOILET SHALL COMPLY WITH MIN 30"W X 24"D AREA IN FRONT OF FIXTURE. CENTER OF FIXTURE SHALL BE ≥ 15" TO ADJACENT WALL OR 30" CTC TO ADJACENT FIXTURE CENTER

AIR GAP OR INTEGRAL BACKFLOW DEVICE REQUIRED FOR DISHWASHER DRAIN LINES.



NO STANDPIPE RECEPTOR FOR CLOTHES WASHER SHALL EXTEND MORE 30 INCHES OR NOT LESS THAN 18 INCHES ABOVE ITS TRAP. NO INDIRECT WASTE RECEPTOR SHALL BE INSTALLED IN A TOILET ROOM; EXCEPT STANDPIPES FOR CLOTHES WASHER SHALL BE PERMITTED TO BE INSTALLED IN TOILET WHERE THE CLOTHES WASHER IS INSTALLED IN THE SAME ROOM. CPC 804.1

SHOWERS
A. MINIMUM SHOWER AREA TO BE 1024 SQUARE INCHES WITH A MINIMUM DIAMETER OF 34, MEASURED FROM FINISH WALL TO CENTER OF THRESHOLD. MINIMUM SHOWER AREA TO BE MAINTAINED TO 70 ABOVE DRAIN. SHOWERHEADS, VALVES, GRAB BARS, AND SOAP DISHES ALLOWED TO PROTRUDE INTO REQUIRED AREA. CPC 408.6
B. FINISHED THRESHOLD HEIGHT TO BE 2 TO 9 ABOVE TOP OF DRAIN. CPC 408.5
C. SHOWERHEAD NOT TO DISCHARGE DIRECTLY TOWARDS DOOR. CPC 408.9
D. DOOR TO HAVE A MINIMUM WIDTH OF 22 AND NOT TO OPEN INTO THE SHOWER. CPC 408.5

DRAWN BY
JEFF MILLER

REV3 3-1-23 ADDED NOTES REGARDING
WATER HEATER AND CODE REQUIREMENTS

DUPLEX ADU

245 ROBLE AVE.,
REDWOOD CITY,
CA 94061
APN 059-122-070

APROVALS:

CITY OF REDWOOD CITY
PLANS REVIEWED FOR COMPLIANCE WITH.
2019 yr.
CBC, CRC,
CMC, CEC, CPC
CAL GREEN
CAL ENERGY
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SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

12/27/2022

SCALE: 1 : 48

PLUMBING

A 10

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ADU22-0077 & ADU22-0078

NOTE:
A) FOR THE BATHROOM, RECEPTACLE OUTLETS SHALL BE SUPPLIED BY DEDICATED 20 AMP BRANCH CIRCUIT PER CEC 210.11(C)(3). THIS CIRCUIT CANNOT SUPPLY ANY OTHER RECEPTACLES, LIGHTS, FANS, ETC. (EXCEPTION - WHERE THE CIRCUIT SUPPLIES A SINGLE BATHROOM, OUTLETS FOR OTHER EQUIPMENT WITHIN THE SAME BATHROOM SHALL BE ALLOWED).
B) FOR THE KITCHEN, A MINIMUM OF TWO 20 AMP DEDICATED CIRCUITS SHALL BE PROVIDED FOR SMALL APPLIANCES. CEC 210.52(C)(3).
C) FOR THE LAUNDRY ROOM, LAUNDRY RECEPTACLE OUTLET TO BE SUPPLIED BY A DEDICATED 20 AMP BRANCH CIRCUIT PER CEC 210.11(C)(2).
D) FOR RECEPTACLES, LOCATED OUTDOORS, SHALL BE GFCI PROTECTED AND WEATHERPROOF PER CEC 210.8 AND 406.9(B).
E) ALL 120-VOLT, SINGLE PHASE, 15- AND 20- AMPERE BRANCH CIRCUITS SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT KITCHEN, FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. CEC 210.12
F) ALL 125-VOLT, 15- AND 20- AMPERE RECEPTACLE OUTLETS SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES PER CEC 406.12.

A4

IN BATHROOMS AT LEAST ONE INSTALLED LUMINAIRE SHALL BE CONTROLLED BY OCCUPANCY OR VACANCY SENSOR PROVIDING AUTOMATIC-OFF FUNCTIONALITY. CENERGYC150.(K)(2)(E).

INTEGRATED LIGHTING OF EXHAUST FANS SHALL BE CONTROLLED INDEPENDENTLY FROM THE FANS. THE FOLLOWING SHALL BE CONTROLLED SEPARATELY FROM CEILING INSTALLED LIGHTING SUCH THAT ONE CAN BE TURNED ON WITHOUT TURNING ON THE OTHER: UNDERCABINET LIGHTING, INTERIOR LIGHTING OF DISPLAY, SWITCHED OUTLETS. CENERGYC150(K)(2)(G).

ALL LIGHTING SHALL BE HIGH EFFICACY (E.G., LED) CENERGYC 150(K)(1)(A).

SMOKE ALARMS ARE REQUIRED IN EVERY BEDROOM, AREA LEADING TO THESE BEDROOMS AND ON EVERY FLOOR. CRC 314.
A CARBON MONOXIDE ALARM IS REQUIRED IN ALL AREAS LEADING INTO THE BEDROOM AND ON EVERY FLOOR. CRC R315.
SMOKE ALARMS AND CARBON
MONOXIDE ALARMS SHALL BE INTERCONNECTED AND HARDWIRED PER CRC R314.4, R314.5, R315.2.4 AND R315.2.5.

ALL KITCHEN, BATHROOM AND LAUNDRY AREA RECEPTACLES SHALL BE PROTECTED BY DUAL FUNCTION CIRCUIT BREAKER GFCI AND COMBINATION TYPE AFCI

IN THE BATHROOMS, PROVIDE GFCI RECEPTACLE OUTLETS WITHIN 3 FEET OF THE SINK BASINS EDGE PER CEC 210.52(D) AND 210.8.

PROVIDE A GFCI, WATERPROOF, AND TAMPER RESISTANT RECEPTACLE OUTLET AT THE FRONT AND REAR OF THE BUILDING PER CEC 210.8, 406.9(B), 406.12, AND 210.52(E).

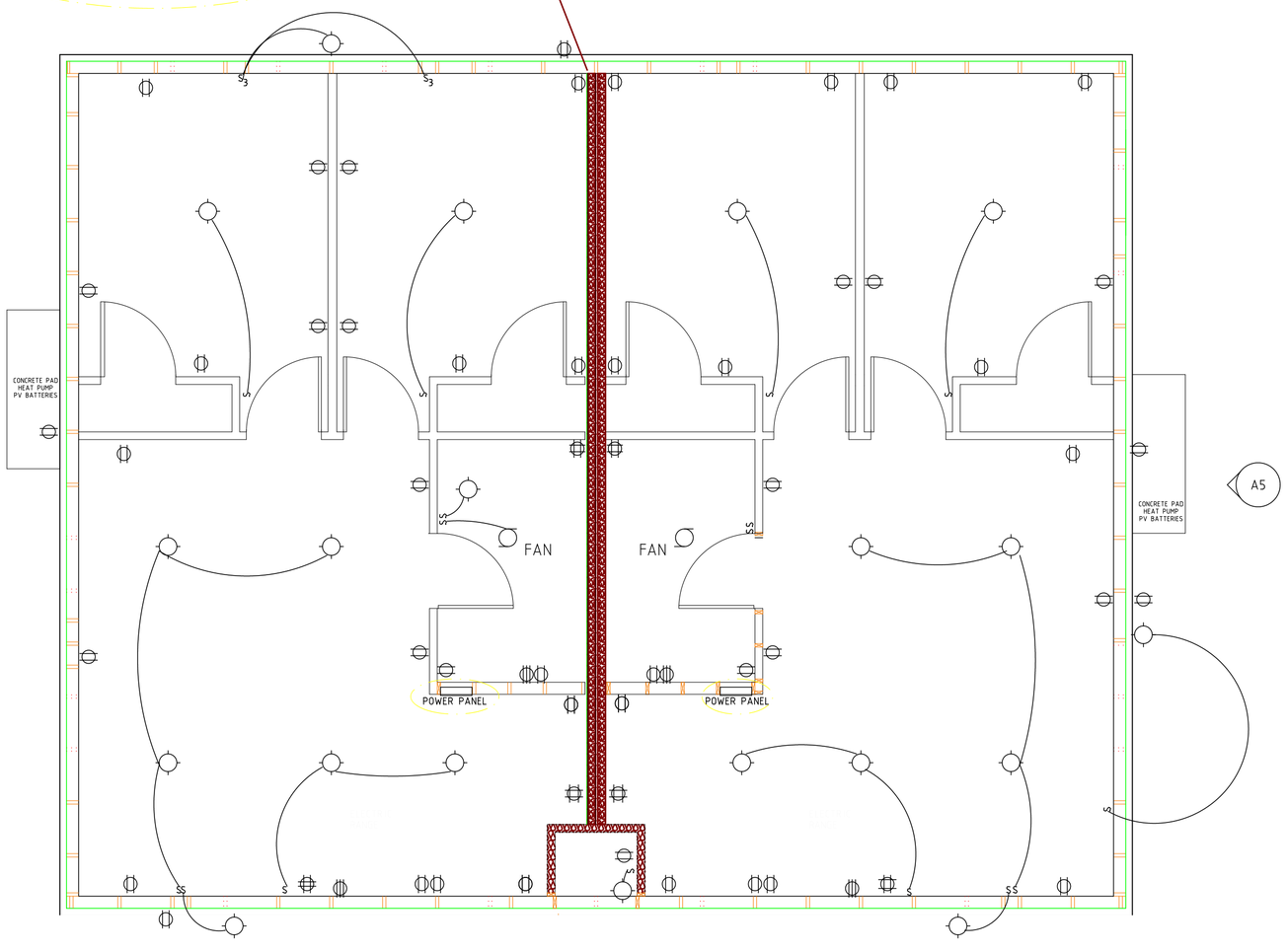
RANGE IS ELECTRIC. NO GAS APPLIANCES.

INDIVIDUAL (DEDICATED) CIRCUITS ARE REQUIRED FOR GARBAGE DISPOSALS, MICROWAVES, AND DISHWASHERS. [CEC210.19A1B]

RECEPTACLE OUTLETS ON THE WALL-SPACES IN THE BEDROOMS, HALLWAY, LIVING ROOM, AND DINING ROOM TO BE COMPLIANT WITH CEC 210.52.
RECEPTACLE OUTLETS SHALL BE LOCATED NOT MORE THAN
6 FEET FROM WALL OPENINGS AND 12 FEET ON CENTER.
NO RECEPTACALE OUTLETS IN PARTY WALL

WALL SPACES ALONG THE KITCHEN COUNTERTOP SHALL BE PROVIDED WITH RECEPTACLES SUCH THAT NO POINT ALONG THE WALL LINE IS MORETHAN 24 INCHES, MEASURED HORIZONTALLY, FROM A RECEPTACLE OUTLET IN THAT SPACE. CEC 210.52(C)(1).

BRACED NON-BEARING 1 HOUR FIREWALL AND STC 57 SOUND WALL EXTENDS TO UNDERSIDE OF ROOF SHEATHING
DETAIL D1-4



A5
A5
A4
A6

NO PENETRATIONS IN COMMON FIREWALL
PENETRATIONS IN WATER HEATER CLOSET
FOR HOT WATER AND ELECTRIC SHALL BE
MINIMAL AND CAULKED WITH FIRESTOP

EXTERIOR LIGHTING TO COMPLY W/ CENERGYC 150.0(K)(3).

SURFACE MOUNTED CEILING LIGHTS IN MAIN ROOM AND BEDROOMS

EACH UNIT: 125A EXTERIOR SUBPANEL
MINIMUM SIZE OF THE SERVICE DISCONNECTING
MEANS AT THE MAIN PANEL IS 100
AMP MINIMUM PER CEC 230.79(C).

EACH UNIT:
125A 24 SPACE PANEL
#2 W #8 GROUND
~125' 2" CONDUIT TO 245 MAIN PANEL

SOLAR:
2 CIRCUITS, ONE TO EACH MAIN PANEL
40-45A
#8 W #10 GROUND

2" or 3" CONDUIT FROM MAIN PANEL
6 #2
8 #8
2 #2

KITCHEN COUNTER OUTLETS:
3 QUAD OUTLETS, 3 SEPARATE CIRCUITS
BATHROOM OUTLETS:
QUAD OUTLETS NEAR SINK

UNLESS OTHERWISED NOTED, BOTTOM OF RECEPTACLE BOXES TO BE 14" ABOVE THE SUB-FLOOR OR SLAB UNLESS OTHERWISE NOTED, BOTTOM OF SWITCH BOXES TO BE 40" ABOVE SUB-FLOOR OR SLAB.

