



DATUM

NAVD 88

SITE DATA

PARCEL NO: 959700801 PARCEL AREA: 40,000 SF

ZONING: R1

LEGAL DESC: HILL'S ADDITION BLOCK 8 LOTS 1-8

LOT COVERAGE CALC

STRUCTURE TYPE	AREA (SF)
HOUSE	1,415
COVERED PORCH	305
TOTAL STRUCTURE AREA TOTAL LOT AREA TOTAL LOT COVERAGE	1,715 40,000 4.29%

IMPERVIOUS CALC

NOTES

IMPROVEMENTS.

CONSTRUCTION.

1. FIELD VERIFY ELEVATIONS AND NOTIFY OWNER OF

ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

2. REMOVE AND RESTORE EXISTING IMPROVEMENTS IN

3. STOCKPILE AND RETAIN ALL EX. TOPSOIL WITHIN

CLEARING LIMITS FOR REUSE. RESTORE AREAS

WITHIN CLEARING LIMITS WITH HYDROSEEDING

FOLLOWING THE COMPLETION OF ALL OTHER

CALL 811 2 BUSINESS DAYS BEFORE YOU DIG!

ROW AS REQUIRED FOR CONSTRUCTION OF NEW

SURFACE TYPE	AREA (SF)
HOUSE ROOF	1,516
COVERED PORCH	346
GRAVEL WALKS	180
GRAVEL DRIVEWAY/PAD	1,552
TOTAL IMPERV. AREA TOTAL LOT AREA TOTAL IMPERV. COVERAGE	3,594 40,000 8.99%

ERRICHETTI RESIDENCE SITE PLAN	REV. NO. DATE DESCRIPTION			
	ERRICHETTI RESIDENCE			

1



Window Schedule

		VVI		JOW S	cneu	ule								
				Nominal S	Size		Glass	Details		Open	Window	Data		
Comments		Mark	ζ	O.A. Width	O.A. Height	Sash Operation		Egress Win	RO Width	RO Height	Mfr	Model No.	Accessories	Comme
Tempered Glass	W-	01	S	2'5"	4'7 5/8"	Casement	Clr-180-279	FALSE	2'5"	4'7 5/8"	Marvin	Elevate	Screens	
Tempered Glass	W-	02	S	2'5"	4'7 5/8"	Casement	Clr-180-279	FALSE	2'5"	4'7 5/8"	Marvin	Elevate	Screens	
1/4 deco-glass	W-	03	W	2'9"	5'11 5/8"	Casement	Clr-180-279	TRUE	2'9"	5'11 5/8"	Marvin	Elevate	Screens	
	W-	04	W	2'9"	5'11 5/8"	Casement	Clr-180-279	TRUE	2'9"	5'11 5/8"	Marvin	Elevate	Screens	
	W-	05	Ν	1'9"	3'7 3/4"	Fixed Glass	Clr-180-279	FALSE	1'9"	3'7 3/4"	Marvin	Elevate		
	W-	06	Ν	2'9"	3'7 3/4"	Casement	Clr-180-279	FALSE	2'9"	3'7 3/4"	Marvin	Elevate	Screens	
	W-	07	Ν	1'9"	1'9"	Fixed Glass	Clr-180-279	FALSE	1'9"	1'9"	Marvin	Elevate	Screens	OCTAG
	W-	08	Ν	2'5"	4'7 5/8"	Casement	Clr-180-279	FALSE	2'5"	4'7 5/8"	Marvin	Elevate		
	W-	9	Е	4'9"	6'3 1/4"	Custom	Clr-180-279	FALSE	4'9"	6'3 1/4"	Marvin	Elevate		
Access Panel	W-	10	E	4'9"	6'3 1/4"	Custom	Clr-180-279	FALSE	4'9"	6'3 1/4"	Marvin	Elevate		
	W-	13	S	3'1 3/8"	6'10 1/2"	Fixed Glass	Clr-180-279	FALSE	3'1 3/8"	6'10 1/2"	Marvin	Elevate		Sideligh
	W-	14	S	3'1 3/8"	6'10 1/2"	Fixed Glass	Clr-180-279	FALSE	3'1 3/8"	6'10 1/2"	Marvin	Elevate		Sideligh
	W-	15	S	2'5"	4'7 5/8"	Fixed Glass	Clr-180-279	FALSE	2'5"	4'7 5/8"	Marvin	Elevate		
Iempered Glass	W-	16	S	2'1"	3'11 5/8"	Casement	Clr-180-279	FALSE	2'1"	3'11 5/8"	Marvin	Elevate	Screens	
 	W-	17	S	2'1"	3'11 5/8"	Fixed Glass	Clr-180-279	FALSE	2'1"	3'11 5/8"	Marvin	Elevate		
	W-	18	S	2'1"	3'11 5/8"	Casement	Clr-180-279	FALSE	2'1"	3'11 5/8"	Marvin	Elevate	Screens	
	W-	19	w	2'9"	3'7 3/4"	Casement	Clr-180-279	FALSE	2'9"	3'7 3/4"	Marvin	Elevate	Screens	
	W-	20	W	6'1"	3'7 3/4"	Fixed Glass	Clr-180-279	FALSE	6'1"	3'7 3/4"	Marvin	Elevate		
	W-	21	Ν	2'5"	4'7 5/8"	Casement	Clr-180-279	FALSE	2'5"	4'7 5/8"	Marvin	Elevate	Screens	
	W-	22	Ν	2'1"	3'7 3/4"	Casement	Clr-180-279	FALSE	2'1"	3'7 3/4"	Marvin	Elevate	Screen	
	W-	23	Ν	2'1"	<u>3'7 3/4"</u>	Casement	Clr-180-279	FALSE	<u>2'1"</u>	3'7 3/4"	Marvin	Elevate		









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Consulta	ant		
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	(360) 969)-2363	ted@zero-energyplans.com
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DAYLIGHT PLANE NOTE STRUCTURE SETBACK FROM PROPERTY LINE IS 37' MINIMUM. DAYLIGHT PLANE IS A MINIMUM OF 52' TALL AT THE BUILDING PERIMETER







