

UL/cUL SYSTEM NO. W-L-1252
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY
F-RATING = 1-HR., 2-HR., 3-HR., OR 4-HR.
T-RATING = 0-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT
L-RATING AT 400° F = LESS THAN 1 CFM / SQ FT

FRONT VIEW **SECTION A-A**

1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U400, V400, OR W400 SERIES) (1-HR., 2-HR., 3-HR., OR 4-HR. FIRE-RATING) (4-HR. SHOWN).
2. STEEL STUDS TO BE MINIMUM 3-1/2" (SPACED MAXIMUM 24" OC).
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
A. MAXIMUM 4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
B. MAXIMUM 4" NOMINAL DIAMETER CAST IRON PIPE.
C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
4. HILTI FIRESTOP SEALANT APPLIED PER TABLE BELOW.
5. MINIMUM 1/2" HILTI BEAD OF FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

F RATING HR.	SEALANT TYPE	SEALANT THICKNESS, IN.
1, 2	FS-ONE MAX OR FS-ONE OR CP 606	5/8
3	FS-ONE MAX OR FS-ONE OR CP 606	1
4	FS-ONE MAX OR FS-ONE	1

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5-3/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 7/8".

HILTI Firestop Systems HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000
Sheet 1 of 1 Scale 11/64" = 1" Date Jan. 12, 2015 Drawing No. **WL 1252d**
Saving Lives through Innovation and Education

UL/cUL SYSTEM NO. F-C-1106
METAL PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY
F-RATING = 1-HR.
T-RATING = 1/4-HR.

TOP VIEW **SECTION A-A**

1. WOOD FLOOR/CEILING ASSEMBLY (UL/cUL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
A. MAXIMUM 4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
B. MAXIMUM 4" NOMINAL DIAMETER CAST IRON OR DUCTILE IRON PIPE.
C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE OR COPPER TUBING.
D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT OR EMT.
4. MINIMUM 3/4" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT OR HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 5/8" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT OR HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI CP 606 FLEXIBLE FIRESTOP SEALANT OR HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 7/8".
3. CHASE WALL (NOT SHOWN, OPTIONAL) - PENETRATING ITEM MAY BE ROUTED THROUGH A FIRE-RATED OR NON-RATED SINGLE, DOUBLE, OR STAGGERED WOOD STUD/GYPSUM CHASE WALL ASSEMBLY CONSISTING OF NOMINAL 2" x 6" OR PARALLEL 2" x 4" LUMBER PLATES AND STUDS.

HILTI Firestop Systems HILTI, Inc. Plano, Texas USA (800) 879-8000
Sheet 1 of 1 Scale 5/32" = 1" Date Apr. 16, 2018 Drawing No. **FC 1106e**
Saving Lives through Innovation and Education

UL SYSTEM NO. F-C-1106
INSULATED METAL PIPE THROUGH 1 OR 2 HR FLOOR ASSEMBLY
UL * FC5024

SECTION A-A

1. WOOD FLOOR ASSEMBLY (1 HR FIRE RATED SHOWN).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
A. MAX. 2" STEEL PIPE
B. MAX. 2" COPPER PIPE
4. PIPE INSULATION TO BE ONE OF THE FOLLOWING:
A. MAX. 1/2" THICK FIBERGLASS INSULATION
B. MAX. 3/4" THICK AB/PVC FLEXIBLE FOAM
5. GYPSUM WALL ASSEMBLY (1 HR SHOWN).
6. PROVIDE A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP, OR EQUAL, SEALANT AT THE TOP PLATE.
7. TOP PLATE
8. MINIMUM 3/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

NOTES:
1. ANNULAR SPACE = 0" MIN., 1/2" MAX.

SCALE: NONE

UL SYSTEM NO. WL5028
METAL PIPE THROUGH 1 OR 2 HR WALL ASSEMBLY
UL * WL5028

SECTION A-A

1. GYPSUM WALL ASSEMBLY (1 OR 2 HR FIRE RATING) (2 HR SHOWN) SEE ARCHITECTURAL WALL DETAIL.
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
A. MAX. 4" STEEL PIPE (SCH. 40 OR HEAVIER)
B. MAX. 2" COPPER PIPE OR TUBING
3. MIN. 1/2" TO MAX. 3/4" THICK AB/PVC FOAM PIPE INSULATION
4. HILTI FS-ONE FIRESTOP SEALANT:
A. MIN. 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, OR EQ.
5. MIN. 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT, OR EQUAL, APPLIED AT POINT OF CONTACT.

NOTES:
1. MAXIMUM D.I.A. OF OPENING = 1 1/2".
2. ANNULAR SPACE = 0" MIN., 1/2" MAX.

SCALE: NONE

System No. F-C-2030
F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0, 3/4, 1, 1-1/2 and 2 Hr (See Item 3)

CLASSIFIED
Classified by Underwriters Laboratories, Inc. to UL 1479

1. Floor-Ceiling Assembly — The 1 or 2 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The F Rating of the firestop system is equal to the rating of the floor-ceiling and wall assemblies. The general construction features of the floor-ceiling assembly are summarized below:
A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
B. Joists — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with end firestop.
C. Gypsum Board — Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
D. Furring Channels — (Not Shown) (As required) - Resilient galvanized steel furring installed in accordance with the manner specified in the individual L500 Series Designs in the Fire Resistance Directory.

System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

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System No. F-C-2030

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2. Chase Wall — (Optional) - The through penetrant (Item 3) may be routed through a fire-rated or non-rated single, double or staggered wood stud/gypsum wallboard chase wall. The chase wall shall be constructed to include the following construction features:
A. Studs — Nom 2 by 6 in. (51 by 152 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
B. Sole Plate — Nom 2 by 6 in. (51 by 152 mm) (or larger) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
C. Top Plate — The double top plate shall consist of two nom 2 by 6 in. (51 by 152 mm) (or larger) or parallel 2 by 4 in. (51 by 102 mm) lumber plates, tightly butted. Diam of opening shall be 1 in. (25 mm) larger than the nom diam of through-penetrant (Item 3).
D. Gypsum Board — One or two layers of min 1/2 in. (13 mm) gypsum board.
3. Through-Penetrants — One nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam nonmetallic pipe to be installed within the firestop system. Diam of opening through flooring system and through sole and top plates of chase wall to be max 2-1/8 in. (54 mm), 2-5/8 in. (67 mm), 4 in. (102 mm) or 5 in. (127 mm) for nom 1-1/2 in. (38 mm), 2 in. (51 mm), 3 in. (76 mm) or 4 in. (102 mm) diam nonmetallic pipe sizes, respectively. Pipe to be rigidly supported on both sides of the floor-ceiling assembly. The T Rating is dependent on the size of the through-penetrant. For 2 hr rated assemblies, the T Rating is 2 hr for 1-1/2 in. (38 mm) diam (and smaller) pipes and 1-1/2 hr for pipes greater than 1-1/2 in. (38 mm) diam. For 1 hr rated assemblies, the T Rating is 1 hr for 1-1/2 in. (38 mm) diam (and smaller) pipes, 3/4 hr for 2 in. (51 mm) diam pipes and 0 hr for pipes greater than 2 in. (51 mm) diam. The following types of nonmetallic pipes may be used:
A. Polyvinyl Chloride (PVC) Pipe — Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — SDR17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
D. Flame Retardant Polypropylene (FRPP) Pipe — Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
4. Firestop System — The details of the firestop system shall be as follows:
A. Fill, Void or Cavity Material* — Sealant — Min 3/4 in. (19 mm) thickness of fill material to be installed within the annular space between the pipe and the flooring (Item 1A) or sole plate. Min 5/8 in. (16 mm) thickness applied within the annular space, flush with the bottom surface of ceiling or lower top plate.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant FS-ONE MAX Intumescent Sealant.
B. Firestop Device* — Firestop Collar — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to underside of ceiling or chase wall top plate (Item 2C) using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 1-1/2 (38 mm) and 2 in. (51 mm) diam pipes and 3 anchor hooks for 3 in. (76 mm) diam pipes). The anchor hooks are to be secured to the ceiling with min 3/16 in. (5 mm) diam steel toggler bolts or to the chase wall top plate with min No. 12 by min 1 in. (25 mm) long steel wood screws in conjunction with steel washers.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP643 63/2"N, CP 643 90/3"N or CP643 110/4"N Firestop Collar

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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UL SYSTEM NO. F-C-2263
CLOSET FLANGE IN WOOD FLOOR/CEILING ASSEMBLY
F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
A. NOMINAL 4" DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
B. NOMINAL 4" DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. MINIMUM 3/4" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT OR HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. (NOT SHOWN), FLOOR MOUNTED VITREOUS WATER CLOSET.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

HILTI Firestop Systems HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000
Sheet 1 of 1 Scale 5/32" = 1" Date Jan. 07, 2015 Drawing No. **FC 2263d**
Saving Lives through Innovation and Education

UL SYSTEM NO. WL2078
PLASTIC PIPE THROUGH 1 OR 2 HR WALL ASSEMBLY
UL * WL2078

SECTION A-A

1. GYPSUM WALL ASSEMBLY (1 OR 2 HR FIRE RATING) (2 HR SHOWN) SEE ARCHITECTURAL WALL DETAIL.
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
A. MAX. 6" ABS
3. HILTI CP642 FIRESTOP COLLAR
4. FASTEN EACH MOUNTING TAB TO WALL ASSEMBLY WITH HILTI 1/4" TOGGLE BOLT.
5. PROVIDE 1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT, OR EQUAL, IN ANNULAR SPACE AROUND PIPE.

NOTES:
1. ANNULAR SPACE = 0" MIN., 1/4" MAX.

SCALE: NONE

MELAS ENERGY ENGINEERING
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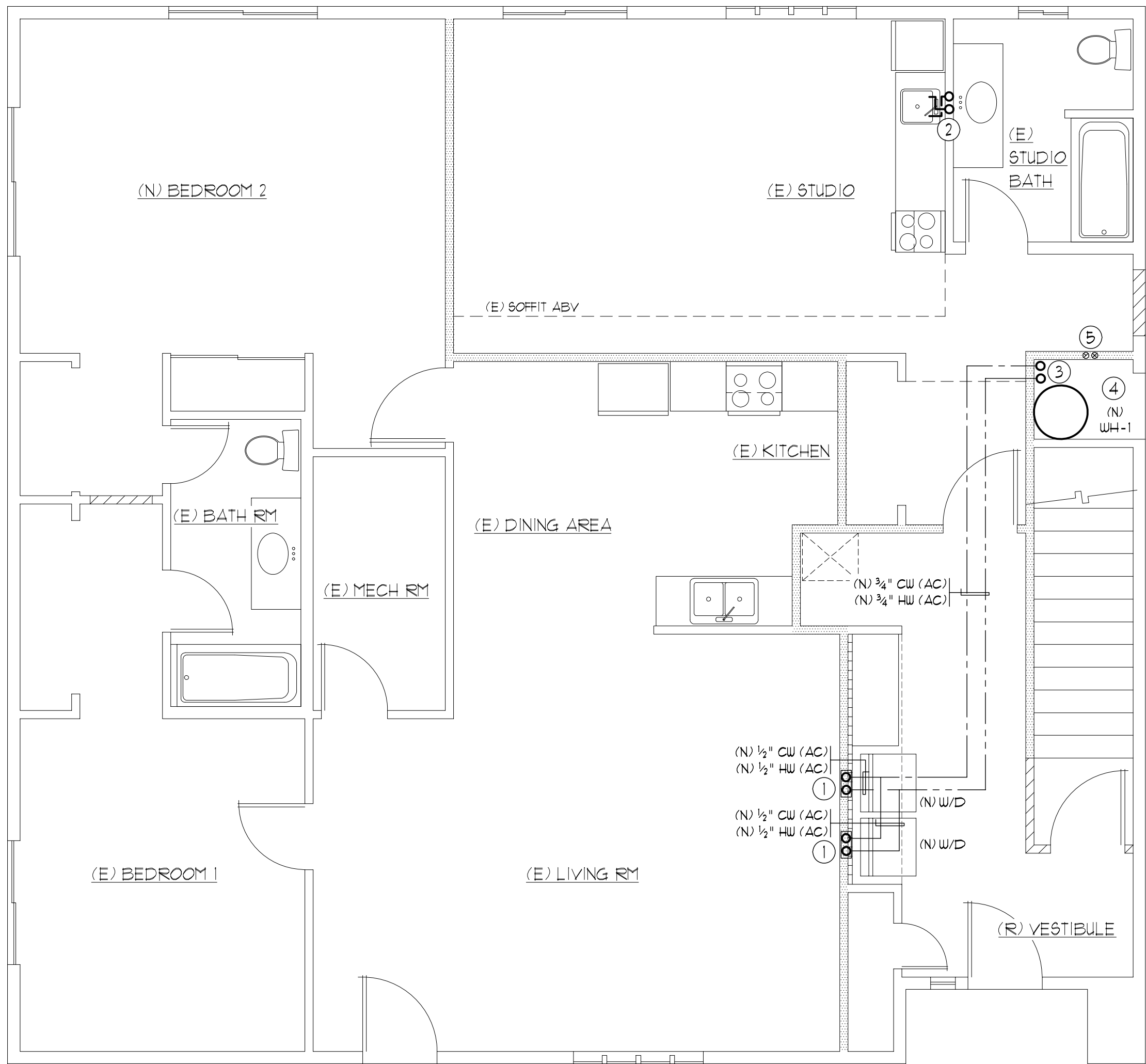
REGISTERED PROFESSIONAL MECHANICAL ENGINEER
No. 936789
Exp. 9/30/26
STATE OF CALIFORNIA

BADGER LANE REMODEL
BADGER LANE
GRASS VALLEY, CA
FIRE PENETRATION DETAILS

Project Title: _____
Project Location: _____
Sheet Title: _____

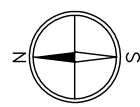
Revisions:
No. Date: By: Description:
1 2-10-25 DD Plan Check
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Plot Date: 3/26/2025
Job # 24-359
Scale as noted
Date 1st Issued 10-31-2024
Sheet Number P0.2