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JEFF MILLER

REV3 3-1-23 ADDED NOTES REGARDING CODE REQUIREMENTS AND INSTALLATION DETAILS. MOVED PANEL LOCATION

DUPLEX ADU

245 ROBLE AVE.,
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CA 94061
APN 059-122-070

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12/27/2022

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ELECTRICAL

A 11

ADU22-0077 & ADU22-0078

NATURAL VENTILATION REQUIREMENTS CRC R303.1:
UNIT 1 MAIN LIVING SPACE
4% X 267 S.F. = 10.68 S.F. VENTILATION REQ.
12.7 S.F. PROVIDED
UNIT 1 BEDROOMS (EACH)
4% X 112 S.F. = 4.48 S.F. VENTILATION REQ.
18.1 S.F. PROVIDED

NATURAL LIGHT REQUIREMENTS:
MAIN LIVING SPACE
8% X 267 S.F. = 21.36S.F. NATURAL LIGHT REQ.
31.21 S.F. PROVIDED
BEDROOM
8% X 112 S.F. = 8.96 S.F. NATURAL LIGHT REQ.
13.92 S.F. PROVIDED

NATURAL VENTILATION REQUIREMENTS CRC R303.1:
UNIT 2 MAIN LIVING SPACE
4% X 267 S.F. = 10.68 S.F. VENTILATION REQ.
38.35 S.F. PROVIDED
UNIT 2 BEDROOMS (EACH)
4% X 1112 S.F. = 4.48 S.F. VENTILATION REQ.
18.1 S.F. PROVIDED

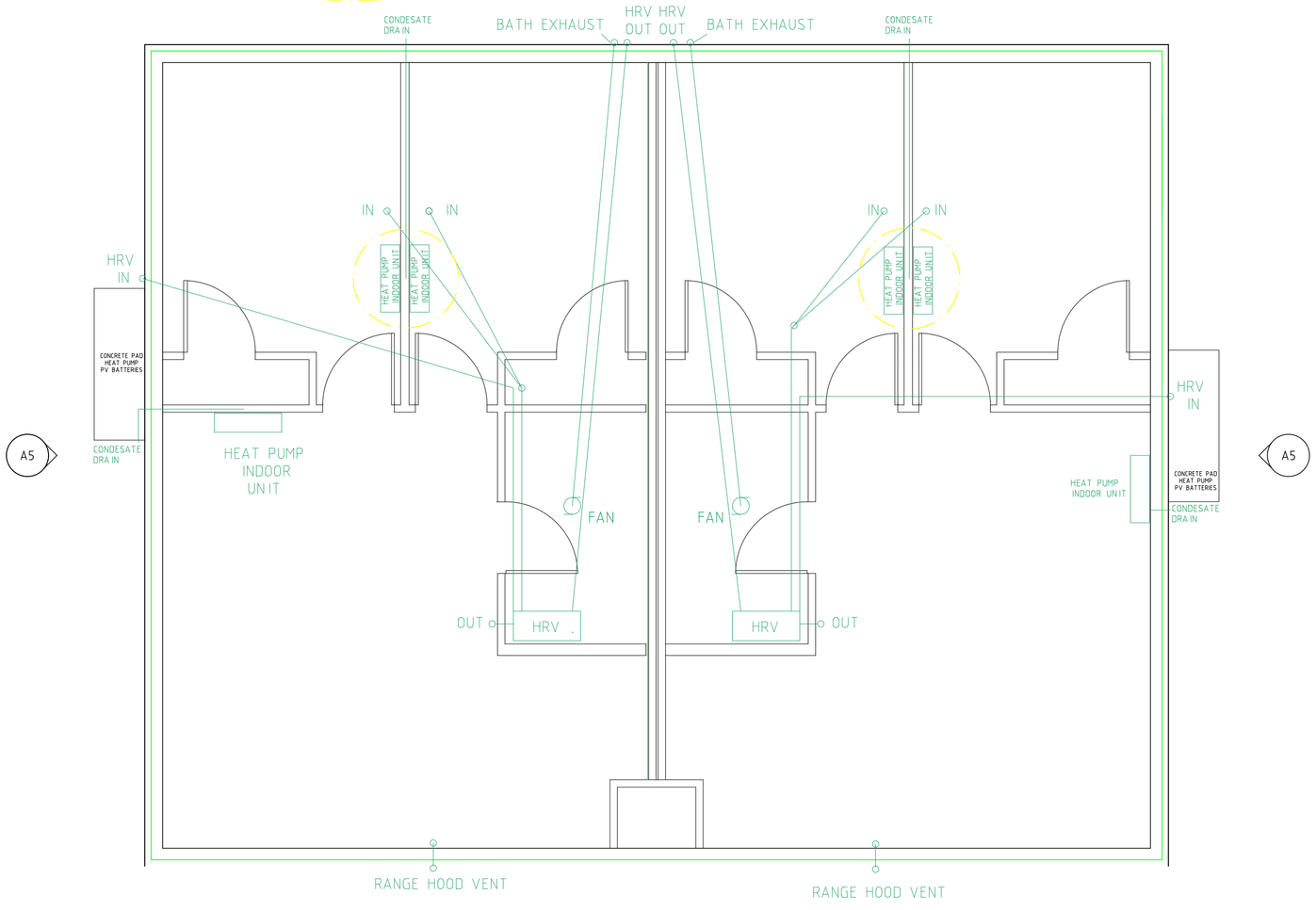
NATURAL LIGHT REQUIREMENTS:
UNIT 2MAIN LIVING SPACE
8% X 267 S.F. = 21.36S.F. NATURAL LIGHT REQ.
42.17 S.F. PROVIDED
UNIT 2 BEDROOMS (EACH)
8% X 112 S.F. = 8.96 S.F. NATURAL LIGHT REQ.
13.66 S.F. PROVIDED

A4

VENTILATION:
CEC EQUATION 150.0-B
.03 x 640 + 7.5 x (2 + 1) = 41.7
TOTAL REQUIRED VENTILATION RATE, CFM
HRV 50 CFM MINIMUM

HUMIDITY SENSING BATHROOM EXHAUST FAN W/ LED LIGHT,
ENERGY STAR®, 50 CFM MINIMUM
CRC R303.3.1

AIR DUCTS SHALL EXHAUST AT LEAST 3-0 FROM
PROPERTY LINE AND 3-0 FROM OPENINGS INTO THE BUILDING. CMC 504.5



HVAC NOTES:
HRV STALE AIR INTAKE IN BEDROOMS
FRESH AIR TO MAIN ROOM
ACCESS FROM KITCHEN

DRYERS ARE VENTLESS

EACH UNIT:
24000 BTU DUCTLESS MINISPLIT
9000 BTU INDOOR UNIT IN MAIN ROOM
6000 BTU INDOOR UNITS IN EACH BEDROOM
MINIMUM SEER 20
MINIMUM HSPF 10

CARRIER 38MGRQ24C3 24000 BTU DUCTLESS MINISPLIT OUTDOOR UNIT
CARRIER 40MAHBQ09XA3 9000 BTU INDOOR UNIT
40MAHBQ06XA3 6000 BTU INDOOR UNIT
OR
MITSUBISHI MXZ-3C24NA3 24000 BTU DUCTLESS MINISPLIT OUTDOOR UNIT
MSZ-FS09NA 9000 BTU INDOOR UNIT
MSZ-FS06NA 6000 BTU INDOOR UNIT
OR EQUIVALENT/BETTER

DRAWN BY
JEFF MILLER

DUPLEX ADU

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HVAC

A 12

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ADU22-0077 & ADU22-0078

WINDOWS

TYPE	QUAN.	DESCRIPTION	WIDTH	HEIGHT	NOTES
W1	2	SLIDER	5’-0”	3’-0”	UNIT 1 MAIN ROOM
W2	2	DOUBLE HUNG	2’-6”	5’-0”	UNIT 1 BEDROOMS
W3	4	CASEMENT	2’-6”	4’-0”	EGRESS, UNIT2 BEDROOMS
W4	2	DOUBLE HUNG	2’-8”	3’-0”	KITCHENS

MINIMUM U VALUE .3

CASEMENT: LEFT, RIGHT, BOTH? TBD

REFER TO EXTERIOR ELEVATIONS FOR WINDOW HEAD HEIGHT ELEVATIONS. REFER TO FLOOR PLANS FOR WINDOW TYPES AND LOCATIONS.

ALL WINDOWS ARE DOUBLE-GLAZED, UNLESS OTHERWISE NOTED. FOR DOUBLE GLAZED WINDOWS, PROVIDE U-VALUE PER SPECIFICATION (MIN. 0.75 PER TITLE 24).

WHERE DOOR & WINDOW SYSTEMS ARE ADJACENT, CONTRACTOR SHALL INSURE ALIGNMENT OF HORIZONTAL AND VERTICAL MEMBERS.

EMERGENCY EGRESS WINDOWS TO COMPLY WITH CBC, SECTION 1030: MINIMUM NET CLEAR HEIGHT OF 24", MINIMUM NET CLEAR WIDTH OF 20", MAXIMUM FINISHED SILL HEIGHT OF 44", AND MINIMUM CLEAR AREA OF 5.7 SQ. FT. CONTRACTOR SHALL VERIFY PRIOR TO START OF ROUGH FRAMING THAT EMERGENCY EGRESS WINDOWS COMPLY WITH SECTION 1030.

SAFETY GLAZING (I.E. TEMPERED GLASS) SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS: (R308.4)

A) GLAZING IN DOORS.
B) GLAZING IN ENCLOSURES FOR BATHTUB OR SHOWER.
C) GLAZING IN WIDOWS MEASURED LESS THAN 60” FROM SHOWER OR BATHTUB
D) GLAZING IN AN INDIVIDUAL FIXED OR OPERABLE PANEL THAT MEETS ALL OF THE FOLLOWING;
   I) THE EXPOSED AREA OF AN INDIVIDUAL PANE IS LARGER THAN 9 S.F.; AND
   II) THE BOTTOM EDGE OF THE GLAZING IS LESS THAN 18” ABOVE THE FLOOR; AND
   III) THE TOP EDGE OF THE GLAZING IS MORE THAN 36” ABOVE THE FLOOR.

DOORS

TYPE	QUAN.	DESCRIPTION	WIDTH	HEIGHT	NOTES
D1	2	HALF LITE GLAZED	2’-8”	6’-8”	EXTERIOR STEEL OR FIBERGLASS, INSULATED, UNIT1 BACK DOORS
D2	1	SLIDING PATIO	6’-0”	6’-8”	UNIT 2 SIDE DOOR
D3	2	HALF LITE GLAZED	3’-0”	6’-8”	EXTERIOR STEEL OR FIBERGLASS, INSULATED, ENTRY DOORS
D4	1	SOLID	2’-10”	6’8”	EXTERIOR - WATER HEATER CLOSET
D5	10	INTERIOR	2’-10”	6’-8”	BED, BATH, CLOSETS

D1 AND D3 MINIMUM U VALUE .2

D2 MIMIMUM U VALUE .3

D4, WATER HEATER CLOSET DOOR MAY NEED LARGE VENT CUTOUT, SOLID WOOD DOOR MAY BE OK,

D5 PRE-HUNG FOR 2X4 WALL – SOLID? HOLLOW? TBD

PROVIDE WEATHER STRIPPING PER TITLE 24 FOR ALL EXTERIOR DOORS. PERIMETER SEAL SHALL PROVIDE CONTINUOUS BARRIER, WITH NO VISIBLE GAPS BETWEEN THE DOOR AND THE FRAME OR THRESHOLD

DRAWN BY
JEFF MILLER

DUPLEX ADU

245 ROBLE AVE.,
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APN 059-122-070

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12/18/22

SCALE: AS INDICATED

DOORS &
WINDOWS
A13

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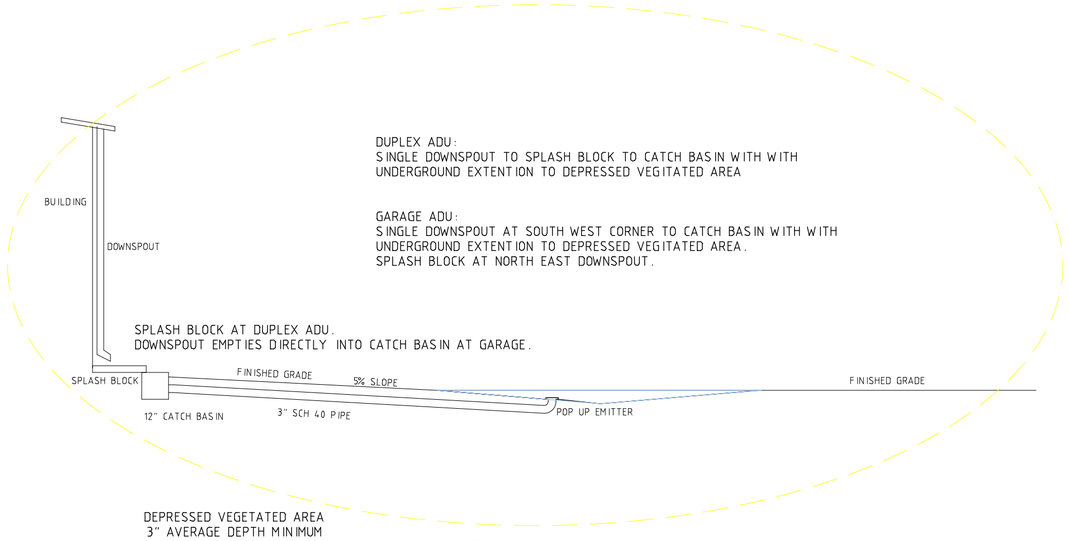
ADU22-0077 & ADU22-0078

DRAINAGE CALCULATION FOR STORMWATER RUN-OFF CONTROL

10 YEAR STORM INCH PER HOUR	1.75
DURATION, MINUTES	10
NEW ADDITIONAL IMPERVIOUS ROOF AREA	1280
CONCRETE PATIO TO BE REMOVED	450
NET INCREASE OF IMPERVIOUS AREA	830
THE CHANGE IN THE RUN-OFF COEFFICIENT FROM NEW ROOF TO EXISTING LAWN	
RUN-OFF COEFFICIENT FOR ROOF	0.95
RUN-OFF COEFFICIENT FOR DIRT	0.30
CHANGE IN THE RUN-OFF COEFFICIENT	0.65
DISCHARGE RATE OF ADDITIONAL IMPERVIOUS AREA	
NET INCREASE OF IMPERVIOUS AREA	830
10 YEAR STORM INCH PER HOUR	1.75
CU FT PER SQ FT PER HOUR	0.15
CU FT/HR OVER AREA	121.04
CHANGE IN THE RUN-OFF COEFFICIENT	0.65
CU FT/HR OVER AREA	78.68
CU FT/ MINUTE OVER AREA	1.31
CU FT/SECOND OVER AREA	0.02
STORAGE/DETENTION VOLUME	
CU FT IN 10 MINUTES	13.11
X1.5	19.67
STORAGE/DETENTION VOLUME PROVIDED	128.25

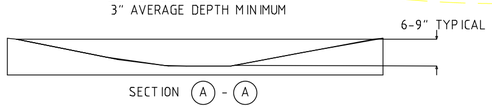


DUPLEX ADU:
SINGLE DOWNSPOUT TO SPLASH BLOCK TO CATCH BASIN WITH WITH UNDERGROUND EXTENTION TO DEPRESSED VEGITATED AREA

GARAGE ADU:
SINGLE DOWNSPOUT AT SOUTH WEST CORNER TO CATCH BASIN WITH WITH UNDERGROUND EXTENTION TO DEPRESSED VEGITATED AREA.
SPLASH BLOCK AT NORTH EAST DOWNSPOUT.