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	S	7/16" x 3" wide 2x	8d @ 6" OC, ea face	greater 2x or king st per heade callou	of ud 8d of er f	@ 6" C, ea face	Single 2x Skin nails: 8d @ 6" OC, each face, typ.	No	NA	NA	Big screws at 9" max	SDS or similar @ 9" w/ 1.5" embed to plate below.	Big screw at 9" max. thru flr cavity w/ 1.5" embed to sill or plate below.	SDS @ / 9", or 16d @ 5 4"	5/8" j-bolt or Titen HD or MASA or MASAP	72/4	
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(see d st becs awr	spac 'I St) spac 4/4(1 7/7("g @ P ud P 'g, in. 1 @24 @16	Fop plate, s nin. 4 2- 2x v	plate plice, w min. 8" lap w/ 10- 16d	studs v/ edge nail'g 2x	unsup porte edge none require	o- or rim d rim s blk'; e ed NA	H3 H3 H2 or SD 156 (@ 1 ma	rpen- B cular p ming. fr. .5A, WC- 500, 24" x	ottom late to aming.	Mud sill anchor to concrete 5/8" j-bolt or 5/8" Titen HD, w/ 3" wshr. Or MASA or MASAP	w/ 4" min embed	F	RELEVANT SNOW LOA	- CODES: 2 AD = 25 PS D = 90 MPH	018 IRC, F	Engineer's seal is for structural items only. See S and S2 herein for structural plans, callouts, and specifications. Conflicts between architectural and structural plans: the more stringent shall control.
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 PA Per Architect Structural Item: This item and related connectors shall be per architect / designer. RDS Roof Diaphragm, SIPs Shear Capacity: Good for Eh = 430 plf diaphragm shear. Max snow or live load = 25 psf. Max aspect ratio = 4:1. SIP Panels: All panels shall be 9.25" thick core (10.25" overall thickness), min. Panels spanning less than 18' (true length, not horizontal projection) may be Type S, I, or L. Panels spanning 18' to 22' (true length, not horizontal projection) must be Type I or L. Type S Splines: Use standard block or surface splines with 8d @ 6" each side of splice, both faces, where possible. Surface splines allowed on top face only at supports. In this case use 8d @ 3" OC, each side of splice. Type I Splines: Use one I joist at panel joint. Connect skins with 8d @ 6" OC, each side of splice, each face. Type L Splines: Use 2, full depth 2x's at panel joint. Connect 2x's together with 16d @ 9" OC, staggered. Connect skins to 2x's with 8d @ 6" OC, each side of splice, each face. Interior Support: Where SIPs bear on beams and bearing walls: If panels are spliced over support, in addition to spline connections per above, use a Big Screw on each side of splice over support, attach SIPs to support with Big Screws at 9" OC. Boundary Support: In addition to boundary spline nails, connect SIPs panel to support with Big Screws at 9" OC. Ledger Support: Where SIPs bear on a ledger connected to beam or wall see 81L Lumber Overhangs: Overhangs of 2x lumber shall be designed and installed at the SIPs factory and roundary support: where SIPs bear on a ledger connected to beam or wall see 81L Lumber Overhangs: Overhangs of 2x lumber shall be designed and installed at the SIPs factory and roundary support: 	 80 L Ledger - Rafter or Joist To SIPs Wall. * Ledger: Use min 2x, or 1.75x LSL or LVL ledger, at least as tall as joists or rafters. Connection to SIPs Wall: Connect ledger to SIPs wall panel with #14 Big Screw at max., 12" OC and within 3" of ends and splices. Big Screws shall be installed through both OSB faces of SIPs and with full embedment in ledger. Connection to Header: At solid wood window header, connect ledger to header with SDS screws at same spacing as above, length as necessary for min., 1.5" penetration into header. * Rafter Connection to Ledger: Use Boped U or LU hanger. As alternate to hanger, may use 3, #9x3.5" screws in toenail orientation. Must predrill rafter with pilot hole to avoid splitting. * Joist Connection to Ledger: Use U or LU hanger. * Roof Diaphragm Connection to Ledger: Use 8 d ring shank or screws @ 3" max spacing. 81 L Ledger - SIPs Roof Panel to SIPs Wall. * Ledger Connection to SIPs Wall: Connect to SIPs wall panel with #14 Big Screw at max., 6" OC and within 3" of ends and splices. Big Screws shall be installed through both OSB faces of SIPs and with full embedment in ledger. Ledger Connection to Solid Wood: At solid wood beam, header or rim, connect ledger with SDS screws, same spacing as noted above, length as necessary for 1.5" min penetration into solid wood member. * SIPs Skin Nailing: Nail skins of roof SIPs to ledger w/ 8d @ 3" OC, each face. 90 FC Footing, Continuous * Retained Height: Maximum retained height (unbalanced fill) = 4'. * Stepping: Okay to step this footing as necessary for grade changes. All footing longitudinal rebar shall continue through beap of verses at diversion a changes. 	Beams Default sawn material is Doug Fir No 2 or better. Default glulam, LVL, PSL materials - see Standard Structural Specs herein. Default LSL is 1.5E, 2,300 psi, min Fb. Default wall connection: 3" bearing in pocket or on plate with min., 2 studs below. Default and post connection: LCE, ACE, EPCZ, ECCQ, or similar. Default mid-post connection: Hanger: HU, HUC, HUCQ or similar. Default beam to beam connection: Hanger: HU, HUC, HUCQ or similar. Default beam to beam connection: Hanger: HU, HUC, HUCQ or similar. Default beam to beam connection: Hanger: HU, HUC, HUCQ or similar. Befault seam to beam connection: Hanger: HU, HUC, HUCQ or similar. Default beam to beam connection: Hanger: HU, HUC, HUCQ or similar. Befault seam to beam connection: LPCZ, PCZ, CCQ, or similar. Base dots Alt 1 min., use Alt 2 min., use Connector (if blank use default, above) Notes 30B 5.5x16.5 glulam 31B, 32B 5.5x16.5 glulam 32B 4x6 34B 6x8 5.5x13.5 glulam 7x11.8 PSL full bearing on 72P. Post above to bear on this beam with default connector. 41B 1.75x11.8 LVL 42B 1.75x11.8 LVL 43B 1
 Max spacing of overhang lumber = 24". Max overhang (cantilever) length = 36", or less per Arch. Min size = 2x6 or larger per Arch in strong (tall) orientation. Overhang lumber shall bear on notched SIPs end lumber or other solid wood at face of wall. Support and connection of backspan end in SIPs panel shall ensure that OSB skins are not overstressed due to wind uplift, or live load or snow load on overhang. Min backspan length in SIPs roof panel = 2x overhang length. Less backspan may be used provided backspan end is positively connected to adequate lumber to resist all code-required forces. 	 Footing: Use min., 16" wide x 8" tall. Longitudinal rebar, use 2, #4 continuous, 3" from bottom. * Stemwall: Use min 6" thick. Vertical rebar, use #4 at all corners, wall ends, intersections, and at 24" OC, max, centered in wall, with alternating 6" bends at bottom footing rebar. Horizontal rebar, #4 top and bottom and at 24" OC max., centered. At doors, stemwall may be shortened or omitted. * Drains: Install footing drains and / or downspout drains per others and as required by code. 	Use HSS 6x4x1/4. At bottom weld 7"x12"x1/4" plate to end of 44B, bear on slab and connect with 4, 5/8" x 4" Titen 44B HD. At mid post, weld L4x4x3/8, 4" long, min., to side of 44B and lag to 71P with 5/8"x6" lag bolt. At top, weld min., 7"x9"x1/4" plate to end of 44B and bolt to 43B with 8, SDS 1/4 x 1.5. See Arch for details.