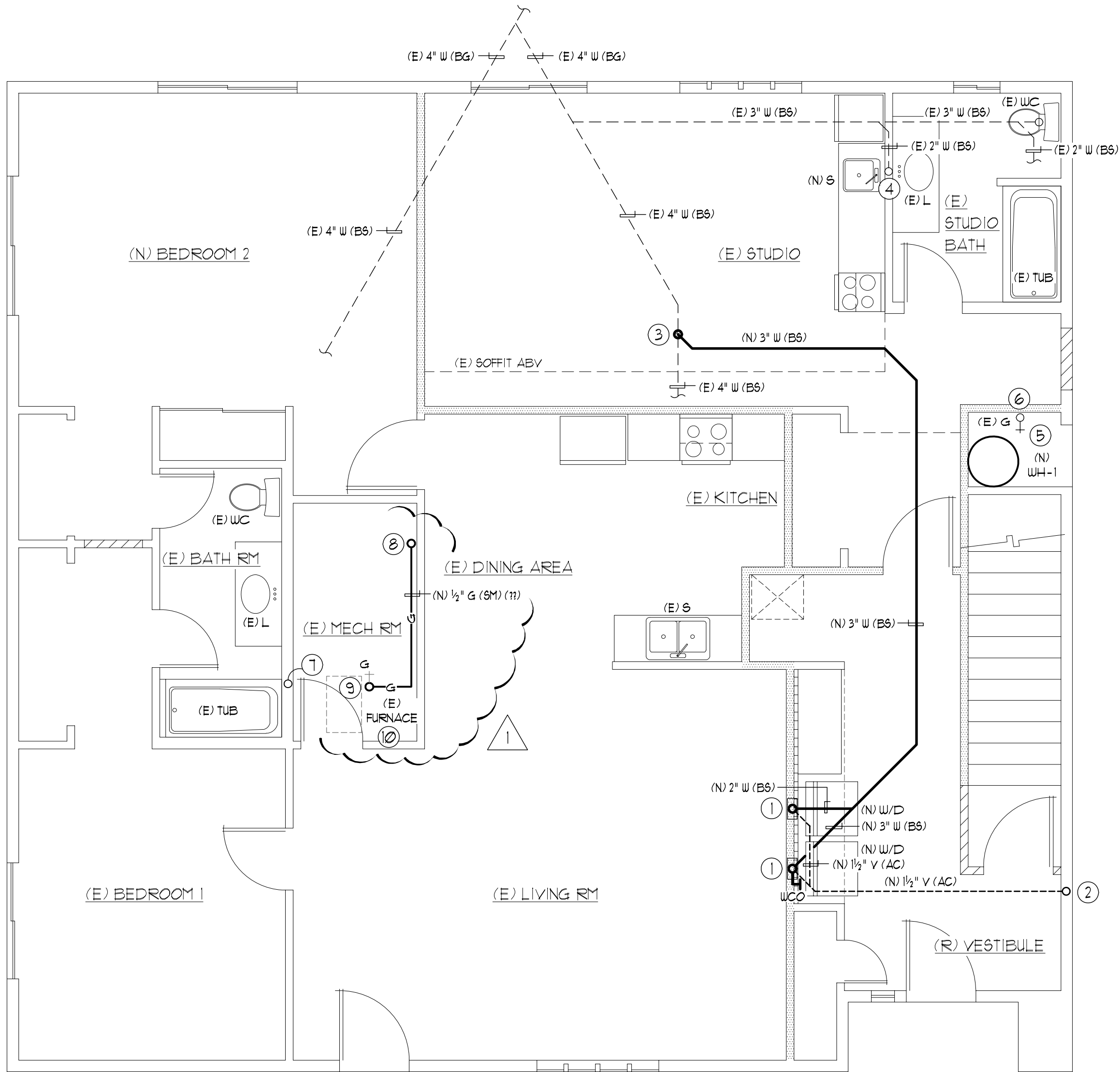


FIRST FLOOR PLUMBING PLAN - WATER

SCALE: 1/4" = 1'-0"

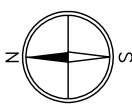


- WATER KEYED NOTES
- (N) 1/2" HW & CW DROPS TO (N) WASHER WALL BOX
 - CONNECT (N) 1/2" HW & CW PIPES FOR (N) SINK TO (E) HW & CW PIPES IN WALL AT LAVATORY
 - CONNECT (N) 1/2" HW & CW PIPES TO (E) HW & CW PIPING SYSTEM IN (E) WH CLOSET
 - PROVIDE (N) WH-1, CONNECT TO (E) PIPING
 - 3' PVC INTAKE & EXHAUST VENT RISERS TO CONCENTRIC VENT KIT THROUGH ROOF



FIRST FLOOR PLUMBING PLAN - W,V&G

SCALE: 1/4" = 1'-0"



- W&V KEYED NOTES
- 2" WD & 1 1/2" VR PROVIDE WASHER WALL BOX
 - 1 1/2" VR TO UPPER FLOOR, TRANSITION TO 2" VTR
 - CONNECT (N) 3" WASTE PIPE TO (E) 4" WASTE PIPE (B6), FIELD VERIFY LOCATION AND INVERT ELEVATION
 - CONNECT WASTE AND VENT PIPES FOR (N) SINK TO (E) WASTE AND VENT PIPES IN WALL AT LAVATORY
 - DRAIN (N) WH-1 CONDENSATE & TAP TO EXTERIOR
 - CONNECT (N) WH-1 TO (E) GAS PIPING SERVING (E) REMOVED WATER HEATER, INSTALL (N) DIRT LEG AND FLEX CONNECTOR
 - INSTALL (N) P-TRAP ON (E) WASTE PIPING FOR RE-ROUTED CONDENSATE FROM FURNACES AND COOLING COILS
 - (N) 1/2" GAS RISER, EXTEND (E) GAS PIPING FOR (E) FURNACE TO NEW LOCATION OF FURNACE ON SECOND FLOOR
 - (N) 1/2" GAS RISER TO NEW FURNACE LOCATION
 - (E) FURNACE RELOCATED TO SECOND FLOOR

BADGER LANE REMODEL

BADGER LANE
GRASS VALLEY, CA

REMODEL PLUMBING FLOOR PLANS

Project Title:

Project Location:

Sheet Title:

Revisions:

No.	Date:	By:	Description:
1	2-10-25	DD	Plan Check
-	-	-	-

Plot Date:

3/26/2025

Job #

24-359

Scale

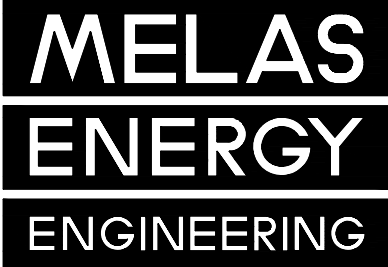
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10-31-2024

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Number

P1.1



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BADGER LN RESIDENCE

BADGER LANE
GRASS VALLEY, CA

TITLE-24 ENERGY REPORT

Project Title:
Project Location:
Sheet Title:

Revisions:
No. Date: By: Description:

1. 02/11/25 NP -

Plot Date: 11/06/2024

Job # 24-359

Scale N/A

Issued By

Sheet Number T24-1

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Badger Ln Residence
Calculation Date/Time: 2025-02-10T15:57:46-08:00
Calculation Description: Title 24 Analysis
Input File Name: Badger Ln Residence (1) - 24359.rbd22x

CF1R-PRF-01-E

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GENERAL INFORMATION						
01	Project Name		Badger Ln Residence			
02	Run Title		Title 24 Analysis			
03	Project Location		Badger Lane			
04	City	Gress Valley	05	Standards Version	2022	
06	Zip code	95945	07	Software Version	EnergyPro 9.3	
08	Climate Zone	11	09	Front Orientation (deg/ Cardinal)	0	
10	Building Type	Single family	11	Number of Dwelling Units	1	
12	Project Scope	Addition and/or Alteration	13	Number of Bedrooms	6	
14	Addition Cond. Floor Area (ft²)	493	15	Number of Stories	3	
16	Existing Cond. Floor Area (ft²)	3749	17	Fenestration Average U-factor	0.43	
18	Total Cond. Floor Area (ft²)	4242	19	Glazing Percentage (%)	11.11%	
20	ADU Bedroom Count	n/a	21	ADU Conditioned Floor Area	n/a	
22	Fuel Type	Natural gas	23	No Dwelling Unit	No	
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: 425-P0100430368-000-000-0000000-0000
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Registration Date/Time: 02/11/2025 08:53
Report Version: 2022.0.000
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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	Status
2nd Floor Zone	Conditioned	HVAC3	1986	8	DHW Sys 1	Existing Unchanged
Loft Zone	Conditioned	HVAC3	330	8	DHW Sys 1	Existing Unchanged
OPAQUE SURFACES						
01	02	03	04	05	06	07
Name	Zone	Construction	Area (ft²)	Orientation	Window and Door Area (ft²)	Tilt (deg)
Right Wall	Studio Zone	R-13 Wall	270	Right	210	16.7
Back Wall	Studio Zone	R-13 Wall	180	Back	280	51
Front Wall	1st Floor Zone	R-13 Wall	0	Front	460	71.67
Right Wall 2	1st Floor Zone	R-13 Wall	270	Right	215	0
Back Wall 2	1st Floor Zone	R-13 Wall	180	Back	180	12
Left Wall	1st Floor Zone	R-13 Wall	90	Left	425	73.35
Front Wall 3	2nd Floor Zone	R-13 Wall	0	Front	316	129.7
Front Wall 1	2nd Floor Zone	R-13 Wall	30	n/a	28	15
Front Wall 2	2nd Floor Zone	R-13 Wall	240	n/a	28	15
Right Wall 3	2nd Floor Zone	R-13 Wall	270	Right	340	24
Back Wall 3	2nd Floor Zone	R-13 Wall	180	Back	368	38
Left Wall 2	2nd Floor Zone	R-13 Wall	90	Left	340	42
Front Wall 4	Loft Zone	R-13 Wall	0	Front	96	39.38
Wall to 1st Floor	Studio Zone>1st Floor Zone	R-13 Wall	n/a	n/a	215	0
Wall to 1st Floor 2	Studio Zone>1st Floor Zone	R-13 Wall	n/a	n/a	280	0
Wall to Attic	Loft Zone	R-13 Wall	n/a	n/a	120	0

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ENERGIZATION / GLAZING															
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface	Orientation	Altitude	Width (ft)	Height (ft)	Mult.	Area (ft²)	U-factor	U-factor Source	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition
Front Window (OP) 3	Window	Front Wall 3	Front	0		1	15	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Front Window (OP) 4	Window	Front Wall 3	Front	0		1	15	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Front Window (OP) 5	Window	Front Wall 3	Front	0		1	15	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Front Patio Door	Window	Front Wall 3	Front	0		1	66.7	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Front 1 Window (OP)	Window	Front Wall 1		30		1	15	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Front 2 Window (OP)	Window	Front Wall 2		240		1	15	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Right Window (OP)	Window	Right Wall 3	Right	270		1	12	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Right Window (OP) 2	Window	Right Wall 3	Right	270		1	12	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No
Back Window (OP) 5	Window	Back Wall 3	Back	180		1	2	0.79	Table 110.6-A	0.7		Table 110.6-B	Bug Screen	Existing	No

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Calculation Description: Title 24 Analysis
Input File Name: Badger Ln Residence (1) - 24359.rbd22x

CF1R-PRF-01-E

(Page 2 of 15)

ENERGY USE SUMMARY						
Energy Use	Standard Design Source Energy (EDRS) (kBtu/ft²-yr)	Standard Design TDV Energy (EDR2) (kBtu/ft²-yr)	Proposed Design Source Energy (EDRS) (kBtu/ft²-yr)	Proposed Design TDV Energy (EDR2) (kBtu/ft²-yr)	Margin (EDR1)	Margin (EDR2)
Space Heating	0	42.59	0	41.93	0	0.66
Space Cooling	0	52.94	0	54.75	0	-1.81
IAQ Ventilation	0	0	0	0	0	0
Water Heating	0	11.58	0	9.32	0	2.26
Self Utilization/Flexibility Credit				0		0
Efficiency Compliance Total	0	107.11	0	106	0	1.11
Photovoltaics		0		0		
Battery				0		
Flexibility						
Indoor Lighting	0	6.06	0	6.06		
Appl. & Cooking	0	10.36		10.36		
Plug Loads	0	20.24		20.24		
Outdoor Lighting	0	1.63	0	1.63		
TOTAL COMPLIANCE	0	145.4	0	144.29		

Registration Number: 425-P0100430368-000-000-0000000-0000
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CA Building Energy Efficiency Standards - 2022 Residential Compliance
Registration Date/Time: 02/11/2025 08:53
Report Version: 2022.0.000
Schema Version: rev 20220901
HERS Provider: CHERS
Report Generated: 2025-02-10 15:58:28

CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Badger Ln Residence
Calculation Date/Time: 2025-02-10T15:57:46-08:00
Calculation Description: Title 24 Analysis
Input File Name: Badger Ln Residence (1) - 24359.rbd22x

CF1R-PRF-01-E

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OPAQUE SURFACES													
01	02	03	04	05	06	07	08	09	10	11			
Name	Zone	Construction	Area (ft²)	Orientation	Gross Area (ft²)	Window and Door Area (ft²)	Tilt (deg)	Wall Exceptions	Status	Verified Existing Condition			
Wall to Attic 2	Loft Zone	R-13 Wall	n/a	n/a	176	0	n/a	Existing	No				
Wall to Attic 3	Loft Zone	R-13 Wall	n/a	n/a	92	0	n/a	Existing	No				
Ceiling	2nd Floor Zone	R-19 Attic	n/a	n/a	1986	n/a	n/a	Existing	No				
Raised Floor No Crawl	2nd Floor Zone	R-19 No Crawl	n/a	n/a	60	n/a	n/a	Existing	No				
Floor to 1st Floor	2nd Floor Zone	R-19 No Crawl	n/a	n/a	1433	n/a	n/a	Existing	No				
Floor to Studio	2nd Floor Zone	R-19 No Crawl	n/a	n/a	493	n/a	n/a	Existing	No				
Floor to 2nd Floor	Loft Zone	R-19 No Crawl	n/a	n/a	330	n/a	n/a	Existing	No				
OPAQUE SURFACES - CATHEDRAL CEILING													
01	02	03	04	05	06	07	08	09	10	11			
Name	Zone	Construction	Area (ft²)	Orientation	Area (ft²)	Skylight Area (ft²)	Roof Rise (x in 12)	Roof Reflectance	Roof Emissance	Cool Roof	Status	Verified Existing Condition	14
Flat Roof	Loft Zone	R-19 Roof Cathedral	0	Front	330	0	0	0.1	0.85	No	Existing		
ATTIC													
01	02	03	04	05	06	07	08	09	10	11			
Name	Construction	Type	Roof Rise (x in 12)	Roof Reflectance	Roof Emissance	Radiant Barrier	Cool Roof	Status	Verified Existing Condition				
Attic 2nd Floor Zone	Attic Roof 2nd Floor Zone	Ventilated	7	0.1	0.85	No	No	Existing	No				

Registration Number: 425-P0100430368-000-000-0000000-0000
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Badger Ln Residence
Calculation Date/Time: 2025-02-10T15:57:46-08:00
Calculation Description: Title 24 Analysis
Input File Name: Badger Ln Residence (1) - 24359.rbd22x

CF1R-PRF-01-E

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ENERGIZATION / GLAZING															
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Name	Type	Surface	Orientation	Area (ft²)	U-factor	SHGC	SHGC Source	Exterior Shading	Status	Verified Existing Condition					
Back Window (OP) 6	Window	Back Wall 3	Back	180	1	24	0.3	NFRC	0.23	NFRC	Bug Screen	New	NA		
Back Window (OP) 7	Window	Back Wall 3	Back	180	1	12	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		
Left Window (OP) 6	Window	Left Wall 2	Left	90	1	18	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		
Left Window (OP) 2	Window	Left Wall 2	Left	90	1	24	0.3	NFRC	0.23	NFRC	Bug Screen	New	NA		
Front Window (OP) 6	Window	Front Wall 4	Front	0	1	10	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		
Front Window (OP) 7	Window	Front Wall 4	Front	0	1	10	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		
Front Window (F) 2	Window	Front Wall 4	Front	0	1	9.69	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		
Front Window (F) 3	Window	Front Wall 4	Front	0	1	9.69	0.79	Table 110.6-A	0.7	Table 110.6-B	Bug Screen	Existing	No		

Registration Number: 425-P0100430368-000-000-0000000-0000
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CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD


Project Name: Badger Ln Residence
Calculation Date/Time: 2025-02-10T15:57:46-08:00
Calculation Description: Title 24 Analysis
Input File Name: Badger Ln Residence (1) - 24359.rbd22x



CF1R-PRF-01-E

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ENERGY USE INTENSITY						
	Standard Design (kBtu/ft² · yr)	Proposed Design (kBtu/ft² · yr)	Margin (kBtu/ft² · yr)	Margin Percentage		
Gross EUI¹	21.93	21.35	0.58	2.64		
Net EUI²	21.93	21.35	0.58	2.64		
Notes 1. Gross EUI is Energy Use Total (not including PV) / Total Building Area. 2. Net EUI is Energy Use Total (including PV) / Total Building Area.						
REQUIRED SPECIAL FEATURES						
The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis. • Non-standard duct location (any location other than attic)						
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. • Verified heat pump rated heating capacity						
BUILDING - FEATURES INFORMATION						
01	02	03	04	05	06	07
Project Name	Conditioned Floor Area (ft²)	Number of Dwelling Units	Number of Bedrooms	Number of Zones	Number of Ventilation Cooling Systems	Number of Water Heating Systems
Badger Ln Residence	4242	1	6	4	0	1
ZONE INFORMATION						
01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft²)	Avg. Ceiling Height	Water Heating System 1	Status
Studio Zone	Conditioned	HVAC1	493	10	DHW Sys 1	New
1st Floor Zone	Conditioned	HVAC2	1433	10	DHW Sys 1	Existing Unchanged

