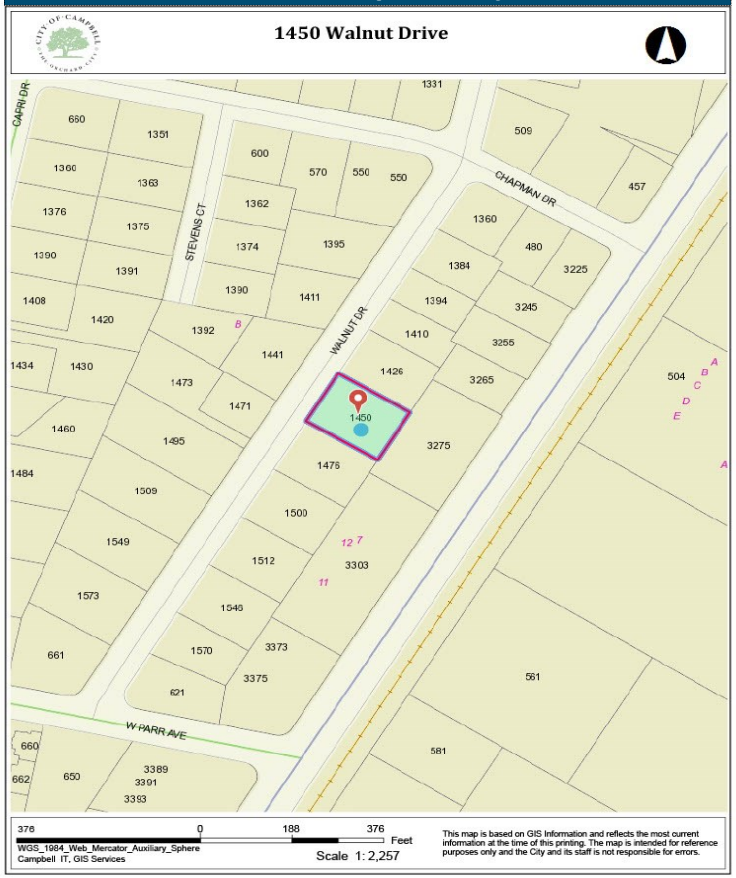
Location of Proposed Project



City of Campbell
70 North First Street
Campbell, CA 95008 –1423

Project Image



(N) FRONT ELEVATION

NOTE: ADDRESS LETTERS/NUMBERS SHALL BE MINIMUM 4 INCHES HIGH, WITH A MINIMUM STROKE WIDTH OF 1/2 INCH, AND SHALL CONTRAST WITH THEIR BACKGROUND. HEIGHT NO GREATER THAN 5 FEET, 6 INCHES (5' 6") ABOVE THE FINISHED FLOOR AND SHALL BE EITHER INTERNALLY OR EXTERNALLY ILLUMINATED IN ALL NEW CONSTRUCTION. CRC R319.

(N) PERSPECTIVES (E) & (N) ELEVATIONS

Courtesy Notice

Dear Campbell Resident, **October 20, 2022**

We are notifying you that the Planning Division of the Community Development Department of the City of Campbell has received an application for the following project:

Project Address: 1450 Walnut Drive

Zoning | Area Plan: R-1-10 | STANP

Neighborhood Association(s): STACC

File No.: PLN-2022-136

APN: 406-22-016

Applicant: Diego Valencia

Property Owner: Arun Reddy Kandoor

Application Type: Administrative Site and Architectural Review Permit

Project Planner: Larissa Lomen, Assistant Planner

Email Contact: larissal@campbellca.gov

Phone Contact: (408) 866-2144

Project Description:

To allow the addition of 361 square-feet of floor area and conversion of 464 square-feet of existing garage into an ADU within an existing single-family dwelling.

If you would like to find out more information regarding the proposed project, please view the project plans using the QR code below or contact the Project Planner. The City will send you another notice before the City makes a decision regarding approval of the project.

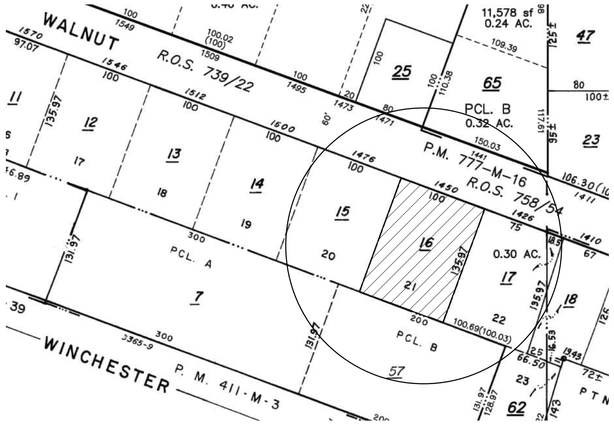
Before a decision is reached you will receive a formal notice providing another opportunity for public comment.

- City of Campbell -
Community Development Department
70 N. First Street, Campbell CA 95008
(408)866-2140 I planning@campbellca.gov

Note: Applications may change after initial application submittal. To view the project plans, please scan the QR code.

****Asistencia en Español disponible,**
Simplemente marque (408) 866-2140 y pida traduccion en Español

PARCEL ASSESSOR MAP



APPLICABLE CODES

THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES:

2019 CBC CALIFORNIA BUILDING CODE
2019 CRC CALIFORNIA RESIDENTIAL CODE
2019 CMC CALIFORNIA MECHANICAL CODE
2019 CEC CALIFORNIA ELECTRICAL CODE
2019 CPC CALIFORNIA PLUMBING CODE
2019 CFC CALIFORNIA FIRE CODE
2019 T24 CALIFORNIA ENERGY CODE
2019 CGBSC CALIFORNIA GREEN BUILDING STANDARDS CODE
CAMPBELL MUNICIPAL CODE
ALONG WITH CITY ORDINANCES AND ANY OTHER APPLICABLE LOCAL AND STATE LAWS AND REGULATIONS.

SHEET INDEX

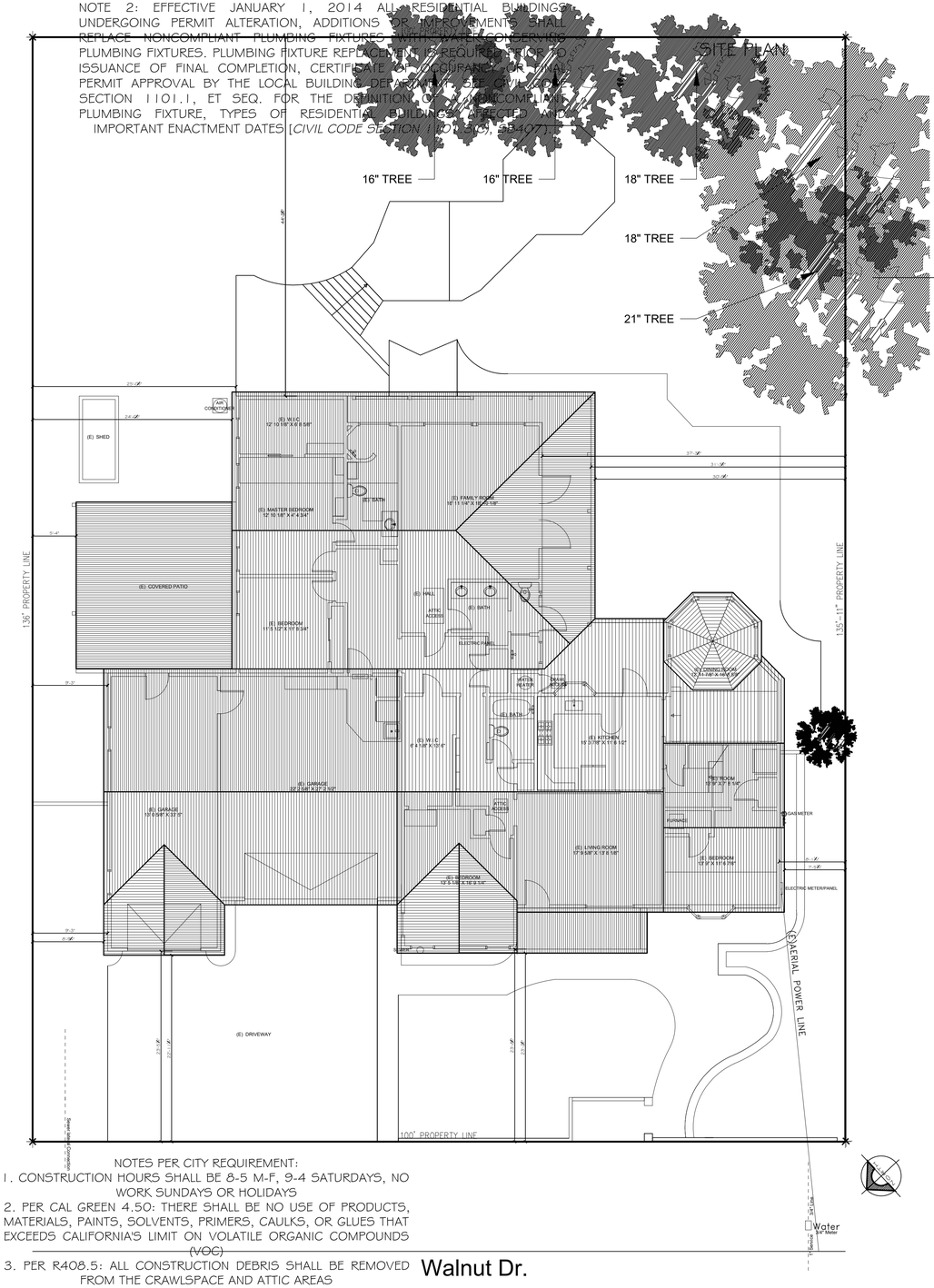
A 0.0 _	TILE PAGE / (E) SITE PLAN
A 0.1 _	(E) SITE PLAN & PICTURES
A 0.2_	(E) DIAGRAM
A 0.3_	(N) DIAGRAM
A 0.4_	(E) & (N) SITE PLAN
A 1.0_	(E) FLOOR PLAN
A 1.1_	(N) FLOOR PLAN
A 1.2_	(E) & (N) ELEVATIONS & PERSPECTIVES
A 1.3_	(E) & (N) ELEVATIONS & PERSPECTIVES
A 1.4_	(E) & (N) ELEVATIONS & PERSPECTIVES
A 1.5_	(N) ROOF LINE
A 1.6_	(E) & (N) SECTION
A 2.0_	ELECTRICAL FLOOR PLAN
SN1	STRUCTURAL NOTES AND SPECIFICATIONS
SN2	STRUCTURAL NOTES AND SPECIFICATIONS
SN3	STRUCTURAL NOTES AND SPECIFICATIONS
S1.1.0	FOUNDATION PLAN
S1.2.0	ROOD FRAMING PLAN
SD1	CONVENTIONAL FOUNDATION W/S.O.G.
SD2	GENERAL FRAMING DETAILS
SD3	ROOF FRAMING DETAILS
CGB-1	CALIFORNIA GREEN BUILDING - 1
CGB-2	CALIFORNIA GREEN BUILDING -2
BMP	BEST MANAGEMENT PRACTICES
TITLE 24	REPORT ON SHEET 1
TITLE 24	REPORT ON SHEET 2

NOTES PER CITY REQUIREMENT:
1. "VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION" IS REQUIRED FOR THIS PROJECT AS "REQUIRED SPECIAL FEATURE" OF THE ENERGY CALCULATIONS."
2. "HERS VERIFICATION REQUIRED FOR THE HVAC HEAT PUMPS, VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION, AND IAQ (INDOOR AIR QUALITY). PROVIDE EVIDENCE OF THIRD PARTY VERIFICATION (HERS) TO PROJECT BUILDING INSPECTOR, PRIOR TO FINAL INSPECTION".
3. "A HERS RATER MUST VERIFY THAT INSTALLED RANGE HOODS ARE LISTED IN THE HVI CERTIFIED HOME VENTILATING PRODUCTS DIRECTORY AND HAVE BEEN HVI-CERTIFIED AS MEETING ASHRAE 62.2 VENTILATION AND SOUND REQUIREMENTS. PROVIDE EVIDENCE OF HERS VERIFICATION TO TOWN BUILDING INSPECTOR, PRIOR TO FINAL INSPECTION".
4. THE BUILDER MUST PROVIDE THE HOMEOWNER WITH A LUMINAIRE SCHEDULE (AS REQUIRED IN TITLE 24 CALIFORNIA CODE OF REGULATIONS, PART 1, §10-103(B)) THAT INCLUDES A LIST OF LAMPS INSTALLED IN THE LUMINARIES.

NOTE 1: FIRE DEPARTMENT ACCESS ROADWAY MUST BE PROVIDED AND MAINTAINED SERVICEABLE PRIOR TO AND DURING CONSTRUCTION.

NOTE 2: EFFECTIVE JANUARY 1, 2014 ALL RESIDENTIAL BUILDINGS UNDERGOING PERMIT ALTERATION, ADDITIONS OR IMPROVEMENTS SHALL REPLACE NONCOMPLIANT PLUMBING FIXTURES WITH WATER CONSERVING PLUMBING FIXTURES. PLUMBING FIXTURE REPLACEMENT IS REQUIRED PRIOR TO ISSUANCE OF FINAL COMPLETION, CERTIFICATE OF OCCUPANCY OR FINAL PERMIT APPROVAL BY THE LOCAL BUILDING DEPARTMENT. SEE CIVIL CODE SECTION 1101.1, ET SEQ. FOR THE DEFINITION OF NONCOMPLIANT PLUMBING FIXTURE, TYPES OF RESIDENTIAL BUILDINGS AFFECTED AND IMPORTANT ENACTMENT DATES. (*CIVIL CODE SECTION 1101.3*) EMOTT

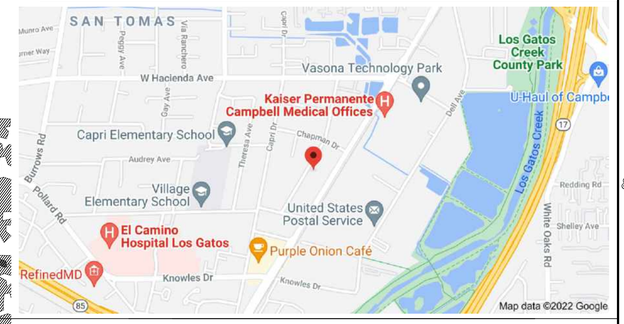
SITE PLAN



NOTES PER CITY REQUIREMENT:
1. CONSTRUCTION HOURS SHALL BE 8-5 M-F, 9-4 SATURDAYS, NO WORK SUNDAYS OR HOLIDAYS
2. PER CAL GREEN 4.50: THERE SHALL BE NO USE OF PRODUCTS, MATERIALS, PAINTS, SOLVENTS, PRIMERS, CAULKS, OR GLUES THAT EXCEEDS CALIFORNIA'S LIMIT ON VOLATILE ORGANIC COMPOUNDS (VOC)
3. PER R408.5: ALL CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE CRAWLSPACE AND ATTIC AREAS
4. PER CFC 505: ADDRESS NUMBERS SHALL BE A MINIMUM OF 4" HIGH, ½" WIDE, PLACED VISIBLE FROM THE STREET
5. PER R401.3: FINISH GRADE SHALL BE 5% AWAY FROM FOUNDATION AND HAVE SUFFICIENT SLOPE TO RETAIN STORM WATER ON-SITE AND NOT TO FLOW TO THE NEIGHBOR'S PROPERTY OR TO THE STREET.

THIS PROPERTY IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA

VICINITY MAP



SITE DATA AND ZONING

PROJECT LOCATION	: 1450 WALNUT DR.
JURISDICTION	: CITY OF CAMPBELL COUNTY OF SANTA CLARA
A.P.N.	: 406-22-016
LOT SIZE	: 13,503 S.F. / 0.31 ACRES
PARCEL #	: 40622016
TYPE	: V-B
FIRE SPRINKLES	: NO
BUILT	: 1948
EXTERIOR WALL	: HORIZONTAL WOOD SIDING
(E) ROOF MATERIAL	: COMPOSITION SHINGLE
ZONING	: R-1
OCCUPANCY GROUP	: R-3/U
(E) BATHROOMS	: 4
(E) BEDROOMS	: 3
(E) LOT COVERAGE	: % 32

SQUARE FOOTAGE

DESCRIPTION	EXISTING	ADD/DEMO PROPOSED	TOTALS
LOT As Assessor's Parcel Map			13,503 S.F.
Single Story House	2,693 S.F.		2,693 S.F.
Attached Garage	1,090 S.F.	(464 S.F.)	626 S.F.
Covered Porch	81 S.F.		81 S.F.
Covered Patio	414 S.F.	(414 S.F.)	
A.D.U.		825 S.F.	825 S.F.
TOTALS	4,278 S.F.	(53 S.F.)	4,237 S.F.

(E) LOT COVERAGE : 32% (4,278 S.F.)
(N) LOT COVERAGE : 31% (4,225 S.F.)

PROJECT INFORMATION:

OWNER : ARUN REDDY KANDOOR
EMAIL : karunreddy30@gmail.com
ADDRESS : 1450 Walnut Dr, CAMPBELL, CA 95008

DRAFTING AND DESIGN:
DIEGO VALENCIA
2311 Ivy Hill Way San Ramon, Ca, 94582
valenciaconstruservices@gmail.com
408.594.8452

STRUCTURAL ENGINEER:
WILLIAM M WETTIG
6280 West Las Positas, Pleasanton, CA, 94588 Suite 201
billw@ids.eng.net
925.413.33378

SCOPE OF WORK

1o. DEMOLITION OF 414 S.F. (E) PATIO COVERED ON LEFT SIDE OF THE (E) HOUSE.

2o. (E) 464 GARAGE CONVERSION INTO LIVING SPACE.

3o. (N) 825 S.F. A.D.U: TWO BEDROOM, ONE BATHROOM, SOCIAL AREA, LAUNDRY ROOM. PER PLAN.

*MECHANICAL, PLUMBING AND ELECTRICAL PER CODES

A

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CAMPBELL, CA 95008

REVISIONS:
1 DEVELOPMENT REVIEW 06/26/2022
2 DEVELOPMENT REVIEW 09/02/2022

SHEET	TITLE PAGE / SITE PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	____

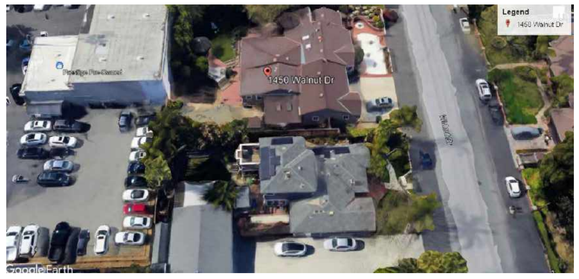
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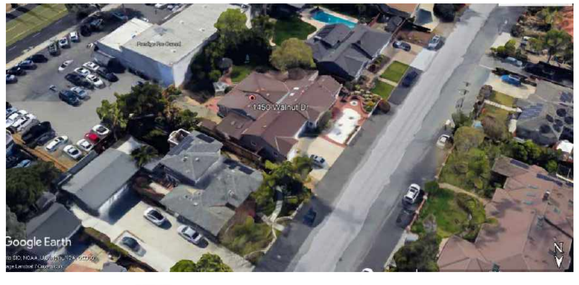
PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

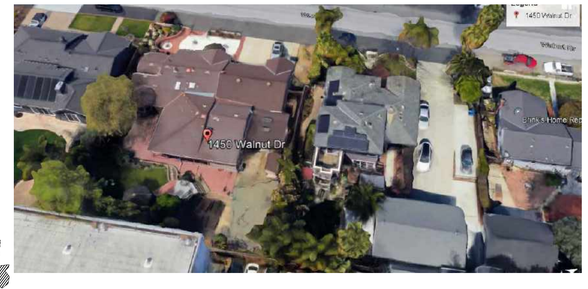




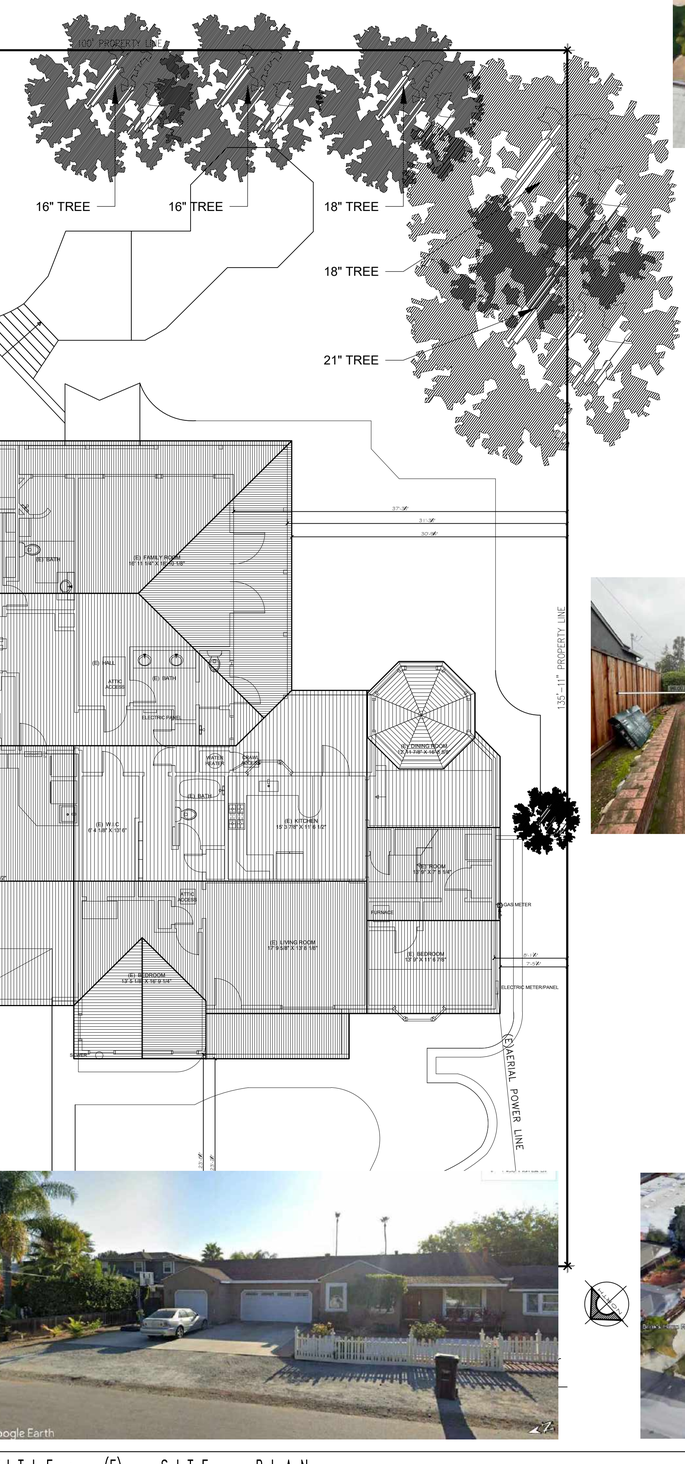


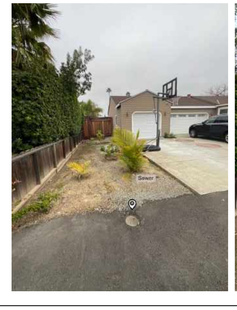




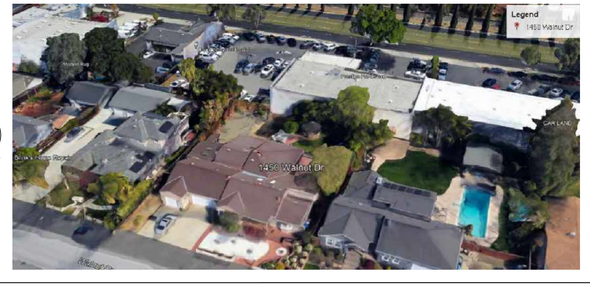












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CAMPBELL, CA 95008

REVISIONS:

1	DEVELOPMENT REVIEW	06/26/2022
2	DEVELOPMENT REVIEW	09/02/2022

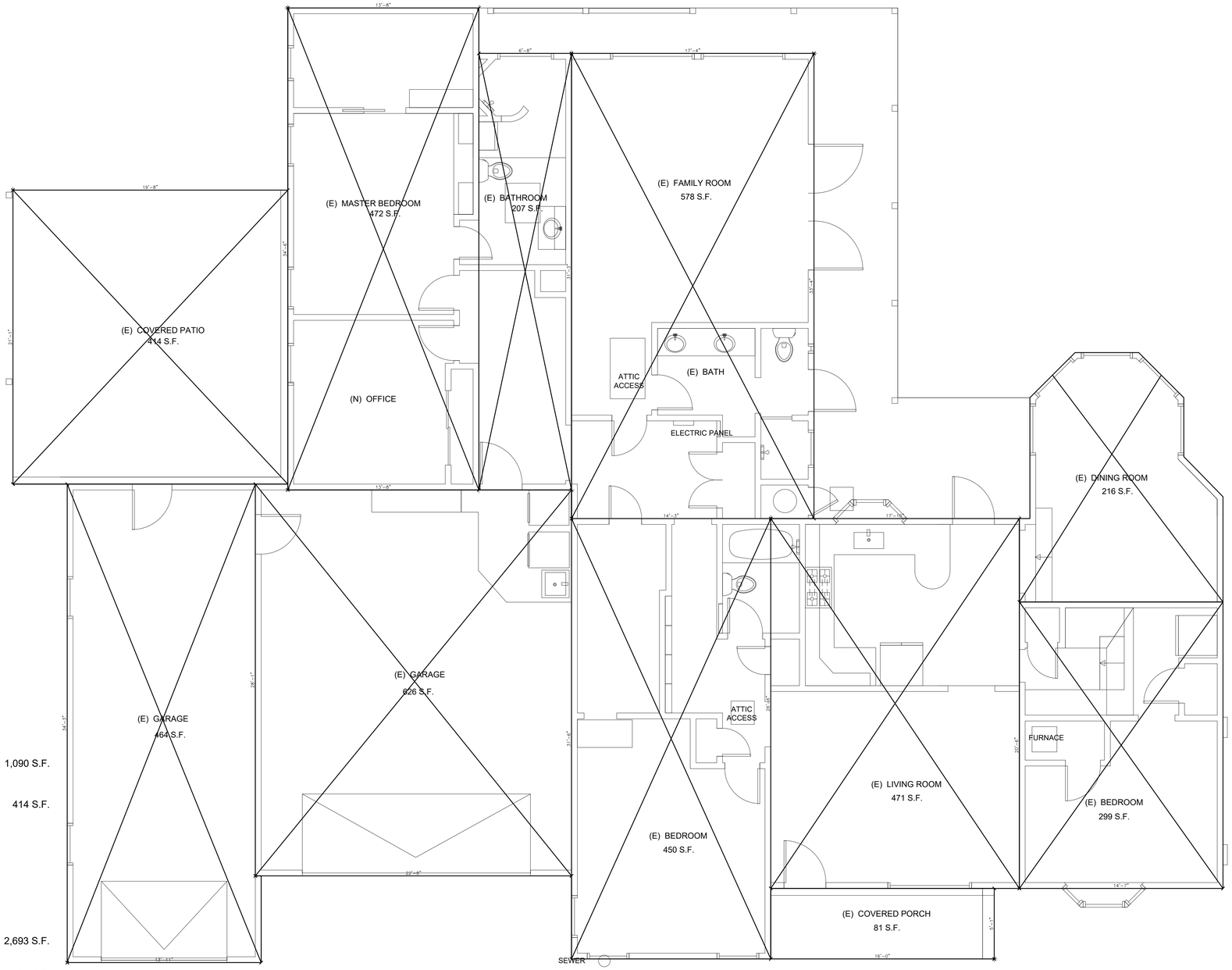
SHEET	(E) SITE PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	____

A_0.1

TITLE : (E) SITE PLAN

3/16" | 1

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.



(E) GARAGE	626 S.F.	
(E) GARAGE	464 S.F.	
(E) GARAGE		1,090 S.F.
(E) COVERED PATIO	414 S.F.	
(E) COVERED PATIO		414 S.F.
(E) MASTER BEDROOM	472 S.F.	
(E) BATHROOM	207 S.F.	
(E) FAMILY ROOM	578 S.F.	
(E) DINING ROOM	216 S.F.	
(E) BEDROOM	450 S.F.	
(E) LIVING ROOM	471 S.F.	
(E) BEDROOM	299 S.F.	
(E) LIVING SPACE		2,693 S.F.
(E) COVERED PORCH	81 S.F.	
(E) COVERED PORCH		81 S.F.
(E) TOTAL		4,278 S.F.

TITLE : (E) DIAGRAM

3/16"

1

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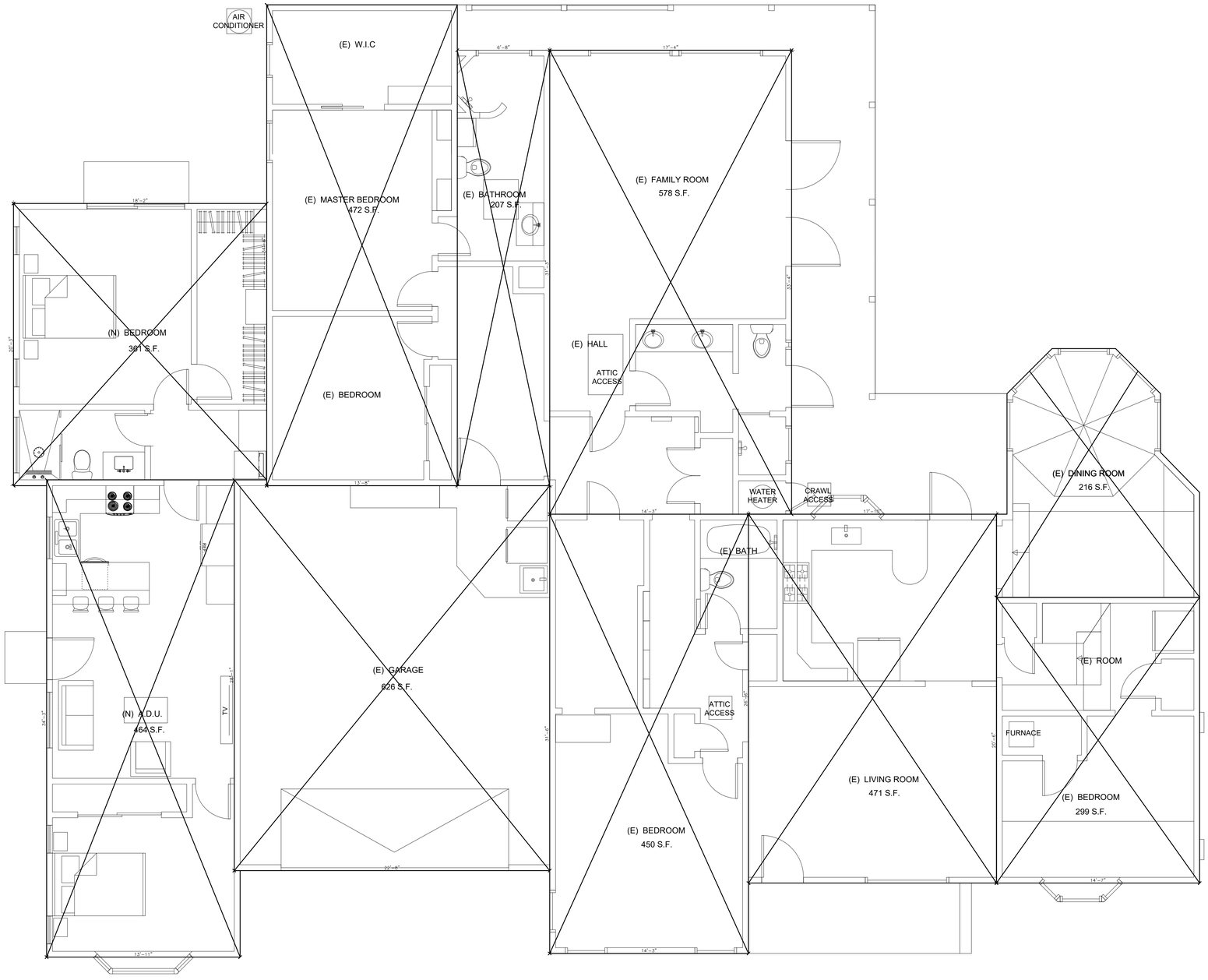
REVISIONS:

1 DEVELOPMENT REVIEW	06/26/2022
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SHEET	(E) DIAGRAM
SCALE	
DATE	09-20-2022
PRJ.No.	___

A_0.2

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.



(E) GARAGE	626 S.F.	
(E) GARAGE		626 S.F.
(N) ADU	464 S.F.	
(N) ADU BEDROOM	361 S.F.	
(N) A.D.U.		825 S.F.
(E) MASTER BEDROOM	472 S.F.	
(E) BATHROOM	207 S.F.	
(E) FAMILY ROOM	578 S.F.	
(E) DINING ROOM	216 S.F.	
(E) BEDROOM	450 S.F.	
(E) LIVING ROOM	471 S.F.	
(E) BEDROOM	299 S.F.	
(E) LIVING SPACE		2,693 S.F.
(E) COVERED PORCH	81 S.F.	
(E) COVERED PORCH		81 S.F.
(E) TOTAL		4,225 S.F.