SPLASH BLOCK AT DUPLEX ADU.
DOWNSPOUT EMPTIES DIRECTLY INTO CATCH BASIN AT GARAGE.

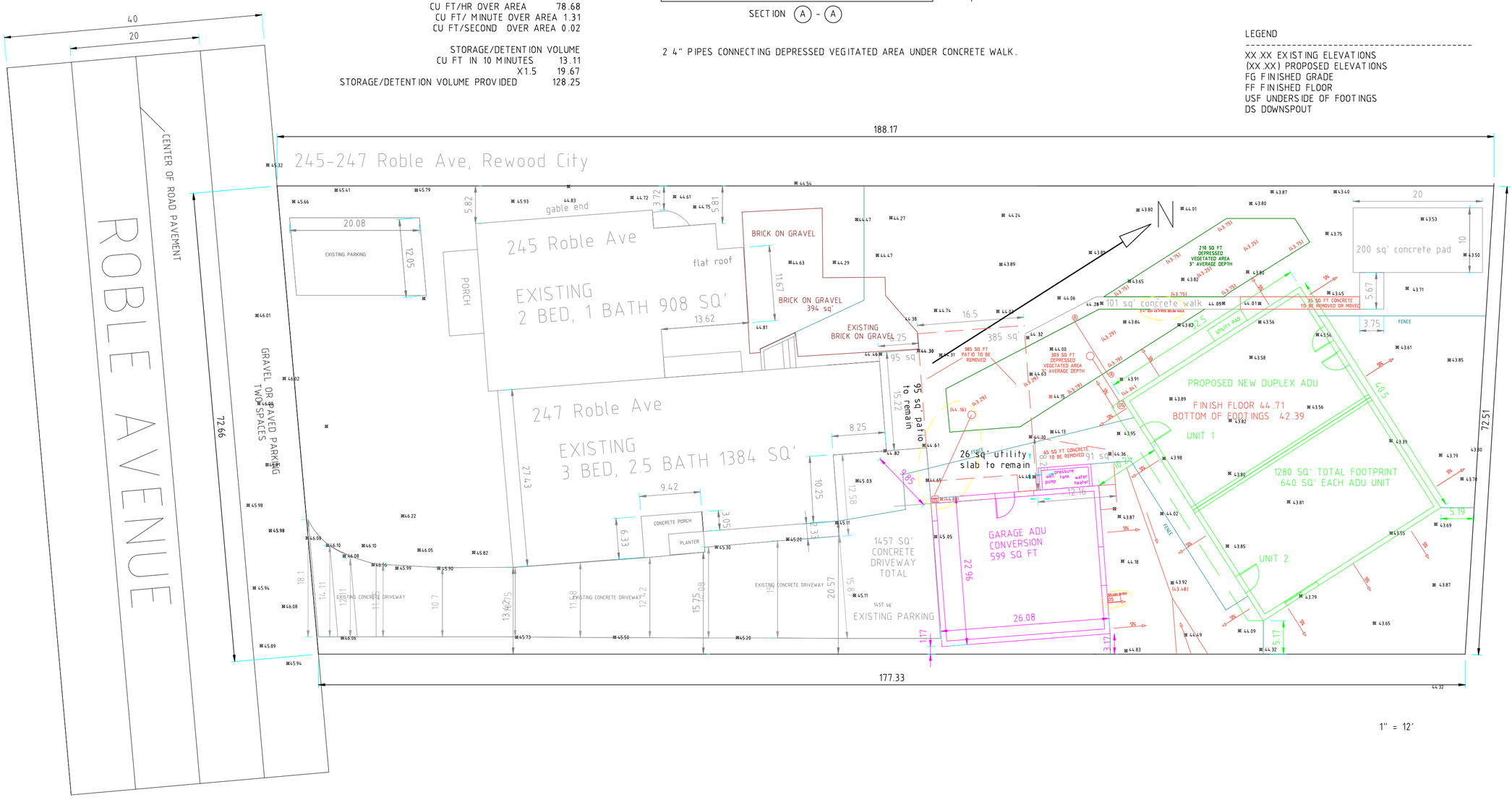
DEPRESSED VEGETATED AREA
3" AVERAGE DEPTH MINIMUM



2 4" PIPES CONNECTING DEPRESSED VEGITATED AREA UNDER CONCRETE WALK.

LEGEND

XX.XX EXISTING ELEVATIONS
(XX.XX) PROPOSED ELEVATIONS
FG FINISHED GRADE
FF FINISHED FLOOR
USF UNDERSIDE OF FOOTINGS
DS DOWNSPOUT



REV3 3-1-23 ADDED NOTES REGARDING DOWNSPOUT EXTENSION, ADDED VEGITATED AREA SECTION, REFINED FINISH ELEVATIONS
REV4 5-19-23 ADDED DOWNSPOUT DETAILS AND PIPES UNDER WALK

DRAWN BY
JEFF MILLER

DUPLEX ADU AND GARAGE ADU CONVERSION

245-247 ROBLE AVE.,
REDWOOD CITY,
CA 94061
APN 059-122-070

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2/8/2023

SCALE: 1 : 144

GRADING AND DRAINAGE
A 14

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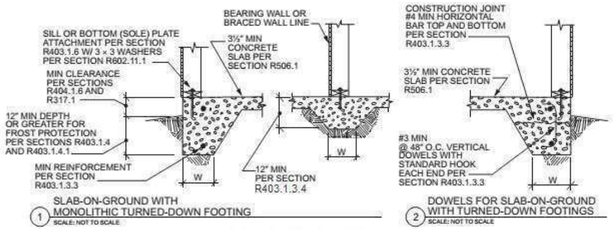
ADU22-0077 & ADU22-0078

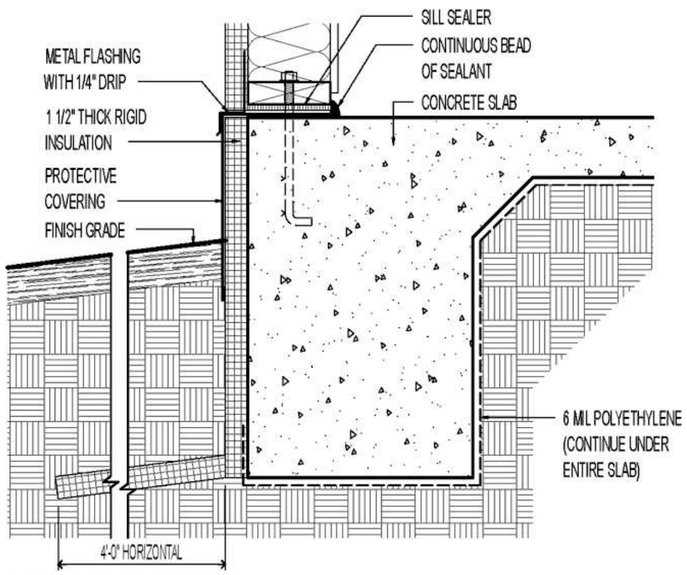
FOUNDATION

FOOTING REBAR: #4 AT TOP AND BOTTOM

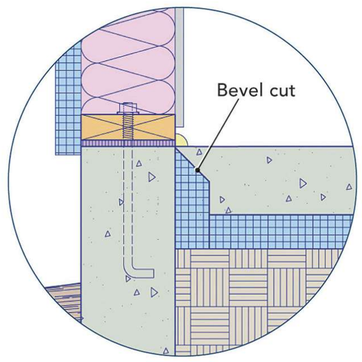
SLAB REBAR: #4 @ 16" O.C. E.W.



DETAIL D1-1



DETAIL D1-2

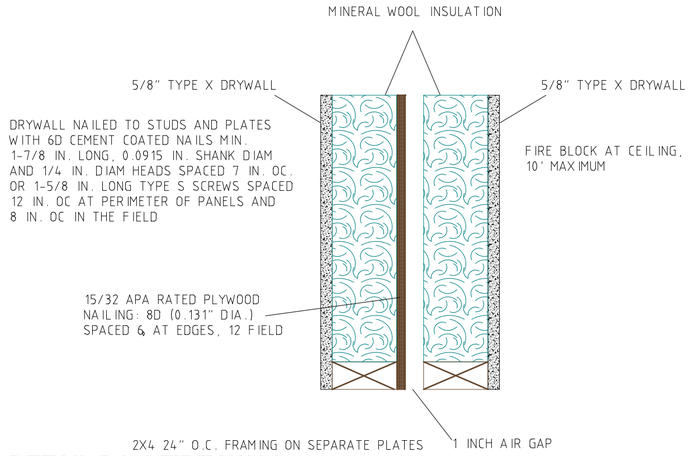


DETAIL D1-3

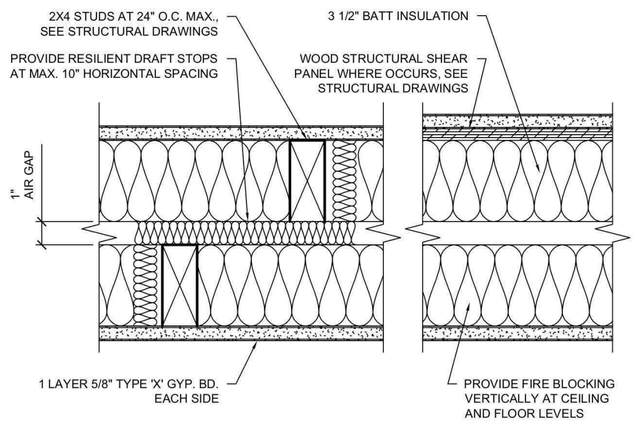
FRAMING

SHEAR WALL 15/32 APA RATED CONTINUOUS ON ALL EXTERNAL WALLS AND INTERNAL FIRE WALL

NAILING: 8D (0.131" DIA.) SPACED 6" AT EDGES, 12 FIELD



DETAIL D1-4 FIRE WALL



1 HOUR RATED PER UL DESIGN No. U341
AND STC 57 PER CALIFORNIA OFFICE OF NOISE CONTROL ASSEMBLY No. 1.2.4.1.5.4

1 HOUR STC57 DOUBLE WALL

DETAIL D1-5

DETAIL D1-6

DRAWN BY
JEFF MILLER

DUPLEX ADU

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SCALE: AS INDICATED

DETAILS

D1

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ADU22-0077 & ADU22-0078

GENERAL INFORMATION					
01	Project Name	Left Duplex ADU			
02	Run Title	Duplex ADU unit 1			
03	Project Location	245 Roble Ave			
04	City	Redwood City, CA	05	Standards Version	2019
06	Zip code	94061	07	Software Version	CBECC-Res 2019.1.2
08	Climate Zone	3	09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	NewConstruction	13	Number of Bedrooms	1
14	Addition Cond. Floor Area (ft^2)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft^2)	n/a	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft^2)	640	19	Glazing Percentage (%)	9.81%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Is Natural Gas Available?	Yes			

VALID ONLY FOR NEW PERMIT APPLICATIONS THROUGH DECEMBER 31, 2021

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

ENERGY DESIGN RATING

	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	Total[2] (EDR)	Efficiency[1] (EDR)	Total[2] (EDR)
Standard Design	63.7	38		
Proposed Design	62.8	0	0.9	38

RESULT: [3]: COMPLIES

1: Efficiency EDR includes improvements to the building envelope and more efficient equipment
2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries
3: Building complies when efficiency and total compliance margins are greater than or equal to zero

- Standard Design PV Capacity: 1.54 kWdc
- Proposed PV kWh output exceeds proposed electricity use by 59% which may violate NEM rules. Contact local utility.
- PV System resized to 5.07 kWdc (a factor of 2.535) to achieve 'Maximum PV for Compliance Credit' PV scaling
- EDR is capped at zero

ENERGY USE SUMMARY

Energy Use ($kTDV/ft^2$-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	33.75	42.83	-9.08	-26.9
Space Cooling	0	0.2	-0.2	
IAQ Ventilation	3.82	3.82	0	0
Water Heating	41.56	29.43	12.13	29.2
Self Utilization Credit	n/a	0	0	n/a
Compliance Energy Total	**79.13**	**76.28**	**2.85**	**3.6**