Registration Number: 425-P0100430368-000-000-00

Plot Date:	11/06/2024
Job #	24-359
Scale	N/A
Issued By	
Sheet Number	T24-2

DECLARATION OF COMPLIANCE – RESIDENTIAL PERFORMANCE COMPLIANCE METHOD Project Name: Badger LN Residence Calculation Date/Time: 2025-02-10T15:57:46-08:00 Input File Name: Badger LN Residence (1) - 24359.ridd22x		CFIR-PRF-01-01 (Page 15 of 15)
DOCUMENTATION AUTHORITY'S DECLARATION STATEMENT I, I certify that this Certificate of Compliance documentation is accurate and complete.		
Documentation Authority Name: Nicole Porata Company: Melas Energy Engineering Address: 547 Union Street City/State/Zip: Nevada City, CA 95959		Documentation Authority Signature:  Signature Date: 02/10/2025 CEV: HERS Certification Identification (if applicable): R1D-17-30033 Phone: 530-265-2492
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 1 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 the building permit application.		
Responsible Designer Name: Gary A. Burke Company: Gary A. Burke Address: 148 CELESTIA DR City/State/Zip: Grass Valley, CA 95945		Responsible Designer Signature:  Date signed: 02/11/2025 License: 02015 Phone: (530) 575 0336

CERTIFICATE OF COMPLIANCE – RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

Project Name: Badger Inn Residence

Calculation Description: Title 24 Analysis

Calculation Date/Time: 2025-02-10T15:46:08-00

Input File Name: Badger Inn Residence [3] - 24359.rbd2xa

HVAC - HEAT PUMPS

01	02	03	04	05	06	07	08	09	10	11	12	13
			Heating				Cooling					
Name	System Type	Number of Units	Heating Efficiency HSP/FHP/COP	HSP/FHP/CAP	Cop 47	Cop 17	Cooling Efficiency SEER/EER	SEER/EER	EER/EER/2/CER	Zonally Controlled	Compressor Type	HERS Verification
Heat Pump System 1	Ductless MiniSplit HP	1	HSPF2	7.5	12000	10000	EER3SEER2	14.3	2/CER	Not Zonal	Single Speed	Heat-Pump System 1-hers-pumpsum

HVAC HEAT PUMPS - HERS VERIFICATION

01	02	03	04	05	06	07	08	09
Name	Verified Airflow	Airflow Target	Verified EER/SEER2	Verified SEER/SEER2	Verified Refrigerant Charge	Verified HSP/FHP	Verified Heating Cap 47	Verified Heating Cap 17
Heat-Pump System 1-hers-pumpsum	Not Required	0	Not Required	Not Required	No	No	Yes	Yes

DISTRIBUTION SYSTEMS

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
		Duct Ins R-value		Duct Location		Surface Area									
Name	Type	Design Type	Supply V	Return n	Con ditio ned Zone	Con ditio ned Zone e	Supply V	Return n	Bypass Duct	Duct leakage	HERS Verification	Status	Verified Existing Condition	Existing Distribution system	New Ducts >= 25 ft
Air Distribution System 2	Conditione d space-entry	Non-Verified	R-6	R-6	Con ditio ned Zone	n/a	n/a	n/a	No Bypass Duct	Existing (not specified)	Air Distribution System 2-hers-dit	Existing	No	n/a	n/a
Air Distribution System 3	Unconditio ned attic	Non-Verified	R-6	R-6	Atti c	Atti c	n/a	n/a	No Bypass Duct	Existing (not specified)	Air Distribution System 3-hers-dit	Existing	No	n/a	n/a

Registration Number: 425-PO10043059A-000-000-0000000-0000

Report Version: 2023.0-000000

Schema Version: 2023.00001

Registration Date/Time: 02/11/2025 08:52

HERS Provider: CHEERS

Generated: 2025-02-10 15:58:28

CA Building Energy Efficiency Standards - 2022 Residential Compliance

[illegible]

ENERGY CALCULATIONS: ENERGY CONSERVATION MEASURES SUMMARY		
SPECIAL FEATURES:	NA	
SPACE HEATING:	STUDIO: (N) DUCTLESS HEAT PUMP (HSPF2=7.5) 1 ST FLOOR: (E) GAS FURNACE (AFUE=90%) 2 ND FLOOR/LOFT: (E) GAS FURNACE (AFUE=90%)	
SPACE COOLING:STUDIO:	(N) DUCTLESS HEAT PUMP (SEER2=14.3, EER2=8.0) 1 ST FLOOR: (E) AIR CONDITIONER (SEER2=14.0, EER2=11.7) 2 ND FLOOR/LOFT: (E) AIR CONDITIONER (SEER2=14.0, EER2=11.7)	
HEAT & COOL LOADS:	STUDIO: HEAT: 5,993 BTU/HR COOL: 5,008 BTU/HR 1 ST FLOOR: HEAT: 16,255 BTU/HR COOL: 13,260 BTU/HR 2 ND FLOOR: HEAT: 28,012 BTU/HR COOL: 29,804 BTU/HR (E) R-6 (N) GAS STORAGE WATER HEATER (UEF=0.95) ALL DHW PIPING SHALL BE INSULATED WITH 1"THICK OR MINIMUM R-VALUE 7.7	
DUCT INSULATION:	NA	
WATER HEATING:	VERIFIED HEAT PUMP RATED HEATING CAPACITY	
PIPE INSULATION:	NA - EXISTING RESIDENCE	
RADIANT BARRIER:	KITCHEN RANGE HOOD CFM REQUIREMENTS VARY BASED ON DWELLING UNIT SQUARE FOOTAGE.	
HERS TESTS:	SEE TABLE BELOW OF REQUIRED CFM, A SOUND RATING OF 3 SONES OR LESS FOR SOUND.	
IAQ VENTILATION:	UNLESS THE EXHAUST FAN IS 400 CFM OR GREATER, 0.25"EXTERNAL STATIC PRESSURE HOOD	
KITCHEN VENTILATION:	DUCT VENT FANS REQUIRE 7"DUCT MIN. OTHER COMPLIANCE OPTIONS ARE LISTED UNDER TITLE 24, PART 6 SECTION 150.0.	
BATHROOM VENTILATION:	THE MINIMUM BATHROOM INTERMITTENT VENTILATION AIRFLOW SHALL BE 50 CFM.	
REQUIRED CF2R'S:	ENV-01 - PENETRATION, ENV-03 - INSULATION, LTG-01 - LIGHTING, MCH-01 - SPACE	
EXTERIOR WALLS:	CONDITIONING SYSTEMS, PLB-22 - WATER HEATERS	
ROOF ATTIC:	EXISTING: R-13	
ROOF CATHEDRAL:	EXISTING: R-19	
FLOOR:	EXISTING: SLAB ON GRADE, R-19 IN RAISED	
WINDOWS:	NEW: NON-METAL FRAMED, DOUBLE PANE WITH LOWE GLASS (U-VALUE=0.30, SHGC=0.23) EXISTING: METAL FRAMED, DOUBLE PANE WITH CLEAR GLASS (U-VALUE=0.79, SHGC=0.70)	
GLASS DOORS:	EXISTING: METAL FRAMED, DOUBLE PANE WITH CLEAR GLASS (U-VALUE=0.79, SHGC=0.70)	
EXTERIOR SC DOORS:	EXISTING: SOLID CORE AT U-FACTOR=0.50	
SKYLIGHTS:	NA	

REQUIRED KITCHEN RANGE HOOD AIRFLOW RATES (CFM)		
DWELLING UNIT FLOOR AREA (FT2)	HOOD OVER ELECTRIC RANGE	HOOD OVER GAS RANGE
> 1500	110 CFM	180 CFM
< 1000 = 1500	110 CFM	250 CFM
750-1000	130 CFM	280 CFM
< 750	160 CFM	280 CFM

NEW ■ EXISTING				'A'		AIC: EXISTING		
VOLTAGE:		120/240V-1Ø-3W				MAIN: 200A MCB		
BUS:		225A		MOUNTING: RECESSED		LOCATION: EXTERIOR		
LINE	LOAD DESCRIPTION	VOLT-AMPERES #A	CB #B	CB A B	VOLT-AMPERES #A	CB #B	LOAD DESCRIPTION	LINE
1	WASHER #1	1,500	20	20	825	20	WATER HEATER	2
3	WASHER #2	1,500	20	20	1,500	20	STUDIO SMALL APPLIANCE #1	4
5	WATER HEATER	825	20	20	(E) LOAD	20		6
7	(E) SUB-PANEL "A1"	-	100	100	(E) SUB-PANEL "A2"	-		8
9	↓	-	2	2	1,116	2	HEAT PUMP "HP-2"/FAN COIL "FC-2"	10
11	DRYER #1	2,500	30	30	1,500	30	STUDIO SMALL APPLIANCE #2	12
13	↓	2,500	2	2	4,000	2	STUDIO RANGE	14
15	DRYER #2	2,500	30	30	4,000	30	↓	16
17	↓	2,500	20	20				18
19	BUILDING EXTERIOR LTG	100	20	20				20
21								22
23								24
25								26
27								28
29								30
SUBTOTAL		-	-		-	-	SUBTOTAL	
TOTAL VOLT-AMPERES/PHASE:		ØA = -		ØB = -				
TOTAL PANEL VOLT-AMPERES: -						AMPS = -		

□ NEW ■ EXISTING		"A1"				AIC: EXISTING	
VOLTAGE: 120/240V-1Ø-3W						MAIN: MLO	
BUS: 125A		MOUNTING: RECESSED		LOCATION: PANTRY			
1A	(E) LOAD						2A
1B	↓						2B
3A							4A
3B	↓						4B
5A	(E) LOAD						6A
5B	↓						6B
7A	(E) LOAD						8A
7B	↓						8B
9A	(E) LOAD						10A
9B	(E) LOAD						10B
11A	(E) LOAD						12A
11B	↓						12B
SUBTOTAL		-	-	-	-	SUBTOTAL	
TOTAL VOLT-AMPERES/PHASE:		ØA =		ØB =			
TOTAL PANEL VOLT-AMPERES: -						AMPS = -	

PREVAILING BUILDING CODES:

2022 CALIFORNIA BUILDING CODE (CBC)
2022 CALIFORNIA ELECTRICAL CODE W/ LOCAL AMENDMENTS (CEC)
2020 NATIONAL ELECTRICAL CODE (NEC)

NOTE:

(E) LOAD ENTRIES NOT SHOWN DUE TO OUTDATED PANEL SCHEDULES. E.C. TO VERIFY BRANCH CIRCUIT TERMINATION POINTS & THAT CONDUCTOR LOADING DOES NOT EXCEED ALLOWED AMPACITY.

E.C. TO PROVIDE NEW TYPED UPDATED PANEL SCHEDULES SHOWING LOADS BEING SERVED.

NOTE TO CONTRACTOR

THE CONTRACTOR SHALL THOROUGHLY REVIEW THESE ELECTRICAL CONSTRUCTION DOCUMENTS PRIOR TO PREPARING A BID FOR THE ELECTRICAL WORK SHOWN. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF EXISTING ELECTRICAL SERVICES AND CONNECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICTS OR DISCREPANCIES FOUND PRIOR TO BID. BY SUBMITTING A BID FOR THE ELECTRICAL WORK, THE ELECTRICAL CONTRACTOR IS AFFIRMING THAT THE REQUIRED FIELD VERIFICATION OF EXISTING CONDITIONS HAS BEEN COMPLETED AND ASSUMES FULL RESPONSIBILITY FOR CONFLICTS FOUND AFTER THE AWARD OF THE ELECTRICAL CONTRACT. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR CONFLICTS AND/OR DISCREPANCIES FOUND TO EXIST AFTER THE AWARD OF THE ELECTRICAL CONTRACT.

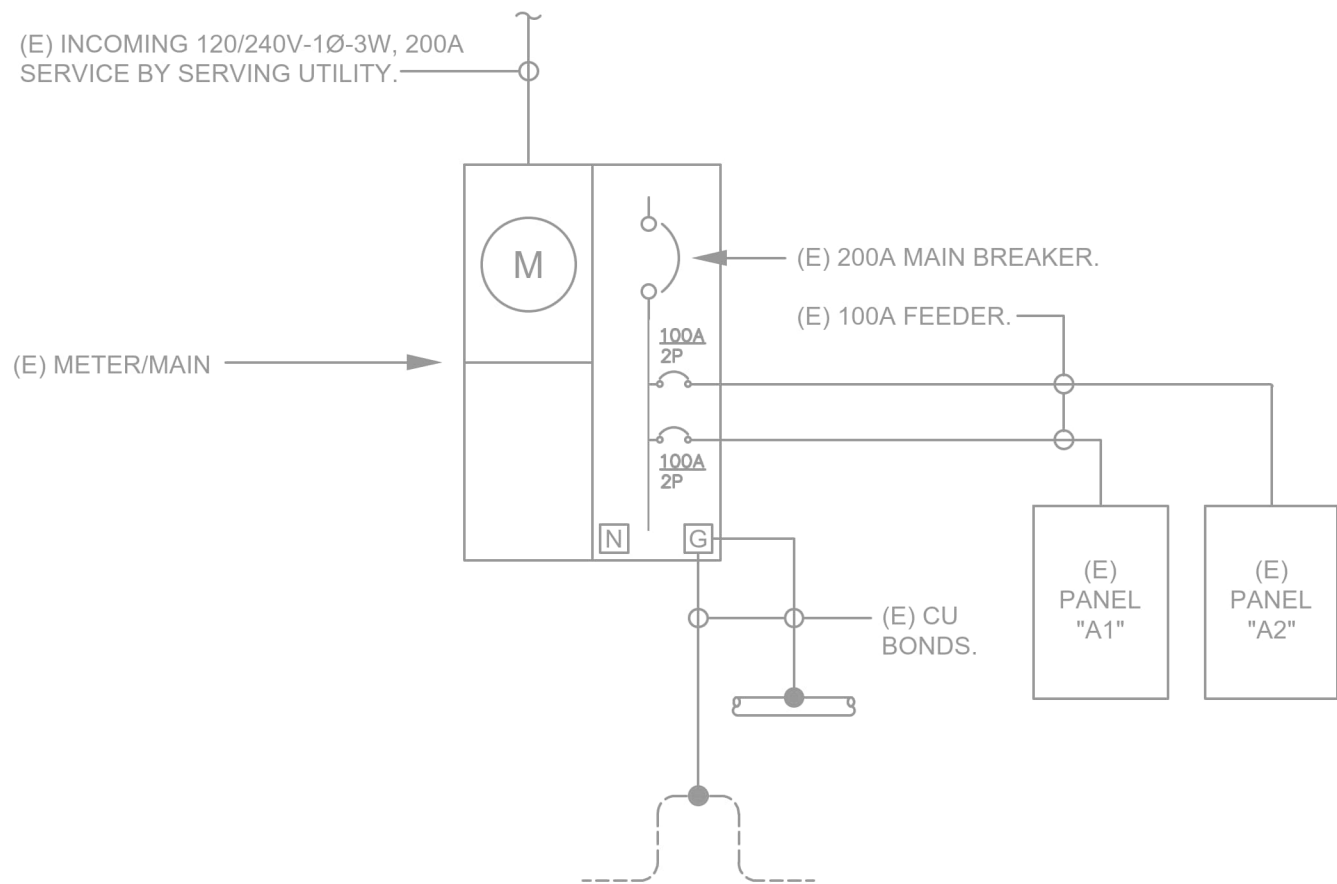
LOAD & FEEDER CALCS

SQUARE FOOTAGE:	4,491
GENERAL LTG/RECEPTACLES @ 3 W/SF	13,473 W
WASHER: 3 @ 1,500 W EACH	4,500 W
SMALL APPLIANCE : 6 @ 1,500 W EACH	9,000 W
DRYER: 3 @ 5,000 W EACH	15,000 W
RANGE: 3 @ 8,000 W EACH	24,000 W
RANGE HOOD: 3 @ 300 W EACH	900 W
FANS	200 W
WATER HEATER "WH-1"	825 W
DISHWASHER: 2 @ 1,200 W EACH	2,400 W
DISHPOSAL: 2 @ 828 W EACH	1,656 W
SUBTOTAL	71,954 W
1ST 10KW @ 100%	10,000 W
REMAINDER @ 40%	24,782 W
SUBTOTAL	34,782 W
HVAC	
(E) FURNACE	817 W
(E) CONDENSING UNIT	4,646 W
FURNACE "F-1"	1,196 W
CONDENSING UNIT "CU-1"	2,806 W
HEAT PUMP "HP-2"/FAN COIL "FC-2"	2,231 W
SUBTOTAL	11,696 W
TOTAL DEMAND LOAD	46,477 W
TOTAL AMPS @ 120/240V-1P-3W	194 A
(E) 200A SERVICE IS ADEQUATE.	