TITLE : (N) DIAGRAM 3/16" 1

A

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CAMPBELL, CA 95008

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SHEET	(N) DIAGRAM
SCALE	
DATE	09-20-2022
PRJ.No.	___

A_0.3

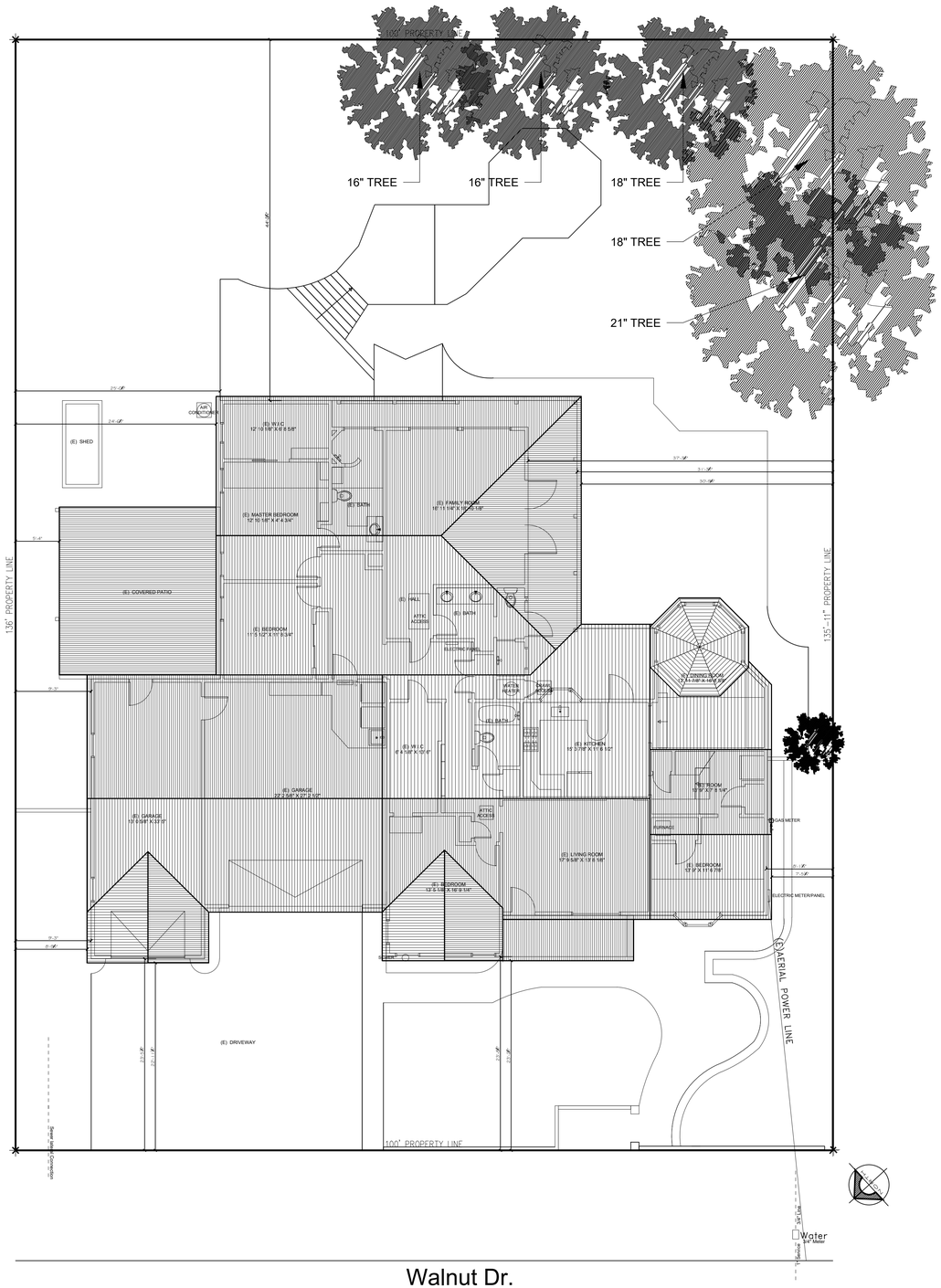
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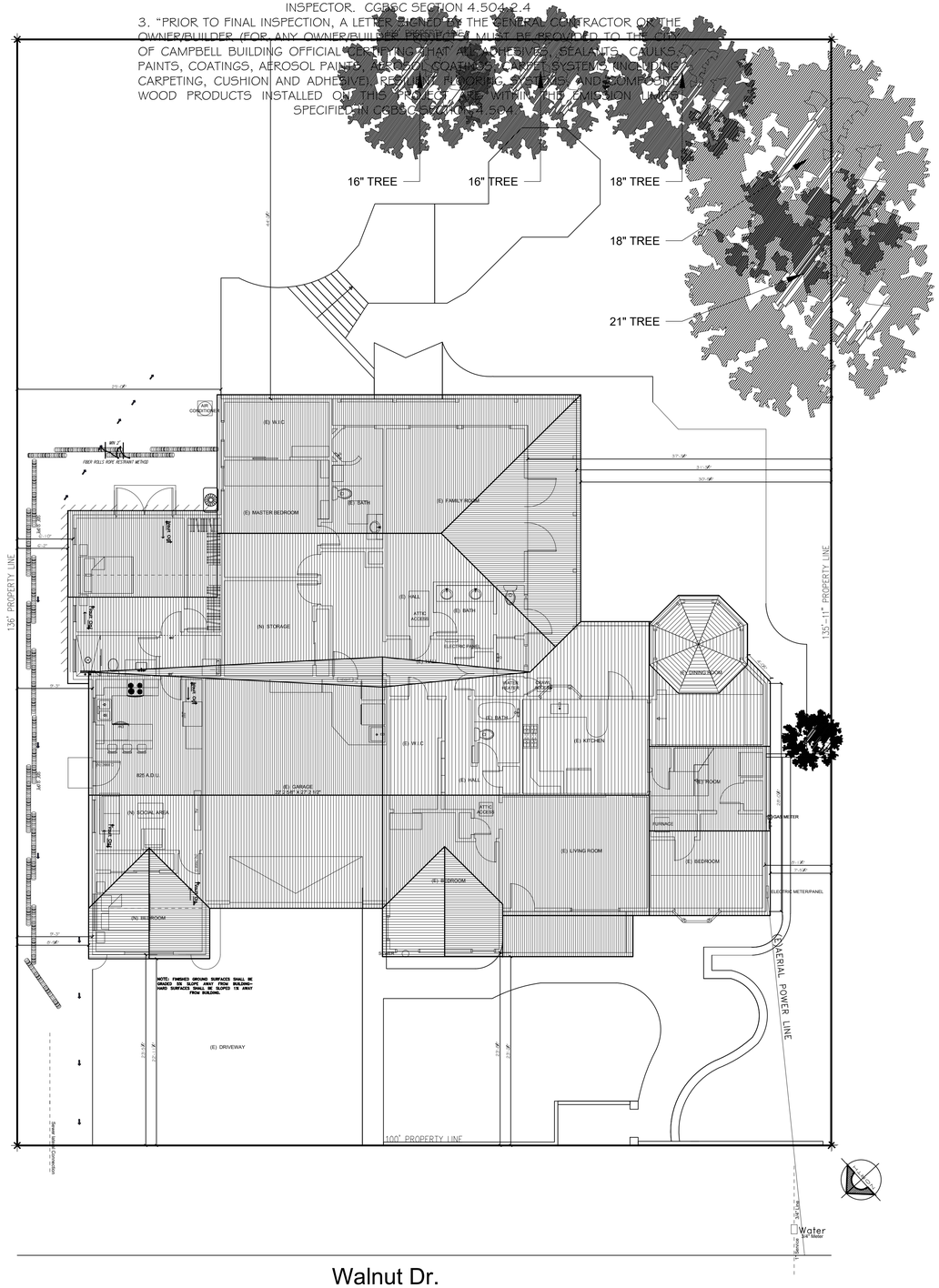
NOTES PER CITY REQUIREMENT:

1. A MINIMUM OF 65% OF THE NONHAZARDOUS CONSTRUCTION AND DEMOLITION DEBRIS WILL BE RECYCLED AND/OR SALVAGED FOR REUSE IN ACCORDANCE WITH SECTIONS 4,408.2, 4.408.3, OR 4.408.4, OR SHOW COMPLIANCE TO LOCAL ORDINANCE (WHICHEVER IS STRICTER). CGBSC SECTION 4.408.1

2. ALL ADHESIVES, SEALANTS, CAULKS, PAINTS, COATINGS, AND AEROSOL PAINT CONTAINERS MUST REMAIN ON THE SITE FOR FIELD VERIFICATION BY THE BUILDING INSPECTOR. CGBSC SECTION 4.504.2.4

3. "PRIOR TO FINAL INSPECTION, A LETTER SIGNED BY THE GENERAL CONTRACTOR OR THE OWNER/BUILDER (FOR ANY OWNER/BUILDER PROJECTS) MUST BE PROVIDED TO THE CITY OF CAMPBELL BUILDING OFFICIAL CERTIFYING THAT ALL ADHESIVES, SEALANTS, CAULKS, PAINTS, COATINGS, AEROSOL PAINTS, AEROSOL COATINGS, FLOOR SYSTEMS (INCLUDING CARPETING, CUSHION AND ADHESIVE), RESILIENT FLOORING SYSTEMS, AND COMPOSITE WOOD PRODUCTS INSTALLED ON THIS PROJECT ARE WITHIN THE EMISSION LIMITS SPECIFIED IN CGBSC SECTION 4.504.5"





TITLE : (E) & (N) SITE PLAN

3/16" | 1

A

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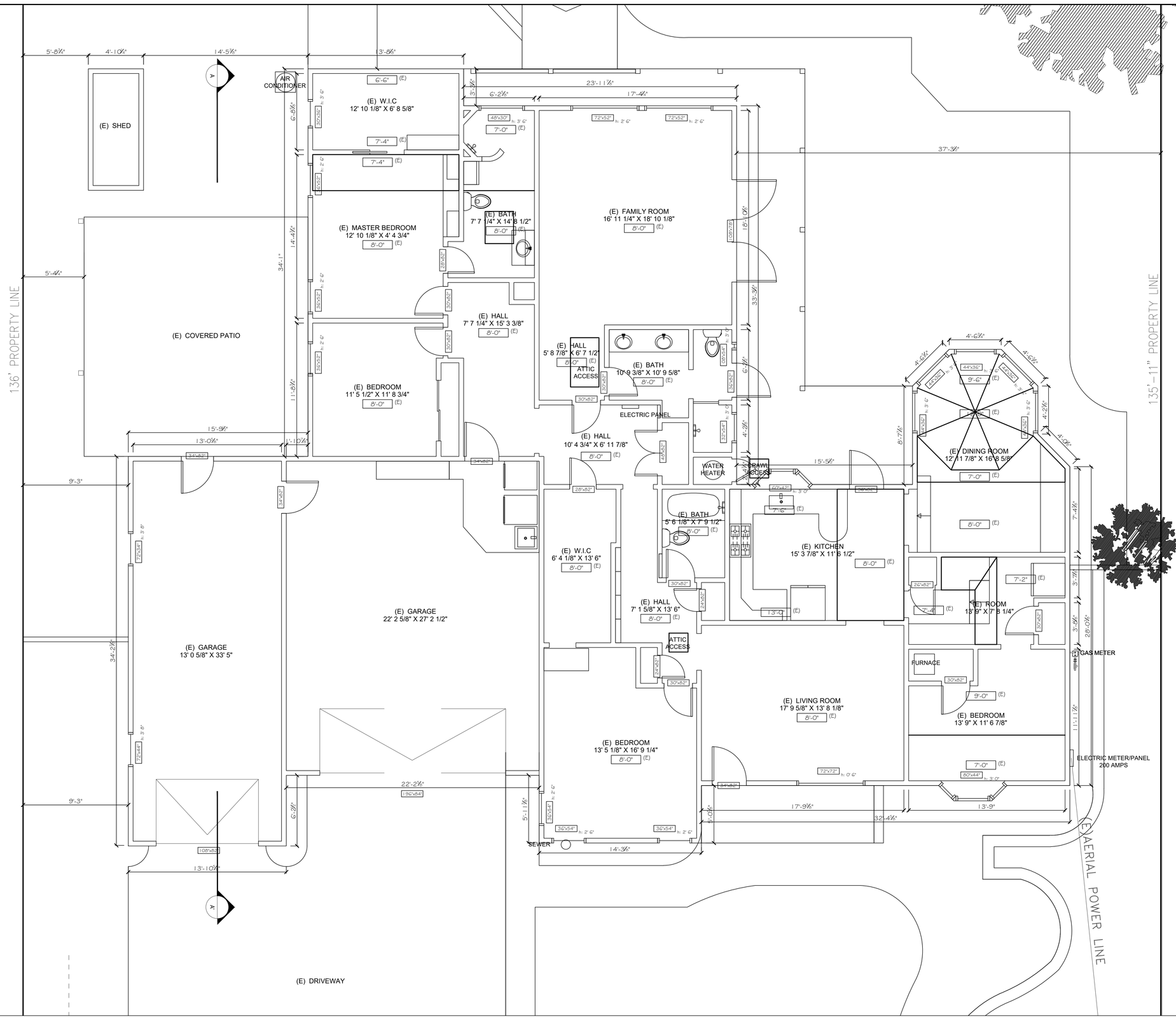
1 DEVELOPMENT REVIEW 06/26/2022

2 DEVELOPMENT REVIEW 09/02/2022

SHEET	(E) & (N) SITE PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	____

A_0.4

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.



(E) FLOOR PLAN

1/4" | 1

A

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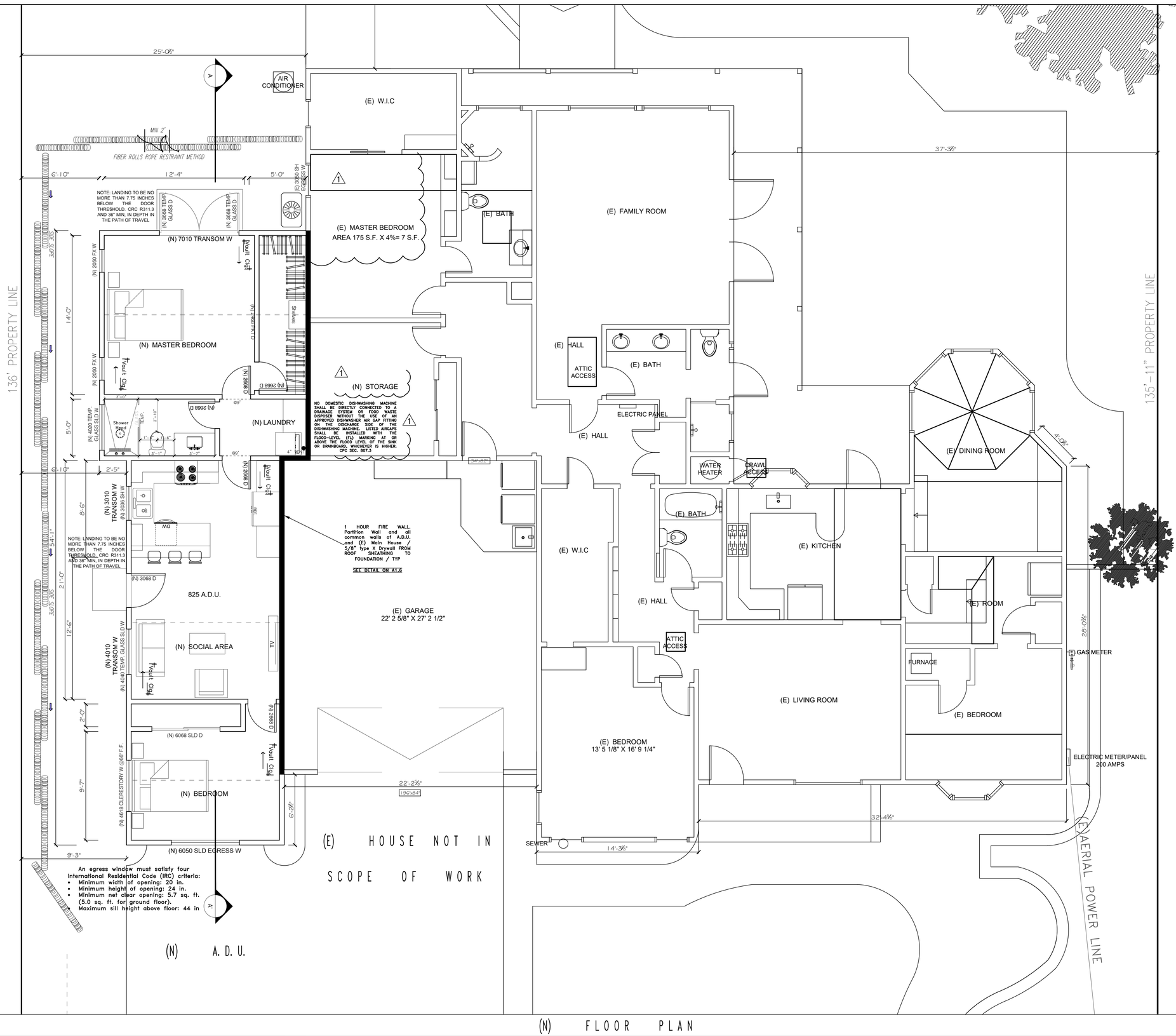
1 DEVELOPMENT REVIEW 06/26/2022

2 DEVELOPMENT REVIEW 09/02/2022

SHEET	(E) FLOOR PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	——

A_1.0

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.



(N) FLOOR PLAN

1/4" | 1

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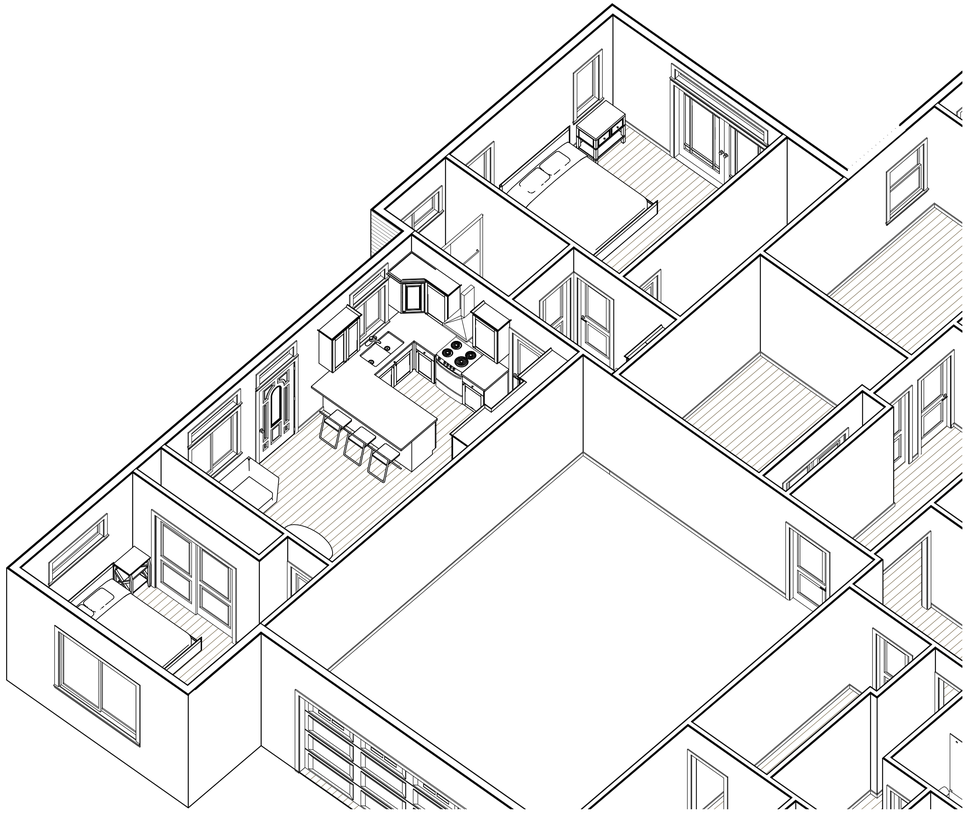
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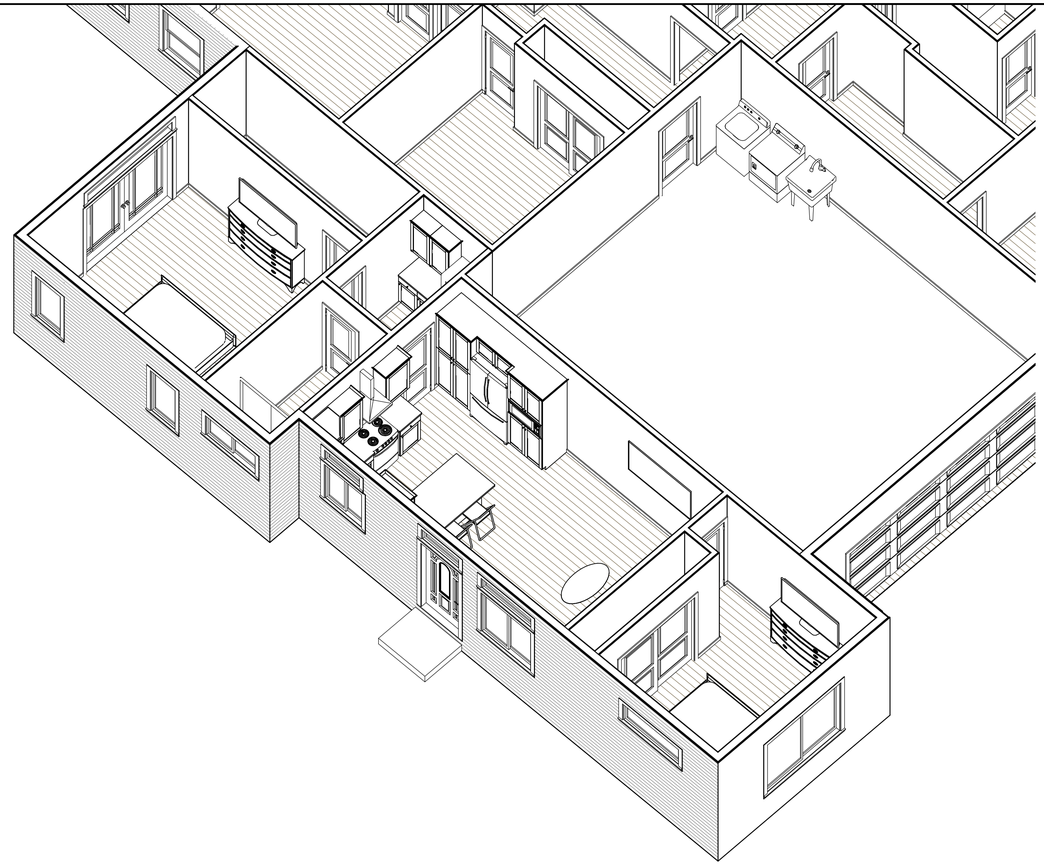
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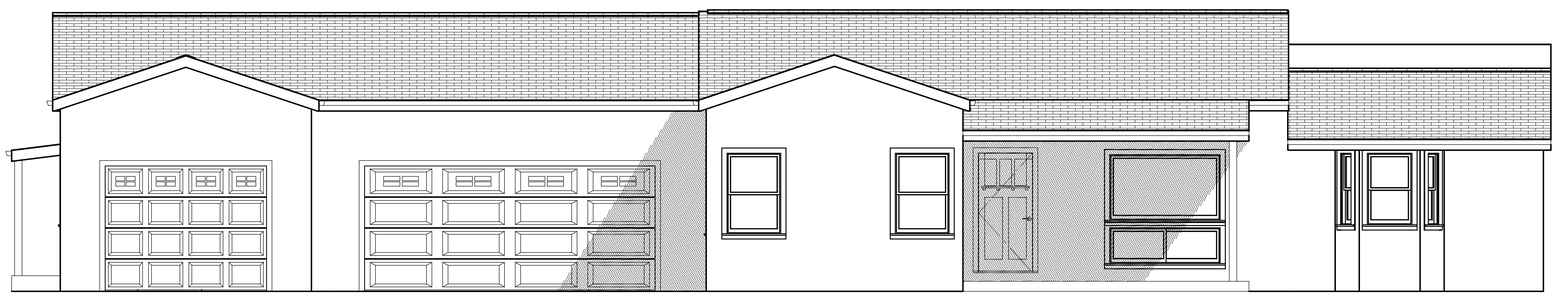
SHEET	(N) FLOOR PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	——

A_1.1

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.







(E) FRONT ELEVATION



(N) FRONT ELEVATION

NOTE: ADDRESS LETTERS/NUMBERS SHALL BE MINIMUM 4 INCHES HIGH, WITH A MINIMUM STROKE WIDTH OF 1/2 INCH, AND SHALL CONTRAST WITH THEIR BACKGROUND. HEIGHT NO GREATER THAN 5 FEET, 6 INCHES (5' 6") ABOVE THE FINISHED FLOOR AND SHALL BE EITHER INTERNALLY OR EXTERNALLY ILLUMINATED IN ALL NEW CONSTRUCTION. CRC R319.

(N) PERSPECTIVES (E) & (N) ELEVATIONS 1/4" 1

A

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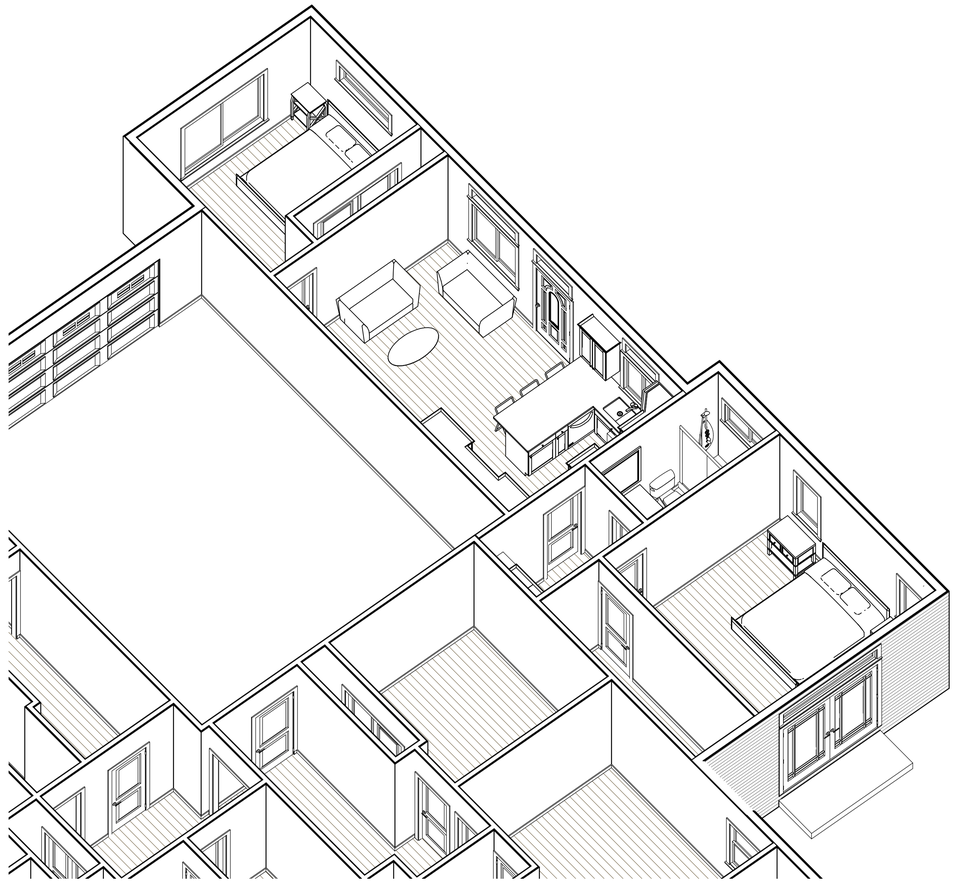
1 DEVELOPMENT REVIEW 06/26/2022

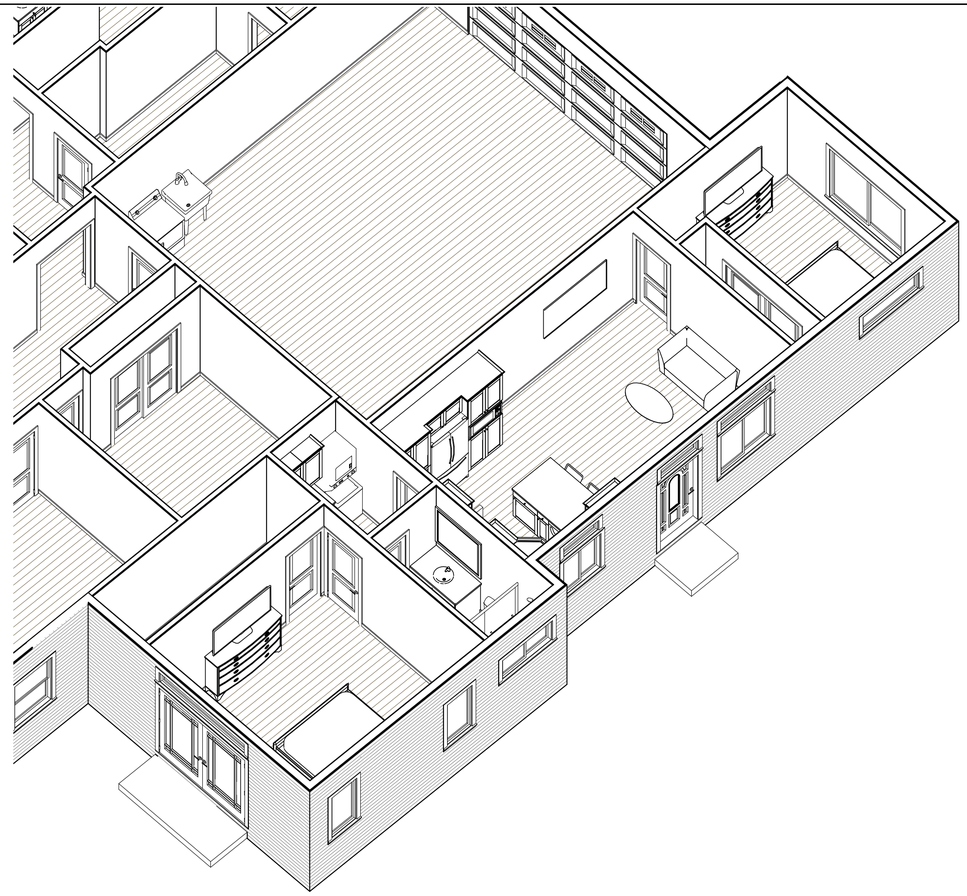
2 DEVELOPMENT REVIEW 09/02/2022

SHEET	(N) ROOF LINE
SCALE	
DATE	09-20-2022
PRJ.No.	——

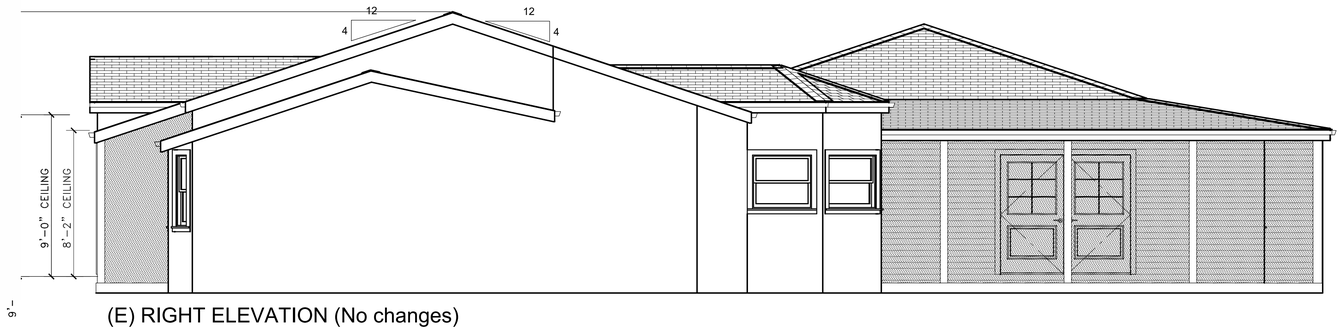
A_1.2

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.









(E) RIGHT ELEVATION (No changes)

A

CONSTRUCTION & DOCUMENTATION SERVICES

Diego Valencia
DESIGNER

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408.594.8452
valenciaconstruservices
@gmail.com

A.D.U.