 Kor Namer Agentity: Good for Eh = 230 plf - seismic; Eh = 322 plf - wind. Max aspect ratio = 3:1. Shear Capacity: Good for Eh = 230 plf - seismic; Eh = 322 plf - wind. Max aspect ratio = 3:1. Framing: Trusses or rafters: 2x at 24" OC, max. Framing Connection at Support: Where connected to shear wall, connect per shear wall callout - top of wall. Where trusses or rafters connect to beam, use H2.5, or A34 with screws, or similar, typ. At ledger, connect per ledger callout. Sheathing: 7/16" min., OSB or CDX plywood. Sheathing: Use 8d at 6" edges, 12" field. Blocking: Not required except at supports and at connections to shear walls below. FD Floor Diaphragm Sheathing: With joists at 24" or 19.2" OC, use min., 24 oc rated, APA Sturd-I-Floor, either 3/4" species group 1, or 7/8" species group 4. May be OSB or plywood. Good for 130 psf, TL @ L/360 defl. Sheathing: With joists at 16" OC, use min., 16 oc rated, APA Sturd-I-Floor, min., 19/32" thick. May be OSB or plywood. Good for 245 psf TL @ L/360 defl. Sheathing: With joists at 16" OC, use min., 16 oc rated, APA Sturd-I-Floor, min., 19/32" thick. May be OSB or plywood. Good for 245 psf TL @ L/360 defl. Sheathing: Layout: Case 1 per IBC 2306.2.(1) Orient sheets continuous over two or more spans, with the long dimension across supports. 	 92 FT Footing, Thickened Slab Footing: Use a monolithically poured thickened slab: At interior locations, footing to be min., 8" tall x 16" wide at bottom. Height may include slab height if poured monolithically. At exterior locations footing to be min., 12" tall x 12" wide at bottom. Height may include slab height if poured monolithically. Longitudinal Rebar: At interior locations, use 2, #4 continuous, 3" from bottom. At exterior locations, use 2, #4 continuous, 3" from top and min., 1, #4 continuous 3" from bottom. At exterior locations, use 2, #4 continuous 2" from top and min., 1, #4 continuous 3" from bottom. At exterior locations, use with any use XPS or EPS rigid foam with min., 25 psi compressive strength under thickened slab footing. If used, provide and install per insulation manufacturer's recommendations. Slab on Grade Subgrade: Use structural fill or native material, compacted to 95% relative compaction. It is strongly recommended that all structural fill be checked by a geotechnical consultant. Underslab Insulation: May use XPS or EPS rigid foam with min., 25 psi compressive strength under slab. If used, provide and install per insulation manufacturer's recommendations. Slab on Grade Slab Thickness: Use 4" min. Reinforcement: Use any of the following: Min., #3 rebar at 24" OC, each way, centered in slab. Welded wire fabric, min., W2.9, 6"x6" (6 Ga.), centered in slab. Splices overlap 8" min. Fibermesh per manufacturer's recommendation. Helix micro rebar, min., 5 lbs. per cubic yard. * Control Joints: Maximum recommended spacing = 8'OC, each way. This is a non-structural item and 	Joists and Rafters Default rafter or deck joist to beam connection is con't or skip blocking and H2.5A, or H1, or A34 with screws. Framed roof overhangs, eaves, outriggers, etc. use IRC-compliant construction. Default sawn material is Doug Fir No 2 or better. Exposed to weather shall be Pressure Treated (PT) Default sawn material is Doug Fir No 2 or better. Exposed to weather shall be Pressure Treated (PT) Default awn face mount hanger is U, LU, LUS, or if sloped rafter use LRUZ. Default deck joist hanger is U or LU (not LUS) with galv screws, or galv TECO or similar nails. Default sawn top flange hanger is JBA, LB, BA, or B (weided app, use LB, BA, or B) Any national I-joist brand, equal or stronger may be substituted I-Joist roof overhangs, extensions, outriggers, and cantilevers shall per per manufacturer's recommendations. Default I-Joist face mount hanger is IUS or MIU Default I-Joist for flange hanger is ITS, HIT, or MIT Callout Min., use Alt 1 min., use Alt 2 min., use Connector (if blank use default, above) 60R 2x6 DF #1 @ 24* (see 80L callout for hanger ait.) 61J 2x6 @ 24* End 65J 11.8 TJI 110 @ 24* End Default material is Doug Fir No 2 or better. Default bottom connection on plate: 2, FC or 2, A34 with screws, or 4, 16d face nails.
 Naming: Grue, and connect with 8d ring shark names of #9 screws, at 6 edges, 12 field. * Blocking: not required except at supports (beams) and connections to shear walls below. H Header * Header: use min: 2x6 in "L" configuration; or 2- 2x4; or 4x4. * Trimmer: (a.k.a., Jack Stud) use min., 1- 2x, each end. * King stud: Use min., 1- 2x, each end, full height bottom plate to top plate. H Header * Header: use min: 2x10 in "L" configuration; or 2- 2x6; or 4x6. * Trimmer: (a.k.a., Jack Stud) use min., 1- 2x, each end. 	 may be changed or omitted by Owner or architectural designer. * Vapor Barrier: Suggest a min., 6 mil., plastic vapor barrier under interior slabs. This is a non-structural item and may be changed or omitted by Owner or architectural designer. 	Default bottom connection on concrete: PB, or AB, or ABU, or ABU, or CBSQ Alternate bottom connection on concrete: #5 rebar or 5/8" all-thread, epoxy 6" min. into post butt, and 6" min., embed in conc. Conc embed may be wet set or epoxy. Callout Min., use Alt 1 min., use Alt 2 min., use Connector (if blank use default, above) Notes 70P 2- 2x4 4x4 71P 3- 2x4 2- 2x6 4x6
 King stud: Use min., 1-2x, each end, full height bottom plate to top plate. H SIP Header - min 12" tall. Header: The wall SIP panel itself is the header. A spline may occur over the opening no closer than 6" from either edge of opening. Minimum header depth = 12". Or may use 21H or 22H. H SIP Header - min 12" tall. Header: The wall SIP panel itself is the header. No splines allowed over the opening. Minimum header depth = 12". Or may use 22H H InsuBeam Header Header: Use Premier InsuBeam II Header. Where end(s) of header thit roof diaphragm, okay to trim off top corner of header to match roof slope. Min., height of header end after trimming = 4". Trimmer: (a.k.a., Jack Stud) use min., 1- 2x, each end. For openings greater than 6-feet wide, use 2, 2x, each end. Header: use min: 5.5x12 glulam, or 5.25x11.8 PSL, or 3.5x14 PSL Trimmer: (a.k.a., Jack Stud) use min., 1- 2x, each end. King stud: Use min., 2- 2x, each end, full height bottom plate to top plate. 	This Table is for Seismic Design Category A-F with up to 3.5:1 A.R., per ICC - ES - 2233, 04/2019 A.R. = Aspect Ratio defined as heightwidth, height measured plate to plate, or opening height with full height vert. chord lumber at side of opening. Structural Shear Wall Callouts [©] - Copyright ConstructionCale, Inc (CCI) Typical Shear Wall Callout Symbol This symbol indicates a dedicated shear wall or panel, the type per callout belt Walls without this symbol are not dedicated shear wall sea use doe-standard co If a number is listed here it is the min. length of shear panel, ft. If "W,", construct the panels in this Wall with their : angth written on the plan p length written may be considered "NS", per the following If "NS", means Not a Shear Wall. Build per code minimum and manufacturer's SIPs city, Panel thick- either shear wind/ height ness, unless Spline Skin indicated at shear shear wind/ height ness, unless Spline Skin indicated at shear at all splines panels shear panel ft Top of Wall Top of wall Top of on floor soft of shear panel, ft. S 7/16" x 3" wide Single 2x SDS or similar	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Big screw at 9" max. thru flr SDS @ 5/8" j-bolt or Titen cavity w/ 9", or HD or 72/4 1.5" 16d @ MASA or embed to 4" MASA P plate below.