SYMBOL LEGEND

□	SURFACE MOUNTED FIXTURE	—LV—	LOW VOLTAGE WIRING IN CONDUIT
⊕	PENDANT MOUNTED FIXTURE	----	CONDUIT RUN CONCEALED BELOW FLOOR OR FINISHED GRADE, U.N.O.
— — —	STRIP LIGHT — SURFACE MOUNTED UNO	—	CONDUIT CONCEALED IN CEILING OR WALL, U.N.O.
⊞	RECESSED DOWNLIGHT	⤵	HOMERUN TO RESPECTIVE PANEL OR TERMINAL CABINET — OVERHEAD
○	CEILING MOUNTED FIXTURE	⤵	HOMERUN TO RESPECTIVE PANEL OR TERMINAL CABINET — UNDERGROUND
○	WALL MOUNTED FIXTURE	—○	CONDUIT RISER — UP
⊗	EXIT LIGHT — WALL MOUNTED WITH ARROWS AS SHOWN	—●	CONDUIT RISER — DOWN
⌵	EMERGENCY LIGHTING FIXTURE — SURFACE MOUNTED	BRANCH CIRCUIT WITHOUT FURTHER DESIGNATION INDICATES A 2 #12 WIRE CIRCUIT ADDITIONAL NO. OF #12: — — —, 3 #12; — — —, 2 #12 & 1 #12 GND; — — —, 5 #12 & 1 #12 GND; ETC. OTHER WIRE SIZES: — — —, 2 #10 & 1 #12 GND; — — —, 3 #4 & 1 #8 GND; ETC.	
LED	LED DRIVER	MT	EMPTY CONDUIT WITH PULLSTRING
\$	SINGLE POLE TOGGLE SWITCH, Ⓢ +46" UNO	EL	EMERGENCY LIGHT
\$2	TWO POLE TOGGLE SWITCH, Ⓢ +46" UNO	NL	NIGHT LIGHT
\$3	THREE-WAY TOGGLE SWITCH, Ⓢ +46" UNO	U/C	UNDERCOUNTER
\$W	MOTOR RATED SINGLE POLE SWITCH, Ⓢ UNIT UNO	(E)	EXISTING
\$M.C.	MASTER LIGHTING CONTROL STATION	(N)	NEW
\$D	DIMMER. SEE CONTROL SCHEDULE FOR TYPE.	(R)	RELOCATED
\$S	SWITCH. LOWERCASE LETTER INDICATES LUMINAIRE(S) CONTROLLED BY SWITCH.	C.	CONDUIT
X-#	X = PANEL NAME; # = PANEL CIRCUIT NUMBER.	WP	WEATHERPROOF
X-#0	LOWERCASE LETTER INDICATES CONTROL SWITCH.	G	GROUND
Ⓢ	WALL MOUNTED OCCUPANCY SENSOR	N	NEUTRAL
Ⓢ	CEILING MOUNTED OCCUPANCY SENSOR	C.T.	CURRENT TRANSFORMER
ⓈA	FIXTURE TAG: LETTER INDICATES TYPE	LCC	LIGHTING CONTROL CABINET
○	JUNCTION BOX, SIZE & TYPE AS INDICATED OR AS REQUIRED	EM	EMERGENCY LUMINAIRE.
Ⓢ	15 OR 20 AMP 125V 3W DUPLEX RECEPTACLE, Ⓢ +18" UNO	NL	NIGHT LIGHT (ON AT DUSK / OFF AT SUNRISE)
Ⓢ	15 OR 20 AMP 125V 3W DUPLEX RECEPTACLE W/ ISO GND, Ⓢ +18" UNO	DZ#	DAYLIGHT ZONE. # = 1, 2, 3, ...
Ⓢ	20 AMP 125V 3W DEDICATED DUPLEX RECEPTACLE, Ⓢ +18" UNO	NL	NIGHT LIGHT (ON AT DUSK / OFF AT SUNRISE)
Ⓢ	15 OR 20 AMP 125V 3W DOUBLE DUPLEX RECEPTACLE, Ⓢ +18" UNO	DT	DUAL-TECH
Ⓢ	CEILING MOUNTED DUPLEX RECEPTACLE	MCS	MASTER SWITCH CONTROLLER
Ⓢ	DUPLEX RECEPTACLE IN FLUSH MOUNTED FLOOR J-BOX.	OR	OVERRIDE
□	NON-FUSED DISCONNECT SWITCH	PIR	PASSIVE INFRARED
Ⓢ	FUSED DISCONNECT SWITCH, SIZE PER UNIT LABEL	TC	TIME CLOCK (LCC)
Ⓢ	SMOKE DETECTOR	LL	LANDLORD
XX YY	XX = SWITCH SIZE IN AMPS; YY = FUSE SIZE IN AMPS	Ⓢ	EQUIPMENT TAG. SEE RESPECTIVE SCHEDULE FOR ITEM.
Ⓢ	MOTOR, N.I.E.S. CONNECT AS REQUIRED, NUMBER INDICATES HP	Ⓢ	SECTION DESIGNATION: TOP LETTER INDICATES SECTION, BOTTOM LETTER/NUMBER INDICATES SHEET
Ⓢ	PANELBOARD — SEE SCHEDULE	Ⓢ	DETAIL DESIGNATION: TOP NUMBER INDICATES DETAIL, BOTTOM LETTER/NUMBER INDICATES SHEET
Ⓢ	MAIN SWITCHBOARD OR MOTOR CONTROL CENTER, SEE ONE LINE DIAGRAM	Ⓢ	MECHANICAL & PLUMBING EQUIPMENT DESIGNATION
Ⓢ	TERMINAL CABINET, SIZE & TYPE AS NOTED	NOTE: SYMBOLS INDICATED ABOVE MAY NOT NECESSARILY APPEAR AS PART OF THESE DRAWINGS IF NOT REQUIRED.	
Ⓢ	CEILING EXHAUST FAN		
Ⓢ	PHONE/DATA OUTLET, 4" SQ. BOX w/ SINGLE DEVICE RING & PLATE Ⓢ +18" UNO		
Ⓢ	TELEPHONE TERMINAL BOARD: 4' x 8' x 1" PLYWOOD OR AS NOTED		
Ⓢ	w/ DOUBLE DUPLEX RECEPTACLE & 1 #6 GND		

□ NEW ■ EXISTING		"A2"				AIC: EXISTING	
VOLTAGE: 120/240V-1Ø-3W						MAIN: MLO	
BUS: 125A		MOUNTING: RECESSED		LOCATION: PANTRY			
1A	(E) LOAD					2A	
1B						2B	
3A						4A	
3B	↓				↓	4B	
5A	(E) LOAD				(E) LOAD	6A	
5B	(E) LOAD				(E) LOAD	6B	
7A	(E) LOAD				(E) LOAD	8A	
7B	(E) LOAD				(E) LOAD	8B	
9A	(E) LOAD				(E) LOAD	10A	
9B	↓				(E) LOAD	10B	
11A	(E) LOAD				(E) LOAD	12A	
11B	↓				(E) LOAD	12B	
SUBTOTAL		-	-	-	SUBTOTAL		
TOTAL VOLT-AMPERES/PHASE:		ØA = -		ØB = -			
TOTAL PANEL VOLT-AMPERES: -				AMPS = -			



ONE-LINE DIAGRAM

SCALE: NONE

REVISIONS	BY
02.18.25 PLAN CHECK 1	JP
04.24.25 PLAN CHECK 2	JP

BADGER LANE REMODEL
BADGER LANE
GRASS VALLEY, CA

Project:

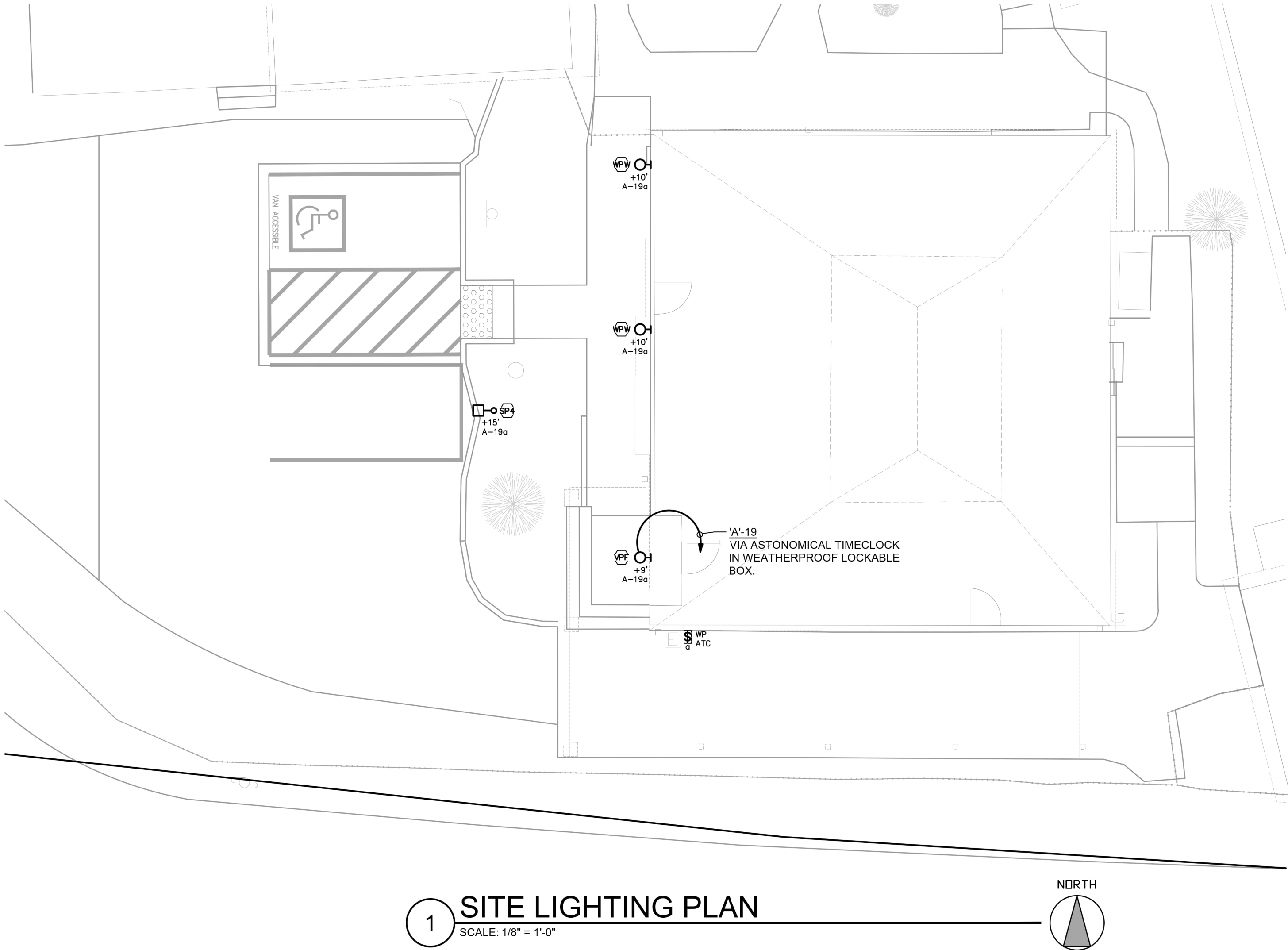
Drawing:

ONE-LINE & PANEL SCHEDULES & SYMBOL LIST



Date	11.01.24
Scale	AS NOTED
Drawn	JP
Job	24052
Sheet	E1.0
Of	Sheets

LIGHTING FIXTURE SCHEDULE								
TAG	DESCRIPTION	MANUFACTURER	V	LAMPS	W	DIMMING	MOUNTING	REMARKS
SP4	POLE MOUNT LED LUMINAIRE W/ INTEGRAL OCCUPANCY SENSOR.	LITHONIA # RSX1 LED P1 30K R4	120	LED	51	N/A	POLE	
VPP	WALL MOUNTED LED WEDGE LUMINAIRE.	LITHONIA # WDGE1 LED P0 30K 80CRI VW	120	LED	7	N/A	SURFACE WALL	
WPW	WALL MOUNTED LED WEDGE LUMINAIRE.	LITHONIA # WDGE1 LED P0 30K 80CRI VF	120	LED	7	N/A	SURFACE WALL	



REVISIONS	BY
02.18.25 PLAN CHECK 1	JP
04.24.25 PLAN CHECK 2	JP

Project: **BADGER LANE REMODEL**
BADGER LANE
GRASS VALLEY, CA

Drawing: **SITE LIGHTING PLAN**



Date	11.01.24
Scale	AS NOTED
Drawn	JP
Job	24052
Sheet	E1.1
Of	Sheets

UP-LIGHT

3030 Tubman Road, Suite 100, Sacramento, CA 95831
402 Longstar Avenue, Sacramento, CA 95820
P: 916.655.1822

REVISIONS

BY

02.19.25
PLAN CHECK 1

JP

04.24.25
PLAN CHECK 2

JP

Project:

BADGER LANE REMODEL

BADGER LANE

GRASS VALLEY, CA

Drawing:

SITE PHOTOMETRIC PLAN



Date11.01.24

ScaleAS NOTED

DrawnJP

Job24052

Sheet

E1.2

OfSheets

UP-LIGHT

3330 Tubeland Road, Suite 100, Sacramento, CA 95831
402 Livingston Avenue, Shreveport, LA 70564
P: 916.655.1822

REVISIONS

BY

02.18.25
PLAN CHECK 1

JP

04.24.25
PLAN CHECK 2

JP

Project:

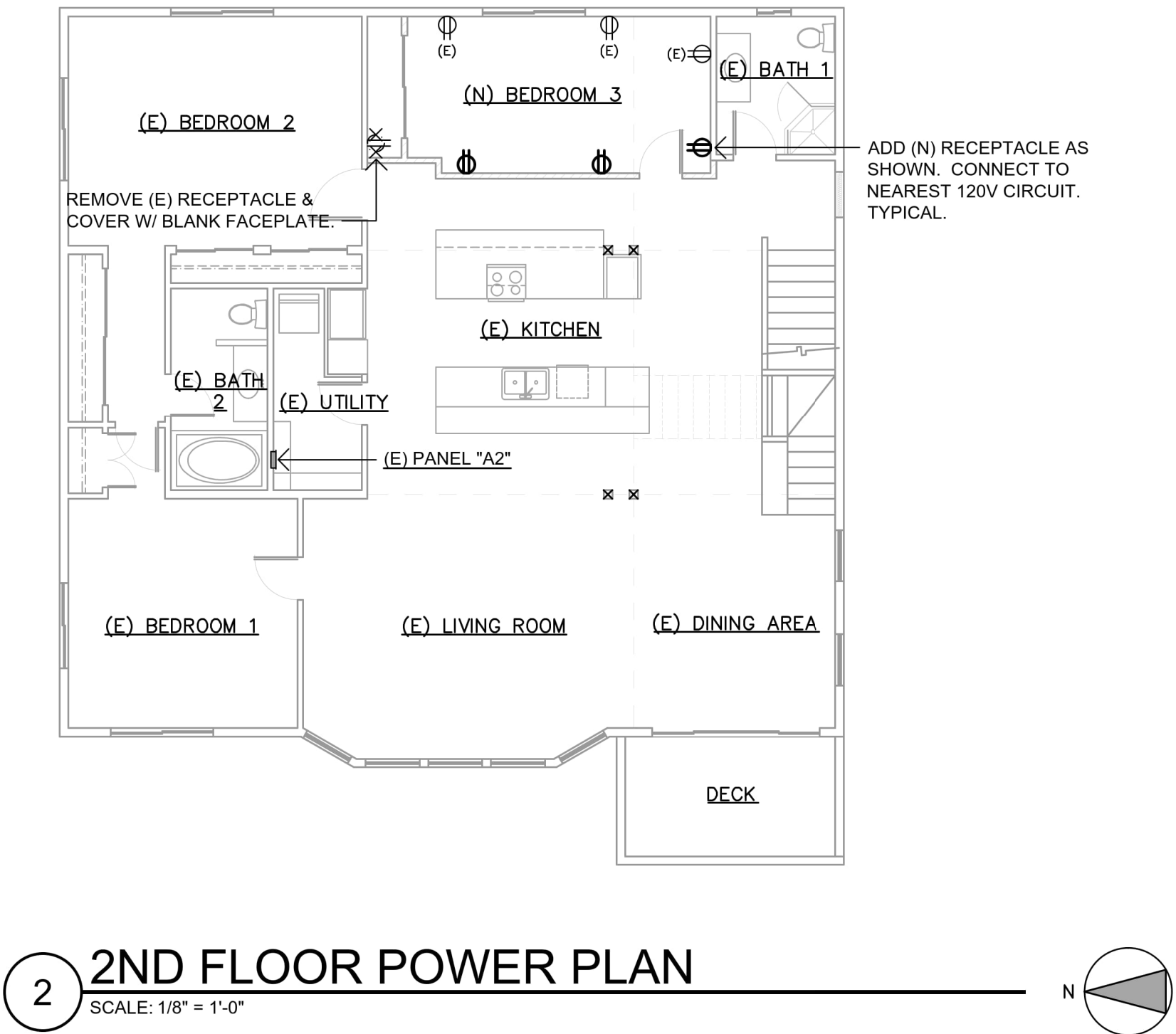
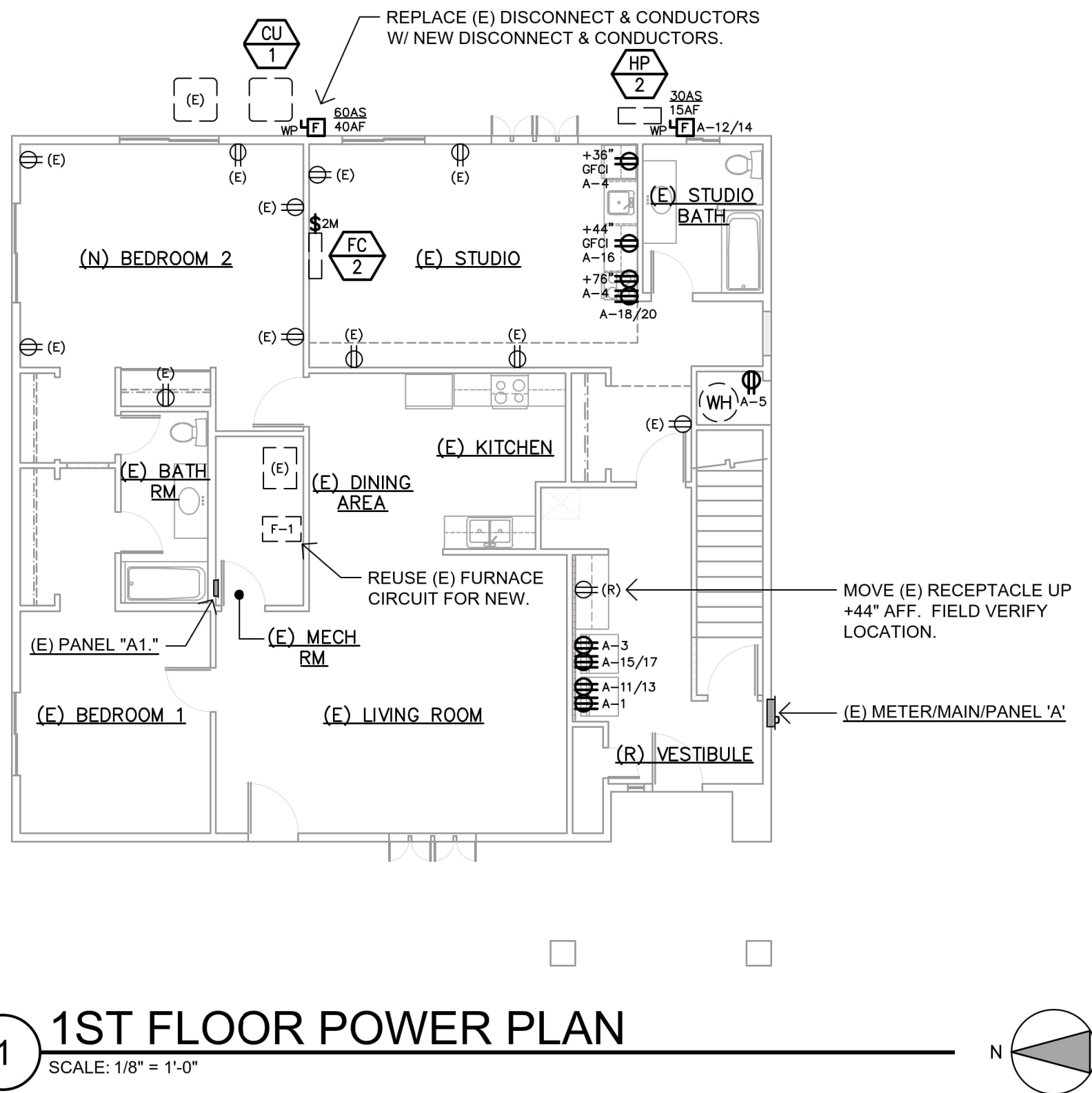
BADGER LANE REMODEL
BADGER LANE
GRASS VALLEY, CA

Drawing:

POWER PLANS



Date	11.01.24
Scale	AS NOTED
Drawn	JP
Job	24052
Sheet	E2.0
Of	Sheets



UP-LIGHT

3030 Tubeland Road, Suite 100, West Sacramento, CA 95691
402 Longstar Avenue, Shasta County, CA 96070
P: 916.655.1822

REVISIONS

BY

02.19.25
PLAN CHECK 1

JP

04.24.25
PLAN CHECK 2

JP

Project: BADGER LANE REMODEL
BADGER LANE
GRASS VALLEY, CA

Drawing: LIGHTING PLANS

REGISTERED PROFESSIONAL ELECTRICIAN
No. 16872
Exp. 03/31/27
STATE OF CALIFORNIA

Date11.01.24

ScaleAS NOTED

DrawnJP

Job24052

Sheet
E3.0
Of Sheets

NOTE:

EXTERIOR DOORS THAT ARE BEING REMOVED AND NOT REPLACED TO HAVE LUMINAIRE REMOVED, IF PRESENT. CAP WIRE & INSTALL WEATHERPROOF COVER OVER EXTERIOR J-BOX.

FOR INTERIOR SWITCH, REMOVE SWITCH, CAP CONDUCTORS, & COVER WITH A BLANK FACEPLATE.

1ST FLOOR LIGHTING PLAN

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

PROVIDE RECESSED FLUSH MOUNT LED LUMINAIRE W/ LINE-VOLTAGE DIMMING. TYPICAL OF (3).

PROVIDE & INSTALL NEW LIGHT SWITCH FOR ROOM LIGHTING CONTROL.

(N) BEDROOM 2

(E) STUDIO

(E) STUDIO BATH

CONNECT NEW EXHAUST FAN TO EXISTING LIGHTING CIRCUIT. FAN TO OPERATE WHEN LIGHT IS ON. VERIFY OPERATION W/ MECHANICAL INSTALLER.

(E) KITCHEN

(E) DINING AREA

(E) BATH RM.

(E) MECH RM.

(E) BEDROOM 1

(E) LIVING ROOM

(R) VESTIBULE

2ND FLOOR LIGHTING PLAN

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

REMOVE (E) DIMMER & SWITCH IN THIS AREA. CONNECT/CAP CONDUCTORS & INSTALL BLANK COVER PLATE ON UNUSED J-BOX.

REMOVE (E) TRACK & HEADS. CAP UNUSED CONDUCTORS & INSTALL BLANK COVER PLATE ON UNUSED J-BOXES. TYPICAL OF (2).

(N) BEDROOM 3

(E) BEDROOM 2

(E) BEDROOM 1

(E) BATH 2

(E) UTILITY

(E) KITCHEN

(E) DINING AREA

(E) LIVING ROOM

(E) BATH 1

RELOCATE (E) J-BOX TO (N) LOCATION AS SHOWN. PROVIDE DIMMER CONTROL FOR NEW PENDANT LUMINAIRE.

DECK

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City of Grass Valley Builders Copy

ELECTRICAL SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. All labor, tools, and materials necessary to install, test, and place in operation complete and functional electrical systems, as shown on the plans and described herein.
- B. Secure all permits and pay all fees necessary for the execution and completion of this work.

1.02 DRAWINGS

The electrical layouts are generally diagrammatic. The location of outlets and equipment are approximate unless dimensioned. The exact locations and routing of conduits shall be governed by structural conditions and physical interferences and by the location of electrical terminations of equipment.

1.03 QUALITY ASSURANCE

- A. All work shall be in full accordance with the latest edition of the National Electrical Code, all local, state, and federal codes, and with the requirements of the serving utility companies.
- B. All electrical materials used on this project shall be best possible grade of their kinds, new, free from defects and, unless otherwise specifically noted, shall conform to applicable standards of National Electrical Manufacturers Association, the American National Standards Institute and Underwriters Laboratories, Inc. Each article of a kind shall be the standard product of a single manufacturer.
- C. Specific brand names and catalog numbers are used to describe materials in order to establish standards of performance and quality. The decision of the Architect shall govern as to what materials may be substituted, but the burden of proof as to the equivalency of any proposed substitution shall be upon the Contractor.

1.04 SUBMITTALS

Submit to the Architect a complete list of materials and equipment stating manufacturer's names, catalog numbers, etc. No materials shall be installed until final approval is given.

Guarantee all work for one year from date of acceptance against all defects in material, equipment and workmanship.

PART 2 PRODUCTS

2.01 RACEWAYS

- A. Rigid Steel Conduit: Galvanized, complying with specifications UL-6, ANSI C80.1, Federal WW-C-58IE or latest revisions.
- B. Intermediate Metallic Conduit (IMC): Galvanized, complying with specifications UL 1242, Federal WW-C-58IE of latest revisions.
- C. Electrical Metallic Tubing (EMT): Galvanized, complying with specifications UL 797, ANSI C.80.3, Federal WW-C-563 or latest revisions.
- D. Polyvinylchloride Conduit (PVC): Minimum Schedule 40.
- E. Steel Flexible Conduit: Galvanized interlocking spirally wound steel.
- F. Steel Liquidtight Flexible Conduit: Liquidtight, non-metallic, sunlight resistant jacket over flexible metal core.
- G. Electrical Non-Metallic Tubing (ENT): A non-metallic pliable corrugated raceway, resistant to moisture and chemicals.

2.02 RACEWAY FITTINGS

- A. Rigid Steel Conduit and IMC:
- Galvanized, waterproof, and threaded type.
- B. Electrical Metallic Tubing:
- Galvanized steel
 - Die cast
 - Compression ring type
 - Set screw type
- C. Polyvinylchloride and ENT:
- PVC Schedule 40, cemented type.
- D. Metallic Flexible Conduit:
- Galvanized, clamp, type, and approved for grounding.
- E. Liquidtight Flexible Metal Conduit:
- Galvanized, screw in type, approved for grounding.

2.03 WIRE AND CABLE

- A. Plainly marked with UL label, gauge, voltage and insulation type.
- B. General Wiring: 600V type "TW" of "THHN" Copper, minimum size #12 AWG.
- C. Feeders: 600V type "THW" Aluminum, or as shown on plans.

2.04 DEVICES

- A. Wall switches: "AC" rated, heavy duty, quiet type, rated 20 amperes at 120 volts AC. Special switches as noted.
- B. Convenience outlets: Rated 15 amperes at 120 volts AC, 3-wire groundable type, Leviton #5262 duplex or #5261 single. Special outlets shall be as noted on plans.
- C. Plates: Supply for all outlet or junction boxes, flush or surface. Two or more gangs in box shall have gang plates. Color of box covers to be selected by Architect.

PART 3 EXECUTION & APPLICATION

3.01 RACEWAY APPLICATION

- A. Rigid Steel Conduit and IMC:
- May be exposed, concealed, installed underground, or in concrete.
 - Shall be installed per the designation on the plans.
- B. Electrical Metallic Tubing:
- Shall be concealed in protected attic spaces, or hollow stud spaces.
 - May be exposed in mechanical and electrical rooms where designated on the plans.
- C. Polyvinylchloride Conduit:
- Shall be a minimum of 3/4".
 - Shall only be installed beneath grade or in concrete.
 - A Maximum of 4 feet of exposed or concealed PVC may extend from grade or the concrete slab to the bottom or a switchboard, panelboard, device box, or similar equipment in electrical rooms only.
 - A maximum of 18 inches of PVC may extend from the concrete slab to the first device box when concealed in a stud space.
 - PVC shall not be installed in fire rated areas or where subject to mechanical damage.
- D. Flexible Steel Conduit:
- May be used in interior, dry, and non-hazardous locations only.
 - Shall be used in lengths no longer than 3 feet for motors and other equipment requiring flexible connections.
 - Shall be used in lengths no longer than 6 feet for connection of light fixtures.

E. Liquidtight Metallic Flexible Conduit:

- Shall be used as indicated in item "D" above for damp or wet locations.

F. Electrical Non-Metallic Tubing:

- May be installed in buildings not exceeding three stories.
- Shall be concealed in walls, ceilings, and floors having a minimum finish rating of 15 minutes.
- Shall not be installed in fire rated and assembly areas.

3.02 RACEWAY INSTALLATION

- A. Rigid or intermediate metal conduit shall have threads filled with conductive sealant before screwing into fittings.
- B. Entire electrical raceway system shall form a continuous metallic electrical conductor from service point to every outlet, and shall be grounded by connection to main service ground conductor.
- C. Install conduit runs exposed to view parallel or at right angles to structural members, walls or building lines.
- D. Close open ends of conduit with factory made conduit seals during construction. Examine inside of each piece of conduit just before installation and remove any dirt or foreign objects.
- E. Support conduit with one-hole malleable factory made pipe straps, fastened with screws; nails shall not be used.

3.03 WIRE INSTALLATION

- A. Make joints, splices, taps and connections of conductors with solderless connectors.
- B. Provide grounding and bonding in accordance with applicable codes and regulations.
- C. Connect all air conditioning motors to conduit systems with sections of flexible conduit to facilitate removal of motor. Use approved fittings only.

3.04 LIGHTING FIXTURE INSTALLATION



- A. Install fixtures complete with all necessary connectors and brackets. Remove all labels except UL label from exposed parts of fixtures. Clean fixtures upon project completion.
- B. Where structural members or mechanical equipment prevent installation of fixtures as shown, resulting layout shall be symmetrical within ceiling space and approved by the Architect.
- C. Install lamps of proper type.

3.05 TESTS

Test all systems upon completion of work to demonstrate that the equipment furnished and installed as connected functions electrically in the manner required.