REQUIRED PV SYSTEMS - SIMPLIFIED

01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
5.07	NA	Standard	Fixed (roof mount)	none	true	150-270	n/a	n/a	<=7:12	96	100

ENERGY DESIGN RATING BATTERY INPUTS

01	02	03	04	05	06
Control	Capacity (kWh)	Charging Efficiency	Rate (kW)Rate (kW)	Discharging Efficiency	Rate (kW)Rate (kW)
Basic	5	0.95	n/a	0.95	n/a

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- PV System: 5.07 kWdc
- Battery System: 5 kWh
- Indoor air quality, balanced fan
- Cool roof
- Ceiling has high level of insulation
- Window overhangs and/or fins
- Exposed slab floor in conditioned zone
- Slab Edge Insulation
- Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the buildng tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- Verified Refrigerant Charge

Heating System Verifications:
- -- None --

HVAC Distribution System Verifications:
- -- None --

Domestic Hot Water System Verifications:
- -- None --

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft^2)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Left Duplex ADU	640	1	1	2	0	1

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft^2)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
Conditioned	Conditioned	HVAC System 1	631	10	DHW System	N/A
WH closet	Conditioned	HVAC System 1	9	10	DHW System	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)
Front	Conditioned	2x6 24oc R21+r5	0	Front	200	27.8	90

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JEFF MILLER

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DUPLEX ADU

245 ROBLE AVE.,
REDWOOD CITY,
CA 94061
APN 059-122-070

APPROVALS:

CITY OF REDWOOD CITY
PLANS REVIEWED FOR COMPLIANCE WITH.
2019 yr. CBC, CRC,
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CAL GREEN
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PLAN CHECK OF DOCUMENTS DOES NOT AUTHORIZE CONSTRUCTION TO PROCEED IN VIOLATION OF ANY FEDERAL, STATE OR LOCAL REGULATIONS.
SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

3/4/2023

SCALE: AS INDICATED

ENERGY REPORT

T24-1-1

ADU22-0077 & ADU22-0078

OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)
Left	Conditioned	2x6 24oc R21+r5	90	Left	320	30	90
Back	Conditioned	2x6 24oc R21+r5	180	Back	200	60.6	90
Exterior Wall 5	WH closet	2x6 24oc R21+r5	0	Front	30	0	90
Ceiling (below attic) 1	Conditioned	R38 Ceiling below attic	n/a	n/a	640	n/a	n/a
Ceiling (below attic) 2	WH closet	R38 Ceiling below attic	n/a	n/a	8	n/a	n/a

ATTIC

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic	Asphalt Shingle Roof	Ventilated	2	0.2	0.85	No	Yes

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
DH32x36	Window	Front	Front	0	2.6	3	1	7.8	0.3	NFRC	0.23	NFRC	Bug Screen
60x36 slider	Window	Left	Left	90	5	3	1	15	0.3	NFRC	0.23	NFRC	Bug Screen
Window 10	Window	Left	Left	90	5	3	1	15	0.3	NFRC	0.23	NFRC	Bug Screen
DH30x60	Window	Back	Back	180	2.5	5	1	12.5	0.3	NFRC	0.23	NFRC	Bug Screen
Window 2	Window	Back	Back	180	2.5	5	1	12.5	0.3	NFRC	0.23	NFRC	Bug Screen

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft^2)	U-factor
Front Dr	Front	20	0.2
back door	Back	17.8	0.2

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft^2)	U-factor
back door 2	Back	17.8	0.2

OVERHANGS AND FINS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Window	Overhang					Left Fin				Right Fin			
	Depth	Dist Up	Left Extent	Right Extent	Flap Ht.	Depth	Top Up	Dist L	Bot Up	Depth	Top Up	Dist R	Bot Up
DH32x36	3	2	14	22	0	0	0	0	0	0	0	0	0

SLAB FLOORS

01	02	03	04	05	06	07
Name	Zone	Area (ft2)	Perimeter (ft)	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab On Grade	Conditioned	640	104	None	0%	No
Slab On Grade 2	WH closet	8	8.6667	R-5 / 8	0%	No

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
2x6 24oc R21+r5	Exterior Walls	Wood Framed Wall	2x6 @ 24 in. O. C.	R-21	None / R-5	0.044	Inside Finish: Gypsum Board Sheathing / Insulation: Wood Siding/sheathing/decking Cavity / Frame: R-21 / 2x6 Sheathing / Insulation: R-5 Sheathing Exterior Finish: Wood Siding/sheathing/decking

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Gar House R21	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-21	None / None	0.075	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x4 Other Side Finish: Gypsum Board
Asphalt Shingle Roof	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4 Top Chrd
R38 Ceiling below attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Btm Chrd Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04
Quality Insulation Installation (QII)	Quality Installation of Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Required	Not Required	Not Required	n/a

WATER HEATING SYSTEMS

01	02	03	04	05	06	07
Name	System Type	Distribution Type	Water Heater Name (#)	Solar Heating System	Compact Distribution	HERS Verification
DHW System	Domestic Hot Water (DHW)	Standard Distribution System	Water Heater (1)	n/a	None	n/a

WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12
Name	Heating Element Type	Tank Type	# Units	Tank Vol. (gal)	Energy Factor or Efficiency	Input Rating or Pilot	Tank Insulation R-value (Int/Ext)	Standby Loss or Recovery Eff.	1st Hr. Rating or Flow Rate	NEEA Heat Pump Brand or Model	Tank Location or Ambient Condition
Water Heater	Heat Pump	n/a	1	80	NEEA	<= 12 kW	n/a	n/a	n/a	Rheem\RheemPRO PH80RH350D15	Conditioned

WATER HEATING - HERS VERIFICATION

01	02	03	04	05	06	07	08
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Central DHW Distribution	Shower Drain Water Heat Recovery
DHW System - 1/1	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required

SPACE CONDITIONING SYSTEMS

01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Heating Unit Name	Cooling Unit Name	Fan Name	Distribution Name	Required Thermostat Type	Status	Verified Existing Condition	Heating Equipment Count	Cooling Equipment Count
HVAC System 1	Heat pump heating cooling	Heat Pump System 2	Heat Pump System 2	HP Fan		Setback	New	NA	1	1

HVAC - HEAT PUMPS

01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Number of Units	Heating			Cooling		Zonally Controlled	Compressor Type	HERS Verification
			HSPF/COP	Cap 47	Cap 17	SEER	EER			
Heat Pump System 2	Ductless MiniSplit HP	1	12.8	1800	1800	27	13	Not Zonal	Single Speed	Heat Pump System 2-hers-htpump

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3/4/2023

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ENERGY REPORT

T24-1-2

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HVAC HEAT PUMPS - HERS VERIFICATION

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER	Verified SEER	Verified Refrigerant Charge	Verified HSPF	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 2-hers-htpump	Not Required	0	Not Required	Not Required	Yes	No	No	No

HVAC - FAN SYSTEMS

01	02	03	04
Name	Type	Fan Power (Watts/CFM)	Name
HP Fan	HVAC Fan	0.58	HP Fan-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION

01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficacy (Watts/CFM)
HP Fan-hers-fan	Not Required	0

IAQ (INDOOR AIR QUALITY) FANS

01	02	03	04	05	06
Dwelling Unit	IAQ CFM	IAQ Watts/CFM	IAQ Fan Type	IAQ Recovery Effectiveness (%)	IAQ Recovery Effectiveness - SREIAQ Recovery Effectiveness - SRE
SFam IAQVentRpt 1-1	40	0.25	Balanced HRV	80	n/a

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Jeff Miller	Documentation Author Signature: Jeff Miller
Company: Homeowner - Jeff Miller	Signature Date: 12/20/2022
Address: 133 Spruce Ave	CEA/ HERS Certification Identification (If applicable):
City/State/Zip: Menlo Park, CA 94025	Phone: 6507996880

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
3. 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.

Responsible Designer Name: Jeff Miller	Responsible Designer Signature: Jeff Miller
Company: Homeowner - Jeff Miller	Date Signed: 12/20/2022
Address: 133 Spruce Ave	License:
City/State/Zip: Menlo Park, CA 94025	Phone: 6507996880

Digitally signed by ConSol Home Energy Efficiency Rating System Services, Inc. (CHEERS). This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

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3/4/2023

SCALE: AS INDICATED

ENERGY REPORT

T24-1-3

ADU22-0077 & ADU22-0078

GENERAL INFORMATION					
01	Project Name	Duplex ADU Unit 2 -Right			
02	Run Title	Duplex ADU Unit 2			
03	Project Location	245 Roble Ave			
04	City	Redwood City, CA	05	Standards Version	2019
06	Zip code	94061	07	Software Version	CBECC-Res 2019.1.2
08	Climate Zone	3	09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	NewConstruction	13	Number of Bedrooms	2
14	Addition Cond. Floor Area (ft²)	0	15	Number of Stories	1
16	Existing Cond. Floor Area (ft²)	n/a	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft²)	640	19	Glazing Percentage (%)	13.72%
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a
22	Is Natural Gas Available?	Yes			

VALID ONLY FOR NEW PERMIT APPLICATIONS THROUGH DECEMBER 31, 2021

COMPLIANCE RESULTS	
01	Building Complies with Computer Performance
02	This building incorporates features that require field testing and/or verification by a certified HERS rater under the supervision of a CEC-approved HERS provider.
03	This building incorporates one or more Special Features shown below

ENERGY DESIGN RATING

	Energy Design Ratings		Compliance Margins	
	Efficiency[1] (EDR)	Total[2] (EDR)	Efficiency[1] (EDR)	Total[2] (EDR)
Standard Design	66.9	38.7		
Proposed Design	66.6	0	0.3	38.7

RESULT: [3]: COMPLIES

1: Efficiency EDR includes improvements to the building envelope and more efficient equipment
2: Total EDR includes efficiency and demand response measures such as photovoltaic (PV) systems and batteries
3: Building complies when efficiency and total compliance margins are greater than or equal to zero

- Standard Design PV Capacity: 1.79 kWdc
- Proposed PV kWh output exceeds proposed electricity use by 59% which may violate NEM rules. Contact local utility.
- PV System resized to 5.53 kWdc (a factor of 2.764) to achieve 'Maximum PV for Compliance Credit' PV scaling
- EDR is capped at zero

ENERGY USE SUMMARY

Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	23.55	38.69	-15.14	-64.3
Space Cooling	0.51	0.17	0.34	66.7
IAQ Ventilation	3.82	3.82	0	0
Water Heating	49.58	33.58	16	32.3
Self Utilization Credit	n/a	0	0	n/a
Compliance Energy Total	**77.46**	**76.26**	**1.2**	**1.5**

REQUIRED PV SYSTEMS - SIMPLIFIED

01	02	03	04	05	06	07	08	09	10	11	12
DC System Size (kWdc)	Exception	Module Type	Array Type	Power Electronics	CFI	Azimuth (deg)	Tilt Input	Array Angle (deg)	Tilt: (x in 12)	Inverter Eff. (%)	Annual Solar Access (%)
5.53	NA	Standard	Fixed (roof mount)	none	true	150-270	n/a	n/a	<=7:12	96	100

ENERGY DESIGN RATING BATTERY INPUTS

01	02	03	04	05	06
Control	Capacity (kWh)	Charging Efficiency	Rate (kW)Rate (kW)	Discharging Efficiency	Rate (kW)Rate (kW)
Basic	5	0.95	n/a	0.95	n/a

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- PV System: 5.53 kWdc
- Battery System: 5 kWh
- Indoor air quality, balanced fan
- Cool roof
- Ceiling has high level of insulation
- Window overhangs and/or fins
- Exposed slab floor in conditioned zone
- Slab Edge Insulation
- Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed

HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the buildng tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- Verified Refrigerant Charge

Heating System Verifications:
- -- None --

HVAC Distribution System Verifications:
- -- None --

Domestic Hot Water System Verifications:
- -- None --

BUILDING - FEATURES INFORMATION

01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft²)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Duplex ADU Unit 2 -Right	640	1	2	2	0	1

ZONE INFORMATION

01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft²)	Avg. Ceiling Height	Water Heating System 1	Water Heating System 2
Conditioned	Conditioned	HVAC System 1	631	10	DHW System	N/A
WH closet	Conditioned	HVAC System 1	9	10	DHW System	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft²)	Window and Door Area (ft2)	Tilt (deg)
Front	Conditioned	2x6 24oc R23+r5	0	Front	200	27.8	90

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3/4/2023

SCALE: AS INDICATED

ENERGY REPORT

T24-2-1

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OPAQUE SURFACES

01	02	03	04	05	06	07	08
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)
Right	Conditioned	2x6 24oc R23+r5	90	Left	320	60.0002	90
Back	Conditioned	2x6 24oc R23+r5	180	Back	200	20	90
Exterior Wall 5	WH closet	2x6 24oc R23+r5	0	Front	30	0	90
Ceiling (below attic) 1	Conditioned	R38 Ceiling below attic	n/a	n/a	631	n/a	n/a
Ceiling (below attic) 2	WH closet	R38 Ceiling below attic	n/a	n/a	9	n/a	n/a

ATTIC

01	02	03	04	05	06	07	08
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Radiant Barrier	Cool Roof
Attic	Asphalt Shingle Roof	Ventilated	2	0.2	0.85	No	Yes