1450 WALNUT DR.,
CAMPBELL, CA 95008

REVISIONS:

1	DEVELOPMENT REVIEW	06/26/2022
2	DEVELOPMENT REVIEW	09/02/2022

SHEET	(E) & (N) ELEVATIONS
SCALE	
DATE	09-20-2022
PRJ.No.	——

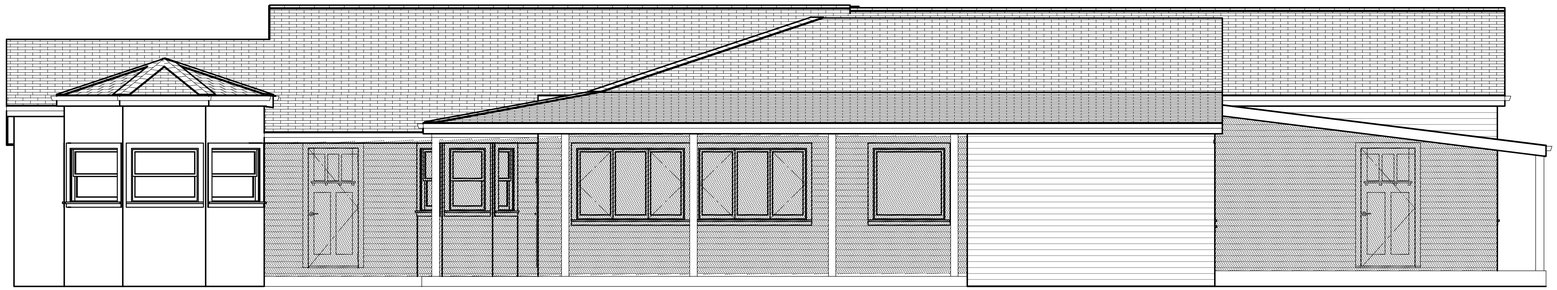
A_1.3

(N) PERSPECTIVES

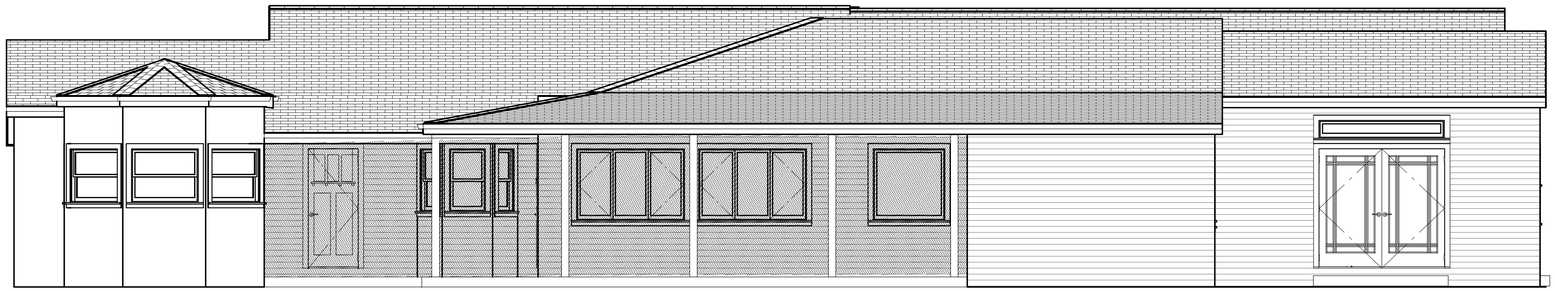
(E) & (N) ELEVATIONS

1/4"

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

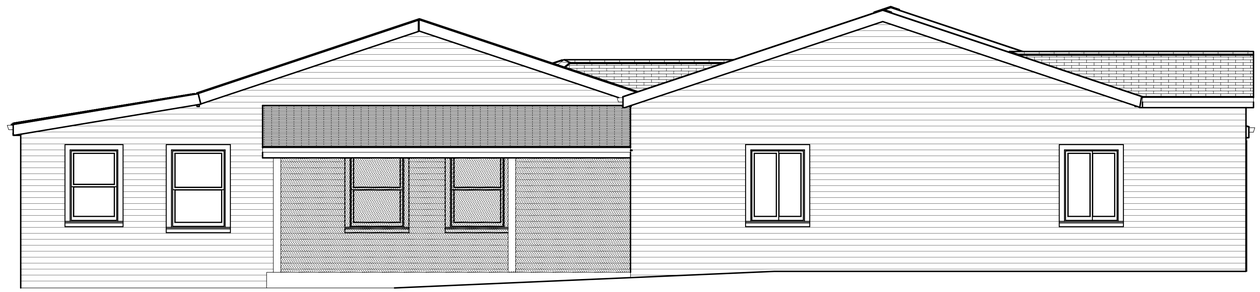


(E) BACK ELEVATION

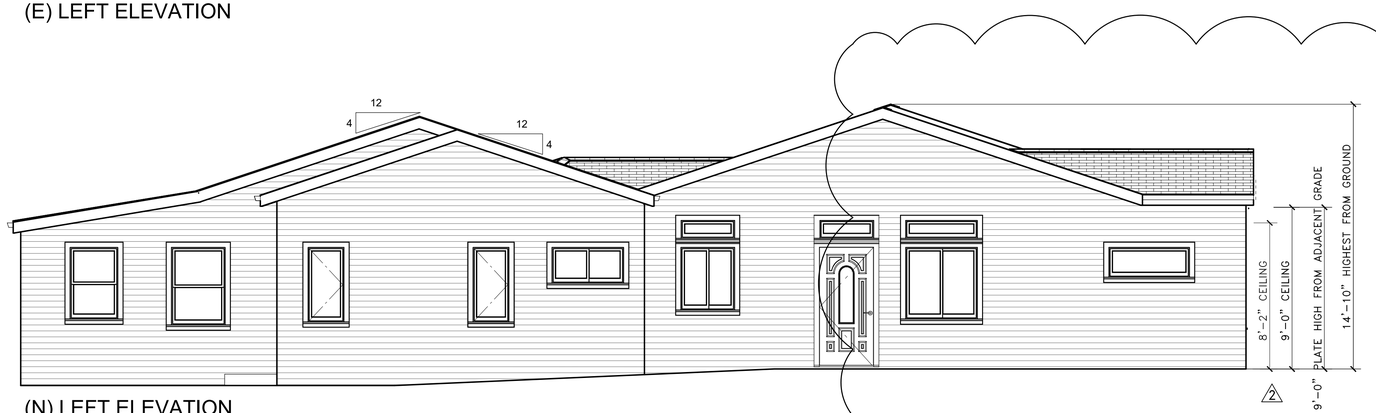


(N) BACK ELEVATION





(E) LEFT ELEVATION



(N) LEFT ELEVATION

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REVISIONS:

1	DEVELOPMENT REVIEW	06/26/2022
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SHEET	(E) & (N) ELEVATIONS
SCALE	
DATE	09-20-2022
PRJ.No.	___

A_1.4

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

25'-0½"

6'-10"

9'-3"

9'-3"

136' PROPERTY LINE

135'-11" PROPERTY LINE

37'-3½"

4'-0½"

AIR CONDITIONER

(E) W.I.C

(E) MASTER BEDROOM

(E) BATH

(E) FAMILY ROOM

(E) HALL

ATTIC ACCESS

(E) BATH

(N) STORAGE

ELECTRIC PANEL

(E) HALL

(E) DINING ROOM

WATER HEATER

CRAWL ACCESS

(E) BATH

(E) KITCHEN

(E) W.I.C

(E) HALL

(E) ROOM

825 A.D.U.

(E) GARAGE
22' 2 5/8" X 27' 2 1/2"

(N) SOCIAL AREA

ATTIC ACCESS

FURNACE

GAS METER

(E) LIVING ROOM

(E) BEDROOM

(E) BEDROOM

ELECTRIC METER/PANEL

(N) BEDROOM

SEWER

(E) DRIVEWAY

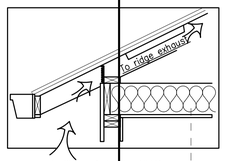
(E) AERIAL POWER LINE

4'-0"

28'-0"

DOWNSPOUT TO ROUTE WATER 2%

ROOF DOWNSPOUTS SHALL BE DISCONNECTED AND RUNOFF SHALL BE DIRECTED TO AREA DRAINS. DOWNSPOUTS MAY DRAIN TO SPLASH BLOCKS OR COBBLESTONES THAT DIRECT WATER AWAY FROM THE BUILDING; THEY CANNOT BE DIRECTLY CONNECTED TO THE STORM DRAIN SYSTEM. CUTTHROUGH DRAINS ARE NOT ALLOWED. GRADE SHALL DRAIN AWAY FROM FOUNDATION WALLS A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET (5%) OR 2 1/2 INCHES IN 10 (2%) FOR IMPERVIOUS SURFACES. AREA DRAINS OR SWALES SHALL BE DETAILED WHERE LOT LINES, WALLS, SLOPES OR OTHER PHYSICAL DON'T ALLOW FOR THE REQUIRED GRADE DROP IN THE FIRST 10 FEET FROM NEW CONSTRUCTION.



* 72 sq. in.Intake NFVA
(On soffits / undereave)
4"X16" VentSure Aluminum

ROOF VENTILATION

Ventilation requirements are one square foot of net free vent area per 150 square feet of attic area to to be vented (1/150 rule).
NEW ROOF AREA : 148 S.F.
NEW ROOF AREA : 148 X 144/150 = 144 SQ. IN.
An ideally balanced system (50% intake, 50% exhaust).

* 72 sq. in. Exhaust NFVA (Near ridge of the roof)
VentSure 4-Foot Strip Heat & Moisture Ridge Vent with Weather PROtector Moisture Barrier 4 LINEAL FEET REQUIRED. ORDER QTY: 1 PIECES.

* 72 sq. in. Intake NFVA (On soffits / undereave)
6"X16" VentSure Aluminum Undereave Intake Vent VentSure InFlow Intake Vent 2-5 PIECES REQUIRED. ORDER QTY: 5 4X16" PIECES

(N) ROOF LINE

1/4" | 1

A

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REVISIONS:

1 DEVELOPMENT REVIEW	06/26/2022
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SCALE	
DATE	09-20-2022
PRJ.No.	——

A_1.5

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

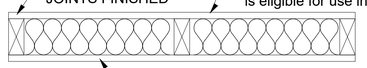
KITCHEN REMODEL PERMIT REQUIREMENTS

FOLLOWING IS A LISTING OF THE GENERAL REQUIREMENTS BASED ON THE 2019 CALIFORNIA BUILDING CODE, 2019 CALIFORNIA RESIDENTIAL CODE, 2019 CALIFORNIA ELECTRICAL CODE, 2019 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN), AND 2019 CALIFORNIA ENERGY EFFICIENCY STANDARDS. CONTACT THE BUILDING SAFETY DIVISION FOR ANY QUESTIONS OR ADDITIONAL INFORMATION, INCLUDING REQUIREMENTS FOR NEW/ALTERED PLUMBING OR MECHANICAL (EXHAUST HOOD).

GENERAL ELECTRICAL REQUIREMENTS

1. RECEPTACLES SHALL MEET ALL OF THE FOLLOWING REQUIREMENTS: (CEC 210.8, 210.12, 210.23, 210.52, 406.12)
2. GFCI PROTECTION SHALL BE PROVIDED FOR ALL COUNTERTOP RECEPTACLES, RECEPTACLES WITHIN 6 FEET OF A SINK (INCLUDING BELOW COUNTER AND BEHIND AN APPLIANCE), AND FOR RECEPTACLES SUPPLYING DISHWASHERS. THE RESET BUTTON FOR GFCI RECEPTACLES SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION (I.E. NOT BEHIND AN APPLIANCE).
3. ALL OUTLETS AND DEVICES (I.E. RECEPTACLES, LIGHTING, HOODS, ETC.) IN THE KITCHEN SHALL BE AFCI PROTECTED AND TAMPER-RESISTANT (TR).
4. RECEPTACLES SHALL BE PROVIDED AT ALL COUNTERTOP AREAS WITH A MINIMUM DIMENSION OF 12 INCHES.
5. COUNTERTOP RECEPTACLES SHALL BE LOCATED SO THAT NO POINT ALONG THE WALL IS MORE THAN 24 INCHES FROM A RECEPTACLE.
6. COUNTERTOP RECEPTACLES SHALL BE LOCATED NO MORE THAN 20 INCHES ABOVE THE COUNTERTOP.
7. ISLANDS/PENINSULAS SHALL HAVE AT LEAST ONE RECEPTACLE MOUNTED NOT MORE THAN 12 INCHES BELOW THE COUNTERTOP AND WHERE THE COUNTERTOP DOES NOT EXTEND MORE THAN 6 INCHES BEYOND ITS BASE.
8. ELECTRIC STOVES AND OVENS SHALL BE SUPPLIED WITH A 40- OR 50-AMP BRANCH CIRCUIT.
9. KITCHEN RECEPTACLES SHALL BE SUPPLIED BY CIRCUITS MEETING ALL OF THE FOLLOWING REQUIREMENTS: (CEC 210.11, 210.52, 422.16)
10. COUNTERTOP RECEPTACLES SHALL BE SUPPLIED BY A MINIMUM OF TWO 20-AMP BRANCH CIRCUITS.
11. A DEDICATED CIRCUIT IS REQUIRED FOR CORD AND PLUG CONNECTED RANGE EXHAUST HOODS. SEPARATE CIRCUITS MAY BE REQUIRED FOR THE GARBAGE DISPOSAL, DISHWASHER, AND BUILT-IN MICROWAVE BASED ON THE MANUFACTURER'S REQUIREMENTS AND THE MOTOR RATING.
12. ANY NEW RECEPTACLES ADDED IN THE DINING AREA, BREAKFAST ROOM, PANTRY, OR SIMILAR AREA SHALL BE SUPPLIED BY A 20-AMP CIRCUIT, THE COUNTERTOP CIRCUITS MAY BE USED TO SUPPLY THESE AREAS.
13. THE EXISTING ELECTRICAL PANEL MAY NEED TO BE UPGRADED, OR A SUB-PANEL ADDED, IF THE REQUIREMENTS ABOVE CANNOT BE ACCOMMODATED.
14. LIGHTING EFFICIENCY(CEES 150.0(K))
15. ALL LIGHTING FIXTURES SHALL BE CONTROLLED BY EITHER A DIMMER SWITCH OR BY A VACANCY SENSOR SWITCH THAT REQUIRES A MANUAL ON ACTIVATION (DOES NOT AUTOMATICALLY TURN ON) AND AUTOMATICALLY TURNS OFF WITHIN 30 MINUTES AFTER THE ROOM IS VACATED.
16. UNDER CABINET LIGHTING SHALL BE ON A SEPARATE SWITCH FROM ANY OTHER LIGHTING.
17. ALL LIGHT FIXTURES SHALL CONTAIN BULBS THAT ARE LABELED AS JA8-2019 (JA8-2019-E FOR SEALED LENS OR RECESSED FIXTURE). SCREW BASE BULBS ARE PERMITTED, EXCEPT IN RECESSED LIGHTING FIXTURES.
18. RECESSED LIGHTING SHALL BE LISTED AS IC (ZERO CLEARANCE TO INSULATION) AND AT (AIR TIGHT), BE SEALED/CAULKED BETWEEN THE FIXTURE HOUSING AND CEILING, SHALL NOT CONTAIN A SCREW BASE SOCKET, AND CONTAIN BULBS MARKED WITH JA8-2019-E EFFICIENCY LABEL.
19. TERMINATION OF ALL ENVIRONMENTAL AIR DUCTS SHALL BE A MINIMUM OF 3 FEET FROM ANY OPENINGS INTO THE BUILDING (I.E., DRYERS, BATH AND UTILITY FANS, ETC.) MUST BE 3 FEET AWAY FROM DOORS, WINDOWS, OPENING SKYLIGHTS, OR ATTIC VENTS. CMC 504.5
20. NEW HOOD FOR THE NEW COOKTOP HAVE A MINIMUM VENTILATION RATE OF 100 CFM.
21. EACH BATHROOM CONTAINING A BATHTUB, SHOWER OR COMBINATION SHALL BE MECHANICALLY VEFOR HUMIDITY CONTROL AND THE MINIMUM LOCAL EXHAUST RATES SHALL BE 50 CFM FOR INTERMITTENT VENTILATION OR 20 CFM FOR CONTINUOUS VENTILATION.
22. ALL PERMANENTLY INSTALLED HARD WIRED LIGHTING MUST BE HIGH EFFICACY LUMINARIES
23. PROVIDE (1) 20 AMP CIRCUIT FOR BATHROOM OUTLETS AND (1) 30 AMP /220V OUTLET @ LAUNDRY ROOM/ IF DRYER IS ELECTRIC.
24. ALL 125 VOLT, 15AMP AND 20 AMP OUTLETS SHALL BE LISTED TAMPER-RESINTANT RECEPTACLES / PER CEC 406.11
25. A DEDICATED 20-AMP BRANCH CIRCUIT SHALL BE PROVIDED TO SUPPLY THE LAUNDRY RECEPTACLE OUTLET. CEC 210.11(C)(2) & 210.52(F)
26. VENTILATION HEATING AND AIR CONDITIONING SYSTEMS SHALL HAVE MERV 13 FILTERS OR BETTER. CEC 150.0(M)12C.

WALL1 HOUR FIRE WALL.
INTERIOR / EXTERIOR - WOOD FRAMED



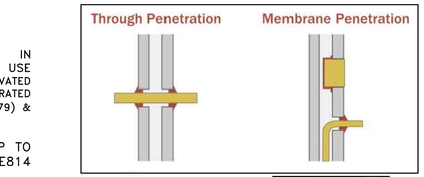
Design No. U348 BXUV.U348 Fire-resistance Ratings - ANSI/UL 263

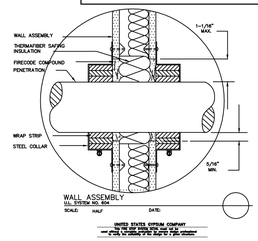
Gypsum Board* — Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305.

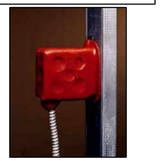
- 5/8" SHEETROCK® BRAND TYPE X EXTERIOR SHEATHING OR 5/8" FIBEROCK AQUA-TOUGH EXTERIOR SHEATHING OR SECUROCK GLASS-MAT SHEATHING
- 5/8" SHEETROCK FIRECODE CORE GYPSUM PANELS OR SHEETROCK MOLD TOUGH FIRECODE CORE GYPSUM PANELS, INTERIOR SIDE
- 2 X 4 WOOD STUDS 16" O.C.
- JOINTS EXPOSED OR FINISHED
- Optional insulation

PIPE AND CONDUIT PENETRATIONS IN ACCORDANCE WITH CRC R302.4.1.1: USE METACAULK MC 150+ FIRESTOP SEALANT ACTIVATED WITH FIRE EXPOSURE, METACAULK MC 150+ IS RATED FOR UP TO 4 HOURS AS PER ASTM E814 (UL1479) & ASTM E1966 (UL 2079) TEST STANDARDS.

OR, 3M FIRESTOP TESTED AND RATED UP TO 2 HOURS IN ACCORDANCE WITH ASTM E814 (UL 1479) AND CAN/ULC-S115



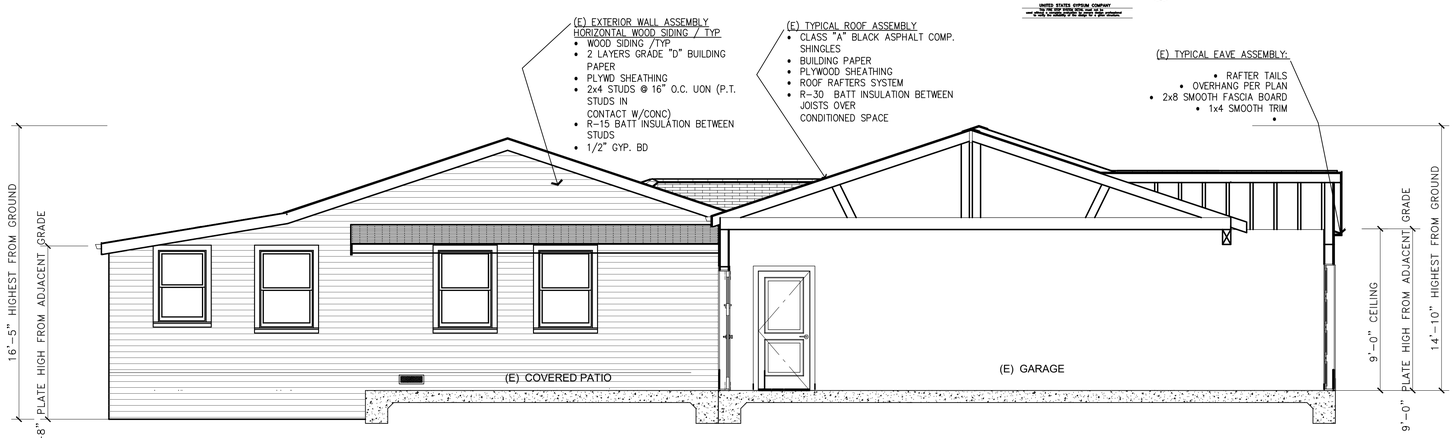




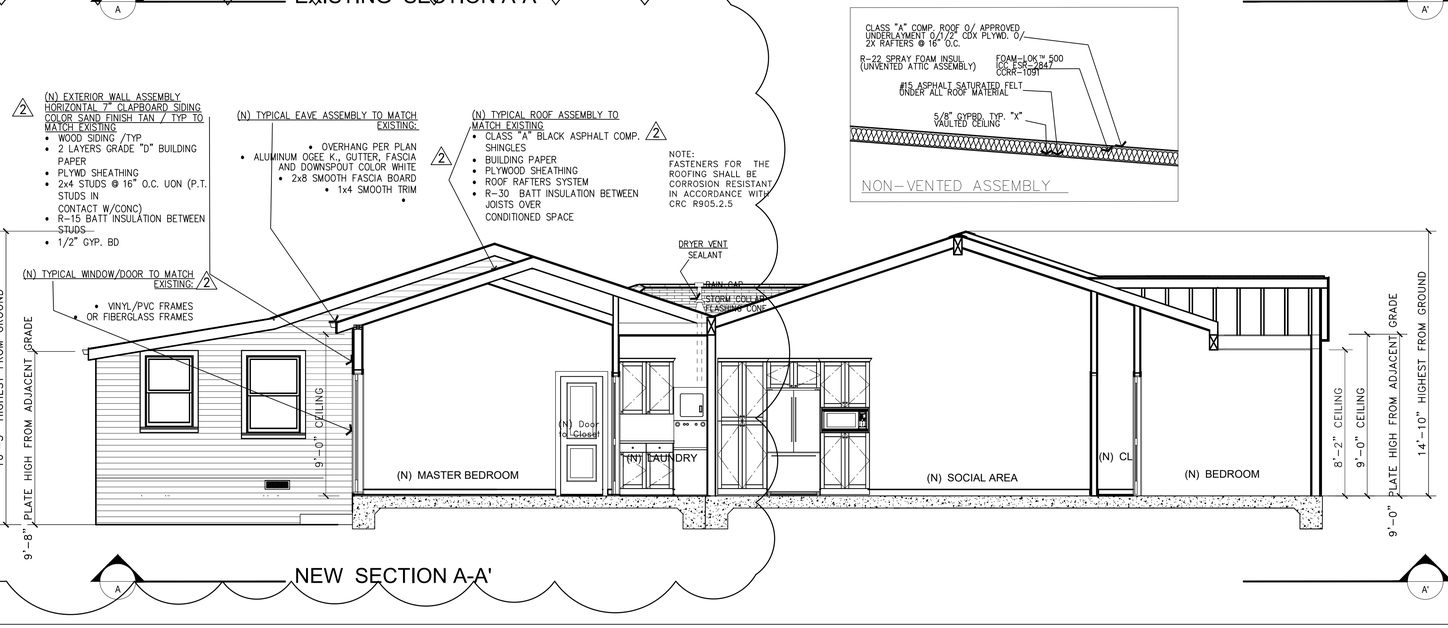
PIPE AND CONDUIT PENETRATIONS IN ACCORDANCE WITH CRC R302.4.1.1: USE METACAULK MC 150+ FIRESTOP SEALANT ACTIVATED WITH FIRE EXPOSURE, METACAULK MC 150+ IS RATED FOR UP TO 4 HOURS AS PER ASTM E814 (UL1479) & ASTM E1966 (UL 2079) TEST STANDARDS.

OR, 3M FIRESTOP TESTED AND RATED UP TO 2 HOURS IN ACCORDANCE WITH ASTM E814 (UL 1479) AND CAN/ULC-S115

3M™ Fire Barrier Moldable Putty Pads MPP+ tested for through penetration and membrane applications for up to 4 hours in accordance with ASTM E 814 (UL 1479)



EXISTING SECTION A-A'



NEW SECTION A-A'

(E) & (N) SECTION

1/4" | 1

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CAMPBELL, CA 95008

REVISIONS:
1 DEVELOPMENT REVIEW 06/26/2022
2 DEVELOPMENT REVIEW 09/02/2022

SHEET (E) & (N) SECTION
SCALE
DATE 08-01-2022
PRJ.No. ——

A_1.6

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

BATHROOM REMODEL PERMIT REQUIREMENTS

FOLLOWING IS A LISTING OF THE GENERAL REQUIREMENTS BASED ON THE 2019 CALIFORNIA BUILDING CODE, 2019 CALIFORNIA RESIDENTIAL CODE, 2019 CALIFORNIA ELECTRICAL CODE, 2019 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN), AND 2019 CALIFORNIA ENERGY EFFICIENCY STANDARDS. CONTACT THE BUILDING SAFETY DIVISION FOR ANY QUESTIONS OR ADDITIONAL INFORMATION, INCLUDING REQUIREMENTS FOR NEW/ALTERED PLUMBING OR MECHANICAL (EXHAUST HOOD).

1. THE MIXING VALVE IN A SHOWER (INCLUDING OVER A TUB) SHALL BE PRESSURE BALANCING SET AT A MAXIMUM 120° F. THE WATER-FILLER VALVE IN BATHTUBS/WHIRLPOOLS SHALL HAVE A TEMPERATURE LIMITING DEVICE SET AT A MAXIMUM OF 120° F. THE WATER HEATER THERMOSTAT CANNOT BE USED TO MEET THESE PROVISIONS. (CPC 408.3, 409.4)
2. NEW OR RECONFIGURED SHOWER STALLS SHALL BE A MINIMUM FINISHED INTERIOR OF 1,024 SQUARE INCHES, BE CAPABLE OF ENCOMPASSING A 30 INCH DIAMETER CIRCLE. ANY DOORS SHALL SWING OUT OF THE ENCLOSURE HAVE A CLEAR OPENING OF 22 INCHES MINIMUM. (CPC 408.5, 408.6)
3. SHOWER STALLS AND BATHTUBS WITH SHOWER HEADS INSTALLED, SHALL HAVE WALLS FINISHED WITH A NON-ABSORBENT SURFACE FOR A MINIMUM OF 6 FEET ABOVE THE FLOOR. (CBC 1210 AND CRC R307.2)
4. HYDRO-MASSAGE TUBS (I.E. JACUZZI TUBS) SHALL HAVE ACCESS TO THE MOTOR, BE SUPPLIED BY A GFCI PROTECTED DEDICATED CIRCUIT, AND BE LISTED BY A RECOGNIZED TESTING AGENCY (I.E. UL). ALL METAL CABLES, FITTINGS, PIPING, OR OTHER METAL SURFACES, WITHIN 5 FEET OF THE INSIDE WALL OF THE HYDRO-MASSAGE TUB SHALL BE PROPERLY BONDED. HYDRO-MASSAGE TUBS SHALL BE BONDED WITH A MINIMUM #8 AWG BARE COPPER WIRE AND THE BONDING SHALL BE ACCESSIBLE. (CEC 680.70)
5. UNDERLAYMENT MATERIAL USED AS BACKERS FOR WALL TILE OR SOLID SURFACE MATERIAL IN BATHROOM REMODEL SHALL BE EITHER GLASS MAT/FIBER-REINFORCED GYPSUM BACKING PANELS (I.E. DENSSHIELD, DENS ARMOR PLUS), NON-ASBESTOS FIBER-CEMENT/FIBER MAT BACK BOARD (I.E. HARDIBACKER, CEMENT BOARD). ALL MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. WATER-RESISTANT GYPSUM BOARD (I.E. PURPLE BOARD) MAY BE USED WHEN ATTACHED DIRECTLY TO STUDS, OVERLAYED WITH MINIMUM GRADE B BUILDING PAPER AND WIRE LATH. TILE SHALL BE ATTACHED TO THE WIRE LATH. (CBC 2509 AND CRC R702.4)
7. SHOWER FLOORS SHALL BE LINED WITH AN APPROVED SHOWER PAN OR AN ON-SITE BUILT WATERTIGHT APPROVED LINING (I.E. HOT MOP). ON-SITE BUILT SHOWER LININGS SHALL EXTEND A MINIMUM OF 3 INCHES VERTICALLY UP THE WALL AND SHALL BE SLOPED ¼" PER FOOT TO WEEP HOLES. (CPC 408.7)
8. A CURB IS REQUIRED AT A SHOWER, IT SHALL BE A MINIMUM OF 1 INCH ABOVE THE SHOWER FLOOR AND BETWEEN 2 INCHES AND 9 INCHES ABOVE THE TOP OF THE DRAIN. A WATERTIGHT NAILING FLANGE THAT EXTENDS A MINIMUM OF 1 INCH HIGH SHALL BE INSTALLED WHERE THE SHOWER FLOOR MEETS THE VERTICAL SURFACE OF THE SHOWER COMPARTMENT. THE FINISHED FLOOR OF THE SHOWER COMPARTMENT SHALL BE UNIFORMLY SLOPED BETWEEN ¼" AND ½" PER FOOT TOWARDS TO THE DRAIN. (CPC 408.5)

WATER CLOSET REQUIREMENTS

9. THE WATER CLOSET SHALL HAVE A CLEARANCE OF 30 INCHES WIDE (15 INCHES ON CENTER) AND 24 INCHES IN FRONT. (CPC 402.5)
10. WHERE THE WATER CLOSET (OR OTHER PLUMBING FIXTURE) COMES INTO CONTACT WITH THE WALL OR FLOOR, THE JOINT SHALL BE CAULKED AND SEALED TO BE WATERTIGHT. (CPC 402.2)

TEMPERED GLAZING (CBC 2406.4, 2403.1 AND CRC 308.1, R308.4)

11. TEMPERED GLAZING SHALL BE INSTALLED IN THE LOCATIONS LISTED BELOW. TEMPERED GLAZING SHALL BE PERMANENTLY IDENTIFIED BY A MANUFACTURER MARKING THAT IS PERMANENTLY APPLIED AND CANNOT BE REMOVED WITHOUT BEING DESTROYED (E.G. SAND BLASTED, ACID ETCHED, CERAMIC FIRED, LASER ETCHED, OR EMBOSSED).
12. WITHIN A PORTION OF WALL ENCLOSING A TUB/SHOWER WHERE THE BOTTOM EXPOSED EDGE OF THE GLAZING IS LESS THAN 60 INCHES ABOVE THE STANDING SURFACE AND DRAIN INLET.
13. WITHIN 60 INCHES OF A TUB/SHOWER WHERE THE GLAZING IS LESS THAN 60 INCHES ABOVE THE WALKING SURFACE.
14. GLAZING ON THE HINGE-SIDE OF AN IN-SWINGING DOOR THAT IS INSTALLED PERPENDICULAR TO A DOOR IN A CLOSED POSITION AND WITHIN 24 INCHES OF THE DOOR.

ELECTRICAL AND LIGHTING REQUIREMENTS

15. ALL RECEPTACLES SHALL BE GFCI PROTECTED AND TAMPER-RESISTANT (TR). IF ANY NEW/ADDITIONAL OUTLETS ARE INSTALLED, THE BATHROOM SHALL HAVE A DEDICATED 20-AMP CIRCUIT. (CEC 210.8, 210.11, 406.12)
16. EXHAUST FANS WITH A MINIMUM VENTILATION RATE OF 50 CFM ARE REQUIRED IN ALL BATHROOMS, EVEN IF AN OPERABLE WINDOW IS INSTALLED. EXHAUST FANS AND LIGHTING SHALL HAVE SEPARATE CONTROL SWITCHES (EVEN IF A COMBINATION UNIT IS INSTALLED). THE EXHAUST FAN MAY NEED TO BE SUPPLIED BY A GFCI PROTECTED CIRCUIT BASED ON THE MANUFACTURER'S REQUIREMENTS. (CEES 150.0(K), 150.0(O))
17. LIGHTING FIXTURES LOCATED WITHIN 3 FEET HORIZONTALLY AND 8 FEET VERTICALLY OF THE BATHTUB RIM OR SHOWER STALL THRESHOLD SHALL BE LISTED FOR A DAMP LOCATION, OR LISTED FOR WET LOCATIONS WHERE SUBJECT TO SHOWER SPRAY. (CEC 410.10)
18. ALL INSTALLED LIGHTING FIXTURES SHALL BE HIGH EFFICACY.
19. AT LEAST ONE LIGHT FIXTURE SHALL BE CONTROLLED BY A VACANCY SENSOR SWITCH THAT REQUIRES A MANUAL ON ACTIVATION (DOES NOT AUTOMATICALLY TURN ON) AND AUTOMATICALLY TURNS OFF WITHIN 30 MINUTES AFTER THE ROOM IS VACATED. ALL OTHER LIGHT FIXTURES SHALL BE CONTROLLED BY A VACANCY SENSOR OR DIMMER.
20. ALL LIGHT FIXTURES SHALL CONTAIN BULBS THAT ARE LABELED AS JA8-2019 (JA8-2019-E FOR SEALED LENS OR RECESSED FIXTURE). SCREW BASE BULBS ARE PERMITTED, EXCEPT IN RECESSED LIGHTING FIXTURES.
21. RECESSED LIGHTING SHALL BE LISTED AS IC (ZERO CLEARANCE TO INSULATION) AND AT (AIR TIGHT), BE SEALED/CAULKED BETWEEN THE FIXTURE HOUSING AND CEILING, SHALL NOT CONTAIN A SCREW BASE SOCKET, AND CONTAIN BULBS MARKED WITH JA8-2019-E EFFICIENCY LABEL. (CEES 150.0(K))

PLUMBING -KITCHEN OR BATHROOM REMODEL PERMIT REQUIREMENTS

FOLLOWING IS A LISTING OF THE GENERAL REQUIREMENTS BASED ON THE 2019 CALIFORNIA BUILDING CODE, 2019 CALIFORNIA RESIDENTIAL CODE, 2019 CALIFORNIA ELECTRICAL CODE, 2019 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN), AND 2019 CALIFORNIA ENERGY EFFICIENCY STANDARDS. CONTACT THE BUILDING SAFETY DIVISION FOR ANY QUESTIONS OR ADDITIONAL INFORMATION, INCLUDING REQUIREMENTS FOR NEW/ALTERED PLUMBING OR MECHANICAL (EXHAUST HOOD).