END OF SPECIFICATION



REVISIONS	BY
 02.18.25 PLAN CHECK 1	JP
 04.24.25 PLAN CHECK 2	JP

Project: **BADGER LANE REMODEL**
BADGER LANE
GRASS VALLEY, CA

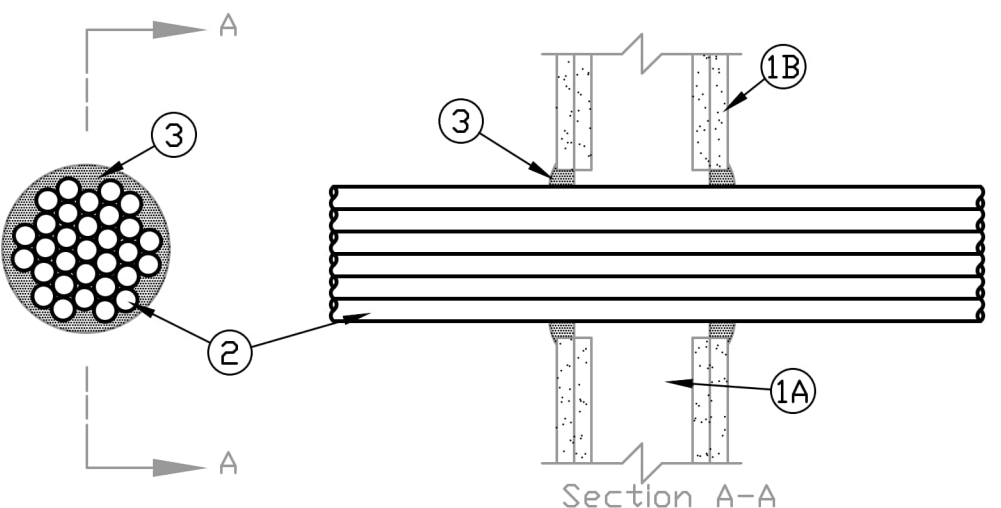
ELECTRICAL SPECIFICATIONS



Date	11.01.24
Scale	AS NOTED
Drawn	JP
Job	24052
Sheet	E4.0
Of Sheets	

System No. W-L-3076

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings -1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 0 Hr



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board** * - The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Diam of circular cutout in gypsum board layers in each side of wall to be 1/2 in. (13 mm) larger than diam of tight cable bundle (Item 2 or 2A). Max diam of opening is 4-1/2 in. (114 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Cables** - Max 4 in. (102 mm) diam tight bundle of cables to be installed either concentrically or eccentricity in circular cutouts in gypsum board opening. Cables to be rigidly supported on both sides of wall assembly. The annular space within the firestop system shall be a min 0 in. (point contact) to a max 1/2 in. (13 mm). Any combination of the following types and sizes of cables may be used:


A. Max 150 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C - 350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) jacket.

C. Max 2/0 AWG (or smaller) copper conductor cable with a XLPE insulation and PVC jacket.

D. Max 3/C (with ground) No. 8 AWG nonmetallic sheathed (Romex) cable (or smaller) with copper conductor, polyvinyl chloride (PVC) insulation and jacket materials.


E. Max 3/C (with ground) No. 2/0 AWG (or smaller) aluminum or copper conductor service entrance cable with PVC insulation and jacket materials.



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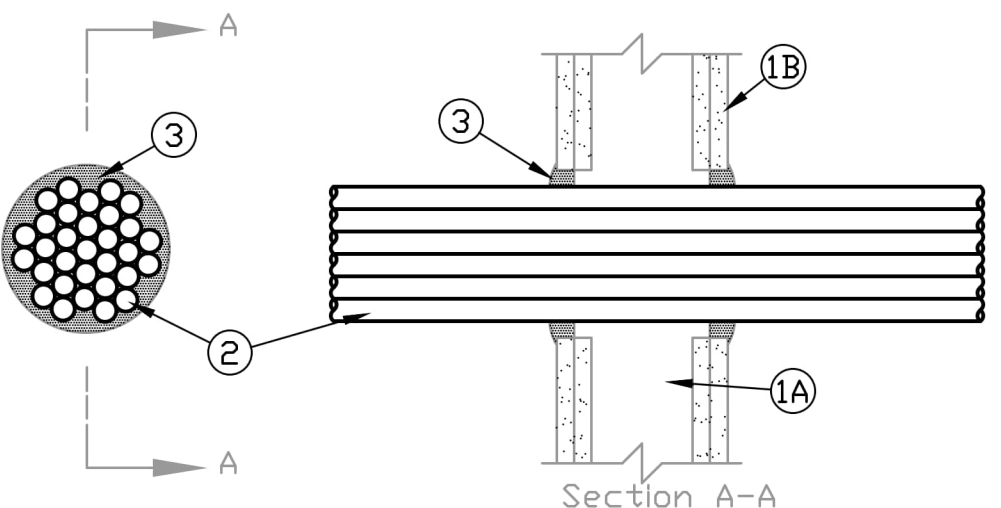
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System No. W-L-3076

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings -1 and 2 Hr (See Item 1)
T Rating - 0 Hr	FT Rating - 0 Hr
	FH Ratings - 1 and 2 Hr (See Item 1)
	FTH Rating - 0 Hr



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board** * - The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Diam of circular cutout in gypsum board layers in each side of wall to be 1/2 in. (13 mm) larger than diam of tight cable bundle (Item 2 or 2A). Max diam of opening is 4-1/2 in. (114 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Cables** - Max 4 in. (102 mm) diam tight bundle of cables to be installed either concentrically or eccentricity in circular cutouts in gypsum board opening. Cables to be rigidly supported on both sides of wall assembly. The annular space within the firestop system shall be a min 0 in. (point contact) to a max 1/2 in. (13 mm). Any combination of the following types and sizes of cables may be used:


A. Max 150 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) insulation and jacket.

B. Max 1/C - 350 kcmil (or smaller) copper conductor cable with cross-linked polyethylene (XLPE) jacket.

C. Max 2/0 AWG (or smaller) copper conductor cable with a XLPE insulation and PVC jacket.

D. Max 3/C (with ground) No. 8 AWG nonmetallic sheathed (Romex) cable (or smaller) with copper conductor, polyvinyl chloride (PVC) insulation and jacket materials.


E. Max 3/C (with ground) No. 2/0 AWG (or smaller) aluminum or copper conductor service entrance cable with PVC insulation and jacket materials.



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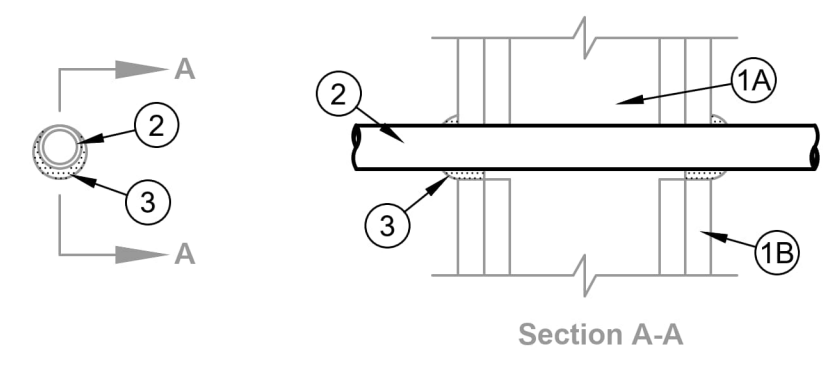
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System No. W-L-3024

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Items 2 and 2A)	F Ratings - 0, 1/2, 1 and 2 Hr (See Items 2 and 2A)
T Rating - 0, 1/2, 1 and 2 Hr (See Items 2 and 2A)	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.

B. **Gypsum Board** * - 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 2-1/2 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Cables** - One cable to be installed either concentrically or eccentricity within the firestop system. The annular space within the firestop system shall be a min 0 in. (point contact) to a max 1/4 in. Cable to be rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used:

A. Max 200 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) jacketing and insulation. **When 200 pair No. 24 AWG telephone cable is used, T Rating is 0 hr. When 50 pair No. 24 AWG telephone cable is used, T Rating is equal to the F Rating of the firestop system.**

B. Max 3/C No. 2/0 AWG (or smaller) aluminum conductor service entrance cable with PVC insulation and jacketing. **When service entrance cable is used, the T Rating is equal to the F Rating of the firestop system.**


C. Max 1/C-750 kcmil copper conductor power cable with cross-linked polyethylene (XLPE) insulation and jacketing. **When 1/C-750 kcmil cable is used, the T Rating is equal to the F Rating of the firestop system.**

D. Max 3/C No. 8 AWG (or smaller) PVC insulated and jacketed nonmetallic sheathed (Romex) cable. **When Romex is used, the T Rating is equal to the F Rating of the firestop system.**

E. Max RG59/U (or smaller) coaxial cable with fluorinated ethylene insulation and jacketing. **When coaxial cable is used, the T Rating is equal to the F Rating of the firestop system.**

F. Max 62.5/125 micron fiber optic cable with PVC insulation and jacketing. **When fiber optic cable is used, the T Rating is equal to the F Rating of the firestop system.**


G. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar insulation and jacketing. **When data cable is used, the T Rating is equal to the F Rating of the firestop system.**



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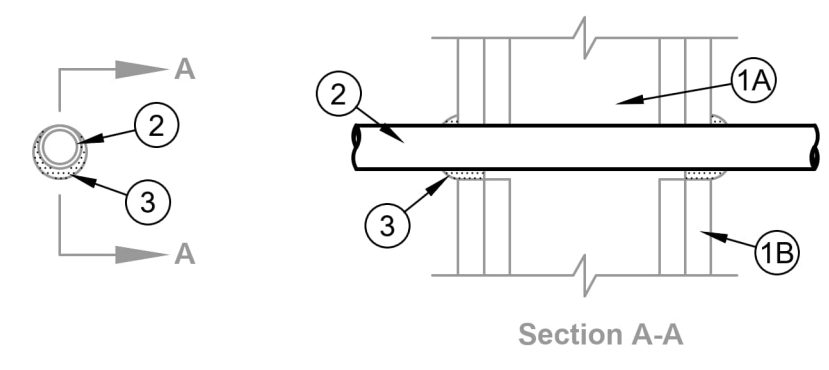
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System No. W-L-3024

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Items 2 and 2A)	F Ratings - 0, 1/2, 1 and 2 Hr (See Items 2 and 2A)
T Rating - 0, 1/2, 1 and 2 Hr (See Items 2 and 2A)	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.

B. **Gypsum Board** * - 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 2-1/2 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Cables** - One cable to be installed either concentrically or eccentricity within the firestop system. The annular space within the firestop system shall be a min 0 in. (point contact) to a max 1/4 in. Cable to be rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used:

A. Max 200 pair No. 24 AWG (or smaller) copper conductor cable with polyvinyl chloride (PVC) jacketing and insulation. **When 200 pair No. 24 AWG telephone cable is used, T Rating is 0 hr. When 50 pair No. 24 AWG telephone cable is used, T Rating is equal to the F Rating of the firestop system.**

B. Max 3/C No. 2/0 AWG (or smaller) aluminum conductor service entrance cable with PVC insulation and jacketing. **When service entrance cable is used, the T Rating is equal to the F Rating of the firestop system.**


C. Max 1/C-750 kcmil copper conductor power cable with cross-linked polyethylene (XLPE) insulation and jacketing. **When 1/C-750 kcmil cable is used, the T Rating is equal to the F Rating of the firestop system.**

D. Max 3/C No. 8 AWG (or smaller) PVC insulated and jacketed nonmetallic sheathed (Romex) cable. **When Romex is used, the T Rating is equal to the F Rating of the firestop system.**

E. Max RG59/U (or smaller) coaxial cable with fluorinated ethylene insulation and jacketing. **When coaxial cable is used, the T Rating is equal to the F Rating of the firestop system.**

F. Max 62.5/125 micron fiber optic cable with PVC insulation and jacketing. **When fiber optic cable is used, the T Rating is equal to the F Rating of the firestop system.**


G. Max 4 pair No. 24 AWG (or smaller) copper conductor data cable with Hylar insulation and jacketing. **When data cable is used, the T Rating is equal to the F Rating of the firestop system.**



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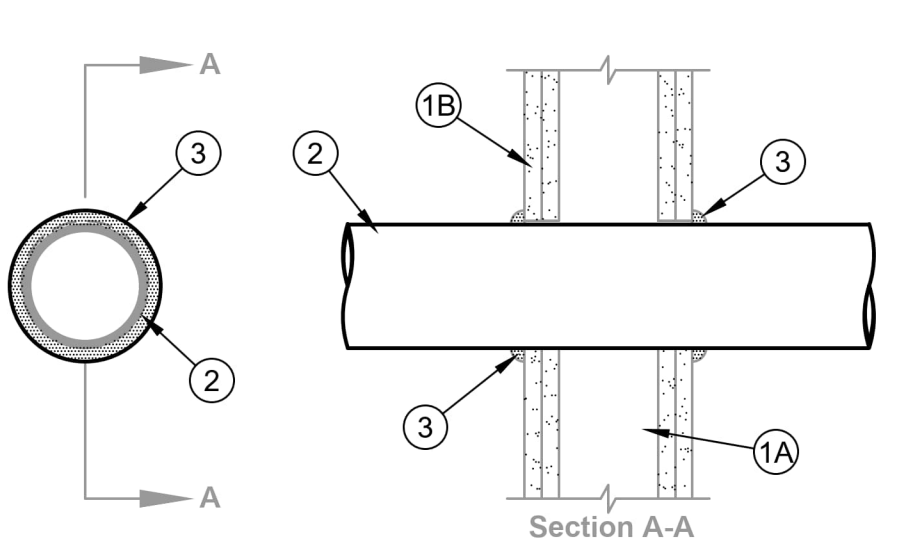
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System No. W-L-1344

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	T Rating - 1/4 Hr
L Ratings At Ambient - Less Than 1 CFM/sq ft	
L Ratings At 400 F - Less Than 1 CFM/sq ft	



1. **Wall Assembly** -- The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board** * -- Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max diam of opening is 5 in. (127 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrants** -- One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and periphery of opening shall be min of 0 in. (0 mm, point contact) to max 1/8 in. (3.2 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. **Copper Tubing** -- Nom 4 in. (102 mm) diam (or smaller) Type M (or heavier) copper tubing.

B. **Copper Pipe** -- Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

C. **Steel Pipe** -- Nom 4 in. (102 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.


D. **Conduit** -- Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or rigid steel conduit.

E. **Iron Pipe** -- Nom 4 in. (102 mm) diam (or smaller) cast or ductile iron pipe.

3. **Fill, Void or Cavity Materials** * - **Sealant or Putty** -- Min 1/2 in. (13 mm) diameter bead of sealant or putty applied continuously around the penetrant on both sides of the wall.

SPECIFIED TECHNOLOGIES INC -- SpecSeal Putty, SpecSeal Series SSS Sealant, SpecSeal LCI Sealant


*Bearing the UL Classification Mark



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UP-LIGHT

UP-LIGHT ELECTRICAL ENGINEERING, INC.

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REVISIONS	BY
02.18.25 PLAN CHECK 1	JP
04.24.25 PLAN CHECK 2	JP


Project:

BADGER LANE REMODEL

BADGER LANE
GRASS VALLEY, CA

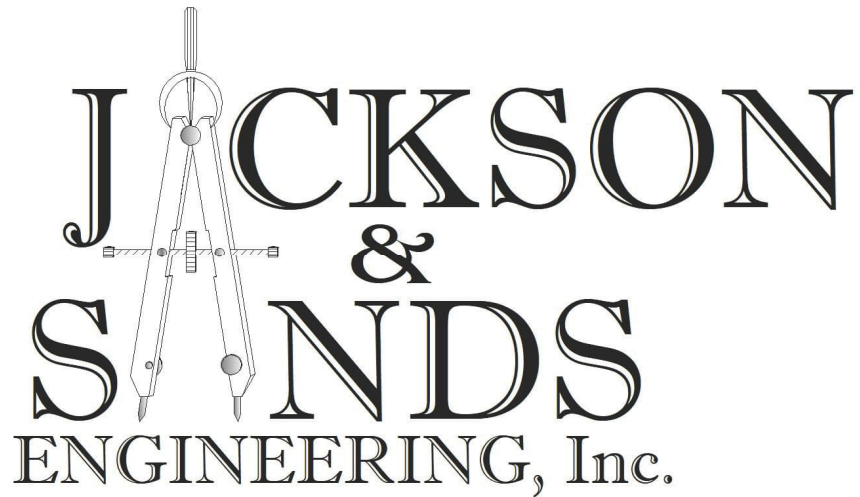
Drawing:

FIRE PENETRATION DETAILS



Date	11.01.24
Scale	AS NOTED
Drawn	JP
Job	24052
Sheet	E5.0
Of	Sheets

City of Grass Valley Builders Copy



STRUCTURAL ANALYSIS

For:

**Badger Ln. Deck
120 Badger Ln.
Grass Valley, CA**

Project # 24-146

November 6, 2024

(INITIAL SUBMITTAL)

JACKSON & SANDS ENGINEERING, Inc.