FENESTRATION / GLAZING

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Type	Surface	Orientation	Azimuth	Width (ft)	Height (ft)	Mult.	Area (ft^2)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
DH32x36	Window	Front	Front	0	2.6	3	1	7.8	0.3	NFRC	0.23	NFRC	Bug Screen
CAS30x48	Window	Right	Left	90	2.5	4	1	10	0.3	NFRC	0.23	NFRC	Bug Screen
Window 5	Window	Right	Left	90	2.5	4	1	10	0.3	NFRC	0.23	NFRC	Bug Screen
Patio 72x80	Window	Right	Left	90	6	6.6667	1	40	0.3	NFRC	0.23	NFRC	Bug Screen
Window 4	Window	Back	Back	180	2.5	4	1	10	0.3	NFRC	0.23	NFRC	Bug Screen
Window 6	Window	Back	Back	180	2.5	4	1	10	0.3	NFRC	0.23	NFRC	Bug Screen

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft^2)	U-factor
Front Dr	Front	20	0.2

OVERHANGS AND FINS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Window	Overhang					Left Fin				Right Fin			
	Depth	Dist Up	Left Extent	Right Extent	Flap Ht.	Depth	Top Up	Dist L	Bot Up	Depth	Top Up	Dist R	Bot Up
DH32x36	3	2	14	22	0	0	0	0	0	0	0	0	0

SLAB FLOORS

01	02	03	04	05	06	07
Name	Zone	Area (ft2)	Perimeter (ft)	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab On Grade	Conditioned	631	104	None	0%	No
Slab On Grade 2	WH closet	9	8.6667	R-5 / 8	0%	No

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
2x6 24oc R23+r5	Exterior Walls	Wood Framed Wall	2x6 @ 24 in. O. C.	R-21	None / R-5	0.044	Inside Finish: Gypsum Board Sheathing / Insulation: Wood Siding/sheathing/decking Cavity / Frame: R-21 / 2x6 Sheathing / Insulation: R-5 Sheathing Exterior Finish: Wood Siding/sheathing/decking

OPAQUE SURFACE CONSTRUCTIONS

01	02	03	04	05	06	07	08
Construction Name	Surface Type	Construction Type	Framing	Total Cavity R-value	Interior / Exterior Continuous R-value	U-factor	Assembly Layers
Gar House R21	Interior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-21	None / None	0.075	Inside Finish: Gypsum Board Cavity / Frame: R-21 / 2x4 Other Side Finish: Gypsum Board
Asphalt Shingle Roof	Attic Roofs	Wood Framed Ceiling	2x4 Top Chord of Roof Truss @ 24 in. O. C.	R-0	None / None	0.644	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: no insul. / 2x4 Top Chrd
R38 Ceiling below attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 Bottom Chord of Truss @ 24 in. O. C.	R-38	None / None	0.025	Over Ceiling Joists: R-28.9 insul. Cavity / Frame: R-9.1 / 2x4 Btm Chrd Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04
Quality Insulation Installation (QII)	Quality Installation of Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Required	Not Required	Not Required	n/a

WATER HEATING SYSTEMS

01	02	03	04	05	06	07
Name	System Type	Distribution Type	Water Heater Name (#)	Solar Heating System	Compact Distribution	HERS Verification
DHW System	Domestic Hot Water (DHW)	Standard Distribution System	Water Heater (1)	n/a	None	n/a

WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12
Name	Heating Element Type	Tank Type	# Units	Tank Vol. (gal)	Energy Factor or Efficiency	Input Rating or Pilot	Tank Insulation R-value (Int/Ext)	Standby Loss or Recovery Eff.	1st Hr. Rating or Flow Rate	NEEA Heat Pump Brand or Model	Tank Location or Ambient Condition
Water Heater	Heat Pump	n/a	1	80	NEEA	<= 12 kW	n/a	n/a	n/a	Rheem\RheemPRO PH80RH350D15	Conditioned

WATER HEATING - HERS VERIFICATION

01	02	03	04	05	06	07	08
Name	Pipe Insulation	Parallel Piping	Compact Distribution	Compact Distribution Type	Recirculation Control	Central DHW Distribution	Shower Drain Water Heat Recovery
DHW System - 1/1	Not Required	Not Required	Not Required	None	Not Required	Not Required	Not Required

SPACE CONDITIONING SYSTEMS

01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Heating Unit Name	Cooling Unit Name	Fan Name	Distribution Name	Required Thermostat Type	Status	Verified Existing Condition	Heating Equipment Count	Cooling Equipment Count
HVAC System 1	Heat pump heating cooling	Heat Pump System 2	Heat Pump System 2	HP Fan		Setback	New	NA	1	1

HVAC - HEAT PUMPS

01	02	03	04	05	06	07	08	09	10	11
Name	System Type	Number of Units	Heating			Cooling		Zonally Controlled	Compressor Type	HERS Verification
			HSPF/COP	Cap 47	Cap 17	SEER	EER			
Heat Pump System 2	Ductless MiniSplit HP	1	12.8	1800	1800	27	13	Not Zonal	Single Speed	Heat Pump System 2-hers-htpump

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SCALE: AS INDICATED

ENERGY REPORT

T24-2-2

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HVAC HEAT PUMPS - HERS VERIFICATION

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER	Verified SEER	Verified Refrigerant Charge	Verified HSPF	Verified Heating Cap 47	Verified Heating Cap 17
Heat Pump System 2-hers-htpump	Not Required	0	Not Required	Not Required	Yes	No	No	No

HVAC - FAN SYSTEMS

01	02	03	04
Name	Type	Fan Power (Watts/CFM)	Name
HP Fan	HVAC Fan	0.58	HP Fan-hers-fan

HVAC FAN SYSTEMS - HERS VERIFICATION

01	02	03
Name	Verified Fan Watt Draw	Required Fan Efficacy (Watts/CFM)
HP Fan-hers-fan	Not Required	0

IAQ (INDOOR AIR QUALITY) FANS

01	02	03	04	05	06
Dwelling Unit	IAQ CFM	IAQ Watts/CFM	IAQ Fan Type	IAQ Recovery Effectiveness (%)	IAQ Recovery Effectiveness - SREIAQ Recovery Effectiveness - SRE
SFam IAQVentRpt 1-1	40	0.25	Balanced HRV	80	n/a

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Jeff Miller	Documentation Author Signature: Jeff Miller
Company: Homeowner - Jeff Miller	Signature Date: 12/20/2022
Address: 133 Spruce Ave	CEA/ HERS Certification Identification (If applicable):
City/State/Zip: Menlo Park, CA 94025	Phone: 6507996880

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

1. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
2. I certify that the energy features and performance specifications identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
3. 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.

Responsible Designer Name: Jeff Miller	Responsible Designer Signature: Jeff Miller
Company: Homeowner - Jeff Miller	Date Signed: 12/20/2022
Address: 133 Spruce Ave	License:
City/State/Zip: Menlo Park, CA 94025	Phone: 6507996880

Digitally signed by ConSol Home Energy Efficiency Rating System Services, Inc. (CHEERS). This digital signature is provided in order to secure the content of this registered document, and in no way implies Registration Provider responsibility for the accuracy of the information.

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3/4/2023

SCALE: AS INDICATED

ENERGY REPORT
UNIT 2
T24-2-3

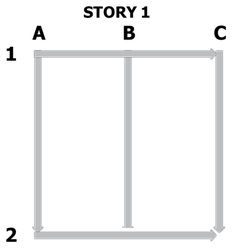
ADU22-0077 & ADU22-0078

APA Wall Bracing Calculator Project Report

Builder/Designer	Jeff Miller
Home/Building Plan Name	Roble Duplex ADU
Development Address	245 Roble Ave
Code	BASED ON 2021 IRC
SDC (Seismic Design Category)	D2
Wind Speed	<= 95 mph
Wind Exposure Category	EXPOSURE B
Total Number of Stories	1 STORY
Cripple Wall	NO
Mean Roof Height less than 30 ft.	YES

Designer Responsibilities:

- Check irregularities per IRC section R301.2.2.6
- Confirm load path to foundation per IRC section R403.1.6
- Design foundations per IRC section R403.1
  - Include interior braced wall line foundations per IRC Section R602.11
- Design cripple walls in one of two ways
  - Redesignate as the first story and use the calculator
  - Design by hand per IRC Section R602.10.10.



WALL LINE ELEVATION VIEW

Total Wall Line Length: 32' 0"

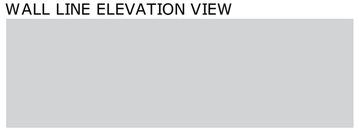
WALL LINE PLAN VIEW

Story	Wall Line	Bracing Method	Wind Factors	Wind Bracing Amount	Seismic Factors	Seismic Bracing Amount	Required Bracing	Qualified Bracing	Bracing Status
1st Story	A	CS-WSP	0.96	2.4	0.94	6.41	6.41	20.17	Compliant

Furthest Distance to Adjacent BWL	20' 0"	**Stone or Masonry Veneer**	Omitted
Roof Eave to Ridge Height	5 feet	**Wall Dead Load**	<= 8 psf
Wall Line Length	32' 0"	**Roof/Ceiling Dead Loads**	<= 15 psf
Gypsum	Included		
Blocking	Included		

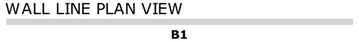
Wall Line Segment	Wall Height	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
B1	10'	11'	CS-WSP	4' 0"	3' 0"	4	6"/12"		
B2	10'	11'	CS-WSP	1' 10"	3' 0"	0	6"/12"		
B3	10'	11'	CS-WSP	16' 2"	3' 0"	16.17	6"/12"		

WALL LINE ELEVATION VIEW



Total Wall Line Length: 32' 0"

WALL LINE PLAN VIEW



Story	Wall Line	Bracing Method	Wind Factors	Wind Bracing Amount	Seismic Factors	Seismic Bracing Amount	Required Bracing	Qualified Bracing	Bracing Status
1st Story	B	CS-WSP	1.04	2.6	0.94	6.41	6.41	32	Compliant

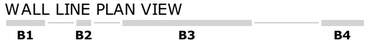
Furthest Distance to Adjacent BWL	20' 0"	**Stone or Masonry Veneer**	Omitted
Roof Eave to Ridge Height	6 feet	**Wall Dead Load**	<= 8 psf
Wall Line Length	32' 0"	**Roof/Ceiling Dead Loads**	<= 15 psf
Gypsum	Included		
Blocking	Included		

Wall Line Segment	Wall Height	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
B1	10'	11'	CS-WSP	32' 0"		32	6"/12"		

WALL LINE ELEVATION VIEW

Total Wall Line Length: 32' 0"

WALL LINE PLAN VIEW



Story	Wall Line	Bracing Method	Wind Factors	Wind Bracing Amount	Seismic Factors	Seismic Bracing Amount	Required Bracing	Qualified Bracing	Bracing Status
1st Story	C	CS-WSP	1.04	2.6	0.94	6.41	6.41	19.67	Compliant

Furthest Distance to Adjacent BWL	20' 0"	**Stone or Masonry Veneer**	Omitted
Roof Eave to Ridge Height	6 feet	**Wall Dead Load**	<= 8 psf
Wall Line Length	32' 0"	**Roof/Ceiling Dead Loads**	<= 15 psf
Gypsum	Included		
Blocking	Included		

Wall Line Segment	Wall Height	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
B1	10'	11'	CS-WSP	3' 8"	4' 0"	3.67	6"/12"		
B2	10'	11'	CS-WSP	1' 6"	4' 0"	0	6"/12"		
B3	10'	11'	CS-WSP	12' 0"	6' 8"	12	6"/12"		
B4	10'	11'	CS-WSP	4' 0"	6' 8"	4	6"/12"		

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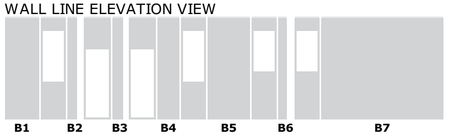
WALL LINE ELEVATION VIEW



Total Wall Line Length: 40' 0"

WALL LINE PLAN VIEW

Story	Wall Line	Bracing Method	Wind Factors	Wind Bracing Amount	Seismic Factors	Seismic Bracing Amount	Required Bracing	Qualified Bracing	Bracing Status
1st Story	1	CS-WSP	0.8	2.88	1.2	10.2	10.2	19.67	Compliant

Furthest Distance to Adjacent BWL 32' 0"
Roof Eave to Ridge Height 6 feet
Wall Line Length 40' 0"
Gypsum Included
Blocking Included
Stone or Masonry Veneer Omitted
Wall Dead Load <= 8 psf
Roof/Ceiling Dead Loads <= 15 psf

Wall Line Segment	Wall Height	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
B1	10'	11'	CS-WSP	3' 5"	5' 0"	3.42	6"/12"		
B2	10'	11'	CS-WSP	0' 11"	6' 8"	0	6"/12"		
B3	10'	11'	CS-WSP	1' 1"	6' 8"	0	6"/12"		
B4	10'	11'	CS-WSP	2' 2"	6' 8"	0	6"/12"		
B5	10'	11'	CS-WSP	4' 2"	5' 0"	4.17	6"/12"		
B6	10'	11'	CS-WSP	0' 10"	4' 0"	0	6"/12"		
B7	10'	11'	CS-WSP	12' 1"	4' 0"	12.08	6"/12"		

APA Wall Bracing Calculator v2.7.0

WALL LINE ELEVATION VIEW

Total Wall Line Length: 40' 0"

WALL LINE PLAN VIEW

Story	Wall Line	Bracing Method	Wind Factors	Wind Bracing Amount	Seismic Factors	Seismic Bracing Amount	Required Bracing	Qualified Bracing	Bracing Status
1st Story	2	CS-WSP	0.66	2.38	1.09	9.26	9.26	22.16	Compliant