WATER EFFICIENT PLUMBING FIXTURES (CALGREEN 301.1.1)

ALL EXISTING NON-COMPLIANT PLUMBING FIXTURES (BASED ON WATER EFFICIENCY) THROUGHOUT THE HOUSE SHALL BE UPGRADED WHENEVER A BUILDING PERMIT IS ISSUED FOR AN ADDITION, ALTERATION, OR IMPROVEMENT. THE FOLLOWING TABLE SHOWS THE FIXTURES THAT ARE CONSIDERED TO BE NON-COMPLIANT AND THE TYPE OF WATER-CONSERVING PLUMBING FIXTURE THAT SHALL BE INSTALLED IN PLACE OF NON-COMPLIANT FIXTURES:

FIXTURE (MAXIMUM FLOW-RATES)

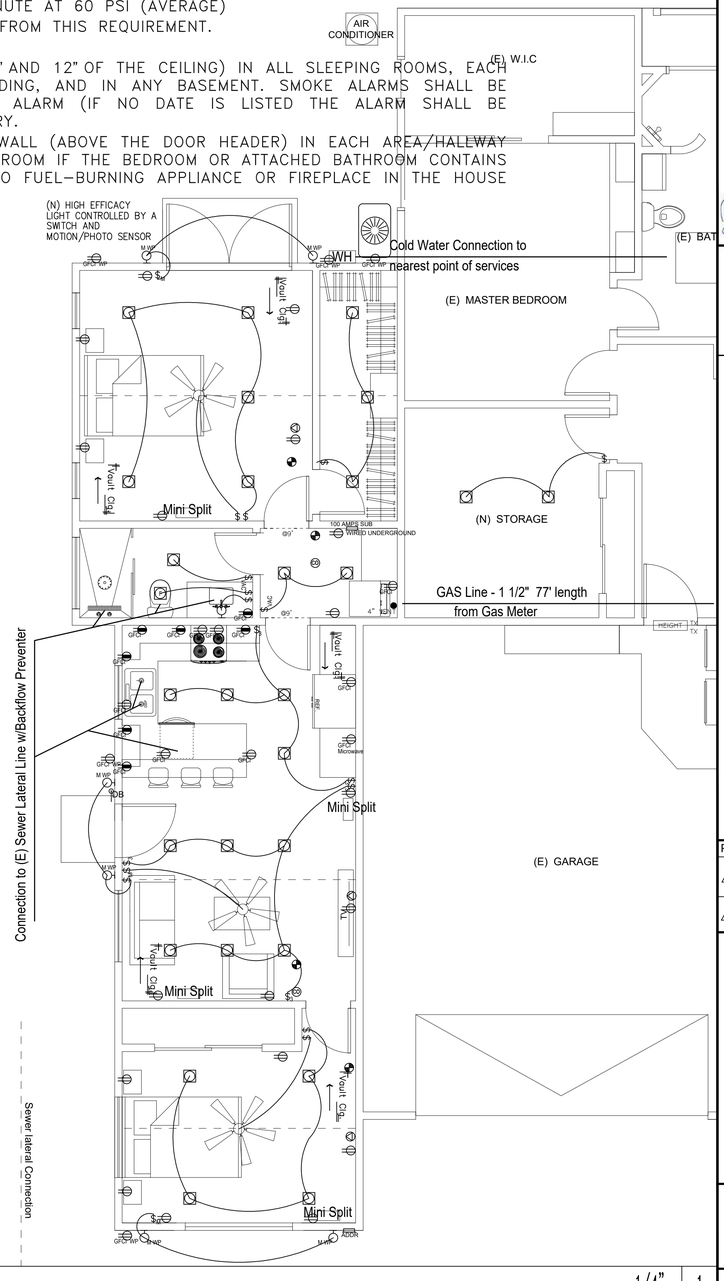
- WATER CLOSET (TOILET) GREATER THAN 1.6 GALLONS/FLUSH 1.28 GALLONS/FLUSH
- SHOWERHEAD GREATER THAN 2.5 GALLONS/MINUTE 1.8 GALLONS/MINUTE AT 80PSI MULTIPLE SHOWERHEADS SERVING ONE SHOWER - COMBINED FLOW RATE OF ALL SHOWERHEADS AND/OR OTHER SHOWER OUTLETS CONTROLLED BY A SINGLE VALVE - 1.8 GPM AT 80 PSI. CGBSC SECTION 4.303.1.3.2
- FAUCET -BATHROOM GREATER THAN 2.2 GALLONS/MINUTE 1.2 GALLONS/MINUTE AT 60 PSI
- FAUCET - KITCHEN GREATER THAN 2.2 GALLONS/MINUTE 1.8 GALLONS/MINUTE AT 60 PSI (AVERAGE)
- * RESIDENTIAL BUILDING CONSTRUCTED AFTER JANUARY 1, 1994 ARE EXEMPT FROM THIS REQUIREMENT.
- SMOKE AND CARBON MONOXIDE ALARMS (CBC 907.2.11, CRC 314 AND 315)
- SMOKE ALARMS SHALL BE INSTALLED ON THE CEILING OR WALL (BETWEEN 4" AND 12" OF THE CEILING) IN ALL SLEEPING ROOMS, EACH AREA/HALLWAY ADJACENT TO SLEEPING ROOMS, EACH STORY OF THE BUILDING, AND IN ANY BASEMENT. SMOKE ALARMS SHALL BE REPLACED 10 YEARS AFTER THE DATE OF MANUFACTURE LISTED ON THE ALARM (IF NO DATE IS LISTED THE ALARM SHALL BE REPLACED). NEWLY INSTALLED SMOKE ALARMS SHALL HAVE A 10-YEAR BATTERY.
- CARBON MONOXIDE (CO) ALARMS SHALL BE INSTALLED ON THE CEILING OR WALL (ABOVE THE DOOR HEADER) IN EACH AREA/HALEWAY ADJACENT TO SLEEPING ROOMS, EACH OCCUPIABLE STORY, AND WITHIN A BEDROOM IF THE BEDROOM OR ATTACHED BATHROOM CONTAINS A FUEL-BURNING APPLIANCE. CO ALARMS ARE NOT REQUIRED IF THERE IS NO FUEL-BURNING APPLIANCE OR FIREPLACE IN THE HOUSE AND WHERE THE GARAGE IS DETACHED FROM THE HOUSE.
- ANY NIGHT LIGHTS, STEP LIGHTS, AND PATH LIGHTS MUST BE HIGH EFFICACY AND CONTROLLED BY A VACANCY SENSOR. CEC 150.0(K)1E
- ANY LIGHT SOURCES INTEGRAL TO DRAWERS, CABINETS, AND LINEN CLOSETS MUST BE HIGH EFFICACY AND CONTROLLED BY A VACANCY SENSOR. CEC 150.0(K)1
- COMPLETED CF2R-LTG-01-E FORM MUST BE PROVIDED TO THE CITY BUILDING INSPECTOR, PRIOR TO FINAL INSPECTION.

LEGEND

- DUPLEX CONVENIENCE RECEPTACLE GFCI, 120 V, +15" TO BOTTOM OF OUTLET TYP U.O.N.
- DUPLEX CONVENIENCE RECEPTACLE GFCI, 120 V, +8" ABOVE COUNTER, U.O.N.
- OUTLET ABOVE FOR GARAGE DOOR OPENER
- DATA / T.V. OUTLET +12" TYP. U.O.N.
- 220 VOLT OUTLET
- DUPLEX CONVENIENCE RECEPTACLE 120 V, +15" TO BOTTOM OF OUTLET TYP U.O.N. ALL RECEPTACLES MUST BE ARC-FAULT CIRCUIT INTERRUPTER (AFCI)
- ELECTRICAL SUB PANEL
- PUSH BUTTON FOR GARAGE DOOR OPENER
- PUSH BUTTON FOR DOOR BELL
- ILLUMINATED ADDRESS SIGN
- SUPPLY DUCT
- SINGLE POLE SWITCH +44" TYP. U.O.N.
- WALL MOUNTED LIGHT FIXTURE
- CEILING SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE
- LIGHT/ EXHAUST FAN UNIT, WITH HUMIDISTAT CONTROL FOR FAN. EACH FUNCTION SWITCHED SEPARATELY
- RECESSED 4" LED CEILING LIGHT FIXTURE RECESSED LIGHTING AS AT AND IC RATED. RATED LISTED SA8-2019-E LUMINARIES. RECESSED LIGHTS THAT AREN'T IN HALLWAYS AND AREN'T IN CLOSETS <70 S.F. TO BE ON DIMMERS
- VACANCY SENSOR SWITCH
- SWITCH WITH DIMMER
- 3 WAY SWITCH
- WALL MOUNTED FLOOR LIGHT FIXTURE
- UNDER CABINET LIGHT FIXTURE
- EXTERIOR WEATHER PROOF WALL LIGHT FIXTURE
- EXTERIOR WEATHER PROOF FLOOR LIGHT FIXTURE
- GAS
- SMOKE DETECTOR W/ 110V. POWER SOURCE (W/BATTERY BACKUP) INTERCONNECTED
- CARBON MONOXIDE DETECTOR W/ 110V. POWER SOURCE (W/BATTERY BACKUP) AS PER 2019 C.R.C. INTERCONNECTED
- COMBO SMOKE/CARBON MONOXIDE DETECTOR W/ 110V. POWER SOURCE (W/BATTERY BACKUP) AS PER 2019 C.R.C. INTERCONNECTED

* CARBON MONOXIDE ALARMS ARE IN THE FOLLOWING LOCATIONS (BOTH IN THE SCOPE OF WORK AND OUTSIDE OF IT): CRC R315.3 A. IN THE IMMEDIATE VICINITY OF BEDROOMS. B. ON EVERY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. C. WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM, A CARBON MONOXIDE ALARM SHAL BE INSTALLED IN THIS BEDROOM.
* TWO SMALL APPLIANCE BRANCH CIRCUITS FOR THE KITCHEN THAT ARE LIMITED TO SUPPLYING WALL AND COUNTER SPACE OUTLETS FOR THE KITCHEN, PANTRY, BREAKFAST ROOM, DINING ROOM, OR SIMILAR AREAS. NOTE: THESE CIRCUITS CANNOT SERVE OUTSIDE PLUGS, RANGE HOODS, DISPOSALS, DISHWASHERS, OR MICROWAVES. THEY MAY ONLY SERVE THE REQUIRED COUNTERTOP / WALL OUTLETS AND THE REFRIGERATOR. CEC 210.11.C.1(1) AND 210.52(B)(1).
* A DEDICATED 20-AMP BRANCH CIRCUIT FOR THE LAUNDRY RECEPTACLE OUTLETS. CEC 210.11.C.1(2) AND 210.52(F).
* ALL 125-VOLT, 15- AND 20- AMPERE RECEPTACLE OUTLETS SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES PER CEC 406.12.

*THE CALIFORNIA ENERGY CODE REQUIRES REPLACEMENT WINDOW TO MEET A MAXIMUM U-FACTOR OF 0.40 AND A MAXIMUM SOLAR HEAT GAIN COEFICIENT (SHGC)OF 0.35 FOR UP TO 75 S.F. OF REPLACEMENT FENESTRATION. FOR REPLACEMENT FENESTRATION IN EXCESS OF 75 S.F. THE MAXIMUM U-FACTOR SHALL BE 0.30 AND THE MAXIMUM SHGC SHALL BE 0.23 PER CENC TABLE 150.1-A. NEW OR RELOCATED WINDOWS MUST MEET EITHER THE PRESCRIPTIVE APPROACH OR THE PERFORMANCE APPROACH OF THE T-24 ENERGY REGULATIONS.



(N) ELECTRICAL PLAN

1/4" | 1

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A.D.U.

REVISIONS:

1 DEVELOPMENT REVIEW	06/26/2022
2 DEVELOPMENT REVIEW	09/02/2022

SHEET	(N) ELECTRICAL PLAN
SCALE	
DATE	09-20-2022
PRJ.No.	___

A_2.0

PLANS ARE NOT FOR CONSTRUCTION UNLESS APPROVED AND STAMPED BY BUILDING DEPARTMENT.

SYMBOLS, STRUCTURAL SCHEDULE:

This listing applies only to the structural drawings.

Mark	Comment
N	Change in drawing from previous issue.
# - #	Reference to structural shearwall calculations for the benefit of the Building Official.
N	Reference to structural beams calculations for the benefit of the Building Official.
# SHT	Detail reference giving item and sheet number.
FRAME X # SHT	Framing elevation reference giving item and sheet number.
FRAMING	Floor Joists
FRAMING	Roof Trusses
FRAMING	Ceiling Joists
FRAMING	Roof Rafters
FRAMING	Deck Joist

The arrow on the framing callouts ( ) designates bearing(s) wall(s).

FRAMING	Girder, girder truss, double joist, rafter, or truss of the same size as the surrounding framing unless noted otherwise.
FRAMING	Beam, header or built-up framing member.
	Shear wall indication giving special framing when necessary and length if critical. Refer to shear wall schedule for complete information. It is acceptable to place the sheathing on either side of the wall, especially to avoid cutting from plumbing lines or manifold boxes. The dashed line is only graphical in nature.
FRAMING LENGTH N	
A.B.'S AT N" OC	Spacing of anchor bolts.

Note:
Not all symbols used are defined here.
Refer to American Welding Society publications for weld symbols.

ABBREVIATORS, STRUCTURAL:

This listing applies only to the structural drawings.

Annotation	Definition
Φ	Diameter
#	Pound/Number
&	And
/	Per
@	At
±	Plus or Minus
AB	Anchor Bolt
Alt	Alternate
Blk'g	Block'ing
BM	Beam
BN	Boundary Nail
BOF	Bottom Of Footing
Bolt	Bottom
Br'g	Bearing
Cbr	Camber
Cant	Cantilever
CJ	Ceiling Joist
CJ.	Construction Joint
℄	Center Line
Comm	Common, nail
Cont	Continuous
d	Penny, nail
Dbl	Double
Det	Detail
DF	Douglas Fir
DIA	Diameter
DJ	Deck Joist
Dr	Drop
DSS	Dense Select Structural
E/E	Each End
E/F	Each Face
EN	Edge Nail
Eq	Equal
E/S	Each Side
E/W	Each Way
Ft	Foot
Fnd	Foundation
Ft'g	Footing
Fl	Flush
FJ	Floor Joist
G+L	Gang+Lam
Ga	Gauge
Galv	Galvanized
GLB	Glued Laminated Beam
GT	Girder Truss
Hgr	Hanger
Hdr	Header
Ht	Heights
I-Jst	I-Joist
In	Inch
KP	King Post
KS	King Stud
LSL	Laminated Strand Lumber
LVL	Laminated Veneer Lumber
MAX	Maximum
MB	Machine Bolt
MIN	Minimum
M+L	Micro+Lam Beam
NTS	Not To Scale
OC	On Center
OSB	Oriented Strand Board
PSF	Pounds per Sq. ft.
PSI	Pounds per Sq. inch
PSL	Parallel Strand Lumber
Ply	Plywood
RJ	Roof Joist
RR	Roof Rafter
Sht'g	Sheathing
Sink	Sinker, nail
SPRN	Sill/Sole plate nailing
Sq	Square
SS	Select Structural
Stud	Standard
SW	Shear Wall
T&G	Tongue & Groove
Thk	Thick
TOC	Top of Concrete/Curb
Tpl	Triple
Trim	Trimmer, stud
TS	Tube Steel
Typ	Typical
UNO	Unless Noted Otherwise
Vert	Vertical
V+L	Verse Lam
V.I.F.	Verify in Field
W	Wide flange I beam, steel
W/	With
W/O	Without
Wd	Wide

Note:
Refer to Simpson Company product catalogue for hardware abbreviations.
Refer to Trus Joist Company product catalogue for fabricated joist abbreviations.

SHEAR WALL SCHEDULE:

(3)(4)(6)(8)(10)

LENGTH

Note: When an asterisk * is adjacent to the shearwall specification, install sheathing before any adjacent framing.

SPN/SCREWS — SEE DETAILS ON SD5 FOR MORE INFO.

DESIGNATION	SHEATHING & FASTENING (1)(2)	A35/LTP4 SPECIFIED SHEARWALL (13) (14)	STUDS AT PANEL JOINTS & BLOCKING	MUD SILL PLATES	SILL/SOLE PLATE FASTENING (11)
*					
9	3/8" OSB sheathing w/ 8d common nails at: 6" o.c. at panel edges 12" o.c. at field (7)	24" O.C.	2X-	2X-	16d Sinkers at 4" o.c. or 1/4"x4-1/2" Simpson SDS wood screws at 16" o.c.
10	3/8" OSB sheathing w/ 8d common nails at: 4" o.c. at panel edges 12" o.c. at field (7)	16" O.C.	2X-	2X-	16d Sinkers at 3" o.c. or 1/4"x4-1/2" Simpson SDS wood screws at 12" o.c.
11	3/8" OSB sheathing w/ 8d common nails at: 3" o.c. at panel edges 12" o.c. at field (9)	12" O.C.	3X-	2X-	16d Sinkers at 2-1/2" o.c. staggered or 1/4"x4-1/2" Simpson SDS wood screws at 8" o.c.
12	3/8" OSB sheathing w/ 8d common nails at: 2" o.c. at panel edges 12" o.c. at field (9)	10" O.C.	3X-	2X-	1/4"x4-1/2" Simpson SDS screws at 6" o.c.
13	15/32" Structural I OSB sheathing w/ 10d common nails at: 2" o.c. at panel edges 12" o.c. at field (9)	8" O.C.	3X-	2X-	1/4"x4-1/2" Simpson SDS screws at 4" o.c.
DOUBLE 11 (5) (9) (TWO SIDED)	3/8" OSB sheathing w/ 8d common nails at: 3" o.c. at panel edges 12" o.c. at field	6" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 4" o.c.
DOUBLE 12 (5) (9) (TWO SIDED)	3/8" OSB sheathing w/ 8d common nails at: 2" o.c. at panel edges 12" o.c. at field	4" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 3" o.c.
DOUBLE 13 (5) (9) (TWO SIDED)	15/32" Structural I OSB sheathing w/ 10d common nails at: 2" o.c. at panel edges 12" o.c. at field	4" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 3" o.c.

Notes:
(1) OSB sheathing is included as part of required nail penetration.
(2) Refer to specifications for sheathing (wood product panel) grading and permitted alternatives, see SN sheet, section 06100, Note 6.
(3) Stud framing shall be minimum 2X4 at 16" o.c.
(4) Sheets shall be not less than 4'-0" by 8'-0" except at boundaries and changes where the minimum dimension shall be 16".
(5) Studs only may be 2X- provided panel joints are offset so as to fall on different framing members when sheathing is on both sides of wall. Else use 3X- minimum studs at panel joints and nails shall be staggered.
(6) Stagger is 1/2" at all framing members receiving edge nailing.
(7) Provide minimum 2X4 flat blocking at all horizontal panel joints.
(8) Space fasteners no closer than 1-1/2". Over any 48" line of fasteners, the average spacing shall be at least as close as that specified.
(9) Provide minimum 3X4 flat blocking at horizontal panel joints.
(10) See detail 6/SD2 for more information.
(11) Note: The number of required sill screws/ nails is determined by dividing the total shearwall length by the specified fastener spacing. For instance, if the total length of the shearwall is 8'-0", and the required fastener spacing is 12" o.c., there should be 8 total fasteners evenly spaced. It is understood that posts, studs, and plumbing lines may obstruct the fasteners from being "evenly" spaced, but the required number of fasteners is still required.
(12) It is acceptable to place the sheathing on either side of the wall, especially to avoid cutting from plumbing lines or manifold boxes. The dashed line is only graphical in nature.
(13) See details on SD3, SD4, and SD5 for hardware location.
(14) AT multifamily projects, see sheets SD3.1 & SD5.1 for hardware location as well.

SCHEDULE OF SPECIAL INSPECTION:

Note: C = Continuous Inspection, P = Periodic Inspection, X = Denotes either Continuous Inspection or Periodic Inspection.

VERIFICATION & INSPECTION	C	P
STRUCTURAL WOOD		
1. Inspect nailing, bolting, anchoring, and other fastening of components within the seismic force-resisting system, including:		
a. wood		X
b. wood diaphragms		X
c. drag struts, braces		X
d. shear panels		X
e. Hodloun		X

FOUNDATION NOTES, CONVENTIONAL, WOOD FRAMING:

1. Foundation dimensions are extracted from architectural drawings. IDS Engineering, Inc. does not assume any liability with respect to these dimensions. Contractor shall verify all foundation dimensions with the architectural drawings and with field conditions. Contractor shall verify the location and sizes of all anchor bolts, holdowns, embedded straps and framing materials. Contractor shall verify configuration and location of all architectural features, such as but not limited to, depressions, slopes, shelves, patios, porches, and stoops.
2. For lapping of conventional reinforcing, see detail (2/SD1).
3. For trenches adjacent to foundations, see detail (24/SD1).
4. For conventional reinforcing bar bend, see detail (1/SD1). For stirrup and tie bends, see detail (1/SD1).
5. Refer to the soils report(s) for any pad preparation and pre saturation requirements.
6. The floor slab shall be poured level to within 1/8 inch in 10 feet.
7. The floor slab and foundation may be poured monolithically (at the same time) or in two pours with a cold joint between at the Contractor's option. Details in general are shown using two pours.
8. Anchor Bolts: Install anchor bolts as noted on the plans. If no notation is given, at exterior walls provide 5/8 inch dia. anchor bolts at 72 inch OC. In all bolted walls, at least one bolt shall be installed within 12 inches of each end of each plate, with no less than two (2) bolts per plate 12 inches or longer. See floor framing plans for reference in providing extension of anchor bolts above concrete. Anchor bolts shall be galvanized if set corrosive preservative treated lumber. Anchor bolts may be set set during placement of concrete. See detail (6/SD1).

Mark	Comment
*	Spacing of anchors per the below schedule, see detail 6/SD1 for more information. *

Shearwall Type	5/8" dia. Anchor Bolt	3/4" dia. Anchor Bolt	1" dia. Anchor Bolt	MASA/MASAP
Non-Shearwalls	48"	48"	72"	48"
9	36"	48"	N.A.	48"
10	32"	48"	N.A.	36"
11	24"	32"	N.A.	32"
12	16"	24"	30"	24"
13	12"	18"	24"	16"
Dbl. 11 *	10"	16"	20"	12"
Dbl. 12 *	8"	12"	18"	8"
Dbl. 13 *	6"	8"	12"	8"

* Denotes shearwall requires 3x- mudsill plate.
* Note: It is recommended for shorter shearwalls the larger diameter anchor bolts are used in order to achieve the proper spacing and quantity. The number of anchors is determined by dividing the total shearwall length by the specified anchor spacing. For instance, if the total length of the shearwall is 8'-0", and the required anchor spacing is 12" o.c., there should be 8 total anchors evenly spaced. It is understood that posts, studs, and plumbing lines may obstruct the anchors from being "evenly" spaced but the required number of anchors is still required. Finally, holdown anchor rods are not considered anchor bolts.

9. Shot Pins: Install at all interior walls and partitions where anchor bolts are not noted, 0.145 inch dia. x 2.875 inches shank length with metal plate washer at 36 inches OC. Each piece of plate longer than 16 inches shall have a minimum of two fasteners. At each end of each piece of plate, place one fastener at 6" from the end.
10. Holdowns and Embedded Straps: See floor framing plans for reference in locating hardware and providing extension of hardware above concrete. It is the responsibility of the Contractor to determine their exact location. Hardware shall be tied in place prior to placement of concrete. For holdoun and embedded straps to foundation, see detail (8/SD1).
11. Foundations: Size, depth and reinforcement of continuous footings shall be as follows. Reinforcement shall be chaired and tied in place prior to placement of concrete.

Exterior footings		
Width	Depth	Typical, • Reinforcement
12"	18"	(3) #5 top and bottom

Note:
1. Foundations shall be per schedule U.N.O. on plans at specific locations.
2. (1) #6 bar may be used in place of (2) #4 bars.
3. Line indicates extent of additional foundation reinforcement in addition to typical reinforcement. (----------)

12. Floor slab. Place slab reinforcement above center line and below upper 1/3 of slab thickness. Reinforcement shall be chaired and tied in place prior to placement of concrete. Sand shall be dampened prior to placement of concrete. Slab and sand thickness' given are actual not nominal

Floor Slab Thickness	Floor Slab Reinforcement	Upper base layer	Vapor Barrier	Lower base layer
5"	#4 at 18" oc E.W.	2" sand	10 mil Visqueen	4" of 3/4" crushed rock

Note:
1. #3 bars at 24 inches o.c. in each direction may be used as an alternative to WWF for slab reinforcement.
2. Vapor Barrier & lower base layer may be omitted at non-conditioned areas such as garages.

GENERAL FRAMING NOTES:

1. Studs shall extend full height from floor to floor and from floor to ceiling or roof without interruption except as necessary for openings. See detail 1/SD2 for typical wall framing.
2. Provide double trimmers at all opening greater than 8'-0", unless noted otherwise.
3. Provide king studs per the following schedule:

PLATE HEIGHT	OPENING WIDTH 4'-0"		6'-0"		8'-0"		10'-0"		12'-0"		UP TO 16'-0"	
	2X4	2X6	2X4	2X6	2X4	2X6	2X4	2X6	2X4	2X6	2X4	2X6
8'-1"	2X-	2X-	(2)2X-	2X-	(2)2X-	2X-	(2)2X-	(2)2X-	(4)2X-	(3)2X-	(5)2X-	(4)2X-
9'-1"	2X-	2X-	(2)2X-	2X-	(2)2X-	(2)2X-	(3)2X-	(2)2X-	(4)2X-	(3)2X-	(5)2X-	(4)2X-
10'-1"	2X-	2X-	(2)2X-	2X-	(2)2X-	(2)2X-	(3)2X-	(2)2X-	(4)2X-	(3)2X-	(5)2X-	(4)2X-

Note: Opening width is measured from king stud to king stud, do not include intermediate trimmers.

4. Provide interior non-bearing headers per the following schedule:

OPENING	2X4 WALL	2X6 WALL
6'-0" and less	4X4	6X4
6'-0" to 8'-0"	4X6	6X6
8'-0" to 10'-0"	4X8	6X8
10'-0" to 12'-0"	4X8	6X8
12'-0" to 14'-0"	4X10	6X8
14'-0" to 16'-0"	4X10	6X10

Note: A 9.5 TJI 110 Joist may be used in lieu of any of the above specified non-bearing headers

5. Framing shall be free of unusual defects. Shearwalls 48" or less in length shall have no splits in the sill plate. Sill plates longer than 48" in length shall be allowed splits within 5% of its total length. No splits shall extend more than 1/3 of the total height or width of the sill plate.
6. Provide wall framing as shown below unless otherwise specified on the plans or shearwall schedule.

Designation	Comment
	Exterior Partitions, (walls un-marked) shall be framed 2x4 studs spaced at 16" on center for studs heights less than 116". For stud heights between 116" and 192", the studs shall be 2x4 at 16" on center. For studs greater than 192" in height, use (2)2x6 at 16" on center, unless otherwise noted on plans
	Interior non-bearing partitions, (walls un-marked) shall be framed with 2x4 studs spaced at 24 on center, unless otherwise noted on plans
	Interior Bearing Walls mdked shall be minimum 2x4 studs at 16" on center, unless noted otherwise on plans.

7. Provide minimum nailing in accordance with the 2016 CBC Fastening Schedule (Table 2304.10) of the CBC) unless otherwise specified on the plans or Shearwall Schedule. All connectors into pressure treated wood shall be galvanized.
8. Provide wall sheathing in accordance with the Shearwall Schedule, unless otherwise specified on the plans.
9. Provide roof and floor sheathing in accordance with the Roof and Floor Sheathing Schedule, unless otherwise noted on the plans.
10. See detail 6/SD2 for typical shear panel framing. See detail 2/SD2 for typical floor and roof sheathing layout.
11. Provide solid blocking under all trimmers, bearing points, and posts at holdouns. Posts on upper levels shall have posts of equal or greater size installed below on the lower levels to transfer loads to the foundations or girders.
12. See detail 11/SD2 for typical plate splices and breaks.
13. See details (16/SD2) for typical drilling and notching of top plates, studs, and joists. For drilling and notching of posts consult with Structural Engineer. Hole may be may be made in the sill plates provided the holes or breaks do not decrease the overall sill length by more than 5% of the total required length specified on the plans.
14. See detail 12/SD2 for typical beam to post connections.
15. Floor joists, I joists, roof rafters, ceiling joist, and metal plate connected trusses shall be laterally braced at their ends and each support by solid blocking, I joists blocking, or metal plate connected blocking at least the same size as the framing member. See detail 23/SD5.
16. Stiffeners shall be installed where I joists cantilever over a wall, where a bearing wall is supported at mid-span by I joists, and where joist hangers do not provide lateral support for the top chord of the joists, and where shown on plans.
17. Double floor joists under non-bearing walls parallel with framing or wall lengths in excess of 5 feet. As an alternate a single additional joist may be placed under the wall when the layout of the floor framing is not altered to compensate for the additional wall loading.
18. Joists hangers shall be as follows, unless otherwise specified on plans:

APPLICATION	HANGER
2X- Top mount	Simpson BA
2X- Face mount	Simpson HU
I-Joist top mount	Simpson IT5
I-Joist face mount	Simpson HIU

19. See detail 21/SD2 for wall bracing at non- bearing interior walls.
20. At shear/drag trusses with perpendicular framing over the top chord of the drag/shear truss, block and nail per 11/SD3.
21. At truss to girder connections where the roof sheathing is not continuous over all the truss top chords, the trusses shall be blocked and nailed per 8/SD3. When two trusses are parallel and the roof sheathing is not continuous, provide shear transfer per 16/SD3.

STRUCTURAL DESIGN CRITERIA:

2019 California Building Code

1. Roof and Floor Loading
   Roof slope less ≤ 4:12: Roof Live = 20 PSF
   Roof slope less ≤ 5:12: Roof Live = 19 PSF
   Roof slope less ≤ 6:12: Roof Live = 18 PSF
   Roof slope less ≤ 7:12: Roof Live = 17 PSF
   Roof slope less ≤ 8:12: Roof Live = 16 PSF
   Roof slope less ≤ 9:12: Roof Live = 15 PSF
   Roof slope less ≤ 10:12: Roof Live = 14 PSF
   Deck live load = 60 PSF
   Floor live load = 40 PSF
   Exit live load = N.A.
   Storage live load = N.A.
   Snow Load = N.A.
   Dead load for Solar Panel = 5 psf
2. Wind Design Data
   Basic wind speed (3 sec. gust) = 110 mph
   Exposure = C Wind Importance Factor = 1.0
   Occupancy = II
   Building is classified as 'enclosed'
3. Seismic Design Data
   Fa = 1.2 Sms = 2.552 Sds = 1.701 Ss = 2.127
   S1 = 0.762
   Seismic Importance Factor =1.0 Site Class = D
   Seismic Design Category = D Occupancy = II
   Analysis Procedure used: Equivalent Lateral Force
   Seismic Response Coefficient: Cs=0.15
   Response Modification Coefficient: R = 6.5
   Base seismic force resisting systems: wood shearwall
   Design Base Shear V=0.15W
4. Foundation Design
   Soil Bearing Capacity 1000 psf

GENERAL PLAN NOTES:

1. All work not detailed, specified or noted shall be constructed the same as similar work shown in the construction documents. Where the work is not detailed, specified or noted it shall be in accordance with accepted trade standards for good and workmanship like construction.
2. Refer to Architectural drawings for elevation and location of roofs, floors, walls, partitions and non-structural elements together with their general configurations, size and location of door and window openings roof and floor openings, size and location of elements such as but not limited to drains, curbs, depressed areas, level changes, chamfers, grooves, inserts.
3. Refer to Mechanical, Plumbing, Heating and Air Conditioning, and Electrical drawings for size and location of elements such as but not limited to pipe and conduit runs, sleeves and box outs, and hangers and equipment supports.
4. All dimensions on the structural drawings shall be compared with those on the architectural drawings by the Contractor prior to construction. The Contractor shall notify the Architect and Structural Engineer of discrepancies.

PROJECT HISTORY

Issued for:	Date:	Description:
Submittal	04-13-2022	

STRUCTURAL SHEET INDEX

SHEET	DESCRIPTION
NOTES	
SN1	Structural Notes & Specifications
SN2	Structural Notes & Specifications
SN3	Structural Notes & Specifications
S1.1.0	Foundation Plan
S1.2.0	Roof Framing Plan
DETAILS	
SD1	Foundation Details
SD2	General Framing Details
SD3	Roof Framing Details

IDS engineering, inc.