dec ol, r pa tire	licated shear or labled "N nel, ft. Wall per th	wall or S" are no is callou	panel, the ot dedica t, with m	e type per ted shear inimum i	• callout b walls - us ndividual	elow. e code-star panel leng	idard const ths indicate	truction. ed on plan.		
d :'l e :t'l :s)	Nail Edge / Field spac'g @ Stud spac'g, in.	Top Plate, min.	Top plate splice, min.	Sill plate & studs w/ edge nail'g	Block- ing at .unsup- ported edges	Top of wall to parallel framing or rim or rim blk'g.	Top of wall to perpen- dicular framing.	Bottom plate to framing.	Mud sill anchor to concrete	Conc. anchor max spc'g, w/ 4" min embed
'n	4/4@24 7/7@16	2- 2x	48" lap w/ 10- 16d	2x	none required	NA	H3, or H2.5A, or SDWC- 15600, @ 24" max	NA	5/8" j-bolt or 5/8" Titen HD, w/ 3" wshr. Or MASA or MASAP	72"

No. Date Appr **Revision Notes** EXPIRE 8/30/ 22 Engineer's seal is for structural items only. See S1 and S2 herein for structural plans, callouts, and specifications. Conflicts between architectural and structural plans: the more stringent shall control. RELEVANT CODES: 2018 IRC, 2018 WSEC, 2020 NEC SNOW LOAD = 25 PSF WIND LOAD = 90 MPH FROST DEPTH = 6" RADON = LOW | DESIGN DEGREE DAY (HEATING) = +25°F DRY BULB DESIGN DEGREE DAY (COOLING) = +76°F DRY BULB SHEET INDEX: SHT-1 = FLOOR PLANS, SCHEDULES SHT-2 = FOUNDATION PLAN, DETAILS SHT-3 = FLOOR & ROOF FRAMING PLANS SHT-4 = SECTION VIEWS SHT-5 = ELEVATIONS SHT-6 = ENGINEERING NOTES SHT-7 = ENGINEERING SKETCHES SHT-8 = ENGINEERING CALLOUTS SHT-9 = ELECTRICAL & VENT. PLANS SHT-10 = ENERGY CALCULATIONS SHT-11 = SITE PLAN Issue Notes No. Date **ENERGY** HOME PLANS Design Firm Zero-Energy Plans LLC 107 S. Main St. Ste. G201 Coupeville, WA 98239 (360) 969-2363 ted@zero-energyplans.com Tim Garrison 2316 Antone Way Anacortes, WA 98221 Errichetti Residence Cliff St., Block 8 Port Townsend, WA Sheet Title Engineering Callouts ect Manager Ted L. Clifton oject ID Custom Drawn By Ted L. Clifton 1/4" = 1' Reviewed By Sheet No. S-1B

4/28/21

CAD File Name MB-3 +

_____ of _____

Standard Structural Specifications[©] – Copyright, Tim K. Garrison, P.E.

BASIS OF DESIGN – APPLICABLE CODES:

Code. The designs herein are prepared in accordance with the 2018 IBC. Construction shall conform with the most recent building code adopted by the approving jurisdiction.

Calculations. The calculations included herein are only those required to ensure compliance with code. We do not intend to compute every structural element nor every load combination. Much of our analysis is "BI" (By Inspection.)

ABBREVIATIONS:

A: Area	IEBC: International Existing Building	REF: Reference, not actual
AC: Asphalt Concrete	Code	REQ or Reqd: Required
31: By Inspection	IRC: International Residential Code	ROW: Right Of Way
3RNG: Bearing (wall usually)	K: Kip (1,000 lbs.)	Rt: Right
E: Elastic modulus or Electrical	KSI: Kips per Square Inch	S: Section modulus
E): Existing	LVL: Laminated Veneer Lumber	SC: See Callout
CCI: ConstructionCale, Inc.	LSL: Laminated Strand Lumber	SD: Storm Drain
CIP: Cast in place concrete	Lt: Left	SIP: Structural Insulated Panel
CMU: Concrete Masonry Unit	NA: Not Applicable	SK: Sketch
CO: Callout or Cleanout	NB: Not Bearing	SOG: Slab On Grade
Conc: Concrete	NIC: Not Included	SPF: Spruce Pine Fir
Cont: Continuous	OC: On Center spacing	SS: Sanitary Sewer
DF: Douglas Fir	OSB: Oriented Strand Board	STAO: Shear Transfer Around Opening
HF: Hem Fir	PCF: Pounds per cubic foot	SP: SIPs shear wall
IVAC: Heating, Ventilation, and Air	PLF: Pounds per Lineal Foot	TYP: Typical
Conditioning	Ply: Plywood	UNO: Unless Otherwise specified
GW: Gypsum shear wall	PSL: Parallel Strand Lumber	elsewhere
Gyp: Gypsum wall board	PSF: Pounds per Square Foot	V or v: Shear (lbs) or unit shear (plf)
GLB: Glulam Beam	PSI: Pounds per Square Inch	respectively
: Moment of Inertia	PT: Pressure Treated with preservative	W: Wall, full length
BC: International Building Code	PW: Plywood or OSB shear wall	WWF: Welded Wire Fabric
CF: Insulated Concrete Form	RC: Relative Compaction	

LIMITED SCOPE OF CONSULTANT'S WORK:

Consultant. The consultant in responsible charge of the work indicated herein is Tim K. Garrison, P.E., doing business as ConstructionCalc, Inc., hereafter indicated as "CCI."

Scope of Consultant's Work. The scope of work of CCI is limited to structural analysis of a new singlefamily residence. CCI takes responsibility only for items specifically addressed in our drawings and calculations. Constructed items not specifically addressed herein shall be built per minimum code.

LOADS

Following are the loads used for the subject design / analysis:

- O Roof live: 20 psf.
- O Roof + ceiling dead, includes 3 psf for solar panels: 15 psf.
- O Roof snow: 25 psf
- O Uninhabitable attics with storage live: 20
- O Exterior wall dead: 10 psf O Interior wall dead: 7 psf

O Seismic Factors: Ss= 1.344, S1= 0.491

O Stairs and exits, residential, live: 40 psf

- O Seismic Des Category: "D"
- O Wind Exposure 'B', 3-sec gust: 110 mph.
- O Assumed allowable soil bearing pressure: 1,500 psf.

SINGLE PROJECT:

O Floor live: 40 psf O Floor dead: 15 psf

The calculations, drawings, notes, specifications, and / or tables prepared by CCI are valid only for the project indicated herein. These documents are not valid, are not applicable to, and shall not be used for any other project at any other location.

COMPETENT CONSTRUCTION PERSONNEL / SAFETY:

Only competent personnel familiar with construction and safety practices germane to the project shown herein should be employed to assemble and construct the work.

Contractor shall be responsible to comply with all OSHA and State Labor and Industries Standards Contractor assumes full responsibility as to construction methods used, safety provisions employed, and the finished as-built condition of the structure and related systems.

MATERIALS AND METHODS:

Provide and install all materials in accordance with manufacturer's requirements and recommendations. It is the contractor's responsibility to ensure all field personnel understand and adhere to this.

TEMPORARY SUPPORT AND BRACING:

Generat. Provide adequate temporary support to all walls, roofs, beams, columns, and floors during construction. Design of same is not included herein. Contractor or owner should check all temporarysupporting devices with a qualified person. Contractor shall be responsible for the adequacy of all temporary and/or permanent support systems.

FOOTINGS, FOUNDATIONS, SLABS ON GRADE:

Geotechnical Report: CCI is not aware of a geotechnical report for this project. CCI strongly recommends that a geotechnical report be performed by a qualified geotechnical engineer for all construction projects. Soils analysis and geotechnical engineering are not a specialty of CCI. CCI depends on others for the provision of soils data, which includes but is not limited to: allowable bearing capacity, liquefaction potential, slope stability, active and passive lateral pressures, internal friction angle, and cohesion. In the absence of a geotechnical report CCI will make assumptions regarding soil parameters, however, CCI takes no responsibility or liability for future settlement, or damage or injury due to earth movement or failure of any kind.