Furthest Distance to Adjacent BWL 32' 0"
Roof Eave to Ridge Height 5 feet
Wall Line Length 40' 0"
Gypsum Included
Blocking Included
Stone or Masonry Veneer Omitted
Wall Dead Load <= 8 psf
Roof/Ceiling Dead Loads <= 15 psf

Wall Line Segment	Wall Height	Story Height	Bracing Method	Segment Length	Adjacent Opening Height	Qualified Segment	Nails	Tension Tie	Hold Down
B1	8'	9'	CS-WSP	4' 10"	6' 8"	4.83	6"/12"		
B2	8'	9'	CS-WSP	6' 3"	6' 8"	6.25	6"/12"		
B3	8'	9'	CS-WSP	1' 10"	6' 8"	0	6"/12"		
B4	8'	9'	CS-WSP	1' 10"	6' 8"	0	6"/12"		
B5	8'	9'	CS-WSP	6' 3"	6' 8"	6.25	6"/12"		
B6	8'	9'	CS-WSP	4' 10"	6' 8"	4.83	6"/12"		

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2019 Low-Rise Residential Mandatory Measures Summary

*NOTE: Low-rise residential buildings subject to the Energy Standards must comply with all applicable mandatory measures, regardless of the compliance approach used. Review the respective section for more information. *Exceptions may apply.*
(01/2020)

Building Envelope Measures:	
§ 110.6(a)1:	**Air Leakage.** Manufactured fenestration, exterior doors, and exterior pet doors must limit air leakage to 0.3 CFM per square foot or less when tested per NFRC-400, ASTM E283 or AAMA/WDMA/CSA 101/I.S.2/A440-2011.*
§ 110.6(a)5:	**Labeling.** Fenestration products and exterior doors must have a label meeting the requirements of § 10-111(a).
§ 110.6(b):	**Field fabricated exterior doors and fenestration** products must use U-factors and solar heat gain coefficient (SHGC) values from Tables 110.6-A, 110.6-B, or JA4.5 for exterior doors. They must be caulked and/or weather-stripped.*
§ 110.7:	**Air Leakage.** All joints, penetrations, and other openings in the building envelope that are potential sources of air leakage must be caulked, gasketed, or weather stripped.
§ 110.8(a):	**Insulation Certification by Manufacturers.** Insulation must be certified by the Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS).
§ 110.8(g):	**Insulation Requirements for Heated Slab Floors.** Heated slab floors must be insulated per the requirements of § 110.8(g).
§ 110.8(i):	**Roofing Products Solar Reflectance and Thermal Emittance.** The thermal emittance and aged solar reflectance values of the roofing material must meet the requirements of § 110.8(i) and be labeled per §10-113 when the installation of a cool roof is specified on the CF1R.
§ 110.8(j):	**Radiant Barrier.** When required, radiant barriers must have an emittance of 0.05 or less and be certified to the Department of Consumer Affairs.
§ 150.0(a):	**Ceiling and Rafter Roof Insulation.** Minimum R-22 insulation in wood-frame ceiling; or the weighted average U-factor must not exceed 0.043. Minimum R-19 or weighted average U-factor of 0.054 or less in a rafter roof alteration. Attic access doors must have permanently attached insulation using adhesive or mechanical fasteners. The attic access must be gasketed to prevent air leakage. Insulation must be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in § 110.7, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling.*
§ 150.0(b):	**Loose-fill Insulation.** Loose fill insulation must meet the manufacturer's required density for the labeled R-value.
§ 150.0(c):	**Wall Insulation.** Minimum R-13 insulation in 2x4 inch wood framing wall or have a U-factor of 0.102 or less, or R-20 in 2x6 inch wood framing or have a U-factor of 0.071 or less. Opaque non-framed assemblies must have an overall assembly U-factor not exceeding 0.102. Masonry walls must meet Tables 150.1-A or B.*
§ 150.0(d):	**Raised-floor Insulation.** Minimum R-19 insulation in raised wood framed floor or 0.037 maximum U-factor.*
§ 150.0(f):	**Slab Edge Insulation.** Slab edge insulation must meet all of the following: have a water absorption rate, for the insulation material alone without facings, no greater than 0.3 percent; have a water vapor permeance no greater than 2.0 perm per inch; be protected from physical damage and UV light deterioration; and, when installed as part of a heated slab floor, meet the requirements of § 110.8(g).
§ 150.0(g)1:	**Vapor Retarder.** In climate zones 1 through 16, the earth floor of unvented crawl space must be covered with a Class I or Class II vapor retarder. This requirement also applies to controlled ventilation crawl space for buildings complying with the exception to § 150.0(d).
§ 150.0(g)2:	**Vapor Retarder.** In climate zones 14 and 16, a Class I or Class II vapor retarder must be installed on the conditioned space side of all insulation in all exterior walls, vented attics, and unvented attics with air-permeable insulation.
§ 150.0(q):	**Fenestration Products.** Fenestration, including skylights, separating conditioned space from unconditioned space or outdoors must have a maximum U-factor of 0.58; or the weighted average U-factor of all fenestration must not exceed 0.58.*
Fireplaces, Decorative Gas Appliances, and Gas Log Measures:	
§ 110.5(e)	**Pilot Light.** Continuously burning pilot lights are not allowed for indoor and outdoor fireplaces.
§ 150.0(e)1:	**Closable Doors.** Masonry or factory-built fireplaces must have a closable metal or glass door covering the entire opening of the firebox.
§ 150.0(e)2:	**Combustion Intake.** Masonry or factory-built fireplaces must have a combustion outside air intake, which is at least six square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device.*
§ 150.0(e)3:	**Flue Damper.** Masonry or factory-built fireplaces must have a flue damper with a readily accessible control.*
Space Conditioning, Water Heating, and Plumbing System Measures:	
§ 110.0-§ 110.3:	**Certification.** Heating, ventilation and air conditioning (HVAC) equipment, water heaters, showerheads, faucets, and all other regulated appliances must be certified by the manufacturer to the California Energy Commission.*
§ 110.2(a):	**HVAC Efficiency.** Equipment must meet the applicable efficiency requirements in Table 110.2-A through Table 110.2-K.*
§ 110.2(b):	**Controls for Heat Pumps with Supplementary Electric Resistance Heaters.** Heat pumps with supplementary electric resistance heaters must have controls that prevent supplementary heater operation when the heating load can be met by the heat pump alone; and in which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.*
§ 110.2(c):	**Thermostats.** All heating or cooling systems not controlled by a central energy management control system (EMCS) must have a setback thermostat.*
§ 110.3(c)4:	**Water Heating Recirculation Loops Serving Multiple Dwelling Units.** Water heating recirculation loops serving multiple dwelling units must meet the air release valve, backflow prevention, pump priming, pump isolation valve, and recirculation loop connection requirements of § 110.3(c)4.
§ 110.3(c)6:	**Isolation Valves.** Instantaneous water heaters with an input rating greater than 6.8 kBtu per hour (2 kW) must have isolation valves with hose bibbs or other fittings on both cold and hot water lines to allow for flushing the water heater when the valves are closed.
§ 110.5:	**Pilot Lights.** Continuously burning pilot lights are prohibited for natural gas: fan-type central furnaces; household cooking appliances (except appliances without an electrical supply voltage connection with pilot lights that consume less than 150 Btu per hour); and pool and spa heaters.*
§ 150.0(h)1:	**Building Cooling and Heating Loads.** Heating and/or cooling loads are calculated in accordance with the ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; the SMACNA Residential Comfort System Installation Standards Manual; or the ACCA Manual J using design conditions specified in § 150.0(h)2.

2019 Low-Rise Residential Mandatory Measures Summary

Requirements for Ventilation and Indoor Air Quality:	
§ 150.0(o)1:	**Requirements for Ventilation and Indoor Air Quality**. All dwelling units must meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified in § 150.0(o)1.
§ 150.0(o)1C:	**Single Family Detached Dwelling Units.** Single family detached dwelling units, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces must have mechanical ventilation airflow provided at rates determined by ASHRAE 62.2 Sections 4.1.1 and 4.1.2 and as specified in § 150.0(o)1C.
§ 150.0(o)1E:	**Multifamily Attached Dwelling Units.** Multifamily attached dwelling units must have mechanical ventilation airflow provided at rates in accordance with Equation 150.0-B and must be either a balanced system or continuous supply or continuous exhaust system. If a balanced system is not used, all units in the building must use the same system type and the dwelling-unit envelope leakage must be ≤ 0.3 CFM at 50 Pa (0.2 inch water) per square foot of dwelling unit envelope surface area and verified in accordance with Reference Residential Appendix RA3.8.
§ 150.0(o)1F:	**Multifamily Building Central Ventilation Systems.** Central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow for each dwelling unit served at a rate equal to or greater than the rate specified by Equation 150.0-B. All unit airflows must be within 20 percent of the unit with the lowest airflow rate as it relates to the individual unit's minimum required airflow rate needed for compliance.
§ 150.0(o)1G:	**Kitchen Range Hoods.** Kitchen range hoods must be rated for sound in accordance with Section 7.2 of ASHRAE 62.2.
§ 150.0(o)2:	**Field Verification and Diagnostic Testing.** Dwelling unit ventilation airflow must be verified in accordance with Reference Residential Appendix RA3.7. A kitchen range hood must be verified in accordance with Reference Residential Appendix RA3.7.4.3 to confirm it is rated by HVI to comply with the airflow rates and sound requirements as specified in Section 5 and 7.2 of ASHRAE 62.2.
Pool and Spa Systems and Equipment Measures:	
§ 110.4(a):	**Certification by Manufacturers.** Any pool or spa heating system or equipment must be certified to have all of the following: a thermal efficiency that complies with the Appliance Efficiency Regulations; an on-off switch mounted outside of the heater that allows shutting off the heater without adjusting the thermostat setting; a permanent weatherproof plate or card with operating instructions; and must not use electric resistance heating.*
§ 110.4(b)1:	**Piping.** Any pool or spa heating system or equipment must be installed with at least 36 inches of pipe between the filter and the heater, or dedicated suction and return lines, or built-in or built-up connections to allow for future solar heating.
§ 110.4(b)2:	**Covers.** Outdoor pools or spas that have a heat pump or gas heater must have a cover.
§ 110.4(b)3:	**Directional Inlets and Time Switches for Pools.** Pools must have directional inlets that adequately mix the pool water, and a time switch that will allow all pumps to be set or programmed to run only during off-peak electric demand periods.
§ 110.5:	**Pilot Light.** Natural gas pool and spa heaters must not have a continuously burning pilot light.
§ 150.0(p):	**Pool Systems and Equipment Installation.** Residential pool systems or equipment must meet the specified requirements for pump sizing, flow rate, piping, filters, and valves.*
Lighting Measures:	
§ 110.9:	**Lighting Controls and Components.** All lighting control devices and systems, ballasts, and luminaires must meet the applicable requirements of § 110.9.*
§ 150.0(k)1A:	**Luminaire Efficacy.** All installed luminaires must meet the requirements in Table 150.0-A.
§ 150.0(k)1B:	**Blank Electrical Boxes.** The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device must be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, vacancy sensor control, or fan speed control.
§ 150.0(k)1C:	**Recessed Downlight Luminaires in Ceilings.** Luminaires recessed into ceilings must meet all of the requirements for: insulation contact (IC) labeling; air leakage; sealing; maintenance; and socket and light source as described in § 150.0(k)1C.
§ 150.0(k)1D:	**Electronic Ballasts for Fluorescent Lamps.** Ballasts for fluorescent lamps rated 13 watts or greater must be electronic and must have an output frequency no less than 20 kHz.
§ 150.0(k)1E:	**Night Lights, Step Lights, and Path Lights.** Night lights, step lights and path lights are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided they are rated to consume no more than 5 watts of power and emit no more than 150 lumens.
§ 150.0(k)1F:	**Lighting Integral to Exhaust Fans.** Lighting integral to exhaust fans (except when installed by the manufacturer in kitchen exhaust hoods) must meet the applicable requirements of § 150.0(k).*
§ 150.0(k)1G:	**Screw based luminaires.** Screw based luminaires must contain lamps that comply with Reference Joint Appendix JA8.*
§ 150.0(k)1H:	**Light Sources in Enclosed or Recessed Luminaires.** Lamps and other separable light sources that are not compliant with the JA8 elevated temperature requirements, including marking requirements, must not be installed in enclosed or recessed luminaires.
§ 150.0(k)1I:	**Light Sources in Drawers, Cabinets, and Linen Closets.** Light sources internal to drawers, cabinetry or linen closets are not required to comply with Table 150.0-A or be controlled by vacancy sensors provided that they are rated to consume no more than 5 watts of power, emit no more than 150 lumens, and are equipped with controls that automatically turn the lighting off when the drawer, cabinet or linen closet is closed.
§ 150.0(k)2A:	**Interior Switches and Controls.** All forward phase cut dimmers used with LED light sources must comply with NEMA SSL 7A.
§ 150.0(k)2B:	**Interior Switches and Controls.** Exhaust fans must be controlled separately from lighting systems.*
§ 150.0(k)2C:	**Interior Switches and Controls.** Lighting must have readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF.*
§ 150.0(k)2D:	**Interior Switches and Controls.** Controls and equipment must be installed in accordance with manufacturer's instructions.
§ 150.0(k)2E:	**Interior Switches and Controls.** Controls must not bypass a dimmer, occupant sensor, or vacancy sensor function if the control is installed to comply with § 150.0(k).
§ 150.0(k)2F:	**Interior Switches and Controls.** Lighting controls must comply with the applicable requirements of § 110.9.