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CLIENT:
Arun Reddy Kandoor

ARCHITECT:
Diego Valencia
Designer

1450 WALNUT DRIVE
CAMPBELL, CA

DATE ISSUED: 04-13-2022

NO.	DATE:	DESCRIPTION:
1		
2		
3		
4		
5		
6		

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ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. WATTIG
No. C68631
Exp. 09/30/2023
CIVIL
STATE OF CALIFORNIA

SHEET:
STRUCTURAL NOTES AND SPECIFICATIONS

SCALE : NONE

SHT NO. SN1

FASTENING SCHEDULE

Connection	Fastening(a,n)	Location
1. Joist to sill or girder	3-8d common (2-1/2" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	toenail
2. Bridging to joist	2-8d common (2-1/2"x0.131") 2-3"x0.131" nail 2-3"14 gage staples	toe nail ea. end
3. 1" x 6" subfloor or less to ea. joist	2-8d common (2-1/2" x 0.131")	face nail
4. Wider than 1" x 6" subfloor to ea. joist	3-8d common (2-1/2" x 0.131")	face nail
5. 2" subfloor to joist or girder	2-16d common (3-1/2" x 0.162")	blind and face nail
6. Sole plate to joist or blocking	16d (3-1/2" x 0.135") at 16" o.c. 3" x 0.131" nails at 8"o.c. 3" 14 gage staples at 12" o.c.	typical face nail
Sole plate to joist or blocking at braced wall panel	3"-16d (3-1/2" x 0.135") at 16" o.c. 4-3" x 0.131" nails at 16"o.c. 4-3" 14 gage staples per 16"	braced wall panel
7. Top plate to stud	2-16d common (2-1/2" x 0.162") 3-3 1/2" x 0.135" nail 3-3" x 0.131" nail 3-3" 14 gage staples	end nail
8a. Stud to 2x-sole/sill plate	4-8d common (2-1/2" x 0.131") 4-3" x 0.131" nails 3-3" 14 gage staples	toe nail
8b. Stud to 2x-sole/sill plate	2-16d (3-1/2" x 0.162") 3-3 1/2" x 0.135" nail 3-3" x 0.131" nails 3-3" 14 gage staples	end nail
8c. Stud to 3x-sole/sill plate	2-20d Sinker nails 2-0.148"x4 1/8" nails	end nail
9. Double studs	16d (3-1/2" x 0.135") at 24" o.c. 3" x 0.131" nails at 8" o.c. 3" 14 gage staples at 8" o.c.	face nail
10. Simpson double top plates, u.n.o.	16d (3-1/2" x 0.135") at 16" o.c. 3" x 0.131" nails at 12" o.c. 3" 14 gage staples at 12" o.c.	typical face nail
Simpson double top plates, u.n.o. ¢ see detail II/SD2 for more information	8-16d common (3-1/2" x 0.162") 12-3" x 0.131" nails 12-3" 14 gage staples	lap splice
11. Blocking between joist or rafters to top plate	3-8d common (2-1/2" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	toe nail
12. Rim joist to top plate	8d (2-1/2" x 0.131") at 6" o.c. 3" x 0.131" nail at 6" o.c. 3" 14 gage staples at 6" o.c.	toe nail
13. Top plates, laps and intersections	2-16d common (3-1/2" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	toe nail
14. Continuous header, two pieces	16d common (3-1/2" x 0.161")	16" o.c. along edge
15. Ceiling joists to plate	3-8d common (2-1/2" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	toe nail
16. Countinuous header to stud	4-8d common (2-1/2" x 0.131")	toe nail
17. Ceiling joists, laps over partition (see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (2-1/2" x 0.162") min, Table 2308.10.4.1 4-3" x 0.131" nails 4-3" 14 gage staples	face nail
18. Ceiling joists to parallel rafters (see Section 2308.10.4.1, Table 2308.10.4.1)	3-16d common (2-1/2" x 0.162") min, Table 2308.10.4.1 4-3" x 0.131" nails 4-3" 14 gage staples	face nail
19. Rafter or truss to plate (see Section 2308.10.4.1, Table 2308.10.4.1)	3-8d common (2-1/2" x 0.131") 3-3" x 0.131" nails 3-3" 14 gage staples	toe nail
20. 1" diagonal brace to ea. stud and plate	2-8d common (2-1/2" x 0.131") 2-3" x 0.131" nails 3-3" 14 gage staples	face nail
21. 1" x 8" sheathing to ea. bearing	3-8d common(2-1/2" x 0.131")	face nail
22. Wider than 1" x 8" sheathing to ea. bearing	3-8d common (2-1/2" x 0.131")	face nail
23. Built-up corner studs ¢ see detail 7/SD2 for more information	16d common (3-1/2" x 0.162") 3" x 0.131" nails 3" 14 gage staples	24" o.c. 16" o.c. 16" o.c.
24. Built-up girder and beams, u.n.o.	20d common (4" x 0.192") 32" o.c. 3" x 0.131" nails at 24" o.c. 3" 14 gage staple at 24" o.c.	face nail at top and bott. staggered on opposite sides
	2-20d common (4" x 0.192") 3-3" x 0.131" nails 3-3" 14 gage staples	face nail at ends and at ea. splice
25. 2" planks	16d common (3-1/2" x 0.162")	at ea. bearing
26. Collar tie to rafter	3-10d common (3" x 0.148") 4-3" x 0.131" nails 4-3" 14 gage staples	face nail
27. Jack rafter to hip	3-10d common (3" x 0.148") 4-3" x 0.131" nails 4-3" 14 gage staples	toe nail
	2-16d common (3-1/2" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	face nail
28. Roof rafter to 2-by ridge beam	2-16d common (3-1/2" x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	toe nail/face nail
29. Joist to band joist	3-16d common (3-1/2" x 0.162") 4-3" x 0.131" nails 4-3" 14 gage staples	face nail
30. Ledger strip	3-16d common (3-1/2" x 0.162") 4-3" x 0.131" nails 4-3" 14 gage staples	face nail
31. Wood structural panels and particleboard subfloor, roof and wall sheathing (to framing)	1/2" and less - 6d 2-3/8" x 0.113" nail 1-3/4"16 gage	face nail
	19/32" to 3/4" - 8d(c) or 6d(d) 2-3/8" x 0.113" nail(p) 2" 16 gage(p)	
	7/8" to 1" - 8d(c) 1-1/8" to 1-1/4" - 10d(d) or 8d(d)	
Single Floor (combination subfloor-underlayment to framing)	3/4" and less 2" 16 gage(p) 7/8" to 1" 8d(e) 1-1/8" to 1-1/4" 10d(d) or8d(e)	

Connection	Fastening(a,n)	Location
32. Panel siding (to framing)	1/2" or less 6d(f) 5/8" 8d(f)	face nail
33. Fiberboard sheathing(g)	1/2" No.11 gage roofing nail(h) 6d commonn nail (2" x 0.113") No.16 gage staple(i)	face nail
	25/32" No.11 gage roofing nail(h) 8d commonn nail (2-1/2" x 0.131") No.16 gage staple(i)	
34. Interior paneling	1/4" 4d(j) 3/8" 6d(k)	face nail

For SI: 1"=25.4mm

a. Common or box nails are permitted to be used except where otherwise stated.

b. Nails spaced at 6" o.c. at edges , 12" at intermediate supports except 6" at supports where spans are 48" or more. For nailing of wood structural panel and particleboard diaphrams and shear walls, refer to Section 2305. Nails for wall sheathing are permited to be common, box or casting.

c. Common or deformed shank (6d-2" x 0.113" , 8d-2-1/2" x 0.113 , 10d-3" x 0.148").

d. Common (6d-2" x 0.113" , 8d-2-1/2" x 0.131" , 10d-3" x 0.148")

e. Deformed shank (6d-2" x 0.113" , 8d-2-1/2" x 0.113" , 10d-3" x 0.148")

f. Corrosion-resistant siding(6d-1-7/8" x 0.106" , 8d-2-3/8" x 0.128") or casing(6d-2" x 0.099" , 8d-2-1/2" x 0.113") nail.

g. Fasteners spaced 3" o.c. at exterior edges and 6" o.c. at intermediate supports, when used as structural sheathing. Spacing shall be 6" o.c. on the edges and 12" o.c. at intermediate supports for nonstructural applications.

h. Corrosion-resistant roofing nails with $\frac{7}{16}$" diameter head and 1-1/2" length for $\frac{1}{2}$" sheathing and 1-3/4" length for $\frac{25}{32}$" sheathing.

i. Corrosion-resistant staples with nominal $\frac{7}{16}$" crown and 1-1/8" length for $\frac{1}{2}$" sheathing and 1-1/2" lenght for $\frac{25}{32}$" sheathing. Panel supports at 16" (20" if strength axis in the long direction of the panel, unless otherwise marked).

j. Casing (1-1/2" x 0.080") or finish (1-1/2" X 0.072") nails spaced 6" on panel edges, 12" at intermediate supports.

k. Panel supports at 24". Casing or finish nails spaced 6" on panel edges, 12" at intermediate supports.

l. For roof sheathing application, 8d nails(2-1/2" X 0.113") are the min. required for wood structural panels.

m. Staples shall have a min. crown width of $\frac{7}{16}$"

n. For roof sheathing application, fasteners spaced 4" o.c. at edges, 8" at intermediate supports.

o. Fasteners spaced 4" o.c. at edges, 8" at intermediate supports for subfloor and wall sheathing and 3" o.c. at edges, 6" o.c. at intermediate supports for roof sheathing.

p. Fasteners spaced 4" o.c. at edges, 8" at intermediate supports.

q. Fasteners installed into pressure treated wood shall be hot dip galvanized.

HARDWARE SUBSTITUTION SCHEDULE:

1. Hardware shown on the Structural Drawings is Simpson Strong-Tie company products. USP company products may be substituted in accordance with the following schedule:

Simpson (Specified)	USP (Alternate)	Simpson (Specified)	USP (Alternate)
A34	MP34	SSTB24	STB24
A35	MTA1	SSTB28	STB28
LTP4	MP4F	SSTB34	STB34
ITT	THO	HPAHD22	HPAHDD2
IUB/IUT	THF	STHD10	STAD10
LUS	JUS	STHD14	STAD14
MIT	THO	HTT22	HTT22
T922	RTI6T	PHD6	PHD6
ST6224	KST224	PHD8	PHD8
ST6236	KST234	HD10A	TDX10
MST48	KST248	HD14A	AD814
MST60	KST260	HD15	T515
MST72	KST272	MIT	THO
CS16	RSI5O	MIU	THF (used w/ stiffiners only)
CMSTC16	CMSTC16		

ROOF AND FLOOR SHEATHING SCHEDULE, WOOD:

1. Floor Sheathing: 23/32" thick wood product panel. Edges shall be tongue and groove span rating shall be 24 inches. Orientation shall be with face grain perpendicular to support. Provide 2x4 blocking at all edges (except those supported by framing) where blocking is indicated. Sheathing adhesive to be applied to framing members prior to placement of sheathing. Sheathing to be fully nailed prior to setting of adhesive. Nail sheathing as follows:
2. Typical floor sheathing fastening shall be:
   10d common or 10d plywood ring shank nails or "8 X 2" or longer screws at 6 inches OC along all boundaries and edges and 10 inches OC in field. Blocking is not required.
3. Blocked floor sheathing fastening shall be (where noted on drawings):
   10d common or 10d plywood ring shank nails or "8 X 2" or longer screws at 4 inches OC along all boundaries and edges and 10 inches OC in field. Provide 2x4 blocking flat.
4. Roof Sheathing: 15/32" wood product panels. Span index shall be 32/16. Orientation shall be with face grain perpendicular to support. Provide 2x4 flat blocking at all unsupported edges where blocking is indicated. Crickets and saddles to be framing to overlay plywood sheathing. Nail sheathing as follows:
5. Typical roof sheathing nails shall be:
   8d common nails at 6 inches OC along all boundaries and edges and 12 inches OC in field. Blocking is not required.
   Alternate straps may not be used for blocked portions of the roof.
6. Blocked roof sheathing nails shall be:
   8d common nails at 4 inches OC along all boundaries and edges and 12 inches OC in field. Provide 2x4 blocking flat.
   Alternate straps may not be used for blocked portions of the roof.
7. Fastening of floor and roof sheathing shall be inspected by the Building Official prior to concealment.
8. The floor and roof sheathing are entirely structural and vital for shear transfer at seismic and wind loading on a structure. Ventilation holes are not permitted in the floor or roof sheathing unless specifically detailed or specified on the structural plans. This includes areas at over-framing, decks, roofs, mechanical ducts, and plumbing lines, or any other penetrations, even if or when mentioned on the architectural or M.E.P. plans and details. If allowable penetrations are not noted on the structural plans or details, then the structural engineer is not aware of penetrations and they may be detrimental to the structure.

DIVISION 1: GENERAL REQUIREMENTS

01000 GENERAL REQUIREMENTS AND CODES:

1. Work shall comply with these structural specifications, notes, and drawings together with associated specifications, notes and drawings--collectively referred to as the Construction Documents. Where the construction documents do not give specific instruction, work shall be in accordance with accepted trade standards for good and workmanlike construction.
2. Work shall comply with the 2019 California Building Code (CBC) as adopted and amended by the California Code of Regulations (CCR) Title 24 California Building Code and as adopted and amended by the local city or county and any agencies having jurisdiction--collectively referred to as the Building Code.
3. Work shall comply with applicable federal laws, state statutes, local ordinances, and the regulations of agencies having jurisdiction. The Contractor shall assume full responsibility for complying with the construction safety orders and the general industrial safety orders of the State Division of Industrial Safety, the regulations of the Federal and State Occupational Safety and Health Administrations, and such other agencies governing the Contractor's acts. The Contractor shall be responsible for and hold harmless the Structural Engineer for any damages and penalties or both resulting from his failure to comply with said laws, statutes, ordinances, and regulations.
4. The design, adequacy and safety of erection bracing, shoring, temporary supports, etc. is the sole responsibility of the Contractor, and has not been considered by the Structural Engineer. The Contractor is responsible for the stability of the structure prior to the application of all shear walls, roof and floor diaphragms and finish materials. He shall provide the necessary bracing to provide stability prior to the application of the aforementioned materials. Observation visits to the site by the Structural Engineer or his designee shall not include inspection of the above items.

01100 ALTERNATIVES AND DISCREPANCIES:

1. No alternate methods of construction or substitutions shall be allowed without written approval of the Owner and Structural Engineer.
2. The Contractor shall verify all dimensions and conditions on the Construction Documents and at the site and shall notify the Architect and Structural Engineer of any discrepancies found prior to commencing work. The structural drawings take precedence over specifications. Detailed drawings and detailed specifications take precedence over general drawings and general specifications. Dimensions take precedence over scaled measurements.

01340 SHOP DRAWINGS

1. The Contractor shall submit to the Structural Engineer, and if required to the Building Official, shop drawings as noted in the SHOP DRAWINGS AND DEFERRED SUBMITTAL SCHEDULE. Prior to the submission, the Contractor shall check the drawings for conformance with the Construction Documents and so indicate on the drawings that he has done so.
2. Sufficient copies shall be submitted so as to allow the Structural Engineer to retain one copy.
3. Deviations from the design intent shall be clearly indicated as such by clouding them on the submittal or in another readily apparent manner.
4. Review made of the Shop Drawings shall not relieve the contractor from responsibility for compliance with the Construction Documents. The Shop Drawings will be reviewed for general conformance with the design concept of the project as indicated by the Construction Documents. Quantities or dimensions will not be reviewed. Processes, techniques of construction, safety procedures, or coordination of the work with that of any other trade will not be reviewed.

01410 TESTING AGENCIES:

1. The Owner shall retain the services of an Independent Testing Agency (Testing Laboratory) as required elsewhere by these Construction Documents. The Testing Agency shall be approved by the Building Official.
2. Each Testing Agency shall furnish the results to the Special Inspector, the Building Official, Architect and Structural Engineer.

01420 SPECIAL (DEPUTY) INSPECTIONS:

1. The Owner shall retain the services of a Special Inspector (Registered Deputy Inspector), when such services are required, as noted in the SCHEDULE OF SPECIAL INSPECTION.
2. The Special Inspector shall have a valid Certificate of Registration or License issued by the Building Official. A current copy shall be submitted to the owner and structural engineer.
3. Each Special Inspector shall observe the work of the Contractor and the taking of test samples for conformance with the Construction Documents, and the applicable workmanship provisions of the Building Code. The Special Inspector shall furnish inspection reports to the Building Official, Architect and Structural Engineer. All discrepancies in work shall be brought to the immediate attention of the Contractor for correction, then if uncorrected, to the Building Official, Architect and Structural Engineer. The Special Inspector shall submit progress reports, appropriate to the nature of the work, and a final signed report stating whether the work requiring special inspection was, to the best of the Inspector's knowledge, in conformance with these Construction Documents and the applicable workmanship provisions of the Building Code to the Building Official, Architect and Structural Engineer.
4. Inspection of work by a Special Inspector shall not relieve the Contractor of any inspections by the Building Official. Work inspected by a Special Inspector but covered or concealed prior to inspections by the Building Official may be required to be exposed.

01430 SOILS OBSERVATION:

1. The owner shall retain the services of the Soils Engineer, when such services are required, as noted in the SCHEDULE OF SPECIAL INSPECTION.
2. The Soils Engineer shall observe and document, in accordance with the Soils Report, the work of the Contractor.
3. The Soils Engineer shall furnish observation reports to the Building Official, Architect and Structural Engineer as to the conformance of the contractor's work with the soils report and building code.

01440 STRUCTURAL OBSERVATION:

1. The owner shall retain the services of the Structural Engineer, when such services are required, as noted in the SCHEDULE OF SPECIAL INSPECTION.
2. The individual designated by the owner, shall be responsible for observing the structural work on a periodic basis during the course of construction.
3. The Contractor shall coordinate, in a timely manner, a pre-construction meeting. The meeting shall include the Structural Engineer's designee providing periodic structural observation, the contractor, appropriate subcontractors, Special Inspectors and other interested parties. The purpose of the meeting is to identify and clarify all essential structural elements and connections that affect the vertical and lateral systems, and to review scheduling of the required structural observations
4. The Structural Observer shall prepare written reports for each observation visit, including reports in a form according to the Building Official's policies and procedures, of his observations and specifics as to findings and recommendations. The report shall be signed and sealed by the Structural Observer. The Structural Observer shall furnish the reports to the Building Official prior to his inspections and to the Contractor.
5. Observation of the work by the Structural Engineer-of-Record or his designee is made only to assist the Contractor in complying with the intent of the structural construction documents and as necessary to afford the Structural Engineer-of-Record an opportunity to make a determination as to if, in his professional opinion, the work observed was constructed in general conformance with the intent of the structural construction documents. Observation of the work or the rendition of an opinion that it is in general conformance with the intent of the construction documents does not constitute a warrantee, either expressed or implied, that the work is in fact in conformance with the construction documents or the Building Code. Observation of the work does not relieve the contractor, et. al. (that is, the general contractor, sub- contractors, sub subcontractors, material-men and others,) of their responsibility for the quality of the work and for adhering to the construction documents and the requirements of the Building Code.
6. Observation of the work by the Structural Observer does not relieve the Contractor from obtaining other inspections, including but not limited to those of the Building Official, Soil Engineer or Special Inspector. Work must not be concealed or covered until each party obligated to make inspections or observations has done so. An opinion by the Structural Observer that the work observed was constructed in general conformance with the intent of the structural construction documents, does not obligate the Building Official to approve the work nor does it relieve the Building Official from his obligation to inspect the work.

DIVISION 2: SITE WORK AND FOUNDATIONS

02010 SUBSURFACE INVESTIGATION:

1. The soils report is hereby incorporated into these drawings. Recommendations made therein shall be complied with.

02350 CONVENTIONAL FOUNDATIONS:

1. The Contractor shall take all necessary measures to fully protect adjacent properties.
2. All site and pad preparation, such as but not limited to, grading, compaction of the fill, pre-saturation, concrete slab base preparation and vapor retarder installation shall be performed in accordance with the Soils Engineer's recommendations as included in the soils report.
3. The bottoms of footing excavations shall be level, clean, and free of loose material or water when concrete is placed. Over excavation shall be filled with concrete as for the footings. Back fill shall not be placed until supporting foundations, walls, and slab have attained sufficient strength to support lateral soil pressure.
4. No pipes and conduits shall extend under isolated column footing or under continuous wall footing unless specifically detailed or approved by the Architect and Structural Engineer and the Building Official.
5. Finish grade about the perimeter of the structure shall be such that rain and irrigation water drain away from the foundation as required by the civil drawings.
6. Vapor (retarder) barrier shall be High-Density Polyethylene plastic film and shall conform to ASTM E 1745, Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
7. Slab must not be poured during or immediately after rainstorms base layer material above vapor barrier shall not be saturated at the time if the concrete pour. Any free water trapped in the base layer must be removed prior to the concrete pour.
8. Workmanship during the placing and finishing operations and protection during the curing of the foundations shall be such that the resulting cured concrete shall be free of significant cracks or significant vertical displacement.
9. The Contractor shall arrange for observation of the work by the Soils Engineer. Following are requirements of the Soils Engineer:
   a) All pad preparation and footing excavations shall be inspected and certified in compliance with the soils report by the Soils Engineer prior to placing of concrete or steel.
   b) A Certificate of Compliance regarding pad preparation and footing excavation) shall be submitted to the Building Official prior to his foundation inspection and a copy of the certification shall be submitted to the Architect and Structural Engineer.

DIVISION 3: CONCRETE

03230 REINFORCING STEEL FOR CONVENTIONAL FOUNDATIONS:

1. Steel reinforcing bars shall conform to ASTM A 615, Deformed and Plain Billet Steel Bars for Reinforcing Steel. Bars shall be grade 60 except that No. 3 ¢ 4 bars may be grade 40. Bars shall be deformed. Mill certificates for reinforcing bars shall be submitted to the Building Official prior to use, and to the Architect and Structural Engineer.
2. Wire fabric shall conform to ANSI/ASTM A 185, Steel Welded Wire Fabric, Plain for Concrete Reinforcement.
3. Placement of reinforcing steel need not be inspected by a Special Inspector.
4. Refer to latest edition of the ACI-117 for construction tolerances.

03260 CONCRETE ACCESSORIES:

1. Anchor bolts, L-bolts, J-bolts, bars, and rods shall conform to ASTM A 307, Carbon Steel Externally and Internally Threaded Standard Fasteners. Threads may be cut into full size bar stock or may be rolled threads.
2. SSTBm anchor bolts are Simpson Company products, Brea, California, (ICC report no. 4935). Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
3. Shot-pins shall be one of the following. Installation shall be in accordance with the manufacturer's recommendations. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
   a) Hilti Company products, Tulsa, Oklahoma, (ICC reports nos. 1290 and 2388; L.A. City report no. 25821).
   b) ITW Ramset/Red Head products, Wood Dale, Illinois, (ICC reports nos. 1147 and 1639).
4. Expansion anchors (wedge anchors) shall be one of the following. Installation shall be in accordance with the manufacturer's recommendations. When noted on Construction Documents installation shall be inspected by a Special Inspector in accordance with Section 01410 of this specification. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
   a) Hilti Company products, Tulsa, Oklahoma, (ICC reports no. 4627).
   b) ITW Ramset/Red Head products, Wood Dale, Illinois, (ICC reports no. 1372).
   c) Simpson products, Dublin, California, (ICC reports no. 3631).
5. Concrete screw anchors (large diameter anchors) shall be one of the following. Installation shall be in accordance with the manufacturer's recommendations. When noted on Construction Documents installation shall be inspected by a Special Inspector in accordance with Section 01410 of this specification. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
   a) ITW Ramset/Red Head products, Wood Dale, Illinois, (ICC reports no. 5890).
   b) Simpson products, Dublin, California, (ICC reports no. 5794).
6. Adhesive anchors (chemical anchors) shall be one of the following. Installation shall be in accordance with the manufacturer's recommendations. When noted on Construction Documents installation shall be inspected by a Special Inspector in accordance with Section 01410 of this specification. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
   a) Hilti Company products, Tulsa, Oklahoma, Hilti "Re-500 Adhesive" (ICC reports no. 5363) or Hilti "HY150 Adhesive" (ICC no. 5193).
   b) ITW Ramset/Red Head products, Wood Dale, Illinois, " C6 Adhesive" or "AT Adhesive".
   c) Simpson products, Dublin, California, "Set High Strength Epoxy Adhesive (ICC reports no. 5278) or "AT High Strength Acrylic Adhesive" (ICC Report no. pending).
7. Manufactured hardware shall be Simpson Company products, Brea, California, (ICC report nos. NER 393, NER 4693 L.A. City report no. 24818). Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of hardware to be substituted.
8. Steel field and shop-fabricated accessories shall comply with Section 05120 of this specification.
9. Installation of Adhesive Anchors shall be continuously inspected by a special inspector. Following are requirements of the Special Inspector: The inspector shall observe the work of the contractor during the installation of the Adhesive Anchors for conformance with the applicable ICBO Report, the manufacturer's recommendations, and the applicable workmanship provisions of the building code. The Special Inspector shall furnish inspection reports to the Building Official, Architect and Structural Engineer. All discrepancies in the work shall be brought to the immediate attention of the contractor for correction, then if un-corrected to the Building Official, Architect, and Structural Engineer The Special Inspector shall submit a final signed report stating whether the work requiring Special Inspection was to the best of Inspector's knowledge, in conformance with the approved construction documents and the applicable workmanship provisions of the Building Code to the Building Official, Architect, and Structural Engineer. Inspection of work by a Special Inspector shall not relieve the contractor of any inspections by the Building Official.

IDS engineering, inc.

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DATE ISSUED: 04-13-2022

NO.	DATE:	DESCRIPTION:
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ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. WATTIG
No. C68831
Exp. 08/30/2023
CIVIL
STATE OF CALIFORNIA

SHEET:
STRUCTURAL NOTES AND SPECIFICATIONS

SCALE : NONE

SHT NO. SN2

03300 CONCRETE, CAST IN PLACE:

1. Cement shall conform with ASTM C 150 & C 595, Portland Cement & Blended Hydraulic Cements.
2. Fly ash or pozzolans, if used, shall conform with ASTM C 618, Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete. Usage shall not exceed 25 percent, by weight of the total of the cementitious materials. When pozzolans are used to mitigate the effect of sulfate containing soils they shall be of a type that has demonstrated such ability by test or service record.
3. Water shall be potable and free from deleterious quantities of acids, alkalis, and organic materials. Sulfate (SO4) in water shall not exceed 150 parts per million.
4. Aggregate shall conform with ASTM C 33, Concrete Aggregates. The nominal maximum size of course aggregate shall be not larger than any of the following:
   a) One-fifth the narrowest dimension between the sides of the form.
   b) One third the depth of the slab.
   c) Three fourths the minimum clear spacing between individual bars or bundles of bars.
   d) 1 inch.
5. Admixtures containing calcium chlorides shall not be used.
6. The Contractor shall retain the services of a qualified licensed engineer to provide a Concrete Mix Design for each Class of Concrete to be used. The engineer shall sign and seal the mix designs.
7. Concrete Mix Designs used shall have the following properties and be subject to the listed quality control procedures:
   a) Strength, slump, testing, and inspection of the concrete shall be:

Concrete Usage Schedule:

Class (Use) of Concrete	28 Day Min. Strength	Maximum Slump	Special Inspector	Cylinder Testing
Floor Slab on Grade.	2500 PSI	4 in.	Not required.	Not required.
Piers	2500 PSI	4 in.	Required	Required
Grade Beams	2500 PSI	4 in.	Required	Required
Post-Tention Slabs	2500 PSI	4 in.	Required	Required

Note:
1) The 28 day minimum strength may be reduced to 2500 PSI for concrete subject to negligible sulfate exposure.
2) The maximum slump of the concrete may be increased by 1 inch when the concrete is hand consolidated. The slump given is based on mechanical consolidation.

   b) Water-cement ratio, cement type, and pozzolans and minimum strength shall additionally conform to the following for concrete used in floor slabs-on-grade and foundations:

Requirements for Concrete Exposed to Sulfate:

Water Soluble Sulfate (SO4) in Soil, Percent by Weight	Sulfate Exposure	Cement type ASTM C 150	Maximum Water-Cement Ratio	28 Day Min. Strength
0.00 - 0.10	Negligible	II or V	0.45	
0.10 - 0.20	Moderate	II or V	0.45	4000 PSI
0.20 - 2.00	Severe	V	0.45	4500 PSI
Over 2.00	Very Severe	V w/ pozzolan	0.45	4500 PSI

   c) The concrete mix design shall be such that the resulting cured concrete shall be free of significant cracks or significant vertical displacement
   d) The concrete mix design shall be such that the resulting cured concrete at 28 to 42 days of age shall have a water soluble chloride ion(Cl) content in concrete of no more than 0.30 percent by weight for conventionally reinforced concrete and 0.06 percent for post-tensioned concrete.
8. Concrete shall be mixed and delivered in accordance with ASTM C 94, Ready-Mixed Concrete.
9. Monolithic pour: except for where cold joints are noted concrete shall be poured monolithically. When placement consists of multiple batches or truck deliverys, the work shall be scheduled so that each batch is placed while the preceding one is still plastic. If the preceding batch placement has just stiffened beyond the point where it can be penetrated by vibration, bond may be achieved by thoroughly and systematically vibrating the subsequent batch into contact with the proceeding batch.
10. Testing of concrete:
    a) Tests need not be made as noted above provided the total quantity of concrete placed is less than fifty (50) cu. yd. In place of the tests, a Letter of Certification shall be furnished by the Material Supplier to the Building Official, Architect and Structural Engineer prior to delivery of the materials to the job site. The letter shall assure that the concrete will have the strength specified.
    b) Tests shall be made when testing is noted above or where the total quantity of concrete placed is greater than fifty (50) cu. yd. Concrete test cylinders shall be taken and tested in accordance with ASTM C 31, & ASTM C 39. A cylinder set is a set of two (2) cylinders from each batch of concrete sampled. Cylinder sets shall be sampled at a rate of not less than one (1) set per Class of Concrete placed per day, nor less than one set per 150 cu. yd. placed, nor less than one set per 5000 sq. ft. of slab or wall area. Further no less than five (5) cylinders sets shall be made of each Class of Concrete or should the total number of batches for a given Class of Concrete be less than five (5), one (1) cylinder set shall be made for each batch placed. Test results shall be furnished to the Building Official, Architect, and Structural Engineer. Test results shall assure that the concrete cylinders achieve a minimum strength specified.
11. Curing. Concrete shall be maintained above 50°F and in a continuously moist condition for at least seven (7) days after placement.
12. Minimum concrete protection for stressing tendons and reinforcing steel shall be as follows:

Stressing Tendon and Reinforcing Bar Cover Schedule:

Condition	Clearance
Cast against and permanently exposed to earth.	3"
Cast against forms, exposed to earth or weather:	
#6 through #11 bars (19mm through 36mm):	2"
#5 bars (16mm), and smaller, Stressing tendon.	1-1/2"
Cast against forms, not exposed to weather or in contact with ground:	
#11 bars (19mm) and smaller. In slabs, walls, joists.	3/4"
#11 bars (19mm) and smaller. In beams, girders, columns.	1-1/2"
Stressing tendon.	1-1/2"
Tolerances	

Prestressed Reinforcement

Tendons/ Vertical: Center on Gravity of Steel (or CGS) in the middle 1/3 of the actual foundation thickness, but not to exceed ±1 in.

Tendons/ Horizontal: Variance from plan location ±12 in. with smooth transition around obstructions with a minimum deviation of 1:6.

Non-prestressed Reinforcement

Vertical: CGS in the middle 1/3 of the actual foundation thickness or when the vertical location is specified in the contract documents.

±3/4 in. for foundations 0 12 in. thick.

±1 in. for foundations > 12 in. thick.

Horizontal: ±3 in.

Note:Refer to latest edition of the ACI-117 for construction tolerances.

13. Placement of concrete shall be continuously inspected, by a Special Inspector when inspection is noted as being required above. Following are requirements of the Special Inspector:
    a) He shall verify the taking of test samples.
    b) He shall verify slump.
    c) He shall verify the various types and classes of concrete used. He shall verify load tickets.
    d) He shall verify that construction details, procedures, and workmanship are in accordance with the Construction Documents and Building Code.
    e) He shall verify that proper curing procedures are implemented.
    f) A Certificate of Inspection shall be furnished by the Special Inspector to the Building Official prior to his inspection and to the Architect, and Structural Engineer.

DIVISION 6: WOOD

06050 FASTENERS AND SUPPORTS:

1. Generic nails shall be of steel wire and conform with ASTM F 1667 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples. All nails shown on the drawings , and not specified otherwise, shall be sinker or common nails. Sinker, box or other configuration of nails may not be substituted for common nails when common nails are shown on the drawings. Paslode nails shall be substituted for joist hanger nails of the same size. Paslode nails shall be manufactured by ITW Paslode, Vernon Hills, Illinois (ICC ER-5179).
2. Pneumatic nails may be substituted for generic nails provided they are of the same dimensions as generic nails with the exception of the nail head. Pneumatic nail dimensions may be larger in diameter than generic nails by up to the size of a common nail within the same penny weight classification. The head may, in addition to being of a standard-diameter round-head type, be a T-shaped or modified round-head. Pneumatic nails shall be ICC approved.
3. Nail sizes shall conform with the following table. When necessary to prevent splitting of the wood, a prebored pilot hole shall be drilled.