Structural Fill: "Structural Fill" shall be granular material conforming to local or state highway specifications for imported road base or sub base; or use sand or other clean granular materials no larger than pea gravel. All structural fill must be compacted per the following section.

Compaction: Place all fill materials in lifts not exceeding 8-inches. Compact using mechanical (vibratory or impact) methods. In paved areas and under structures, use structural backfill compacted to 95% relative compaction. In non-paved or non-footing areas use structural backfill or native backfill minus rocks, lumps, and organic matter, compacted to 92% relative compaction.

Where pipes enter and exit structures (distribution boxes, utility boxes, catch basins, manholes, etc.) use structural fill around the structure. Carefully place and compact to 95% relative compaction under and around all pipes.

When roots, rocks, or other undesirable materials cause over-excavation, fill over-excavation and compact per the above.

Foundations, Footings on Soil: All footings and foundations to bear on undisturbed existing soil or structural fill. All organic and deleterious material beneath footings and foundations to be removed and replaced with structural fill. Bottom of footings to be below locally prescribed frost zone, not less than 12". Slabs on Grade. Subgrade below slabs shall be similar to the above. A layer of free draining material and a

suitable vapor barrier (designed by others) are recommended for all interior slabs. Footing Drains. Footing drains, with washed drain rock or Mira Drain or equivalent extending to finished

grade, shall be provided at the base of all footings and retaining walls which will have earth placed against them. Footing drains shall be 4" perforated pipe routed downgradient to daylight, unless otherwise specified.

STANDARD CONCRETE:

Standard Concrete. Concrete for footings, slabs, and walls shall attain a minimum 28 day strength of f'c =2,500 psi unless otherwise noted on Plans. Minimum cement content = 5 sacks per cubic yard. Maximum water/cement ratio shall be 0.45. All materials shall be in accordance with ACI 318, latest edition. Mixing and placing of all concrete to be in accordance with IBC and ACI 304, latest edition.

Admixtures. Industry recognized and approved admixtures affecting set time, flowability, and / or waterproofing may be used provided the strength and durability of the concrete is not adversely affected. Air Entrainment. Provide 5% air entraining in all concrete exposed to the earth or weather.

Fly Ash. High quality fly ash or other natural pozzolan may be used in accordance with ASTM C618 with a corresponding reduction in cement content. Any such concrete shall obtain at least the strength and durability characteristics as Standard Concrete listed above.

CONCRETE REINFORCING:

Strength: Standard Footings, Stem walls, Slabs on Grade. Reinforcing bars (rebar) for standard footings, stem walls, and slabs on grade shall be grade 40 (Fy = 40 ksi) or better, unless otherwise specified in the Plans.

most recent ACI code adopted by the jurisdiction. Welded Wire Fabric. Unless otherwise specified, welded wire fabric (WWF) shall be W2.9, 6"x6" (6 Ga.), ASTM A-185. Splice by lapping one mesh +2" all sides.

Cover. Provide the following minimum cover:

Formed surfaces in direct contact with earth2"

Surfaces exposed to weather.....1-1/2" For slabs on grade, center the reinforcement in the slab unless otherwise specified.

BOLTS AND DOWELS IN CURED CONCRETE: General. This section shall apply to bolts and dowels installed in cured concrete using rotohammer

techniques. Minimum concrete embedment = 4-inches unless otherwise specified. Minimum distance to any edge or end of concrete = 3" from hole centerline unless otherwise specified. Existing Reinforcing. It is important that no existing rebars are drilled or cut during rotohammer operations. Location of existing reinforcing bars may be by non-destructive methods (pachometer, radar, or similar).

Washers. Use 3"x3"x.229" washers on all wood mud sill anchor bolts. Such washers may be slotted, with plate washer under the nut as allowed by the IBC. At non-mud sill locations, smaller washers may be used. Use a steel plate or malleable iron washer under nuts and the heads of all bolts that connect wood.

resist tension loads and shear loads. Install per manufacturer's recommendations.

Epoxy Systems. For bolts, use Simpson epoxy-tie bolt system with ET-HP or SET high strength epoxy, with zinc plated, A307 'all-thread' bolts as shown in the sketches. For dowels, use ET-HP or SET high strength epoxy and rebar as specified on the Plans and Callouts. Drilling of holes and installation shall be in strict accordance with epoxy manufacturer's recommendation. **CONVENTIONAL WOOD FRAMING:**

General Construction: Predrill all nail holes where required to avoid splitting. Connect all wood members per the Plans and applicable building code. Where Structural Plans do not specifically address a structural element, construct said element per minimum building code. Framing Material. All sawn framing lumber, not including beams, posts, and columns, shall be Spruce Pine Fir, Hem Fir, or Douglas Fir - Larch, Number 2 or better, unless otherwise shown. All sawn wood shall have moisture content less than 25%.

Beams and Posts. All sawn structural beams, headers, and posts shall be Doug Fir Larch No 2 or better, except where exposed to weather and specified as PT (Pressure Treated) may be Hem Fir No. 2 or better. Glulams, PSLs, LVLs, etc. shall be per Prefabricated Wood Products section below.

Nails: Nails called out herein are "common" sizes, i.e. 16d, 12d, 10d, 8d. Smaller diameter, similar length nail gun nails may be substituted provided 50% more pails are used. For example if 8, 16d are called out, the number of similar length .131 diameter nail gun nails required is 8*1.5 = 12. As another example if 16d nails are called out at 4" spacing, the spacing of similar length, narrower nail gun nails shall be 4/1.5 = 2.7". Shear Walls: Walls called out as shear walls on the Plan shall be constructed per the Structural Shear Wall Table herein using materials designated for lateral load resistance by nationally-approved manufacturers. All shear walls must be positively connected at top and bottom to diaphragms. Walls not specifically called out, or labled "NS" are not intended as shear walls and shall be built per minimum code.

Sheathing. "PW" walls, use plywood or OSB, minimum thickness and nailing as indicated in Shear Wall Table, oriented either direction. "GW" walls are drywall shear walls, use per Shear Wall Table. Sheathing Joints. Use blocking behind joints if indicated in the Shear Wall Table. With "PW" and "GW" walls, no sheathing joints are allowed within 2-feet in any direction of a door or window corner. Multiple Ply Members.

Trimmers, King Studs, Headers. Where more than one 2x is placed against another and used as a multiple ply king stud, trimmer, or header, connect all plies with 16d at 4" OC, staggered. Beams, Columns. Where more than one 2x, or LVL, or LSL is placed against another and used as a multiple ply beam or column, connect all plies with glue and 2, 16d at 4" spacing. Glue, Epoxy. Where specified, wood glue shall be commercial grade with minimum shear strength of 450

Epoxy used with wood dowels or drift pins shall be Simpson ET-HP, or other brand intended for wood use. Wood and dowel shall be clean and dry prior to epoxy installation. Window and Door Openings.

assumed non-load bearing and wall top plate may serve as the header. Trimmers, aka Jack Studs. Use size (or larger) per Structural Callouts. Concealed flange hanger of similar bearing length and capacity may be substituted for trimmer. King Studs. Unless otherwise shown on Plans use the following. These must be full-height, bottom plate to top plate, IE diaphragm to diaphragm.

* Opening less than 6' wide – use min., one king stud each end of header.