1250 East Ave. #10

Chico, CA 95926

info@jacksonandsandsengineering.com

Prepared by:
JACKSON & SANDS ENGINEERING INC.

Assistant Engineer:

Jeffrey Ford, E.I.T.

Senior Engineer:

Frank Sands, P.E.



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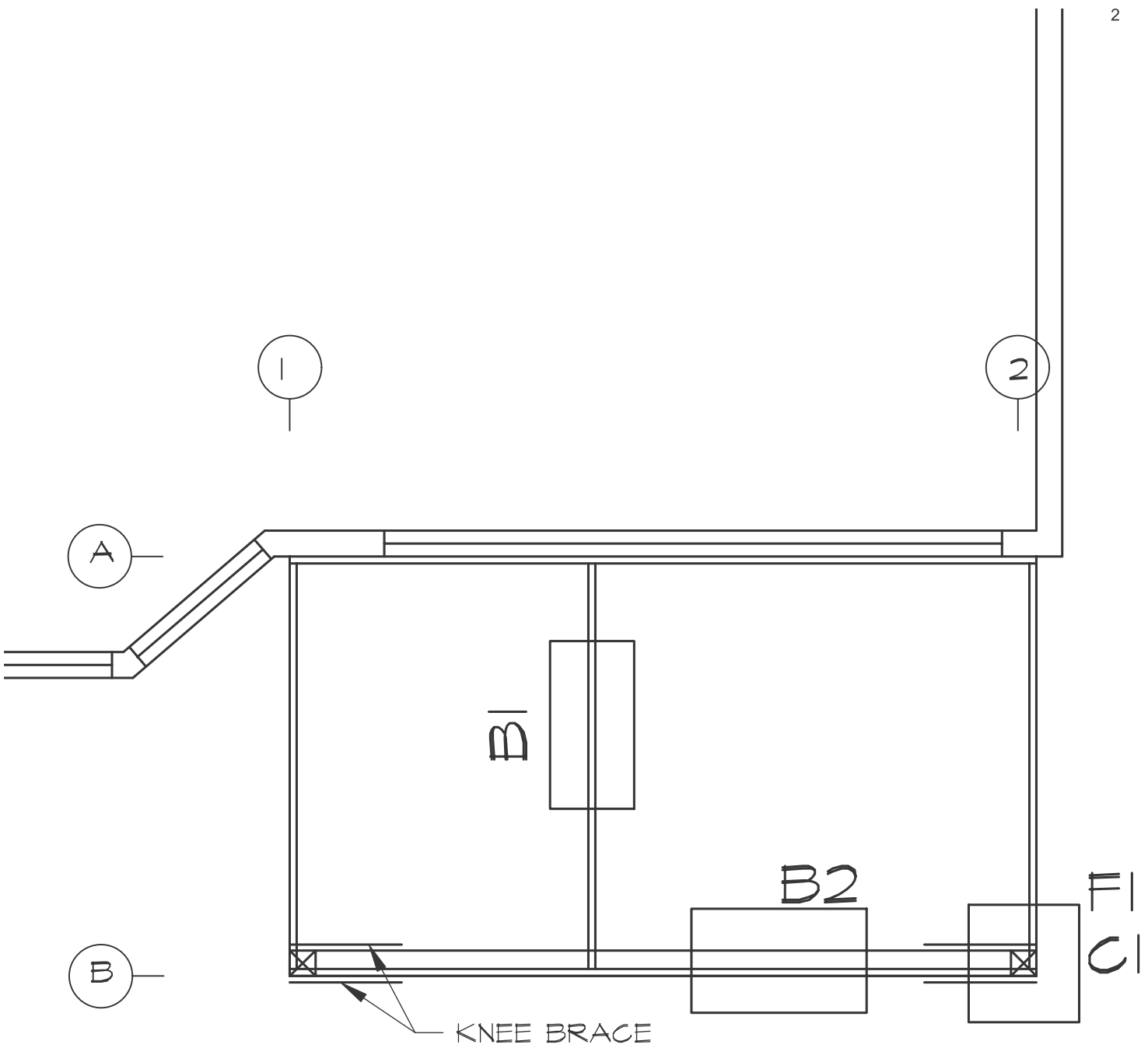
SCOPE OF WORK

Scope

The following Structural Analysis is for a replacement deck to be built within a portion of the footprint of the existing deck to be demolished. Analysis of structure was performed with respect to the forces of seismic and wind and gravity using the applicable chapters of the A.S.C.E. 7-16. Analysis and design for gravity loads were performed to verify beam design per AWC NDS 2021 for wood members.

Analysis

The deck was analyzed as 1 diaphragm and idealized as flexible for a simplified analysis. The footings and beams were designed with appropriate design loads using the Enercalc and Forte web software. The existing house foundation and lateral retaining system will remain unaffected due to the loading of the structure being unchanged. It is assumed that the existing building takes all the lateral load from the deck along wall lines 1 and 2.



Gravity loads: Per ASCE7-16			
Deck Dead Loads			
Slope=	1 /12		
	4.76 Degrees	Framing	6 psf
		Misc	5 psf
		Total =	11 psf
		Total Sloped=	12.00 psf
Deck Snow Loads			
		Ground Snow=	43 psf
		Flat Roof Snow=	38 psf
		Seismic Roof Snow=	8.6 psf

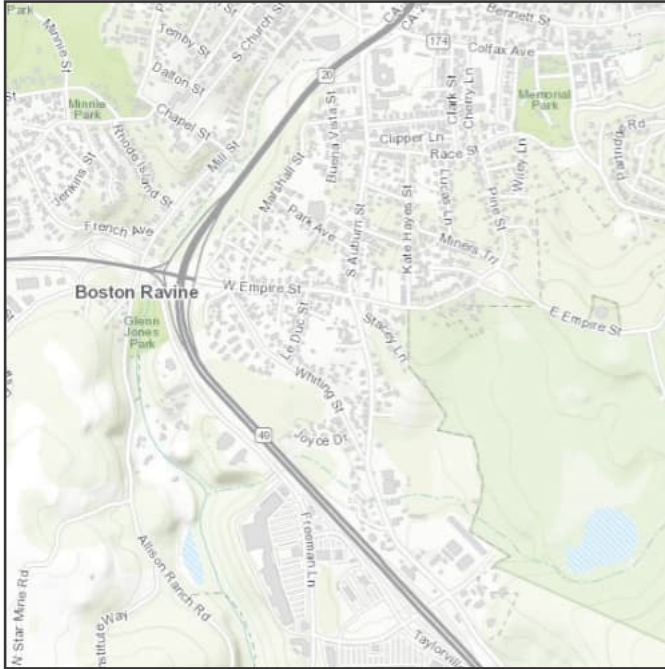


ASCE Hazards Report

Address:
120 Badger Ln
Grass Valley, California
95945

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see
Section 11.4.3)

Latitude: 39.207976
Longitude: -121.062502
Elevation: 2472.524646971836 ft
(NAVD 88)



Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.546	S_{D1} :	N/A
S_1 :	0.232	T_L :	12
F_a :	1.363	PGA :	0.237
F_v :	N/A	PGA_M :	0.323
S_{MS} :	0.744	F_{PGA} :	1.363
S_{M1} :	N/A	I_e :	1
S_{DS} :	0.496	C_v :	1.064

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed Oct 23 2024

Date Source: [USGS Seismic Design Maps](#)

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Seismic Design: Equivalent Lateral Force Procedure, ASCE7-16, Chp.12.8

	Value	Reference			
$V=C_sW$, Ultimate		12.8-1	$C_t=$	0.02	Table 12.8-2
$C_s=SDS/(R/I)$	0.331	12.8-2	$\alpha=$	0.75	Table 12.8-2
Response, $R=$	1.5	Table 12.2-1	$S_S=$	0.546	g, 11.4.1
Importance, $I=$	1	Table 1.5-2	$S_1=$	0.232	g, 11.4.1
$T=T_a=C_t \cdot h_n^x$	0.121	12.8-7	$S_{MS}=$	0.744	g, 11.4.3
Mean Roof (ft), $h=$	11		$S_{M1}=$	null	g, 11.4.3
$F_x=C_v \alpha V$			$S_{DS}=$	0.496	g, 11.4.4
			$S_{D1}=$	null	g, 11.4.4
			$T_L=$	12	Table 22-12
			$\rho=$	1.3	Redundancy, 12.3.4

Diaphragm#

1 Deck

Building element	Weight, psf	Sq. Ft.	Load, lbs	Wall Lines	Distance, ft	$V_{ULTIMATE=plf}$	$V_{WORKING=plf}$
Deck	12	100	1200	1-2	13.337	66.40	47.43
Snow	8.6	100	860	A-B	7.5	118.07	84.34
$\Sigma=$			2060				

Lateral Load Summary

Wall line	Diaphragm	Wind direction	Tributary Length	Seismic Loading, (plf)	Wind Loading, (plf)	Seismic Line Loading, (kips)	Wind Line Loading, (kips)
1	1	Parallel	6.67	47.43	13.09	0.32	0.09
2	1	Parallel	6.67	47.43	13.09	0.32	0.09
A	1	Normal	3.75	84.34	12.10	0.32	0.05
B	1	Normal	3.75	84.34	12.10	0.32	0.05

Longitude

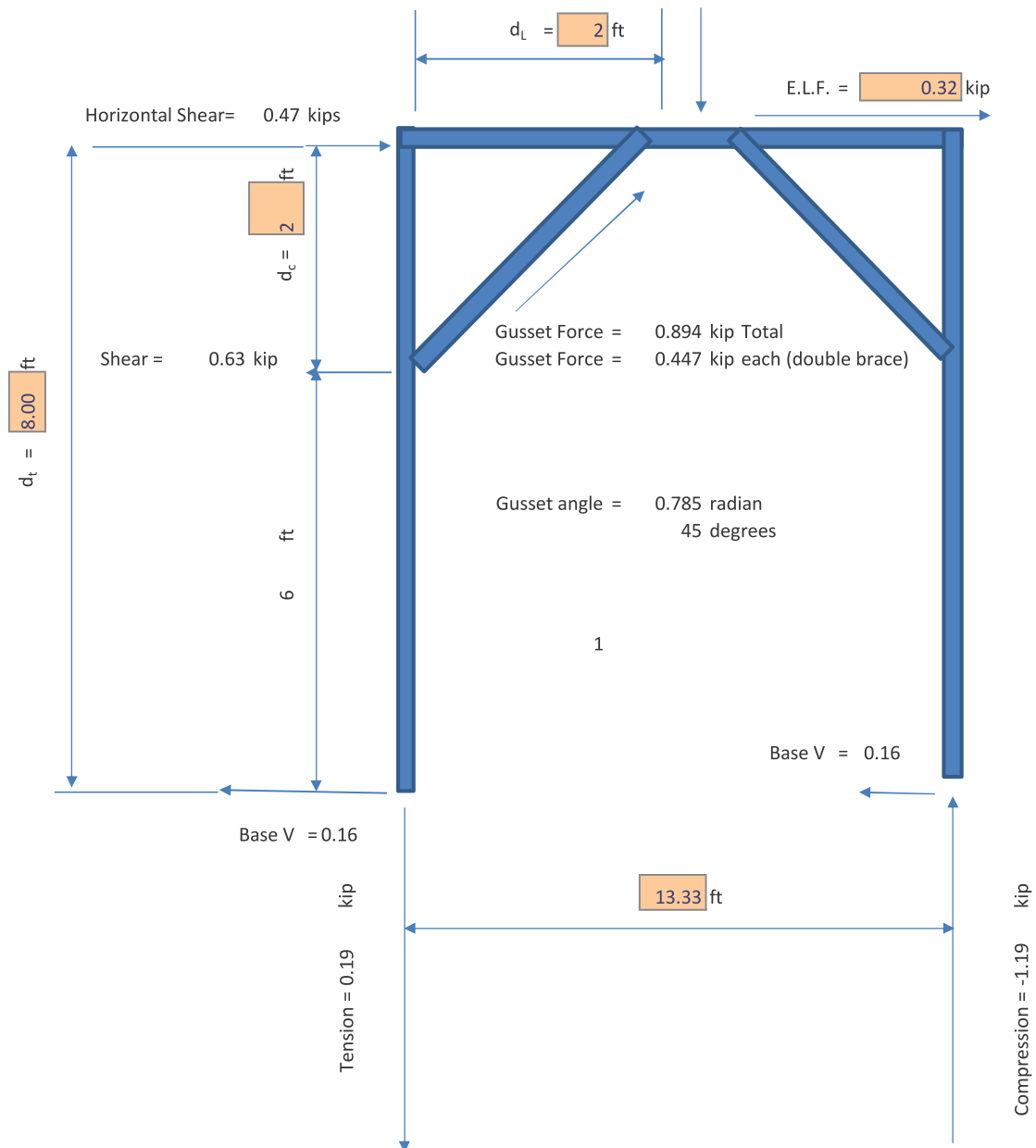
Moment Resisting Frames

Typ. Deck Knee Brace

Load force diagram

Wall lines: B-C

Gravity = 1.00 kip



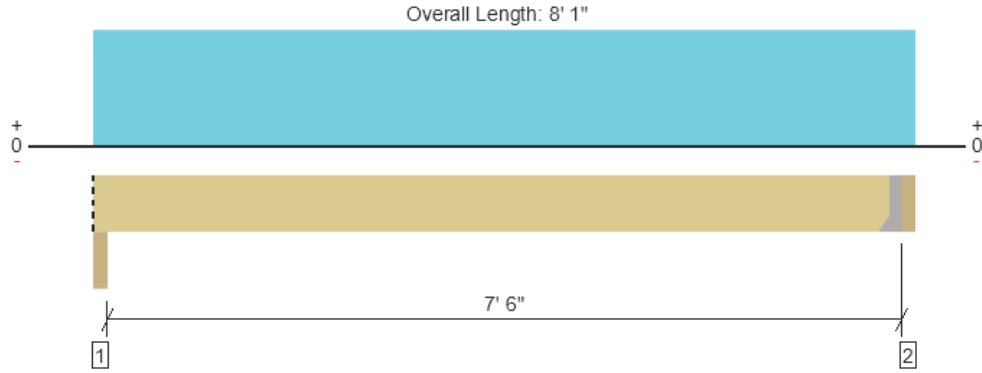
Knee Brace Connection

Horizontal force	0.63	Species	dfi
vertical force	0.63		
		2x4 Brace	
		SDS25300	
Lower connection			
p	0.63	2	
v	0.63	3	
		Withdraw	345
		Shear	280
		Bolt Diameter:	1/4
Upper connection			
p	0.63	3	
v	0.63	2	
Angle to Grain	45		

of braces on a post 2 Material
 post and brace size 2x4 brace 6x6 post

Level, Deck Joist: B1

1 piece(s) 2 x 8 DF No.2 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	451 @ 7' 9 1/2"	1406 (1.50")	Passed (32%)	—	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	379 @ 7' 2 1/4"	1501	Passed (25%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	855 @ 4'	1564	Passed (55%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.101 @ 4'	0.190	Passed (L/905)	—	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.116 @ 4'	0.379	Passed (L/783)	—	1.0 D + 0.75 L + 0.75 S (All Spans)
TJ-Pro™ Rating	N/A	N/A	N/A	—	N/A

Member Length : 7' 9 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.
- No composite action between deck and joist was considered in analysis.