Nail Size Schedule:

Size & Name	Nail Length	Wire Dia.	Wire Gauge	Head Dia.	Pre-bore Drill Dia.
8d Joist Hanger (Simp. N8)	1-1/2"	.131"	10-1/4	.281"	
8d Paslode	1-1/2"	.131"			
8d Ring Shank	2-3/8"	.120"	11	.297"	
8d Common	2-1/2"	.131"	10-1/4	.281"	
10d Joist Hanger (Simp. N10)	1-1/2"	.148"	9	.312"	
10d Paslode	1-1/2"	.148"			
10d Plywood	2-1/4"	.148"	9	.312"	
10d Plywood Ring	2-3/8"	.135"	10	.312"	
10d Common	3"	.148"	9	.312"	
16d Joist Hanger (Simp. N16)	2-1/2"	.162"	8	.344"	
16d Paslode	2-1/2"	.162"			
16d Short (Framer)	3-1/4"	.131"	10-1/4	.281"	
16d Box	3-1/2"	.135"	10	.344"	
16d Sinker	3-1/4"	.148"	9	.344"	
16d Common	3-1/2"	.162"	8	.344"	1/8" or no. 30 drill gage
20d Box	4"	.148"	9	.375"	
20d Common	4"	.192"	6	.406"	1/8" or no. 30 drill gage
20d Simpson N20A, Ring	1-3/4"	.192"	6	.406"	1/8" or no. 30 drill gage
20d Simpson N20AN, Ring	2-1/8"	.192"	6	.406"	1/8" or no. 30 drill gage
40d Common	5"	.225"	4	.469"	11/64"or no. 18 drill gage
50d Simpson N54A, Ring	2-1/2"	.250"	3		3/16" or no. 14 drill gage

4. Adhesives used to attach floor sheathing to framing shall conform with American Plywood Association Specification AFG-01, ASTM D 3498 Adhesives for Field-Gluing Plywood to Wood Framing. The Adhesive shall be certified as conforming to AFG-01 by a testing agency approved by the Building Official or accepted by the Federal Housing Administration. Adhesive shall meet the requirements for wet condition of service. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a a listing of adhesives to be substituted.
5. Masons shall be one of the following. Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of products and sizes to be substituted.
   a) Simpson Company products, Brea, California:

ICC Report Nos.				L.A. City Report Nos.		
1211	5313	5671	NER 209	RR 22086	RR 25149	RR 25388
3631	5328	5672	NER 393	RR 24682	RR 25158	RR 25471
4546	5349	5683	NER 413	RR 24818	RR 25185	RR 25493
4935	5351	5708	NER 421	RR 24947	RR 25236	RR 25469
4945	5485	5709	NER 422	RR 24949	RR 25248	RR 25489
5090	5531	5781	NER 432	RR 25064	RR 25279	
5171	5649	5784	NER 443	RR 25074	RR 25281	
5268	5655	5824	NER 469	RR 25076	RR 25293	
5275	5656	5952	NER 498	RR 25119	RR 25300	
5279	5670			RR 25120	RR 25318	

   b) USP Structural Connectors, Montgomery, Minnisota:

ICC Report Nos.			L.A. City Report Nos.		
ES ER-2039	ES ER-5531		RR 23868	RR 25332	
ES ER-2725	ES ER-5634		RR 25104	RR 25391	
ES ER-3613	ES ER-5684		RR 25283	RR 25357	
ES ER-3125	ES ER-5700		RR 25303	RR 25361	
ES ER-5321	ES ER-5736		RR 25307	RR 25433	
ES ER-5356	ES ER-5764		RR 25325	RR 25434	
ES ER-5379	ES ER-5830		RR 25327		

6. Machine bolts shall be of metal conforming with ASTM A 307, Low Carbon Steel Externally and Internally Threaded Standard Fasteners and shall conform with ANSI/ASME B 18.2.1, Square and Hex Bolts and Screws (Inch Series). Washers shall be used under all bolt heads and nuts bearing on wood. Machine bolts shall be installed in accordance with the following:

Machine Bolting Hole Schedule:

Bolt Diameter	Hole Through Wood
1/4 inch	9/32 inch
3/8 inch	13/32 inch
1/2 inch	9/16 inch
5/8 inch	11/16 inch
3/4 inch	13/16 inch
7/8 inch	15/16 inch
1 inch	1 1/16 inches

7. Lag screws shall conform with ANSI/ASME B 18.2.1, Square and Hex Bolts and Screws (Inch Series). Lead holes shall be bored prior to installation for the full length of the lag bolt. The threaded portion of the lag bolt shall be inserted in its lead hole by turning with a wrench, not by driving with a hammer. Soap or other lubricant shall be used on the screw or in the lead hole to facilitate insertion and prevent damage to screw. In determining the penetration of the threaded portion of lag screw into a member, the reduced portion (threaded or gimlet point) of the shank shall not be considered as part of the penetration. Washers shall be used under all lag bolt heads and nuts bearing on wood. Lag bolts shall be installed in accordance with the following:

Lag Screwing Schedule:

Bolt Diameter	Hole For Unthreaded Shank	Hole For Threaded Shank
1/4 inch	1/4 inch	5/32 inch
3/8 inch	3/8 inch	15/64 inch
1/2 inch	1/2 inch	5/16 inch
5/8 inch	5/8 inch	13/32 inch
3/4 inch	3/4 inch	1/2 inch
7/8 inch	7/8 inch	39/64 inch
1 inch	1 inch	23/32 inch

8. Round washers shall be ANSI/ASME B 18.22.1, Plain Washers. Square washers shall be of mild steel. Washers shall be used under all bolt heads and nuts bearing on wood. Machine bolts shall be installed in accordance with the following:

Washer Schedule:

Bolt Diameter	Washer Inside Dia.	Round Washer Outside Dia.	Round Washer Thickness	Square Washer Side length	Square Washer Thickness
1/4 inch	5/16 inch	3/4 inch	1/16 inch		
3/8 inch	7/16 inch	1 inch	5/64 inch		
1/2 inch	9/16 inch	1-3/8 inch	5/64 inch	2 inch	3/16 inch
5/8 inch	11/16 inch	1-3/4 inch	9/64 inch	2-1/2 inch	1/4 inch
3/4 inch	13/16 inch	2 inch	5/32 inch	2-3/4 inch	5/16 inch
7/8 inch	15/16 inch	2-1/4 inch	11/64 inch	3 inch	5/16 inch
1 inch	1 1/16 inches	2-1/2 inch	11/64 inch	3-1/2 inch	3/8 inch

Note: Round washers that are Type A Plain Washers, Wide (standard plate) conform with the above dimensions.

9. SDS screws shall be Simpson Strong-Drive® wood screws as manufactured by Simpson Strong-Tie Co., Inc. Dublin, California (ICC report no. 5268 LA City 25281). Alternatives may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of products and sizes to be substituted.
10. Screws for attachment of wood framing to wood framing shall conform to ANSI/ASME B18.6.1 Wood Screws (Inch Series) except that dimension may be in compliance with the ICC report. Fasteners when installed shall firmly clamp material together. Fasteners shall be one of the following. Alternatives may be used only with specific approval of the Structural engineer, and only upon submittal of a listing of products and sizes to be substituted.
    a) Quick Drive USNTL Wood Screws, Quick Drive USA, Inc. Calvert, Tennessee (ICC report no. 5053).
    b) Grabber Brand "Plywood Screws", John Wassner Associates, Inc. Concord California (ICC report no. 5280).

06131 WOOD TRUSSES, LIGHT METAL PLATE CONNECTED, FOR FLOOR SYSTEMS, DESIGN BUILD:

1. Materials, manufacture, fabrication, and quality control shall conform to ANSI/TPI 1 National Design Standard for Metal Plate Connected Wood Trusses.
2. Steel metal plate connectors shall be ICC approved. Steel metal plate connectors shall be galvanized. Galvanizing shall conform with ASTM. A 653, G-60 coating.
3. Lumber species for top and bottom chords shall be Douglas Fir-Larch. Alternates may be used only with specific approval of the Structural Engineer, and only upon submittal of specifics to be substituted.
4. The manufacturer shall retain the services of a qualified licensed engineer to design the trusses and their hangers and supports. He shall sign and seal the truss design and placing drawings. The truss manufacturer shall be responsible for the adequacy of the design.
5. The manufacturer shall have a Quality Control Inspection Agency or individual, approved by the Building Official, attest to the trusses manufacture in accordance with the ICC approval for the metal plate connectors.
6. The manufacturer shall design for and specify all fasteners, hangers, and hardware that support the trusses.
7. Installation of trusses in the structure shall be in accordance with the more restrictive of the manufacturer's directions or the Construction Documents.
8. Bracing, bridging and blocking of joists shall be in accordance with the more restrictive of the manufacturer's directions or the Construction Documents.

06100 ROUGH CARPENTRY:

1. Solid framing lumber shall be new material. It shall be graded and marked in conformance with Western Wood Products Association (WWPA), Standard Grading and Dressing Rules or with West Coast Lumber Inspection Bureau (WCLIB), Standard Grading Rules for West Coast Lumber or with National Lumber Grades Authority (NLGA), Standard Grading Rules for Canadian Lumber as noted below. Grading shall be performed by an agency certified by the American Lumber Standards Committee, Germantoun, Maryland. Alternatives lumber grades, species and grading agencies may be used only with specific approval of the Structural Engineer, and only upon submittal listing lumber grades, species and grading agencies to be substituted.
2. Lumber species grades, including pressure treated lumber shall at least be:

Douglas Fir:

Use	Species and Grade mark	Grading Rules
2x4 studs 9 feet in height or less:	Douglas Fir-Larch Stud	WWPA or WCLIB
2x4 studs more than 9 feet in height:	Douglas Fir-Larch Const. or #2	WWPA or WCLIB
2x6 studs 9 feet in height or less:	Douglas Fir-Larch Stud	WWPA or WCLIB
2x6 studs more than 9 feet in height:	Douglas Fir-Larch #2	WWPA or WCLIB
2x8 & deeper studs:	Douglas Fir-Larch #2	WWPA or WCLIB
2x4, 3x4, & 4x4 plates:	Douglas Fir-Larch #2	WWPA or WCLIB
2x6, 3x6, 4x6 & deeper plates:	Douglas Fir-Larch Const. or #2	WWPA or WCLIB
3x4 & 4x4 studs & posts:	Douglas Fir-Larch Const. or #2	WWPA or WCLIB
4x6 & deeper studs & posts:	Douglas Fir-Larch #2	WWPA or WCLIB
6x6 & larger square posts:	Douglas Fir-Larch #1	WWPA or WCLIB
6x8 & larger rectangular posts:	Douglas Fir-Larch #1	WWPA or WCLIB
2x4 joists & rafters:	Douglas Fir-Larch #2	WWPA or WCLIB
2x6 & deeper joists & rafters:	Douglas Fir-Larch #2	WWPA or WCLIB
4x6 to 4x12 beams:	Douglas Fir-Larch #2	WWPA or WCLIB
4x14 & 4x16 beams:	Douglas Fir-Larch #1	WWPA or WCLIB
6x8, 8x10, 10x12 & deeper beams:	Douglas Fir-Larch #1	WWPA or WCLIB

3. Lumber grading agencies shall be:

Lumber Grading Agencies Schedule:

Grading rules	Lumber Grading Agencies	Mark
WWPA or WCLIB:	California Lumber Inspection Service Pacific Lumber Inspection Bureau, Inc. Redwood Inspection Service. Timber Products Inspection West Coast Lumber Inspection Bureau Western Wood Products Association	
NLGA:	Alberta Forest Products Association California Lumber Inspection Service Canadian Lumbermen's Association Canadian Mill Services Association Cariboo Lumber Manufactures Association Central Forest Products Association Interior Lumber Manufactures Association Macdonald Inspection Maritime Lumber Bureau Northern Forest Products Association Ontario Lumber Manufactures Association Pacific Lumber Inspection Bureau, Inc. Quebec Lumber Manufactures Association	

4. Lumber shall be dry and well seasoned, and the moisture content shall not exceed 19% at the time the structure is wrapped. All lumber shall be air-seasoned not less than 30 days before being covered with finishing materials unless tests are made of its moisture content.
5. All wood resting on or abutting to concrete or masonry (mud sill) shall be preservative treated. All wood embedded in concrete or in contact with soil shall be preservative treated. In so far as practical all working of the wood shall be done prior to the preservative treatment. All treatment shall be in a plant except that cuts may be field treated. Cuts penetrating into the treated zone of the wood shall be field treated when they would result in the cut surface resting on, abutting to or being in contact with concrete, masonry or soil. After installation, exterior exposed surfaces shall be protected with a minimum of two coats of sealer. Framing or drywall shall cover interior surfaces. Treatment shall be as follows:
   a) Plant treatment: Solid framing lumber required to be preservative treated shall be plant treated in accordance with American Wood Preservers Association, AWPA Standard C-2 Lumber, Timbers, Bridge and Mine Ties-Pressure Treatment. Wood product panels required to be preservative treated shall be plant treated in accordance with American Wood Preservers Association, AWPA Standard C-9, Plywood-Preservative Treatment. Treatment shall be appropriate for the location of the wood being either above ground or ground contact. A grade mark indicated conformance to the treating standard and the type of treatment shall be affixed to the material. The inspection agency shall be independant of the treating plant. The inspection agency shall be under the supervision of the American Wood Preservers Bureau. Inspection shall be in accordance with AWPB LP, Standards.
   b) Field treatment: Solid framing lumber and wood product panels required to be preservative treated shall be field treated with copper Naphthenate Solution containing a minimum of 2.0% copper metal. Application shall be in accordance with the manufacturer's directions.
   c) Hardware and fasteners in contact with preservative treated lumber shall be protected with a corrosion resistive coating appropriate to the degree of corrositivity of the treatment and the thickness of the hardware. Preservative treatments and hardware protection shall be on of the following:

Wood Preservative Schedule:

Preservative Type	Manufacturers	Hardware Protection
Sodium Borate Based Compounds Disodium Octoborate Tetrahydrate (Dot)	Advance Guard® Brand Osmose, Inc. Griffin Georgia (ICC ER 648) Tim-Bor® Industrial Brand US, Borax, Inc. Valencia, California (ICC ER 4890) SillBor® and FrameGuard™ Brand Arch Wood Protection, Inc. Smyrna, Georgia	Nails: Hot-dip finish when exposed to weather, otherwise may be natural. Anchor Bolts: Natural finish Plates and Straps: ASTM A653 G 60
Iodine Based Compound	Eco Treat™, Brand EcoTreat, Inc. Greenville, South Carolina	Nails: Hot-dip finish when exposed to weather, otherwise may be natural. Anchor Bolts: Natural finish Plates and Straps: ASTM A653 G 60
Alkaline Copper Quat (ACQ)	Nature Wood® Brand Osmose, Inc. Griffin Georgia	Nails: Hot-dip galvanized ASTM A153 Anchor Bolts: Hot-dip galvanized ASTM A123 Plates and Straps: Hot-dip Galvanized ASTM A653 G 185
Copper Azole A (CBA-A) CopperAzole B (CA-B)	Wolmanized® Natural Select™ , Brand Smyrna, Georgia Arch Wood Protection, Inc. (ICC ER 663)	Nails: Hot-dip galvanized ASTM A153 Anchor Bolts: Hot-dip galvanized ASTM A123 Plates and Straps: Hot-dip Galvanized ASTM A653 G 185

6. OSB sheathing (oriented strand board) shall be in conformance with US. Product Standard PS 1 shall conform with U.S. Product Standard PS 2, Performance Standard for Wood-Based Structural-Use Panels as noted below. A grade mark indicating conformance to the appropriate standard shall be affixed to the material by an independent grading agency. Grading shall be performed by the APA - The Engineered Wood Association, Tacoma, Washington, (ICBO report no. NER QA397) or by Timberco, Inc. d.b.a. Teco, Eugene, Oregon, (ICBO report no. NER QA135). Panels which may have an edge or surface permanently exposed to the weather or to moisture shall have an exposure durability of Exterior Grade, except that roof sheathing exposed only on the underside need only be Exposure 1. The spacing in inches of roof and floor supports over which panels are applied shall not exceed the Span Rating of the panels. The number of ply and layers shall be at least that given below. Alternative grades, thickness, indices, species and grading agencies may be used only with specific approval of the Structural Engineer, and only upon submittal of a listing of grades, thickness, indices, species, and grading agencies to be substituted.

Wood Panel Grade Schedule:

Use	Product Standard	Panel Grade APA or TECO	Minimum Exposure Durability
Roof sht'g:	PS 1, PS 2	Rated Sheathing or Sheathing Span	Exposure 1
Floor sht'g:	PS 1, PS 2	Rated Sturd-I-Floor or Floor Span	Exposure 1
Wall sht'g 3/8":	PS 1, PS 2	Rated Sheathing or Sheathing Span (1)	Exposure 1
Wall sht'g 15/32":	PS 1, PS 2	Rated Sheathing or Sheathing Span (1)	Exposure 1
Plating stock:	PS 1 only	Structural 1	Exposure 1

Footnote:
(1) Panel grade shall be Structural 1 where specifically noted in Shear Wall Schedule.

7. Shear wall installation shall be periodically inspected by a Special Inspector when special inspection is noted on the plan. Following are requirements of the Special Inspector:
   a) He shall verify the lumber species, grades and wood product panels used.
   b) He shall verify that the materials used are properly stored and prepared for use.
   c) He shall verify that moisture content and condition of the wood framing is appropriate.
   d) He shall verify that construction details, procedures, tool calibrations, and workmanship are in accordance with the Construction Documents and Building Code.
   e) A Certificate of Inspection shall be furnished by the Special Inspector to the Building Official prior to his inspection and to the Architect and Structural Engineer.

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CLIENT:
Arun Reddy Kandoor

ARCHITECT:
Diego Valencia
Designer

1450 WALNUT DRIVE
CAMPBELL, CA

DATE ISSUED: 04-13-2022

NO.	DATE:	DESCRIPTION:
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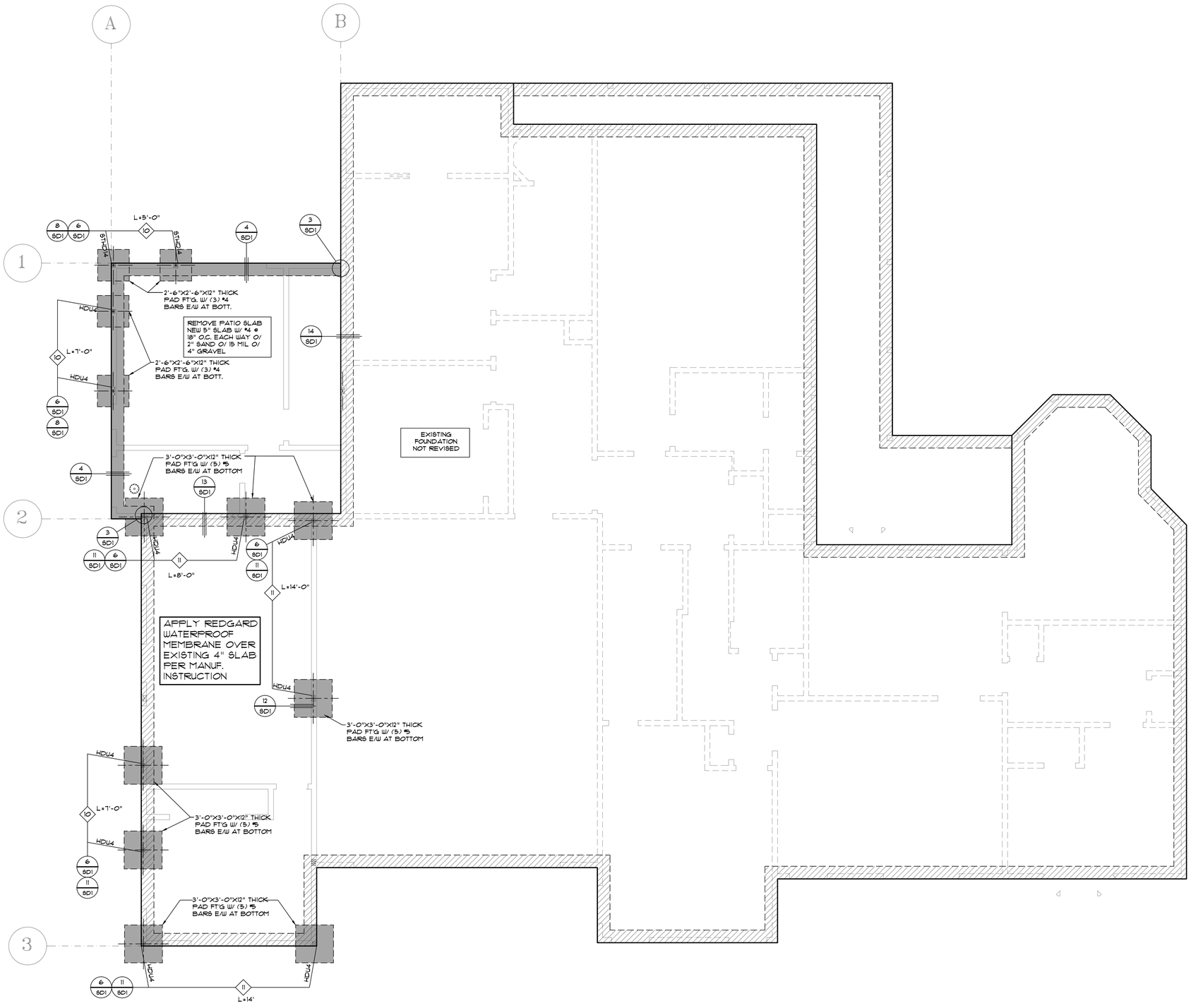
ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. WATTIG
No. C68631
Exp. 08/30/2023
CIVIL
STATE OF CALIFORNIA

SHEET:
STRUCTURAL NOTES AND SPECIFICATIONS

SCALE : NONE

SHT NO. SN3



FOUNDATION PLAN

FOUNDATION NOTES, CONVENTIONAL, WOOD FRAMING:

1. Foundation dimensions are extracted from architectural drawings. IDS Engineering, Inc. does not assume any liability with respect to these dimensions. Contractor shall verify all foundation dimensions with the architectural drawings and with field conditions. Contractor shall verify the location and sizes of all anchor bolts, holdowns, embedded straps and framing materials. Contractor shall verify configuration and location of all architectural features, such as but not limited to, depressions, slopes, shelves, patios, porches, and stoops.
2. For lapping of conventional reinforcing, see detail (2/8D1).
3. For trenches adjacent to foundations, see detail (24/8D1).
4. For conventional reinforcing bar bend, see detail (1/8D1). For stirrup and tie bands, see detail (1/8D1).
5. Refer to the soils report(s) for any pad preparation and pre saturation requirements.
6. The floor slab shall be poured level to within 1/8 inch in 10 feet.
7. The floor slab and foundation may be poured monolithically (at the same time) or in two pours with a cold joint between at the Contractor's option. Details in general are shown using two pours.
8. Anchor Bolts: Install anchor bolts as noted on the plans. If no notation is given, at exterior walls provide 5/8 inch dia. anchor bolts at 72 inch OC. In all bolted walls, at least one bolt shall be installed within 12 inches of each end of each plate, with no less than two (2) bolts per plate 12 inches or longer. See floor framing plans for reference in providing extension of anchor bolts above concrete. Anchor bolts shall be galvanized if set corrosive preservative treated lumber. Anchor bolts may be wet set during placement of concrete. See detail (6/8D1).

Mark — Comment

◇ Spacing of anchors per the below schedule, see detail 6/8D1 for more information. *

Shearwall Type	5/8" dia. Anchor Bolt	3/4" dia. Anchor Bolt	1" dia. Anchor Bolt	MASA/MASAP
Non-Shearwalls	48"	48"	72"	48"
◇9	36"	48"	N.A.	48"
◇10	32"	48"	N.A.	36"
◇11	24"	32"	N.A.	32"
◇12	16"	24"	30"	24"
◇13	12"	18"	24"	16"
Dbl. ◇11 *	10"	16"	20"	12"
Dbl. ◇12 *	8"	12"	18"	8"
Dbl. ◇13 *	6"	8"	12"	8"

* Denotes shearwall requires 3x- mudsill plate.

* Note: It is recommended for shorter shearwalls the larger diameter anchor bolts are used in order to achieve the proper spacing and quantity. The number of required anchors is determined by dividing the total shearwall length by the specified anchor spacing. For instance, if the total length of the shearwall is 8'-0", and the required anchor spacing is 12" o.c., there should be 8 total anchors evenly spaced. It is understood that posts, studs, and plumbing lines may obstruct the anchors from being "evenly" spaced, but the required number of anchors is still required. Finally, holdoun anchor rods are not considered anchor bolts.

9. Shot Pins: Install at all interior walls and partitions where anchor bolts are not noted. 0.145 inch dia. x 2.875 inches shank length with metal plate washer at 36 inches OC. Each piece of plate longer than 16 inches shall have a minimum of two fasteners. At each end of each piece of plate, place one fastener at 6" from the end.
10. Holdowns and Embedded Straps: See floor framing plans for reference in locating hardware and providing extension of hardware above concrete. It is the responsibility of the Contractor to determine their exact location. Hardware shall be tied in place prior to placement of concrete. For holdoun and embedded straps to foundation, see detail (8/8D1).
11. Foundations: Size, depth and reinforcement of continuous footings shall be as follows. Reinforcement shall be chaired and tied in place prior to placement of concrete.

Exterior footings		
Width	Depth	Typical, ● Reinforcement
12"	18"	(3) #5 top and bottom

Note:
1. Foundations shall be per schedule U.N.O. on plans at specific locations.
2. (1) #6 bar may be used in place of (2) #4 bars.
3. Line indicates extent of additional foundation reinforcement in addition to typical reinforcement. (———)

12. Floor slab. Place slab reinforcement above center line and below upper 1/3 of slab thickness. Reinforcement shall be chaired and tied in place prior to placement of concrete. Sand shall be dampened prior to placement of concrete. Slab and sand thickness' given are actual not nominal

Floor Slab Thickness	Floor Slab Reinforcement	Upper base layer	Vapor Barrier	Lower base layer
5"	#4 at 18" oc E.W.	2" sand	10 mil visqueen	4" of 3/4" crushed rock

Note:
1. #3 bars at 24 inches o.c. in each direction may be used as an alternative to W.W.F. for slab reinforcement.
2. Vapor Barrier & lower base layer may be omitted at non-conditioned areas such as garages.

NEW FOUNDATION

EXISTING FOUNDATION

IDS engineering, inc.

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Arun Reddy Kandoor

ARCHITECT:
Diego Valencia
Designer

1450 WALNUT DRIVE CAMPBELL, CA

DATE ISSUED: 04-13-2022

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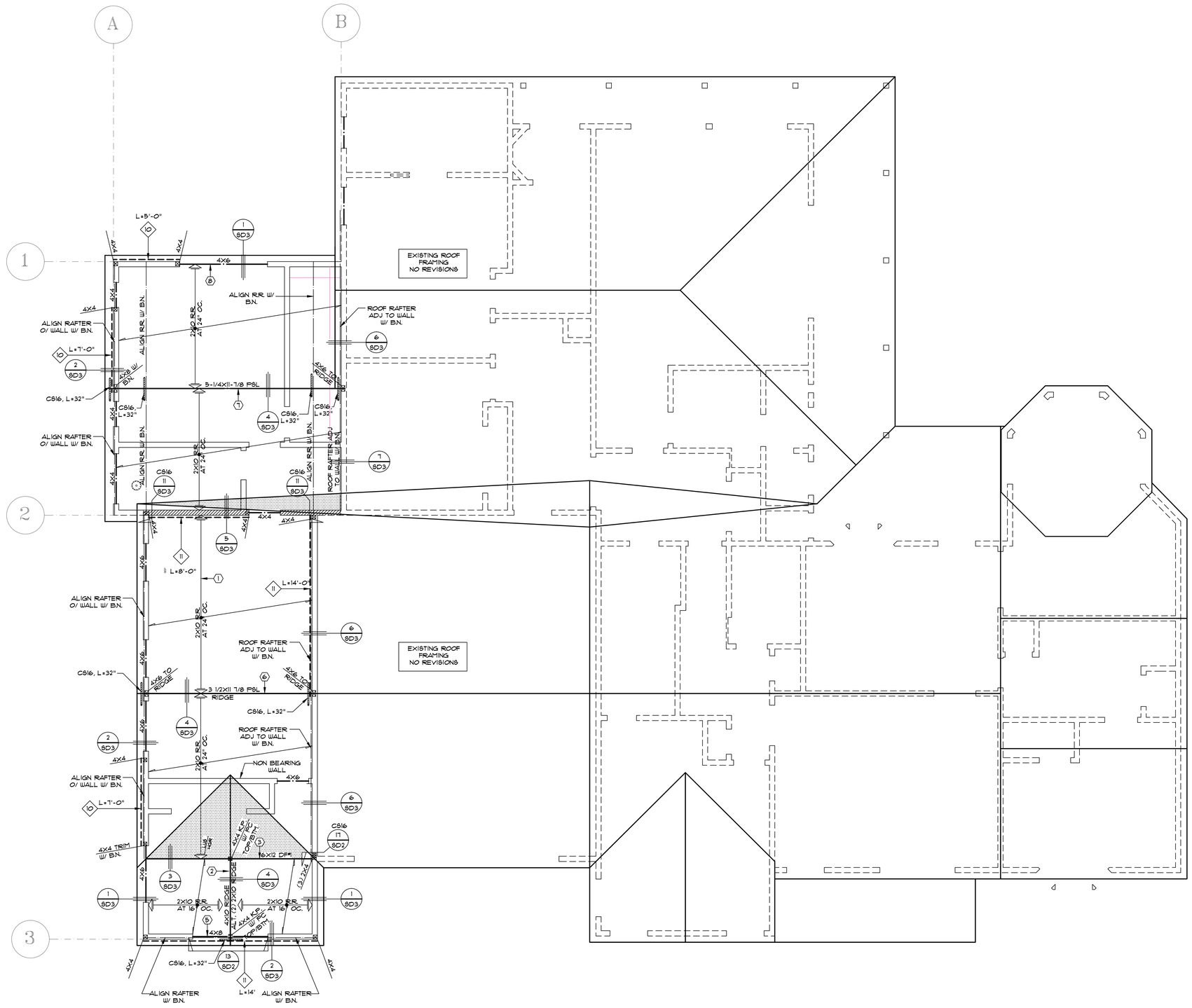
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ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER — WILLIAM M. WATTIG — No. C68631 — Exp. 09/30/2023 — CIVIL — STATE OF CALIFORNIA

SHEET:
FOUNDATION PLAN

SCALE : 1/4" = 1'-0"
SHT NO. S1.1.0



ROOF FRAMING PLAN

SHEAR WALL SCHEDULE:

(3)(4)(6)(8)(10)

Note: When an asterisk ✳ is adjacent to the shearwall specification, install sheathing before any adjacent framing.

SEE DETAILS ON SD5 FOR MORE INFO.

DESIGNATION ✳	SHEATHING & FASTENING (1)(2)	A35/LTP4 SPECIFIED SHEARWALL (13) (14)	STUDS AT PANEL JOINTS & BLOCKING	MUD SILL PLATES	SILL/SOLE PLATE FASTENING (11)
9 (7)	3/8" OSB sheathing W/ 8d common nails at: 6" o.c. at panel edges 12" o.c. at field	24" O.C.	2X-	2X-	16d Sinkers at 4" o.c. or 1/4"x4-1/2" Simpson SDS wood screws at 16" o.c.
10 (7)	3/8" OSB sheathing W/ 8d common nails at: 4" o.c. at panel edges 12" o.c. at field	16" O.C.	2X-	2X-	16d Sinkers at 3" o.c. or 1/4"x4-1/2" Simpson SDS wood screws at 12" o.c.
11 (9)	3/8" OSB sheathing W/ 8d common nails at: 3" o.c. at panel edges 12" o.c. at field	12" O.C.	3X-	2X-	16d Sinkers at 2-1/2" o.c. staggered or 1/4"x4-1/2" Simpson SDS wood screws at 8" o.c.
12 (9)	3/8" OSB sheathing W/ 8d common nails at: 2" o.c. at panel edges 12" o.c. at field	10" O.C.	3X-	2X-	1/4"x4-1/2" Simpson SDS screws at 6" o.c.
13 (9)	15/32" Structural 1 OSB sheathing W/ 10d common nails at: 2" o.c. at panel edges 12" o.c. at field	8" O.C.	3X-	2X-	1/4"x4-1/2" Simpson SDS screws at 4" o.c.
DOUBLE 11 (5) (9) (TWO SIDED)	3/8" OSB sheathing W/ 8d common nails at: 3" o.c. at panel edges 12" o.c. at field	6" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 4" o.c.
DOUBLE 12 (5) (9) (TWO SIDED)	3/8" OSB sheathing W/ 8d common nails at: 2" o.c. at panel edges 12" o.c. at field	4" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 3" o.c.
DOUBLE 13 (5) (9) (TWO SIDED)	15/32" Structural 1 OSB sheathing W/ 10d common nails at: 2" o.c. at panel edges 12" o.c. at field	4" O.C.	3X-	3X-	1/4"x4-1/2" Simpson SDS screws at 3" o.c.

Notes:
(1) OSB sheathing is included as part of required nail penetration.
(2) Refer to specifications for sheathing (wood product panel) grading and permitted alternatives, see SN sheet, section 06100, Note 6.
(3) Stud framing shall be minimum 2X4 at 16" o.c.
(4) Sheets shall be not less than 4'-0" by 8'-0" except at boundaries and changes where the minimum dimension shall be 16".
(5) Studs only may be 2X- provided panel joints are offset so as to fall on different framing members when sheathing is on both sides of wall. Else use 3X- minimum studs at panel joints and nails shall be staggered.
(6) Stagger is 1/2" at all framing members receiving edge nailing.
(7) Provide minimum 2X4 flat blocking at all horizontal panel joints.
(8) Space fasteners no closer than 1-1/2". Over any 48" line of fasteners, the average spacing shall be at least as close as that specified.
(9) Provide minimum 3X4 flat blocking at horizontal panel joints.
(10) See detail 6/SD2 for more information.
(11) Note: The number of required sill screws/ nails is determined by dividing the total shearwall length by the specified fastener spacing. For instance, if the total length of the shearwall is 8'-0", and the required fastener spacing is 12" o.c., there should be 8 total fasteners evenly spaced. It is understood that posts, studs, and plumbing lines may obstruct the fasteners from being "evenly" spaced, but the required number of fasteners is still required.
(12) It is acceptable to place the sheathing on either side of the wall, especially to avoid cutting from plumbing lines or manifold boxes. The dashed line is only graphical in nature.
(13) See details on SD3, SD4, and SD5 for hardware location.
(14) AT multifamily projects, see sheets SD3.1 & SD5.1 for hardware location as well.

ROOF AND FLOOR SHEATHING SCHEDULE, WOOD:

1. Floor Sheathing: 23/32" thick wood product panel. Edges shall be tongue and groove span rating shall be 24 inches. Orientation shall be with face grain perpendicular to support. Provide 2x4 blocking at all edges (except those supported by framing) where blocking is indicated. Sheathing adhesive to be applied to framing members prior to placement of sheathing. Sheathing to be fully nailed prior to setting of adhesive. Nail sheathing as follows:
2. Typical floor sheathing fastening shall be:
   10d common or 10d plywood ring shank nails or "8 X 2" or longer screws at 6 inches OC along all boundaries and edges and 10 inches OC in field. Blocking is not required.
3. Blocked floor sheathing fastening shall be (where noted on drawings):
   10d common or 10d plywood ring shank nails or "8 X 2" or longer screws at 4 inches OC along all boundaries and edges and 10 inches OC in field. Provide 2x4 blocking flat.
4. Roof Sheathing: 15/32" wood product panels. Span index shall be 32/16. Orientation shall be with face grain perpendicular to support. Provide 2x4 flat blocking at all unsupported edges where blocking is indicated. Crickets and miscellaneous framing to overlay plywood sheathing. Nail sheathing as follows:
5. Typical roof sheathing nails shall be:
   8d common nails at 6 inches OC along all boundaries and edges and 12 inches OC in field. Blocking is not required.
   Alternate straps may not be used for blocked portions of the roof.
6. Blocked roof sheathing nails shall be:
   8d common nails at 4 inches OC along all boundaries and edges and 12 inches OC in field. Provide 2x4 blocking flat.
   Alternate straps may not be used for blocked portions of the roof.
7. Fastening of floor and roof sheathing shall be inspected by the Building Official prior to concealment.
8. The floor and roof sheathing are entirely structural and vital for shear transfer at seismic and wind loading on a structure. Ventilation holes are not permitted in the floor or roof sheathing unless specifically detailed or specified on the structural plans. This includes areas at over-framing, decks, roofs, mechanical ducts, and plumbing lines, or any other penetrations, even if or when mentioned on the architectural or M.E.P. plans and details. If allowable penetrations are not noted on the structural plans or details, then the structural engineer is not aware of penetrations and they may be detrimental to the structure.