Discontinuous Top Plate. Where wall top plates are cut, omitted, or otherwise discontinuous at a header, the end of the header shall be connected to the remaining top plate beyond with a horizontal CS18 strap with minimum 12" length on the header and 12" length on the top plate beyond. Strap may be on top, inside, or outside of wall.

Anchor Bolts.

Shear wall anchor bolts connecting mud sills, use 5/8" diameter x 8" min embedment at the spacing shown in the Plans but never greater than 60" OC and within 12" of ends and corners, with 3" x 3" x .229" steel washers, wrench tight. Wet set anchor bolts shall have a hook or head on the embedded end. Rotohammered anchor bolts at the same spacing may be used in lieu of wet set - see specifications in previous section. An alternate to wet-set anchor bolts and washers may be Simpson MASA or MASAP at the same spacing specified for wet set anchor polts.

Non-shear wall anchor bolts shall be spaced a maximum of 72-inches and within 12-inches of ends and corners and shall be fitted with 2" steel plate washers. Use either 1/2" diameter x 8" min embedment wetset, or 1/2" Titen HD with 4" min embedment.

embedment, at 16" OC, unless otherwise shown.

directly exposed to weather. Pressure treating chemicals shall be inert, or otherwise non-reactive with metal connectors (including nails, bolts, framing connectors, etc.) or structural steel members. In certain cases non-pressure treated lumber may butt against concrete. In these cases use a layer of heavy, asphaltic-treated construction paper between wood and concrete.

Blocking / Bridging. Provide continuous blocking at all bearing locations. Provide full depth bridging or blocking at 8' OC max. in joist or rafters without continuous plywood diaphragm connection on the top. Framed floors which support posts shall be solidly blocked within the floor cavity to positively transfer post, column, or other concentrated loads through the floor to the supports beneath.

Bolts. Unless otherwise specified: Use washers on all bolts; tighten all bolts to a very snug wrench tight condition; use standard A307 bolts; for bolts in wood, drill the same diameter hole as the bolt; for bolts in steel drill holes 1/16" larger than the bolt diameter. Provide the following minimum edge distances between centerline of bolt and all edges of bolted wood, and between centerline of multiple bolts:

5/8 inch diameter bolts 3 inches 3/4 inch diameter bolts 3.75 inches

Minimum distance between edge of bolt and any edge of steel plate (angles, gussets, flanges, webs, etc.) shall be one inch.

Engineer shall specifically approve any bolted connection using less edge distance than shown above. Lag Bolts. All lag bolts greater in diameter than 1/4" shall have pilot holes pre-drilled. Size of pilot hole in threaded portion shall be 70% of the unthreaded shank diameter (or alternatively, 90% of the root diameter

Splicing, Bending. All reinforcing shall be spliced, detailed, bent, and supported in accordance with the

Non-Epoxy Systems. Use Simpson Titen HD where shown in the Plans. These anchors may be used to

psi at 28 days. Use Liquid Nails LN-940 or similar. Prep and apply per manufacturer's recommendations.

Header. Use minimum size as called out on Plans. All headers shall be installed with their tall dimension vertical. If header is less than 3 inches wide (I.E. a single 2x or single LVL) use a flat 2x nailed to the bottom of header in an "L" configuration with 16d at 4" max spacing. If no header is specified, the wall is

* Opening 6.1' wide to 9' wide – use min., two king studs each end of header.

* Opening 9.1' wide to 16' wide, use min., three king studs each end of header.

Non-shear wall anchors may be 0.145" diameter powder-actuated pins with 1-1/2" min concrete

Pressure Treated Lumber. Use pressure treated lumber in contact with concrete and / or soil, and when