2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(h)3A:	**Clearances.** Air conditioner and heat pump outdoor condensing units must have a clearance of at least five feet from the outlet of any dryer
§ 150.0(h)3B:	**Liquid Line Drier.** Air conditioners and heat pump systems must be equipped with liquid line filter driers if required, as specified by the manufacturer's instructions.
§ 150.0(j)1:	**Storage Tank Insulation.** Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, must have a minimum of R-12 external insulation or R-16 internal insulation where the internal insulation R-value is indicated on the exterior of the tank.
§ 150.0(j)2A:	**Water Piping, Solar Water-heating System Piping, and Space Conditioning System Line Insulation.** All domestic hot water piping must be insulated as specified in Section 609.11 of the California Plumbing Code. In addition, the following piping conditions must have a minimum insulation wall thickness of one inch or a minimum insulation R-value of 7.7: the first five feet of cold water pipes from the storage tank; all hot water piping with a nominal diameter equal to or greater than 3/4 inch and less than one inch; all hot water piping with a nominal diameter less than 3/4 inch that is: associated with a domestic hot water recirculation system, from the heating source to storage tank or between tanks, buried below grade, and from the heating source to kitchen fixtures.*
§ 150.0(j)3:	**Insulation Protection.** Piping insulation must be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind as required by Section 120.3(b). Insulation exposed to weather must be water retardant and protected from UV light (no adhesive tapes). Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space must include, or be protected by, a Class I or Class II vapor retarder. Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.
§ 150.0(n)1:	**Gas or Propane Water Heating Systems.** Systems using gas or propane water heaters to serve individual dwelling units must include all of the following: A dedicated 125 volt, 20 amp electrical receptacle connected to the electric panel with a 120/240 volt 3 conductor, 10 AWG copper branch circuit, within three feet of the water heater without obstruction. Both ends of the unused conductor must be labeled with the word "spare" and be electrically isolated. Have a reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; a Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; a condensate drain that is no more than two inches higher than the base of the water heater, and allows natural draining without pump assistance; and a gas supply line with a capacity of at least 200,000 Btu per hour.
§ 150.0(n)2:	**Recirculating Loops.** Recirculating loops serving multiple dwelling units must meet the requirements of § 110.3(c)5.
§ 150.0(n)3:	**Solar Water-heating Systems.** Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.
Ducts and Fans Measures:	
§ 110.8(d)3:	**Ducts.** Insulation installed on an existing space-conditioning duct must comply with § 604.0 of the California Mechanical Code (CMC). If a contractor installs the insulation, the contractor must certify to the customer, in writing, that the insulation meets this requirement.
§ 150.0(m)1:	**CMC Compliance.** All air-distribution system ducts and plenums must meet the requirements of the CMC §§ 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition. Portions of supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or a minimum installed level of R-4.2 when ducts are entirely in conditioned space as confirmed through field verification and diagnostic testing (RA3.1.4.3.8). Portions of the duct system completely exposed and surrounded by directly conditioned space are not required to be insulated. Connections of metal ducts and inner core of flexible ducts must be mechanically fastened. Openings must be sealed with mastic, tape, or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than ¼ inch, the combination of mastic and either mesh or tape must be used. Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used to convey conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms must not be compressed to cause reductions in the cross-sectional area.*
§ 150.0(m)2:	**Factory-Fabricated Duct Systems.** Factory-fabricated duct systems must comply with applicable requirements for duct construction, connections, and closures; joints and seams of duct systems and their components must not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.
§ 150.0(m)3:	**Field-Fabricated Duct Systems.** Field-fabricated duct systems must comply with applicable requirements for: pressure-sensitive tapes, mastics, sealants, and other requirements specified for duct construction.
§ 150.0(m)7:	**Backdraft Damper.** Fan systems that exchange air between the conditioned space and outdoors must have backdraft or automatic dampers.
§ 150.0(m)8:	**Gravity Ventilation Dampers.** Gravity ventilating systems serving conditioned space must have either automatic or readily accessible, manually operated dampers in all openings to the outside, except combustion inlet and outlet air openings and elevator shaft vents.
§ 150.0(m)9:	**Protection of Insulation.** Insulation must be protected from damage, sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather must be suitable for outdoor service. For example, protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation.
§ 150.0(m)10:	**Porous Inner Core Flex Duct.** Porous inner core flex ducts must have a non-porous layer between the inner core and outer vapor barrier.
§ 150.0(m)11:	**Duct System Sealing and Leakage Test.** When space conditioning systems use forced air duct systems to supply conditioned air to an occupiable space, the ducts must be sealed and duct leakage tested, as confirmed through field verification and diagnostic testing, in accordance with § 150.0(m)11 and Reference Residential Appendix RA3.
§ 150.0(m)12:	**Air Filtration.** Space conditioning systems with ducts exceeding 10 feet and the supply side of ventilation systems must have MERV 13 or equivalent filters. Filters for space conditioning systems must have a two inch depth or can be one inch if sized per Equation 150.0-A. Pressure drops and labeling must meet the requirements in §150.0(m)12. Filters must be accessible for regular service.*
§ 150.0(m)13:	**Space Conditioning System Airflow Rate and Fan Efficacy.** Space conditioning systems that use ducts to supply cooling must have a hole for the placement of a static pressure probe, or a permanently installed static pressure probe in the supply plenum. Airflow must be ≥ 350 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.45 watts per CFM for gas furnace air handlers and ≤ 0.58 watts per CFM for all others. Small duct high velocity systems must provide an airflow ≥ 250 CFM per ton of nominal cooling capacity, and an air-handling unit fan efficacy ≤ 0.62 watts per CFM. Field verification testing is required in accordance with Reference Residential Appendix RA3.3.*

2019 Low-Rise Residential Mandatory Measures Summary

§ 150.0(k)2G:	**Interior Switches and Controls.** An energy management control system (EMCS) may be used to comply with control requirements if it: provides functionality of the specified control according to § 110.9; meets the Installation Certificate requirements of § 130.4; meets the EMCS requirements of § 130.0(e); and meets all other requirements in § 150.0(k)2.
§ 150.0(k)2H:	**Interior Switches and Controls.** A multiscene programmable controller may be used to comply with dimmer requirements in § 150.0(k) if it provides the functionality of a dimmer according to § 110.9, and complies with all other applicable requirements in § 150.0(k)2.
§ 150.0(k)2I:	**Interior Switches and Controls.** In bathrooms, garages, laundry rooms, and utility rooms, at least one luminaire in each of these spaces must be controlled by an occupant sensor or a vacancy sensor providing automatic-off functionality. If an occupant sensor is installed, it must be initially configured to manual-on operation using the manual control required under Section 150.0(k)2C.
§ 150.0(k)2J:	**Interior Switches and Controls.** Luminaires that are or contain light sources that meet Reference Joint Appendix JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, must have dimming controls.*
§ 150.0(k)2K:	**Interior Switches and Controls.** Under cabinet lighting must be controlled separately from ceiling-installed lighting systems.
§ 150.0(k)3A:	**Residential Outdoor Lighting.** For single-family residential buildings, outdoor lighting permanently mounted to a residential building, or to other buildings on the same lot, must meet the requirement in item § 150.0(k)3Ai (ON and OFF switch) and the requirements in either § 150.0(k)3Aii (photocell and either a motion sensor or automatic time switch control) or § 150.0(k)3Aiii (astronomical time clock), or an EMCS.
§ 150.0(k)3B:	**Residential Outdoor Lighting.** For low-rise residential buildings with four or more dwelling units, outdoor lighting for private patios, entrances, balconies, and porches; and residential parking lots and carports with less than eight vehicles per site must comply with either § 150.0(k)3A or with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k)3C:	**Residential Outdoor Lighting.** For low-rise residential buildings with four or more dwelling units, any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by § 150.0(k)3B or § 150.0(k)3D must comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.
§ 150.0(k)4:	**Internally illuminated address signs.** Internally illuminated address signs must comply with § 140.8; or must consume no more than 5 watts of power as determined according to § 130.0(c).
§ 150.0(k)5:	**Residential Garages for Eight or More Vehicles.** Lighting for residential parking garages for eight or more vehicles must comply with the applicable requirements for nonresidential garages in Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0.
§ 150.0(k)6A:	**Interior Common Areas of Low-rise Multifamily Residential Buildings.** In a low-rise multifamily residential building where the total interior common area in a single building equals 20 percent or less of the floor area, permanently installed lighting for the interior common areas in that building must be comply with Table 150.0-A and be controlled by an occupant sensor.
§ 150.0(k)6B:	**Interior Common Areas of Low-rise Multifamily Residential Buildings.** In a low-rise multifamily residential building where the total interior common area in a single building equals more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must: i. Comply with the applicable requirements in Sections 110.9, 130.0, 130.1, 140.6 and 141.0; and ii. Lighting installed in corridors and stairwells must be controlled by occupant sensors that reduce the lighting power in each space by at least 50 percent. The occupant sensors must be capable of turning the light fully on and off from all designed paths of ingress and egress.
Solar Ready Buildings:	
§ 110.10(a)1:	**Single Family Residences.** Single family residences located in subdivisions with 10 or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete and approved by the enforcement agency, which do not have a photovoltaic system installed, must comply with the requirements of § 110.10(b) through § 110.10(e).
§ 110.10(a)2:	**Low-rise Multifamily Buildings.** Low-rise multi-family buildings that do not have a photovoltaic system installed must comply with the requirements of § 110.10(b) through § 110.10(d).
§ 110.10(b)1:	**Minimum Solar Zone Area.** The solar zone must have a minimum total area as described below. The solar zone must comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area must be comprised of areas that have no dimension less than 5 feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet. For single family residences, the solar zone must be located on the roof or overhang of the building and have a total area no less than 250 square feet. For low-rise multi-family buildings the solar zone must be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project, and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area. The solar zone requirement is applicable to the entire building, including mixed occupancy.*
§ 110.10(b)2:	**Azimuth.** All sections of the solar zone located on steep-sloped roofs must be oriented between 90 degrees and 300 degrees of true north.
§ 110.10(b)3A:	**Shading.** The solar zone must not contain any obstructions, including but not limited to: vents, chimneys, architectural features, and roof mounted equipment.*
§ 110.10(b)3B:	**Shading.** Any obstruction located on the roof or any other part of the building that projects above a solar zone must be located at least twice the distance, measured in the horizontal plane, of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.*
§ 110.10(b)4:	**Structural Design Loads on Construction Documents.** For areas of the roof designated as a solar zone, the structural design loads for roof dead load and roof live load must be clearly indicated on the construction documents.
§ 110.10(c):	**Interconnection Pathways.** The construction documents must indicate: a location reserved for inverters and metering equipment and a pathway reserved for routing of conduit from the solar zone to the point of interconnection with the electrical service; and for single family residences and central water-heating systems, a pathway reserved for routing plumbing from the solar zone to the water-heating system.
§ 110.10(d):	**Documentation.** A copy of the construction documents or a comparable document indicating the information from § 110.10(b) through § 110.10(c) must be provided to the occupant.
§ 110.10(e)1:	**Main Electrical Service Panel.** The main electrical service panel must have a minimum busbar rating of 200 amps.
§ 110.10(e)2:	**Main Electrical Service Panel.** The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation. The reserved space must be permanently marked as "For Future Solar Electric".

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SIGNATURE Robert Chun DATE 6/5/23
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ADU22-0077 & ADU22-0078

City of Redwood City
Community Development & Transportation
Building Department
1017 Middlefield Road
Redwood City, CA 94063

Phone (650) 780-7350

2019 CALGREEN Residential Checklist

PURPOSE:

The residential provisions of the 2019 CalGreen Code outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties; establishes the means of conserving water used indoors, outdoors and in wastewater conveyance; outlines means of achieving material conservation and resource efficiency; and outlines means of reducing the quantity of air contaminants.

Project Name: 245 Roble Ave. duplex ADUs and 247 Roble Ave Garage ADU conv.
Project Address: 245 and 247 Roble Ave
Project Description: Add 2 detached ADUs and convert garage to ADU

INSTRUCTIONS:

1. The Owner or the Owner's agent shall employ a licensed professional* experienced with the 2016 California Green Building Standards Codes to verify and assure that all required work described herein is properly planned and implemented in the project.
2. The licensed professional*, in collaboration with the owner and the design professional shall initial **Column 2** of this checklist, sign and date **Section 1 - Design Verification** at the end of this checklist and have the checklist printed on the approved plans for the project.
3. Prior to final inspection by the Building Division, the licensed professional* shall complete **Column 3** and sign and date **Section 2 - Implementation Verification** at the end of this checklist and submit the completed form to the Building Inspector.