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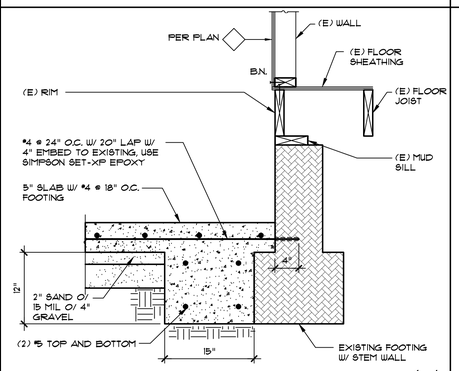
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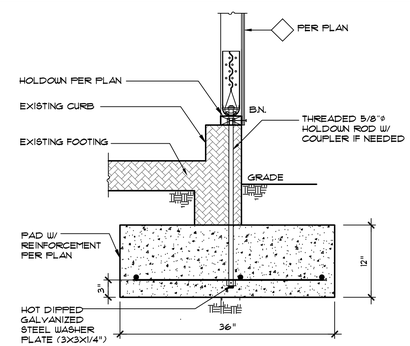
REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. WATTIG
No. C68631
Exp. 09/30/2023
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SHEET:
ROOF FRAMING PLAN

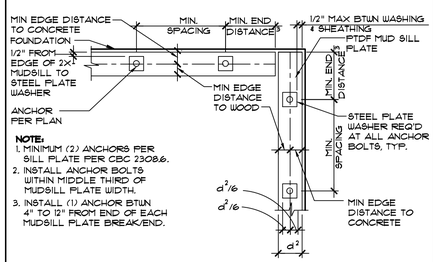
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FOUNDATION DETAIL 14

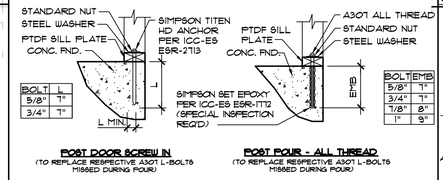


FOUNDATION UNDERPINNING 11



NOTE:
1. MINIMUM (2) ANCHORS PER SILL PLATE PER CBC 2308.6.
2. INSTALL ANCHOR BOLTS WITHIN MIDDLE THIRD OF MUDSILL PLATE WIDTH.
3. INSTALL (1) ANCHOR BTWN 4" TO 12" FROM END OF EACH MUDSILL PLATE BREAK/END.

ANCHORAGE PLACEMENT



POST DOOR SCREW IN
(TO REPLACE RESPECTIVE A307 L-BOLTS MISSED DURING POUR)

POST POUR - ALL THREAD
(TO REPLACE RESPECTIVE A307 L-BOLTS MISSED DURING POUR)

ANCHOR	MIN. END DISTANCE [1]	MIN. EDGE DISTANCE		MIN. SPACING	STEEL SQUARE PLATE WASHER SIZE			BORING THRU PLATE
		TO CONC.	TO WOOD		SIDE	THICKNESS	HOLE [2]	
1/2" L-BOLT	4"	1-3/4"	3/4"	3"	3"	1/4"	9/16"	9/16"
5/8" L-BOLT	4-3/8"	1-3/4"	1"	3"	3"	1/4"	11/16"	11/16"
3/4" L-BOLT	5-1/4"	1-3/4"	1-1/8"	3"	3"	1/4"	13/16"	13/16"

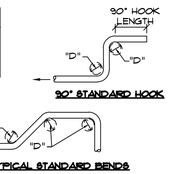
NOTE:
1. MAXIMUM END DISTANCE IS 12".
2. DIAGONALEY SLOTED HOLES PER CBC 2308.12.8 ARE PERMISSABLE.

SILL PLATE ANCHORAGE 6

(1 THRU 5)

STANDARD HOOK DIMENSIONS

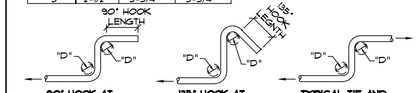
REBAR SIZE	"D"	90° HOOK LENGTH	135° HOOK LENGTH
#3	2-1/4"	4-1/2"	2-1/2"
#4	3"	6"	2-1/2"
#5	3-3/4"	7-1/2"	2-1/2"
#6	4-1/2"	9"	3"
#7	5-1/4"	10-1/2"	3-1/2"



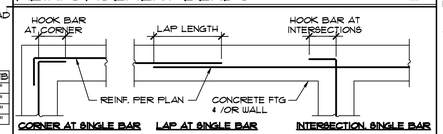
TIE AND STIRRUP HOOK DIMENSIONS

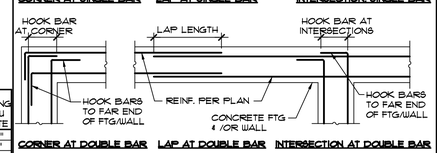
REBAR SIZE	"D"	90° HOOK LENGTH	135° HOOK LENGTH
#3	1-1/2"	2-1/2"	2-1/2"
#4	2"	3"	3"
#5	2-1/2"	3-3/4"	3-3/4"

NOTE: SEE DETAIL 2/- FOR REINFORCEMENT DEVELOPMENT LENGTH AND LAPS.



REINFORCEMENT BENDS 1



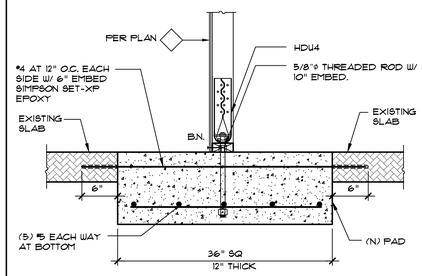


REBAR SIZE	90° HOOK LENGTH	LAP LENGTH
#3	4-1/2"	16"
#4	6"	20"
#5	7-1/2"	24"
#6	9"	30"
#7	10-1/2"	34"

NOTE: REFER TO DETAIL 1/- FOR TYPICAL BENDS AND HOOKS.

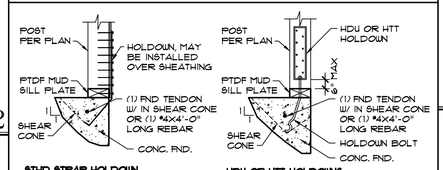
ROOF SHEATHING

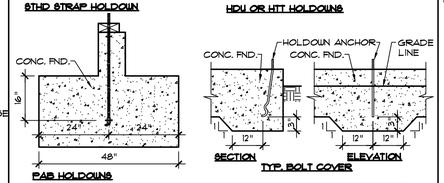
REINFORCEMENT DEVELOPMENT LENGTH AND HOOKS AT FOUNDATIONS & WALLS 2



✳✳ SIMPSON SET-XP EPOXY NO INSPECTION REQUIRED

FOUNDATION DETAIL 12



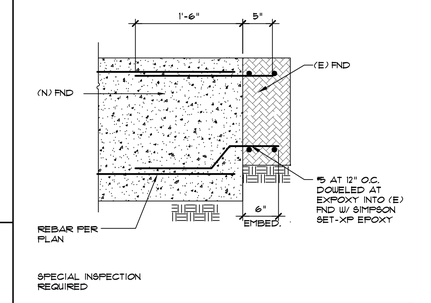


PAB HOLDOWNS

HOLDOWN	CONNECTION TO WOOD POST	SSTB BOLT	SSTB BOLT AT CURB
STHD10	(28) 16d SINKER NAILS	NA	NA
STHD14	(38) 16d SINKER NAILS	NA	NA
HDU4	(10) SIMPSON SDS 1/4"x2-1/2"	5/8" SSTB20	5/8" SSTB24
HDU5	(14) SIMPSON SDS 1/4"x2-1/2"	5/8" SSTB24	5/8" SSTB24
HDU8	(20) SIMPSON SDS 1/4"x2-1/2"	7/8" SSTB28	7/8" SSTB36

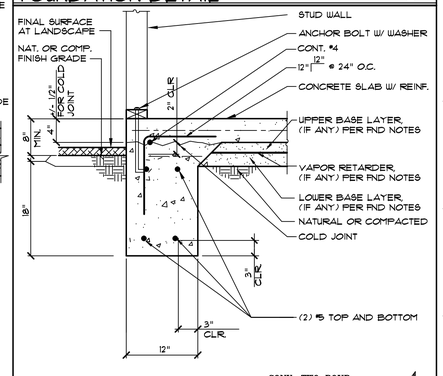
1. DO NOT PLACE CONDUCTS OR PIPES WITHIN 6" RADIUS OF HOLDOWN ANCHORS.
2. TIGHTEN NUTS BEFORE STRUCTUR IS ENCLOSED.

HOLDOWN ANCHORS 8

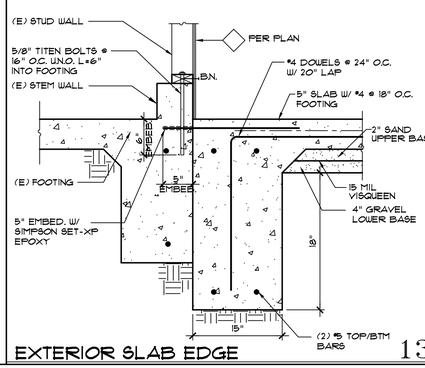


SPECIAL INSPECTION REQUIRED

FOUNDATION DETAIL 3



EXTERIOR SLAB EDGE CONV. TWO POUR FOUNDATION 4



EXTERIOR SLAB EDGE 13

IDS engineering, inc.

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DATE ISSUED: 04-13-2022

NO.	DATE:	DESCRIPTION:
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ENGINEER OF RECORD:



SHEET:
CONVENTIONAL FOUNDATION W/ S.O.G.

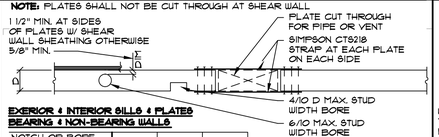
SCALE: 1" = 1'-0"

SHT NO. SD1

(21 THRU 25)

(16 THRU 20)

NOTE: PLATES SHALL NOT BE CUT THROUGH AT SHEAR WALL

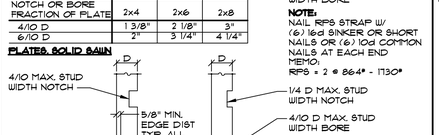


EXERIOR & INTERIOR SILLS & PLATES BEARING & NON-BEARING WALLS

NOTCH OR BORE FRACTION OF PLATE	2x4	2x6	2x8
4/10 D	1 3/8"	2 1/8"	3"
6/10 D	2"	3 1/4"	4 1/4"

NOTE:
NAIL RPS STRAP W/ (6) 16d SINKER OR SHORT NAILS OR (6) 10d COMMON NAILS AT EACH END MEMO:
RPS = 2 @ 864# - 1730#

PLATES, SOLID SAWN

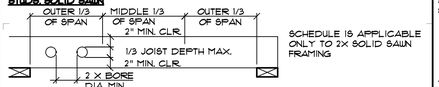


NON-BEARING INTERIOR STUDS | EXTERIOR AND BEARING STUDS

NOTCH OR BORE FRACTION OF STUD	2x4	2x6	2x8
1/4 D	7/8"	1-3/8"	1-7/8"
4/10 D	1-3/8"	2-1/8"	3"
6/10 D	2"	3-1/4"	4-1/4"

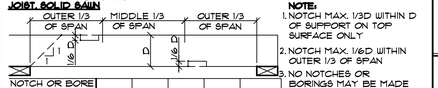
NOTE:
NOTCH AND BORE SHALL NOT OCCUR ON SAME STUD WITHIN 4ft OF EACH OTHER

STUDS, SOLID SAWN



SCHEDULE IS APPLICABLE ONLY TO 2X SOLID SAWN FRAMING

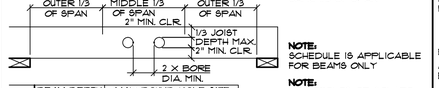
JOIST, SOLID SAWN



NOTCH OR BORE FRACTION OF JST	2x6	2x8	2x10	2x12	2x14
1/6 D	7/8"	1-1/8"	1-1/2"	1-7/8"	2-1/8"
1/3 D	1-1/4"	2-3/8"	3"	3-3/4"	4-3/8"

NOTE:
1. NOTCH MAX. 1/3D WITHIN D OF SUPPORT ON TOP SURFACE ONLY
2. NOTCH MAX. 1/6D WITHIN OUTER 1/3 OF SPAN
3. NO NOTCHES OR BORINGS MAY BE MADE WITHIN MIDDLE 1/3 OF SPAN-NOR MAY BOTH TOP AND BOT. SURFACES BE NOTCHED WITHIN SAME 1/3 OF SPAN

JOISTS SKIED SAWN



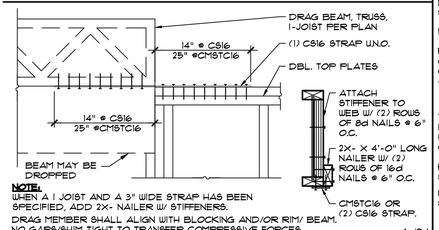
	BEAM DEPTH	MAX ROUND HOLE SIZE
PSL	4-1/4" TO 18"	3"
LVL	5-1/4"	1-3/4"
	7-1/4" TO 20"	2"
	4-3/8"	1"
L&L & GLB	5-1/2"	1-3/4"
	7-1/4" TO 18"	2"
	18" TO _	3"

NOTE:
SCHEDULE IS APPLICABLE FOR BEAMS ONLY

NOTE:
NO NOTCHES OR SQUARE HOLES PERMITTED

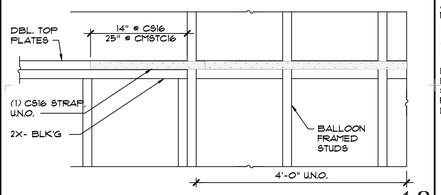
BEAMS, SOLID SAWN, GLUED LAMINATED, & MANUFACTURED

BORE & NOTCH 16

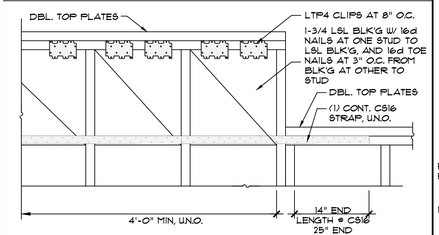


NOTE:
WHEN A I JOIST AND A 3" WIDE STRAP HAS BEEN SPECIFIED, ADD 2X- NAILER W/ STIFFENERS.
DRAG MEMBER SHALL ALIGN WITH BLOCKING AND/OR RIM/ BEAM. NO GAPS/SHIM TIGHT TO TRANSFER COMPRESSIVE FORCES.

DRAG DETAIL 17

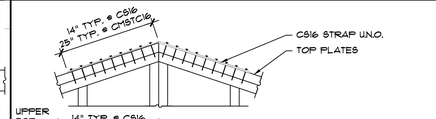


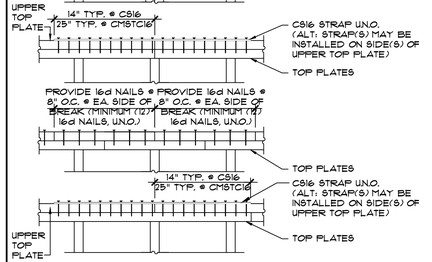
DRAG AT BALLOON FRAMED WALL 18



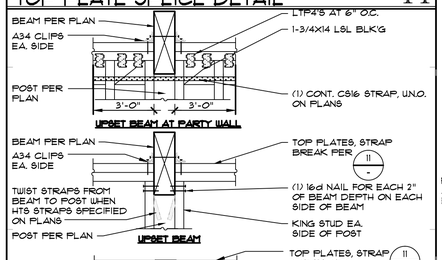
OFFSET DRAG 19

(11 THRU 15)

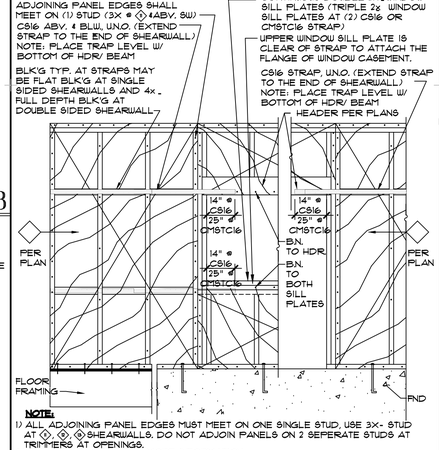




TOP PLATE SPLICE DETAIL 11



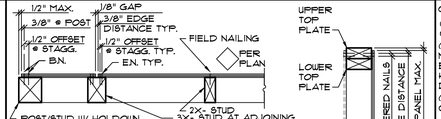
POST SUPPORT 12

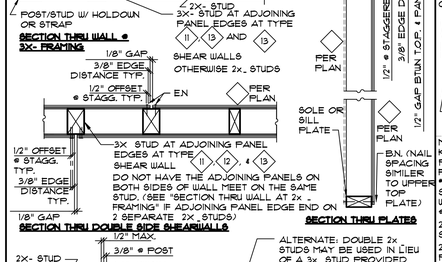


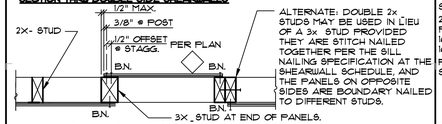
NOTE:
1) ALL ADJOINING PANEL EDGES MUST MEET ON ONE SINGLE STUD. USE 3X- STUD AT ◇, ◈, ◈ SHEARWALLS. DO NOT ADJOIN PANELS ON 2 SEPERATE STUDS AT TRIMMERS AT OPENINGS.
2) SEE DETAIL 6/SD2 FOR MORE INFORMATION.

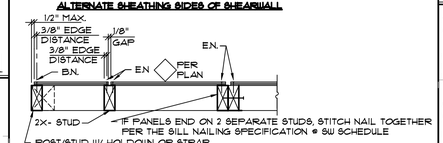
SHEAR TRANSFER AROUND OPENING 13

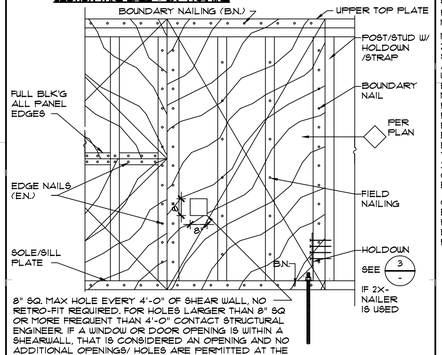
(6 THRU 10)





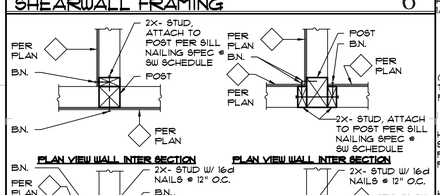






NOTE:
1) PROVIDING BLOCKING AT ALL PANEL EDGES.
2) STAGGER NAILS SPACED LESS THAN 3" O.C.
3) SILL MOST BE ONE PIECE IF WALL IS LESS THAN 4'-0" IN LENGTH. MINIMUM PANEL SHEATHING SIZE IS 2'-0"X2'-0".
4) NAILS SHALL BE DRIVEN TIGHT BUT SHALL NOT FRACTURE SURFACE OF SHT'G.
5) TOLERANCE OF NAILING SHALL BE ±1" WITH THE AVERAGE SPACING OVER ANY 4'-0" LENGTH BEING AT LEAST THAT NOTED ON THE PLAN.
6) SHEATHING SHALL BE APPLIED DIRECTLY TO FRAMING, IT SHALL NOT BE INTERSPACED W/ FURRING ON GYPSUM BOARD.

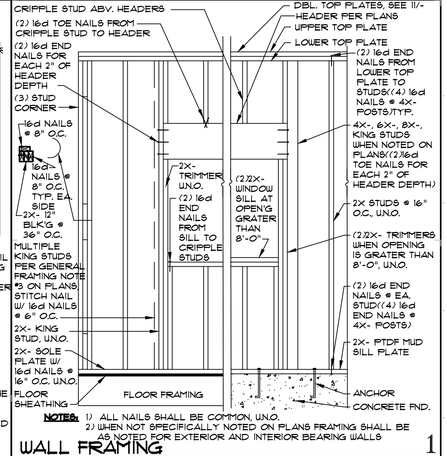
SHEARWALL FRAMING 6



NOTE: SEE DETAIL 3/- FOR 2X- NAILERS BTWN HOLDOUN AND HOLDOUN POST.

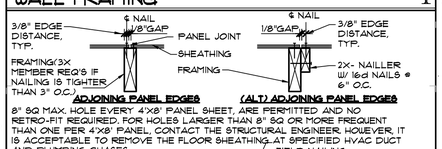
SHEAR WALL @ CORNER 7

(1 THRU 5)

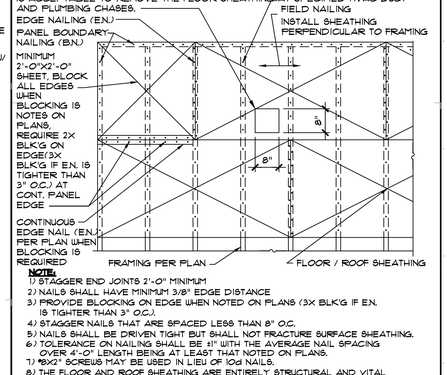


NOTES: 1) ALL NAILS SHALL BE COMMON, U.N.O.
2) WHEN NOT SPECIFICALLY NOTED ON PLANS FRAMING SHALL BE AS NOTED FOR EXTERIOR AND INTERIOR BEARING WALLS

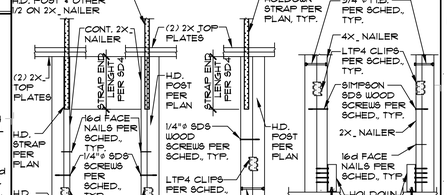
WALL FRAMING 1



8" SQ MAX. HOLE EVERY 4'X8' PANEL SHEET, ARE PERMITTED AND NO RETRO-FIT REQUIRED. FOR HOLES LARGER THAN 8" SQ OR MORE FREQUENT THAN ONE PER 4'X8' PANEL, CONTACT THE STRUCTURAL ENGINEER. HOWEVER, IT IS ACCEPTABLE TO REMOVE THE FLOOR SHEATHING AT SPECIFIED HVAC DUCT AND PLUMBING CHASES.



SHEATHING LAYOUT 2



HOLDOUN HARDWARE	NAILER	16d NAILS	#SDS 1/4"ø SCREWS	LTP4 CLIPS	3/4"ø M.B.
HDU2	2X - 2G	4X - N.A.	8	6	4
HDU4/HDU5	2X - 4G	4X - N.A.	16	8	5
STHD10/ STHD14	2X - 4G	4X - N.A.	16	8	5
HDU8	2X - 8I	4X - N.A.	24	12	6
HDU11	2X - 8I	4X - N.A.	34	16	8
HDU14	2X - 8I	4X - N.A.	44	20	11
(1)CS16	2X - 11		6	4	2
(2)CS16	2X - 11		6	8	3
CMSTC16	4X - 16	N.A.	8	4	2
	4X - 16	N.A.	14	8	4
CMSTI14	2X - 24		10	6	3
	4X - 24	N.A.	20	10	5
CMSTI2	2X - 30		14	8	4
	4X - 30	N.A.	28	14	7

2X NAILER @ TOP OF HOLDOUN POST | 4X NAILER @ TOP OF HOLDOUN POSTS | NAILER @ BOTTOM OF HOLDOUN POST

NOTE:
1) USE ONLY (1) TYPE OF FASTENER PER NAILER, DO NOT USE COMBINATIONS OF FASTENERS.
2) SPACE NAILS AT 2-1/2" O.C. STAGGERED.
3) SPACE SDS SCREWS AT 1-1/2" O.C. STAGGERED. 2X_ NAILERS REQUIRE 3" LONG SCREWS. 4X_ NAILER REQUIRE 6" LONG SCREWS.
4) SPACE CLIPS AT 5" O.C. AND INSTALL 1/2 THE QUANTITY OF CLIPS ON 1 SIDE OF THE NAILER, AND THE REMAINING 1/2 OF THE QUANTITY OF CLIPS ON THE OTHER SIDE OF THE NAILER.
5) SPACE THE MACHINE BOLTS (M.B.) @ 3" O.C. (BOLT HEAD OR NUT MAY BE COUNTER-SUNK INTO 4X_ NAILERS AND/OR 4X_ HOLDOUN POSTS.
6) STRAPS ARE TO BE INSTALLED ON BOTH 1-1/2" SIDES OF THE 2X_ NAILER. CARE MUST BE TAKEN NOT TO SPLIT THE NAILER. FOR INSTANCE, THE HOLES MAY NEED TO BE PRE-DRILLED.
7) THE NAILER AND STRAP ARE SIMILAR IF THE NAILER IS ON THE UPPER LEVEL.

NAILER AT HOLDOUN 3

IDS engineering, inc.

IDS PROJECT NO: 01153

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CLIENT:
Arun Reddy Kandoor

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Designer

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DATE ISSUED: 04-13-2022

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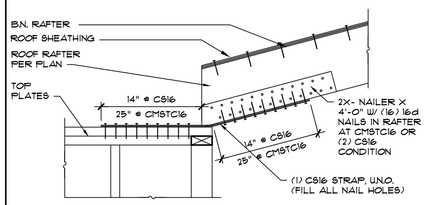
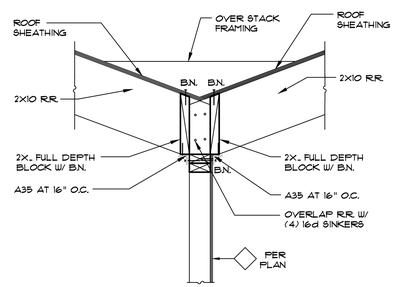
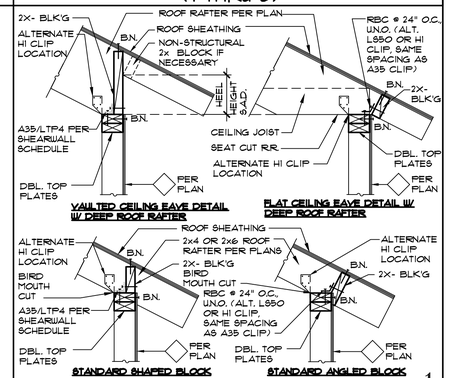
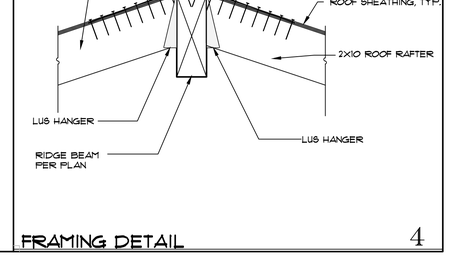
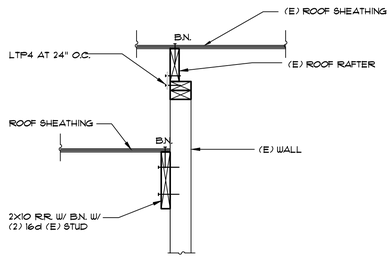
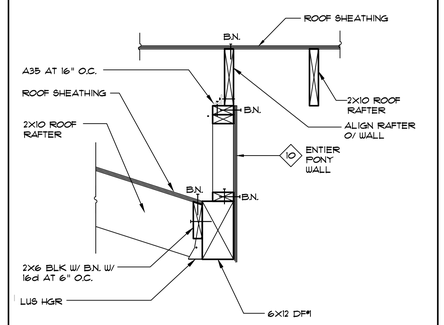
ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. WATTIG
No. C68631
Exp. 09/30/2023
CIVIL
STATE OF CALIFORNIA

SHEET:
GENERAL FRAMING DETAILS

SCALE : 1" = 1'-0"

SHT NO. SD2

(21 THRU 25)	(16 THRU 20)	(11 THRU 15)	(6 THRU 10)	(1 THRU 5)
		 ROOF RAFTER DETAIL 11	 FRAMING DETAIL 5	 ROOF EAVE DETAIL 1
			FRAMING DETAIL 6	 ROOF RAKE DETAIL 2
			 FRAMING DETAIL 7	 FRAMING DETAIL 3
			FRAMING DETAIL 4	

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Designer

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CAMPBELL, CA

DATE ISSUED: 04-13-2022

NO.	DATE:	DESCRIPTION:
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2		
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ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER
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Exp. 09/30/2023
CIVIL
STATE OF CALIFORNIA

SHEET:
ROOF FRAMING DETAILS

SCALE : 1" = 1'-0"
SHT NO. SD3

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
Chapter 1 – ADMINISTRATION	
	Scope
101.3.1	Applies to ALL newly constructed residential buildings: low-rise, high-rise, and hotels/motels.
102.3	Requires a completed Residential Occupancies Application Checklist or alternate method acceptable to the enforcing agency to be used for documentation of conformance.
Chapter 3 – GREEN BUILDING	
	Additions and alterations
301.1.1	• Applies to additions or alterations of residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. • Requirements only apply within the specific area of the addition or alteration.
301.2	**Low-rise and high-rise residential buildings** Banners identify provisions applying to low-rise only [LR] or high-rise only [HR].
	Mixed occupancy buildings
302.1	Requires each portion of mixed occupancy buildings to comply with CALGreen measures applicable for the specific occupancy. **Exceptions:** • Accessory structures and accessory occupancies serving residential buildings to comply with Chapter 4 and Appendix A4, as applicable. • Live/work units complying with the California Building Code Section 419 shall not be considered a mixed occupancy. Live/work units are required to comply with Chapter 4 and Appendix A4, as applicable.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

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2019 CALGREEN CODE

SECTION	REQUIREMENTS
Chapter 4 – RESIDENTIAL MANDATORY MEASURES	
Division 4.1 – PLANNING AND DESIGN	
	Storm water drainage and retention during construction
4.106.2	Projects which disturb less than 1 acre of soil and are not part of a larger common plan of development shall manage storm water drainage during construction.
	Grading and paving
4.106.3	Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. **Exception:** Additions and alterations which do not alter the existing drainage path.
	Electric vehicle (EV) charging for new construction
4.106.4	• Comply with Section 4.106.4.1, 4.106.4.2 or 4.106.4.3 for future installation and use of EV chargers. • Electric vehicle supply equipment (EVSE) shall be installed in accordance with the California Electrical Code, Article 625. **Exceptions:** 1. On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon 1 of the following: 1.1. Where there is no commercial power supply. 1.2. Verification that meeting requirements will alter the local utility infrastructure design requirements on the utility side of the meter increasing costs to the homeowner/developer by more than $400.00 per dwelling unit. 2. Accessory Dwelling Units and Junior Accessory Dwelling Units without additional parking facilities. **Note:** For definitions of Accessory Dwelling Units and Junior Accessory Units, see CALGreen Chapter 2.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

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2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging: 1- & 2-family dwellings/townhouses with attached private garages
4.106.4.1	• Install a listed raceway to accommodate a dedicated 208/240-volt branch circuit for each dwelling unit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. • Raceways are required to be continuous at enclosed, inaccessible, or concealed areas and spaces. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.
	Identification
4.106.4.1.1	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."
	EV charging for multifamily dwellings
4.106.4.2	• Applies to all multifamily dwelling units with parking facilities on the site. • 10% of the total number of parking spaces provided for all types of parking facilities, but in no case less than 1, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the number of EV spaces shall be rounded up to the nearest whole number. **Note:** Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging space (EV space) locations
4.106.4.2.1	Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided at least 1 EV space shall be located in the common use parking areas and shall be available for use by all residents.
	EV charging stations (EVCS)
4.106.4.2.1.1	When EV chargers are installed, EV spaces (required by Section 4.106.4.2.2, Item 3,) shall comply with at least 1 of the following options: 1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the California Building Code, Chapter 11A, to allow use of the EV charger from the accessible parking space. 2. The EV space shall be located on an accessible route to the building, as defined in the California Building Code, Chapter 2. **Exception:** EVCS designed and constructed in compliance with the California Building Code Chapter 11B are not required to comply with Section 4.106.4.2.1.1 and Section 4.106.4.2.2, Item 3.
	EV charging space (EV space) dimensions
4.106.4.2.2	EV spaces shall be designed to comply with the following: 1. The minimum length of each EV space shall be 18 feet. 2. The minimum width of each EV space shall be 9 feet. 3. 1 in every 25 EV spaces, but not less than 1, shall also have an 8-foot wide minimum aisle. A 5-foot wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet. a. Surface slope for this EV space and aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083% slope) in any direction.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Single EV space required
4.106.4.2.3	• Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV space. • Construction documents shall identify the raceway termination point. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.
	Multiple EV spaces required
4.106.4.2.4	• Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics, and electrical load calculations to verify electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. • Plan design shall be based upon a 40-ampere minimum branch circuit. • Required raceways and related components planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.
	Identification
4.106.4.2.5	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	EV charging for hotels and motels
4.106.4.3	• Applies to all newly constructed hotels and motels. • Construction documents shall identify the location of EV spaces. **Note:** Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.
	Number of required EV spaces
4.106.4.3.1	**Table 4.106.4.3.1** shows the number of required EV spaces based on the total number of parking spaces provided for all types of parking facilities.
	EV charging space (EV space) dimensions
4.106.4.3.2	EV spaces shall be designed to comply with the following: • Minimum length of each EV space shall be 18 feet. • Minimum width of each EV space shall be 9 feet.
	Single EV space required (similar to 4.106.4.2.3)
4.106.4.3.3	• Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. • Raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). • Raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the proposed location of the EV space. • Construction documents shall identify the raceway termination point. • Service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
	Multiple EV spaces required (similar to 4.106.4.2.4)
4.106.4.3.4	• Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify electrical panel service capacity and electrical system, including any on-site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EVSE. • Plan design shall be based upon a 40-ampere minimum branch circuit. • Required raceways and related components planned to be installed underground, enclosed, inaccessible or, in concealed areas and spaces shall be installed at the time of original construction.
	Identification (similar to 4.106.4.2.5)
4.106.4.3.5	Service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the California Electrical Code.
	Accessible EV spaces
4.106.4.3.6	In addition to the requirements in Section 4.106.4.3, EV spaces for hotels/motels and all EVSE, when installed, shall comply with the accessibility provisions for EV charging stations in the California Building Code, Chapter 11B.
Division 4.2 – ENERGY EFFICIENCY	
	Scope
4.201.1 & 5.201.1	• Energy efficiency requirements for low-rise residential (Section 4.201.1) and high-rise residential/hotels/motels (Section 5.201.1) are now in both residential and nonresidential chapters of CALGreen. • Standards for residential buildings do not require compliance with levels of minimum energy efficiency beyond those required by the 2019 California Energy Code.