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Structural Shear Wall Callouts – Copyright ConstructionCalc, Inc (CCI) Structural Shear Wall Callouts – Copyright ConstructionCalc, Inc (CCI) Typical Shear Wall Callout Symbol This symbol indicates a dedicated shear wall or panel, the type per callout below. Walls without this symbol are not dedicated shear walls - use code-standard construction Walls without this symbol are not dedicated shear walls - use code-standard construction If "W", construct the panels in this Wall with their length written on the plan per the length written may be considered "NS", per the following If "NS", means Not a Shear Wall. Build per code minimum and manufacturer's records Walls without the symbol are not a Shear Wall. Build per code minimum and manufacturer's records Structural Shear Wall Callout Symbol This symbol indicates a dedicated shear walls - use code-standard construction Structural Shear Wall Callout Symbol This symbol indicates a dedicated shear walls - use code-standard construction Structural Shear Wall Callout Symbol This symbol indicates a dedicated shear walls - use code-standard construction Structural Shear Wall with their length written on the plan per the Structural Shear Wall. Build per code minimum and manufacturer's records Structural Shear Wall. Build per code minimum and manufacturer's records Structural Shear Wall. Shear Wall. Build per code minimum and manufacturer's records Structural Shear Wall. Sh	ruction. is table. Panels without their ommendations.		ZERGENERGY
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LTS - Comparison of Baseline and Proposed Design <u>Component Performance</u>	e, Roccupancies Baseline			Proposed Design					
Over	U Area Doors U = 0.300 80 rhead Glazing U = 0.500 0	UA 0 24.0 0 0.0	0	U Area U 0.250 80 0	20.0 0.0	:	Heatin	g System Sizing Worksheet - Proposed Design Nearest Weather Station	
Ver Flat/Vau Wall (a	ertical Glazing U = 0.300 280 ulted Ceilings U = 0.027 1,470 (above grade) U = 0.056 2,468	84.0 39.7 138.2	0	.204 280 .021 1,470 .036 2,468	57.2 30.1 87.9			Indoor Design Temperature Outdoor Design Temperature Design Temperature Difference (ΔT)	
Floors over S Bala	er Crawlspace U = 0.029 0 Slab on Grade F = 0.540 176 W Grade Wall U = 0.042 0	0.0	0	0.305 176	0.0			Conditioned Floor Area	
Below	w Grade Slab $F = 0.570$	0.0		0	0.0			System Type	
	Target UA 10tal Target Credits	6.0		Proposed UA Total Proposed Credits UA Percent Reduction	7.5 from Table	es 406.2 and 406.3		Location of Ducts	
				Difference	132.1			Envelope Heat Load Sum of UA X∆T	
able R406.2 Fuel Normalization Credits								Air Leakage Heat Load ((Volume X 0.6) X∆T) X.018)) Building Design Heat Load	
em No. Full Descript	tion	Select Syste	em Type	Fuel Normalization Credits	Energy Credits	Total Credits		Air Leakage + Envelope Heat Loss Building and Duct Heat Load	
For an initial heating system using a heat pump that multisted in Table C403.3.2(1)C or C403.3.2(2) OR Air to v to provide both heating and cooling and are rated in an	neets tederal standards for the equipment water heat pump units that are configured accordance with AHRI 550/590. Heat pump	Heat Pump, air-to-aiı	r or air to water	1.0	6.5	7.5		For ducts located in unconditioned space: Sum of Building Heat L For ducts located in conditioned space or ductless: Sum of Buildin Maximum Heat Equipment Output	
with electric resistance or fossil-fuel supplemental heat "Heat Pump Supplementary Heat". Packaged Terminal tested value (See SBC Interpretation dated December	t requires compliance with WSEC 403.1.2 al Heat Pumps (PTAC-HP) requires an HSPF or 2020).							Building and Duct Heat Loss X 1.25 for heat pumps Building and Duct Heat Loss X 1.40 for all other systems	
ble R406.3 Energy Credits									
n No. Category	,	Select Options	Energy Credits	Brief Des	cription of Selected Opti 12ci walls / R-49 odv co	tions*			
Efficient Building Envelope		Option 1.6	2.0	R-10 Fully insulated slab	nov for c / 5 - 5 - 5 - 5				
Air Leakage Control and Efficient Ventilation		Option 3.3	0.5	Heat Pump: Closed loss	ground source or open	loop water source			
High Efficiency HVAC Distribution System		Not Selected	0.0		areand source of open l				
1 Efficient Water Heating		Not Selected	0.0			-			
5.6 Efficient Water Heating		Option 5.6	2.5	Split system heat pump	water heater with min UE	EF of 2.9			
Renewable Electric Energy	kWh	Not Selected	0.0	-					
Appliance Package		Not Selected	0.0	-					
*Please refer to WSEC 2018 Table R406.3 for compl	blete option descriptions	Total Energy Credits	6.5						
	Conditioned Floor Area, Proposed Design	2,095 sq ft							
MAL ENVELOPE DETAILS - Proposed Design	,	50.11					1		
MAL ENVELOPE DETAILS - Proposed Design	Classification	Bedium Dwelling Unit	ietti.xism			4/28/2021	/Users/ted	clifton2/Common Files/ZEP plans developing/Active ZEF	
Plan Component ID Description N Codel SF61 S Marvin Elevate 2gl. Full It. Cl/180 W Codel 1/4 Deco-Lite	Classification ns/Errichetti (Pt. Townsend)/Energy Calcs/WS ns/Errichetti (Pt. Townsend)/Energy Calcs/WS NS	Wedium Dwelling Unit SU_C3_20210216~Errich SU_C3_20210216~Errich Qt Feet 1 3 2 3 1 3 2 1 3 1 3	fidth H Inch Feet 3 0 6 3 0 6 3 0 6	eight Area Inch Area	UA 4.0 11.6 4.4 0.0	4/28/2021 Refer to WSEC R492 Refer to WSEC R492 Refer to WSEC R492	/Users/ted	clifton2/Common Files/ZEP plans developing/Active ZEP HVAC Calculation for UA Alto Project Name Address	
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Plan Component Iclifton2/Common Files/ZEP plans developing/Active ZEP Plans Plan Component ID Description N Codel SF61 S Marvin Elevate 2gl. Full It. Cl/180 V Codel 1/4 Deco-Lite In In In In <td>Classification ns/Errichetti (Pt. Townsend)/Energy Calcs/WS ns/Errichetti (Pt. Townsend)/Energy Calcs/WS Ref. U Custom 0.20 Custom 0.22 Cu</td> <td>Wedium Dwelling Unit SU_C3_20210216-Errich SU_C3_20210216-Errich 1 3 2 3 1 3 2 3 2 3 2 3 2 3 2 3 2 3 4 5 5 6 6 7 8 8 9 1 3 1 3 1 3 1 3 4 5 6 7 8 8 9 10 10 10 10 10 10 10</td> <td>Interference Hereit Interh Feet Interh Feet Interh Feet Interh Ge Interh Ge<!--</td--><td>eight Area Inch Area 0 20 0 40 0 20 0 20 0 40 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>UA 4.0 11.6 4.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td><td>4/28/2021 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482</td><td>/Users/tec</td><td>clifton2/Common Files/ZEP plans developing/Active ZEP HVAC Calculation for UA Alte Project Name Address Address Cit State Zip Code</td></td>	Classification ns/Errichetti (Pt. Townsend)/Energy Calcs/WS ns/Errichetti (Pt. Townsend)/Energy Calcs/WS Ref. U Custom 0.20 Custom 0.22 Cu	Wedium Dwelling Unit SU_C3_20210216-Errich SU_C3_20210216-Errich 1 3 2 3 1 3 2 3 2 3 2 3 2 3 2 3 2 3 4 5 5 6 6 7 8 8 9 1 3 1 3 1 3 1 3 4 5 6 7 8 8 9 10 10 10 10 10 10 10	Interference Hereit Interh Feet Interh Feet Interh Feet Interh Ge Interh Ge </td <td>eight Area Inch Area 0 20 0 40 0 20 0 20 0 40 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>UA 4.0 11.6 4.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td> <td>4/28/2021 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482</td> <td>/Users/tec</td> <td>clifton2/Common Files/ZEP plans developing/Active ZEP HVAC Calculation for UA Alte Project Name Address Address Cit State Zip Code</td>	eight Area Inch Area 0 20 0 40 0 20 0 20 0 40 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0	UA 4.0 11.6 4.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4/28/2021 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482 Refer to WSEC F482	/Users/tec	clifton2/Common Files/ZEP plans developing/Active ZEP HVAC Calculation for UA Alte Project Name Address Address Cit State Zip Code	
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ENGINEERING SPECIF

Capacity and Efficiency Ratings

Model	Full Load Heating	Full Load	Full Load	Full Load Cooling		
Model	Capacity (MBTUH)	COP @ 47°F	COP @ 17°F	Capacity (MBTUH)	IPLV	NPLV
AV030	31.3	5.12	3.24	19.8	17.8	21.2
AV060	55.0	4.83	3.44	37.9	16.6	18.6

Notes:

1. Heating leaving water temperature = 95°F. Full load capacity at 47°F.

2. Cooling leaving water temperature = 44°F. Full load capacity at 95°F. 3. IPLV (Integrated Part Load Value) is a cooling efficiency rating for a typical season, calculated using a weighted average with full load and three part load conditions to simulate a seasonal energy efficiency ratio that is more realistic than a steady state EER, especially for variable speed equipment.

4. NPLV (Non-Standard Part Load Value) is for load temperatures outside of design conditions (typically higher leaving load temperatures in cooling, when dehumidification is not needed).

5. Air-to-Water heat pumps do not currently have an AHRI certification standard. Above efficiencies are designed to gauge performance compared to other heating/cooling

Outdoor Electrical Data

Madal	Voltage Code	60 Hz Power		Fan		Compressor	Drive	Min	
Model		Volts	Phase	HP	FLA	CMCC⁵	LRA	Amps	HAC
AV030	1	208/230	1	1/5	0.85	50.0	20.6	26.6	45
AV060	1	208/230	1	1/5	0.85	50.0	36.0	45.9	80
Notes:									

1. All line and low voltage wiring must adhere to the National Electrical Code and local codes, whichever is the most stringent.

2. In determining the correct supply wire size and maximum length, reference NFPA 70, Section 310. If the calculation is close to the maximum allowable ampacity of a particular wire size, use the next size up. This will ensure that no adverse effects occur, such as light dimming and/or shortened compressor life.

3. All fuses class RK-5. 4. Min/Max Voltage: 208/230/60 = 187-252

5. CMCC (Compressor Maximum Output Current Limit): This value is the maximum output of the dirve (inverter) to the compressor. Although not significant to the installation (continue to use MCA for wire/breaker sizing), this value is a required

Indoor Electrical Data

listing for the unit electrical data.

Model	Voltage Code	60 Hz	60 Hz Power Immersion Heater		Internal Pump		Min Circuit	Max		
WOUEI		Volts	Phase	Volts	kW	FLA	HP	FLA	AMPS	HACR
EMD000	1	208/230	1	N/A Dual Fuel		1/4	1.5	3.4	15	
EME000	1	208/230	1	230	9	39.1	1/4	1.5	52.7	60

1. All line and low voltage wiring must adhere to the National Electrical Code and local codes, whichever is the most stringent.