MANDATORY FEATURE OR MEASURE	COLUMN 2 Projection Requirements	COLUMN 3 Verification
CHAPTER 4 - RESIDENTIAL MANDATORY MEASURES		
General Requirements		
Project meets all of the requirements of Divisions 4.1 through 4.5.	JM	
DIVISION 4.1 - PLANNING AND DESIGN		
Site Development		
4.106.2 Storm water drainage and retention during construction. A plan is developed and implemented to manage storm water drainage during construction	JM	
4.106.3 Grading and paving. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings.	JM	
4.106.4 Provide capability for electric vehicle charging in one- and two - family dwellings and in townhouses with attached private garages and 3% of total parking spaces as specified for multifamily dwellings.	JM	
DIVISION 4.2 - ENERGY EFFICIENCY		
General Requirements		
4.201.1 Scope. Building meets or exceeds the requirements of the California Building Energy Efficiency Standards[3].	JM	

*Owner, contractor, designer, or licensed professional

4.304.1 After December 1,2015, new residential developments with an aggregate landscape area equal to or greater than 500 square feet shall comply with one of the following options: 1. A local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO). whichever is more stringent or 2. Projects with aggregate landscape areas less than 2,500 square feet may comply with the MWELO's Appendix D Prescriptive Compliance Option.	JM	
DIVISION 4.4 - MATERIAL CONSERVATION AND RESOURCE EFFICIENCY		
Enhanced Durability and Reduced Maintenance		
4.406.1 Rodent proofing. Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or similar method acceptable to the enforcing agency.	JM	
Construction Waste Reduction, Disposal and Recycling		
4.408.1 Construction waste management. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with one of the following:	JM	
1. Comply with a more stringent local construction and demolition waste management ordinance; or 2. A construction waste management plan, per Section 4.408.2; or 3. A waste management company, per Section 4.408.3; or 4. The waste stream reduction alternative, per Section 4.408.4.	JM	
Building Maintenance and Operation		
4.410.1 An operation and maintenance manual shall be provided to the building occupant or owner.	JM	
4.410.2 Recycling by occupant. Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive. See exception for rural jurisdictions.	JM	
DIVISION 4.5 - ENVIRONMENTAL QUALITY		
Fireplaces		
4.503.1 Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.	JM	
Pollutant Control		

DIVISION 4.3 - WATER EFFICIENCY AND CONSERVATION

Indoor Water Use

4.303.1 Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) installed in residential buildings shall comply with the prescriptive requirements of Sections 4303.1.1 through 4303.1.4.4.	JM	
4.303.1.1 Water closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the US EPA WaterSense Specification for Tank-type Toilets.	JM	
4.303.1.2 Urinals. The effective flush volume of urinals shall not exceed 0.125 gallons per flush. The effective flush volume of all other urinals shall not exceed 0.5 gallons per flush.	JM	
4.303.1.3 Showerheads.		
4.303.1.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than **1.8 gallons** per minute at 80 psi. Showerheads shall be certified to the performance criteria of the US EPA Water Sense Specification for Showerheads.	JM	
4.303.1.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed **1.8 gallons** per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time. **Note:** A hand-held shower shall be considered a showerhead.	JM	
4.303.1.4.1 Residential lavatory faucets. The maximum flow rate of residential lavatory faucets shall not exceed **1.2 gallons** per minute at 60 psi. The minimum flow rate of residential lavatory faucets shall not be less than 0.8 gallons per minute at 20 psi.	JM	
4.303.1.4.4 Kitchen faucets. The maximum flow rate of kitchen faucets shall not exceed 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi. **Note:** Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.	JM	
4.303.2 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings required in Section 4.303.1 shall be installed in accordance with the California Plumbing Code, and shall meet the applicable referenced standards.	JM	
Outdoor Water Use		

4.504.1 Duct openings and other related air distribution component openings shall be covered during construction.	JM	

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SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

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4.504.2.1 Adhesives, sealants and caulks shall be compliant with VOC and other toxic compound limits	JM	
4.504.2.2 Paints, stains and other coatings shall be compliant with VOC limits.	JM	
4.504.2.3 Aerosol paints and coatings shall be compliant with product weighted MIR limits for ROC and other toxic compounds.	JM	
4.504.2.4 Documentation shall be provided to verify that compliant VOC limit finish materials have been used	JM	
4.504.3 Carpet and carpet systems shall be compliant with VOC limits	JM	
4.504.4 80 percent of floor area receiving resilient flooring shall comply with specified VOC criteria	JM	
4.504.5 Particleboard, medium density fiberboard (MDF) and hardwood plywood used in interior finish systems shall comply with low formaldehyde emission standards.	JM	
Indoor Moisture Control		
4.505.2 Vapor retarder and capillary break is installed at slab-on-grade foundations	JM	
4.505.3 Moisture content of building materials used in wall and floor framing is checked before enclosure Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content.	JM	
Environmental Comfort		
4.507.2 Heating and air-conditioning system design. Duct systems are sized, designed, and equipment is selected using the following methods:	JM	
1. Establish heat loss and heat gain values according to ANSI/ACCA 2 Manual J-2011 or equivalent.	JM	
2. Size duct systems according to ANSI/ACCA 1 Manual D-2014 or equivalent.	JM	
3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S-2014 or equivalent.	JM	
Installer and Special Inspector Qualifications		
Qualifications		
702.1 Installer training. HVAC system installers are trained and certified in the proper installation of HVAC systems.	JM	
702.2 Special inspection. Special inspectors employed by the enforcing agency must be qualified and able to demonstrate competence in the discipline they are inspecting.	JM	
Verifications		
703.1 Documentation. Verification of compliance with this code may include construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which show substantial compliance.	JM	

CALGREEN SIGNATURE DECLARATIONS

Project Name: - 245 Roble Ave duplex ADUs and 247 Roble Ave garage ADU conv.

Project Address: - 245 and 247 Roble Ave

Project Description: - Add 2 detached ADUs and convert garage into an ADU

SECTION 1 - DESIGN VERIFICATION

Complete all lines of Section 1 - "Design Verification" and submit the completed checklist (Columns 1 and 2) with the plans and building permit application to the Building Department.

The owner and design professional responsible for compliance with CalGreen Standards have revised the plans and certify that the items checked above are hereby incorporated into the project plans and will be implemented into the project in accordance with the requirements set forth in the 2016 California Green Building Standards Code as adopted by the City.

Owner's Signature — Date: 1/30/22

Owner's Name (Please Print): Jeff Miller

Design Professional's Signature — Date: 1/30/23

Design Professional's Name (Please Print): Jeff Miller

Signature of License Professional* responsible for CalGreen compliance — Date: 1/30/23

Name of License Professional* responsible for CalGreen compliance (Please Print): Jeff Miller — Phone: 650 799-6880

Email Address for License Professional* responsible for CalGreen compliance: jeff@redwoodoaks.com

SECTION 2 - IMPLEMENTATION VERIFICATION

Complete, sign and submit the completed checklist, including column 3, together with all original signatures on Section 2 to the Building Division prior to Building Division final inspection.

I have inspected the work and have received sufficient documentation to verify and certify that the project identified above was constructed in accordance with this Green Building Checklist and in accordance with the requirements of the 2016 California Green Building Standards Code as adopted by the City.

Signature of License Professional* responsible for CalGreen compliance — Date

Name of License Professional* responsible for CalGreen compliance (Please Print) — Phone

Email Address for License Professional* responsible for CalGreen compliance

*Owner, contractor, designer, or licensed professional

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Construction Best Management Practices (BMPs)

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

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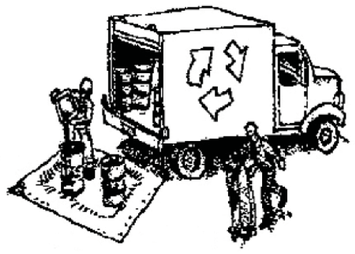
Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

Hazardous Materials

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.

Construction Entrances and Perimeter

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

Equipment Management & Spill Control

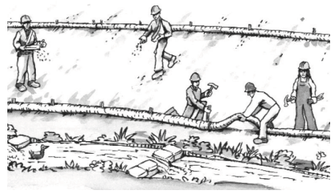
Maintenance and Parking

- ❑ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, steam cleaning equipment, etc.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Earthwork & Contaminated Soils



Erosion Control

- ❑ Schedule grading and excavation work for dry weather only.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.

Sediment Control

- ❑ Protect storm drain inlets, gutters, ditches, and drainage courses with appropriate BMPs, such as gravel bags, fiber rolls, berms, etc.
- ❑ Prevent sediment from migrating offsite by installing and maintaining sediment controls, such as fiber rolls, silt fences, or sediment basins.
- ❑ Keep excavated soil on the site where it will not collect into the street.
- ❑ Transfer excavated materials to dump trucks on the site, not in the street.
- ❑ Contaminated Soils
- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
  - ■ Unusual soil conditions, discoloration, or odor.
  - ■ Abandoned underground tanks.
  - ■ Abandoned wells
  - ■ Buried barrels, debris, or trash.

Paving/Asphalt Work

- ❑ Avoid paving and seal coating in wet weather, or when rain is forecast before fresh pavement will have time to cure.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

Sawcutting & Asphalt/Concrete Removal

- ❑ Completely cover or barricade storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, abosorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

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2019 yr.
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CAL GREEN
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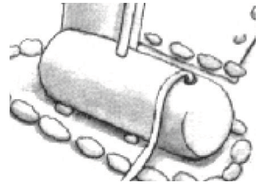
PLAN CHECK OF DOCUMENTS DOES NOT AUTHORIZE CONSTRUCTION TO PROCEED IN VIOLATION OF ANY FEDERAL, STATE OR LOCAL REGULATIONS.
SIGNATURE Robert Chun DATE 6/5/23
CBC [A]105.3.1 [A]107.3.1

Concrete, Grout & Mortar Application

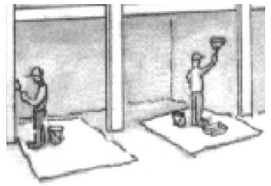
- ❑ Store concrete, grout and mortar under cover, on pallets and away from drainage areas. These materials must never reach a storm drain.
- ❑ Wash out concrete equipment/trucks offsite or in a contained area, so there is no discharge into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ Collect the wash water from washing exposed aggregate concrete and remove it for appropriate disposal offsite.

Dewatering



- ❑ Effectively manage all run-on, all runoff within the site, and all runoff that discharges from the site. Divert run-on water from offsite away from all disturbed areas or otherwise ensure compliance.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the Engineer to determine whether testing is required and how to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

Painting & Paint Removal



Painting cleanup

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or surface waters.
- ❑ For water-based paints, paint out brushes to the extent possible. Rinse to the sanitary sewer once you have gained permission from the local wastewater treatment authority. Never pour paint down a drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of residue and unusable thinner/solvents as hazardous waste.

Paint removal

- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead or tributyltin must be disposed of as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.

Landscape Materials

- ❑ Contain stockpiled landscaping materials by storing them under tarps when they are not actively being used.
- ❑ Stack erodible landscape material on pallets. Cover or store these materials when they are not actively being used or applied.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

Storm drain polluters may be liable for fines of up to $10,000 per day!

ADU22-0077 & ADU22-0078

JOB COPY

COMMUNITY DEVELOPMENT AND TRANSPORTATION DEPARTMENT
Engineering and Transportation Division
www.redwoodcity.org

1017 Middlefield Road
P.O. Box 391
Redwood City, CA 94064
Telephone: 650.780.7380
Facsimile: 650.780.7309

FIRE HYDRANT FLOW TEST

Date and Time:	July 25, 2022		
Project Site Address:	**245 Roble Avenue**		
(Subject Property)	**City of Redwood City**		
APN	**059-122-070**		
Customer Name:	Jeff Miller	Phone:	650-799-6880
RWC Engineering Contact:	Paolo Baltar	Phone:	650-780-7258
Public Works Contact:	Mike Villa	Phone:	650-780-7491
Fire Authority and Contact:	Gareth Harris	Phone:	650-780-7400
Test Conducted By:	Paolo Baltar		
Payment Amount:	Not Established	Account:	Not Established
Received by:	n/a		

READINGS		F.H. ADDRESS	PRESSURE ZONE	SHGL
Static Pressure (S) At [model node for] Test Hydrant or Blow-off Valve, nearest to the subject property	54 PSI	226 Roble Ave [J-MAIN-7870]	Main City	170'
Residual Pressure (R1) At [model node for] Test Hydrant or Blow-off Valve, nearest to the subject property	20 PSI	226 Roble Ave [J-MAIN-7870]		
Flow (Q1) At Flow Hydrant or model node	1200 GPM	226 Roble Ave [J-MAIN-7870]		
****Fire Hydrant Nozzle Coefficient (F)** *Field measurements by hydrant diffusers (e.g. Pollard or Hose Monster)*	1	*Flow Gauge*		
Calculated Flow (Q2) for R2= 20 PSI	**1200 GPM*****			

*Formula

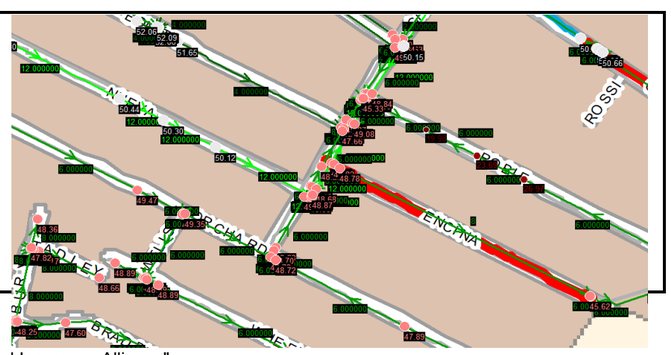
Q2=F*Q1((S-R2)/(S-R1))^0.54

Compiled by:

Paolo Baltar
Water Purveyor Representative (Paolo Baltar)

SKETCH

EPANET 2.2 Hydraulic Model
Roble_245_Master_Water_EX_MDD_2022-03-08.NET
Calibrated to 1,403/0.9 gpm at 49 Orchard 1/3/2019
Demand Multiplier = 1.74
Static pressure calculated from HGL



*From "Test of Water Supplies", p17-105.

**From: "Water Supply Testing - American Mutual Insurance Alliance"

***Regardless of the results of this test, Redwood City Water Utility Division assumes no liability for normal pressure fluctuations from time to time as a result of normal operation of the system.

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