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Beam - DF	3.50"	3.50"	1.50"	64	320	229	476	Blocking
2 - Hanger on 7 1/4" DF Ledger	3.50"	Hanger ¹	1.50"	65	327	234	486	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	7' 10" o/c	
Bottom Edge (Lu)	7' 10" o/c	

- Maximum allowable bracing intervals based on applied load.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LU26	1.50"	N/A	6-10dx1.5	4-10dx1.5	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 8' 1"	16"	12.0	60.0	43.0	Default Load

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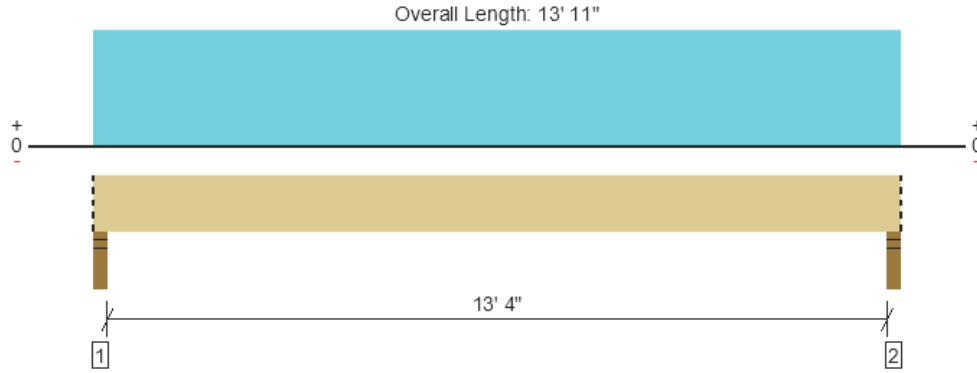
The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Jeffrey Ford Jackson and Sands (530) 715-7184 jeffrey@jacksonandsandsengineering.com	



10/25/2024 3:01:02 AM UTC
ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3
File Name: 24-146 Badger Ln Deck
JOB #24-146

Level, Deck Girder: B2
1 piece(s) 6 x 12 DF No.2



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	2594 @ 2"	8181 (3.50")	Passed (32%)	—	1.0 D + 0.75 L + 0.75 S (All Spans)
Shear (lbs)	2128 @ 1' 3"	8244	Passed (26%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Moment (Ft-lbs)	8599 @ 6' 11 1/2"	10166	Passed (85%)	1.15	1.0 D + 0.75 L + 0.75 S (All Spans)
Live Load Defl. (in)	0.261 @ 6' 11 1/2"	0.453	Passed (L/624)	—	1.0 D + 0.75 L + 0.75 S (All Spans)
Total Load Defl. (in)	0.315 @ 6' 11 1/2"	0.679	Passed (L/517)	—	1.0 D + 0.75 L + 0.75 S (All Spans)

- Deflection criteria: LL (L/360) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- Lumber grading provisions must be extended over the length of the member per NDS 4.2.5.5.
- Applicable calculations are based on NDS.

Member Length : 13' 11"
System : Floor
Member Type : Drop Beam
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Stud wall - SPF	3.50"	3.50"	1.50"	445	1670	1195	2594	Blocking
2 - Stud wall - SPF	3.50"	3.50"	1.50"	445	1670	1195	2594	Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	13' 11" o/c	
Bottom Edge (Lu)	13' 11" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	0 to 13' 11"	N/A	16.0	--	--	
1 - Uniform (PLF)	0 to 13' 11" (Top)	N/A	48.0	240.0	171.8	Linked from: Deck Joist: B1, Support 1

- Side loads are assumed to not induce cross-grain tension.

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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10/25/2024 3:01:06 AM UTC
ForteWEB v3.8, Engine: V8.4.1.24, Data: V8.1.6.3
File Name: 24-146 Badger Ln Deck
JOB #24-146

Level, Deck Post: C1
1 piece(s) 6 x 6 DF No.2

Post Height: 10'



Design Results	Actual	Allowed	Result	LDF	Load: Combination
Slenderness	22	50	Passed (44%)	—	--
Compression (lbs)	2594	16895	Passed (15%)	1.15	1.0 D + 0.75 L + 0.75 S
Base Bearing (lbs)	2594	898425	Passed (0%)	—	1.0 D + 0.75 L + 0.75 S
Bending/Compression	0.14	1	Passed (14%)	1.15	1.0 D + 0.75 L + 0.75 S

- Input axial load eccentricity for this design is 16.67% of applicable member side dimension.
- Applicable calculations are based on NDS.

Supports	Type	Material
Base	Plate	Steel

Member Type : Free Standing Post
Building Code : IBC 2021
Design Methodology : ASD

Max Unbraced Length	Comments
Full Member Length	No bracing assumed.

Drawing is Conceptual

Vertical Load	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
1 - Point (lb)	445	1670	1195	Linked from: Deck Girder: B2, Support 1

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

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Jeffrey Ford Jackson and Sands (530) 715-7184 jeffrey@jacksonandsandsengineering.com	



General Footing

Project File: 24-146 Badger Ln. Deck.ec6

LIC#: KW-06012341, Build:20.24.02.28

Jackson & Sands Engineering

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DESCRIPTION: F1: Typ. Ftg.

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16

Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50 ksi
fy : Rebar Yield	=	40.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

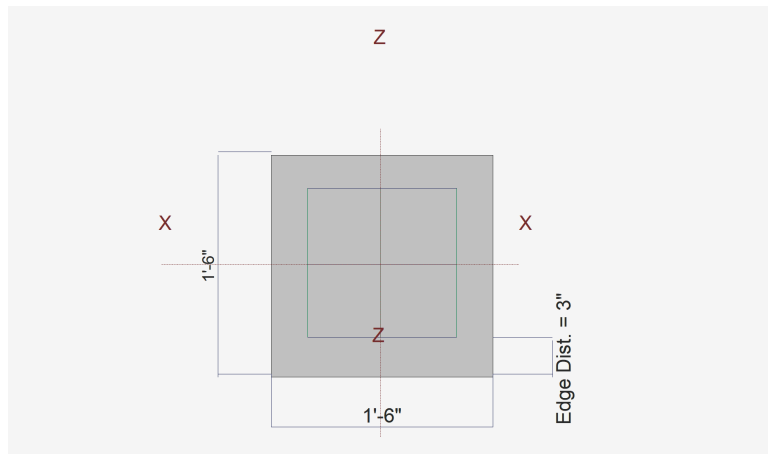
Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	1.50 ft
Length parallel to Z-Z Axis	=	1.50 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in
Rebar Centerline to Edge of Concrete...	=	3.0 in
at Bottom of footing	=	



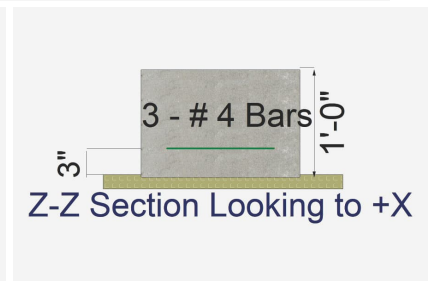
Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	3.0
Reinforcing Bar Size	=	# 4

Bars parallel to Z-Z Axis	=	
Number of Bars	=	3.0
Reinforcing Bar Size	=	# 4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	=	n/a
# Bars required within zone	=	n/a
# Bars required on each side of zone	=	n/a



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	0.50		1.70	1.20		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: 24-146 Badger Ln. Deck.ec6

LIC# : KW-06012341, Build:20.24.02.28

Jackson & Sands Engineering

(c) ENERCALC INC 1983-2023

DESCRIPTION: F1: Typ. Ftg.

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8893	Soil Bearing	1.334 ksf	1.50 ksf	+D+0.750L+0.750S about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.05061	Z Flexure (+X)	0.5275 k-ft/ft	10.424 k-ft/ft	+1.20D+L+1.60S
PASS	0.05061	Z Flexure (-X)	0.5275 k-ft/ft	10.424 k-ft/ft	+1.20D+L+1.60S
PASS	0.05061	X Flexure (+Z)	0.5275 k-ft/ft	10.424 k-ft/ft	+1.20D+L+1.60S
PASS	0.05061	X Flexure (-Z)	0.5275 k-ft/ft	10.424 k-ft/ft	+1.20D+L+1.60S
PASS	n/a	1-way Shear (+X)	0.0 psi	46.416 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	46.416 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	46.416 psi	n/a
PASS	n/a	2-way Punching	9.769 psi	46.416 psi	+1.20D+L+1.60S

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.50	n/a	0.0			0.3672	0.3672	n/a	n/a	0.245
X-X, +D+L	1.50	n/a	0.0			1.123	1.123	n/a	n/a	0.749
X-X, +D+S	1.50	n/a	0.0			0.9006	0.9006	n/a	n/a	0.600
X-X, +D+0.750L	1.50	n/a	0.0			0.9339	0.9339	n/a	n/a	0.623
X-X, +D+0.750L+0.750S	1.50	n/a	0.0			1.334	1.334	n/a	n/a	0.889
X-X, +0.60D	1.50	n/a	0.0			0.2203	0.2203	n/a	n/a	0.147
Z-Z, D Only	1.50	0.0	n/a			n/a	n/a	0.3672	0.3672	0.245
Z-Z, +D+L	1.50	0.0	n/a			n/a	n/a	1.123	1.123	0.749
Z-Z, +D+S	1.50	0.0	n/a			n/a	n/a	0.9006	0.9006	0.600
Z-Z, +D+0.750L	1.50	0.0	n/a			n/a	n/a	0.9339	0.9339	0.623
Z-Z, +D+0.750L+0.750S	1.50	0.0	n/a			n/a	n/a	1.334	1.334	0.889
Z-Z, +0.60D	1.50	0.0	n/a			n/a	n/a	0.2203	0.2203	0.147

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.08750	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.40D	0.08750	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+1.60L	0.4150	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+1.60L	0.4150	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+1.60L+0.50S	0.490	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+1.60L+0.50S	0.490	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L	0.2875	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L	0.2875	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D	0.0750	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D	0.0750	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+1.60S	0.5275	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+1.60S	0.5275	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+1.60S	0.3150	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK

General Footing

Project File: 24-146 Badger Ln. Deck.ec6

LIC#: KW-06012341, Build:20.24.02.28

Jackson & Sands Engineering

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DESCRIPTION: F1: Typ. Ftg.

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.20D+1.60S	0.3150	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+0.50S	0.3625	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+0.50S	0.3625	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +0.90D	0.05625	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +0.90D	0.05625	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+0.20S	0.3175	+Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
X-X, +1.20D+L+0.20S	0.3175	-Z	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.40D	0.08750	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.40D	0.08750	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60L	0.4150	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60L	0.4150	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60L+0.50S	0.490	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60L+0.50S	0.490	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L	0.2875	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L	0.2875	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D	0.0750	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D	0.0750	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+1.60S	0.5275	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+1.60S	0.5275	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60S	0.3150	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+1.60S	0.3150	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+0.50S	0.3625	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+0.50S	0.3625	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +0.90D	0.05625	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +0.90D	0.05625	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+0.20S	0.3175	-X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK
Z-Z, +1.20D+L+0.20S	0.3175	+X	Bottom	0.2592	ACI 7.6.1.1	0.40	10.424	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60L	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60L+0.50S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+1.60S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+0.50S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+0.20S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60L	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60L+0.50S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+1.60S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+1.60S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+0.50S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK
+1.20D+L+0.20S	0.00 psi	0.00 psi	0.00 psi	46.42 psi	0.00	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	1.62 psi	150.00psi	0.0108	OK
+1.20D+1.60L	7.69 psi	150.00psi	0.05124	OK
+1.20D+1.60L+0.50S	9.07 psi	150.00psi	0.06049	OK
+1.20D+L	5.32 psi	150.00psi	0.03549	OK
+1.20D	1.39 psi	150.00psi	0.009259	OK
+1.20D+L+1.60S	9.77 psi	150.00psi	0.06512	OK
+1.20D+1.60S	5.83 psi	150.00psi	0.03889	OK

All units k

General Footing

Project File: 24-146 Badger Ln. Deck.ec6

LIC# : KW-06012341, Build:20.24.02.28

Jackson & Sands Engineering

(c) ENERCALC INC 1983-2023

DESCRIPTION: F1: Typ. Ftg.

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+L+0.50S	6.71 psi	150.00 psi	0.04475	OK
+0.90D	1.04 psi	150.00 psi	0.006944	OK
+1.20D+L+0.20S	5.88 psi	150.00 psi	0.0392	OK

Ledger Inputs

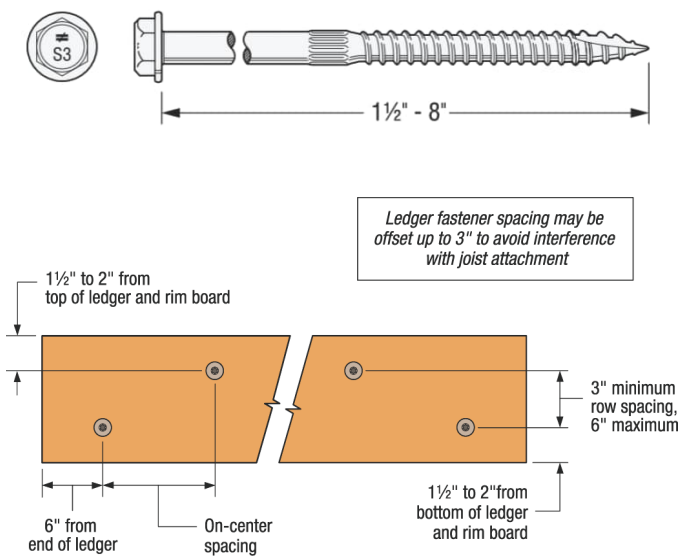
Ledger Connection	Loading Condition	Ledger Size	Rim Board Material and Thickness	Deck Joist Span	Corrosion Resistance
Ledger To Rim Board	60 psf Live / 10 psf Dead	2X	2X DF	Up to 8 ft	All

Ledger Connection Options

Size/Type	Finish/Material	Model Number	Corrosion Resistance	Maximum On-Center Spacing of Anchors (in)
1/4" x 3 1/2" Strong-Drive® SDS HEAVY-DUTY CONNECTOR Screws	Double Barrier Coating	SDS25312	Medium	7

Strong-Drive® SDS HEAVY-DUTY CONNECTOR Screw

Heavy-Duty Simpson Strong-Tie Connectors



A 1/4" diameter high-strength structural wood screw ideal for various connector installations as well as wood-to-wood applications.

Features:

- Type-17 point enables easy driving with no pre-drilling and minimal splitting.
- Available with a double-barrier coating and Type 316 stainless steel.

Fastener Designer: Solutions Report

Report Generated: October 24, 2024

- 3/8" hex head with integrated washer.
- Designed for installation in Simpson Strong-Tie® structural connectors as well as wood-to-wood applications.
- Head is stamped with the Simpson Strong-Tie "S" sign and fastener length for easy identification after installation.

Notes:

- Screw spacing values are equivalent to 2012/2015 IRC Table R507.2.
- Fastener spacings are based on the lesser of single fastener ICC-ES AC233 testing of the screw with a safety factor of 5.0 or ICC-ES AC13 ledger assembly testing with a safety factor of 5.0.
- Ledger To Rim Board spacing requirements were developed using an NDS wet service factor of 0.7.
- Ledger To Rim Board with One or Two Layers of 5/8" Gypsum Board were developed using an NDS wet service factor of 1.0.
- Multiple ledger plies shall be fastened together per code independent of the screws.
- Structural sheathing between the ledger and band shall be a maximum of 1/2" thick and fastened per code.

Codes/Standards: [Click Here](#)

Product Information: [Strong-Drive SDS HEAVY-DUTY CONNECTOR Screw](#)