2. In determining the correct supply wire size and maximum length, reference NFPA 70, Section 310. If the calculation is close to the maximum allowable ampacity of a particular wire size, use the next size up. This will ensure that no adverse effects occur, such as light dimming and/or shortened compressor life. 3. All fuses class RK-5.

4. Min/Max Voltage: 208/230/60 = 187-252

EAV-EM Submittal

Model AV030

Notes:

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ENGINEERING SPECIFICATIONS

Unit Performance Data Tables

Full Load Op	ull Load Operation								
	Heatin	g Mode			Cooling Mode				
	LLT=95 [°] F	LLT=113 [°] F	LLT=131 [°] F		LLT=45 [°] F	LLT=64 [°] F	LLT=77 [°] F		
OAT °F	Capacity	Capacity	Capacity	OAT °F	Capacity	Capacity	Capacity		
	(MBTUH)	(MBTUH)	(MBTUH)		(MBTUH)	(MBTUH)	(MBTUH)		
-13	16.3	16.8	17.2	59	23.8	25.0	25.8		
5	22.9	23.2	23.6	68	24.4	25.8	26.7		
17	27.2	27.5	27.8	75	24.1	26.2	27.1		
32	31.3	31.3	31.3	77	22.6	25.8	26.9		
47	31.3	31.3	31.3	82	22.0	25.1	27.3		
59	31.3	31.3	31.3	95	21.7	25.5	27.3		
75	31.3	31.3	31.3	110	18.6	21.1	22.7		

Model AV060

ull Load O	peration							
	Heatin	g Mode		Cooling Mode				
	LLT=95 [°] F	LLT=113 [°] F	LLT=131 [°] F		LLT=45 [°] F	LLT=64 [°] F	LLT=77 [°] F	
OAT °F	Capacity	Capacity	Capacity	OAT °F	Capacity	Capacity	Capacity	
	(MBTUH)	(MBTUH)	(MBTUH)		(MBTUH)	(MBTUH)	(MBTUH)	
-13	29.7	31.7	33.8	59	46.5	50.1	51.9	
5	39.5	41.3	43.3	68	45.2	50.3	52.7	
17	46.2	47.8	49.8	75	44.2	50.3	52.9	
32	53.6	54.1	54.9	77	43.6	49.9	52.7	
47	55.0	55.0	55.0	82	42.6	48.9	52.5	
59	55.0	55.0	55.0	95	37.5	43.2	47.5	
75	55.0	55.0	55.0	110	33.7	38.4	41.5	

OAT=Outdoor Air Temperatures LLT=Leaving Load Temperature

Notes:

Antifreeze Percen	Antifreeze Percentages by Volume (Fernox Alphi-11 propylene glycol)								
Concentration	25%	30%	35%	40%	45%				
Protection ^o F	12.2	5	-0.4	-7.6	-16.6				
Burst Point ^o F	0	-20	-40	-60	-70				

Heating Capacity/Efficiency Correction Factors for Propylene Glycol							
Propylene Glycol % by Volume		Leaving Load Temp (deg F)					
	85	100	115	130			
20%	0.974	0.984	0.987	0.990			
25%	0.963	0.973	0.976	0.979			
30%	0.951	0.954	0.956	0.959			
35%	0.935	0.945	0.948	0.950			
40%	0.918	0.928	0.930	0.933			

Cooling Capacity/Efficie	Cooling Capacity/Efficiency Correction Factors for Propylene Glycol					
Pronylene Glycol % by Volume	Leaving Load	Temp (deg F)				
	45	50				
20%	0.966	0.967				
25%	0.955	0.956				
30%	0.943	0.944				
35%	0.928	0.929				
40%	0.911	0.912				

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EAV-EM Submittal



netti (Pt. Townsend)/Energy Calcs/WSU_C3_20210216~Errichetti.xlsm



ories	1	2	3
elded	25.8	20.6	18.1
ormal	21.5	17.2	15.1
osed	19.4	15.5	13.5

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50%	
-29.2	
-80	

No.	Date	Appr	Revision Notes	
RELE SNO	EVANT CODI W I OAD = 2	ES: 2018 25 PSF	IRC, 2018 WSEC, 2020 NEC	
WIN	D LOAD = 9	0 MPH		
FKUS RAD	ON = LOW	0		
DESI		DAY (HEA	TING) = +25°F DRY BULB	
SHE	ET INDE	X:	-rror DRIDULD	
SHT	r-1 = FLC	OOR PLA	ANS, SCHEDULES	
SHT-2 = FOUNDATION PLAN, DETAILS				
SHT-3 = FLOOR & ROOF FRAMING PLANS				
SHI-4 = SECTION VIEWS SHT-5 = ELEVATIONS				
SHI	$\Gamma - 6 = ENC$	GINEERII	NG NOTES	
SHT	Γ-7 = ENG	GINEERII	NG SKETCHES	
SHT	-8 = ENC	GINEERI	NG CALLOUTS	
SH1	[-9] = ELE		L & VENT. PLANS	
SHI	1 - 10 = EI 1 - 11 = SI	TF PI A	ALCULATIONS	
0				
No	Date		Issue Notes	
No.	Date		Issue Notes	
No.	Date		Issue Notes	
No.	Date	R	Issue Notes	
No.		R	Issue Notes	
No.	Date	R	Issue Notes	
No.	Date	R R P L	Issue Notes	
No.		P L /	Issue Notes	
No.	Date	P L Zero-En	Issue Notes	
No.	Date	PL/	Issue Notes	
No.		PL Cero-En 107 S. M Coupe	Issue Notes	
No.	Date	PL 2ero-En 107 S. M Coupe 9-2363 te	Issue Notes	
No.	Date	PL Zero-En 107 S. M Coupe 9-2363 te	Issue Notes	
No.	Date	PL Cero-En 107 S. M Coupe 0-2363 te	Issue Notes	
No.	Date	P L P L Cero-En 107 S. M Coupe 0-2363 te	Issue Notes	
No.	Date	P L P L Cero-En 107 S. M Coupe 0-2363 te	Issue Notes	
No.	Date	PL Cero-En 107 S. M Coupe 0-2363 te D-2363 te	Issue Notes	
No.	Date	P L P L Zero-En 107 S. M Coupe 0-2363 te D-2363 te	Issue Notes	
No.	Date	PL PL Cero-En 107 S. M Coupe 0-2363 te Derriche Cliff Port T	Issue Notes	
No.	Date	PL PL Cero-En 107 S. M Coupe 0-2363 te D-2363 te D-2363 te	Issue Notes	
No.	Date	Erriche Coupe 0-2363 te UA C	Issue Notes	
No.	Date	P L Cero-En 107 S. M Coupe 0-2363 te Cliff Port T UA C	Issue Notes Issue	
No.	Date	ero-En 107 S. M Coupe 0-2363 te Dort T UA C	Issue Notes Figure State Figure State Fig	
No.	Date	PL Cero-En 107 S. M Coupe 0-2363 te Cliff Port T UA (n n Sc Sh	Issue Notes	
No.	Date	PL Cero-En 107 S. W Couper 0-2363 te Cliff Port T UA C	Issue Notes	
No.	Date	PL Cero-En 107 S. W Couper 0-2363 te Description Cliff Port T UA C	Issue Notes	
No.	Date	PL Cero-En 107 S. W Couper 0-2363 te Description Cliff Port T UA C	Issue Notes	