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2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
Division 4.3 – WATER EFFICIENCY AND CONSERVATION	
	Water conserving plumbing fixtures and fittings
4.303.1	Plumbing fixtures and fittings shall comply with the following: **4.303.1.1** – Water closets: ≤ 1.28 gal/flush. **4.303.1.2** – Wall mounted urinals: ≤ 0.125 gal/flush; all other urinals ≤ 0.5 gal/flush. **4.303.1.3.1** – Single showerheads: ≤ 1.8 gpm @ 80 psi. **4.303.1.3.2** – Multiple showerheads: combined flow rate of all showerheads controlled by a single valve shall not exceed 1.8 gpm @ 80 psi, or only 1 shower outlet is to be in operation at a time. **4.303.1.4.1** – Residential lavatory faucets: maximum flow rate ≤ 1.2 gpm @ 60 psi; minimum flow rate ≥ 0.8 gpm @ 20 psi. **4.303.1.4.2** – Lavatory faucets in common and public use areas of residential buildings: ≤ 0.5 gpm @ 60 psi. **4.303.1.4.3** – Metering faucets: ≤ 0.2 gallons per cycle. **4.303.1.4.4** – Kitchen faucets: ≤ 1.8 gpm @ 60 psi; temporary increase to 2.2 gpm allowed but shall default to 1.8 gpm.
	Standards for plumbing fixtures and fittings
4.303.2	Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet applicable standards referenced in Table 1701.1 of the California Plumbing Code.
	Outdoor potable water use in landscape areas
4.304.1	New residential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.
Division 4.4 – MATERIAL CONSERVATION & RESOURCE EFFICIENCY	
	Rodent proofing
4.406.1	Annular spaces around pipes, electric cables, conduits or other openings in sole/bottom plates at exterior walls shall be closed with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency to prevent passage of rodents.

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CG-1

CALIFORNIA GREEN BUILDING CHECKLIST
PREPARED BY THE COUNTY OF SANTA CLARA

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CG-1

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020

HCD SHL 615 (New 01/20)

See specific referenced sections for complete details on CALGreen mandatory requirements.

2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.408.1	**Construction waste management** • Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4, or meet a more stringent local construction and demolition waste management ordinance. • Provide documentation to the enforcing agency per Section 4.408.5. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternative waste reduction methods developed by working with local enforcing agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite. 3. The enforcing agency may make exceptions to the requirements of this section when isolated jobsites are located in areas beyond the haul boundaries of the diversion facility.
4.408.2	**Construction waste management plan** Submit a construction waste management plan meeting Items 1 through 5 in Section 4.408.2. Plans shall be updated as necessary and shall be available for examination during construction.
4.408.3	**Waste management company** Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that diverted construction and demolition waste materials meet the requirements in Section 4.408.1.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
HCD SHL 615 (New 01/20)
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2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.408.4 & 4.408.4.1	**Waste stream reduction alternative [LR]** • Projects that generate a total combined weight of construction and demolition waste disposed in landfills, which do not exceed 3.4 pounds per square foot of the building area shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1. • Projects that generate a total combined weight of construction and demolition waste disposed in landfills, which do not exceed 2 pounds per square foot of the building area, shall meet the minimum 65% construction waste reduction requirement in Section 4.408.1.
4.410.1	**Operation and maintenance manual** At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which covers 10 specific subject areas shall be placed in the building.
4.410.2	**Recycling by occupants** Where 5 or more multifamily dwelling units are constructed on a building site, provide readily accessible area(s) that serves all buildings on the site and is identified for the depositing, storage and collection of nonhazardous materials for recycling, including (at minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals, or meet a lawfully enacted local recycling ordinance, if more restrictive. **Exception:** Rural jurisdictions that meet and apply for the exemption in Public Resources Code Section 42649.82 (a)(2)(A) et seq. are not required to comply with the organic waste portion of this section.
Division 4.5 – ENVIRONMENTAL QUALITY	
4.503.1	**Fireplaces - General** 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 all applicable local ordinances.

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SECTION	REQUIREMENTS
4.504.1	**Protection of mechanical equipment during construction** At the time of rough installation, during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air intake and distribution component openings shall be covered. Tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of water, dust and debris entering the system may be used.
4.504.2.1	**Adhesives, sealants and caulks** Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality management district rules apply: 1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products shall also comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products, as specified in Subsection 2. 2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations (CCR), Title 17, commencing with Section 94507.
4.504.2.2	**Paints and coatings** Architectural paints and coatings shall comply with VOC limits in Table 1 of the Air Resources Board Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat, or Nonflat-high Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat, or Nonflat-high Gloss VOC limit in Table 4.504.3 shall apply.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
HCD SHL 615 (New 01/20)
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2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.504.2.3 & 4.504.2.4	**Aerosol paints and coatings** • Aerosol paints and coatings shall meet the Product-weighted MIR Limits for ROC in Section 94522(a)(2) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(e)(1) and (f)(1) of California Code of Regulations, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District shall additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49. • Documentation is required per Section 4.504.2.4.
4.504.3	**Carpet systems** Carpet installed in the building interior shall meet the testing and product requirements of 1 of the following: 1. Carpet and Rug Institute's Green Label Plus Program. 2. California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350). 3. NSF/ANSI 140 at the Gold level. 4. Scientific Certifications Systems Indoor Advantage™ Gold.
4.504.3.1	**Carpet cushion** Carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program.
4.504.3.2	**Carpet adhesive** Carpet adhesives shall meet the requirements of Table 4.504.1.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
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2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.504.4	**Resilient flooring systems** Where resilient flooring is installed, at least 80% of floor area receiving resilient flooring shall comply with 1 or more of the following: 1. Products compliant with the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350), certified as a CHPS Low-Emitting Material in the Collaborative for High Performance Schools (CHPS) High Performance Products Database. 2. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children & Schools program). 3. Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program. 4. Meet the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1, February 2010 (also known as Specification 01350).
4.504.5 & 4.504.5.1	**Composite wood products** • Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in the Air Resources Board's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), as shown in Table 4.504.5. • Documentation is required per Section 4.504.5.1. • Definition of Composite Wood Products: Composite wood products include hardwood plywood, particleboard, and medium density fiberboard. "Composite wood products" do not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, prefabricated wood I-joists, or finger-joined lumber, all as specified in CCR, Title 17, Section 93120.1(a).

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
HCD SHL 615 (New 01/20)
See specific referenced sections for complete details on CALGreen mandatory requirements.
2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.505.2	**Concrete slab foundations** Concrete slab foundations or concrete slab-on-ground floors required to have a vapor retarder by the California Building Code, Chapter 19, or the California Residential Code, Chapter 5, respectively, shall also comply with this section.
4.505.2.1	**Capillary break** A capillary break shall be installed in compliance with at least 1 of the following: 1. A 4-inch thick base of ½ inch or larger clean aggregate shall be provided with a vapor retarder in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06. 2. Other equivalent methods approved by the enforcing agency. 3. A slab design specified by a licensed design professional.
4.505.3	**Moisture content of building materials** Building materials with visible signs of water damage shall not be installed. Wall and floor framing shall not be enclosed when the framing members exceed 19% moisture content. Moisture content shall be verified in compliance with the following: 1. Moisture content shall be determined with either a probe-type or a contact-type moisture meter. Equivalent moisture verification methods may be approved by the enforcing agency and shall satisfy requirements in Section 101.8. 2. Moisture readings shall be taken at a point 2 feet to 4 feet from the grade stamped end of each piece to be verified. 3. At least 3 random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing. Insulation products which are visibly wet or have a high moisture content shall be replaced or allowed to dry prior to enclosure in wall or floor cavities. Manufacturers' drying recommendations shall be followed for wet-applied insulation products prior to enclosure.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
HCD SHL 615 (New 01/20)
See specific referenced sections for complete details on CALGreen mandatory requirements.
2019 CALGREEN CODE

SECTION	REQUIREMENTS
4.506.1	**Bathroom exhaust fans** Each bathroom shall be mechanically ventilated and shall comply with the following: 1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building. 2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidity control. a. Humidity controls shall be capable of manual or automatic adjustment between a relative humidity range of ≤ 50% to a maximum of 80%. b. A humidity control may be a separate component to the exhaust fan and is not required to be integral or built-in. **Note:** For CALGreen, a bathroom is a room which contains a bathtub, shower, or tub/shower combination. Fans or mechanical ventilation is required in each bathroom.
4.507.2	**Heating and air-conditioning system design** Heating and air-conditioning systems shall be sized, designed and equipment selected using the following methods: 1. The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J – 2016 (Residential Load Calculation), ASHRAE handbooks or other equivalent design software or methods. 2. Duct systems are sized according to ANSI/ACCA 1 Manual D – 2016 (Residential Duct Systems), ASHRAE handbooks or other equivalent design software or methods. 3. Select heating and cooling equipment according to ANSI/ACCA 3 Manual S – 2014 (Residential Equipment Selection) or other equivalent design software or methods. **Exception:** Use of alternate design temperatures necessary to ensure the systems function are acceptable.

2019 CALGREEN RESIDENTIAL MANDATORY MEASURES EFFECTIVE JANUARY 1, 2020
HCD SHL 615 (New 01/20)
See specific referenced sections for complete details on CALGreen mandatory requirements.
2019 CALGREEN CODE

SECTION	REQUIREMENTS
CHAPTER 7 – INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS	
702.1	**Installer training** HVAC system installers shall be trained and certified in the proper installation of HVAC systems and equipment by a recognized training or certification program. Examples of acceptable HVAC training and certification programs include, but are not limited to, the following: 1. State certified apprenticeship programs. 2. Public utility training programs. 3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations. 4. Programs sponsored by manufacturing organizations. 5. Other programs acceptable to the enforcing agency.
702.2	**Special inspection** When required by the enforcing agency, special inspectors must be qualified and able to demonstrate competence to the enforcing agency in the discipline in which they are inspecting.
703.1	**Documentation** Documentation of compliance shall include, but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the local enforcing agency. Other specific documentation or special inspections necessary to verify compliance are specified in appropriate sections of CALGreen.

CG-2

CALIFORNIA GREEN BUILDING CHECKLIST
PREPARED BY THE COUNTY OF SANTA CLARA

Diego Valencia
DRAFTER
Call & Text
408.594.8452
valenciaconstruservices
@gmail.com

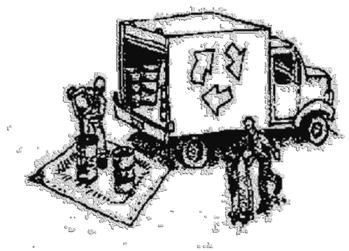
CG-2

Construction Best Management Practices (BMPs)

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

Water Pollution Prevention Program
Clean Water. Healthy Community.

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



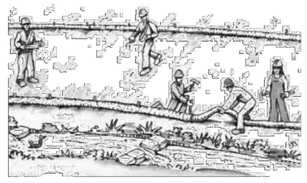
Maintenance and Parking

- ❑ 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 or drop cloths 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, or steam cleaning equipment.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) 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).

Earthmoving



- ❑ Schedule grading and excavation work during dry weather.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Remove existing vegetation only when absolutely necessary, and seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.
- ❑ Prevent sediment from migrating offsite and protect storm drain inlets, gutters, ditches, and drainage courses by installing and maintaining appropriate BMPs, such as fiber rolls, silt fences, sediment basins, gravel bags, berms, etc.
- ❑ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

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, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ 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

- ❑ Protect nearby 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.

Concrete, Grout & Mortar Application



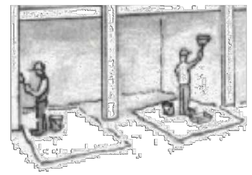
- ❑ Store concrete, grout, and mortar away from storm drains or waterways, and on pallets under cover to protect them from rain, runoff, and wind.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and in a manner that will prevent leaching into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ When washing exposed aggregate, prevent washwater from entering storm drains. Block any inlets and vacuum gutters, hose washwater onto dirt areas, or drain onto a bermed surface to be pumped and disposed of properly.

Landscaping



- ❑ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ❑ Stack bagged material on pallets and under cover.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

Painting & Paint Removal



Painting Cleanup and Removal

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm 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 excess liquids 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.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

Dewatering



- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ 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 or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

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

BEST MANAGEMENT PRACTICES - CLEAN BAY
PREPARED BY THE COUNTY OF SANTA CLARA

Diego Valencia
DRAFTER
Call & Text
408.594.8452
valenciaconstruservices
@gmail.com

BMP

GENERAL INFORMATION

01	Project Name	Walnut Drive ADU			
02	Run Title	Title 24 Analysis			
03	Project Location	1450 Walnut Drive			
04	City	Campbell	05	Standards Version	2019
06	Zip code	95008	07	Software Version	EnergyPro 8.3
08	Climate Zone	4	09	Front Orientation (deg/ Cardinal)	45
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	AdditionOnly	13	Number of Bedrooms	5
14	Addition Cond. Floor Area (ft²)	825	15	Number of Stories	1
16	Existing Cond. Floor Area (ft²)	2704	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft²)	3529	19	Glazing Percentage (%)	18.97%
20	ADU Bedroom Count	2	21	ADU Conditioned Floor Area	825
22	Is Natural Gas Available?	Yes			

Addition Alone Project Analysis Parameters

01	02	03	04	05	06
Existing Area (excl. new addition) (ft2)	Addition Area (excl. existing) (ft2)	Total Area (ft2)	Existing Bedrooms	Addition Bedrooms	Total Bedrooms
2704	825	3529	3	2	5

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 USE SUMMARY

Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	33.94	26.94	7	20.6
Space Cooling	3.33	8.44	-5.11	-153.5
IAQ Ventilation	4.87	4.87	0	0
Water Heating	28.44	26.02	2.42	8.5
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	**70.58**	**66.27**	**4.31**	**6.1**

REQUIRED SPECIAL FEATURES

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

- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)
- 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 building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- Verified EER
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)

Heating System Verifications:
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)

HVAC Distribution System Verifications:
- -- None --

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

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
Living Area	Conditioned	HVAC System1	825	8	DHW Sys 1	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft²)	Window and Door Area (ft2)	Tilt (deg)	Wall Exceptions	Status
Front Wall	Living Area	R-15 Wall	45	Front	432	85.5	90	Extension	New
Left Wall	Living Area	R-15 Wall	135	Left	144	61	90	Extension	New
Rear Wall	Living Area	R-15 Wall	225	Back	432	0	90	Extension	New
Right Wall	Living Area	R-15 Wall	315	Right	144	30	90	Extension	New
Roof 2	Living Area	R-30 Roof Attic	n/a	n/a	25	n/a	n/a		New

OPAQUE SURFACES - CATHEDRAL CEILINGS

01	02	03	04	05	06	07	08	09	10	11
Name	Zone	Construction	Azimuth	Orientation	Area (ft²)	Skylight Area (ft²)	Roof Rise (x in 12)	Roof Reflectance	Roof Emittance	Cool Roof
Roof	Living Area	R-30 Roof No Attic	0	n/a	800	0	4	0.1	0.85	No

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 Living Area	Attic RoofLiving Area	Ventilated	4	0.1	0.85	No	No

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 (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading
Window	Window	Front Wall	Front	45			1	8	0.3	NFRC	0.23	NFRC	Bug Screen
Window 2	Window	Front Wall	Front	45			1	16	0.3	NFRC	0.23	NFRC	Bug Screen
Window 3	Window	Front Wall	Front	45			1	13.5	0.3	NFRC	0.23	NFRC	Bug Screen
Window 4	Window	Front Wall	Front	45			1	8	0.3	NFRC	0.23	NFRC	Bug Screen
Window 5	Window	Front Wall	Front	45			1	10	0.3	NFRC	0.23	NFRC	Bug Screen
Window 6	Window	Front Wall	Front	45			1	10	0.3	NFRC	0.23	NFRC	Bug Screen
French Door	Window	Left Wall	Left	135			1	54	0.3	NFRC	0.23	NFRC	Bug Screen
Window 7	Window	Left Wall	Left	135			1	7	0.3	NFRC	0.23	NFRC	Bug Screen
Window 8	Window	Right Wall	Right	315			1	30	0.3	NFRC	0.23	NFRC	Bug Screen

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft²)	U-factor
Door	Front Wall	20	0.5

SLAB FLOORS

01	02	03	04	05	06	07	08
Name	Zone	Area (ft²)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab	Living Area	825	144	none	0	80%	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
R-15 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Exterior Finish: 3 Coat Stucco
R-30 Roof No Attic	Cathedral Ceilings	Wood Framed Ceiling	2x12 @ 16 in. O. C.	R-30	None / None	0.036	Roofing: Light Roof (Asphalt Shingle) Roof Deck: Wood Siding/sheathing/decking Cavity / Frame: R-30 / 2x12 Inside Finish: Gypsum Board
Attic RoofLiving Area	Attic Roofs	Wood Framed Ceiling	2x4 @ 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
R-30 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-30	None / None	0.032	Over Ceiling Joists: R-20.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04
Quality Insulation Installation (QII)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Not 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 Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heater 1 (1)	n/a	None	n/a

WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Heating Element Type	Tank Type	# of Units	Tank Vol. (gal)	Energy Factor or Efficiency	Input Rating or Pilot	Tank Insulation R-value (in/Ext)	Standby Loss or Recovery Eff	1st Hr. Rating or Flow Rate	NEEA Heat Pump Brand or Model	Tank Location or Ambient Condition	Status	Verified Existing Condition
DHW Heater 1	Heat Pump	n/a	1	50	NEEA Rated	<= 12 kW	n/a	n/a	n/a	Rheem\PROPH50 T2 RH3751S (50 gal)	Outside	New	n/a

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 Sys 1 - 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 System1	Heat pump heating cooling	Heat Pump System 1	Heat Pump System 1	n/a	n/a	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/CEER			
Heat Pump System 1	VCHP-ductless	1	8.2	12000	8000	14	12.5	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump

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 1-hers-htpump	Not Required	0	Required	Not Required	Yes	No	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCHP System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing & Pressure Drop Rating	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3.3 and SC3.3.3.4.1	Certified non-continuous Fan	Indoor Fan not Running Continuously
Heat Pump System 1	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

IAQ (INDOOR AIR QUALITY) FANS

01	02	03	04	05	06	07
Dwelling Unit	IAQ CFM	IAQ Watts/CFM	IAQ Fan Type	IAQ Recovery Effectiveness - SRE	IAQ Recovery Effectiveness - ASRE	HERS Verification
SFam ADU IAQVentRpt	47	0.35	Exhaust	n/a	n/a	Yes

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Timothy Carstairs	Documentation Author Signature: Timothy Carstairs
Company: Carstairs Energy Inc.	Signature Date: 2022-08-02 10:36:10
Address: 2238 Bayview Heights Drive, Suite E	CEA/ HERS Certification Identification (if applicable): r160610042
City/State/Zip: Los Osos, CA 93402	Phone: 805-904-9048

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: Diego Valencia	Responsible Designer Signature: Diego Valencia
Company: A CONSTRUCTION & DOCUMENTATION SERVICES	Date Signed: 2022-08-02 10:51:55
Address: 2311 Ivy Hill Way, Apt 1434	License: na
City/State/Zip: San Ramon, CA 94582	Phone: 408-594-8452

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RESIDENTIAL MEASURES SUMMARY RMS-1

Project Name: Walnut Drive ADU	Building Type: ☑ Single Family ☐ Multi Family	☑ Addition Alone ☐ Existing+ Addition/Alteration	Date: 8/2/2022
Project Address: 1450 Walnut Drive Campbell	California Energy Climate Zone: CA Climate Zone 04	Total Cond. Floor Area: 825	Addition: 825 / # of Units: 1

INSULATION

Construction	Type	Cavity	Area (ft²)	Special Features	Status
Wall	Wood Framed	R 15	347		New
Door	Opaque Door	- no insulation	20		New
Wall	Wood Framed	R 15	63		New
Wall	Wood Framed	R 15	432		New
Wall	Wood Framed	R 15	114		New
Roof	Wood Framed Rafter	R 30	800		New
Roof	Wood Framed Attic	R 30	25		New
Slab	Unheated Slab-on-Grade	- no insulation	825	Perim = 144'	New

FENESTRATION Total Area: 197 Glazing Percentage: 19.0 % New/Altered Average U-Factor: 0.30

Orientation	Area(ft²)	U-Fac	SHGC	Overhang	Sidefins	Exterior Shades	Status
Front (NE)	86.5	0.300	0.23	none	none	N/A	New
Left (SE)	61.0	0.300	0.23	none	none	N/A	New
Right (NW)	30.0	0.300	0.23	none	none	N/A	New

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	Split Heat Pump	8.20 HSPF	Split Heat Pump	14.0 SEER	Setback	New

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status
HVAC System	Ductless / with Fan	Ductless	n/a	n/a	New

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status
1	Heat Pump	50	3.20	Standard	New

EnergyPro 8.3 by EnergySoft User Number: 6249 ID: 22-033928 Page 11 of 16

Carstairs Energy Inc.
2238 Bayview Heights Drive, Suite E
Los Osos, CA 93402
805-904-9048 tim24@vahoo.com
www.carstairsenergy.com

Walnut Drive Addition

CABEC
California Association of Building Energy Consultants
CERTIFIED ENERGY ANALYST
Timothy Carstairs

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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 yet 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)2:	**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 prevent infiltration as specified by § 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(n):	**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(a):	**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 must be 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

§ 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 § 130.5(e); and meets all other requirements in § 130.0(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)3A i) 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 more than 20 percent of the floor area, permanently installed lighting for the interior common areas in that building must 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".

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(i):	**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 labelled 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, labelled 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 drainage 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 Hot-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:	
§ 150.0(m)1:	**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. **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)13. 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.*

ROOM LOAD SUMMARY

Project Name: *Walnut Drive ADU*
Date: *8/2/2022*
System Name: *HVAC System*
Floor Area: *825*

ROOM LOAD SUMMARY

			ROOM COOLING PEAK			COIL COOLING PEAK			COIL HTG. PEAK	
Zone Name	Room Name	Mult.	CFM	Sensible	Latent	CFM	Sensible	Latent	CFM	Sensible
Living Area	*1st Floor*	*1*	*341*	*7,323*	*328*	*341*	*7,323*	*328*	*323*	*12,832*
PAGE TOTAL			*341*	*7,323*	*328*	*341*	*7,323*	*328*	*323*	*12,832*
TOTAL *			*341*	*7,323*	*328*	*341*	*7,323*	*328*	*323*	*12,832*

* Total includes ventilation load for zonal systems.

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 average 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 continuous pilot ignition; and must not use a 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 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)1.
§ 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)2AA:	**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.

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Walnut Drive Addition

CABEC
California Association of Building Energy Consultants
CERTIFIED ENERGY ANALYST
Timothy Carstairs

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CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

Project Name: Walnut Drive ADU **Calculation Date/Time:** 2022-03-29T14:57:52-07:00 **(Page 1 of 8)**

Calculation Description: Title 24 Analysis **Input File Name:** Walnut Drive ADU (1450).ribd19x

GENERAL INFORMATION

01	Project Name	Walnut Drive ADU			
02	Run Title	Title 24 Analysis			
03	Project Location	1450 Walnut Drive			
04	City	Campbell	05	Standards Version	2019
06	Zip code	95008	07	Software Version	EnergyPro 8.3
08	Climate Zone	4	09	Front Orientation (deg/ Cardinal)	45
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	AdditionOnly	13	Number of Bedrooms	5
14	Addition Cond. Floor Area (ft^2)	825	15	Number of Stories	1
16	Existing Cond. Floor Area (ft^2)	2704	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft^2)	3529	19	Glazing Percentage (%)	18.12%
20	ADU Bedroom Count	2	21	ADU Conditioned Floor Area	825
22	Is Natural Gas Available?	Yes			

Addition Alone Project Analysis Parameters

01	02	03	04	05	06
Existing Area (excl. new addition) (ft2)	Addition Area (excl. existing) (ft2)	Total Area (ft2)	Existing Bedrooms	Addition Bedrooms	Total Bedrooms
2704	825	3529	3	2	5

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

Registration Number: 222-P010860383A-000-000-0000000-0000 Registration Date/Time: 2022-03-30 10:32:08 HERS Provider: CalCERTS Inc.

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CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

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ENERGY USE SUMMARY

Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	29.73	25.45	4.28	14.4
Space Cooling	8.34	10.32	-1.98	-23.7
IAQ Ventilation	4.87	4.87	0	0
Water Heating	26.63	23.81	2.82	10.6
Self Utilization/Flexibility Credit	n/a	0	0	n/a
Compliance Energy Total	**69.57**	**64.45**	**5.12**	**7.4**

REQUIRED SPECIAL FEATURES

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

- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)

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 building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

Building-level Verifications:
- Indoor air quality ventilation
- Kitchen range hood

Cooling System Verifications:
- Verified EER
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)

Heating System Verifications:
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)

HVAC Distribution System Verifications:
- -- None --

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

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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
Living Area	Conditioned	HVAC System1	825	8	DHW Sys 1	N/A

OPAQUE SURFACES

01	02	03	04	05	06	07	08	09	10
Name	Zone	Construction	Azimuth	Orientation	Gross Area (ft^2)	Window and Door Area (ft2)	Tilt (deg)	Wall Exceptions	Status
Front Wall	Living Area	R-15 Wall	45	Front	432	85.5	90	Extension	New
Left Wall	Living Area	R-15 Wall	135	Left	144	54	90	Extension	New
Rear Wall	Living Area	R-15 Wall	225	Back	432	0	90	Extension	New
Right Wall	Living Area	R-15 Wall	315	Right	144	30	90	Extension	New
Roof	Living Area	R-30 Roof Attic	n/a	n/a	825	n/a	n/a		New

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 Living Area	Attic Roof/Living Area	Ventilated	4	0.1	0.85	No	No

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
Window	Window	Front Wall	Front	45			1	8	0.3	NFRC	0.23	NFRC	Bug Screen
Window 2	Window	Front Wall	Front	45			1	16	0.3	NFRC	0.23	NFRC	Bug Screen
Window 3	Window	Front Wall	Front	45			1	13.5	0.3	NFRC	0.23	NFRC	Bug Screen
Window 4	Window	Front Wall	Front	45			1	8	0.3	NFRC	0.23	NFRC	Bug Screen
Window 5	Window	Front Wall	Front	45			1	10	0.3	NFRC	0.23	NFRC	Bug Screen

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CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

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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
Window 6	Window	Front Wall	Front	45			1	10	0.3	NFRC	0.23	NFRC	Bug Screen
French Door	Window	Left Wall	Left	135			1	54	0.3	NFRC	0.23	NFRC	Bug Screen
Window 7	Window	Right Wall	Right	315			1	30	0.3	NFRC	0.23	NFRC	Bug Screen

OPAQUE DOORS

01	02	03	04
Name	Side of Building	Area (ft^2)	U-factor
Door	Front Wall	20	0.5

SLAB FLOORS

01	02	03	04	05	06	07	08
Name	Zone	Area (ft^2)	Perimeter (ft)	Edge Insul. R-value and Depth	Edge Insul. R-value and Depth	Carpeted Fraction	Heated
Slab	Living Area	825	144	none	0	80%	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
R-15 Wall	Exterior Walls	Wood Framed Wall	2x4 @ 16 in. O. C.	R-15	None / None	0.095	Inside Finish: Gypsum Board Cavity / Frame: R-15 / 2x4 Exterior Finish: 3 Coat Stucco

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CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

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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
Attic Roof/Living Area	Attic Roofs	Wood Framed Ceiling	2x4 @ 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
R-30 Roof Attic	Ceilings (below attic)	Wood Framed Ceiling	2x4 @ 24 in. O. C.	R-30	None / None	0.032	Over Ceiling Joists: R-20.9 insul. Cavity / Frame: R-9.1 / 2x4 Inside Finish: Gypsum Board

BUILDING ENVELOPE - HERS VERIFICATION

01	02	03	04
Quality Insulation Installation (QII)	High R-value Spray Foam Insulation	Building Envelope Air Leakage	CFM50
Not 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 Sys 1	Domestic Hot Water (DHW)	Standard Distribution System	DHW Heater 1 (1)	n/a	None	n/a

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WATER HEATERS

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Name	Heating Element Type	Tank Type	# of 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	Status	Verified Existing Condition
DHW Heater 1	Gas	Consumer Instantaneous	1	0	0.94-UEF	<= 200 kBtu/hr	0	n/a	n/a	n/a	n/a	New	n/a

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 Sys 1 - 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 System1	Heat pump heating cooling	Heat Pump System 1	Heat Pump System 1	n/a	n/a	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/CEER			
Heat Pump System 1	VCHP-ductless	1	8.2	12000	8000	14	12.5	Not Zonal	Single Speed	Heat Pump System 1-hers-htpump

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CERTIFICATE OF COMPLIANCE **CF1R-PRF-01E**

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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 1-hers-htpump	Not Required	0	Required	Not Required	Yes	No	Yes	Yes

VARIABLE CAPACITY HEAT PUMP COMPLIANCE OPTION - HERS VERIFICATION

01	02	03	04	05	06	07	08	09	10
Name	Certified Low-Static VCHP System	Airflow to Habitable Rooms	Ductless Units in Conditioned Space	Wall Mount Thermostat	Air Filter Sizing & Pressure Drop Rating	Low Leakage Ducts in Conditioned Space	Minimum Airflow per RA3.3 and SC3.3.3.4.1	Certified non-continuous Fan	Indoor Fan not Running Continuously
Heat Pump System 1	Not required	Required	Required	Required	Not required	Not required	Not required	Not required	Not required

IAQ (INDOOR AIR QUALITY) FANS

01	02	03	04	05	06	07
Dwelling Unit	IAQ CFM	IAQ Watts/CFM	IAQ Fan Type	IAQ Recovery Effectiveness - SRE	IAQ Recovery Effectiveness - ASRE	HERS Verification
5Fam ADU IAQVentRpt	47	0.35	Exhaust	n/a	n/a	Yes

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Timothy Carstairs	Documentation Author Signature: Timothy Carstairs
Company: Carstairs Energy Inc.	Signature Date: 2022-03-30 08:11:48
Address: 2238 Bayview Heights Drive, Suite E	CEA/ HERS Certification Identification (if applicable): #16061042
City/State/Zip: Los Osos, CA 93402	Phone: 805-904-9048

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: Diego Valencia	Responsible Designer Signature: Diego Valencia
Company: A CONSTRUCTION & DOCUMENTATION SERVICES	Date Signed: 2022-03-30 10:32:08
Address: 2311 Ivy Hill Way, Apt 1434	License: na
City/State/Zip: San Ramon, CA 94582	Phone: 408-594-8452

Digitally signed by CalCERTS. 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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3/30/2022

DRAWN BY: Timothy Carstairs

SCALE: N/A

SHEET: T24.1

RESIDENTIAL MEASURES SUMMARY — RMS-1

Project Name	Building Type		Date
Walnut Drive ADU	☑ Single Family ☐ Multi Family	☑ Addition Alone ☐ Existing+ Addition/Alteration	*3/30/2022*

Project Address	California Energy Climate Zone	Total Cond. Floor Area	Addition	# of Units
1450 Walnut Drive Campbell	*CA Climate Zone 04*	*825*	*825*	*1*

INSULATION

Construction	Type	Cavity	Area (ft^2)	Special Features	Status
Wall	*Wood Framed*	*R 15*	*347*		*New*
Door	*Opaque Door*	*- no insulation*	*20*		*New*
Wall	*Wood Framed*	*R 15*	*90*		*New*
Wall	*Wood Framed*	*R 15*	*432*		*New*
Wall	*Wood Framed*	*R 15*	*114*		*New*
Roof	*Wood Framed Attic*	*R 30*	*825*		*New*
Slab	*Unheated Slab-on-Grade*	*- no insulation*	*825*	*Perim = 144'*	*New*

FENESTRATION

Total Area: *150* Glazing Percentage: *18.1 %* New/Altered Average U-Factor: *0.30*

Orientation	Area (ft^2)	U-Fac	SHGC	Overhang	Sidefins	Exterior Shades	Status
Front (NE)	*65.5*	*0.300*	*0.23*	*none*	*none*	*N/A*	*New*
Left (SE)	*54.0*	*0.300*	*0.23*	*none*	*none*	*N/A*	*New*
Right (NW)	*30.0*	*0.300*	*0.23*	*none*	*none*	*N/A*	*New*

HVAC SYSTEMS

Qty.	Heating	Min. Eff	Cooling	Min. Eff	Thermostat	Status
1	*Split Heat Pump*	*8.20 HSPF*	*Split Heat Pump*	*14.0 SEER*	*Setback*	*New*

HVAC DISTRIBUTION

Location	Heating	Cooling	Duct Location	Duct R-Value	Status
HVAC System	*Ductless / with Fan*	*Ductless*	*n/a*	*n/a*	*New*

WATER HEATING

Qty.	Type	Gallons	Min. Eff	Distribution	Status
1	*Small Instantaneous Gas*	*1*	*0.94*	*Standard*	*New*

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".

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 on the exterior 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(a)	**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

§ 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 drainage 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 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

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-K.
§ 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.

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